

## SHEET CATALOG

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## SCOPE OF WORK

GENERAL SYSTEM INFORMATION:  
 SYSTEM SIZE:  
 17380W DC, 13600W AC  
 MODULES:  
 (44)HANWHA Q CELLS Q.PEAK DUO L-G5.2 395W  
 INVERTER:  
 (1)SOLAREEDGE TECHNOLOGIES  
 SE7600H-US(240V),  
 (1)SOLAREEDGE TECHNOLOGIES  
 SE6000H-US(240V)  
 OPTIMIZER:  
 (44)SOLAREEDGE P401 POWER OPTIMIZER

**B**  
 12/14/2021

## APPLICABLE CODES

- ELECTRIC CODE:NEC 2017
- FIRE CODE:NCFC 2018
- BUILDING CODE:NCBC 2018
- RESIDENTIAL CODE:NCRC 2018

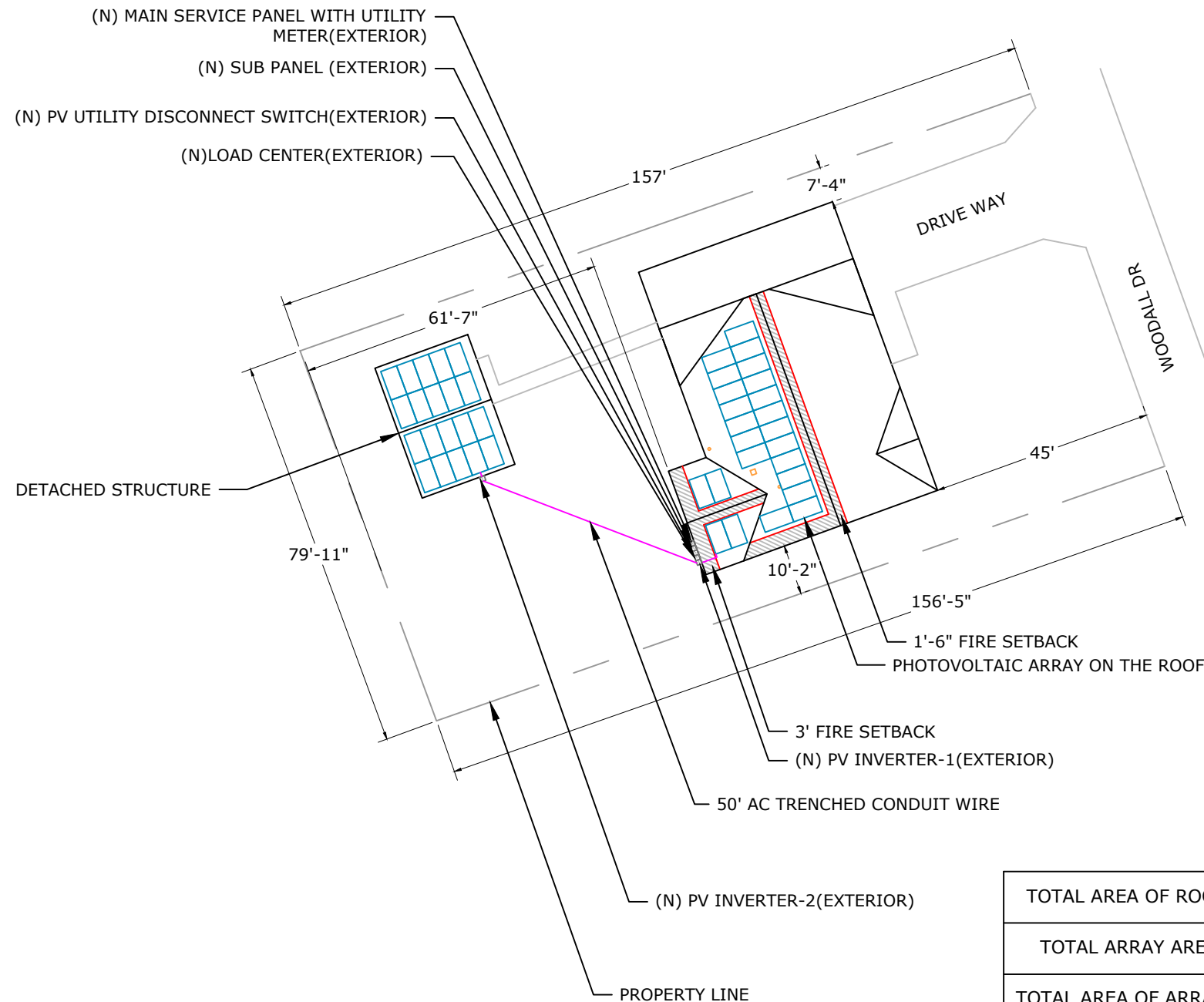
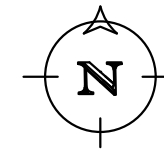
## GENERAL NOTES

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

# PAUL ODOM - 17.380kW DC, 13.600kW AC

## SITE PLAN LAYOUT

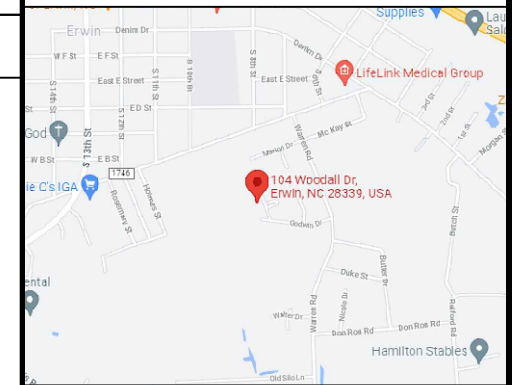
NOTE: NO GATE AND FENCE  
 NOTE: PV SYSTEM TO BE INSTALLED ON DETACHED NON-HABITABLE STRUCTURE.



SCALE:1"=30'-0"

|   |          |
|---|----------|
| TOTAL AREA OF ROOF (SQ.FT)                  | 2783     |
| TOTAL ARRAY AREA (SQ.FT)                    | 520.7367 |
| TOTAL AREA OF ARRAY COVERED IN THE ROOF (%) | 18.71    |

## VICINITY MAP



ADDRESS: 525W, BASELINE RD  
 MESA AZ,85210

## CUSTOMER INFORMATION

NAME: PAUL ODOM

ADDRESS:104 WOODALL DR, ERWIN, NC  
 28339

35.320226, -78.667743  
 APN: 060-597-020-218

AHJ:NC-TOWN OF ERWIN

UTILITY:DUKE ENERGY

PRN NUMBER:TPS-40595



## COVER PAGE

|                                 |                    |
|---------------------------------|--------------------|
| DESIGNER /CHECKED<br>BY: ANK/RK | PAPER SIZE:17"X11" |
| SCALE:AS NOTED                  | REV:B              |
| DATE:12/15/2021                 | T-1                |

### INSTALLATION NOTES

1. STRUCTURAL ROOF MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED BY THE CONTRACTOR WHEN LAG BOLT PENETRATION OR MECHANICAL ATTACHMENT TO THE STRUCTURE IS REQUIRED.

2. ROOFTOP PENETRATIONS FOR SOLAR RACKING WILL BE COMPLETED AND SEALED WITH APPROVED SEALANT PER CODE BY A LICENSED CONTRACTOR.

3. LAGS MUST HAVE A MINIMUM 2.5" THREAD EMBEDMENT INTO THE STRUCTURAL MEMBER.

4. ALL PV RACKING ATTACHMENTS SHALL BE STAGGERED BY ROW BETWEEN THE ROOF FRAMING MEMBERS AS NECESSARY.

5. ROOF MOUNTED STANDARD RAIL REQUIRES ONE THERMAL EXPANSION GAP FOR EVERY RUN OF RAIL GREATER THAN 40'.

6. ALL CONDUCTORS AND CONDUITS ON THE ROOF SHALL BE MINIMUM 7/8" ABOVE THE ROOF SURFACE (INCLUDING CABLES UNDERNEATH MODULES AND RACKING).

7. THE PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL OR BUILDING ROOF VENTS.

**ROOF ACCESS PATHWAYS AND SETBACKS:**

**1204.2.1 SOLAR PHOTOVOLTAIC SYSTEMS FOR GROUP R-3 BUILDINGS.** SOLAR PHOTOVOLTAIC SYSTEMS FOR GROUP R-3 BUILDINGS SHALL COMPLY WITH SECTIONS 1204.2.1.1 THROUGH 1204.2.1.3.

**EXCEPTIONS:**

1. THESE REQUIREMENTS SHALL NOT APPLY TO STRUCTURES DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE INTERNATIONAL RESIDENTIAL CODE.

2. THESE REQUIREMENTS SHALL NOT APPLY TO ROOFS WITH SLOPES OF 2 UNITS VERTICAL IN 12 UNITS HORIZONTAL OR LESS.

**1204.2.1.1 PATHWAYS TO RIDGE.** NOT FEWER THAN TWO 36-INCH-WIDE (914 MM) PATHWAYS ON SEPARATE ROOF PLANES, FROM LOWEST ROOF EDGE TO RIDGE, SHALL BE PROVIDED ON ALL BUILDINGS. NOT FEWER THAN ONE PATHWAY SHALL BE PROVIDED ON THE STREET OR DRIVEWAY SIDE OF THE ROOF. FOR EACH ROOF PLANE WITH A PHOTOVOLTAIC ARRAY, NOT FEWER THAN ONE 36-INCH-WIDE (914 MM) PATHWAY FROM LOWEST ROOF EDGE TO RIDGE SHALL BE PROVIDED ON THE SAME ROOF PLANE AS THE PHOTOVOLTAIC ARRAY, ON AN ADJACENT ROOF PLANE OR STRADDLING THE SAME AND ADJACENT ROOF PLANES

**1204.2.1.2 SETBACKS AT RIDGE.** FOR PHOTOVOLTAIC ARRAYS OCCUPYING 33 PERCENT OR LESS OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 18 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE. FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 36 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

**1204.2.2 EMERGENCY ESCAPE AND RESCUE OPENINGS.** PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS SHALL NOT BE PLACED ON THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A PATHWAY OF NOT LESS THAN 36 INCHES (914 MM) WIDE SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING

**1204.2.1.3 ALTERNATIVE SETBACKS AT RIDGE.** WHERE AN AUTOMATIC SPRINKLER SYSTEM IS INSTALLED WITHIN THE DWELLING IN ACCORDANCE WITH SECTION 903.3.1.3, SETBACKS AT THE RIDGE SHALL CONFORM TO ONE OF THE FOLLOWING:

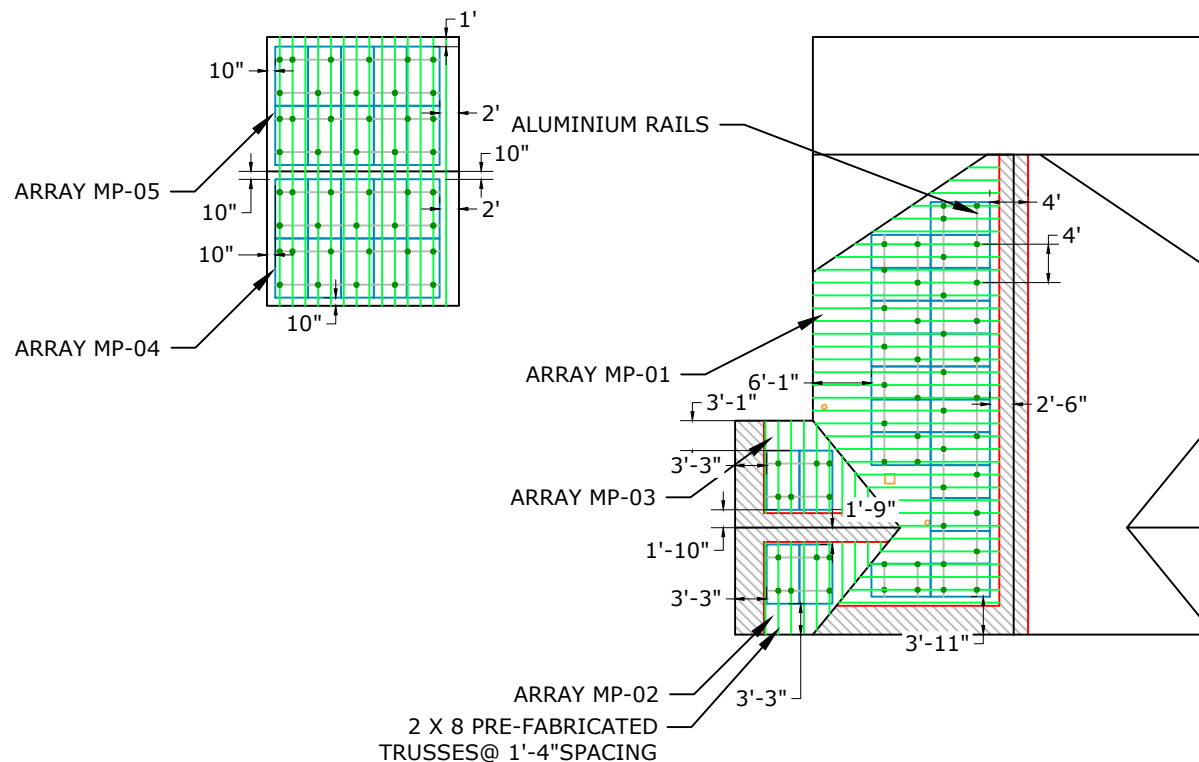
1. FOR PHOTOVOLTAIC ARRAYS OCCUPYING 66 PERCENT OR LESS OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 18 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

2. FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 66 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 36 INCHES (914 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

### SITE INFORMATION - WIND SPEED: 146 MPH AND SNOW LOAD: 10 PSF

| SR. NO | AZIMUTH | PITCH | NO. OF MODULES | ARRAY AREA (SQ. FT.) | ROOF TYPE           | ATTACHMENT       | ROOF EXPOSURE | FRAME TYPE             | FRAME SIZE | FRAME SPACING | MAX RAIL SPAN | OVER HANG |
|--------|---------|-------|----------------|----------------------|---------------------|------------------|---------------|------------------------|------------|---------------|---------------|-----------|
| MP-01  | 258°    | 30°   | 20             | 433.9                | COMPOSITION SHINGLE | K2 SPLICE FOOT X | ATTIC         | PRE-FABRICATED TRUSSES | 2 X 8      | 1'-4"         | 4'-0"         | 1'-6"     |
| MP-02  | 168°    | 30°   | 2              | 43.4                 | COMPOSITION SHINGLE | K2 SPLICE FOOT X | ATTIC         | PRE-FABRICATED TRUSSES | 2 X 8      | 1'-4"         | 4'-0"         | 1'-6"     |
| MP-03  | 348°    | 30°   | 2              | 43.4                 | COMPOSITION SHINGLE | K2 SPLICE FOOT X | ATTIC         | PRE-FABRICATED TRUSSES | 2 X 8      | 1'-4"         | 4'-0"         | 1'-6"     |
| MP-04  | 168°    | 24°   | 10             | 217.0                | COMPOSITION SHINGLE | K2 SPLICE FOOT X | ATTIC         | PRE-FABRICATED TRUSSES | 2 X 8      | 1'-4"         | 4'-0"         | 1'-6"     |
| MP-05  | 348°    | 24°   | 10             | 217.0                | COMPOSITION SHINGLE | K2 SPLICE FOOT X | ATTIC         | PRE-FABRICATED TRUSSES | 2 X 8      | 1'-4"         | 4'-0"         | 1'-6"     |

NOTE: PENETRATIONS ARE STAGGERED

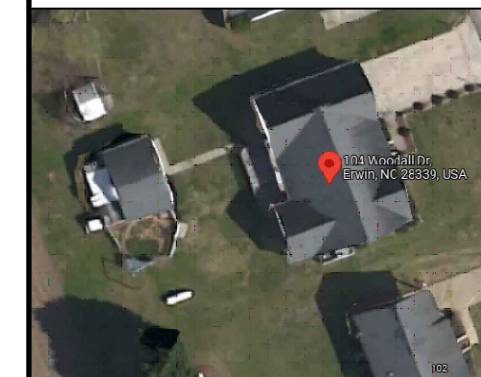


|   |          |
|---|----------|
| TOTAL AREA OF ROOF (SQ.FT)                  | 2783     |
| TOTAL ARRAY AREA (SQ.FT)                    | 520.7367 |
| TOTAL AREA OF ARRAY COVERED IN THE ROOF (%) | 18.71    |

SCALE: 1"=20'-0"



### AERIAL VIEW



ADDRESS: 525W, BASELINE RD  
MESA AZ, 85210

### CUSTOMER INFORMATION

NAME: PAUL ODOM

ADDRESS: 104 WOODALL DR, ERWIN, NC 28339

35.320226, -78.667743  
APN: 060-597-020-218

AHJ: NC-TOWN OF ERWIN

UTILITY: DUKE ENERGY

PRN NUMBER: TPS-40595



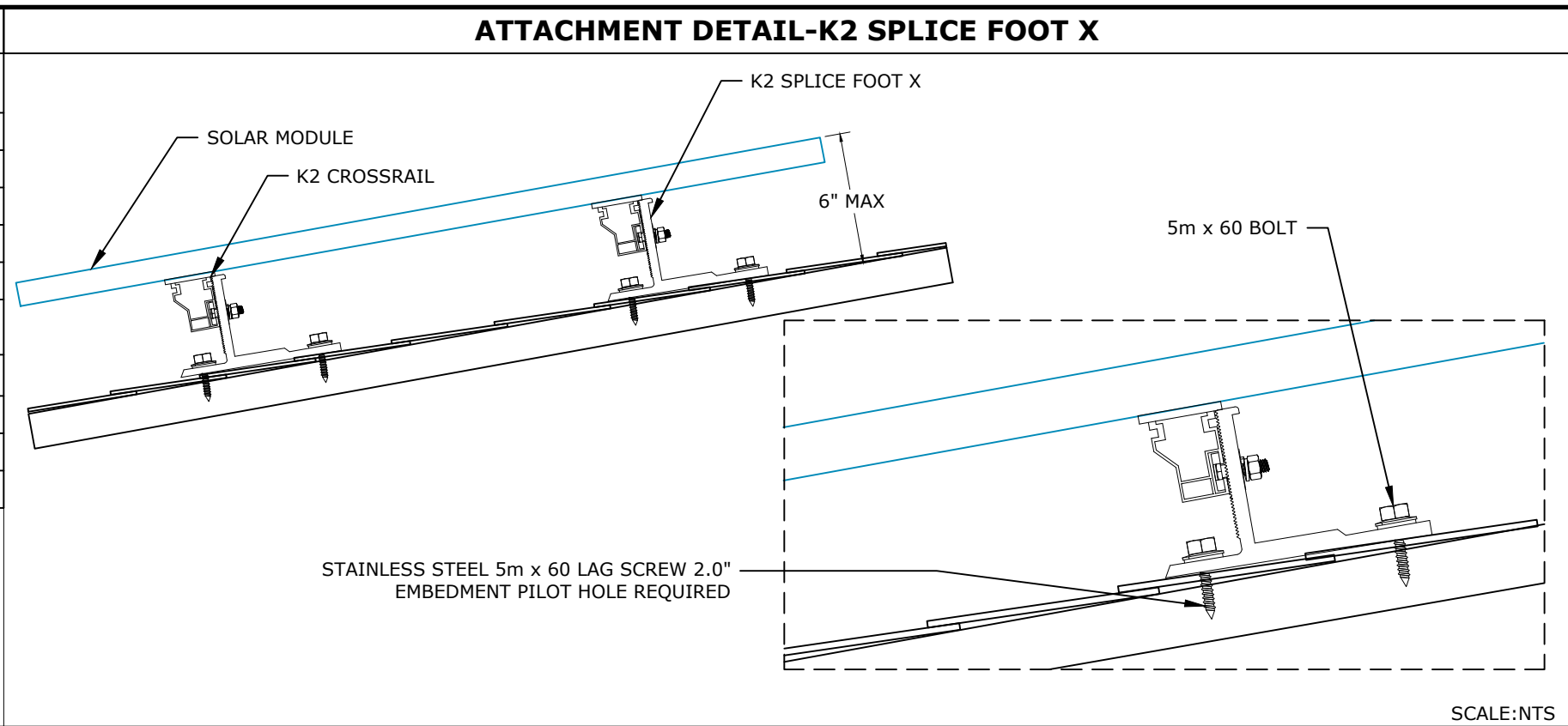
### MOUNTING DETAIL

DESIGNER /CHECKED BY: ANK/RK PAPER SIZE: 17"X11"

SCALE: AS NOTED REV: B

DATE: 12/15/2021 M-1

| DEAD LOAD CALCULATIONS                        |          |          |                    |
|---|----------|----------|--------------------|
| BOM   | QUANTITY | LBS/UNIT | TOTAL WEIGHT (LBS) |
| MODULES                                       | 44       | 51.8     | 2279.20            |
| MID-CLAMP                                     | 70       | 0.300    | 21.00              |
| END-CLAMP                                     | 36       | 0.310    | 11.16              |
| RAIL LENGTH                                   | 294      | 0.560    | 164.64             |
| SPLICE BAR                                    | 14       | 0.650    | 9.10               |
| K2 SPLICE FOOT X                              | 100      | 1.45     | 145.00             |
| <b>TOTAL WEIGHT OF THE SYSTEM (LBS)</b>       |          |          | 2630.10            |
| <b>TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)</b> |          |          | 954.68             |
| <b>WEIGHT PER SQ. FT.(LBS)</b>                |          |          | 2.75               |
| <b>WEIGHT PER PENETRATION (LBS)</b>           |          |          | 26.30              |

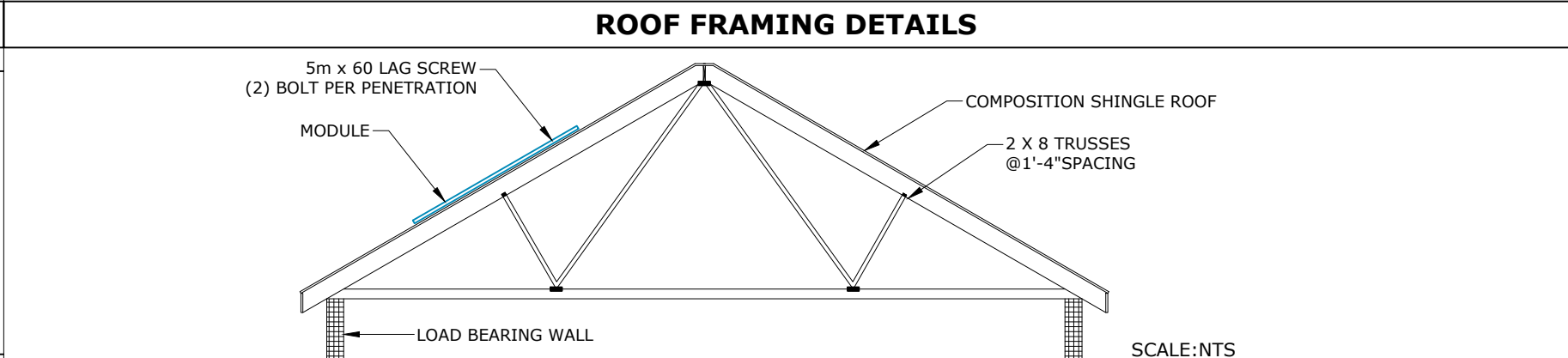
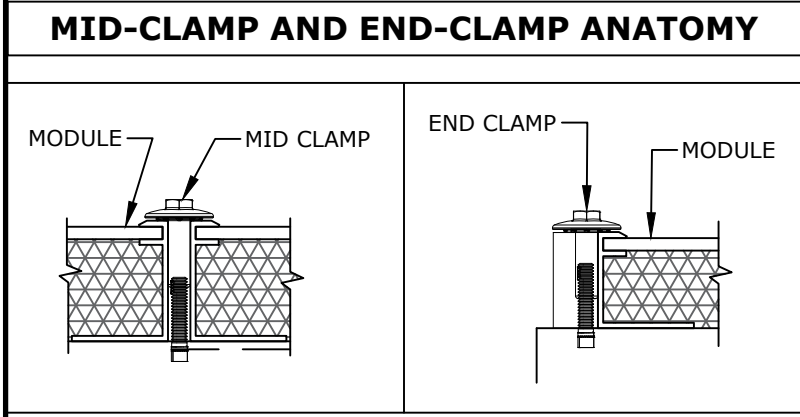


### MODULES DATA

|                                       |                                 |
|---------------------------------------|---------------------------------|
| HANWHA Q CELLS Q.PEAK DUO L-G5.2 395W |                                 |
| MODULE DIMS                           | 79.3"x39.4"x1.38"               |
| LAG SCREWS                            | 5m x 60 x2.3":2.0"MIN EMBEDMENT |

### UPLIFT CALCULATIONS

|                   |         |     |
|-------------------|---------|-----|
| UPLIFT            | 28640.5 | LBS |
| PULL OUT STRENGTH | 61500   | LBS |
| POINT LOADING     | 23      | LBS |



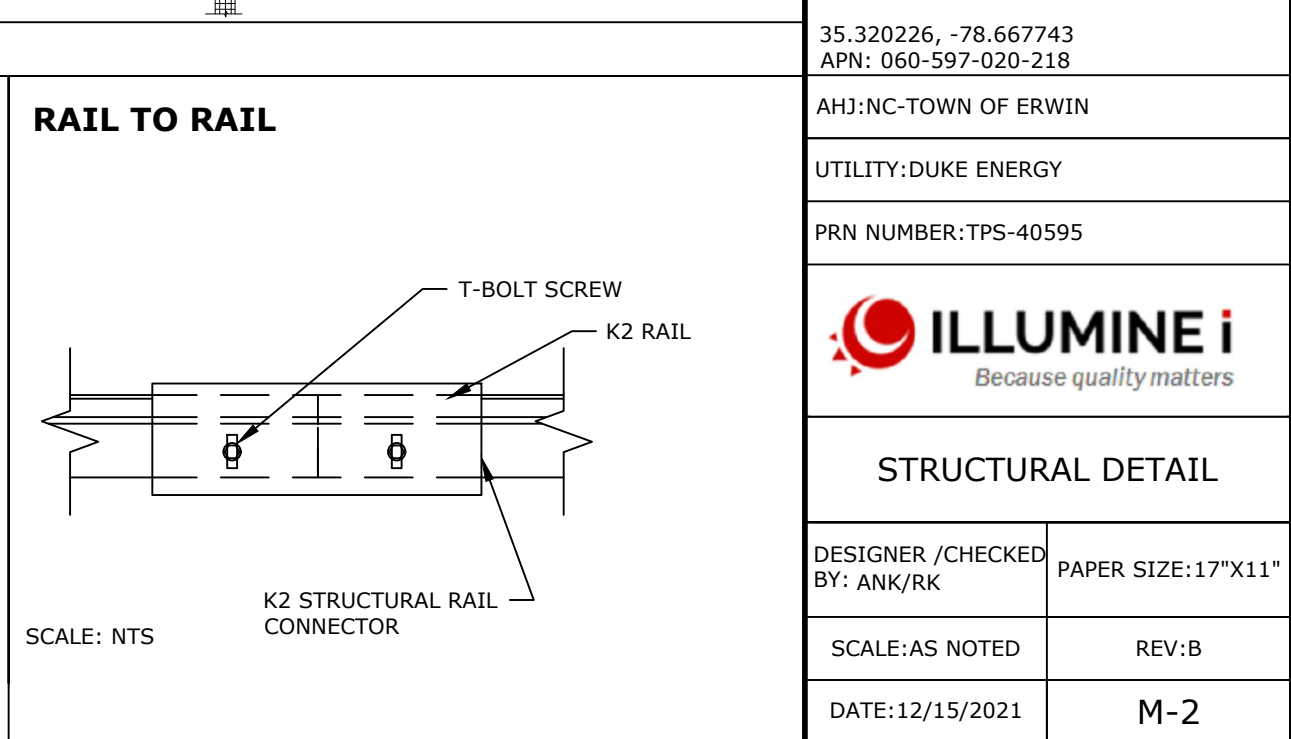
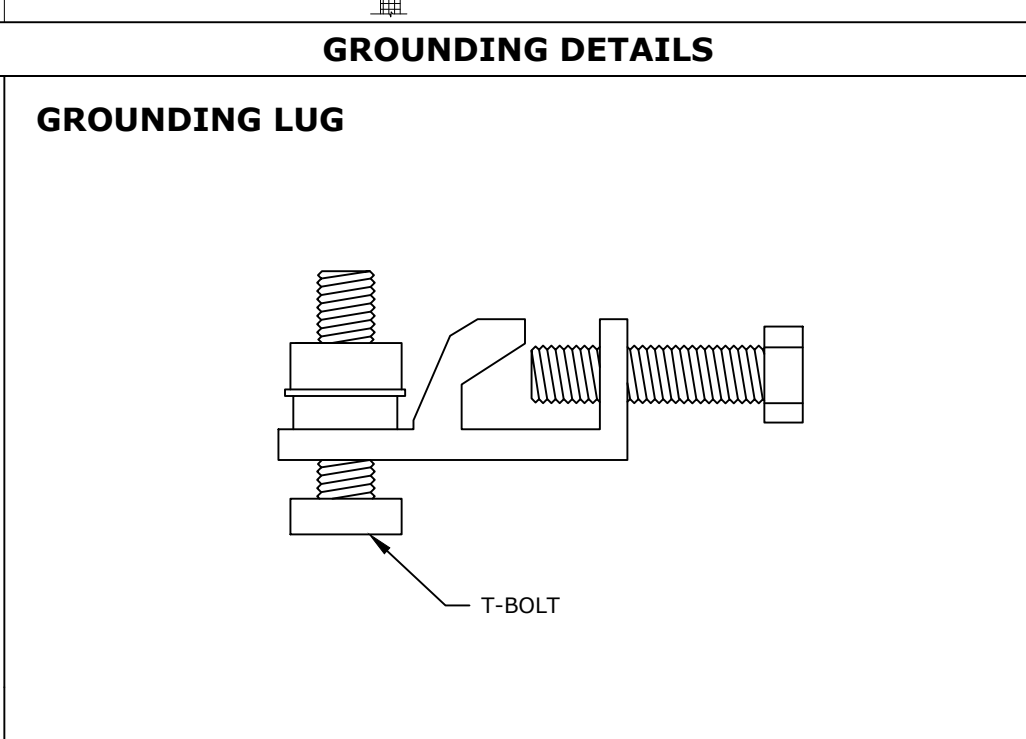
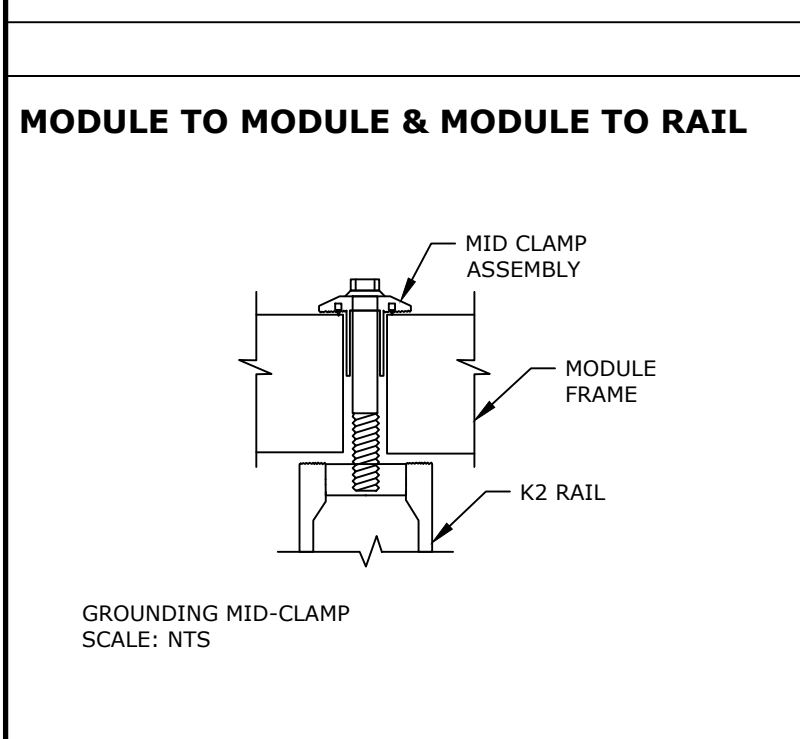
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AHJ:NC-TOWN OF ERWIN

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### STRUCTURAL DETAIL

|                              |                    |
|------------------------------|--------------------|
| DESIGNER /CHECKED BY: ANK/RK | PAPER SIZE:17"X11" |
| SCALE:AS NOTED               | REV:B              |
| DATE:12/15/2021              | M-2                |

**SINGLE LINE DIAGRAM: DC SYSTEM SIZE - 17380W, AC SYSTEM SIZE - 13600W**

**ELECTRICAL NOTES**

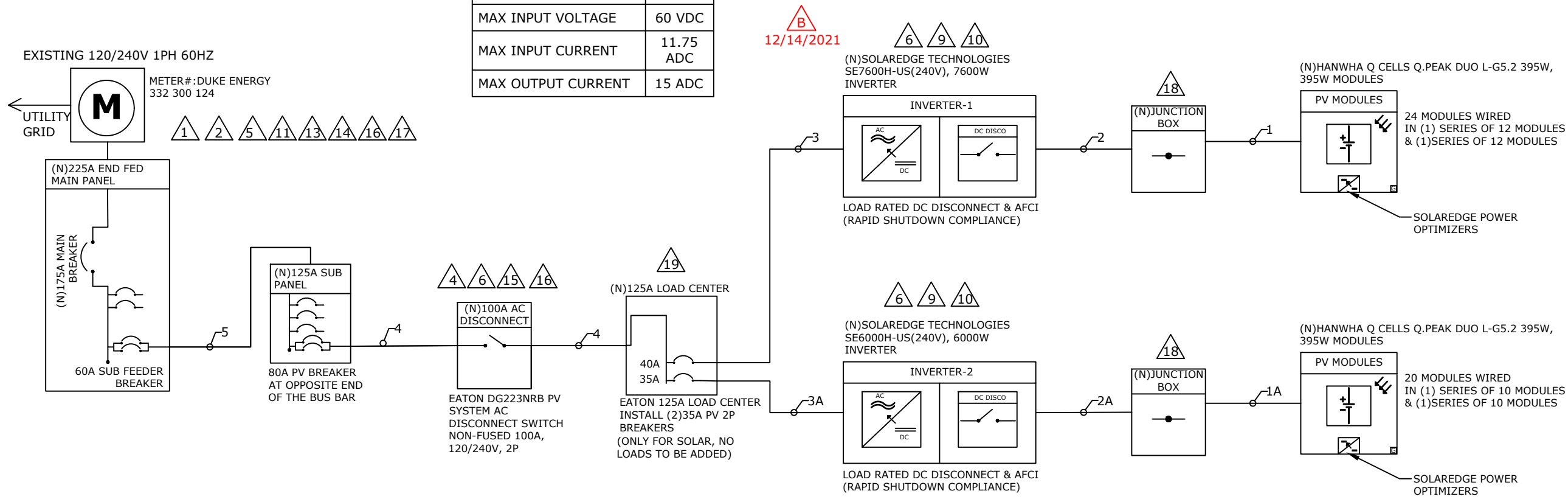
| SPECIFICATIONS          | INVERTER-1                               |              | INVERTER-2                               |              | MODULE SPECIFICATION              |                                       | SYSTEM CHARACTERISTICS                  |            |            |
|-------------------------|--|--------------|--|--------------|-----------------------------------|---------------------------------------|---|------------|------------|
|                         | MODEL                                    | POWER RATING | MODEL                                    | POWER RATING | MODEL                             | HANWHA Q CELLS Q.PEAK DUO L-G5.2 395W | DESCRIPTION                             | INVERTER 1 | INVERTER 2 |
| MODEL                   | SOLAREEDGE TECHNOLOGIES SE7600H-US(240V) | 7600W        | SOLAREEDGE TECHNOLOGIES SE6000H-US(240V) | 6000W        | MODEL                             | HANWHA Q CELLS Q.PEAK DUO L-G5.2 395W | DC SYSTEM SIZE                          | 9480 W     | 7900 W     |
| POWER RATING            | 7600W                                    |              | 6000W                                    |              | MODULE POWER @ STC                | 395W                                  | INVERTER STRING VOLTAGE: <b>Vmp</b>     | 400V       | 380V       |
| MAX OUTPUT CURRENT      | 32A                                      |              | 25A                                      |              | OPEN CIRCUIT VOLTAGE: <b>Voc</b>  | 48.74V                                | MAX INVERTER SYSTEM VOLTAGE: <b>Voc</b> | 480V       | 480V       |
| CEC WEIGHTED EFFICIENCY | 99%                                      |              | 99%                                      |              | MAX POWER VOLTAGE: <b>Vmp</b>     | 40.71V                                | MAX SHORT CIRCUIT CURRENT               | 15A        | 15A        |
| MAX INPUT CURRENT       | 20A                                      |              | 16.5A                                    |              | SHORT CIRCUIT CURRENT: <b>Isc</b> | 10.19A                                | OPERATING CURRENT                       | 11.85A     | 10.39A     |
| MAX DC VOLTAGE          | 480V                                     |              | 480V                                     |              | MAX POWER CURRENT: <b>Imp</b>     | 9.70A                                 |   |            |            |

- CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D).
- CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).
- MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
- ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
- BREAKER/FUSE SIZES CONFORMS TO NEC 240.6 CODE SECTION.
- AC GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC 250.66.
- AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 690.31(C).
- AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON NEC 310.15(B)(2).
- MAX. SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
- CONDUCTORS ARE SIZED PER WIRE AMPACITY TABLE NEC 310.15(B)(16).

**OPTIMIZER CHARACTERISTICS**

| MODEL              | P401      |
|--------------------|-----------|
| MIN INPUT VOLTAGE  | 8 VDC     |
| MAX INPUT VOLTAGE  | 60 VDC    |
| MAX INPUT CURRENT  | 11.75 ADC |
| MAX OUTPUT CURRENT | 15 ADC    |

**MAIN PANEL UPGRADE:** REPLACE EXISTING MAIN SERVICE PANEL WITH NEW 225/175A MAIN PANEL  
 FROM METER MAIN COMBO PANEL LOAD ARE RELOCATED TO NEW SUB PANEL TO MAKE ROOM FOR SUB FEEDER BREAKER



**CONDUIT SCHEDULE**

| TAG ID | CONDUIT SIZE   | CONDUCTOR             | NEUTRAL              | GROUND                |
|--------|--|-----------------------|----------------------|-----------------------|
| 1&1A   | NONE   | (4) 10AWG PV WIRE     | NONE                 | (1) 10AWG BARE COPPER |
| 2&2A   | 3/4"EMT  | (4) 10AWG THHN/THWN-2 | NONE                 | (1) 10AWG THHN/THWN-2 |
| 3      | 3/4"EMT  | (2) 8AWG THHN/THWN-2  | (1) 8AWG THHN/THWN-2 | (1) 10AWG THHN/THWN-2 |
| 3A     | 3/4" SCH 40 PVC (BELOW GROUND)<br>3/4" SCH 80 PVC (ABOVE GROUND) | (2) 8AWG THHN/THWN-2  | (1) 8AWG THHN/THWN-2 | (1) 10AWG THHN/THWN-2 |
| 4      | 1"EMT  | (2) 4AWG THHN/THWN-2  | (1) 4AWG THHN/THWN-2 | (1) 8AWG THHN/THWN-2  |
| 5      | 3/4"EMT  | (2) 6AWG THHN/THWN-2  | (1) 6AWG THHN/THWN-2 | (1) 10AWG THHN/THWN-2 |

**VOLTAGE DROP CALCULATIONS**

|                             |             |
|-----------------------------|-------------|
| Select Material             | Cu          |
| Select Wire Size            | 8           |
| Select Conduit Type         | PVC         |
| Select Voltage & Phase      | 240 1-phase |
| Enter Distance to Load (ft) | 50          |
| Enter Load (Amps)           | 25          |
| <b>OUTPUTS</b>              |             |
| Voltage Drop (Volts)        | 1.95        |
| % Voltage Drop              | 0.81        |
| <b>VARIABLES</b>            |             |
| Phase Factor                | 2           |
| K                           | 12.9        |
| Q-Factor                    | 1           |
| Circular Mills              | 16510       |

**NOTE:**  
 SUB PANEL RATING: 125A, SUB FEEDER BREAKER RATING: 60A  
 120% RULE: (125A x 1.2) - 60A = 90A => ALLOWABLE BACKFEED IS 95A

**OC PD CALCULATIONS:**  
 INVERTER OVERCURRENT PROTECTION = COMBINED INVERTER O/P I X CONTINUOUS LOAD (1.25)  
 = (32+25) x 1.25 = 71.25A => PV BREAKER = 80A  
 ALLOWABLE BACKFEED 95A => 80A PV BREAKER  
**THE DESIGNED INTERCONNECTION MEETS THE 705.12(B)(2) REQUIREMENTS.**



**CUSTOMER INFORMATION**

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 ADDRESS: 104 WOODALL DR, ERWIN, NC 28339  
 35.320226, -78.667743  
 APN: 060-597-020-218  
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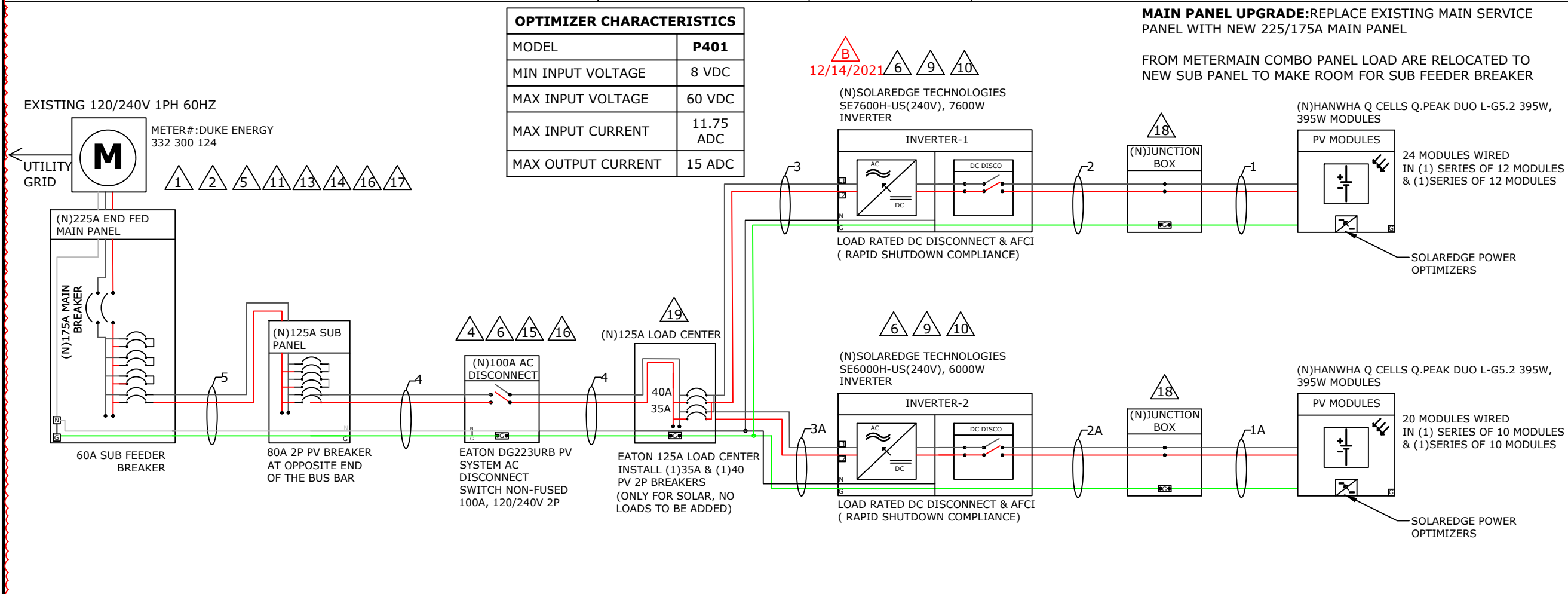
**SINGLE LINE DIAGRAM**

DESIGNER /CHECKED BY: ANK/RK PAPER SIZE: 17"X11"  
 SCALE: AS NOTED REV: B  
 DATE: 12/15/2021 E-1

## THREE LINE DIAGRAM: DC SYSTEM SIZE - 17380W, AC SYSTEM SIZE - 13600W

| SPECIFICATIONS          | INVERTER-1                               | INVERTER-2                               | MODULE SPECIFICATION                         |                                       | SYSTEM CHARACTERISTICS                             |            |            |
|-------------------------|--|--|--|---------------------------------------|--|------------|------------|
| MODEL                   | SOLAREEDGE TECHNOLOGIES SE7600H-US(240V) | SOLAREEDGE TECHNOLOGIES SE6000H-US(240V) | MODEL  | HANWHA Q CELLS Q.PEAK DUO L-G5.2 395W | DESCRIPTION  | INVERTER 1 | INVERTER 2 |
| POWER RATING            | 7600W                                    | 6000W                                    | MODULE POWER @ STC                           | 395W                                  | DC SYSTEM SIZE                                     | 9480 W     | 7900 W     |
| MAX OUTPUT CURRENT      | 32A                                      | 25A                                      | OPEN CIRCUIT VOLTAGE: <b>V<sub>oc</sub></b>  | 48.74V                                | INVERTER STRING VOLTAGE: <b>V<sub>mp</sub></b>     | 400V       | 380V       |
| CEC WEIGHTED EFFICIENCY | 99%                                      | 99%                                      | MAX POWER VOLTAGE: <b>V<sub>mp</sub></b>     | 40.71V                                | MAX INVERTER SYSTEM VOLTAGE: <b>V<sub>oc</sub></b> | 480V       | 480V       |
| MAX INPUT CURRENT       | 20A                                      | 16.5A                                    | SHORT CIRCUIT CURRENT: <b>I<sub>sc</sub></b> | 10.19A                                | MAX SHORT CIRCUIT CURRENT                          | 15A        | 15A        |
| MAX DC VOLTAGE          | 480V                                     | 480V                                     | MAX POWER CURRENT: <b>I<sub>mp</sub></b>     | 9.70A                                 | OPERATING CURRENT                                  | 11.85A     | 10.39A     |

| OPTIMIZER CHARACTERISTICS |             |
|---------------------------|-------------|
| MODEL                     | <b>P401</b> |
| MIN INPUT VOLTAGE         | 8 VDC       |
| MAX INPUT VOLTAGE         | 60 VDC      |
| MAX INPUT CURRENT         | 11.75 ADC   |
| MAX OUTPUT CURRENT        | 15 ADC      |



| CONDUIT SCHEDULE |  |                       |                      |                       |
|------------------|--|-----------------------|----------------------|-----------------------|
| TAG ID           | CONDUIT SIZE   | CONDUCTOR             | NEUTRAL              | GROUND                |
| 1&1A             | NONE   | (4) 10AWG PV WIRE     | NONE                 | (1) 10AWG BARE COPPER |
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| 3                | 3/4"EMT  | (2) 8AWG THHN/THWN-2  | (1) 8AWG THHN/THWN-2 | (1) 10AWG THHN/THWN-2 |
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**NOTE:**  
SUB PANEL RATING: 125A, SUB FEEDER BREAKER RATING: 60A  
120% RULE: (125A x 1.2) - 60A = 90A => ALLOWABLE BACKFEED IS 95A

**OCPD CALCULATIONS:**  
INVERTER OVERCURRENT PROTECTION = COMBINED INVERTER O/P I X CONTINUOUS LOAD (1.25)  
= (32+25) x 1.25 = 71.25A => PV BREAKER = 80A  
ALLOWABLE BACKFEED 95A => 80A PV BREAKER  
**THE DESIGNED INTERCONNECTION MEETS THE 705.12(B)(2) REQUIREMENTS.**

| VOLTAGE DROP CALCULATIONS   |             |
|-----------------------------|-------------|
| Select Material             | Cu          |
| Select Wire Size            | 8           |
| Select Conduit Type         | PVC         |
| Select Voltage & Phase      | 240 1-phase |
| Enter Distance to Load (ft) | 50          |
| Enter Load (Amps)           | 25          |
| OUTPUTS                     |             |
| Voltage Drop (Volts)        | 1.95        |
| % Voltage Drop              | 0.81        |
| VARIABLES                   |             |
| Phase Factor                | 2           |
| K                           | 12.9        |
| Q-Factor                    | 1           |
| Circular Mils               | 16510       |

### ELECTRICAL NOTES

1. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D).
2. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).
3. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
4. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
5. BREAKER/FUSE SIZES CONFORMS TO NEC 240.6 CODE SECTION.
6. AC GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC 250.66.
7. AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 690.31(C).
8. AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON NEC 310.15(B)(2).
9. MAX. SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
10. CONDUCTORS ARE SIZED PER WIRE AMPACITY TABLE NEC 310.15(B)(16).



**ADDRESS:** 525W, BASELINE RD  
MESA AZ, 85210

### CUSTOMER INFORMATION

NAME: PAUL ODOM

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35.320226, -78.667743  
APN: 060-597-020-218

AHJ: NC-TOWN OF ERWIN

UTILITY: DUKE ENERGY

PRN NUMBER: TPS-40595

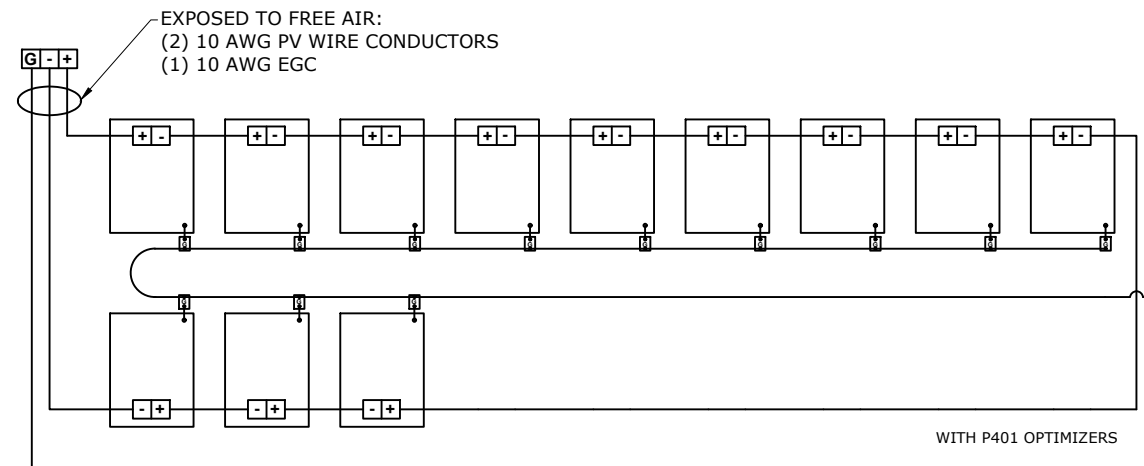


### THREE LINE DIAGRAM

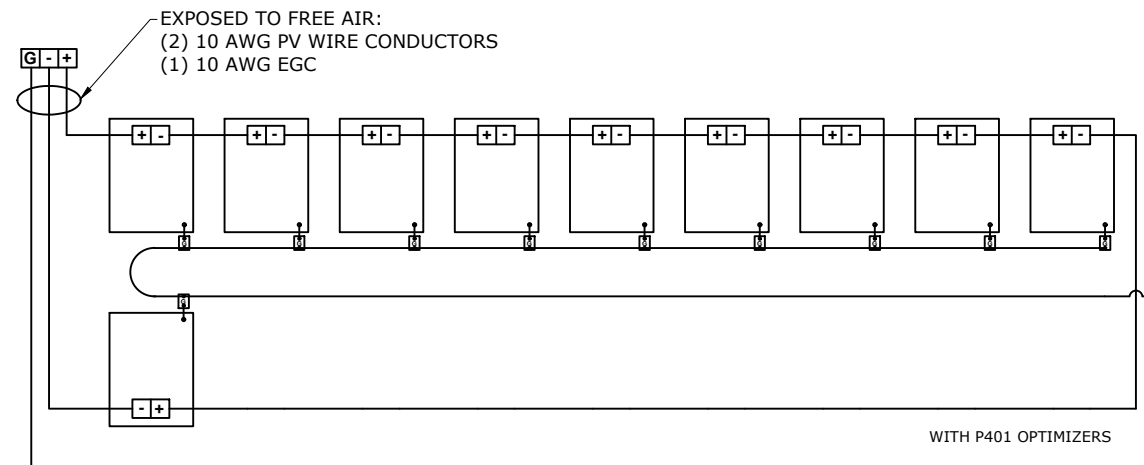
|                              |                     |
|------------------------------|---------------------|
| DESIGNER /CHECKED BY: ANK/RK | PAPER SIZE: 17"X11" |
| SCALE: AS NOTED              | REV: B              |
| DATE: 12/15/2021             | E-2                 |

## STRING WIRING DIAGRAM

2 STRINGS OF 12 MODULES



2 STRINGS OF 10 MODULES



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### STRING WIRING DIAGRAM

DESIGNER /CHECKED BY: ANK/RK

PAPER SIZE:17"X11"

SCALE:AS NOTED

REV:B

DATE:12/15/2021

E-3

## ELECTRICAL CALCULATION

#### DC WIRE SIZING CALCULATIONS BASED OF FOLLOWING EQUATIONS>>

- REQUIRED CONDUCTOR AMPACITY: 125% PER 690.8(A)(1) X I<sub>sc</sub>(A) X #OF PARALLEL STRINGS = MAX CURRENT PER 690.8(A)(1) X 125% PER 690.8(B)(2)(a)=MAX CURRENT PER 690.8(B)(2)(a)
- CORRECTED AMPACITY CALCULATIONS:AMPACITY X TEMPERATURE DERATE FACTOR X CONDUIT FILL DERATE = DERATED CONDUCTOR AMPACITY
- DERATED CONDUCTOR AMPACITY CHECK: MAX CURRENT PER 690.8(B)(2)(2) < DERATED CONDUCTOR AMPACITY

#### AC WIRE SIZING CALCULATIONS BASED OF FOLLOWING EQUATIONS >>

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


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


| TAG ID | REQUIRED CONDUCTOR AMPACITY |   |    |   |   |   | CORRECTED AMPACITY CALCULATION |   |      |   |        |    | DERATED CONDUCTOR AMPACITY CHECK |      |   |     |   |        |        |   |        |
|--------|-----------------------------|---|----|---|---|---|--------------------------------|---|------|---|--------|----|----------------------------------|------|---|-----|---|--------|--------|---|--------|
| 1&1A   | 1                           | X | 15 | X | 1 | = | 15                             | X | 1.25 | = | 18.75A | 40 | X                                | 0.71 | X | 0.8 | = | 22.72A | 18.75A | < | 22.72A |
| 2&2A   | 1                           | X | 15 | X | 1 | = | 15                             | X | 1.25 | = | 18.75A | 40 | X                                | 0.71 | X | 0.8 | = | 22.72A | 18.75A | < | 22.72A |

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

| TAG ID | REQUIRED CONDUCTOR AMPACITY |   |   |   |    |   | CORRECTED AMPACITY CALCULATION |   |        |    |   |      | DERATED CONDUCTOR AMPACITY CHECK |   |   |        |        |   |        |
|--------|-----------------------------|---|---|---|----|---|--------------------------------|---|--------|----|---|------|----------------------------------|---|---|--------|--------|---|--------|
| 3      | 32                          | X | 1 | = | 32 | X | 1.25                           | = | 40.00A | 55 | X | 0.87 | X                                | 1 | = | 47.85A | 40.00A | < | 47.85A |
| 3A     | 25                          | X | 1 | = | 25 | X | 1.25                           | = | 31.25A | 55 | X | 0.87 | X                                | 1 | = | 47.85A | 31.25A | < | 47.85A |
| 4      | 57                          | X | 1 | = | 57 | X | 1.25                           | = | 71.25A | 95 | X | 0.87 | X                                | 1 | = | 82.65A | 71.25A | < | 82.65A |

**WARNING PLACARD**


**1**  **CAUTION**  
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED  
LABEL LOCATION  
BACKFED BREAKER [PER CODE: NEC 705.12(4)]


**2**  **WARNING**  
INVERTER OUTPUT CONNECTION:  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE  
LABEL LOCATION: BACKFED BREAKER  
[PER CODE: 2017 NEC 705.12(2)(3)(b)]

**3** **WARNING**  
A GENERATION SOURCE IS CONNECTED TO THE SUPPLY  
(UTILITY) SIDE OF THE MAIN SERVICE DISCONNECT. FOLLOW  
THE PROPER LOCK-OUT/TAG-OUT PROCEDURES TO ENSURE  
THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH IS  
OPENED PRIOR TO PERFORMING WORK ON THIS DEVICE  
LABEL LOCATION: (IF APPLICABLE) SUPPLY SIDE TAP LOAD PANEL  
[PER CODE: UTILITY]


**4** **PHOTOVOLTAIC AC DISCONNECT**  
RATED AC OPERATING CURRENT 32.00 A  
AC NOMINAL OPERATING VOLTAGE 240 VAC  
LABEL LOCATION: MAIN PANEL AC DISCONNECT(S)  
[PER CODE: NEC 690.54]

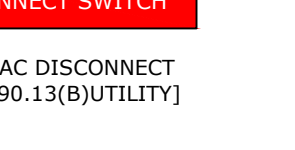
**5** **RAPID SHUTDOWN SWITCH  
FOR SOLAR PV SYSTEM**  
LABEL LOCATION: MAIN PANEL  
[PER CODE: NEC 690.12,690.56(C)(3)]

**6**  **WARNING**  
**ELECTRIC SHOCK HAZARD**  
TERMINALS ON BOTH LINE AND LOAD SIDES MAY  
BE ENERGIZED IN THE OPEN POSITION  
LABEL LOCATION: COMBINER PANEL  
AC DISCONNECT JUNCTION BOX INVERTER(S)  
[PER CODE: NEC 690.13(B)]


**8**  **WARNING**  
PHOTOVOLTAIC SYSTEM  
COMBINER PANEL  
DO NOT ADD LOADS  
LABEL LOCATION: AC COMBINER PANEL  
[PER CODE: NEC 690.13(B)]


**9** **MAXIMUM VOLTAGE:** 480 VDC  
**MAXIMUM CIRCUIT CURRENT:** 15 ADC  
**MAX. RATED OUTPUT CURRENT OF THE  
CHARGE CONTROLLER OR  
DC-TO-DC-CONVERTER (IF  
INSTALLED)** 15 ADC  
LABEL LOCATION: DC DISCONNECT INVERTER  
[PER CODE: NEC 690.53 UTILITY]

**10**  **WARNING**  
**ELECTRIC SHOCK HAZARD**  
TERMINALS ON BOTH LINE AND LOAD SIDES MAY  
BE ENERGIZED IN THE OPEN POSITION  
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR  
MODULES ARE EXPOSED TO SUNLIGHT  
LABEL LOCATION  
DC DISCONNECT INVERTER, COMBINE BOX  
[PER CODE: NEC 690.13(B)]


**11** **SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**  
TURN RAPID SHUTDOWN  
SWITCH TO THE  
"OFF" POSITION TO  
SHUT DOWN PV SYSTEM  
AND REDUCE  
SHOCK HAZARD  
IN THE ARRAY  
  
LABEL LOCATION: MAIN SERVICE  
[PER CODE: NEC 690.12, NEC 690.56(C)(1)(a)]

**19** **DEDICATED PHOTOVOLTAIC SYSTEM  
COMBINER PANEL NO LOAD SHALL BE  
ADDED TO THIS PANEL**  
LABEL LOCATION  
AC PHOTOVOLTAIC COMBINER PANEL  
REF. CODE : NEC 690.64(B)(2)

**13**  **CAUTION**  
DUAL POWER SOURCE  
SECOND SOURCE IS  
PHOTOVOLTAIC  
LABEL LOCATION :SERVICE METER MAIN PANEL  
[PER CODE: UTILITY]

**14**  **WARNING**  
**INVERTER OUTPUT CONNECTION**  
DO NOT RELOCATE THIS  
OVER-CURRENT DEVICE  
LABEL LOCATION :(IF APPLICABLE) SERVICE PANEL  
[PER CODE: NEC 705.12(D)(7)]

**15** **PHOTOVOLTAIC SYSTEM  
UTILITY DISCONNECT SWITCH**  
LABEL LOCATION :AC DISCONNECT  
[PER CODE: NEC 690.13(B)UTILITY]

**16**  **WARNING**  
**ELECTRIC SHOCK HAZARD**  
IF GROUND FAULT IS INDICATED ALL NORMALLY  
GROUNDED CONDUCTORS MAY BE UNGROUNDED  
AND ENERGIZED  
LABEL LOCATION  
AC DISCONNECT COMBINER BOX SERVICE METER  
[PER CODE: NEC 690.5(C)]

**17** **PV SOLAR BREAKER**  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE  
LABEL LOCATION  
MAIN PANEL DEAD FRONT  
[PER CODE: NEC 705.12(B)(2)(3)(b)]

**18** **WARNING PHOTOVOLTAIC POWER SOURCE**  
LABEL LOCATION  
DC CONDUIT JUNCTION BOX NO MORE THAN 10FT  
[PER CODE: NEC 690.31(G)(3),NEC 690.31(G)(4)]



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UTILITY:DUKE ENERGY

PRN NUMBER:TPS-40595



**WARNING PLACARDS**

DESIGNER /CHECKED  
BY: ANK/RK PAPER SIZE:17"X11"

SCALE:AS NOTED REV:B

DATE:12/15/2021 PL-1

REFLECTIVE AND WEATHER RESISTANCE LABEL REQUIRES CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8INCH, WHITE LETTERS ON RED BACKGROUND LABELS SHALL BE PLACED ON INTERIOR AND EXTERIOR DCCONDUIT, RACEWAYS, ENCLOSURE, AND CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDSAND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/ CEILING ASSEMBLIES, WALLS OR BARRIERS.

# SAFETY PLANS-1

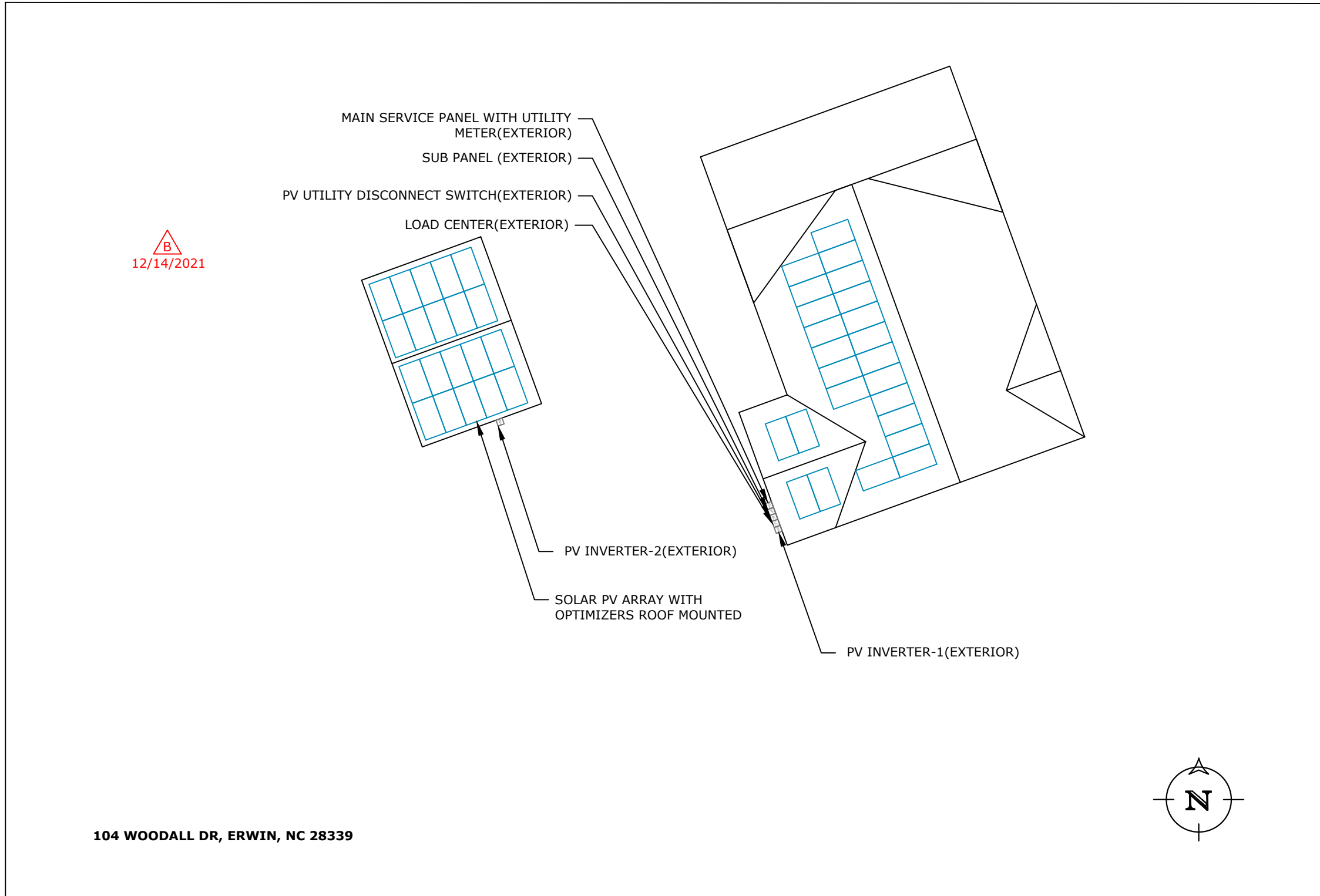
## SAFETY PLANS

**NOTES:**

1. INSTALLERS SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME.
2. INSTALLERS SHALL UPDATE NAME ADDRESS AND PHONE NUMBER OF NEAREST.
3. URGENT CARE FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK.

**LOCATION OF NEAREST URGENT CARE FACILITY**

NAME:  
ADDRESS:  
PHONE NUMBER:



⚠  
12/14/2021

**104 WOODALL DR, ERWIN, NC 28339**



**ADDRESS:** 525W, BASELINE RD  
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### CUSTOMER INFORMATION

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### SAFETY PLANS-1

DESIGNER /CHECKED BY: ANK/RK

PAPER SIZE: 17"X11"

SCALE: AS NOTED

REV: B

DATE: 12/15/2021

PL-2



**SAFETY PLANS-2**

**SAFETY PLANS**

NOTES:

1. INSTALLERS SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME.
2. INSTALLERS SHALL UPDATE NAME ADDRESS AND PHONE NUMBER OF NEAREST.
3. URGENT CARE FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK.

LOCATION OF NEAREST URGENT CARE FACILITY

NAME:  
ADDRESS:  
PHONE NUMBER:

**PERSONS COVERED BY THIS JOB SAFETY PLAN**

**INJURED AT WORK TODAY?  
INITIAL YES OR NO**

| PRINT NAME | INITIAL | YES | NO |
|------------|---------|-----|----|
|            |         |     |    |
|            |         |     |    |
|            |         |     |    |
|            |         |     |    |
|            |         |     |    |
|            |         |     |    |
|            |         |     |    |

UNDERGROUND DIG REQUIRED?

YES \_\_\_\_\_ PERMIT # \_\_\_\_\_



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UTILITY:DUKE ENERGY

PRN NUMBER:TPS-40595



**SAFETY PLANS-2**

DESIGNER /CHECKED  
BY: ANK/RK

PAPER SIZE:17"X11"

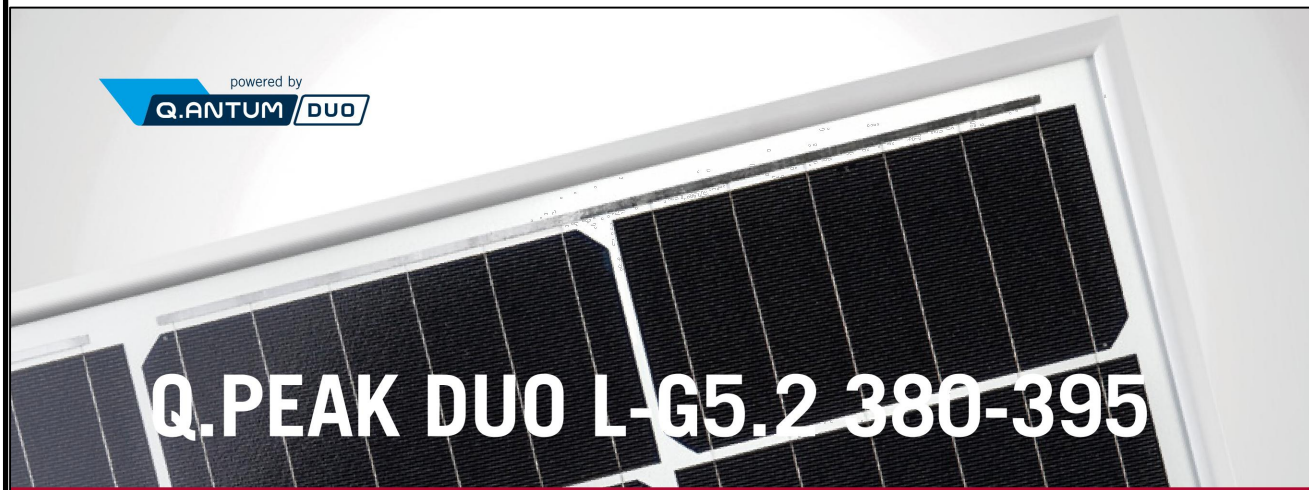
SCALE:AS NOTED

REV:B

DATE:12/15/2021

PL-3

# SPEC SHEET



## Q.PEAK DUO L-G5.2 380-395

### Q.ANTUM SOLAR MODULE

The new high-performance module **Q.PEAK DUO L-G5.2** is the ideal solution for commercial and utility applications thanks to a combination of its innovative cell technology **Q.ANTUM** and cutting edge cell interconnection. This 1500V IEC/UL solar module with its 6 busbar cell design ensures superior yields with up to 395 Wp while having a very low LCOE.



#### LOW ELECTRICITY GENERATION COSTS

Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.9%.



#### 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 (2400 Pa).



#### A RELIABLE INVESTMENT

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



#### THE IDEAL SOLUTION FOR:

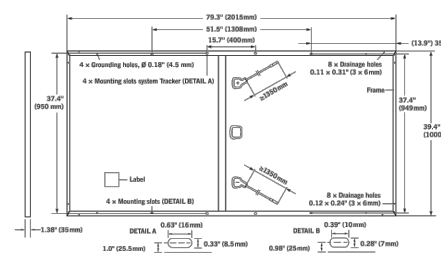


Engineered in **Germany**



#### MECHANICAL SPECIFICATION

|                     |  |
|---------------------|--|
| <b>Format</b>       | 79.3 in × 39.4 in × 1.38 in (including frame)<br>(2015 mm × 1000 mm × 35 mm)   |
| <b>Weight</b>       | 51.8 lbs (23.5 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>        | Anodized aluminum  |
| <b>Cell</b>         | 6 × 24 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), Protection class IP67, with bypass diodes |
| <b>Cable</b>        | 4 mm <sup>2</sup> Solar cable; (+) ≥ 53.1 in (1350 mm), (-) ≥ 53.1 in (1350 mm)  |
| <b>Connector</b>    | Multi-Contact MC4-EVO2, JMTHY PV-JM601A, IP68 or Renhe 05-6, IP67  |

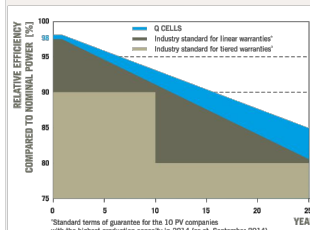


#### ELECTRICAL CHARACTERISTICS

| POWER CLASS   | 380                        | 385    | 390    | 395    |        |
|---|----------------------------|--------|--------|--------|--------|
| <b>MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC<sup>1</sup> (POWER TOLERANCE +5 W / -0 W)</b> |                            |        |        |        |        |
| <b>Power at MPP<sup>1</sup></b>   | <b>P<sub>MPP</sub> [W]</b> | 380    | 385    | 390    | 395    |
| <b>Short Circuit Current<sup>1</sup></b>  | <b>I<sub>sc</sub> [A]</b>  | 10.05  | 10.10  | 10.14  | 10.19  |
| <b>Open Circuit Voltage<sup>1</sup></b>   | <b>V<sub>oc</sub> [V]</b>  | 47.95  | 48.21  | 48.48  | 48.74  |
| <b>Current at MPP</b>   | <b>I<sub>MPP</sub> [A]</b> | 9.57   | 9.61   | 9.66   | 9.70   |
| <b>Voltage at MPP</b>   | <b>V<sub>MPP</sub> [V]</b> | 39.71  | 40.05  | 40.38  | 40.71  |
| <b>Efficiency<sup>1</sup></b>   | <b>η [%]</b>               | ≥ 18.9 | ≥ 19.1 | ≥ 19.4 | ≥ 19.6 |
| <b>MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT<sup>2</sup></b>                           |                            |        |        |        |        |
| <b>Power at MPP</b>   | <b>P<sub>MPP</sub> [W]</b> | 283.9  | 287.6  | 291.3  | 295.1  |
| <b>Short Circuit Current</b>  | <b>I<sub>sc</sub> [A]</b>  | 8.10   | 8.14   | 8.17   | 8.21   |
| <b>Open Circuit Voltage</b>   | <b>V<sub>oc</sub> [V]</b>  | 45.12  | 45.37  | 45.62  | 45.87  |
| <b>Current at MPP</b>   | <b>I<sub>MPP</sub> [A]</b> | 7.53   | 7.57   | 7.60   | 7.64   |
| <b>Voltage at MPP</b>   | <b>V<sub>MPP</sub> [V]</b> | 37.69  | 38.01  | 38.33  | 38.64  |

<sup>1</sup>Measurement tolerances P<sub>MPP</sub> ± 3%; I<sub>sc</sub>, V<sub>oc</sub> ± 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

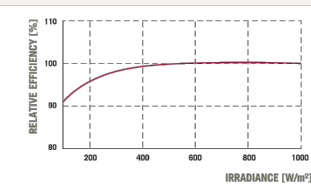
#### Q CELLS PERFORMANCE WARRANTY



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

|   |                |       |  |                  |                      |
|---|----------------|-------|--|------------------|----------------------|
| <b>Temperature Coefficient of I<sub>sc</sub></b>  | <b>α</b> [%/K] | +0.04 | <b>Temperature Coefficient of V<sub>oc</sub></b> | <b>β</b> [%/K]   | -0.28                |
| <b>Temperature Coefficient of P<sub>MPP</sub></b> | <b>γ</b> [%/K] | -0.37 | <b>Normal Operating Module Temperature</b>       | <b>NMOT</b> [°F] | 109 ± 5.4 (43 ± 3°C) |

#### PROPERTIES FOR SYSTEM DESIGN

|  |                              |  |  |
|--|------------------------------|--|--|
| <b>Maximum System Voltage V<sub>sys</sub></b> [V]                            | 1500 (IEC) / 1500 (UL)       | <b>Safety Class</b>                                    | II                                     |
| <b>Maximum Series Fuse Rating</b> [A DC]                                     | 20                           | <b>Fire Rating</b>                                     | C (IEC) / TYPE 1 (UL)                  |
| <b>Max. Design Load, Push / Pull (UL)<sup>2</sup></b> [lbs/ft <sup>2</sup> ] | 75 (3600 Pa) / 33 (1600 Pa)  | <b>Permitted module temperature on continuous duty</b> | -40°F up to +185°F (-40°C up to +85°C) |
| <b>Max. Test Load, Push / Pull (UL)<sup>2</sup></b> [lbs/ft <sup>2</sup> ]   | 113 (5400 Pa) / 50 (2400 Pa) |  | <sup>2</sup> see installation manual   |

#### QUALIFICATIONS AND CERTIFICATES

UL 1703; CE-compliant; IEC 61215:2016, IEC 61730:2016 application class A



#### PACKAGING INFORMATION

|  |   |
|--|---|
| <b>Number of Modules per Pallet</b>                  | 29  |
| <b>Number of Pallets per 53' Trailer</b>             | 26  |
| <b>Number of Pallets per 40' High Cube Container</b> | 22  |
| <b>Pallet Dimensions (L × W × H)</b>                 | 81.9 in × 45.3 in × 46.7 in (2080 mm × 1150 mm × 1185 mm) |
| <b>Pallet Weight</b>                                 | 1635 lbs (742 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



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### MODULE SPEC SHEET

DESIGNER /CHECKED BY: ANK/RK PAPER SIZE:17"X11"

SCALE:AS NOTED REV:B

DATE:12/15/2021 SS-1

Specifications subject to technical changes © Hanwha Q CELLS Q.PEAK DUO L-G5.2\_380-395\_2018-03\_Rev05\_M

# Single Phase Inverter with HD-Wave Technology

for North America

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



INVERTERS

## Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted 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
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

[solaredge.com](http://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

| 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<br>3300 @ 208V | 5000       | 6000 @ 240V<br>5000 @ 208V | 7600       | 10000       | 11400 @ 240V<br>10000 @ 208V | VA  |
| Maximum AC Power Output   | 3000                           | 3800 @ 240V<br>3300 @ 208V | 5000       | 6000 @ 240V<br>5000 @ 208V | 7600       | 10000       | 11400 @ 240V<br>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                            |                            |            | 400                        |            |             |                              | 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  | 600ka Sensitivity              |                            |            |                            |            |             |                              |     |
| Maximum Inverter Efficiency   | 99                             | 99.2                       |            |                            |            |             |                              | %   |
| CEC Weighted Efficiency   | 99                             |                            |            |                            |            |             | 99 @ 240V<br>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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35.320226, -78.667743  
APN: 060-597-020-218

AHJ:NC-TOWN OF ERWIN

UTILITY:DUKE ENERGY

PRN NUMBER:TPS-40595



### INVERTER SPEC SHEET

DESIGNER /CHECKED BY: ANK/RK PAPER SIZE:17"X11"

SCALE:AS NOTED REV:B

DATE:12/15/2021 SS-2

# SPEC SHEET

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

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

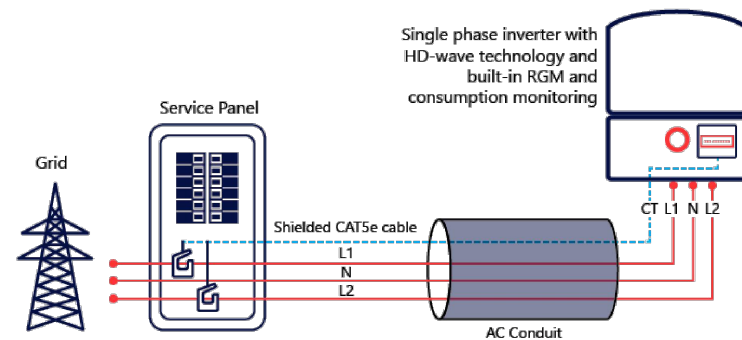
| MODEL NUMBER                                     | SE3000H-US  | SE3800H-US  | SE5000H-US  | SE6000H-US                          | SE7600H-US | SE10000H-US | SE11400H-US |
|--|---|-------------|-------------|-------------------------------------|------------|-------------|-------------|
| <b>ADDITIONAL FEATURES</b>                       |   |             |             |                                     |            |             |             |
| Supported Communication Interfaces               | RS485, Ethernet, ZigBee (optional), Cellular (optional)                                   |             |             |                                     |            |             |             |
| Revenue Grade Metering, ANSI C12.20              | Optional <sup>1)</sup>  |             |             |                                     |            |             |             |
| Consumption metering                             |   |             |             |                                     |            |             |             |
| Inverter Commissioning                           | With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection |             |             |                                     |            |             |             |
| Rapid Shutdown - NEC 2014 and 2017 690.12        | Automatic Rapid Shutdown upon AC Grid Disconnect  |             |             |                                     |            |             |             |
| <b>STANDARD COMPLIANCE</b>                       |   |             |             |                                     |            |             |             |
| Safety   | UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCL according to T.I.L. M-07             |             |             |                                     |            |             |             |
| Grid Connection Standards                        | IEEE1547, Rule 21, Rule 14 (H)  |             |             |                                     |            |             |             |
| Emissions  | FCC Part 15 Class B   |             |             |                                     |            |             |             |
| <b>INSTALLATION SPECIFICATIONS</b>               |   |             |             |                                     |            |             |             |
| 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 |            |             |             |
| Weight with Safety Switch                        | 22 / 10   | 25.1 / 11.4 | 26.2 / 11.9 | 38.8 / 17.6                         |            |             |             |
| Noise  | < 25  |             |             | <50                                 |            |             |             |
| Cooling  | Natural Convection  |             |             |                                     |            |             |             |
| Operating Temperature Range                      | -40 to +140 / -40 to +60 <sup>6)</sup>  |             |             |                                     |            |             |             |
| Protection Rating                                | NEMA 4X (Inverter with Safety Switch)   |             |             |                                     |            |             |             |

<sup>1)</sup> Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BN14. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box

<sup>6)</sup> Full power up to at least 50°C / 122°F; for power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>

### How to Enable Consumption Monitoring

By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills



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AHJ:NC-TOWN OF ERWIN

UTILITY:DUKE ENERGY

PRN NUMBER:TPS-40595



### INVERTER SPEC SHEET

DESIGNER /CHECKED  
BY: ANK/RK

PAPER SIZE:17"X11"

SCALE:AS NOTED

REV:B

DATE:12/15/2021

SS-3

# Power Optimizer

For North America

P370 / P400 / P401 / 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 (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

[solaredge.com](http://solaredge.com)



## Power Optimizer For North America

P370 / P400 / P401 / P485 / P505

| Optimizer model (typical module compatibility)  | P370 (for higher-power 60 and 72-cell modules)       | P400 (for 72 & 96-cell modules)  | P401 (for high power 60 and 72 cell modules) | P485 (for high-voltage modules)      | P505 (for higher current modules) |         |
|---|--|----------------------------------|--|--------------------------------------|-----------------------------------|---------|
| <b>INPUT</b>  |  |                                  |  |                                      |                                   |         |
| Rated Input DC Power <sup>(1)</sup>   | 370  | 400                              | 400  | 485                                  | 505                               | W       |
| Absolute Maximum Input Voltage (Voc at lowest temperature)  | 60   | 80                               | 60   | 125 <sup>(2)</sup>                   | 83 <sup>(2)</sup>                 | Vdc     |
| MPPT Operating Range  | 8 - 60   | 8 - 80                           | 8-60   | 12.5 - 105                           | 12.5 - 83                         | Vdc     |
| Maximum Short Circuit Current (Isc)   | 11   | 10.1                             | 11.75  | 11                                   | 14                                | Adc     |
| Maximum Efficiency  | 99.5   |                                  |  |                                      |                                   | %       |
| Weighted Efficiency   | 98.8   |                                  |  |                                      |                                   | %       |
| Overvoltage Category  | II   |                                  |  |                                      |                                   |         |
| <b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREGE INVERTER)</b>                   |  |                                  |  |                                      |                                   |         |
| Maximum Output Current  | 15   |                                  |  |                                      |                                   | Adc     |
| Maximum Output Voltage  | 60   |                                  |  | 85                                   |                                   | Vdc     |
| <b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREGE INVERTER OR SOLAREGE INVERTER OFF)</b> |  |                                  |  |                                      |                                   |         |
| Safety Output Voltage per Power Optimizer   | 1 ± 0.1  |                                  |  |                                      |                                   | Vdc     |
| <b>STANDARD COMPLIANCE</b>  |  |                                  |  |                                      |                                   |         |
| Photovoltaic Rapid Shutdown System  | NEC 2014, 2017 & 2020                                |                                  | NEC 2014, 2017 & 2020                        | NEC 2014, 2017 & 2020                |                                   |         |
| EMC   | FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3      |                                  |  |                                      |                                   |         |
| Safety  | IEC62109-1 (class II safety), UL1741                 |                                  |  |                                      |                                   |         |
| Material  | UL94 V-0, UV Resistant                               |                                  |  |                                      |                                   |         |
| 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 153 x 29.5 / 5.1 x 6 x 1.16            | 129 x 153 x 33.5 / 5.1 x 6 x 1.3     | 129 x 162 x 59 / 5.1 x 6.4 x 2.3  | mm / in |
| Weight (including cables)   | 655 / 1.4  | 750 / 1.7                        | 655 / 1.4                                    | 845 / 1.9                            | 1064 / 2.3                        | gr / lb |
| Input Connector   | MC4 <sup>(3)</sup>                                   |                                  |  | Single or dual MC4 <sup>(3)(4)</sup> | MC4 <sup>(3)</sup>                |         |
| Input Wire Length   | 0.16 / 0.52, 0.9 / 2.95 <sup>(4)</sup>               | 0.16 / 0.52                      | 0.16 / 0.52, 0.9 / 2.95 <sup>(4)</sup>       | 0.16 / 0.52                          | 0.16 / 0.52                       | m / ft  |
| Output Wire Type / Connector  | Double Insulated / MC4                               |                                  |  |                                      |                                   |         |
| Output Wire Length  | 1.2 / 3.9  |                                  |  |                                      |                                   | m / ft  |
| Operating Temperature Range <sup>(5)</sup>  | -40 to +85 / -40 to +185                             |                                  |  |                                      |                                   | °C / °F |
| Protection Rating   | IP68 / NEMA6P  |                                  |  |                                      |                                   |         |
| Relative Humidity   | 0 - 100  |                                  |  |                                      |                                   | %       |

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed  
 (2) NEC 2017 requires max input voltage be not more than 80V  
 (3) For other connector types please contact SolarEdge  
 (4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals  
 (5) For ambient temperature above +85°C / +185°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 <sup>(6)(7)</sup> | Single Phase HD-Wave                                   | Single phase | Three Phase for 208V grid | Three Phase for 277/480V grid |    |
|---|--|--------------|---------------------------|-------------------------------|----|
| Minimum String Length (Power Optimizers)                      | P370, P400, P401<br>P485, P505                         | 8            | 10                        | 18                            |    |
| Maximum String Length (Power Optimizers)                      |  | 6            | 8                         | 14                            |    |
| Maximum Nominal Power per String                              | 5700 <sup>(8)</sup> (6000 with SE7600-US - SE11400-US) | 25           | 5250 <sup>(8)</sup>       | 25                            | 50 |
| Parallel Strings of Different Lengths or Orientations         | Yes  |              |                           |                               | W  |

(6) 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)  
 (7) It is not allowed to mix P485/P505 with P370/P400/P401 in one string  
 (8) If the inverters rated AC power < 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>  
 (9) For 208V grid: it is allowed to install up to 7,200W per string when the maximum power difference between each string is 1,000W  
 (10) For 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

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PRN NUMBER:TPS-40595



## OPTIMIZER SPEC SHEET

DESIGNER /CHECKED BY: ANK/RK

PAPER SIZE:17"X11"

SCALE:AS NOTED

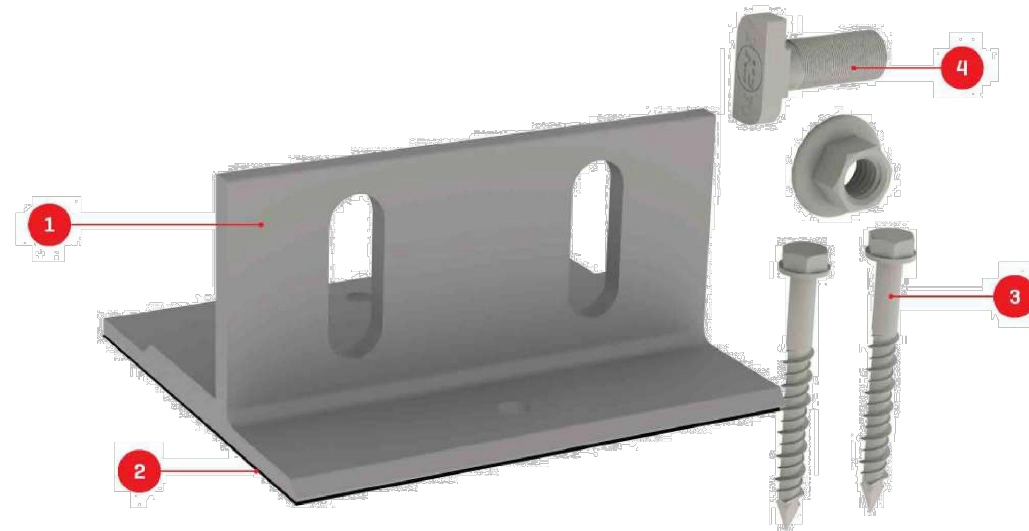
REV:B

DATE:12/15/2021

SS-4

**SPEC SHEET**

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# Splice Foot X

## TECHNICAL SHEET

| Item Number | Description             | Part Number                       |
|-------------|-------------------------|-----------------------------------|
| 1           | Splice Foot X           | 4000113   Splice Foot X Kit, Mill |
| 2           | K2 Solar Seal Butyl Pad |                                   |
| 3           | M5 x 60 lag screws      |                                   |
| 4           | T-Bolt & Hex Nut Set    |                                   |

### Technical Data

|                 |  |
|-----------------|--|
|                 | Splice Foot X                          |
| Roof Type       | Composition shingle                    |
| Material        | Aluminum with stainless steel hardware |
| Finish          | Mill                                   |
| Roof Connection | M5 x 60 lag screws                     |
| Code Compliance | UL 2703                                |
| Compatibility   | CrossRail 44-X, 48-X, 48-XL, 80        |

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### MOUNT SPEC SHEET

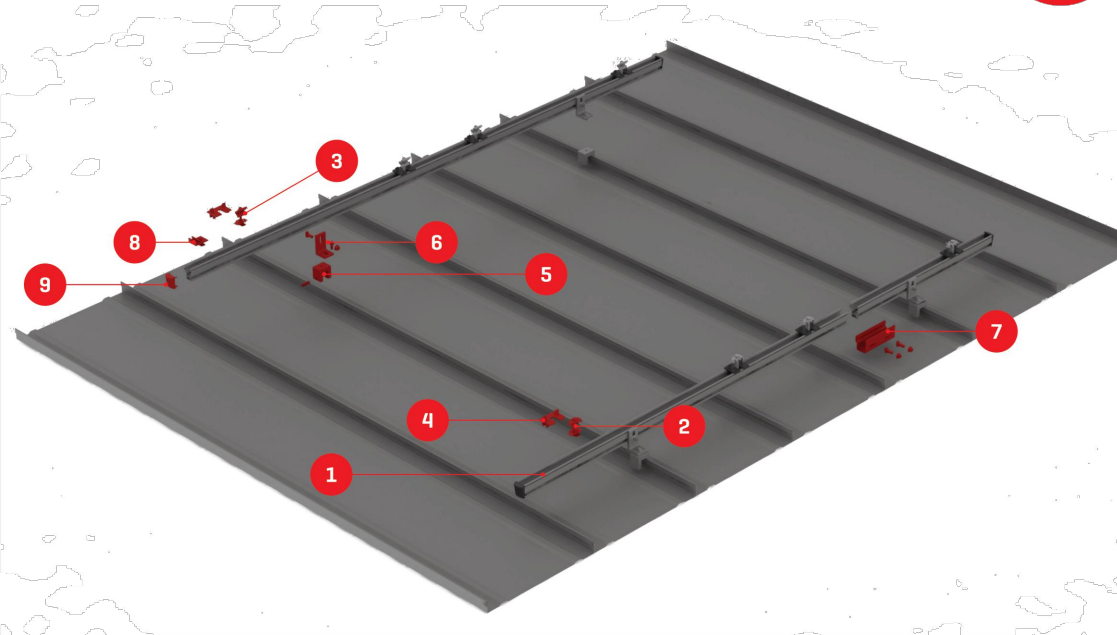
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|---------------------------------|---------------------|
| DESIGNER /CHECKED<br>BY: ANK/RK | PAPER SIZE: 17"X11" |
|---------------------------------|---------------------|

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|                  |      |
|------------------|------|
| DATE: 12/15/2021 | SS-5 |
|------------------|------|

**SPEC SHEET**

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# CrossRail Shared Rail System

## TECHNICAL SHEET

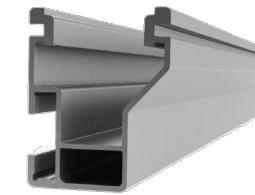
| Item Number | Description  | Part Number  |
|-------------|--|--|
| 1           | CrossRail 44-X (shown) all CR profiles applicable                                | 4000019 [166" mill], 4000020 [166" dark], 4000021 [180" mill], 4000022 [180" dark] |
| 2           | CrossRail Mid Clamp  | 4000601-H (mill), 4000602-H (dark)   |
| 3           | CrossRail (Standard) End Clamp   | 4000429 (mill), 4000430 (dark)   |
| 4           | Add-On (5mm shown)   | 4000632 (5mm), 4000609 (10mm)  |
| 5           | Standing Seam PowerClamp (mini shown)  | 4000016 (mini), 4000017 (standard)   |
| 6           | L-Foot Slotted Set   | 4000630 (mill), 4000631 (dark)   |
| 7           | CrossRail 44-X Rail Connector (shown)<br>CR 48-X, 48-XL Rail Connector available | 4000051 (mill), 4000052 (dark)   |
| 8           | Everest Ground Lug   | 4000006-H  |
| 9           | CrossRail 44-X End Cap (shown)<br>CrossRail 48-X, 48-XL and 80 available         | 4000067  |

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## CROSSRAIL 48-X



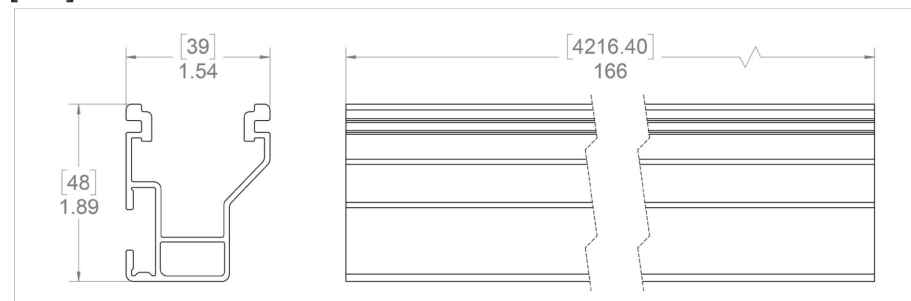
### Mechanical Properties

|                           | CrossRail 48-X           |
|---------------------------|--------------------------|
| Material                  | 6000 Series Aluminum     |
| Ultimate Tensile Strength | 37.7 ksi [260 MPa]       |
| Yield Strength            | 34.8 ksi [240 MPa]       |
| Weight                    | 0.56 lbs/ft [0.833 kg/m] |
| Finish                    | Mill or Dark Anodized    |

### Sectional Properties

|               | CrossRail 48-X                                  |
|---------------|---|
| Sx            | 0.1980 in <sup>3</sup> [3.245 cm <sup>3</sup> ] |
| Sy            | 0.1510 in <sup>3</sup> [2.474 cm <sup>3</sup> ] |
| A [X-Section] | 0.4650 in <sup>2</sup> [2.999 cm <sup>2</sup> ] |

Units: [mm] in



**Notes:**

- ▶ Structural values and span charts determined in accordance with Aluminum Design Manual and ASCE 7-16
- ▶ UL2703 Listed System for Fire and Bonding

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### RAIL SPEC SHEET

DESIGNER /CHECKED  
BY: ANK/RK

PAPER SIZE:17"X11"

SCALE:AS NOTED

REV:B

DATE:12/15/2021

SS-6

# SPEC SHEET

## Product data sheet Characteristics

**HOM4080L225PRB**  
Homeline, LC, 225 A, 120/240 V, 1 PH, MLO,  
PoN, 40 SP, N3R, surf



Product availability: Stock - Normally stocked in distribution facility



### Main

|                           |                 |
|---------------------------|-----------------|
| Product or component type | Load Center     |
| Marketing Trade Name      | Homeline        |
| Load center type          | Main lugs       |
| Line Rated Current        | 225 A           |
| Number of spaces          | 40              |
| Number of circuits        | 80              |
| Enclosure Rating          | NEMA 3R outdoor |
| Cover type                | Surface cover   |
| Electrical connection     | Lugs            |

### Complementary

|                           |  |
|---------------------------|--|
| Short-circuit current     | 10 kA  |
| Number of Tandem Breakers | 40   |
| Phase                     | 1 phase  |
| System Voltage            | 120/240 V AC   |
| Wire Size                 | AWG 4...300 kcmil (aluminium)<br>AWG 4...250 kcmil (copper)      |
| Wiring configuration      | 3-wire   |
| Cover finish              | Gray baked enamel  |
| Busbar Material           | Tin plated aluminium busbar                                      |
| Enclosure material        | Welded galvanized steel  |
| Surface finish            | Baked enamel grey  |
| Box number                | 14R  |
| Height                    | 39.37 in (1000 mm)   |
| Width                     | 14.76 in (375 mm)  |
| Depth                     | 4.53 in (115 mm)   |
| Tightening torque         | 250 lbf.in (AWG 4...250 kcmil)<br>250 lbf.in (AWG 4...300 kcmil) |

### Environment

|                        |           |
|------------------------|-----------|
| Product certifications | UL E-6294 |
|------------------------|-----------|

### Ordering and shipping details

|                       |                                    |
|-----------------------|------------------------------------|
| Category              | 00145 - HOM LC&CVR,12-42CKT NEMA3R |
| Discount Schedule     | DE3C                               |
| GTIN                  | 0078590197773                      |
| Nbr. of units in pkg. | 1                                  |
| Package weight(Lbs)   | 42.240000000000002                 |
| Returnability         | Y                                  |
| Country of origin     | US                                 |

Aug 11, 2019



1

### Offer Sustainability

|                                  |  |
|----------------------------------|--|
| Sustainable offer status         | Green Premium product  |
| RoHS (date code: YYWW)           | Compliant - since 1414 - Schneider Electric declaration of conformity <a href="#">Schneider Electric declaration of conformity</a> |
| REACH                            | Reference not containing SVHC above the threshold  |
| Product environmental profile    | Available  |
| Product end of life instructions | Need no specific recycling operations  |
| California proposition 65        | WARNING: This product can expose you to chemicals including:   |
| ----- Substance 1                | Lead and lead compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm.    |
| ----- More information           | For more information go to <a href="http://www.p65warnings.ca.gov">www.p65warnings.ca.gov</a>                                      |

The information provided in this documentation contains general descriptions and/or technical characteristics of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.



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AHJ:NC-TOWN OF ERWIN

UTILITY:DUKE ENERGY

PRN NUMBER:TPS-40595



## MPU SPEC SHEET

|                                 |                    |
|---------------------------------|--------------------|
| DESIGNER /CHECKED<br>BY: ANK/RK | PAPER SIZE:17"X11" |
|---------------------------------|--------------------|

|                |       |
|----------------|-------|
| SCALE:AS NOTED | REV:B |
|----------------|-------|

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| DATE:12/15/2021 | SS-7 |
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