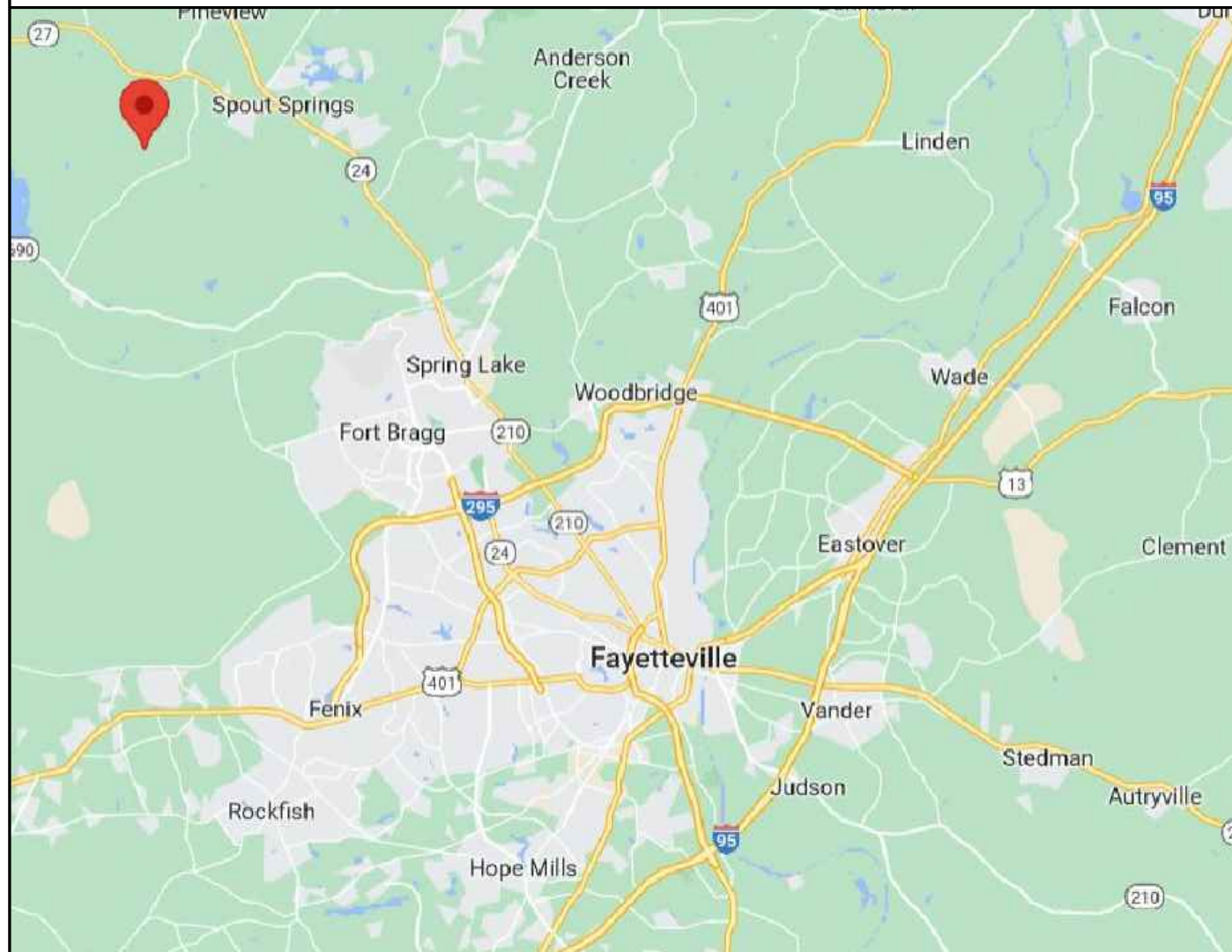


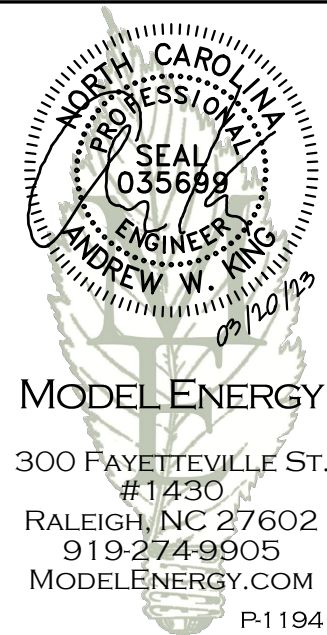
VICINITY MAP



PROPERTY MAP



ENGINEER:



MODEL ENERGY

300 FAYETTEVILLE ST.
#1430
RALEIGH, NC 27602
919-274-9905
MODELENERGY.COM
P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM

9.200 kW DC INPUT
7.600 kW AC EXPORT

Ricardo Montoya
31 Roping Ln,
Cameron, NC 28326

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CLIENT:



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| ISSUED FOR: | DATE: |
| CONSTRUCTION | 03/20/23 |

PROJECT INFORMATION

PV1.1

SCOPE OF WORK

(23) HANWHA Q-CELL Q.PEAK DUO BLK ML-G10+ 400
(1) SOLAREEDGE SE7600H-US
(23) SOLAREEDGE S440
ROOF MOUNT: PROTEA BRACKET
MOUNTING RAILS: UNIRAC SM LIGHT RAIL

SITE CONDITION

ASCE 7-10 WIND SPEED - 117 MPH
EXPOSURE CATEGORY - B
RISK CATEGORY - II
SNOW LOAD - 10 LBS/SQFT

SHEET INDEX

PV1.1 - 1.2 PROJECT INFORMATION
PV2.1 SITE INFORMATION
PV3.1 STRUCTURAL INFORMATION
PV4.1 - 4.2 ELECTRICAL INFORMATION
PV5.1 - 5.5 LABELS, DETAILS & SPECS

INTERCONNECTIONS TYPE

LOAD SIDE TAP

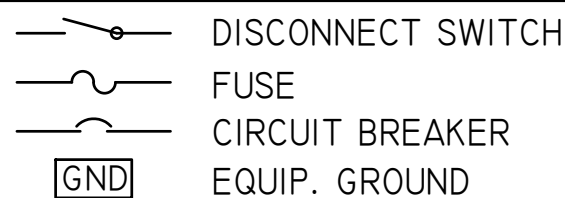
CODE REFERENCES

2017 NATIONAL ELECTRIC CODE
2018 NORTH CAROLINA FIRE CODE
2018 NORTH CAROLINA BUILDING CODE
2018 NORTH CAROLINA RESIDENTIAL CODE

UTILITY COMPANY

CENTRAL EMC

LEGEND





AURORA SOLAR SHADE ANALYSIS

RICARDO MONTOYA
 31 ROPING LN,
 CAMERON, NC 28326
 9.200 KW DC STC
 7.600 KW AC

MODULES:

(23) HANWHA Q-CELL Q.PEAK DUO BLK ML-G10+ 400

INVERTERS:

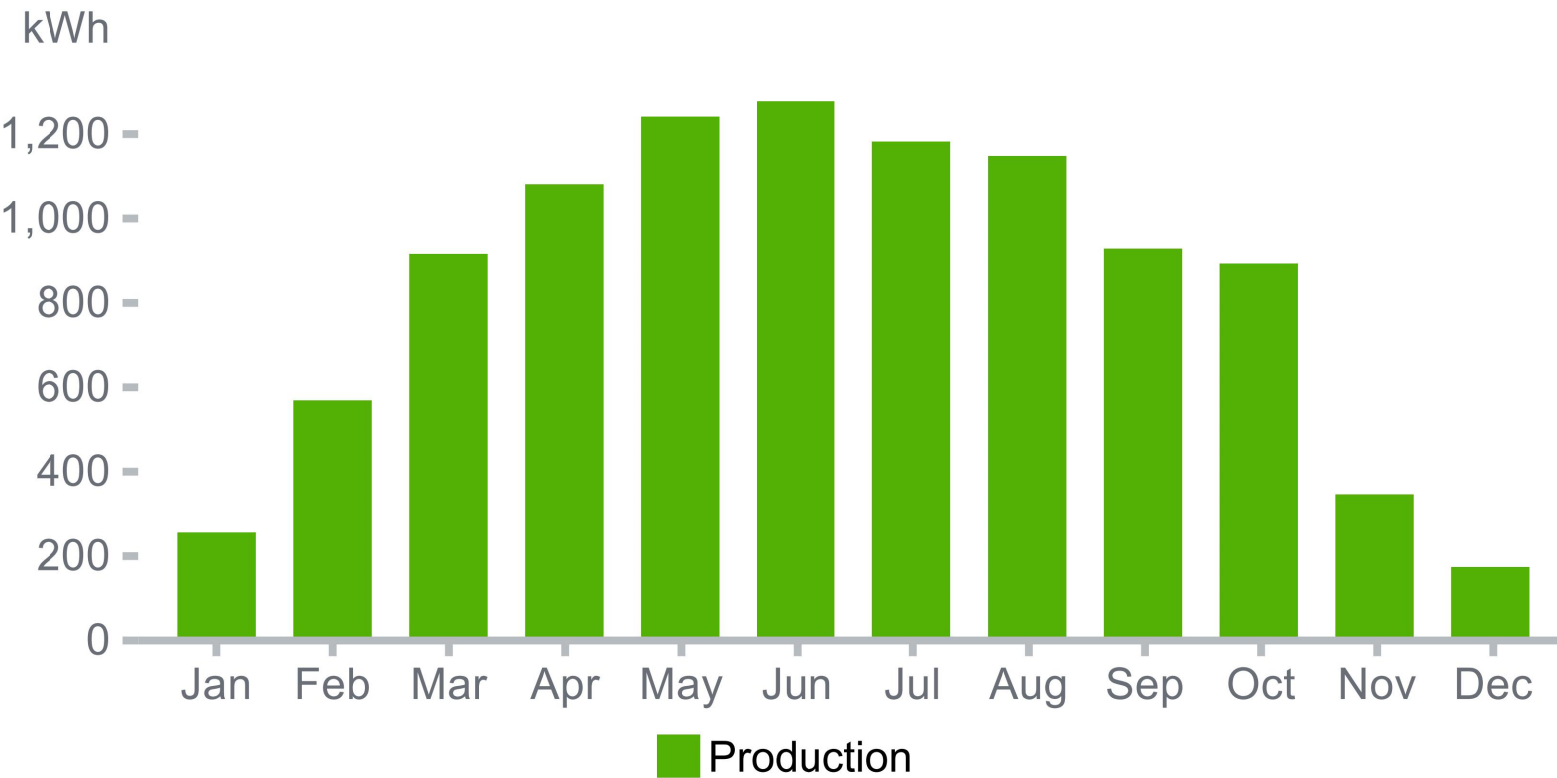
(1) SOLAREEDGE SE7600H-US

POWER OPTIMIZERS:

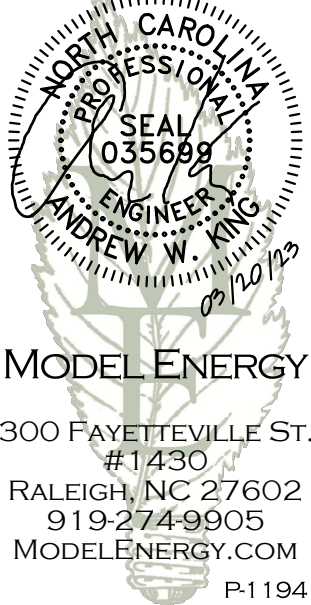
(23) SOLAREEDGE S440

THE SYSTEM HAS A FIRST YEAR ANNUAL ENERGY PRODUCTION OF: 10,011 KWH/YEAR

THIS PRODUCTION IS AN ESTIMATE PREPARED USING AURORA SOLAR SHADE ANALYSIS SOFTWARE. ALL SOLAR SYSTEMS EXPERIENCE PERFORMANCE DEGRADATION OVER THEIR LIFETIME. THIS IS USUALLY APPROXIMATELY 1% PER YEAR, BUT VARIES BASED ON EQUIPMENT USED AND ENVIRONMENTAL CONDITIONS.



ENGINEER:



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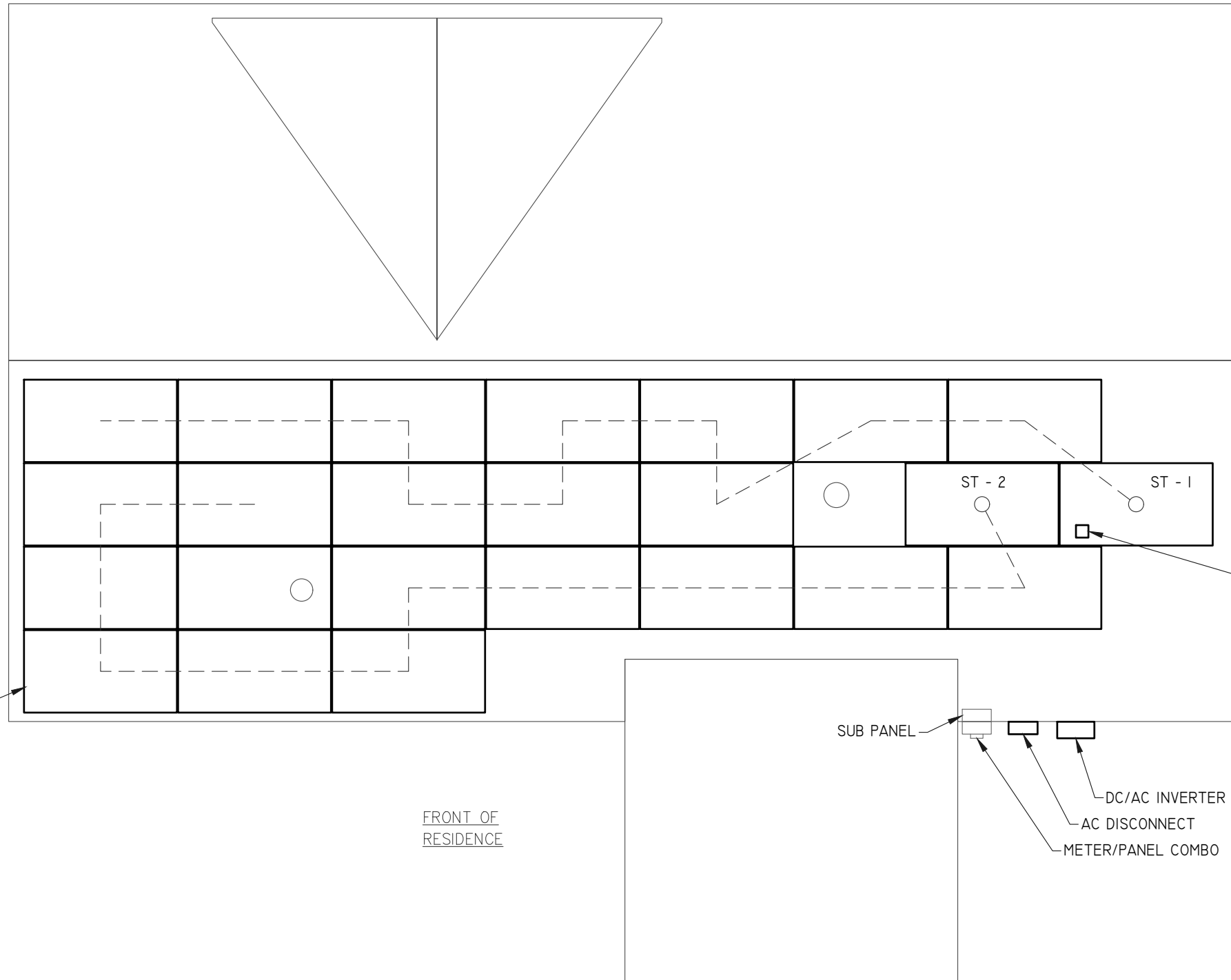
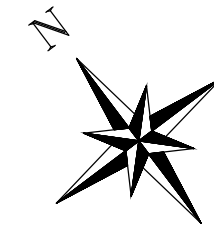
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PROJECT INFORMATION

PV1.2



PV MODULE (TYP.)

FRONT OF
RESIDENCE

SUB PANEL

DC/AC INVERTER
AC DISCONNECT
METER/PANEL COMBO

JUNCTION BOX

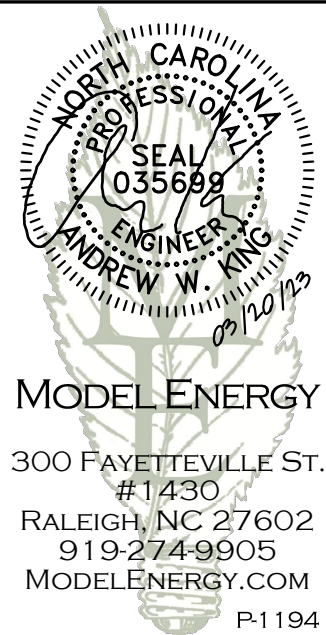
ST - 2

ST - 1

NOTE: PROVIDE ADDITIONAL JUNCTION BOXED AS REQUIRED TO COMBINE MODULES ON DIFFERENT ARRAYS INTO A SINGLE STRING

1 SITE PLAN
SCALE: 3/16" = 1' - 0"

ENGINEER:



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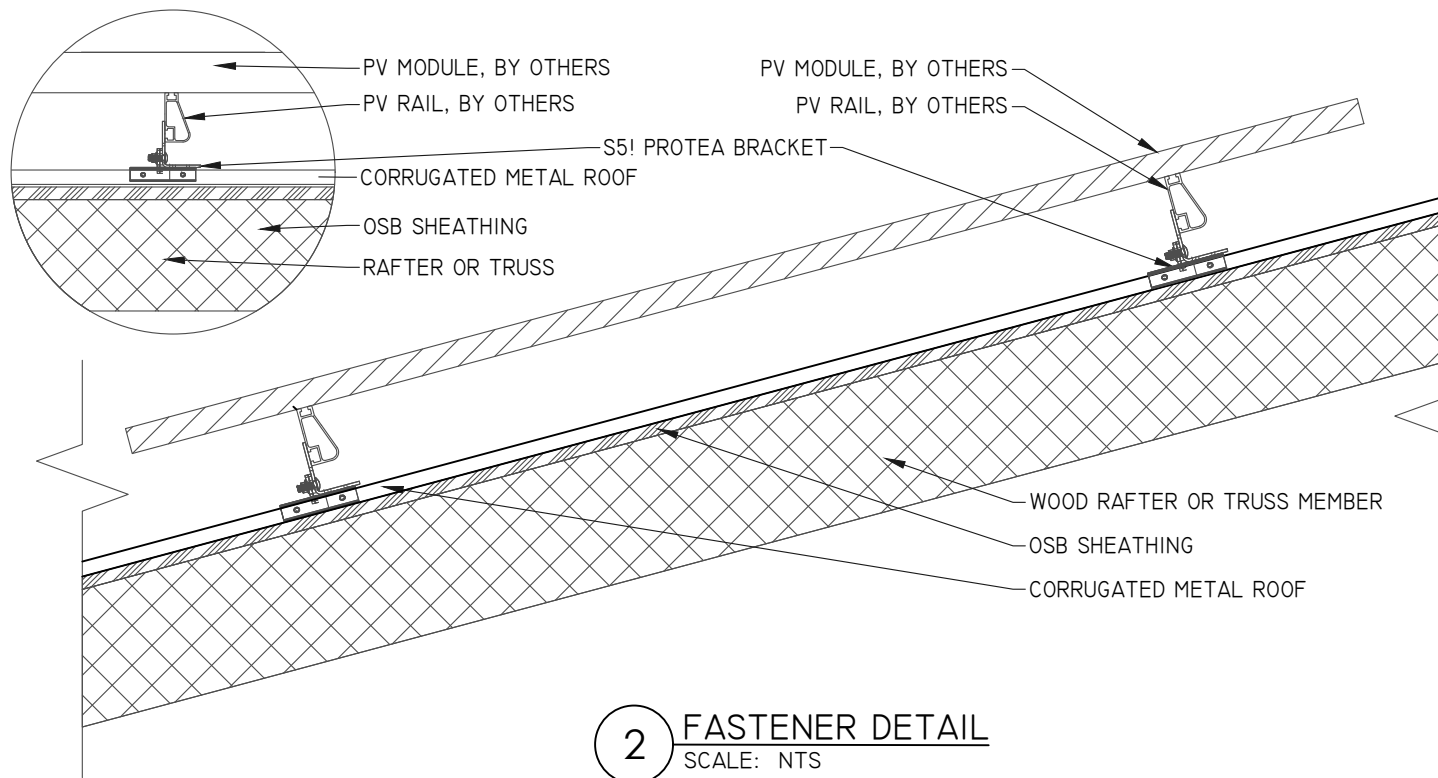


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SITE INFORMATION

PV2.1



2 FASTENER DETAIL
 SCALE: NTS

| ARRAY "A" SUMMARY | |
|-------------------|-----------|
| # MODULES | 23 |
| # ROOF MOUNTS | 108 |
| RAIL LENGTH | 292 FT. |
| ARRAY AREA | 486 SQFT. |
| ARRAY WEIGHT | 1258 LBS. |
| AZIMUTH @ SN | 217° |
| TILT ANGLE | 10° |

| MOUNTING RAILS | |
|----------------|---------------|
| MAKE | UNIRAC |
| MODEL | SM LIGHT RAIL |
| MATERIAL | ALUMINUM |
| WEIGHT | 0.49 LBS/SQFT |
| SPACING | 34" |

| ROOF "A" ZONES: | | | |
|-----------------|-----------------------------|--|-----|
| ALL ZONES | MAX. RAIL OVERHANG = | | 12" |
| □ ZONE 1 | MAX. FASTENER SPAN ZONE 1 = | | 60" |
| ▨ ZONE 2 | MAX. FASTENER SPAN ZONE 2 = | | 24" |
| ▩ ZONE 3 | MAX. FASTENER SPAN ZONE 3 = | | 12" |

| PV MODULES | |
|------------|----------------------------|
| MAKE | HANWHA Q-CELL |
| MODEL | Q.PEAK DUO BLK ML-G10+ 400 |
| WIDTH | 41.1" |
| LENGTH | 74.0" |
| THICKNESS | 1.26" |
| WEIGHT | 48.5 LBS |

STATEMENT OF STRUCTURAL COMPLIANCE

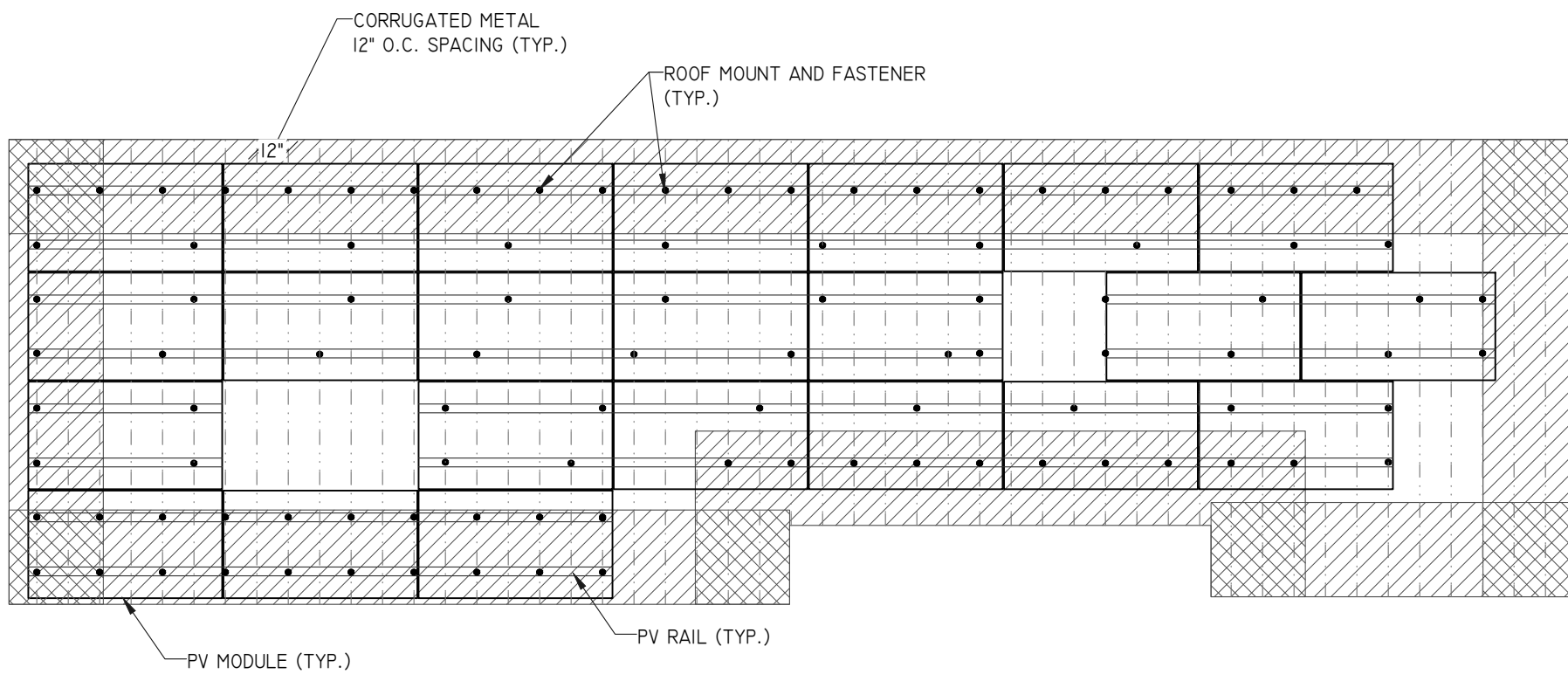
THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PURPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

SIGNED: *Andrew W. King*
 NAME: ANDREW W. KING, PE
 TITLE: PROFESSIONAL ENGINEER

| ROOF MOUNT & FASTENER | |
|-----------------------|----------------|
| ROOF MOUNT: | |
| MAKE | S-5! |
| MODEL | PROTEA BRACKET |
| MATERIAL | ALUMINUM |
| FASTENER | |
| MAKE | GENERIC |
| MODEL | BI-METAL |
| MATERIAL | 304 SS |
| SIZE | 6MM X 25MM |
| GENERAL | |
| WEIGHT | 3 LBS |
| FASTENERS PER MOUNT | 4 PER MOUNT |
| MAX. PULL-OUT FORCE | 546 LBS. |
| SAFETY FACTOR | 2 |
| DESIGN PULL-OUT FORCE | 273 LBS. |

| ROOF "A" LOADING | |
|-------------------|----------------|
| GROUND SNOW LOAD: | 10 LBS./SQFT. |
| LIVE LOAD: | 20 LBS./SQFT. |
| DEAD LOAD: | |
| ROOFING | 3.9 LBS./SQFT. |
| PV ARRAY | 3.0 LBS./SQFT. |
| TOTAL | 6.9 LBS./SQFT. |
| WIND LOAD: | |
| UPLIFT ZONE 1 | -31.4 LBS/SQFT |
| UPLIFT ZONE 2 | -51.7 LBS/SQFT |
| UPLIFT ZONE 3 | -77.7 LBS/SQFT |
| DOWNWARD | 18.5 LBS/SQFT |
| FASTENER LOAD: | |
| UPLIFT ZONE 1 | -269 LBS |
| UPLIFT ZONE 2 | -177 LBS |
| UPLIFT ZONE 3 | -133 LBS |
| DOWNWARD | 158 LBS |

| ROOF "A" SUMMARY | |
|------------------|------------------|
| STRUCTURE: | |
| TYPE | TRUSS |
| MATERIAL | SOUTHERN PINE #2 |
| SIZE | 2" X 4" |
| SPACING | 24" |
| EFF. SPAN | 14'-7" |
| PITCH | 3/12 |
| DENSITY | 30 LBS./CU.FT. |
| DECKING: | |
| TYPE | OSB |
| MATERIAL | WOOD COMPOSITE |
| THICKNESS | 7/16 |
| WEIGHT | 1.6 LBS./SQFT. |
| ROOFING: | |
| TYPE | CORRUGATED METAL |
| MATERIAL | STEEL |
| WEIGHT | 1.5 LBS./SQFT. |



1 ROOF "A" PLANAR VIEW
 SCALE: 3/16" = 1' -0"

ENGINEER:

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 7.600 kW AC EXPORT

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CLIENT:

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| ISSUED FOR: | DATE: |
| CONSTRUCTION | 03/20/23 |
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| | |

STRUCTURAL INFORMATION

PV3.1

| PV MODULES | |
|--------------------------------|----------------------------|
| MAKE | HANWHA Q-CELL |
| MODEL | Q.PEAK DUO BLK ML-G10+ 400 |
| TECHNOLOGY | MONO-CRYST. |
| NOM. POWER (P _{nom}) | 400 WATTS |
| NOM. VOLT. (V _{mp}) | 37.13 VOLTS |
| O.C. VOLT. (V _{oc}) | 45.30 VOLTS |
| MAX. SYS. VOLT. | 1000 V (UL) |
| TEMP. COEF. (V _{tc}) | -0.27 %/°C |
| NOM. CURR. (I _{mp}) | 10.77 AMPS |
| S.C. CURR. (I _{sc}) | 11.14 AMPS |
| MAX. SERIES FUSE | 20 AMPS |

| DC/AC INVERTER | |
|-----------------|-------------|
| MAKE | SOLAREDEGE |
| MODEL | SE7600H-US |
| TECHNOLOGY | TRANS-LESS |
| DC INPUT: | |
| MAX. POWER | 11800 WATTS |
| MAX. VOLT | 480 VOLTS |
| NOM. VOLT. | 400 VOLTS |
| MAX. CURRENT | 20 AMPS |
| MAX. SCC | 45 AMPS |
| STRINGS INPUTS | 2 STRINGS |
| AC OUTPUT: | |
| RATED POWER | 7600 WATTS |
| MAX. POWER | 7600 WATTS |
| NOM. VOLT. | 240 VOLTS |
| MAX. CURR. | 32 AMPS |
| GFP (Y/N) | YES |
| RPP (Y/N) | YES |
| GFCI (Y/N) | YES |
| AFCI (Y/N) | YES |
| DC DISC. (Y/N) | YES |
| RAPID SHUTDOWN | AUTOMATIC |
| FUSE RATING | 15 AMPS |
| PROTECT. RATING | NEMA 4X |

| MODULE OPTIMIZER | |
|-------------------|---------------|
| MAKE | SOLAREDEGE |
| MODEL | S440 |
| DC INPUT: | |
| RATED POWER | 440 WATTS |
| VOLT. RANGE | 8-60 |
| MAX. SCC | 14.5 AMPS |
| DC OUTPUT: | |
| MAX. CURRENT | 15 AMPS |
| MAX. VOLT. | 60 VOLTS |
| MAX. SYSTEM VOLT. | 1000 VOLTS |
| MIN. STRING | 8 OPTIMIZERS |
| MAX. STRING | 25 OPTIMIZERS |
| MAX. POWER | 5700 WATTS |

| JUNCTION BOX | |
|--------------|-----------|
| MAKE | SOLADECK |
| MODEL | 0783-3R |
| PRO. RATING | NEMA 3R |
| VOLT. RATING | 600 VOLTS |
| AMP RATING | 120 AMPS |
| UL LISTING | UL 50 |

| TAG | CURRENT CARRYING CONDUCTORS | | | | GROUNDING CONDUCTORS | | | | CONDUIT/RACEWAY | | | | NOTES |
|-----|-----------------------------|--------|----------|------------|----------------------|--------|----------|------------|-----------------|------|------------|----------|-------|
| | QTY. | SIZE | MATERIAL | INSULATION | QTY. | SIZE | MATERIAL | INSULATION | QTY. | SIZE | MATERIAL | LOCATION | |
| C1 | 4 | 10 AWG | COPPER | PV WIRE | 1 | 6 AWG | COPPER | BARE WIRE | - | - | - | FREE AIR | 1 |
| C2 | 4 | 10 AWG | COPPER | THWN-2 | 1 | 10 AWG | COPPER | THWN-2 | 1 | 1/2" | FMC/EMT/MC | EXT/INT | 2,4 |
| C3 | 3 | 8 AWG | COPPER | THWN | 1 | 10 AWG | COPPER | THWN | 1 | 3/4" | NOTE 5 | EXTERIOR | 2,4,5 |
| C4 | 3 | 8 AWG | COPPER | THWN | 1 | 6 AWG | COPPER | THWN | 1 | 3/4" | NOTE 5 | EXTERIOR | 2,4,5 |

NOTES:

1. MANUFACTURER PROVIDED, UL LISTED WIRING HARNESS FOR USE ON EXPOSED ROOFS
2. CONDUIT SIZE SHOWN IS CODE MINIMUM. LARGER SIZES ARE ALLOWED.
3. EXISTING CONDUCTORS, FIELD VERIFY
4. EQUIPMENT TERMINAL RATING SHALL BE A MINIMUM OF 75°C AT BOTH END OF CONDUCTOR
5. PVC, EMT, ROMEX, LFNMC & FMC ARE ACCEPTABLE WHEN USED IN ACCORDANCE WITH ARTICLES 330, 334, 348, 350, 352, 356, & 358 OF THE 2017 NEC

| AC DISCONNECT | |
|----------------|-----------|
| MAKE | GENERIC |
| MODEL | N/A |
| ENCL. RATING | NEMA 3R |
| VOLT. RATING | 240 VOLTS |
| AMP RATING | 60 AMPS |
| UL LIST. (Y/N) | YES |
| FUSED (Y/N) | YES |
| FUSE RATING | 40 AMPS |

NOTES:

- LOAD-BREAK RATED
- VISIBLE OPEN
- LOCKABLE IN OPEN POSITION
- INSTALL ADJACENT TO METER
- DISCONNECT TO BE READILY ACCESSIBLE TO UTILITY COMPANY PERSONNEL AT ALL TIMES

| SUB PANEL (EXISTING) | |
|----------------------|-----------|
| MAKE | N/A |
| MODEL | N/A |
| ENCL. RATING | NEMA 3R |
| VOLT. RATING | 240 VOLTS |
| BUS RATING | 200 AMPS |
| UL LIST. (Y/N) | YES |
| MAIN BREAKER (Y/N) | YES |
| BREAKER RATING | 200 AMPS |

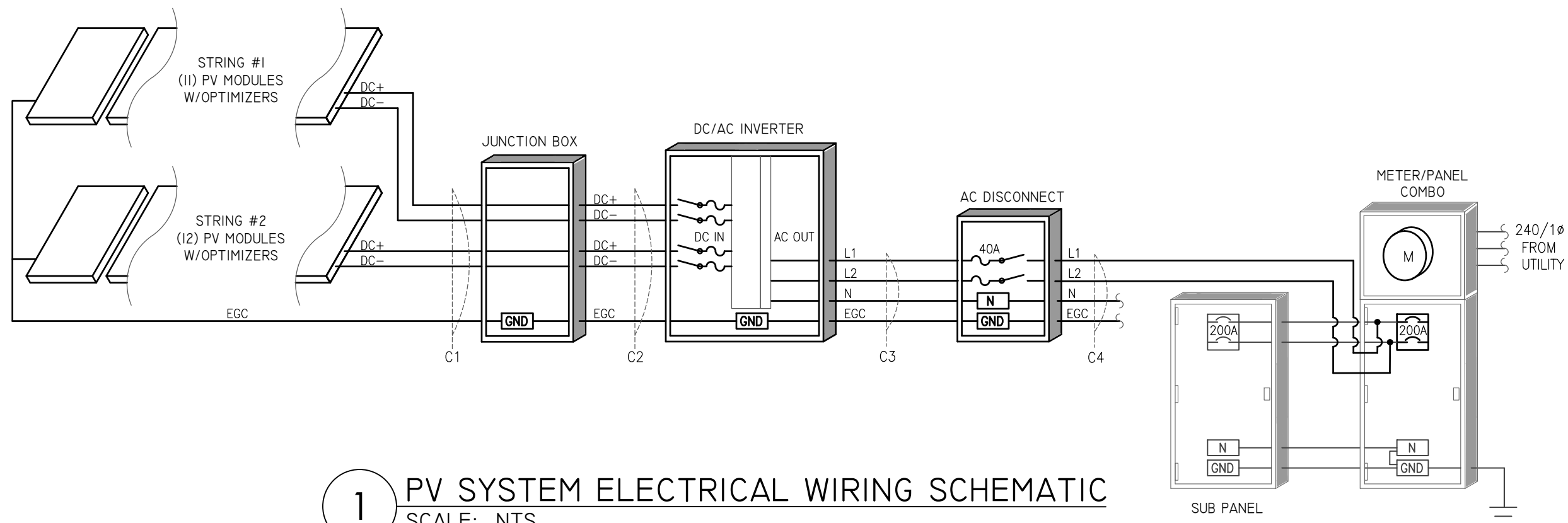
NOTES:

- SUB PANEL FED VIA FEED THROUGH LUGS

| METER/PANEL COMBO (EXISTING) | |
|------------------------------|-----------|
| MAKE | N/A |
| MODEL | N/A |
| ENCL. RATING | NEMA 3R |
| VOLT. RATING | 240 VOLTS |
| BUS RATING | N/A |
| UL LIST. (Y/N) | YES |
| MAIN BREAKER (Y/N) | YES |
| BREAKER RATING | 200 AMPS |

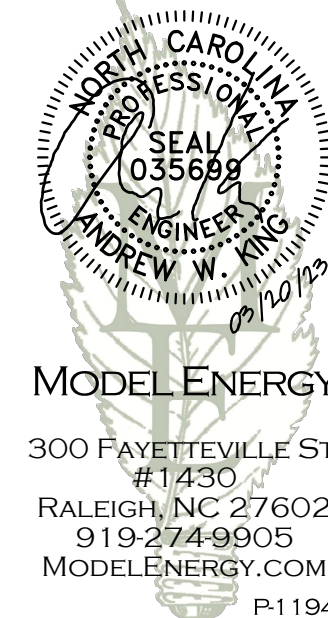
NOTES:

- BACK-FEED SOLAR OUTPUT VIA FEEDER TAP INSIDE OF METER/DISCONNECT COMBO
- SUB PANEL FED VIA FEED THROUGH LUGS
- MAIN BREAKER SERVES AS SERVICE DISCONNECT



1 PV SYSTEM ELECTRICAL WIRING SCHEMATIC
SCALE: NTS

ENGINEER:



JOB TITLE:

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ISSUED FOR: CONSTRUCTION
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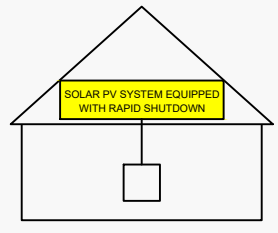
ELECTRICAL INFORMATION

PV4.1

EQUIPMENT LABELS

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)
PLACE WITHIN 3FT OF SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATIONS OF RAPID SHUTDOWN SWITCHES

WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31 (G)(3)&(4)
PLACE ON ALL JUNCTION BOXES, EXPOSED RACEWAYS, AND OTHER WIRING METHODS EVERY 10' AND ON EVERY SECTION SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

NEC 690.56 (C)(3)
PLACE ON RAPID SHUTDOWN SWITCH OR EQUIPMENT WITH INTEGRATED RAPID SHUTDOWN *REFLECTIVE*

PV SYSTEM DISCONNECT

NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

NEC 705.12 (B)(3)
PLACE ON ALL EQUIPMENT THAT IS SUPPLIED BY BOTH POWER SOURCES

EQUIPMENT LABEL NOTES

1. LABELS SHOWN ARE 1/2 THEIR ACTUAL REQUIRED SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.

WARNING

FED BY MULTIPLE POWER SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING UTILITY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR

NEC 705.12 (B)(2)(3)(c)
PLACE ADJACENT TO BACK-FED BREAKER

WARNING

ELECTRIC SHOCK HAZARD

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

NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE

MAXIMUM VOLTAGE 600 VDC
MAX CIR. CURRENT 30 AMPS

NEC 690.53
PLACE ON ALL DC DISCONNECTING MEANS

PHOTOVOLTAIC POWER SOURCE

OPERATING AC VOLT. 240 VAC
MAXIMUM OPERATING AC OUTPUT CURRENT 32 AMPS

NEC 690.54
PLACE ON INTERCONNECTION DISCONNECTING MEANS

WARNING

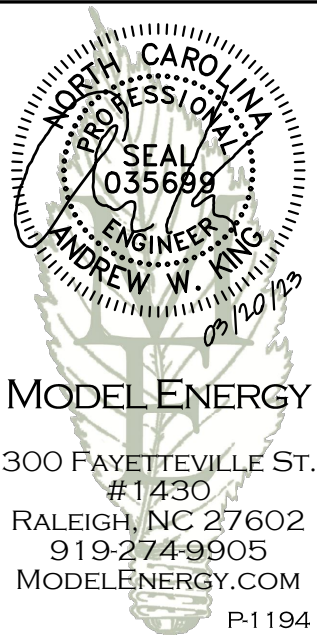
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

NEC 705.12 (B)(2)(3)(b)
PLACE ADJACENT TO BACK-FED BREAKER

CONSTRUCTION NOTES

1. ALL WORK AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL, STATE, AND LOCAL CODES AND ORDINANCES
2. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS
3. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS
4. THE PHOTOVOLTAIC SYSTEM SHALL NOT EXCEED 600 VOLTS OR 800 AMPS
5. EACH ELECTRICAL APPLIANCE SHALL BE PROVIDED WITH A NAMEPLATE GIVING THE IDENTIFYING NAME AND THE RATING IN VOLTS AND AMPERES, OR VOLTS AND WATTS. IF THE APPLIANCE IS TO BE USED ON A SPECIFIC FREQUENCY OR FREQUENCIES, IT SHALL BE SO MARKED. WHERE MOTOR OVERLOAD PROTECTION EXTERNAL TO THE APPLIANCES IS REQUIRED, THE APPLIANCE SHALL BE SO MARKED
6. WHERE APPLICABLE, GROUNDING ELECTRODE CONDUCTOR TO BE CONTINUOUS. GROUNDING CRIMPS TO BE IRREVERSIBLE
7. IN ONE- AND TWO-FAMILY DWELLINGS, LIVE PARTS IN PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OVER 150 VOLTS TO GROUND, SHALL ONLY BE ACCESSIBLE TO QUALIFIED PERSONS WHILE ENERGIZED.
8. PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
9. EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT
10. WHERE ALL TERMINALS OF A DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECT
11. A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED BY THE INSTALLED AT THE DC DISCONNECT MEANS
12. A PERMANENT PLAQUE OR DIRECTORY, DENOTING ALL ELECTRIC POWER SOURCES SERVING THE PREMISES, SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT LOCATIONS OF ALL POWER PRODUCTION SOURCES.
13. A PERMANENT PLAQUE OR DIRECTORY SHALL BE PROVIDED DENOTING THE LOCATIONS OF THE SERVICE DISCONNECT MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECT MEANS IF THEY ARE NOT LOCATED AT THE SAME LOCATION.
14. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC SECTION 690.4 (C)

ENGINEER:



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ELECTRICAL
INFORMATION

PV4.2

Q.PEAK DUO BLK ML-G10 SERIES



385-405 Wp | 132 Cells
20.6% Maximum Module Efficiency

MODEL Q.PEAK DUO BLK ML-G10
Q.PEAK DUO BLK ML-G10.4



Breaking the 20% efficiency barrier

QANTUM DUO Z technology with zero gap cell layout boosts module efficiency up to 20.6%.



Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology¹ and Hot-Spot Protect.



Extreme weather rating

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



Innovative all-weather technology

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



A reliable investment

Inclusive 12-year product warranty and 25-year linear performance warranty².



The most thorough testing programme in the industry

Qcells 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.

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

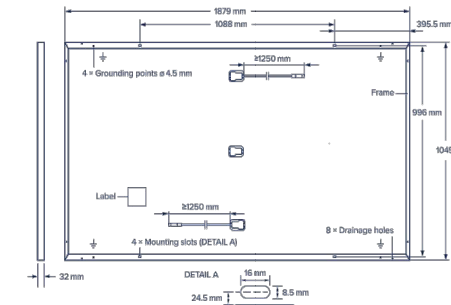
The ideal solution for:



Q.PEAK DUO BLK ML-G10 SERIES

Mechanical Specification

| | |
|--------------|--|
| Format | 1879 mm × 1045 mm × 32 mm (including frame) |
| Weight | 22.0 kg |
| Front Cover | 3.2 mm thermally pre-stressed glass with anti-reflection technology |
| Back Cover | Composite film |
| Frame | Black anodised aluminium |
| Cell | 6 × 22 monocrystalline Q.ANTUM solar half cells |
| Junction box | 53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes |
| Cable | 4 mm ² Solar cable; (+) ≥ 1250 mm, (-) ≥ 1250 mm |
| Connector | Stäubli MC4; IP68 |



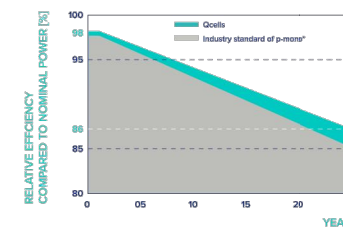
Electrical Characteristics

| POWER CLASS | | 385 | 390 | 395 | 400 | 405 |
|---|----------------------|--------|--------|--------|--------|--------|
| MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5 W/-0 W) | | | | | | |
| Power at MPP ¹ | P _{MPP} [W] | 385 | 390 | 395 | 400 | 405 |
| Short Circuit Current ¹ | I _{SC} [A] | 11.04 | 11.07 | 11.10 | 11.14 | 11.17 |
| Open Circuit Voltage ¹ | V _{OC} [V] | 45.19 | 45.23 | 45.27 | 45.30 | 45.34 |
| Current at MPP | I _{MPP} [A] | 10.59 | 10.65 | 10.71 | 10.77 | 10.83 |
| Voltage at MPP | V _{MPP} [V] | 36.36 | 36.62 | 36.88 | 37.13 | 37.39 |
| Efficiency ¹ | η [%] | ≥ 19.6 | ≥ 19.9 | ≥ 20.1 | ≥ 20.4 | ≥ 20.6 |

| | | | | | | |
|---|----------------------|-------|-------|-------|-------|-------|
| MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ² | | | | | | |
| Power at MPP | P _{MPP} [W] | 288.8 | 292.6 | 296.3 | 300.1 | 303.8 |
| Short Circuit Current | I _{SC} [A] | 8.9 | 8.92 | 8.95 | 8.97 | 9.00 |
| Open Circuit Voltage | V _{OC} [V] | 42.62 | 42.65 | 42.69 | 42.72 | 42.76 |
| Current at MPP | I _{MPP} [A] | 8.35 | 8.41 | 8.46 | 8.51 | 8.57 |
| Voltage at MPP | V _{MPP} [V] | 34.59 | 34.81 | 35.03 | 35.25 | 35.46 |

¹Measurement tolerances P_{MPP} ± 3%; I_{SC}; V_{OC} ± 5% at STC; 1000 W/m², 25 ± 2°C, AM 1.5 according to IEC 60904-3 • ²800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

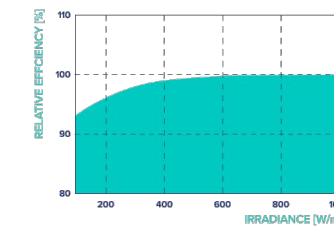


At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

^{*}Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

| | | | | | |
|---|---------|-------|--|-----------|--------|
| Temperature Coefficient of I _{SC} | α [%/K] | +0.04 | Temperature Coefficient of V _{OC} | β [%/K] | -0.27 |
| Temperature Coefficient of P _{MPP} | γ [%/K] | -0.34 | Nominal Module Operating Temperature | NMOT [°C] | 43 ± 3 |

Properties for System Design

| | | | | |
|-----------------------------|----------------------|-----------|---|---------------|
| Maximum System Voltage | V _{sys} [V] | 1000 | PV module classification | Class II |
| Maximum Reverse Current | I _r [A] | 20 | Fire Rating based on ANSI/UL 61730 | C/TYPE 2 |
| Max. Design Load, Push/Pull | [Pa] | 3600/2660 | Permitted Module Temperature on Continuous Duty | -40°C - +85°C |
| Max. Test Load, Push/Pull | [Pa] | 5400/4000 | | |

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016. This data sheet complies with DIN EN 50380.

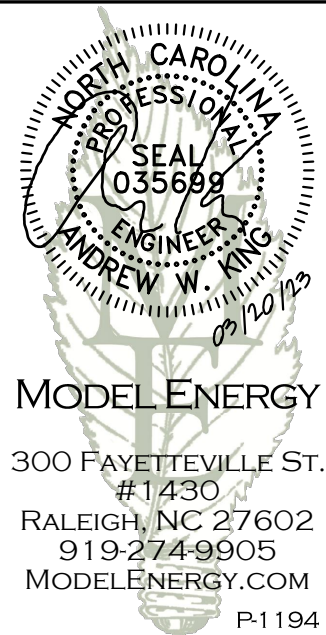


Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS GmbH Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | TEL +49 (0)3494 66 99-23444 | FAX +49 (0)3494 66 99-23000 | EMAIL sales@q-cells.com | WEB www.qcells.com



ENGINEER:



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RALEIGH, NC 27602
919-274-9905
MODELENERGY.COM
P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM

9.200 kW DC INPUT
7.600 kW AC EXPORT

Ricardo Montoya

31 Roping Ln,
Cameron, NC 28326

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DATE: 03/20/23

LABELS,
DETAILS & SPECS

PV5.1

Specifications subject to technical changes © Qcells Q.PEAK DUO BLK ML-G10 series_385-405_2022-06_Rev02_EN

Power Optimizer For Residential Installations

S440, S500



POWER OPTIMIZER

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detected abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

solaredge.com



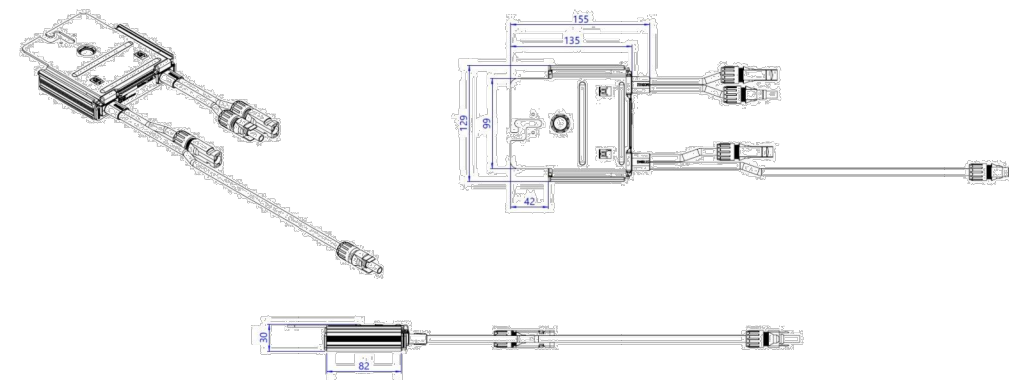
Power Optimizer For Residential Installations S440, S500

| | S440 | S500 | UNIT |
|---|--|--------------------|---------|
| Rated Input DC Power ⁽¹⁾ | 440 | 500 | W |
| Absolute Maximum Input Voltage (Voc) | | 60 | Vdc |
| MPPT Operating Range | | 8 - 60 | Vdc |
| Maximum Short Circuit Current (Isc) of Connected PV Module | 14.5 | 15 | Adc |
| Maximum Efficiency | | 99.5 | % |
| Weighted Efficiency | | 98.6 | % |
| Overtoltage Category | | II | |
| OUTPUT DURING OPERATION | | | |
| Maximum Output Current | | 15 | Adc |
| Maximum Output Voltage | | 60 | Vdc |
| OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF) | | | |
| Safety Output Voltage per Power Optimizer | | 1 | Vdc |
| STANDARD COMPLIANCE | | | |
| EMC | FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011 | | |
| Safety | IEC62109-1 (class II safety), UL1741 | | |
| Material | UL94 V-0, UV Resistant | | |
| RoHS | Yes | | |
| Fire Safety | VDE-AR-E 2100-712:2013-05 | | |
| INSTALLATION SPECIFICATIONS | | | |
| Maximum Allowed System Voltage | | 1000 | Vdc |
| Dimensions (W x L x H) | | 129 x 155 x 30 | mm |
| Weight (including cables) | | 655 / 1.5 | gr / lb |
| Input Connector | | MC4 ⁽²⁾ | |
| Input Wire Length | | 0.1 | m |
| Output Connector | | MC4 | |
| Output Wire Length | | (+) 2.3, (-) 0.10 | m |
| Operating Temperature Range ⁽³⁾ | | -40 to +85 | °C |
| Protection Rating | | IP68 / NEMA6P | |
| Relative Humidity | | 0 - 100 | % |

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
 (2) For other connector types please contact SolarEdge
 (3) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

| PV System Design Using a SolarEdge Inverter | | Single Phase HD-Wave | Three Phase | Three Phase for 277/480V Grid | |
|---|------------|----------------------|----------------------|-------------------------------|---|
| Minimum String Length (Power Optimizers) | S440, S500 | 8 | 16 | 18 | |
| Maximum String Length (Power Optimizers) | | 25 | 50 | 50 | |
| Maximum Nominal Power per String ⁽⁴⁾ | | 5700 | 11250 ⁽⁵⁾ | 12750 ⁽⁶⁾ | W |
| Parallel Strings of Different Lengths or Orientations | | | Yes | | |

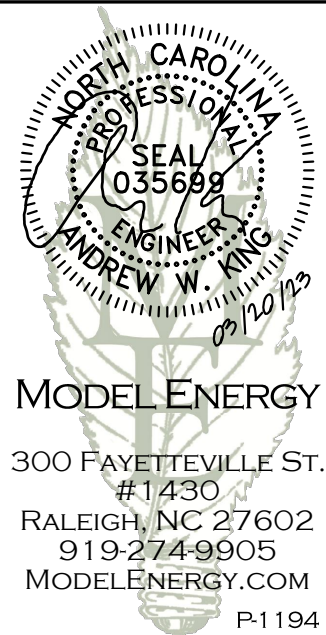
(4) If the inverters rated AC power \leq maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>
 (5) For the 230/400V grid: it is allowed to install up to 13,500W per string when the maximum power difference between each string is 2,000W
 (6) For the 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W
 (7) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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CE RoHS

ENGINEER:



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NEW SOLAR PV SYSTEM

9.200 kW DC INPUT
 7.600 kW AC EXPORT

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 DATE: 03/20/23

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EQUIPMENT SPEC SHEETS

PV5.2

Single Phase Inverter with HD-Wave Technology

for North America

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



12-25
YEAR
WARRANTY

INVERTERS

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)

solaredge.com



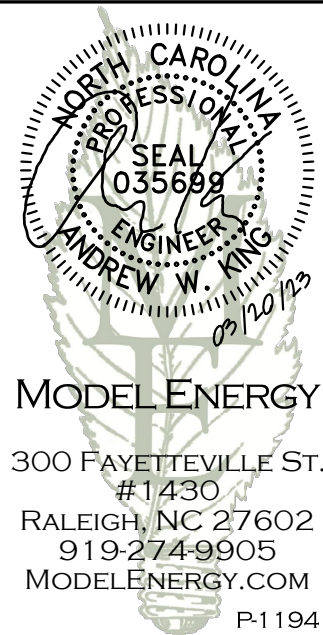
Single Phase Inverter with HD-Wave Technology for North America

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 | 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 ⁽¹⁾ | | | | | | | 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 | |
| GFDI Threshold | 1 | | | | | | | A | |
| Utility Monitoring, Islanding Protection, Country Configurable Thresholds | Yes | | | | | | | | |
| INPUT | | | | | | | | | |
| 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 ⁽²⁾ | 8.5 | 10.5 | 13.5 | 16.5 | 20 | 27 | 30.5 | Adc | |
| Maximum Input Current @208V ⁽²⁾ | - | 9 | - | 13.5 | - | - | 27 | Adc | |
| Max. Input Short Circuit Current | 45 | | | | | | | Adc | |
| Reverse-Polarity Protection | Yes | | | | | | | | |
| Ground-Fault Isolation Detection | 600k Ω Sensitivity | | | | | | | | |
| Maximum Inverter Efficiency | 99 | 99.2 | | | | 99 @ 240V 98.5 @ 208V | | % | |
| CEC Weighted Efficiency | 99 | | | | | | | % | |
| Nighttime Power Consumption | < 2.5 | | | | | | | W | |
| ADDITIONAL FEATURES | | | | | | | | | |
| Supported Communication Interfaces | RS485, Ethernet, ZigBee (optional), Cellular (optional) | | | | | | | | |
| Revenue Grade Data, ANSI C12.20 | Optional ⁽³⁾ | | | | | | | | |
| Rapid Shutdown - NEC 2014 and 2017 690.12 | Automatic Rapid Shutdown upon AC Grid Disconnect | | | | | | | | |
| STANDARD COMPLIANCE | | | | | | | | | |
| Safety | UL1741, UL1741 SA, UL1599B, CSA C22.2, Canadian AFCEI according to T.I.L. M-07 | | | | | | | | |
| Grid Connection Standards | IEEE1547, Rule 21, Rule 14 (HI) | | | | | | | | |
| Emissions | FCC Part 15 Class B | | | | | | | | |
| INSTALLATION SPECIFICATIONS | | | | | | | | | |
| AC Output Conduit Size / AWG Range | 1" Maximum / 14-6 AWG | | | | 1" Maximum / 14-4 AWG | | | | |
| DC Input Conduit Size / # of Strings / AWG Range | 1" Maximum / 1-2 strings / 14-6 AWG | | | | 1" Maximum / 1-3 strings / 14-6 AWG | | | | |
| Dimensions with Safety Switch (HxWxD) | 17.7 x 14.6 x 6.8 / 450 x 370 x 174 | | | | 21.3 x 14.6 x 7.3 / 540 x 370 x 185 | | | | in / mm |
| Weight with Safety Switch | 22 / 10 | 25.1 / 11.4 | 26.2 / 11.9 | 38.8 / 17.6 | | | lb / kg | | |
| Noise | < 25 | | | | <50 | | | | dBA |
| Cooling | Natural Convection | | | | | | | | |
| Operating Temperature Range | -13 to +140 / -25 to +60 ⁽⁴⁾ (-40°F / -40°C option) ⁽⁵⁾ | | | | | | | °F / °C | |
| Protection Rating | NEMA 4X (Inverter with Safety Switch) | | | | | | | | |

⁽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 values stated
⁽³⁾ Revenue grade inverter P/N: SExxxxH-US000NNC2
⁽⁴⁾ For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>
⁽⁵⁾ -40 version P/N: SExxxxH-US000NNU4

ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

9.200 kW DC INPUT
7.600 kW AC EXPORT

Ricardo Montoya
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EQUIPMENT
SPEC SHEETS

PV5.3

S-5!® The Right Way

The right way to attach almost anything to metal roofs!

ProteaBracket™

ProteaBracket™ is the most versatile attachment solution on the market, fitting most metal trapezoidal sheet profiles with and without intermediate insulation. It features an adjustable attachment base and multiple solar module attachment options (illustrated on back) to accommodate varying widths and heights. There are no messy sealants to apply and no chance for leaks; the ProteaBracket comes with factory-applied, adhesive rubber sealant to ensure quick installation and a weather-proof fit.

The ProteaBracket is mounted directly onto the crown of the panel, straddling the profile. No surface preparation is necessary; simply wipe away excess oil and debris, align, and apply. Secure ProteaBracket through all 6 pre-punched holes.

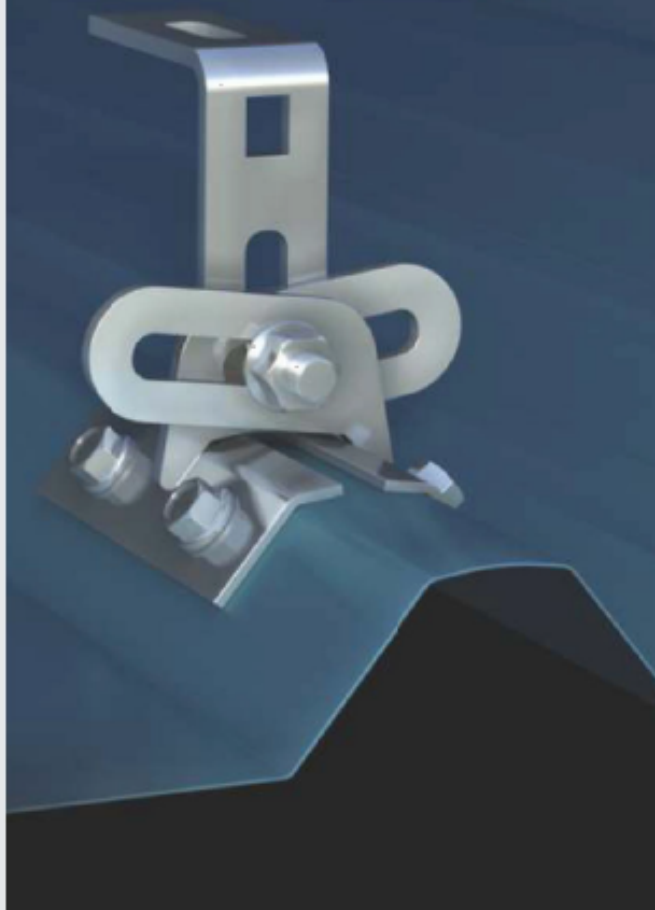
ProteaBracket is the perfect match for the S-5-PV Kit, for a solar attachment solution that is both economical and easy to use.

S-5!® ProteaBracket™ is a versatile bracket that adjusts easily to most trapezoidal roof profiles.

S-5! PV kits have an M8 bolt and are suitable for use with all S-5! clamps.



ProteaBracket™



S-5!® The Right Way

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal exposed-fastened metal roof profiles. No messy sealants to apply: the factory-applied adhesive rubber sealant weather-proofs and makes installation easy.

5-5!® holding strength is unmatched in the industry.

Each ProteaBracket™ comes with a factory-applied, adhesive rubber sealant on the base. A structural A2 stainless steel bimetal attachment bracket, ProteaBracket is compatible with most common metal roofing materials.

All four pre-punched holes must be used to achieve tested strength. For design assistance, contact Safintra South Africa (and see our website www.safintra.co.za), or visit www.S-5.com for the independent lab test data that can be used for load-critical designs and applications. Also, please visit S-5! website for more information including metallurgical compatibilities and specifications.

Multiple Attachment Options:

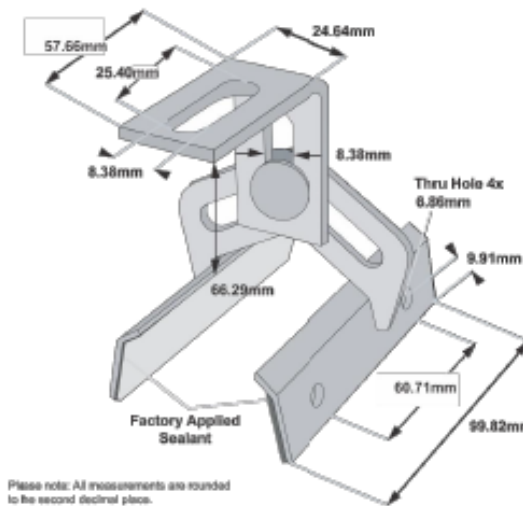
ProteaBracket™ with Top Rail option for PV attachment



ProteaBracket™ with S-5-PV Kit option (if not using a rail)



ProteaBracket™



Please note: All measurements are rounded to the second decimal place.

FLUTELINE



VERSATILE



S-5!® Warning! Please use this product responsibly!

S-5! Brackets and clamps are not tested for performance as part of a Fall Arrest or Personal Safety system. These applications need to be tested as a dynamic system and warranties or test results must be issued by the system provider.

Safintra, Safin Group and its subsidiaries provide no warranties or any assurances in this application, and will accept no claims of any nature whatsoever arising out of any such applications.

Product are protected by multiple international patents. For published data regarding holding strength, bolt torque, patents and trademarks visit the S-5! website at www.S-5.com.

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Sole Agents for Africa:

SAFINTRA
world class roofing systems

www.safintra.co.za / www.safintra.com

ENGINEER:



MODEL ENERGY

300 FAYETTEVILLE ST.
#1430

RALEIGH, NC 27602
919-274-9905

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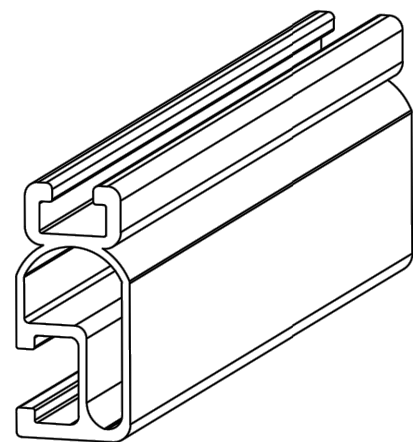
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CONSTRUCTION 03/20/23

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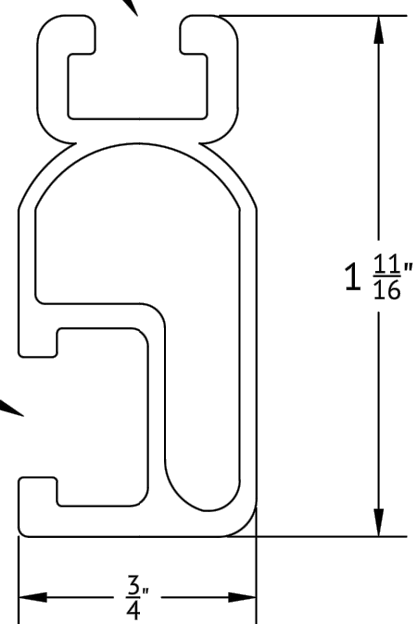
EQUIPMENT
SPEC SHEETS

PV5.4



1/4" BOLT LOCATION

3/8" BOLT LOCATION



UNIRAC
 1411 BROADWAY BLVD NE
 ALBUQUERQUE, NM 87102 USA
 WWW.UNIRAC.COM

| | |
|-----------------------|-------------|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART DETAIL |
| DESCRIPTION: | LIGHT RAIL |
| REVISION DATE: | APRIL 2016 |

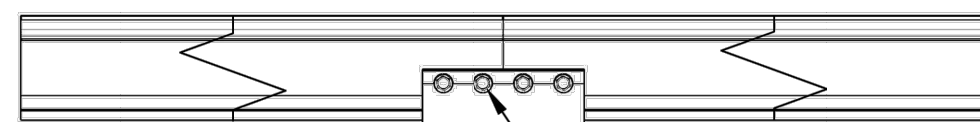
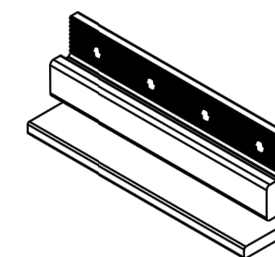
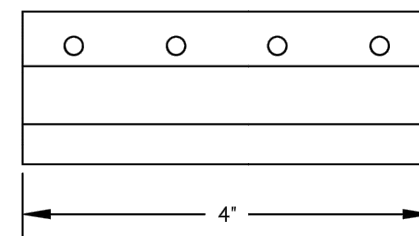
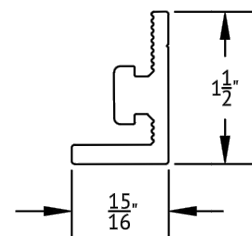
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 ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
 OR MORE US PATENTS

LEGAL NOTICE

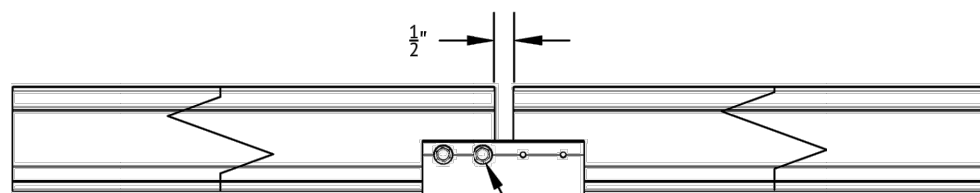
SM-P02
 SHEET

BONDING SPLICE BAR



#12 X 3/4" SELF DRILLING SS SCREWS INCLUDED

TYPICAL SPLICE BAR DETAIL



NOTE THAT ONLY 2 SCREWS ARE
 USED AT AN EXPANSION JOINT.
 THE SPLICE BAR DOES NOT BOND
 ACROSS AN EXPANSION JOINT.

TYPICAL EXPANSION JOINT DETAIL

UNIRAC
 1411 BROADWAY BLVD NE
 ALBUQUERQUE, NM 87102 USA
 WWW.UNIRAC.COM

| | |
|-----------------------|--------------------|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | BONDING SPLICE BAR |
| REVISION DATE: | APRIL 2016 |

DRAWING NOT TO SCALE
 ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE
 US PATENTS

LEGAL NOTICE

SM-A01
 SHEET

ENGINEER:



MODEL ENERGY
 300 FAYETTEVILLE ST.
 #1430
 RALEIGH, NC 27602
 919-274-9905
 MODELENERGY.COM
 P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM

9.200 kW DC INPUT
 7.600 kW AC EXPORT

Ricardo Montoya
 31 Roping Ln,
 Cameron, NC 28326

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 WHATSOEVER, NOR ARE THEY TO BE ASSIGNED
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 THE EXPRESSED WRITTEN PERMISSION AND
 CONSENT OF MODEL ENERGY, PLLC.

CLIENT:



| | |
|--------------|----------|
| ISSUED FOR: | DATE: |
| CONSTRUCTION | 03/20/23 |

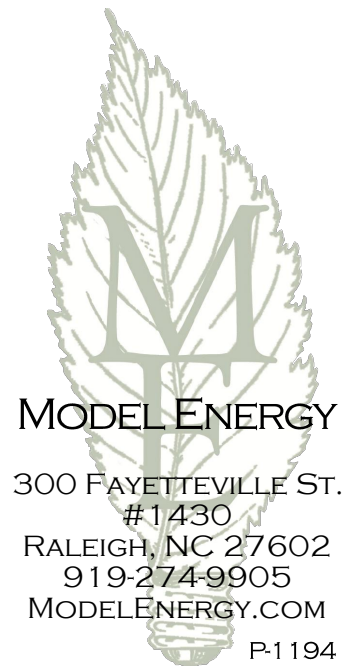
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EQUIPMENT
 SPEC SHEETS

PV5.5



Customer: Ricardo Montoya
Installer: SmartSun
Subject: PV System Structural Compliance
Date: 03/20/23



To whom it may concern:

Model Energy, PLLC has reviewed the installation details of the proposed PV system that is to be installed by SmartSun at 31 Roping Ln,, Cameron, NC 28326. The conditions of the existing structure have been reviewed and validated by Model Energy, PLLC. The existing roof structure has been designed to support the additional loads of the proposed PV system. In addition, the racking and fastening system shall be capable of securing the system to the structure under design conditions when installed properly and in accordance with the racking and fastening arrangement detailed within the accompanying permit set. The installation design is compliant with current 2018 North Carolina state and national building codes.

Thank you,

Andrew King, PE

