

# PHOTOVOLTAIC GROUND MOUNT SYSTEM

40 MODULES-GROUND MOUNTED - 19.200 kW DC, 23.000 kW AC

2184 WIRE RD, BUNNLEVEL, NC 28323



**SOUTHEAST ENERGY SOLUTIONS**

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

## PROJECT DATA

PROJECT ADDRESS: 2184 WIRE RD, BUNNLEVEL, NC 28323

OWNER: TRAVIS BASS

DESIGNER: ESR

SCOPE: 19.200 KW DC GROUND MOUNT SOLAR PV SYSTEM WITH 40 HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W PV MODULES WITH 01 SOL-ARK 15K-LV INVERTER 01 SOL-ARK 8K-P INVERTER

AUTHORITIES HAVING JURISDICTION: BUILDING: HARNETT COUNTY ZONING: HARNETT COUNTY UTILITY: DUKE ENERGY PROGRESS

## SHEET INDEX

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## SIGNATURE

## GENERAL NOTES

- ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
- THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
- WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
- HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
- A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
- PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
- PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
- ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
- ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

## VICINITY MAP



## HOUSE PHOTO



## CODE REFERENCES

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

## REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A

## PROJECT NAME & ADDRESS

TRAVIS BASS  
 RESIDENCE  
 2184 WIRE RD,  
 BUNNLEVEL, NC 28323

## DRAWN BY

ESR

## SHEET NAME

COVER SHEET

## SHEET SIZE

ANSI B  
 11" X 17"

## SHEET NUMBER

PV-1

# PROJECT DESCRIPTION:

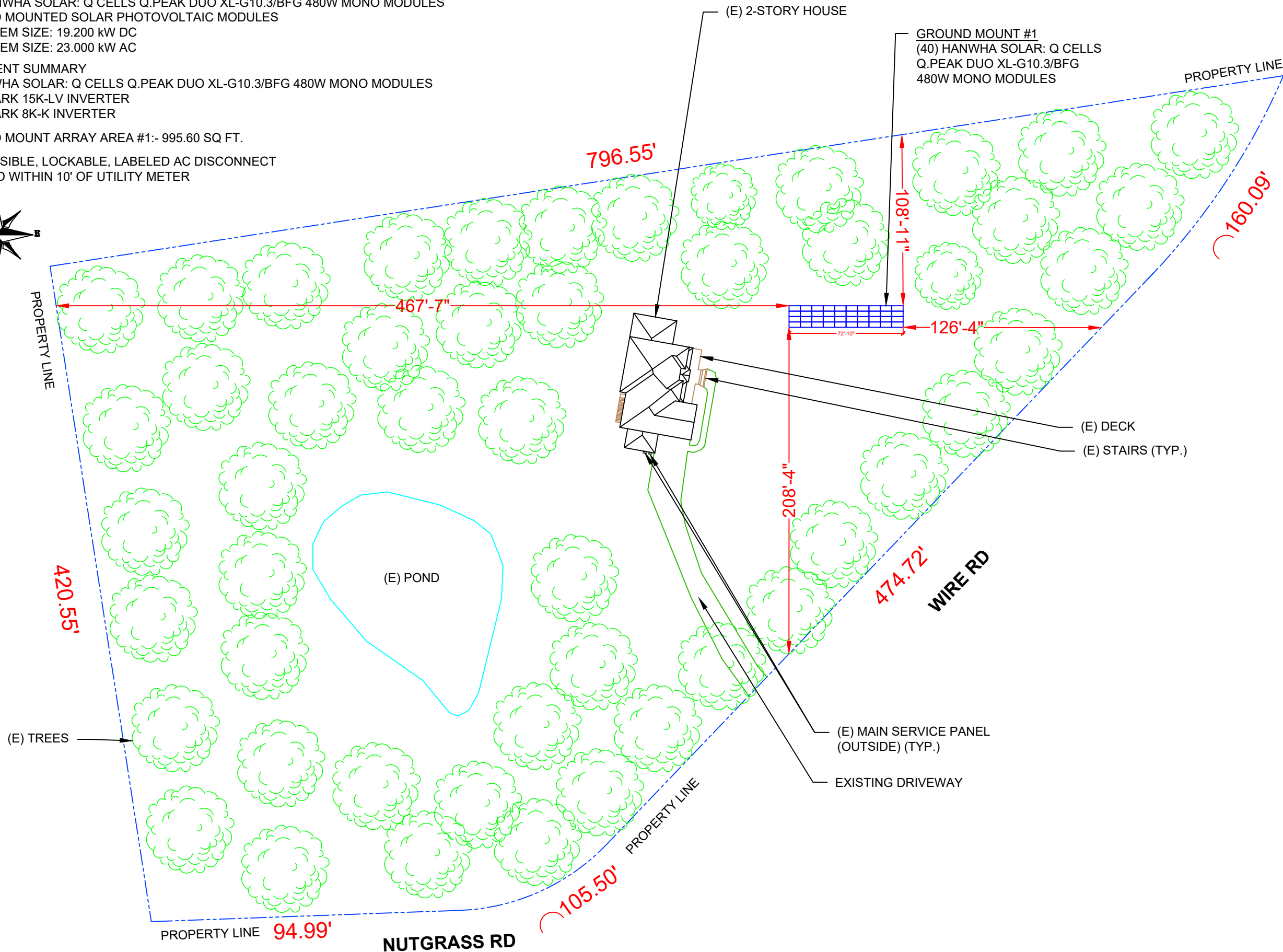
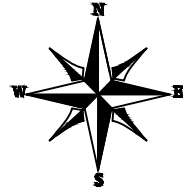
40 X HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MONO MODULES  
 GROUND MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 DC SYSTEM SIZE: 19.200 kW DC  
 AC SYSTEM SIZE: 23.000 kW AC

## EQUIPMENT SUMMARY

40 HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MONO MODULES  
 01 SOL-ARK 15K-LV INVERTER  
 01 SOL-ARK 8K-K INVERTER

GROUND MOUNT ARRAY AREA #1:- 995.60 SQ FT.

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT  
 LOCATED WITHIN 10' OF UTILITY METER



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#### DRAWN BY

ESR

#### SHEET NAME

PLOT PLAN WITH  
 GROUND PLAN

#### SHEET SIZE

ANSI B  
 11" X 17"

#### SHEET NUMBER

PV-2

**MODULE TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULES = 40 MODULES  
 MODULE TYPE = HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MONO MODULES  
 MODULE WEIGHT = 64.2 LBS / 29.1KG.  
 MODULE DIMENSIONS = 87.2" x 41.1" = 24.89 SF



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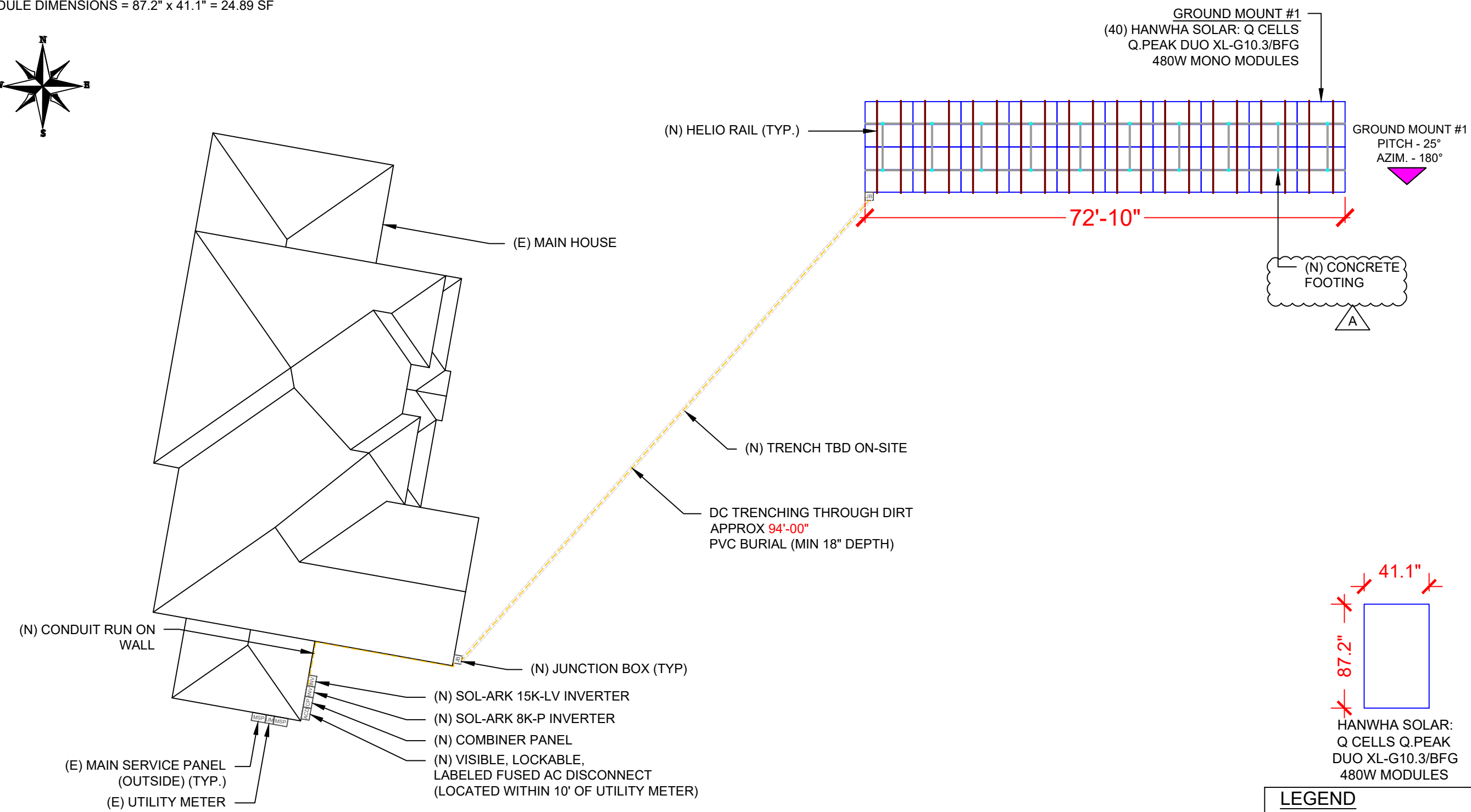
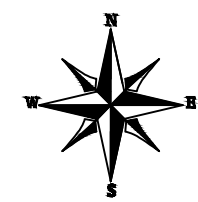
**TRAVIS BASS RESIDENCE**  
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**ESR**

SHEET NAME  
**GROUND PLAN & MODULES**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-3**



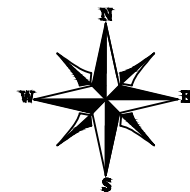
**LEGEND**

ACD	- AC DISCONNECT
INV	- INVERTER
UM	- UTILITY METER
SUB	- SUBPANEL
MSP	- MAIN SERVICE PANEL
JB	- JUNCTION BOX
---	- CONDUIT
---	- TRENCH

**1 GROUND PLAN & MODULES**

PV-3 SCALE: 1/16" = 1'-0"

STRING LEGENDS	
	STRING #1/INV#1
	STRING #2/INV#1
	STRING #3/INV#1
	STRING #4/INV#1
	STRING #5/INV#1
	STRING #1/INV#2
	STRING #2/INV#2



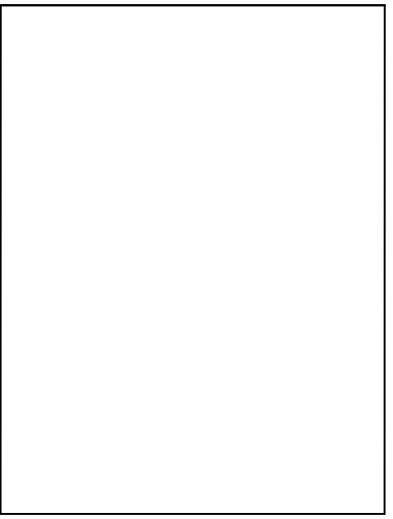
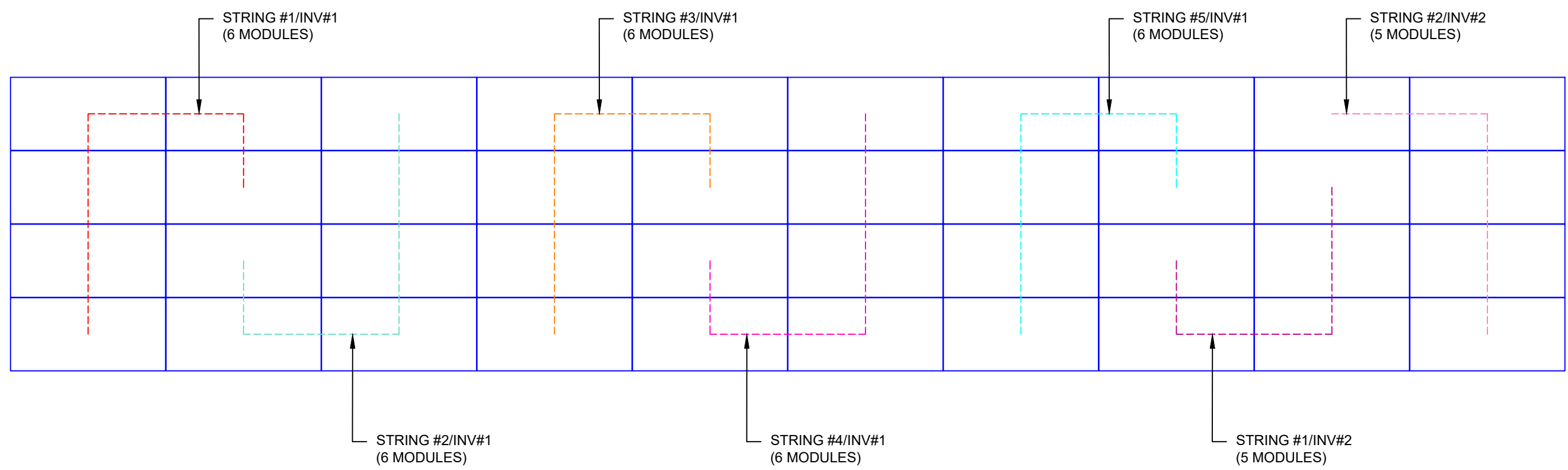
Bill of Materials		
Part	Spares	Total Qty
A21165-120 HSS 2.375" OD Front Pipe		10
Not provided by SunModo - ASTM A53 Grade B Sch. 40 Galvanized Pipe (or better) - 136'		
A21168-112 2.875" OD E/W Pipe Beam, 112"		16
A50164-066 HSS E/W Tube Brace		2
A50164-092 HSS N/S Tube Brace		10
A20444-174-ML SMR300 Rail, 174"		20
K10343-005 2.5" Pipe U-Clamp Kit		40
K10341-002 2.5" Pipe T-Cap Kit		20
K10219-001 2" Pipe Clamp Kit		22
K10222-001 2.5" Pipe Clamp Kit		2
K10342-001 2.5" Pipe Splice Kit		14
K10417-003 Mid Clamp, SMR Pop-on		60
K10418-003 End Clamp, SMR Pop-On		40
K10469-001 SMR Grounding Lug		1
A20445-001 Rail End Cap, SMR300		40

A

BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MODULE	40
INVERTER: SOL-ARK 15K-LV INVERTER	40
INVERTER: SOL-ARK 8K-P INVERTER	01
JUNCTION BOXES: 6"X6"X4" UL LISTED, STEEL WATER TIGHT NEMA TYPE 3R, UL LISTED	2
AC DISCONNECT: FUSED AC DISCONNECT, 200A FUSED, (2) 125A FUSES 240V NEMA 3R, UL LISTED	1

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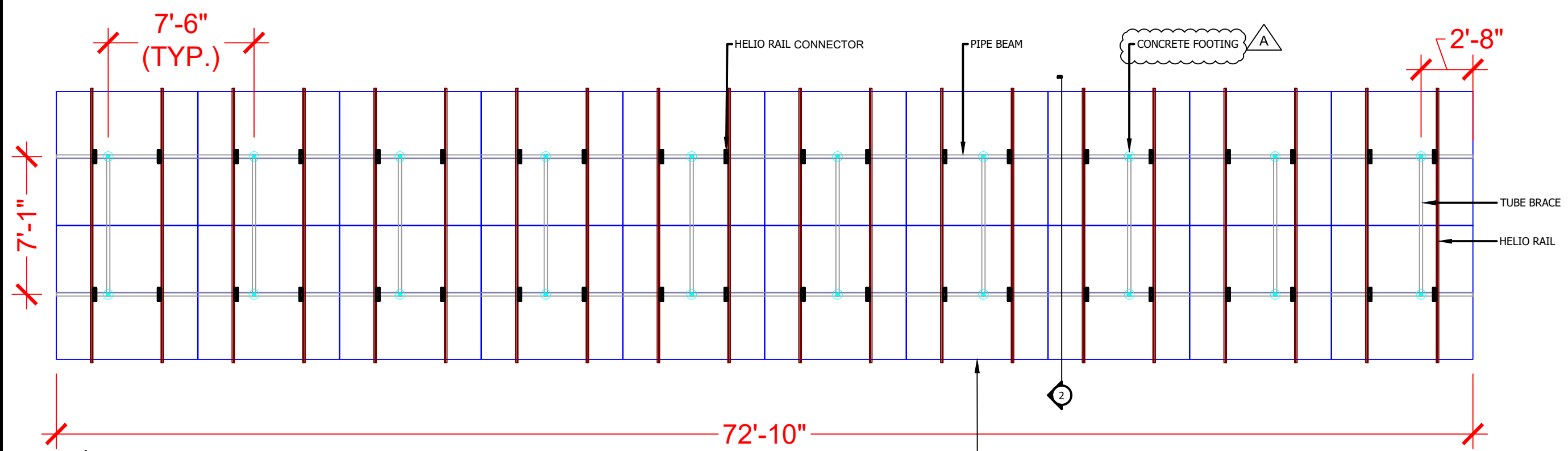
DRAWN BY  
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SHEET NAME  
**ELECTRICAL PLAN**

SHEET SIZE  
**ANSI B  
11" X 17"**

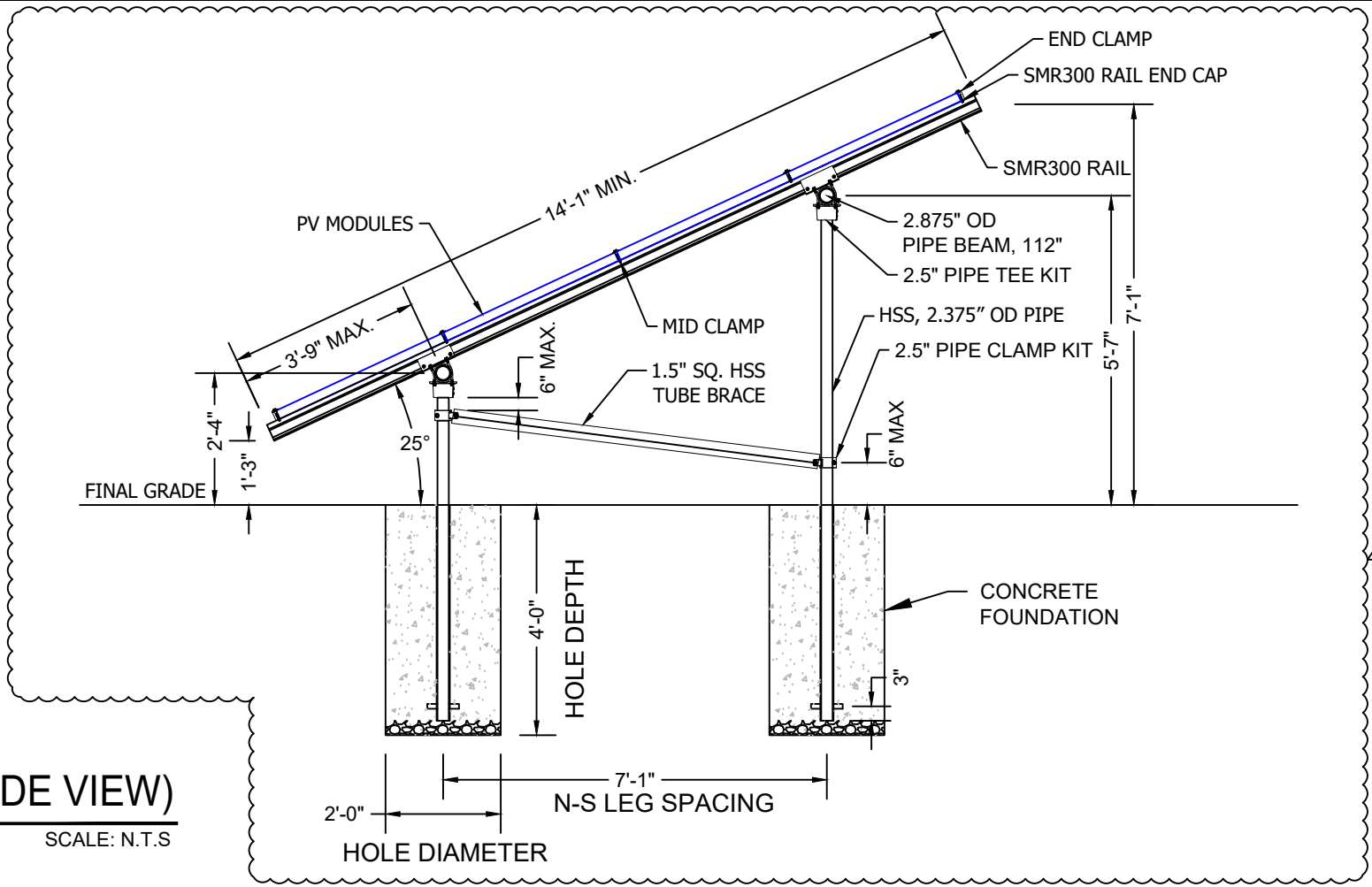
SHEET NUMBER  
**PV-4**

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**1** | **ARRAY DETAILS (TOP VIEW)**  
PV-5 | SCALE: N.T.S

**GROUND ARRAY #1**  
(40) HANWHA SOLAR: Q CELLS  
Q.PEAK DUO XL-G10.3/BFG 480W  
MONO MODULES



**2** | **ARRAY DETAILS (SIDE VIEW)**  
PV-5 | SCALE: N.T.S

PROJECT NAME & ADDRESS  
**TRAVIS BASS RESIDENCE**  
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DRAWN BY  
**ESR**

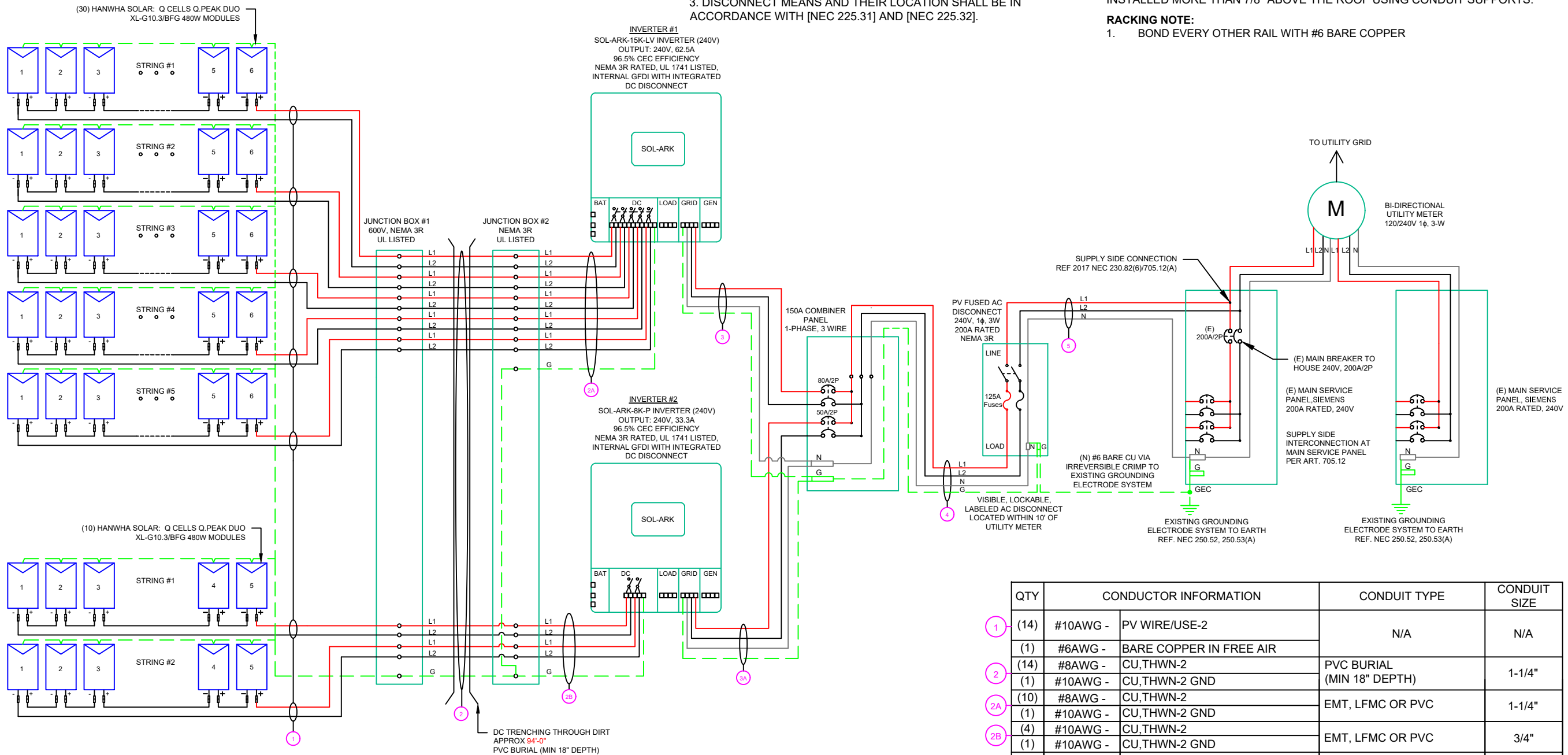
SHEET NAME  
**RACKING DETAILS**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-5**

DC SYSTEM SIZE: 19,200 kW DC  
AC SYSTEM SIZE: 23,000 kW AC

(40) HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MONO MODULES  
(01) SOL-ARK 15K-LV INVERTER  
01 SOL-ARK 8K-P INVERTER  
(05) STRINGS OF 06 MODULES AND  
(02) STRINGS OF 05 MODULES ARE CONNECTED IN SERIES



**INTERCONNECTION NOTES:**

1. INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
2. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
3. ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
4. PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

**DISCONNECT NOTES:**

1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. DISCONNECT MEANS AND THEIR LOCATION SHALL BE IN ACCORDANCE WITH [NEC 225.31] AND [NEC 225.32].

**GROUNDING & GENERAL NOTES:**

1. PV GROUNDING ELECTRODE SYSTEM NEEDS TO BE INSTALLED IN ACCORDANCE WITH [NEC 690.43]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.

**RACKING NOTE:**

1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER

QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
1 (14)	#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	#6AWG - BARE COPPER IN FREE AIR		
2 (14)	#8AWG - CU, THWN-2	PVC BURIAL (MIN 18" DEPTH)	1-1/4"
2A (1)	#10AWG - CU, THWN-2 GND	EMT, LFMC OR PVC	1-1/4"
2B (1)	#10AWG - CU, THWN-2 GND	EMT, LFMC OR PVC	3/4"
3 (1)	#4AWG - CU, THWN-2 N	EMT, LFMC OR PVC	1"
3A (1)	#8AWG - CU, THWN-2 N	EMT, LFMC OR PVC	3/4"
4 (1)	#1AWG - CU, THWN-2 N	EMT, LFMC OR PVC	1-1/4"
5 (1)	#1AWG - CU, THWN-2 N	EMT, LFMC OR PVC	1-1/4"

NOTE: CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV PROTECTED



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DRAWN BY  
**ESR**

SHEET NAME  
**ELECTRICAL LINE DIAGRAM**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-6**

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	HANWHA SOLAR: Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MODULE
VMP	45.33V
IMP	10.59A
VOC	53.39V
ISC	11.12A
TEMP. COEFF. VOC	-0.27%/°C
MODULE DIMENSION	87.2"L x 41.1"W x 1.38"D (In Inch)

INVERTER #1 SPECIFICATIONS	
MANUFACTURER / MODEL #	SOL-ARK 15K-LV INVERTER
NOMINAL AC POWER	15.000 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	62.5A

INVERTER #2 SPECIFICATIONS	
MANUFACTURER / MODEL #	SOL-ARK 8K-P INVERTER
NOMINAL AC POWER	8.000 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	33.3A

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-9°
AMBIENT TEMP (HIGH TEMP 2%)	38°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.27%/°C

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20



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DC FEEDER CALCULATIONS																					
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.56 (A)	OC PD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
STRING 1/INV#1	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
STRING 2/INV#1	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
STRING 3/INV#1	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
STRING 4/INV#1	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
STRING 5/INV#1	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
STRING 1/INV#2	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
STRING 2/INV#2	JUNCTION BOX 1	500	11.12	17.35	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.028	N/A	#N/A
JUNCTION BOX 1	JUNCTION BOX 2	500	11.12	17.35	20	CU #10 AWG	CU #8 AWG	50	PASS	38	14	55	0.91	0.5	25.025	PASS	94	0.778	0.325	1 1/4" PVC	36.71714
JUNCTION BOX 2	INVERTER 1	500	11.12	17.35	20	CU #10 AWG	CU #8 AWG	50	PASS	38	10	55	0.91	0.5	25.025	PASS	28	0.778	0.097	1 1/4" EMT	25.87567
JUNCTION BOX 2	INVERTER 2	500	11.12	17.35	20	CU #10 AWG	CU #10 AWG	35	PASS	38	4	40	0.91	0.8	29.12	PASS	28	1.24	0.154	3/4" EMT	19.79362

String 1/Inv#1 Voltage Drop	0.450
String 2/Inv#1 Voltage Drop	0.450
String 3/Inv#1 Voltage Drop	0.450
String 4/Inv#1 Voltage Drop	0.450
String 5/Inv#1 Voltage Drop	0.450
String 1/Inv#2 Voltage Drop	0.507
String 2/Inv#2 Voltage Drop	0.507

AC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OC PD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER 1	COMBINER PANEL	240	62.5	78.125	80	CU #4 AWG	CU #8 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.080	1" EMT	32.8472
INVERTER 2	COMBINER PANEL	240	33.3	41.625	50	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.108	3/4" EMT	24.5591
COMBINER PANEL	AC DISCONNECT	240	95.8	119.75	125	CU #1 AWG	CU #6 AWG	CU #1 AWG	130	PASS	38	2	145	0.91	1	131.95	PASS	5	0.154	0.061	1 1/4" EMT	34.7126
AC DISCONNECT	POI	240	95.8	119.75	125	CU #1 AWG	N/A	CU #1 AWG	130	PASS	38	2	145	0.91	1	131.95	PASS	5	0.154	0.061	1 1/4" EMT	31.3235

CUMULATIVE VOLTAGE DROP INV #1	0.20
CUMULATIVE VOLTAGE DROP INV #2	0.23

**ELECTRICAL NOTES**

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON GROUNDTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSKO GBL-4DBT LAY-IN LUG.
- TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.

PROJECT NAME & ADDRESS

TRAVIS BASS  
RESIDENCE

2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY

ESR

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-7

# PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT & ENCLOSURES

LABEL- 1:  
LABEL LOCATION:  
EMT/CONDUIT RACEWAY  
SOLADECK / JUNCTION BOX  
CODE REF: NEC 690.31 (D)(2)

## WARNING

### ELECTRIC SHOCK HAZARD

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

LABEL- 2:  
LABEL LOCATION:  
AC DISCONNECT  
CODE REF: NEC 690.13(B)

## WARNING

### DUAL POWER SUPPLY

SOURCE: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL- 3:  
LABEL LOCATION:  
MAIN SERVICE PANEL  
CODE REF: NEC 705.12(C) & NEC 690.59

# SOLAR PV BREAKER:

## BREAKER IS BACKFED DO NOT RELOCATE

LABEL-4:  
LABEL LOCATION:  
MAIN SERVICE PANEL  
CODE REF: NEC 705.12(C) & NEC 690.59

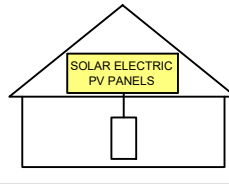
## WARNING

### POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL- 5:  
LABEL LOCATION:  
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
SUBPANEL (ONLY IF SOLAR IS BACK-FED)  
CODE REF: NEC 705.12(B)(3)(2)

# SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



LABEL- 6:  
LABEL LOCATION:  
AC DISCONNECT  
CODE REF: [NEC 690.56(C)(1)(A)]

# RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL- 7:  
LABEL LOCATION:  
AC DISCONNECT  
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
CODE REF: NEC 690.56(C)(2)

# DC DISCONNECT

LABEL- 8:  
LABEL LOCATION:  
INVERTER  
CODE REF: NEC 690.13(B)

# AC DISCONNECT PHOTOVOLTAIC SYSTEM POWER SOURCE

NOMINAL OPERATING AC VOLATGE **240 V**  
RATED AC OUTPUT CURRENT **95.8 A**

LABEL- 9:  
LABEL LOCATION:  
AC DISCONNECT  
CODE REF: NEC 690.54

FOR INV #1

# INVERTER AC DISCONNECT

NOMINAL OPERATING AC VOLATGE **240 V**  
RATED AC OUTPUT CURRENT **62.50 A**

LABEL- 10:  
LABEL LOCATION:  
INVERTER  
CODE REF: NEC 690.54

FOR INV #2

# INVERTER AC DISCONNECT

NOMINAL OPERATING AC VOLATGE **240 V**  
RATED AC OUTPUT CURRENT **33.3 A**

LABEL- 11:  
LABEL LOCATION:  
INVERTER  
CODE REF: NEC 690.54

FOR INV #1 & #2

MAXIMUM VOLTAGE **500 V**

MAXIMUM CIRCUIT CURRENT **18 A**

MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)

LABEL- 12:  
LABEL LOCATION:  
INVERTER  
CODE REF: NEC 690.53



## SOUTHEAST ENERGY SOLUTIONS

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

### REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A

### PROJECT NAME & ADDRESS

TRAVIS BASS  
RESIDENCE  
2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY

ESR

SHEET NAME

LABELS

SHEET SIZE

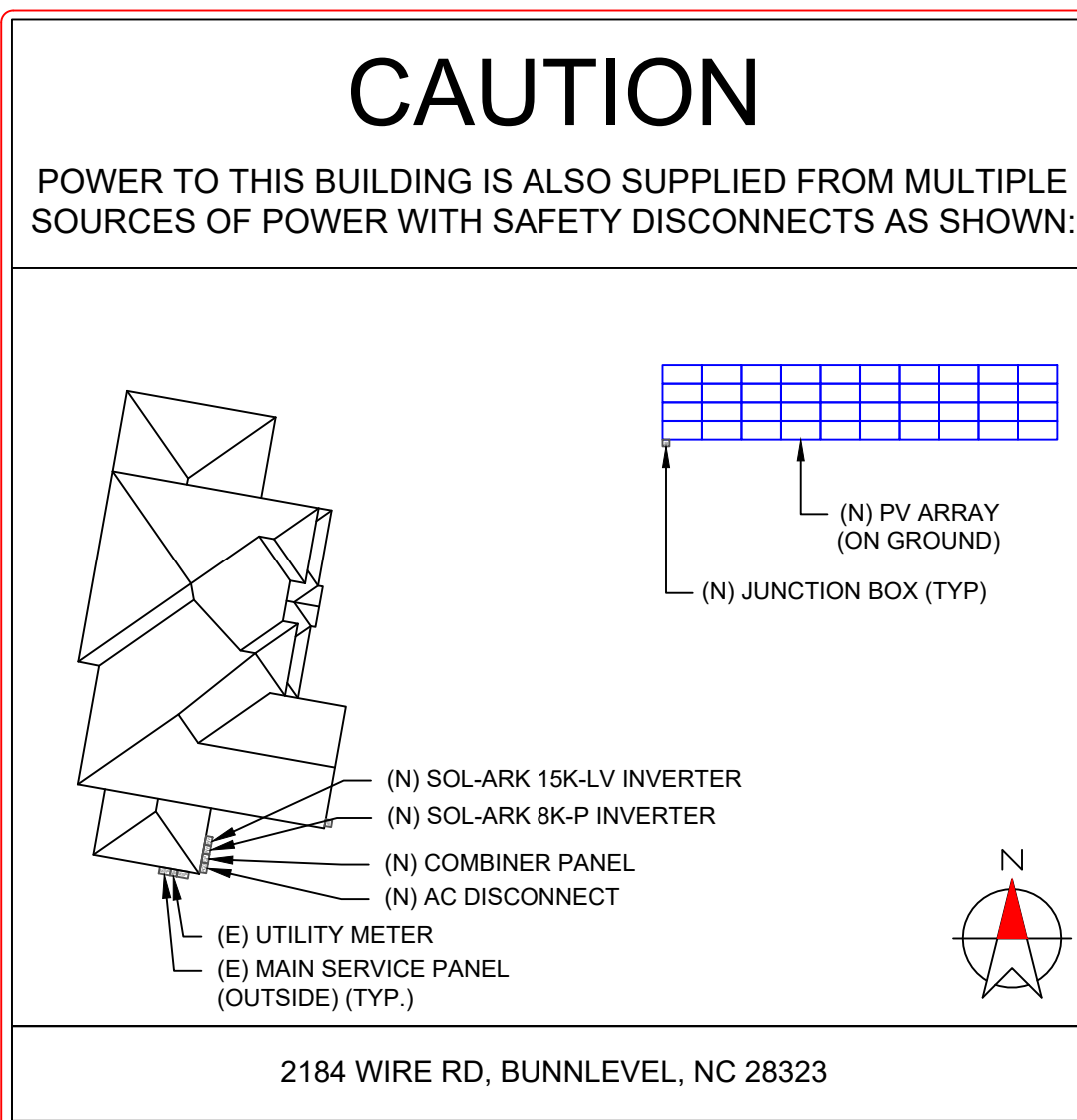
ANSI B  
11" X 17"

SHEET NUMBER

PV-8



REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A



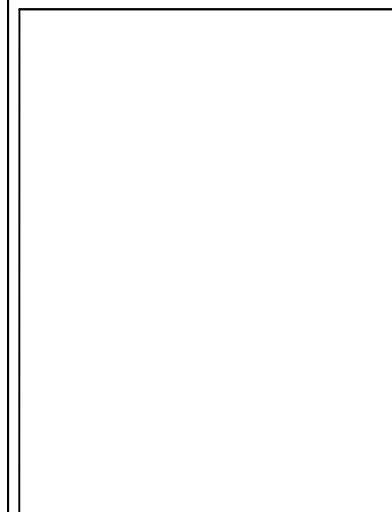
**DIRECTORY**

PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN:  
 NEC 690.56(B)&(C), [NEC 705.10])  
 [NEC 690.56(C)(1)(A)]

LABELING NOTES:

1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21]
5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [NEC 690.56(C)(1)(A)].



PROJECT NAME & ADDRESS

**TRAVIS BASS  
RESIDENCE**

2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
**ESR**

SHEET NAME  
**PLACARD**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-9**

**REVISIONS**

DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A

**PROJECT NAME & ADDRESS**

**TRAVIS BASS  
RESIDENCE**

**2184 WIRE RD,  
BUNNLEVEL, NC 28323**

**DRAWN BY**

**ESR**

**SHEET NAME  
EQUIPMENT  
SPECIFICATION**

**SHEET SIZE**

**ANSI B  
11" X 17"**

**SHEET NUMBER**

**PV-10**



**Q.PEAK DUO XL-G10.3 / BFG  
470-485**

**BIFACIAL DOUBLE GLASS MODULE  
WITH EXCELLENT RELIABILITY  
AND ADDITIONAL YIELD**



**BIFACIAL ENERGY YIELD GAIN OF UP TO 20%**

Bifacial Q.ANTUM solar cells with zero gap cell layout make efficient use of light shining on the module rear-side for radically improved LCOE.



**LOW ELECTRICITY GENERATION COSTS**

Q.ANTUM DUO Z combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology for higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 21.2%.



**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 and Anti PID Technology<sup>1</sup>, Hot-Spot Protect and Traceable Quality Tra.Q™.



**FRAME FOR VERSATILE MOUNTING OPTIONS**

High-tech aluminum alloy frame protects from damage, enables use of a wide range of mounting structures and is certified regarding IEC for high snow (5400Pa) and wind loads (2400Pa).



**A RELIABLE INVESTMENT**

Double glass module design enables extended lifetime with 12-year product warranty and improved 30-year performance warranty<sup>2</sup>.

<sup>1</sup> APT test conditions according to IEC / TS 62804-1:2015 method B (-1500 V, 168h) including post treatment according to IEC 61215-1-1 Ed. 2.0 (CD)  
<sup>2</sup> See data sheet on rear for further information.

**THE IDEAL SOLUTION FOR:**

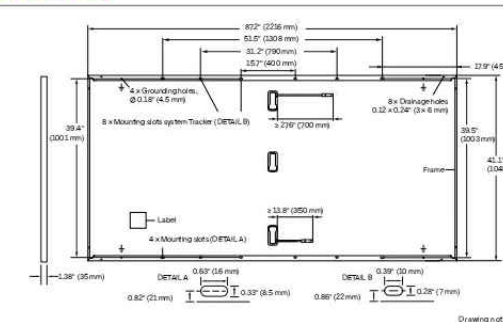


Engineered in Germany



**MECHANICAL SPECIFICATION**

Format	87.2 in × 41.1 in × 1.38 in (including frame) (2216 mm × 1045 mm × 35 mm)
Weight	64.2 lbs (29.1 kg)
Front Cover	0.08 in (2.0 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	0.08 in (2.0 mm) semi-tempered glass
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm <sup>2</sup> Solar cable; (+) ≥ 27.6 in (700 mm), (-) ≥ 13.8 in (350 mm)
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68



**ELECTRICAL CHARACTERISTICS**

POWER CLASS		470	475	480	485	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC* AND BSTC* (POWER TOLERANCE +5 W / -0 W)						
Minimum	Power at MPP <sup>1</sup>	P <sub>MPP</sub> [W]	470	475	480	485
	Short Circuit Current <sup>1</sup>	I <sub>SC</sub> [A]	11.04	11.08	11.12	11.16
	Open Circuit Voltage <sup>1</sup>	V <sub>OC</sub> [V]	52.91	53.10	53.34	53.63
	Current at MPP	I <sub>MPP</sub> [A]	10.51	10.55	10.59	10.63
	Voltage at MPP	V <sub>MPP</sub> [V]	44.73	45.03	45.33	45.63
	Efficiency <sup>2</sup>	η [%]	≥ 20.3	≥ 20.5	≥ 20.7	≥ 20.9

Bifaciality of P<sub>MPP</sub> and I<sub>SC</sub>: 70% ± 5% • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

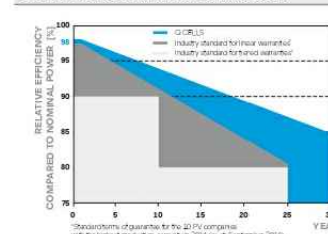
\* Measurement tolerances P<sub>MPP</sub> ± 3%; I<sub>SC</sub>, V<sub>OC</sub> ± 5% at STC: 1000 W/m<sup>2</sup>; \*at BSTC: 1000 W/m<sup>2</sup>; φ = 135° W/m<sup>2</sup>; φ = 70° ± 5%; 25 ± 2°C, AM 1.5 according to IEC 60904-3

**MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMO<sup>1</sup>**

Minimum	Power at MPP	P <sub>MPP</sub> [W]	353.8	357.6	361.4	365.1
	Short Circuit Current	I <sub>SC</sub> [A]	8.89	8.92	8.96	8.99
	Open Circuit Voltage	V <sub>OC</sub> [V]	50.04	50.27	50.49	50.72
	Current at MPP	I <sub>MPP</sub> [A]	8.27	8.30	8.34	8.37
	Voltage at MPP	V <sub>MPP</sub> [V]	42.77	43.06	43.35	43.63

<sup>1</sup> 800 W/m<sup>2</sup>, NMO<sup>1</sup>, spectrum AM 1.5

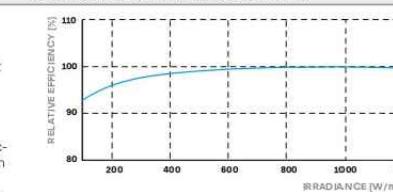
**Q CELLS PERFORMANCE WARRANTY**



At least 98% of nominal power during first year. Thereafter max. 0.45% degradation per year. At least 93.95% of nominal power up to 10 years. At least 84.95% of nominal power up to 30 years.

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

**PERFORMANCE AT LOW IRRADIANCE**



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

**TEMPERATURE COEFFICIENTS**

Temperature Coefficient of I <sub>SC</sub>	α [%/K]	+0.04	Temperature Coefficient of V <sub>OC</sub>	β [%/K]	-0.27
Temperature Coefficient of P <sub>MPP</sub>	γ [%/K]	-0.34	Nominal Module Operating Temperature	NMOT [°F]	108 ± 5.4 (42 ± 3 °C)

**PROPERTIES FOR SYSTEM DESIGN**

Maximum System Voltage V <sub>sys</sub>	[V]	1500	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 29*
Max. Design Load, Push / Pull <sup>1</sup>	[lbs / ft <sup>2</sup> ]	75 (3600 Pa) / 33 (1600 Pa)	Permitted Module Temperature on Continuous Duty	-40°F up to +185°F (-40°C up to +85°C)
Max. Test Load, Push / Pull <sup>1</sup>	[lbs / ft <sup>2</sup> ]	113 (5400 Pa) / 50 (2400 Pa)		

<sup>1</sup> See Installation Manual

\*New Type is similar to Type 3 but with metallic frame

**QUALIFICATIONS AND CERTIFICATES**

UL 61730, CE-compliant, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells), Certification in process.



**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.**

400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.us

Specifications subject to technical changes © Q CELLS Q.PEAK DUO XL-G10.3 / BFG\_470-485\_2023-01\_Rev01\_NA



**LIMITLESS  
15K-LV  
Spec Sheet**



**Solar Input Power 17000W**

Max Allowed PV Power	17000W
Max PV Power Delivered to Battery & AC Outputs	15000W
Max DC Voltage (Voc)	500V @ 18A, 450V @ 20A
MPPT Voltage Range	150-425V
Starting Voltage	125V
Number of MPPT	3
Max Solar Strings Per MPPT	2
Max DC Current per MPPT (Self Limiting)	26A
Max AC Coupled Input (Micro/String Inverters)	19200W

**AC Output Power 15kW On-Grid & Off-Grid**

Connections	120/240/208V Split Phase
Continuous AC Power from PV	15000W 62.5A-L (240V)
Continuous AC Power from Batteries	12000W 50A-L (240V)
Surge AC Power 10sec	24,000W L-L (240V)
Surge AC Power 100ms	TBD
Parallel Stacking	Yes - 12 Max
Frequency	60/50Hz
Continuous AC Power with Grid or Generator	48000W 200A L-L (240V) 24000W 200A L-N (120V)
CEC Efficiency	96.5% (Peak 97.5%)
Idle Consumption Typical—No Load	90W
Sell Back Power Modes	Limited to Household/Fully Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	4ms
Power Factor	+/- 0.9 - 1.0

**Battery (optional) Output Power 12000W**

Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	50 — 9900Ah
Voltage Range	43.0 — 63.0V
Continuous Battery Charging Output	275A
Charging Curve	3-Stage w/ Equalization
Grid to Batt Charging Efficiency	96.0%
External Temperature Sensor	Included
Current Shunt for Accurate % SOC	Integrated
External Gen Start Based on Voltage or %SOC	Integrated
Communication to Lithium Battery	CanBus & RS485

**General**

Dimensions (H x W x D)	31.8" x 18.3" x 10.9"
Weight	101 lbs
Enclosure	IP65 / NEMA 3R
Ambient Temperature	-40~60°C, >45°C Derating
Installation Style	Wall-Mounted
Wi-Fi & LAN Communication	Included
Standard Warranty (verified by HALT Testing)	10 Years

**Protections & Certifications**

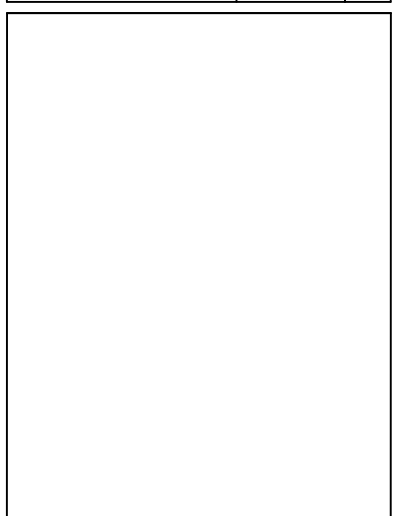
Electronics Certified Safety by SGS Labs to NEC & UL Specs - NEC 690.4B & NEC 705.4/6	Yes
Grid Sell Back — UL1741-2010/2018, IEE-E1547a-2003/2014, FCC 15 Class B, UL1741SA, CA Rule 21, HECO Rule 14H	Yes
PV DC Disconnect Switch — NEC 240.15	Integrated
Ground Fault Detection — NEC 690.5	Integrated
PV Rapid Shutdown Control — NEC 690.12	Integrated
PV Arc Fault Detection — NEC 690.11	Integrated
PV Input Lightning Protection	Integrated
PV String Input Reverse Polarity Protection	Integrated
AC Output Breakers - 63A	Integrated
250A Battery Breaker / Disconnect	Integrated
Surge Protection	DC Type II / AC Type II



**SOUTHEAST ENERGY SOLUTIONS**

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
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FOUNDATION CHANGE	11/09/2023	A



PROJECT NAME & ADDRESS

**TRAVIS BASS  
RESIDENCE**

2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-11**



**Sol-Ark  
8K-P  
Spec Sheet**



Solar Input Power 9000W	
Max Allowed PV Power	5500W + 5500W = 11000W
Max PV Power Delivered to Battery & AC Outputs	8000W
Max DC Voltage (Voc)	500V @ 18A, 450V @ 20A
MPPT Voltage Range	150-425V
Starting Voltage	125V
Number of MPPT	2
Max Solar Strings Per MPPT	2
Max DC Current per MPPT (Self Limiting)	20A
Max AC Coupled Input (Micro/String Inverters)	9600W

AC Output Power 8kW On-Grid & Off-Grid	
Connections	120/240/208V Split Phase
Continuous AC Power to Grid (On-Grid)	8000W 33.3A-L (240V)
Continuous AC Power to Load (Off-Grid)	8000W 33.3A-L (240V)
Surge AC Power 10sec (Load)	16,000VA L-L (240V)
Surge AC Power 100ms (Load)	25,000VA L-L(240V)
Parallel Stacking	No
Frequency	60/50Hz
Continuous AC Power with Grid or Generator (Pass-through Power)	15120W 63A L-L (240V) 7560W 63A L-N (120V)
CEC Efficiency	96.5% (Peak 97.5%)
Idle Consumption Typical—No Load	60W
Sell Back Power Modes	Limited to Household/Fully Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	4ms
Power Factor	+/- 0.9 - 1.0

Battery (optional) Output Power 8000W	
Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	50 — 9900Ah
Voltage Range	43.0 — 63.0V
Continuous Battery Charging Output	185A
Charging Curve	3-Stage w/ Equalization
Grid to Batt Charging Efficiency	96.0%
External Temperature Sensor	Included
Current Shunt for Accurate % SOC	Integrated
External Gen Start Based on Voltage or %SOC	Integrated
Communication to Lithium Battery	CanBus & RS485

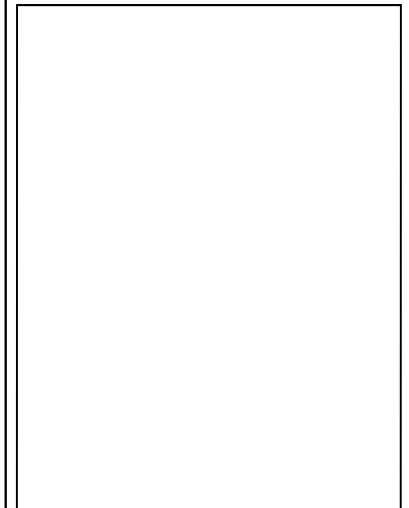
General	
Dimensions (H x W x D)	30.0" x 18.3" x
Weight	78 lbs
Enclosure	NEMA 3R
Ambient Temperature	-25-55°C, >45°C
Installation Style	Wall-Mounted
Wi-Fi & LAN Communication	Included
Standard Warranty (verified by HALT Testing)	5 Years

Protections & Certifications	
Electronics Certified Safety by SGS Labs to NEC & UL Specs - NEC 690.4B & NEC 705.4/6	Yes
Grid Sell Back — UL1741-2010/2018, IEE-E1547a-2003/2014, FCC 15 Class B, UL1741SA,	Yes
PV DC Disconnect Switch — NEC 240.15	Integrated
Ground Fault Detection — NEC 690.5	Integrated
PV Rapid Shutdown Control — NEC 690.12	Integrated
PV Arc Fault Detection — NEC 690.11	Integrated
PV Input Lightning Protection	Integrated
PV String Input Reverse Polarity Protection	Integrated
AC Output Breakers - 63A	Integrated
250A Battery Breaker / Disconnect	Integrated
Surge Protection	DC Type II / AC Type II



**SOUTHEAST ENERGY SOLUTIONS**  
855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

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PROJECT NAME & ADDRESS  
**TRAVIS BASS  
RESIDENCE**  
2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-12**



# GO BIG ON TURF

SunTurf™ Ground Mount System



SunModo offers the next generation Ground Mount System with SunTurf™. The streamlined design combines the strength of Helio Rails with steel pipes to create the perfect ground mount solution.

SunTurf™ is ideal for solar installers looking for a durable and cost-effective system that can accommodate a wide variety of soil conditions.

## The SunTurf™ Ground Mount Advantage

- ✓ Easily scalable from kilowatts to multimegawatts PV Arrays.
- ✓ Foundation design solution for every soil condition.
- ✓ Online configuration tool available to streamline design process.
- ✓ Components optimized for strength, durability and fast installation.
- ✓ UL 2703 Listed by Intertek.

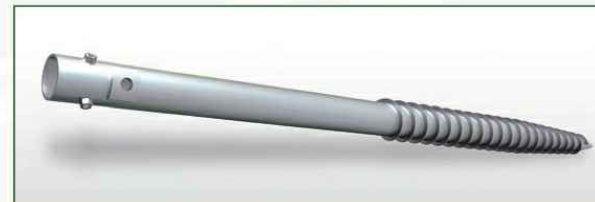
## Key Features of SunTurf™ Ground Mount System

SunTurf™ Ground Mount System easily integrate Helio Rails with Schedule 40 steel pipes. No drilling is required to attach the aluminum rails to the horizontal pipe. Optional bracing can provide additional structural rigidity for sites with high snow or wind load conditions. Anchor any ground mount installation using one of our fountain types including helical piles, precast ballasts and concrete piers.

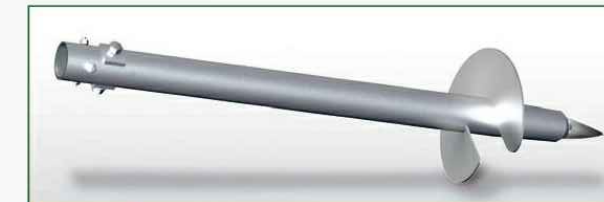


## Augers and Ground Screws

Our augers are suitable for use in weak to moderate strength soils and areas with a high-water table. Our ground screws are ideal for use in hard packed earth or soils with large amounts of cobble and gravel.



Ground Screw



Earth Auger

### Technical Data

Application	Ground Mount
Material	High grade aluminum, galvanized steel and 304 stainless steel hardware
Module Orientation	Portrait and Landscape
Tilt Angle	Range between 10 to 50 degrees
Foundation Types	Post in concrete, helical earth auger, ground screw anchor and ballast
Structural Integrity	Stamped engineering letters available
Certificate	UL2703 listed by ETL
Warranty	25 years

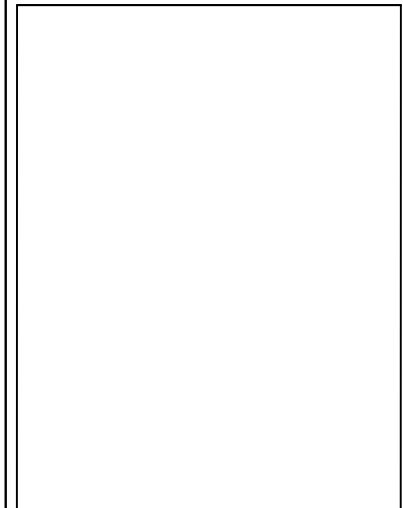
SunModo, Corp. Vancouver, WA., USA • www.sunmodo.com • 360.844.0048 • info@sunmodo.com



SOUTHEAST ENERGY SOLUTIONS

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

REVISIONS		
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FOUNDATION CHANGE	11/09/2023	A



PROJECT NAME & ADDRESS

TRAVIS BASS  
RESIDENCE  
2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-13

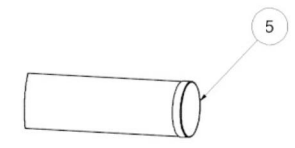
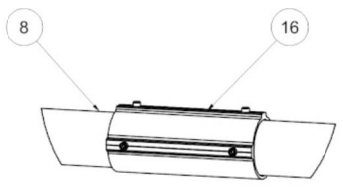
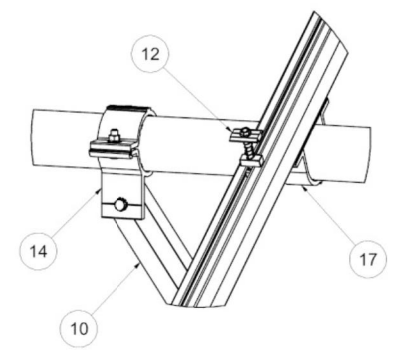
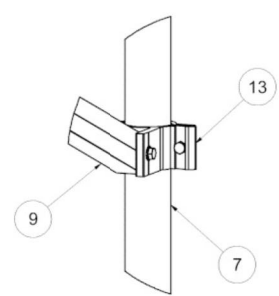
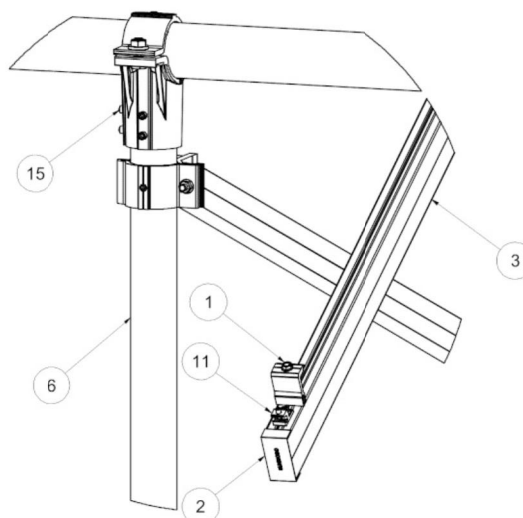
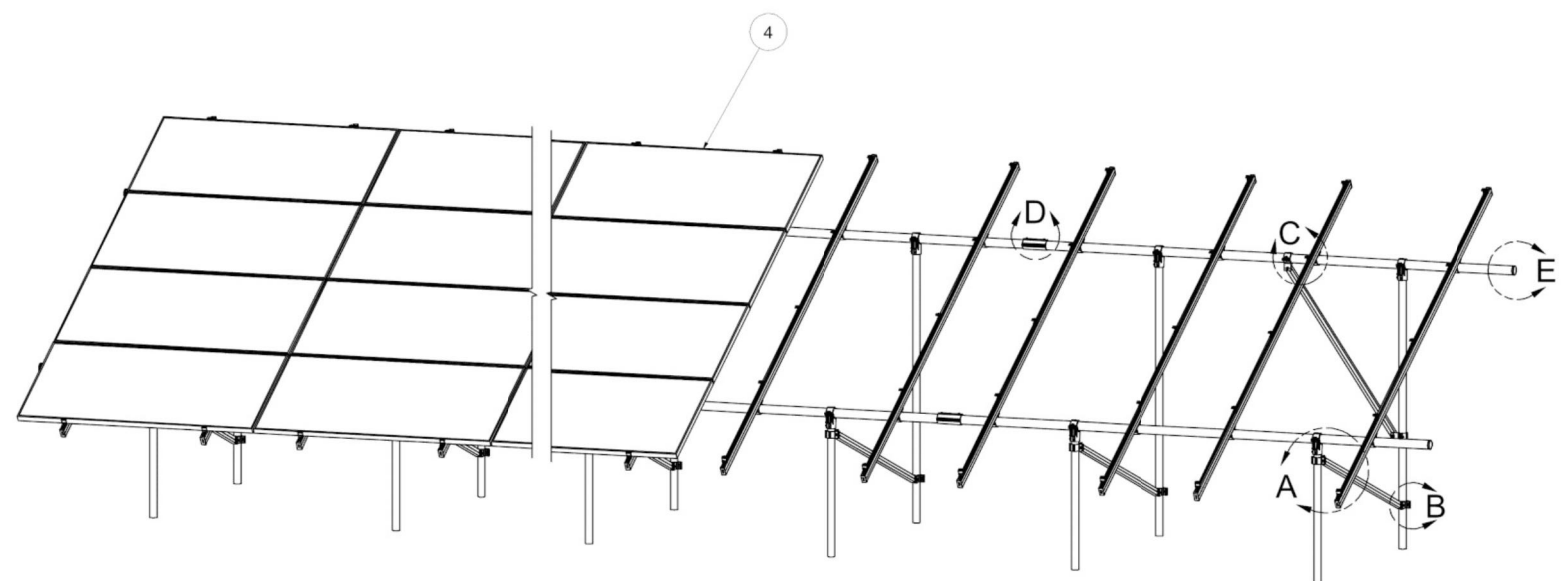
**Sub Array #1 Layout**

**NOTES: UNLESS OTHERWISE SPECIFIED**

1. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ENGINEERING HAS REVIEWED AND STAMPED THIS DOCUMENT.
2. DIMENSIONS SHOWN ARE INCHES.
3. THE SELF-BONDING SYSTEM AND SINGLE GROUND LUG IS FOR USE WITH PV MODULES THAT HAVE A MAXIMUM SERIES FUSE RATING OF 30A.
4. MATERIALS ARE AS SPECIFIED OR EQUIVALENT:  
HARDWARE: 304 STAINLESS STEEL  
FABRICATED EXTRUDED PARTS: 6005-T5 ALUMINUM ALLOY  
FABRICATED DIE CAST PARTS: ANSI/AA A380 ALUMINUM ALLOY  
STEEL PIPE: SCHEDULE 40 GALVANIZED  
ALUMINUM PIPE: SCHEDULE 10 ANODIZED
5. THE MAXIMUM PERMISSIBLE LENGTH OF ANY STRUCTURE SHALL BE 200 FT. FOR SYSTEMS USING A SHARED RAIL CONFIGURATION, A THERMAL BREAK IS REQUIRED IN THE RAIL EVERY 40 FT. PER THE DRAWING DETAILS.
6. 4LX10-25DEG-STR-GSM-AGM-BGM-PGM
7. APPROVED RAIL PROFILES VARY BASED ON ENGINEERING REQUIREMENTS. CONFIRM SELECTION WITH STRUCTURAL ENGINEER. SEE BOM IN BOTTOM RIGHT CORNER.
8. K10224-XXX END CLAMP KIT OR K10299-XXX ADJ. END CLAMP KIT.
9. FOUNDATION TYPES:  
GSM = GROUND SCREW GROUND MOUNT  
AGM = HELICAL AUGER GROUND MOUNT  
PGM = POST-IN-CONCRETE GROUND MOUNT  
BSM = BALLAST GROUND MOUNT
10. 1 OF 1 ARRAY TYPES
11. 1 ARRAYS TOTAL

PACKET A7	
Model Code	ASCE 7-10
Exposure Category	C
Wind Speed	110
Ground Snow Load	10
Tilt	25

4LX10 ARRAY



ITEM	PART NUMBER	DESCRIPTION	QTY
17	K10343-005	2.5" Pipe U-Clamp Kit	40
16	K10342-001	2.5" Pipe Splice Kit	14
15	K10341-002	2.5" Pipe T-Cap Kit	20
14	K10222-001	2.5" Pipe Clamp Kit	2
13	K10219-001	2" Pipe Clamp Kit	22
12	K10417-003	Mid Clamp, SMR Pop-on	60
11	K10469-001	SMR Grounding Lug	1
10	A50164-066	HSS E/W Tube Brace	2
9	A50164-092	HSS N/S Tube Brace	10
8	A21168-112	2.875" OD E/W Pipe Beam, 112"	16
7	A21165-120	HSS 2.375" OD Front Pipe	10
6			0
5	A20380-001	2.5" PIPE END CAP (OPTIONAL)	4
4		Panel 2,215 x1,044 x35.0mm	40
3	A20444-174-ML	SMR300 Rail, 174"	20
2	A20445-001	Rail End Cap, SMR300	40
1	K10418-003	End Clamp, SMR Pop-On	40

SEE BOM

**SunModo Corp.**  
14800 NE 65TH STREET, VANCOUVER WA 98682

TITLE: TRAVIS BASS  
DRAWING NUMBER: 795EF9

SCALE: N.T.S. SHEET 1 of 4

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A

PROJECT NAME & ADDRESS

**TRAVIS BASS RESIDENCE**

2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE  
**ANSI B 11" X 17"**

SHEET NUMBER  
**PV-14**

THIS DRAWING IS CONFIDENTIAL PROPERTY OF SUNMODO AND ITS CONTENTS MAY NOT BE DISCLOSED WITHOUT THE PRIOR WRITTEN CONSENT OF SUNMODO CORP.

**Sub Array #1 Spans**



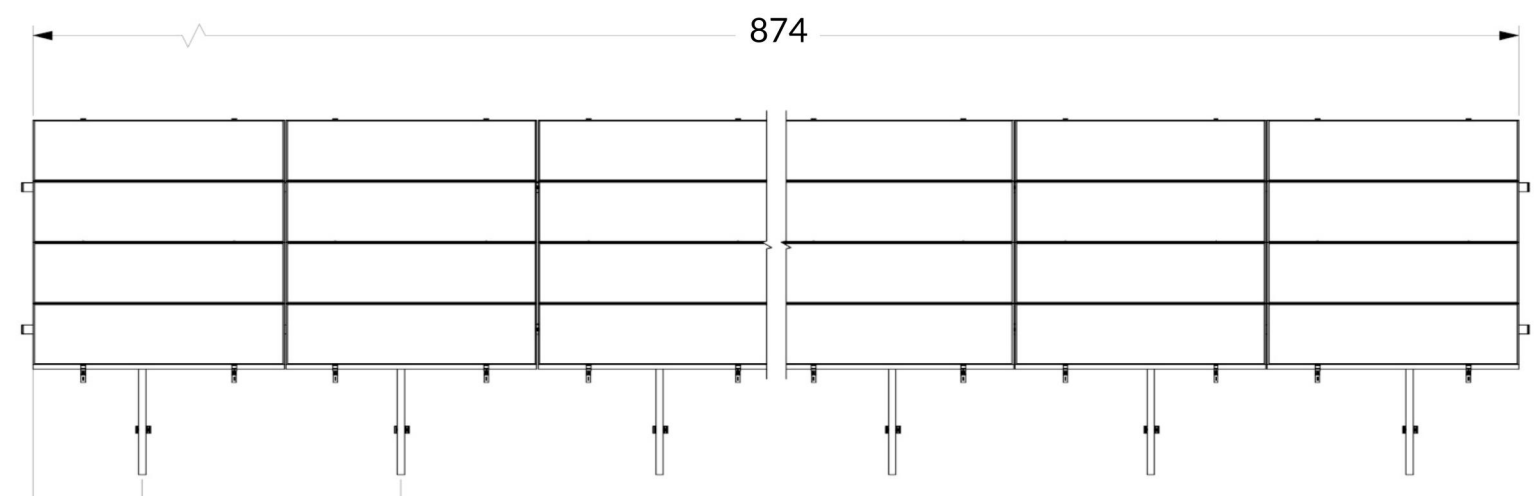
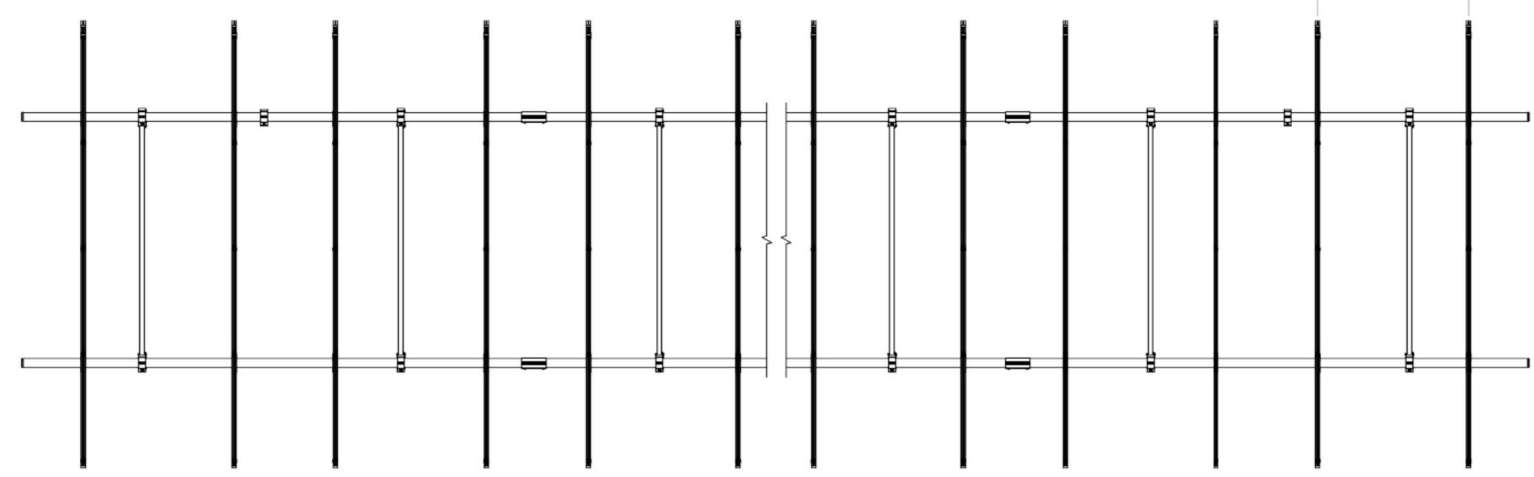
**SOUTHEAST ENERGY SOLUTIONS**

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A

**NOTES:**  
 1. DIMENSIONS LABELED AS MAX ARE MAXIMUM ALLOWABLE AND MAY RESULT IN END POSTS BEING OUTSIDE ARRAY EDGES. MAXIMUM DIMENSIONS MAY BE REDUCED IF DESIRED.

**RAIL SPACING**  
 LANDSCAPE: PER MODULE MANUFACTURER



32 MAX  
 90  
 96 IN. MAX. ALLOW. SPAN  
 MIN # OF FRONT POSTS = 10  
 MIN # OF BACK POSTS = 10

<b>SunModo Corp.</b>	
TITLE	TRAVIS BASS
D	DRAWING NUMBER 795EF9
SCALE: N.T.S.	SHEET 2 of 4 REV 1

PROJECT NAME & ADDRESS

**TRAVIS BASS RESIDENCE**  
 2184 WIRE RD,  
 BUNNLEVEL, NC 28323

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-15**

Sub Array #1 Foundation Part 2



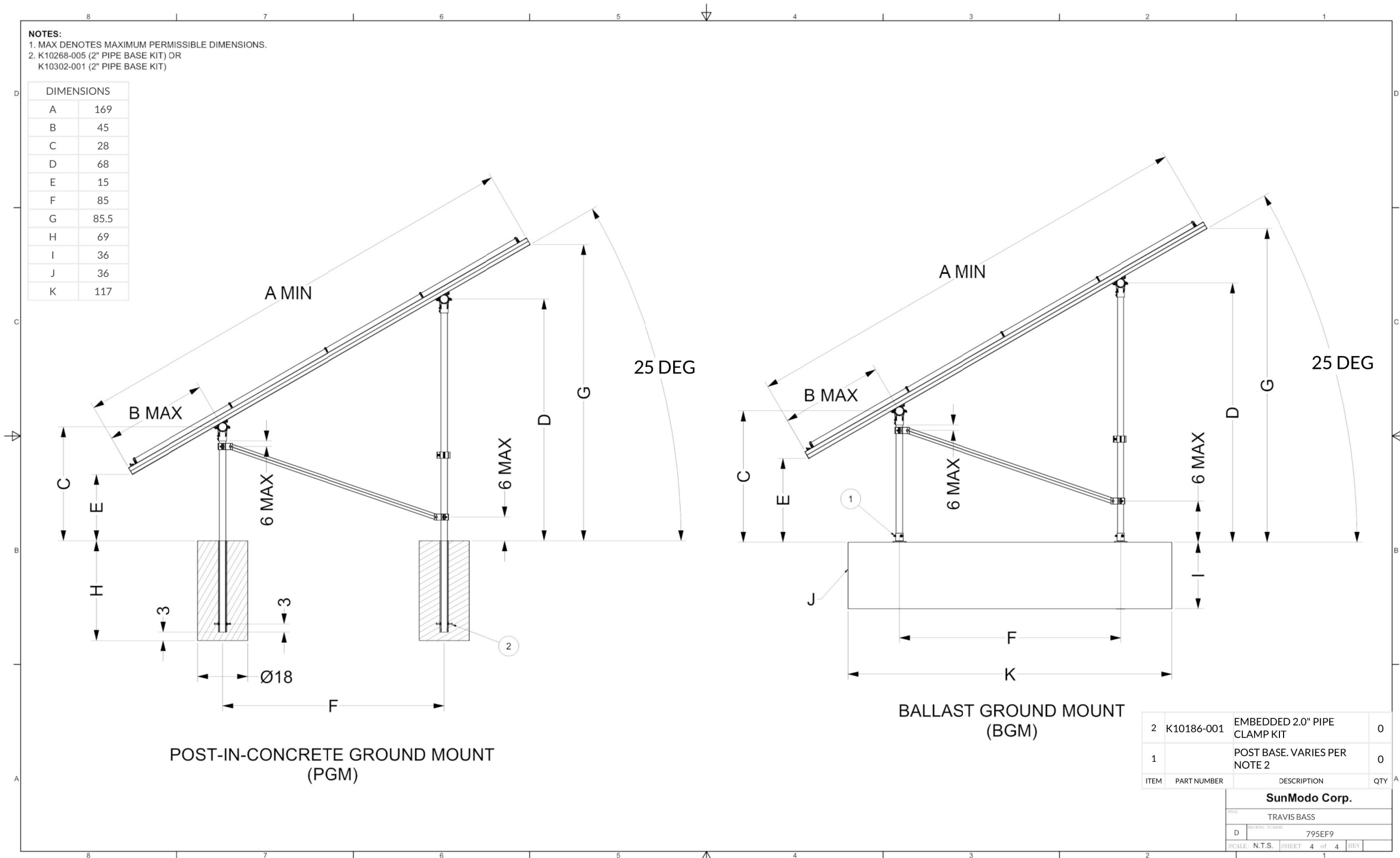
**SOUTHEAST ENERGY SOLUTIONS**

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A

- NOTES:**
1. MAX DENOTES MAXIMUM PERMISSIBLE DIMENSIONS.
  2. K10268-005 (2" PIPE BASE KIT) OR K10302-001 (2" PIPE BASE KIT)

DIMENSIONS	
A	169
B	45
C	28
D	68
E	15
F	85
G	85.5
H	69
I	36
J	36
K	117



ITEM	PART NUMBER	DESCRIPTION	QTY
2	K10186-001	EMBEDDED 2.0" PIPE CLAMP KIT	0
1		POST BASE. VARIES PER NOTE 2	0

**SunModo Corp.**

TITLE: TRAVIS BASS  
 DRAWING NUMBER: 795EF9  
 SCALE: N.T.S. SHEET 4 of 4 REV

PROJECT NAME & ADDRESS

**TRAVIS BASS RESIDENCE**

2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE  
**ANSI B 11" X 17"**

SHEET NUMBER  
**PV-16**



Grounding

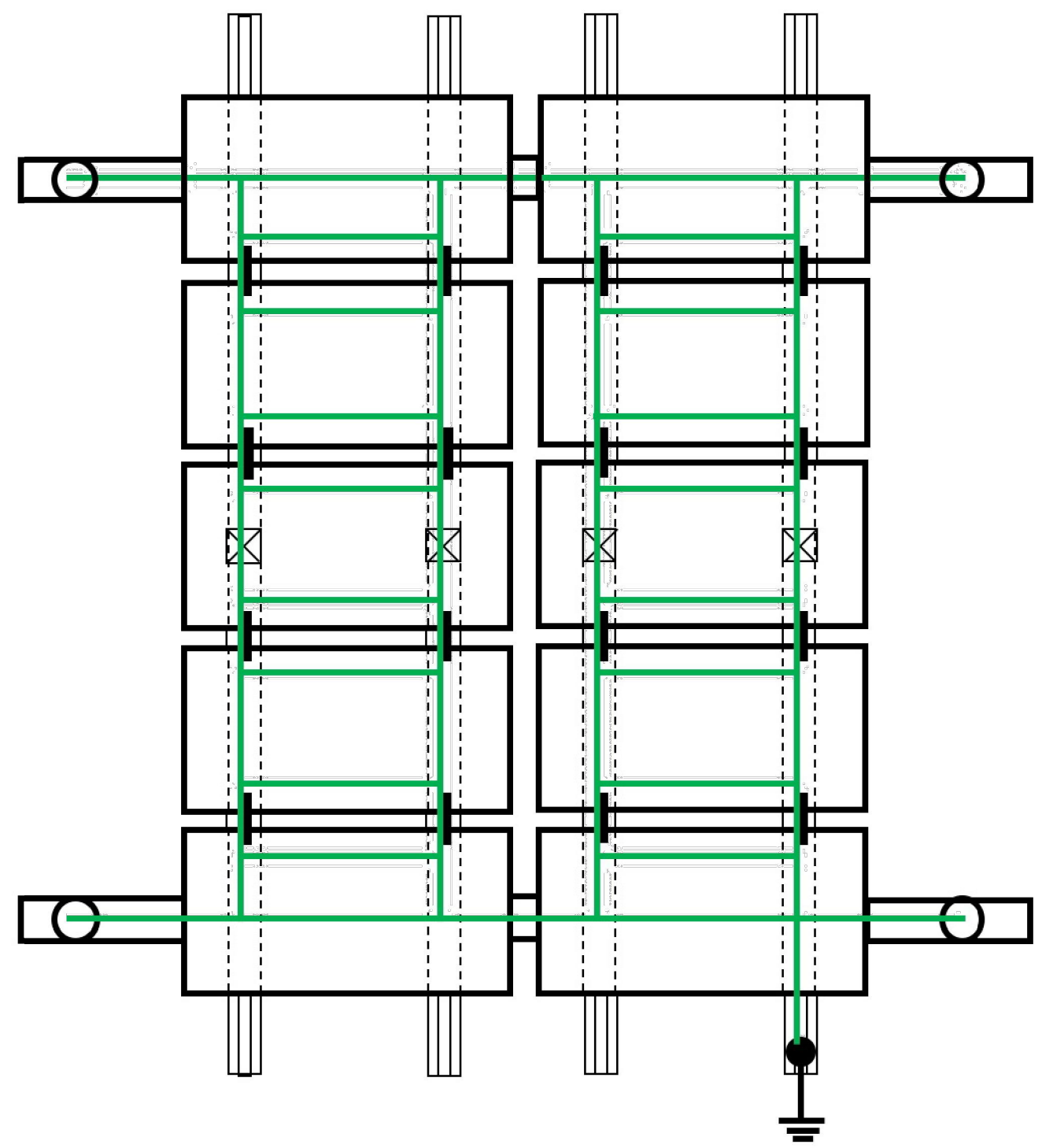
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**SOUTHEAST ENERGY SOLUTIONS**

855 SUNSET DR #8, ATHENS, GA 30606, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	10/27/2023	
FOUNDATION CHANGE	11/09/2023	A



- Pipe Connection
- ▬ Mid Clamp
- ▨ Rail
- ⊠ Rail Splice
- Ground Lug
- ▭ Pipe
- Fault Current Path
- ▭ Solar Panel

Note: All SunTurf metal structural components (Horizontal and Vertical Pipe, Pipe Splices, Post Caps, Pipe Clamps, Braces, Rail and Rail Splices) are electrically bonded together by design during the assembly of the racking.

PROJECT NAME & ADDRESS

TRAVIS BASS  
RESIDENCE  
2184 WIRE RD,  
BUNNLEVEL, NC 28323

DRAWN BY  
ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-17