



1011 N Causeway Blvd, Suite 19 ♦ Mandeville, Louisiana 70471 ♦ Phone: 985.624.5001 ♦ Fax: 985.624.5303

December 2021

Property Owner: William Bradley

Property Address: 635 Southwest Grape Street, Lake City, FL 32024

RE: Goundmount Installation

I have reviewed the address referenced above to determine the adequacy of the existing area supports the proposed installation of an array of solar panels in the ground.

The photovoltaic ground mount structure offered by Unirac is found to be of sufficient capacity for the design loads when installed in accordance with the drawings and calculations attached, and manufacturer's instructions. The foundation shall be installed as marked on the drawings to the depth specified in the drawing table. To the best of my professional knowledge and belief, the product and system installation will be in compliance with all state and local building codes and guidelines at the time of our review.

Evaluation Criteria:

Windspeed: 115
Applied Codes: ASCE 7-10 FBC 2020 NEC 2017
Risk Category: II
Wind Exposure Category: C
Ground Snow Load: PSF
Footing Depth: 36"
Row Spacing: 10'-6"

Connection of Array to Ground:

Manufacturer: UNIRAC
Model: ULA (Unirac Large Array)
Foundation Type: Drilled Cast-In-Hole Concrete Pile

Limitations

Unirac's ground mount system is to be installed per manufacturer's specifications and in accordance with accepted industry-wide safety standards. Electrical engineering is beyond our scope of the installation.



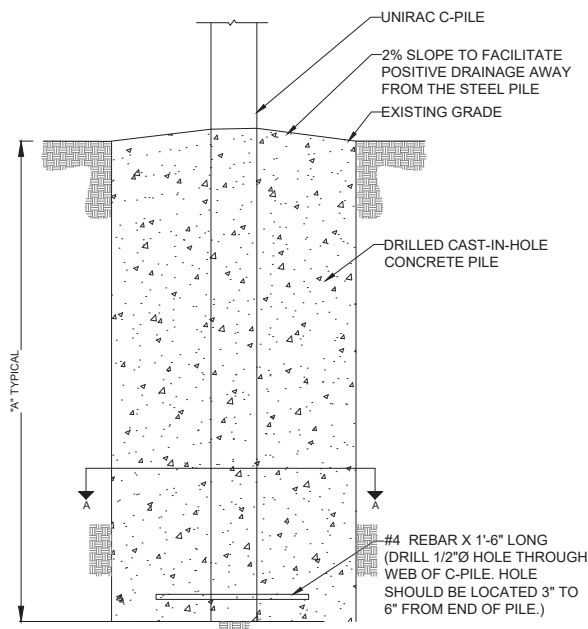
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PRINCIPAL ENGINEERING, INC.
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FLORIDA FIRM NO. 30649

PRINCIPAL Infrastructure™

Architecture ♦ Engineering ♦ Construction

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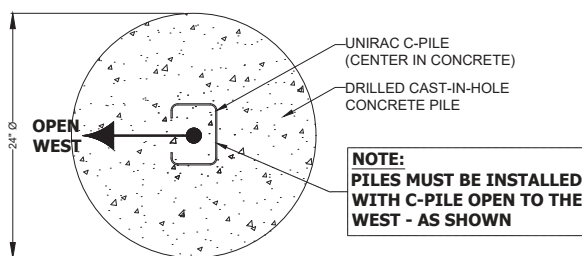
20 OR 30 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS (REFER TO SHEET SR-200 OR SR-300 FOR PILE STICK-UP HEIGHT) (c)				
FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH		FROST DEPTH = 3.5 FT OR LESS
		DIMENSION "A"		DIMENSION "A"
24" FULL CAST-IN-PLACE CONCRETE	400	6'-0" (a)	6'-0" (a)	6'-0"
18" FULL CAST-IN-PLACE CONCRETE	400	7'-0"	7'-0"	8'-0"

(a) FOR 20 DEGREE DESIGNS THE 6'-0" EMBEDMENT REQUIRES CUTTING 24" OFF OF THE BOTTOM OF A 12'-6" LONG C-PILE. (DO NOT CUT THE END OF PILE WITH PRE-PUNCHED HOLES.) IF CUTTING IS NOT PREFERRED, AN 8'-0" CONCRETE FOUNDATION IS ACCEPTABLE.

(b) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(c) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 20 DEGREE GFT TABLE. ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-1" OR GREATER, REQUIRE A 15 FT LONG PILE.

(d) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 30 DEGREE GFT TABLE. ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-4" OR GREATER, REQUIRE A 15 FT LONG PILE.

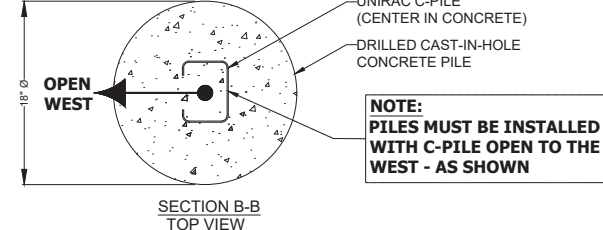
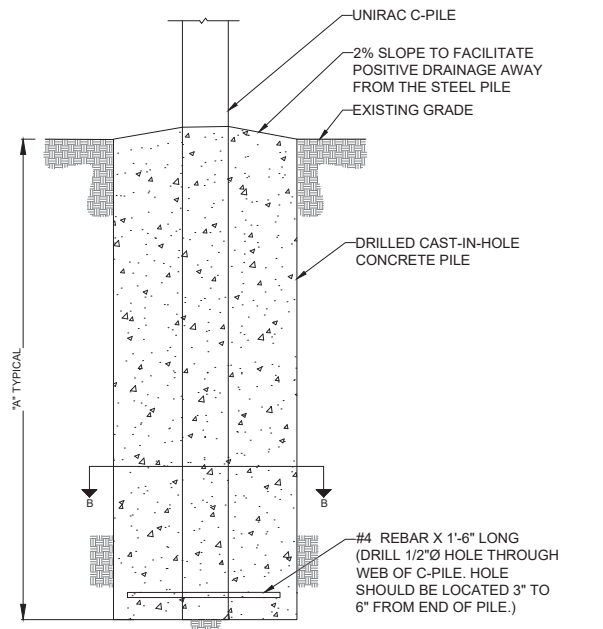


SECTION A-A
TOP VIEW

400 DRILLED CAST-IN-HOLE CONCRETE PILE FOUNDATION (ALTERNATE OPTION)

NOT TO SCALE

- FOUNDATION 400: DRILLED CAST-IN-HOLE CONCRETE PILE FOUNDATION
1. THE FOUNDATION MUST BE EXCAVATED WITH LITTLE TO NO LOOSE MATERIAL IN THE BOTTOM.
 2. THE FOUNDATION CANNOT BE BELOW THE GROUND WATER UNLESS WRITTEN APPROVAL FROM UNIRAC.
 3. IN SOFT OR UNSTABLE SOILS, A TEMPORARY CASING TO STABILIZE THE EXCAVATION IS PERMITTED.
 4. THE PILE SHALL HAVE A #4 REBAR PLACED THROUGH THE BOTTOM OF THE PILE.
 5. THE PILE MUST BE CENTERED IN THE HOLE WITH EQUAL AMOUNTS OF CONCRETE AROUND THE CASING.
 6. CONCRETE SHALL CONFORM TO THE CONCRETE SPECIFICATIONS LISTED ON SR-100.
 7. CONCRETE DEPTH SHALL CONFORM TO THE DEPTHS LISTED IN THE TABLE ON THIS SHEET.
 8. THE TOP OF THE CONCRETE MUST BE ABOVE GRADE.
 9. THE CORE OF THE CONCRETE CAST-IN-DRILLED HOLE PILE WILL CONSIST OF THE UNIRAC C-PILES AS DEPICTED IN THE FIGURE.
 10. FOUNDATIONS MUST NOT BE INSTALLED IN ORGANIC SOILS.
 11. DEPTH OF CONCRETE CAN BE +6/-2 INCHES.
 12. UNIRAC C-PILE CAN EXTEND TO BOTTOM OF CONCRETE OR EXTEND DEEPER THAN THE CONCRETE.



SECTION B-B
TOP VIEW

NOTE:
PILES MUST BE INSTALLED
WITH C-PILE OPEN TO THE
WEST - AS SHOWN

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/20/2019	Rev-1
2	05/26/2020	Rev-2
3	07/30/2020	Rev-3

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE
SPECIFIC STAMPED
& SIGNED GFT
CERTIFICATION
LETTER



PROJECT NUMBER:	GFT 1
ENGINEERED BY:	HEI
DRAWN BY:	HEI
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET:	07/24/2021

SHEET TITLE
FOUNDATION
EMBEDMENT AND
FOUNDATION DETAILS

SHEET NUMBER
SR-400
6 of 11

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The engineer's seal and signature
on this manufacturer's drawing certifies
the product for use in this project only.

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FLORIDA FIRM NO. 30649

NEW PHOTOVOLTAIC SYSTEM 15.00 KW DC
635 SW GRAPE ST, LAKE CITY, FL 32024



CONTRACTOR
SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS

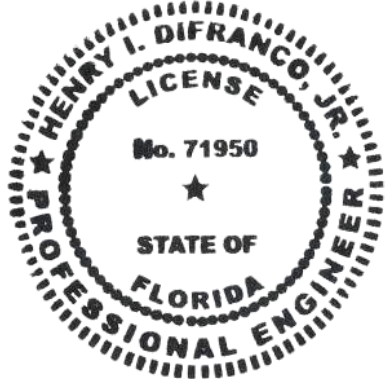
WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



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SHEET TITLE

COVER PAGE

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

G-001

GENERAL NOTES

1.1.1 PROJECT NOTES:
1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
1.1.4 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICRO-INVERTER IN ACCORDANCE WITH NEC 690.41(B)
1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4. SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

1.2.1 SCOPE OF WORK:
1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ULA GROUND -MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT

1.3.1 WORK INCLUDES:
1.3.2 PV RACKING SYSTEM INSTALLATION - UNIRAC SOLAR
1.3.3 PV MODULE AND INVERTER INSTALLATION - LG ELECTRONICS LG375N1C-A6 / ENPHASE IQ7PLUS-72-2-US INVERTER
1.3.4 PV EQUIPMENT ULA GROUND MOUNT
1.3.5 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
1.3.6 PV LOAD CENTERS (IF INCLUDED)
1.3.7 PV METERING/MONITORING (IF INCLUDED)
1.3.8 PV DISCONNECTS
1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
1.3.10 PV FINAL COMMISSIONING
1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

PROJECT INFORMATION

OWNER

NAME: WILLIAM BRADLEY

PROJECT MANAGER

NAME: SHAHIN HAYNES
PHONE: 8665071461

CONTRACTOR NAME

MARC JONES CONSTRUCTION,
LLC DBA SUNPRO SOLAR
PHONE: 5052180838

SCOPE OF WORK

SYSTEM SIZE: STC:40 X 375W= 15.00 kW DC
PTC: 40 x 347.3W = 13.89 kW DC
(40) LG ELECTRONICS LG375N1C-A6
(40) ENPHASE IQ7PLUS-72-2-US

ATTACHMENT TYPE: ULA GROUND MOUNT
MSP UPGRADE: NO
UTILITY METER UPGRADE: NO

AUTHORITIES HAVING JURISDICTION

BUILDING: COLUMBIA COUNTY
ZONING: COLUMBIA COUNTY
UTILITY: CLAY ELECTRIC CO-OP
METER NO: 156 218 936

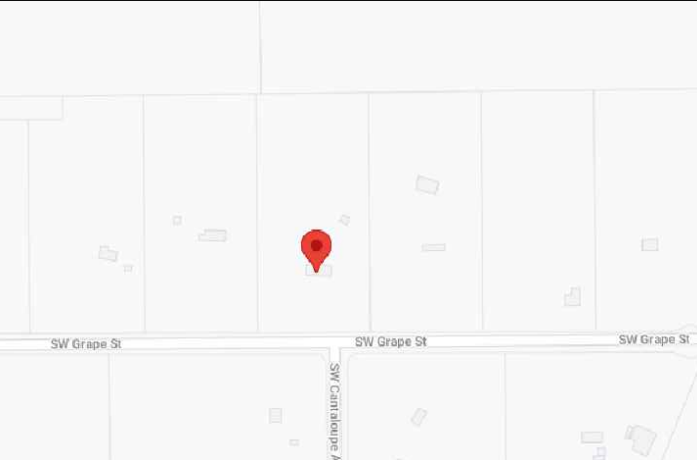
DESIGN SPECIFICATION

OCCUPANCY: II
CONSTRUCTION: SINGLE-FAMILY
ZONING: RESIDENTIAL
GROUND SNOW LOAD: REFER STRUCTURAL LETTER
WIND EXPOSURE: REFER STRUCTURAL LETTER
WIND SPEED: 165MPH

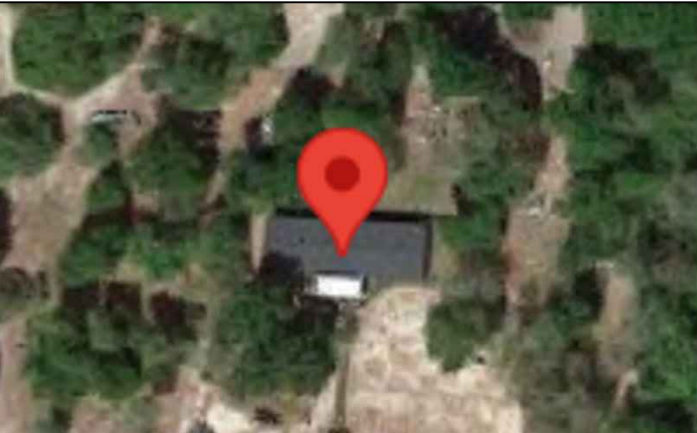
APPLICABLE CODES & STANDARDS

BUILDING: IBC 2018, IRC 2018, FBC 2020 (7TH EDITION)
ELECTRICAL: NEC 2017
FIRE: IFC 2020

VICINITY MAP



SATELLITE VIEW



SHEET INDEX

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R-002	RESOURCE DOCUMENT
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R-008	RESOURCE DOCUMENT
R-009	RESOURCE DOCUMENT
R-010	RESOURCE DOCUMENT
R-011	RESOURCE DOCUMENT
R-012-R-015	RESOURCE DOCUMENT

2.1.1 SITE NOTES:

2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.

2.1.3 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.

2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.

2.1.5 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.

2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

2.2.1 EQUIPMENT LOCATIONS:

2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.

2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).

2.2.4 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.

2.2.5 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.

2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.

2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

2.3.1 STRUCTURAL NOTES:

2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.

2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.

2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.

2.3.5 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.

2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

2.4.1 WIRING & CONDUIT NOTES:

2.4.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.

2.4.3 CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.

2.4.4 VOLTAGE DROP LIMITED TO 1.5%.

2.4.5 DC WIRING LIMITED TO MODULE FOOTPRINT.

MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.

2.4.6 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

2.5.1 GROUNDING NOTES:

2.5.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.

2.5.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.

2.5.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).

2.5.5 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTURERS' INSTRUCTIONS.

2.5.6 EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.

2.5.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.

2.5.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]

2.5.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.

2.5.10 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE RECONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).

2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH

2.6.4 PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).

2.6.5 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.

2.6.6 MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).

2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL 1699B.

2.7.1 INTERCONNECTION NOTES:

2.7.2 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]

2.7.3 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(B)(2)(3)(b)].

2.7.4 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].

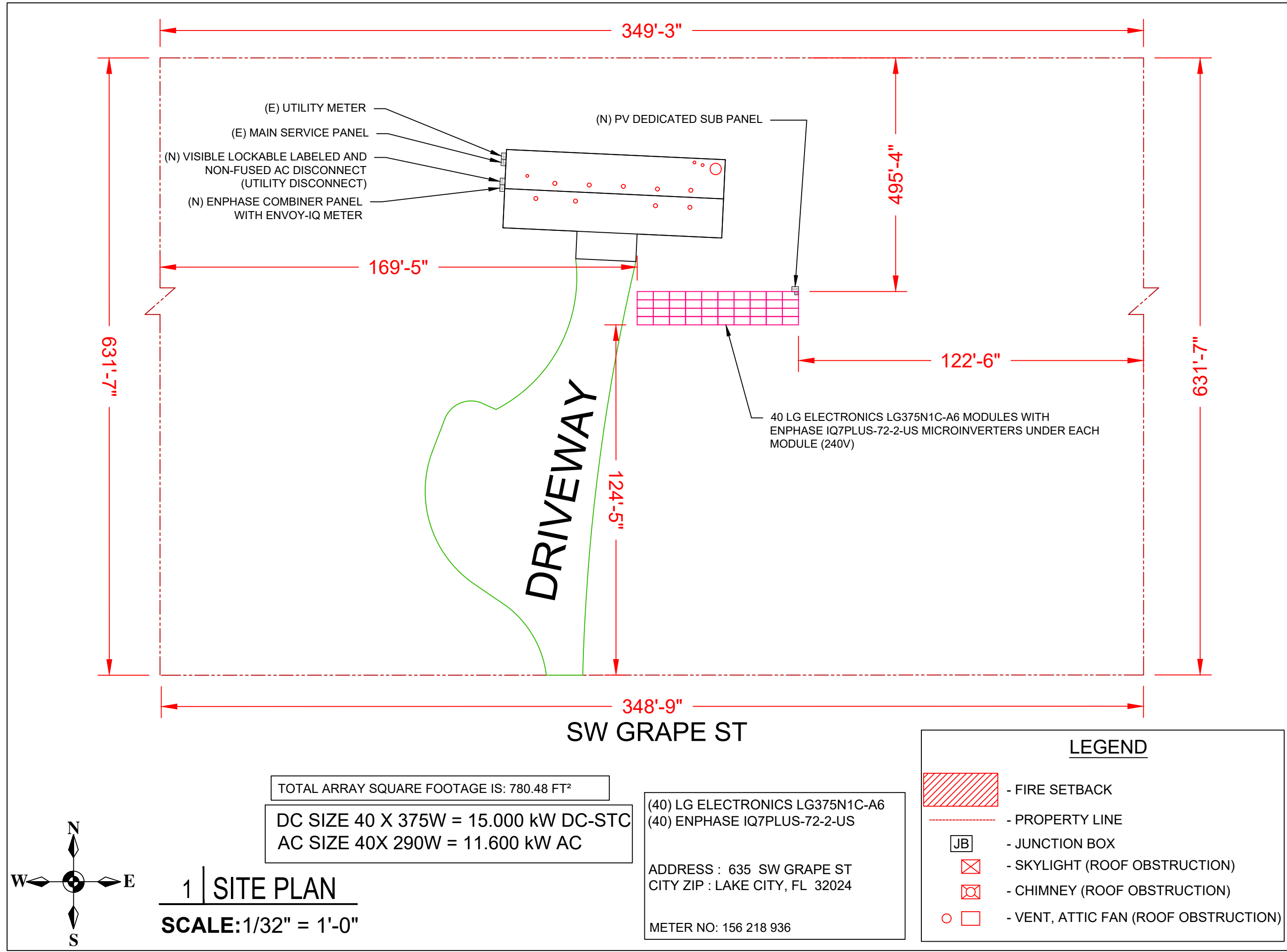
2.7.5 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).

2.7.6 FEEDER TAP INTERCONNECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)

2.7.7 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42

2.7.8 BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

CONTRACTOR	
	
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PROJECT NAME & ADDRESS WILLIAM BRADLEY	
635 SW GRAPE ST, LAKE CITY, FL 32024 COUNTY: -COLUMBIA COUNTY	
SYSTEM SIZE DC SIZE: 15.000 KW DC-(STC) AC SIZE: 11.600 KW AC	
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SHEET TITLE	
NOTES	
DRAWN DATE	12/29/2021
DRAWN BY	VI
SHEET NUMBER	
G-002	



CONTRACTOR
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SHEET TITLE
SITE PLAN

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER
A-101

ARRAY(S)

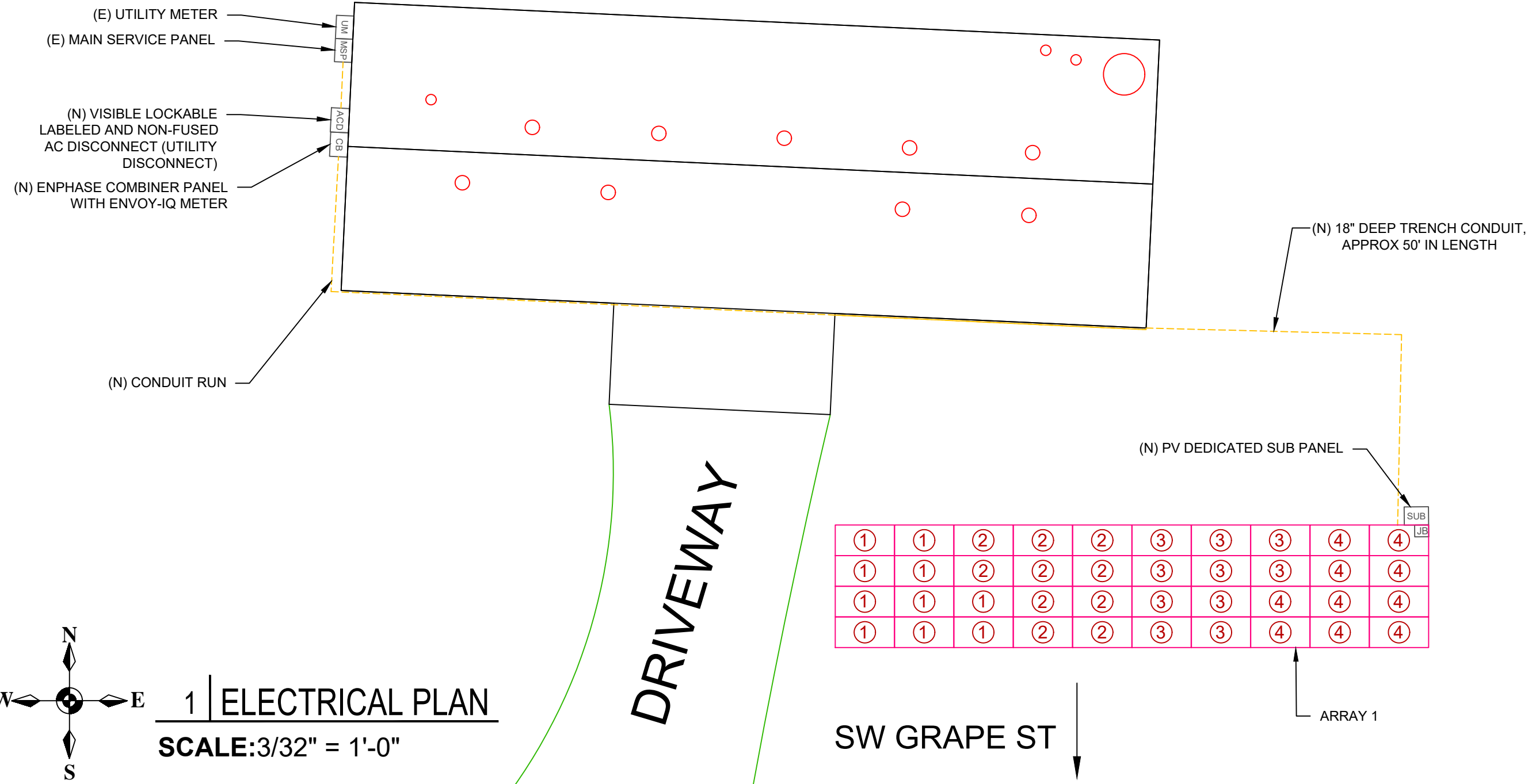
ARRAY 1	TILT - 30° AZIMUTH - 180° MODULE - 40 SYSTEM SIZE (KW)- 15.00
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- ① - MODULE STRING
- ② - MODULE STRING
- ③ - MODULE STRING
- ④ - MODULE STRING

LEGEND

- FIRE SETBACK
- PROPERTY LINE
- JB

- JUNCTION BOX
- SKYLIGHT (ROOF OBSTRUCTION)
- CHIMNEY (ROOF OBSTRUCTION)
- VENT, ATTIC FAN (ROOF OBSTRUCTION)



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PROJECT NAME & ADDRESS

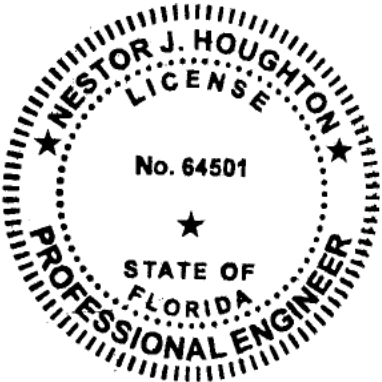
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FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



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SHEET TITLE

ELECTRICAL PLAN

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

A-102

FOOTING DEPTH - 36"

FOOTING DIAMETER - 24"

Note 1: Windspeed value is design 3-sec gust in accordance with ASCE 7-16



- CLAMP



- SM HD RAIL



- SQUARE BRACE



- PIPE-1,2 (2" SCH 40 GAL PIPE)



- PIPE 3 (2" SCH 40 GAL PIPE)

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MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

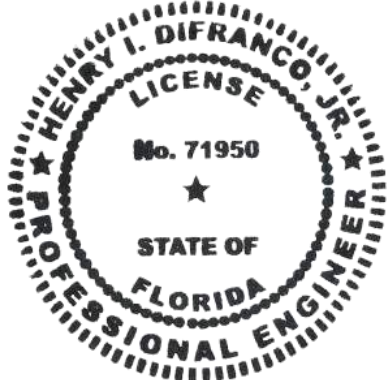
WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



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Henry I. DiFranco, Jr., P.E.
on **December 30, 2021**
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PRINCIPAL ENGINEERING, INC.
1011 N. CAUSEWAY BLVD. STE 19
MANDEVILLE, LA 70471
985.624.5001
INFO@PI-AEC.COM
FLORIDA FIRM NO. 30649

SHEET TITLE

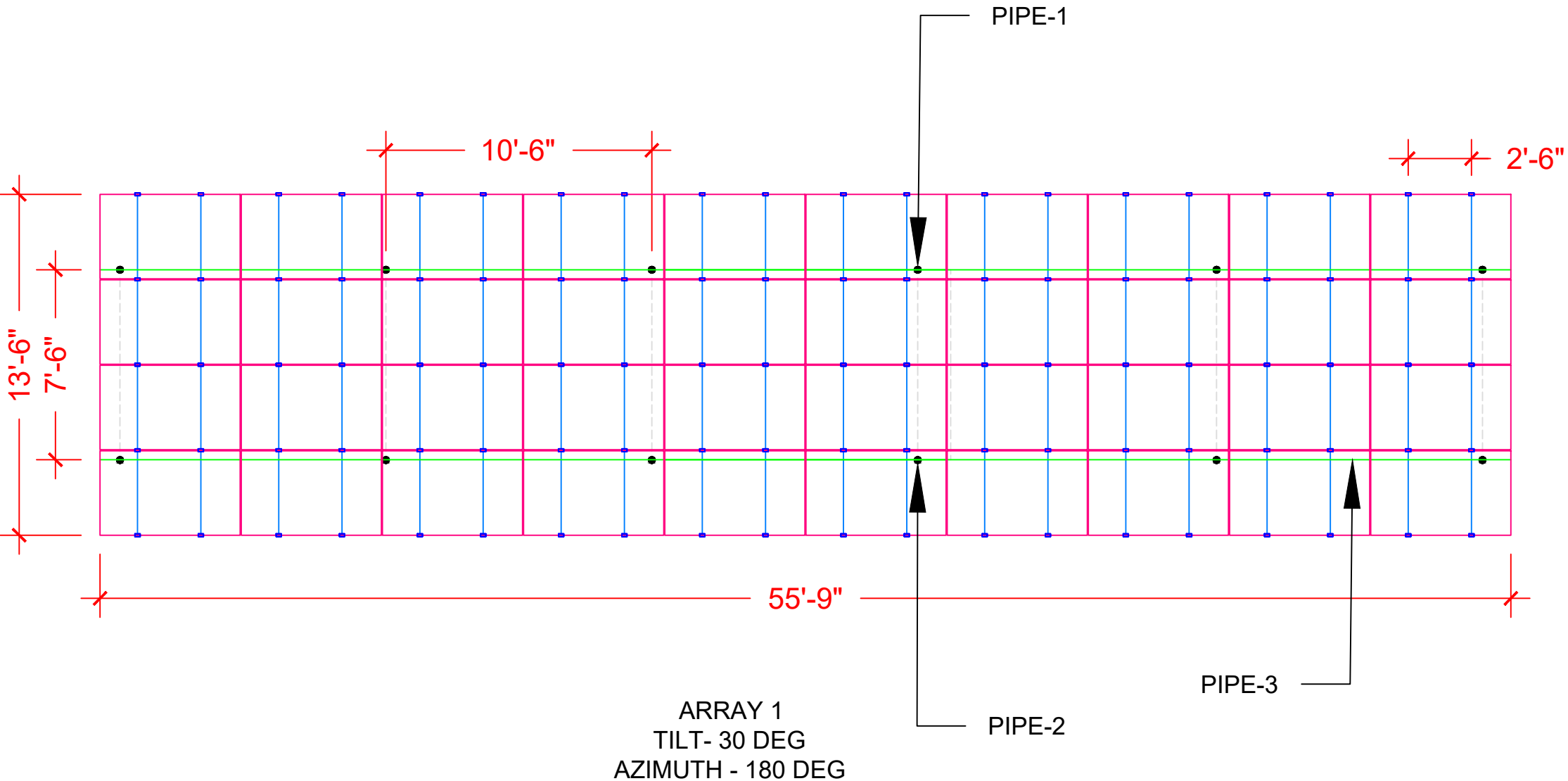
ATTACHMENT PLAN

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

A-103



1 | ATTACHMENT PLAN

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

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	LG ELECTRONICS LG375N1C-A6
VMP	35.3V
IMP	10.63A
VOC	41.8V
ISC	11.35A
TEMP. COEFF. VOC	-0.26%/°C
MODULE DIMENSION	68.50"L x 41.00"W x 1.57"D (In Inch)

DC SIZE 40 X 375W = 15.000 kW DC-STC
AC SIZE 40X 290W = 11.600 kW AC

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE IQ7PLUS-72-2-US MICROINVERTER
MIN/MAX DC VOLT RATING	22V MIN/ 60V MAX
MAX INPUT POWER	235W-440W
NOMINAL AC VOLTAGE RATING	240V/ 211-264V
MAX AC CURRENT	1.21A
MAX MODULES PER STRING	13 (SINGLE PHASE)
MAX OUTPUT POWER	290 VA

(GN) GENERAL CONDUIT NOTE :
CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV
PROTECTED (EX. -EMT,SCH 80 PVC OR RMC)*FMC MAYBE
USED IN INDOOR APPLICATIONS WHERE PERMITTED BY
NEC ART .348

WIRE /CONDUIT SCHEDULE	
TAG	DESCRIPTION
1	#12 THWN-2 ON EXTERIOR & (1)#6 THWN -2 / (GN)
2	#4 THWN-2 & (1)#6 THWN-2 GROUND / (GN) (18" DEEP TRENCH CONDUIT, APPROX 50')
3	#4 THWN-2 & (1)#6 THWN-2 GROUND / (GN)
4	(1)#6 BARE GROUND

CONTRACTOR


22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

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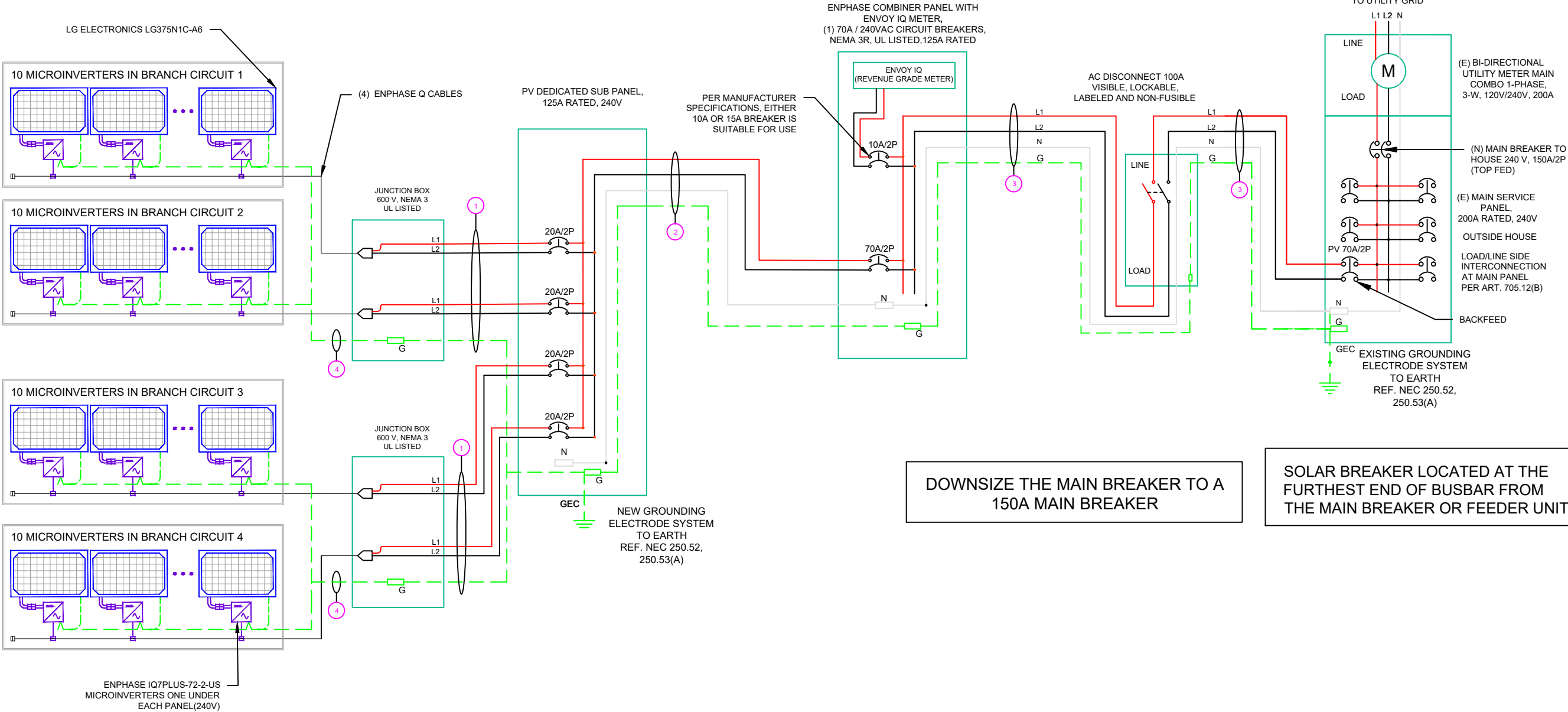
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SHEET TITLE
LINE DIAGRAM

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER
E-601



AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-5°
AMBIENT TEMP (HIGH TEMP 2%)	34°
CONDUIT HEIGHT	0.5"
CONDUCTOR TEMPERATURE RATE	90°

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

CALCULATIONS:

1. CURRENT CARRYING CONDUCTOR

(A) BEFORE PV DEDICATED SUB PANEL
 AMBIENT TEMPERATURE - (34)°C ...NEC 310.15(B)(3)(c)
 TEMPERATURE DERATE FACTOR - 0.96 ...NEC 310.15(B)(2)(a)
 GROUPING FACTOR - 0.8...NEC 310.15(B)(3)(a)

CONDUCTOR AMPACITY
 = (INV O/P CURRENT) x 1.25 / A.T.F / G.F ...NEC 690.8(B)
 = [(10 x 1.21) x 1.25] / [0.96 x 0.8]
 = 19.69A
 SELECTED CONDUCTOR - #12 THWN-2 ...NEC 310.15(B)(16)

(B) AFTER PV DEDICATED SUB PANEL
 TEMPERATURE DERATE FACTOR - 0.96
 GROUPING FACTOR - 1

CONDUCTOR AMPACITY
 = (TOTAL INV O/P CURRENT) x 1.25 / 0.96/ 1 ...NEC 690.8(B)
 = [(40 x 1.21) x 1.25] / [0.96 x 1]
 = 63.02 A
 SELECTED CONDUCTOR - #4 THWN-2 ...NEC 310.15(B)(16)

2. PV OVER CURRENT PROTECTION ...NEC 690.9(B)
 = TOTAL INVERTER O/P CURRENT x 1.25
 = (40 x 1.21) x 1.25 = 60.50 A
 SELECTED OCPD = 70 A ...NEC 240.6

3. 120% RULE FOR BACKFEED BREAKER
 ...NEC 705.12(B)(2)(3)(b)

MCB + PV BREAKER <= (1.2 x BUS BAR
 RATING RATING RATING)
 (150 + 70) <= 1.2 x 200A
 220.00 <= 240.00 HENCE OK

4. VOLTAGE DROP CALCULATION (BETWEEN PV DEDICATED SUBPANEL AND COMBINER BOX)
 VOLTAGE DROP= (0.2 x LENGTH OF CONDUCTOR x CURRENT x RESISTANCE IN CONDUCTOR) / 240
 = (0.2 x 50 x 48.40 x 0.31 (FOR #4 AWG WIRE)) / 240
 = 0.63%

VOLTAGE DROP IS WITHIN PERMISSIBLE LIMIT OF 3%.HENCE OK

CONTRACTOR

SUNPRO

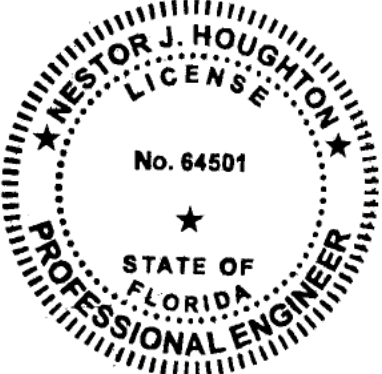
22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

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 985.624.5001
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SHEET TITLE

ELECTRICAL CALCULATIONS

DRAWN DATE

12/29/2021

DRAWN BY

VI

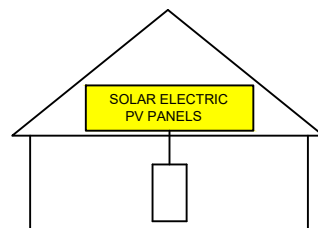
SHEET NUMBER

E-602

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

**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



AC DISCONNECT

WARNING
ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS.
TERMINALS ON BOTH LINE AND
LOAD SIDES
MAY BE ENERGIZED IN THE
OPEN POSITION

**PHOTOVOLTAIC SYSTEM
AC DISCONNECT**

OPERATING VOLTAGE: ___ VOLTS
OPERATING CURRENT: ___ AMPS

**SOLAR
BREAKER**

AC COMBINER BOX

**PHOTOVOLTAIC
MICROINVERTERS
LOCATED UNDER
EACH PV MODULE IN
ROOFTOP ARRAY**

**PHOTOVOLTAIC SYSTEM
EQUIPPED WITH
RAPID SHUTDOWN**

RATED AC OUTPUT CURRENT: ___
NOM. OPERATING VOLTAGE: ___

WARNING
DUAL POWER SOURCES

SOURCES: UTILITY GRID AND PV
SOLAR ELECTRIC SYSTEM

___ KW SOLAR
DISCONNECT LOCATED

___ FT ←

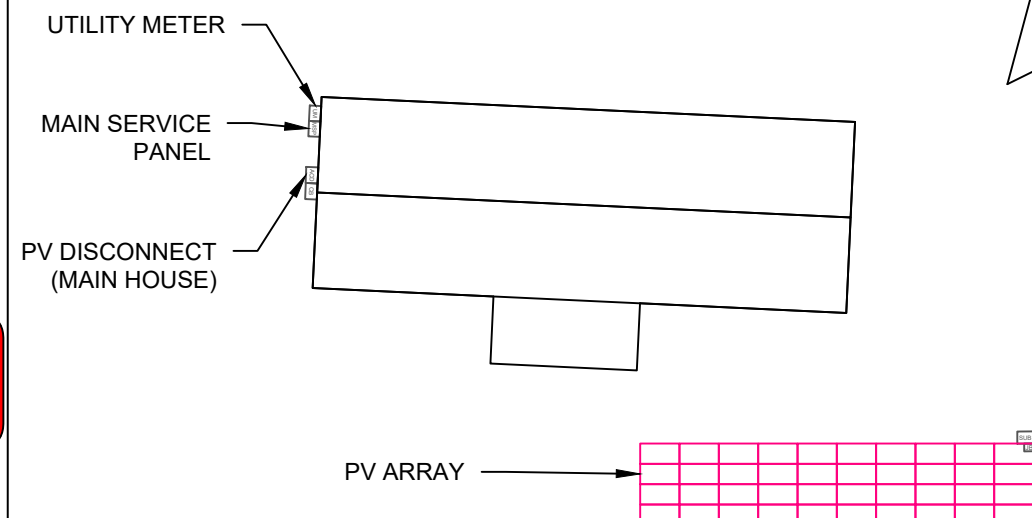
→ FT ___

WARNING
INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS
OVERCURRENT DEVICE

CAUTION

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



CONTRACTOR

SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

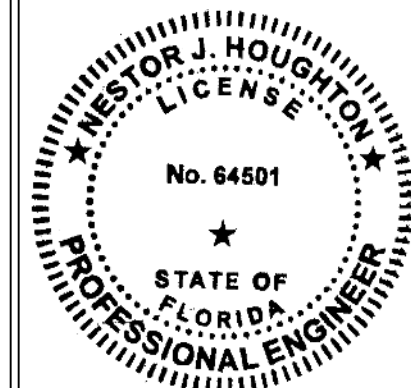
WILLIAM BRADLEY

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SHEET TITLE

PLACARD

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

E-603

LG NeON[®]2

LG375N1C-A6

375W

The LG NeON[®] 2 is LG's best selling solar module and one of the most powerful and versatile modules on the market today. The cells are designed to appear all-black at a distance, and the performance warranty guarantees 90.6% of labeled power output at 25 years.



Features



Enhanced Performance Warranty

LG NeON[®] 2 has an enhanced performance warranty. After 25 years, LG NeON[®] 2 is guaranteed at least 90.6% of initial performance.



25-Year Limited Product Warranty

The NeON[®] 2 is covered by a 25-year limited product warranty. In addition, up to \$450 of labor costs will be covered in the rare case that a module needs to be repaired or replaced.



Solid Performance on Hot Days

LG NeON[®] 2 performs well on hot days due to its low temperature coefficient.



Roof Aesthetics

LG NeON[®] 2 has been designed with aesthetics in mind using thinner wires that appear all black at a distance.

When you go solar, ask for the brand you can trust: LG Solar

About LG Electronics USA, Inc.

LG Electronics is a global leader in electronic products in the clean energy markets by offering solar PV panels and energy storage systems. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry and materials industries. In 2010, LG Solar successfully released its first Mono[®] series to the market, which is now available in 32 countries. The NeON[®] (previous Mono[®] NeON), NeON[®]2, NeON[®]2 Bifacial won the "Intersolar AWARD" in 2013, 2015 and 2016, which demonstrates LG's leadership and innovation in the solar industry.



LG NeON[®]2

LG375N1C-A6

General Data

Cell Properties (Material/Type)	Monocrystalline/N-type
Cell Maker	LG
Cell Configuration	60 Cells (6 x 10)
Module Dimensions (L x W x H)	1,740mm x 1,042mm x 40mm
Weight	18.6 kg
Glass (Material)	Tempered Glass with AR Coating
Backsheet (Color)	White
Frame (Material)	Anodized Aluminium
Junction Box (Protection Degree)	IP 68 with 3 Bypass Diodes
Cables (Length)	1,100mm x 2EA
Connector (Type/Maker)	MC 4/MC

Certifications and Warranty

Certifications*	IEC 61215-1/-1-1/2 : 2016, IEC 61730-1/2 : 2016, UL 61730-1 : 2017, UL 61730-2 : 2017, ISO 9001, ISO 14001, ISO 50001, OHSAS 18001
Salt Mist Corrosion Test	IEC 61701:2012 Severity 6
Ammonia Corrosion Test	IEC 62716 : 2013
Module Fire Performance	Type 1 (UL 61730)
Fire Rating	Class C (UL 790, UL/CORD C 1703)
Solar Module Product Warranty	25 Year Limited
Solar Module Output Warranty	Linear Warranty*

*Improved: 1st year 98.5%, from 2-24th year: 0.33%/year down, 90.6% at year 25

Temperature Characteristics

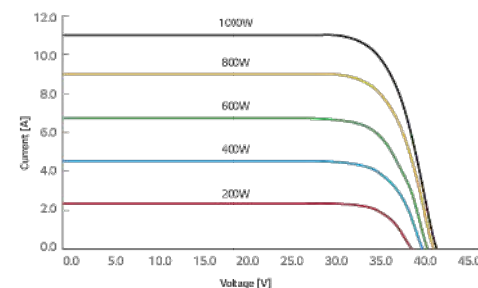
NMOT*	[°C]	42 ± 3
P _{max}	[%/°C]	-0.34
V _{oc}	[%/°C]	-0.26
I _{sc}	[%/°C]	0.03

*NMOT (Nominal Module Operating Temperature): Irradiance 800 W/m², Ambient temperature 20°C, Wind speed 1 m/s, Spectrum AM 1.5

Electrical Properties (NMOT)

Model		LG375N1C-A6
Maximum Power (P _{max})	[W]	281
MPP Voltage (V _{mpp})	[V]	33.2
MPP Current (I _{mpp})	[A]	8.48
Open Circuit Voltage (V _{oc})	[V]	39.4
Short Circuit Current (I _{sc})	[A]	9.13

I-V Curves



LG Electronics USA, Inc.
Solar Business Division
2000 Millbrook Drive
Lincolnshire, IL 60069
www.lg-solar.com

Product specifications are subject to change without notice.
LG375N1C-A6_AUS.pdf
012221

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Electrical Properties (STC*)

Model		LG375N1C-A6
Maximum Power (P _{max})	[W]	375
MPP Voltage (V _{mpp})	[V]	35.3
MPP Current (I _{mpp})	[A]	10.63
Open Circuit Voltage (V _{oc} , ± 5%)	[V]	41.8
Short Circuit Current (I _{sc} , ± 5%)	[A]	11.35
Module Efficiency	[%]	20.7
Bifaciality Coefficient of Power	[%]	10
Power Tolerance	[%]	0 - +3

*STC (Standard Test Condition): Irradiance 1000 W/m², cell temperature 25°C, AM 1.5

Operating Conditions

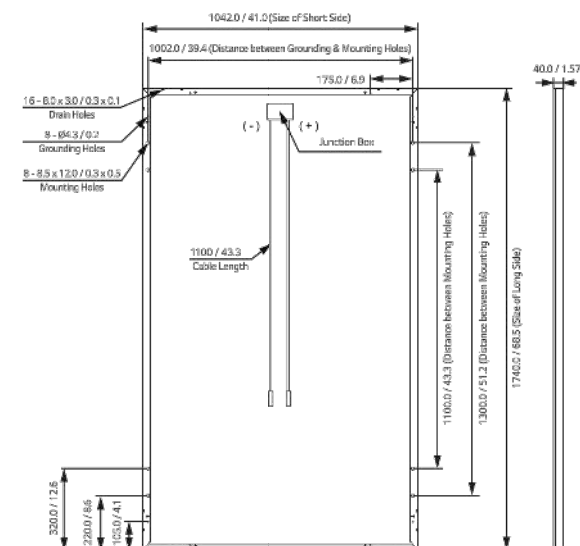
Operating Temperature	[°C]	-40 ~+85
Maximum System Voltage	[V]	1,000
Maximum Series Fuse Rating	[A]	20
Mechanical Test Load* (Front)	[Pa/psf]	5,400
Mechanical Test Load* (Rear)	[Pa/psf]	4,000

*Based on IEC 61215-2 : 2016 (Test Load = Design Load x Safety Factor (1.5))
Mechanical Test Loads 6,000Pa / 5,400Pa based on IEC 61215 : 2005

Packaging Configuration

Number of Modules per Pallet	[EA]	25
Number of Modules per 40' Container	[EA]	650
Number of Modules per 53' Container	[EA]	850
Packaging Box Dimensions (L x W x H)	[mm]	1,790 x 1,120 x 1,213
Packaging Box Dimensions (L x W x H)	[in]	70.5 x 44.1 x 47.8
Packaging Box Gross Weight	[kg]	500
Packaging Box Gross Weight	[lb]	1,102

Dimensions (mm/inch)



CONTRACTOR

SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471

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SHEET TITLE
RESOURCE
DOCUMENT

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

R-001

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US		IQ7PLUS-72-2-US	
Commonly used module pairings ¹	235 W - 350 W +		235 W - 440 W +	
Module compatibility	60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage	48 V		60 V	
Peak power tracking voltage	27 V - 37 V		27 V - 45 V	
Operating range	16 V - 48 V		16 V - 60 V	
Min/Max start voltage	22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)	15 A		15 A	
Overvoltage class DC port	II		II	
DC port backfeed current	0 A		0 A	
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range ²	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit*	16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %

MECHANICAL DATA

Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4-UTX with additional Q-DCC-5 adapter)
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES

Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.
Disconnecting means:	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.
2. Nominal voltage range can be extended beyond nominal if required by the utility.
3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com

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2019-3-26



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**RESOURCE
DOCUMENT**

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER
R-002

Enphase
IQ Combiner 3
(X-IQ-AM1-240-3)

The **Enphase IQ Combiner 3™** with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring
- Supports Ensemble Communications Kit for communication with Enphase Encharge™ storage and Enphase Enpower™ smart switch

Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- Supports back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- UL listed



To learn more about Enphase offerings, visit enphase.com



Enphase IQ Combiner 3

MODEL NUMBER	
IQ Combiner 3 X-IQ-AM1-240-3	IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES and REPLACEMENT PARTS (not included, order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G/12-year data plan) CELLMODEM-01 (3G/5-year data plan) CELLMODEM-M1 (4G based LTE-M/5-year data plan)	Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)
Consumption Monitoring* CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering (+/- 2.5%).
* Consumption monitoring is required for Enphase Storage Systems	
Ensemble Communications Kit COMMS-KIT-01	Installed at the IQ Envoy. For communications with Enphase Encharge™ storage and Enphase Enpower™ smart switch. Includes USB cable for connection to IQ Envoy or Enphase IQ Combiner™ and allows wireless communication with Encharge and Enpower.
Circuit Breakers BRK-10A-2-240 BRK-15A-2-240 BRK-20A-2P-240	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replace the default solar shield with this Ensemble Combiner Solar Shield to match the look and feel of the Enphase Enpower™ smart switch and the Enphase Encharge™ storage system
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Envoy printed circuit board (PCB) for Combiner 3
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80 A of distributed generation / 95 A with IQ Envoy breaker included
Envoy breaker	10A or 15A rating GE Q-line/Siemens Type QP /Eaton BR series included
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.5 x 37.5 x 16.8 cm (19.5" x 14.75" x 6.63"). Height is 21.06" (53.5 cm with mounting brackets).
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
Cellular	CELLMODEM-M1 4G based LTE-M cellular modem (not included). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
COMPLIANCE	
Compliance, Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit enphase.com

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CONTRACTOR
SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

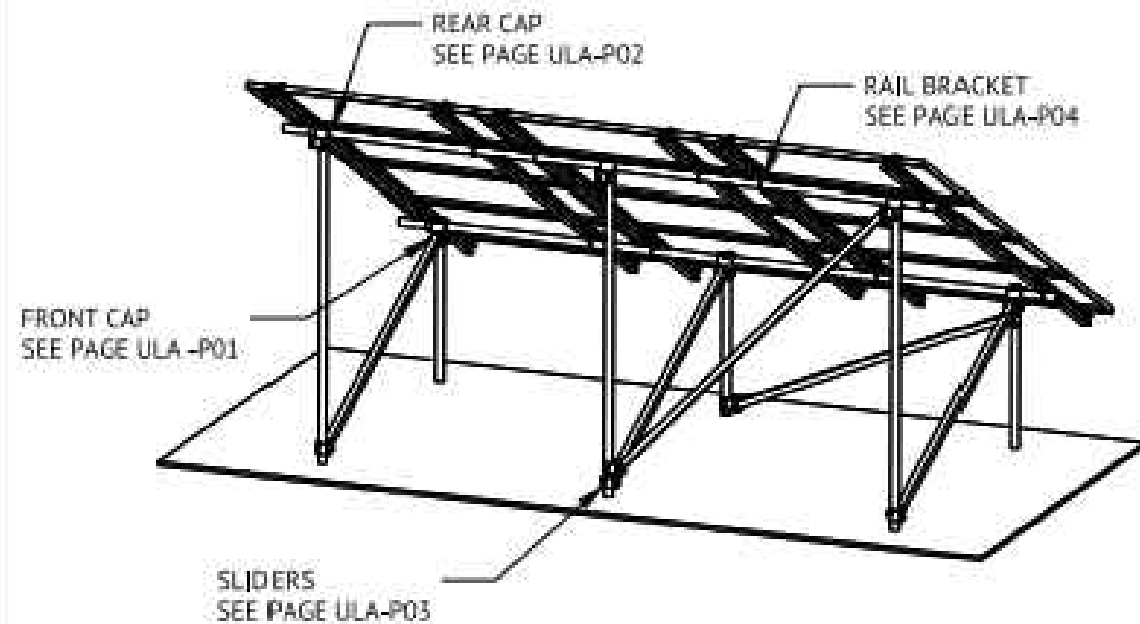
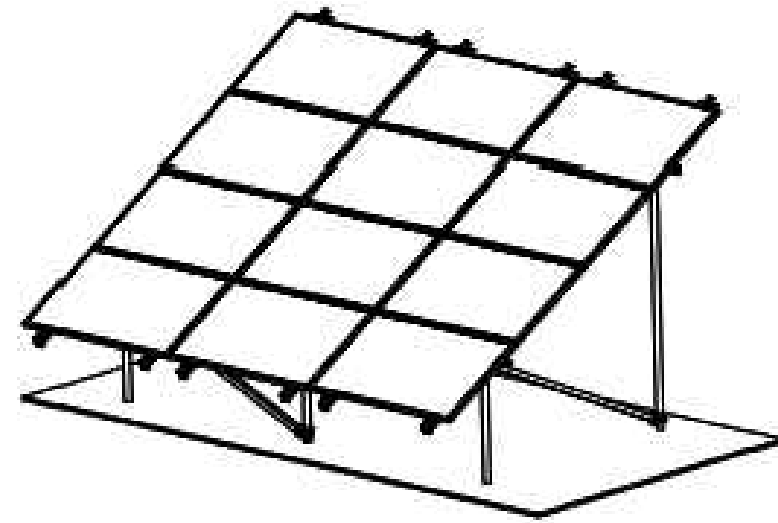
**635 SW GRAPE
ST, LAKE CITY,
FL 32024**
COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE
DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC

SHEET TITLE
**RESOURCE
DOCUMENT**

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER
R-003



UNIRAC

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

PRODUCT LINE:	ULA
DRAWING TYPE:	ASSEMBLY
DESCRIPTION:	ASSEMBLY EXAMPLE
REVISION DATE:	APRIL 2016

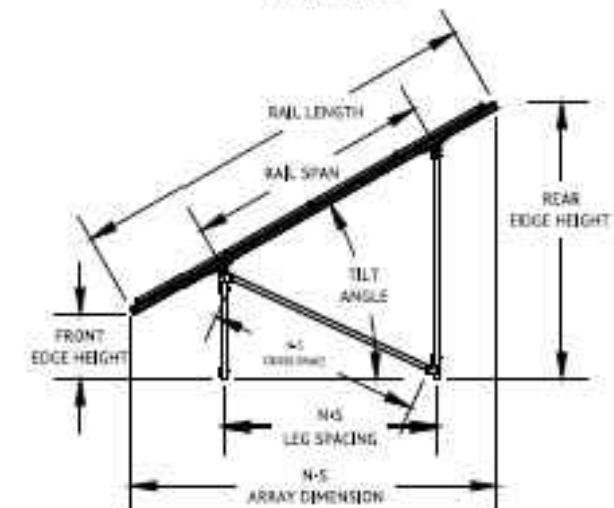
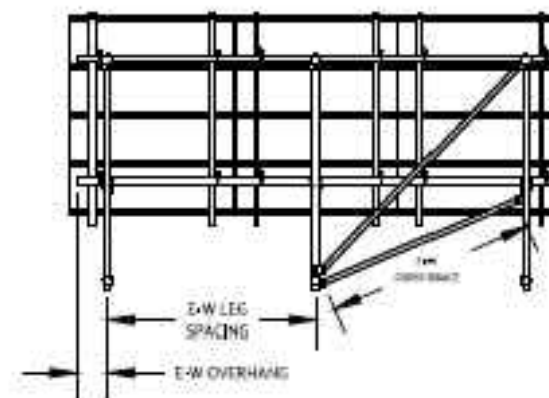
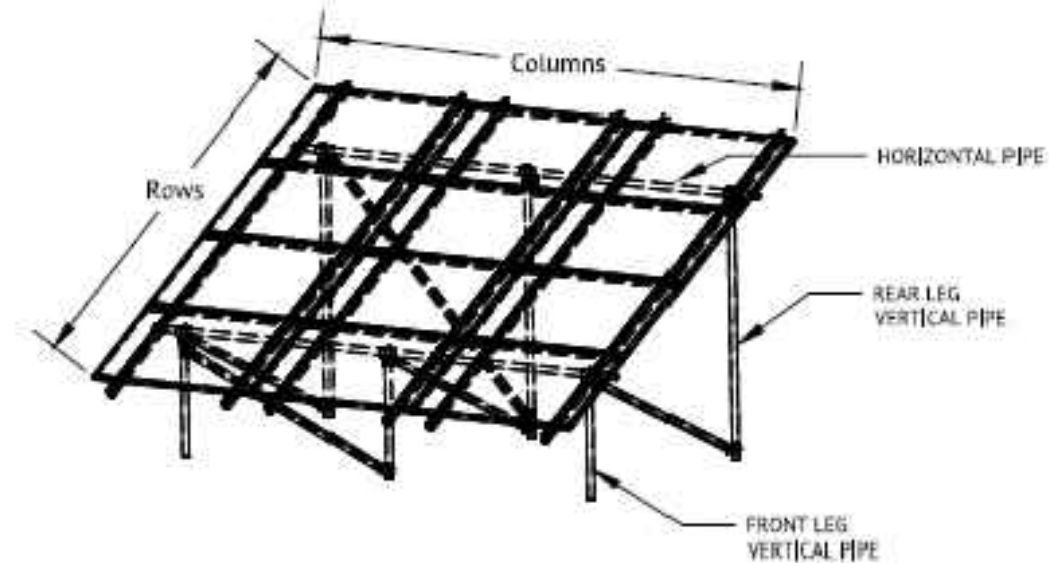
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
OR MORE US PATENTS

LEGAL NOTICE

ULA-A01

SHEET



UNIRAC

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

PRODUCT LINE:	ULA
DRAWING TYPE:	ASSEMBLY
DESCRIPTION:	ASSEMBLY EXAMPLE
REVISION DATE:	APRIL 2016

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
OR MORE US PATENTS

LEGAL NOTICE

ULA-A02

SHEET

CONTRACTOR

SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

635 SW GRAPE
ST, LAKE CITY,
FL 32024

COUNTY: COLUMBIA COUNTY

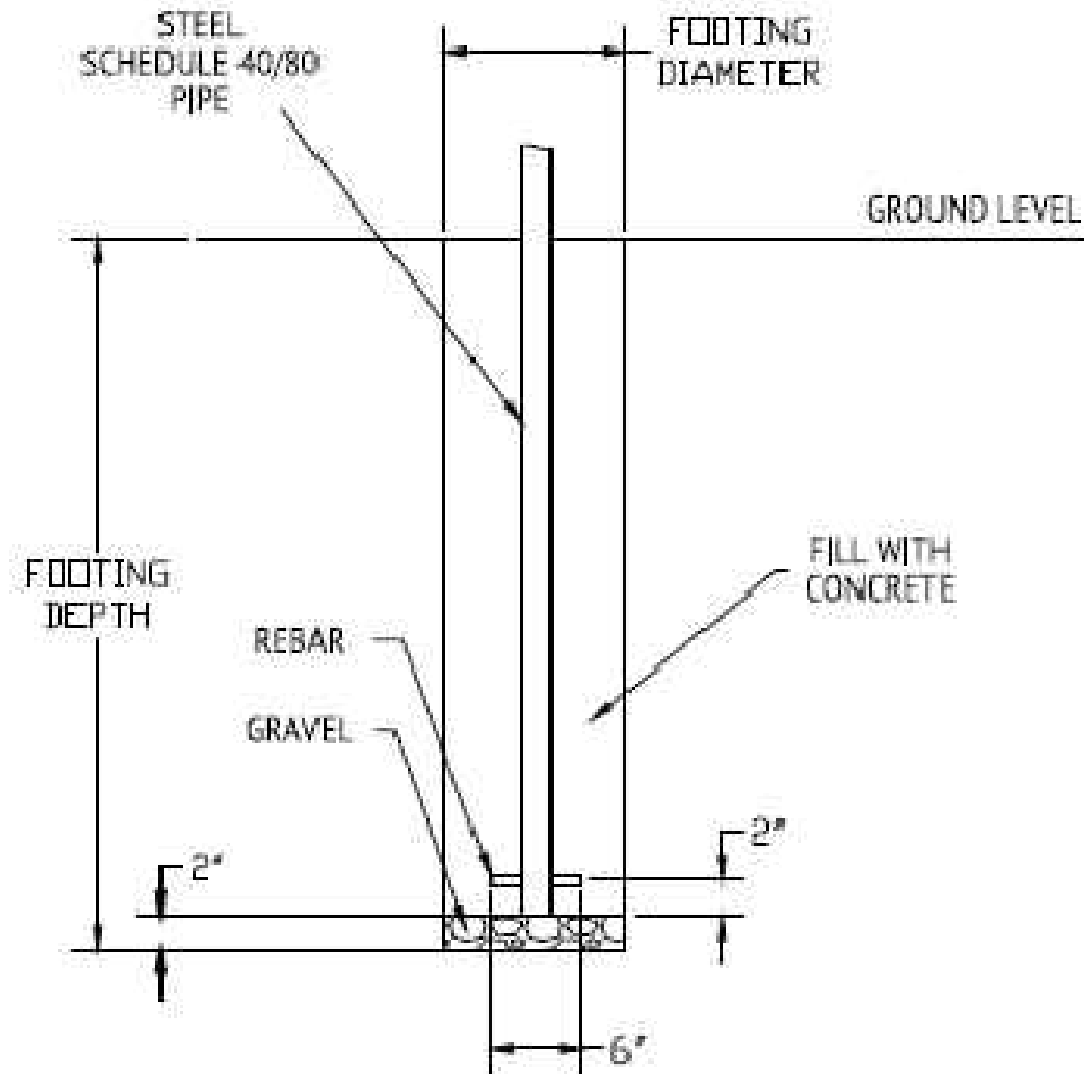
SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC

SHEET TITLE
**RESOURCE
DOCUMENT**

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER
R-004



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

PRODUCT LINE:	ULA
DRAWING TYPE:	ASSEMBLY
DESCRIPTION:	ULA FOUNDATION
REVISION DATE:	APRIL 2016

DRAWING NOT TO SCALE
 ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
 OR MORE US PATENTS

LEGAL NOTICE

ULA-A03

SHEET

CONTRACTOR

SUNPRO

22171 MCH RD
 MANDEVILLE, LA 70471
 PHONE: 9152011490

PROJECT NAME & ADDRESS

WILLIAM BRADLEY

**635 SW GRAPE
 ST, LAKE CITY,
 FL 32024**

COUNTY: COLUMBIA COUNTY

SYSTEM SIZE

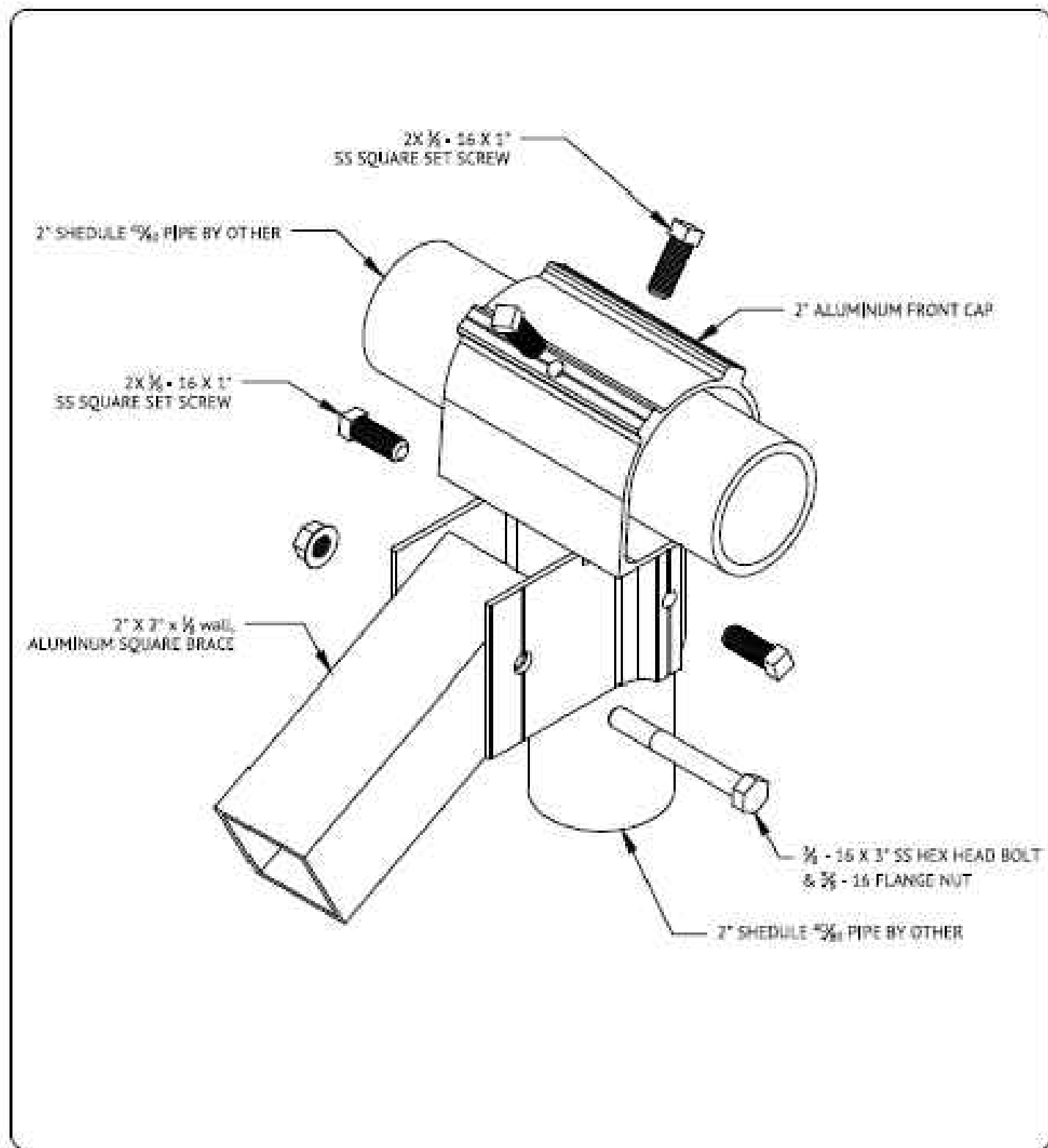
DC SIZE: 15.000 KW DC-(STC)
 AC SIZE: 11.600 KW AC

SHEET TITLE
**RESOURCE
 DOCUMENT**

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER

R-005



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

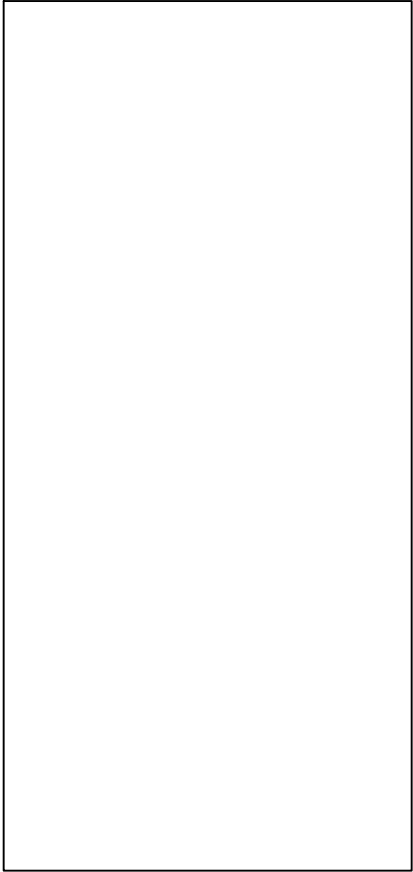
PRODUCT LINE:	ULA
DRAWING TYPE:	PART
DESCRIPTION:	ALUM. FRONT CAP
REVISION DATE:	APRIL 2016

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

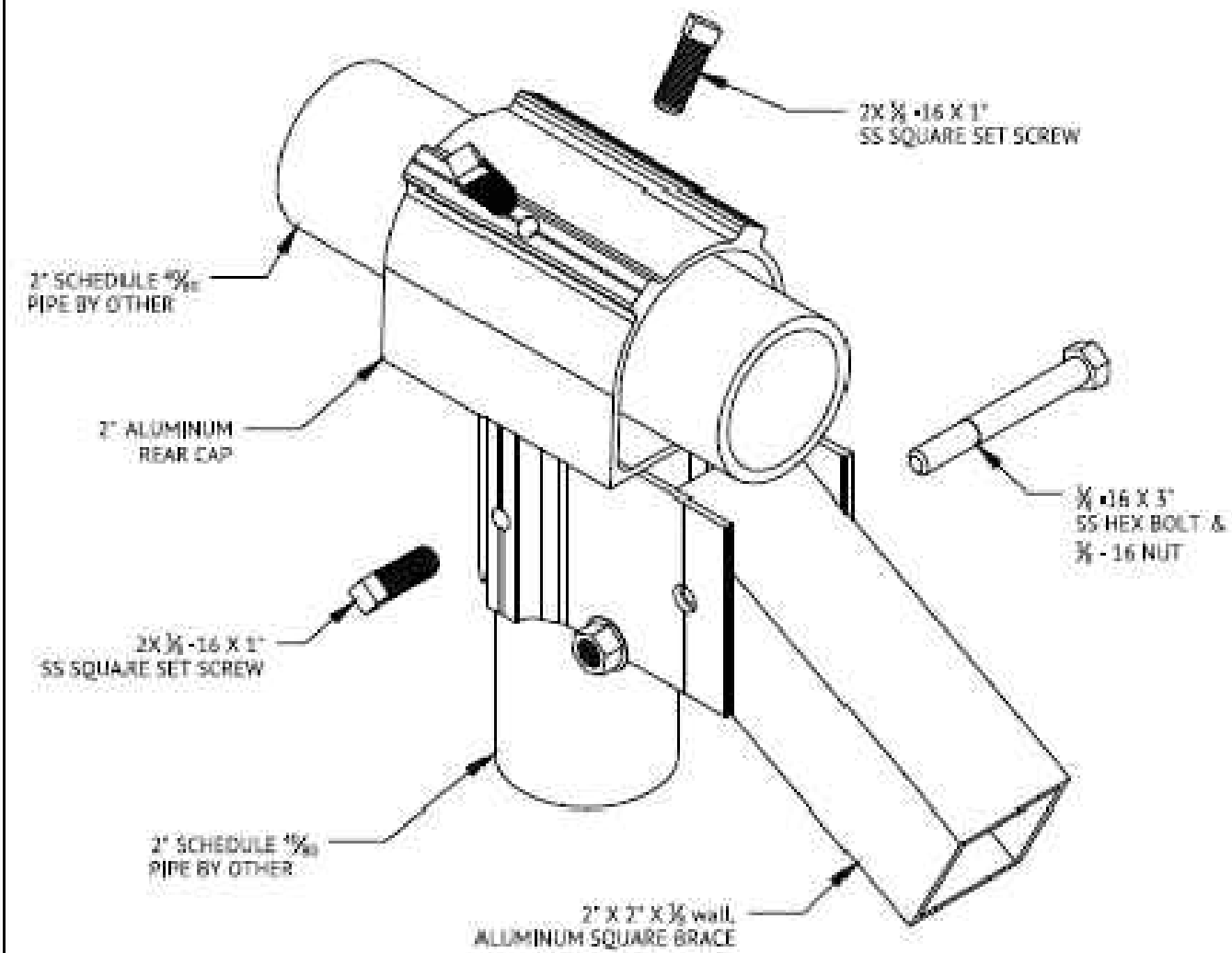
ULA-A04
 SHEET

CONTRACTOR
SUNPRO
 22171 MCH RD
 MANDEVILLE, LA 70471
 PHONE: 9152011490
 PROJECT NAME & ADDRESS
 WILLIAM BRADLEY
**635 SW GRAPE
 ST, LAKE CITY,
 FL 32024**
 COUNTY: COLUMBIA COUNTY

SYSTEM SIZE
DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



SHEET TITLE RESOURCE DOCUMENT	
DRAWN DATE	12/29/2021
DRAWN BY	VI
SHEET NUMBER R-006	





1431 BROADWAY BLVD NE
ALBUQUERQUE, NM 87102 USA
WWW.UNIRAC.COM

PRODUCT LINE:	ULA
DRAWING TYPE:	PART
DESCRIPTION:	ALUMINUM REAR CAP
REV(S)ION DATE:	APRIL 2016

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

ULA-A05

SHEET

CONTRACTOR



22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

635 SW GRAPE
ST, LAKE CITY,
FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC

SHEET TITLE

RESOURCE
DOCUMENT

DRAWN DATE

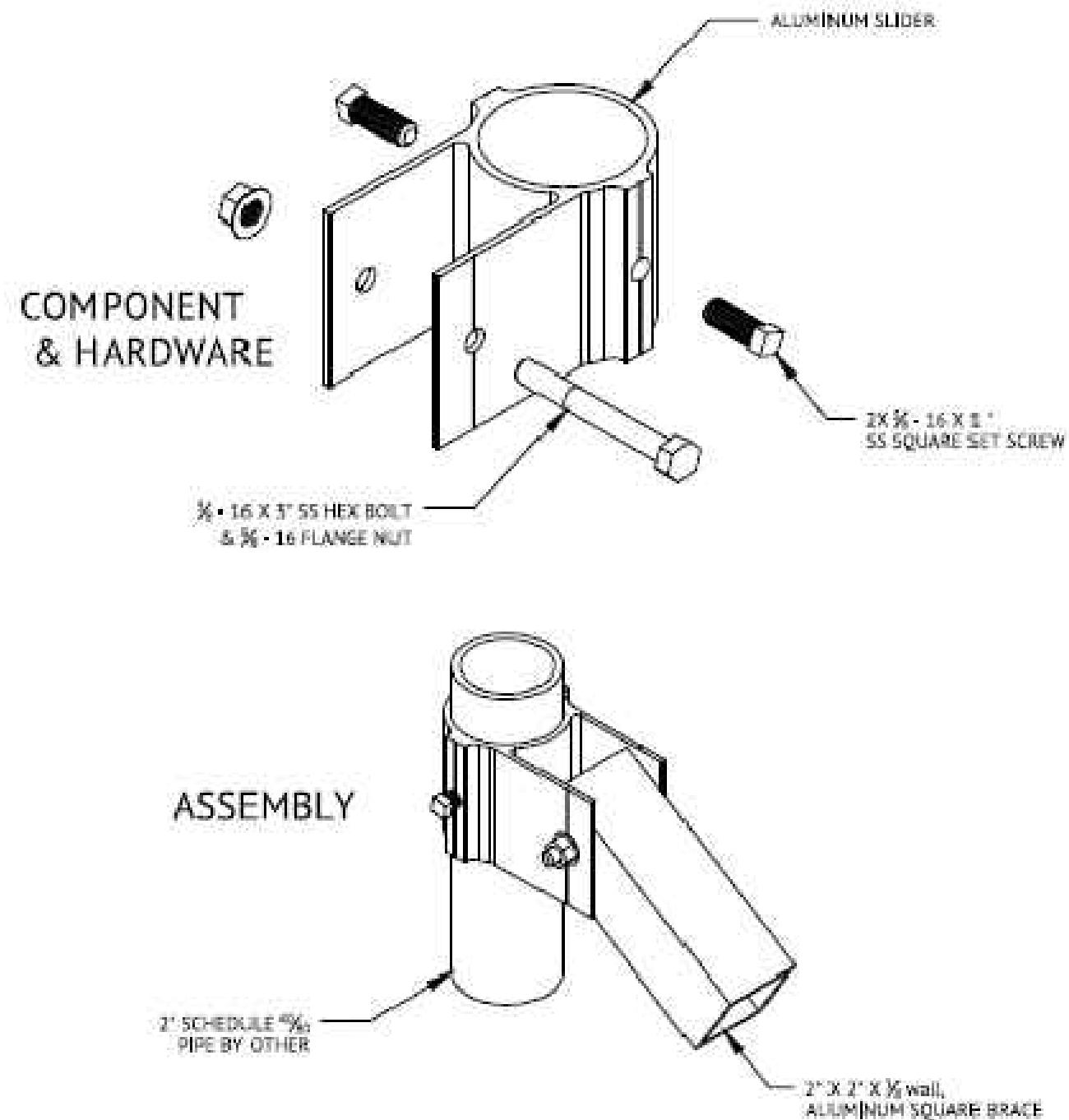
12/29/2021

DRAWN BY

VI

SHEET NUMBER

R-007



UNIRAC

5411 BROADWAY BLVD NE
ALBUQUERQUE, NM 87103 USA

WWW.UNIRAC.COM

PRODUCT LINE: ULA

DRAWING TYPE: PART

DESCRIPTION: ALUM SLIDER

REVISION DATE: APRIL 2016

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
OR MORE US PATENTS

LEGAL NOTICE

ULA-A06

SHEET

CONTRACTOR

SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY: COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)

AC SIZE: 11.600 KW AC

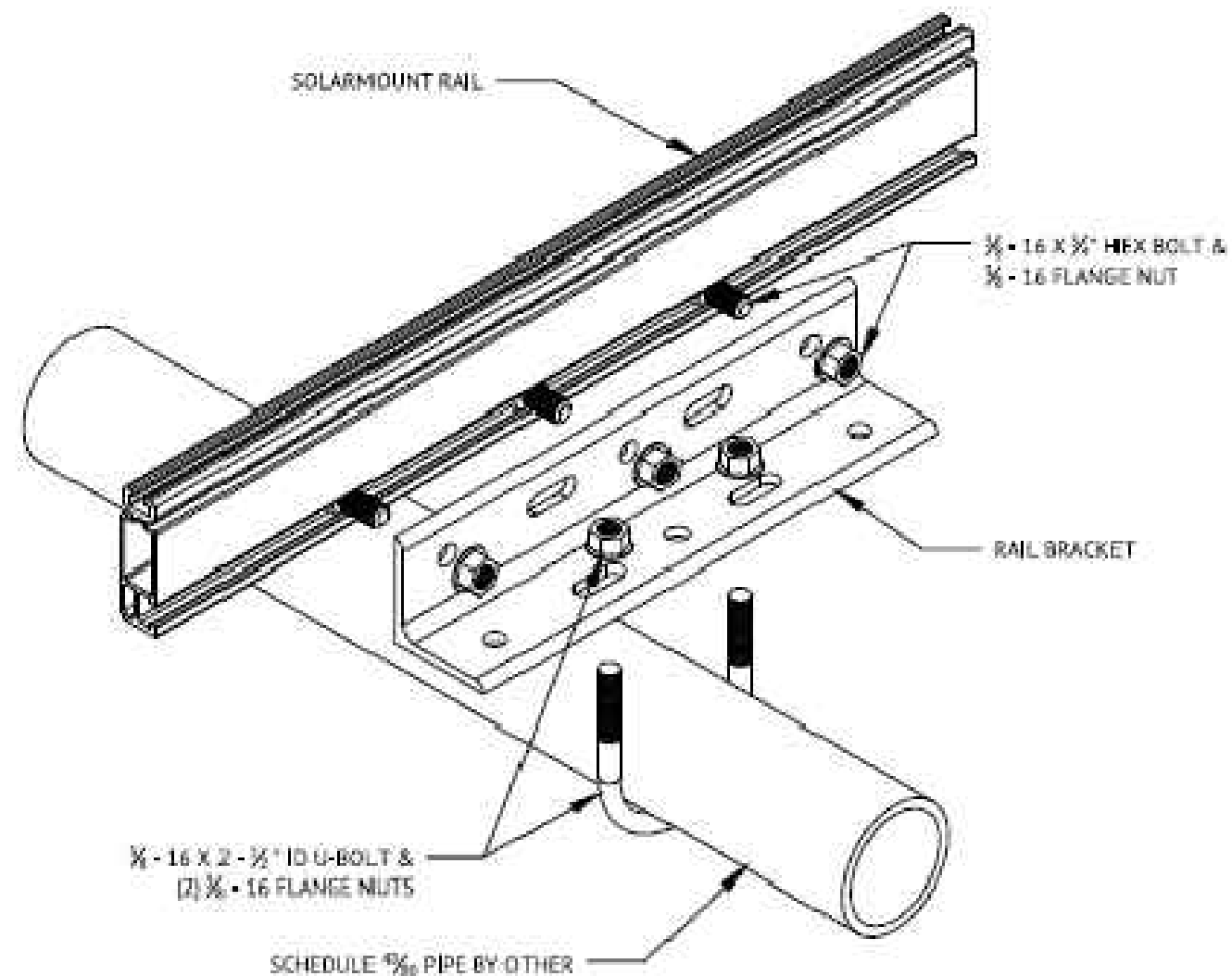
SHEET TITLE
**RESOURCE
DOCUMENT**

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

R-008



UNIRAC
 1431 BROADWAY BLVD NE
 ALBUQUERQUE, NM 87107 USA
 WWW.UNIRAC.COM

PRODUCT LINE:	ULA
DRAWING TYPE:	PART
DESCRIPTION:	UNIVERSAL RAIL BRACKET
REVISION DATE:	APRIL 2016

DRAWING NOT TO SCALE
 ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
 OR MORE US PATENTS

LEGAL NOTICE

ULA-A07

SHEET

CONTRACTOR

SUNPRO

22171 MCH RD
 MANDEVILLE, LA 70471
 PHONE: 9152011490

PROJECT NAME & ADDRESS

WILLIAM BRADLEY

**635 SW GRAPE
 ST, LAKE CITY,
 FL 32024**

COUNTY: COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
 AC SIZE: 11.600 KW AC

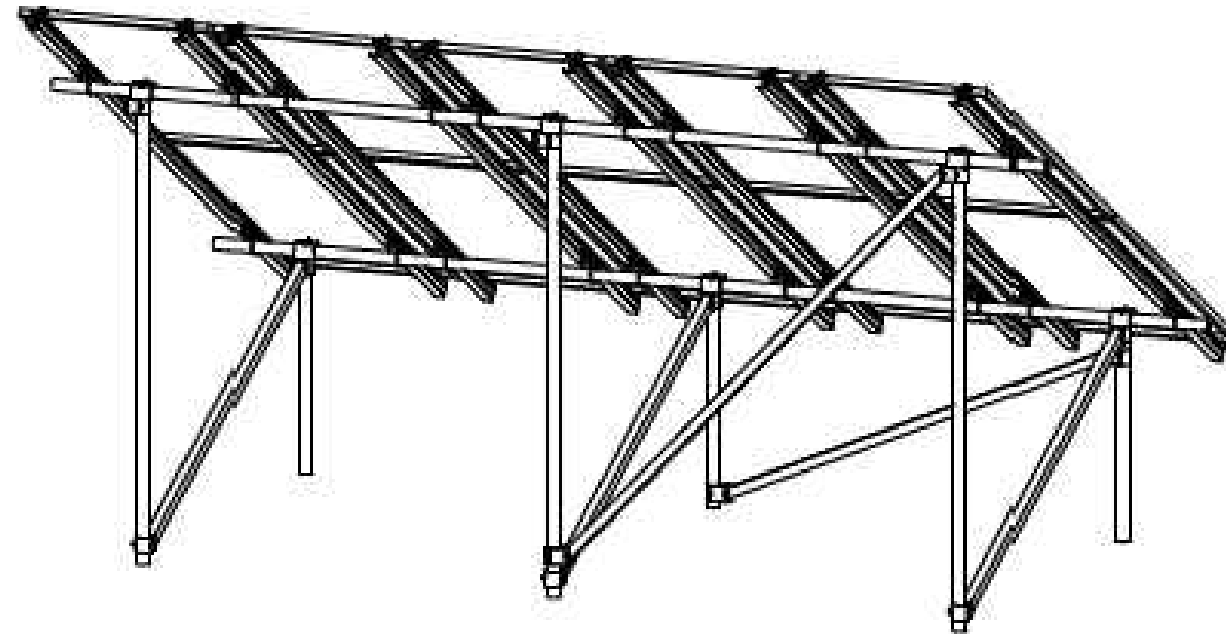
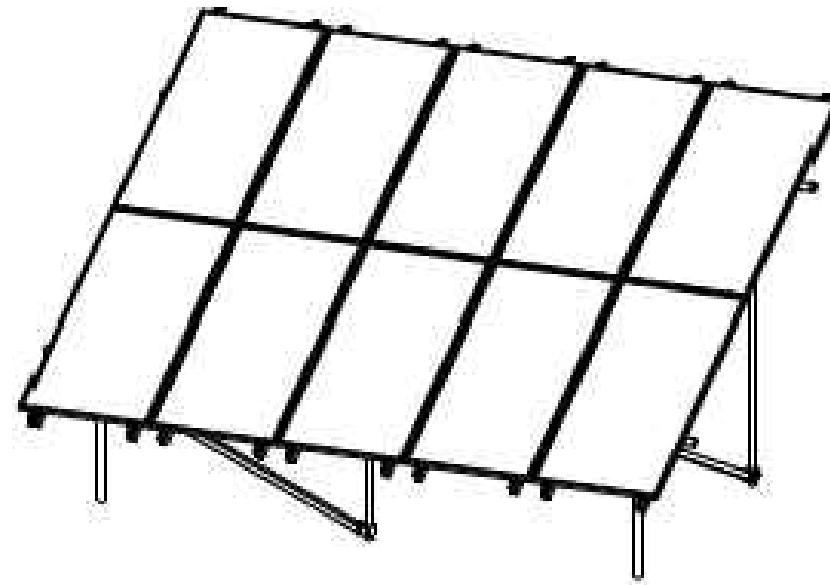
SHEET TITLE

**RESOURCE
 DOCUMENT**

DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER

R-009



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

PRODUCT LINE:	ULA
DRAWING TYPE:	ASSEMBLY
DESCRIPTION:	PORTRAIT ORIENTATION
REVISION DATE:	APRIL 2016

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
OR MORE US PATENTS

LEGAL NOTICE

ULA-A08

SHEET

CONTRACTOR

SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS

WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC

SHEET TITLE

**RESOURCE
DOCUMENT**

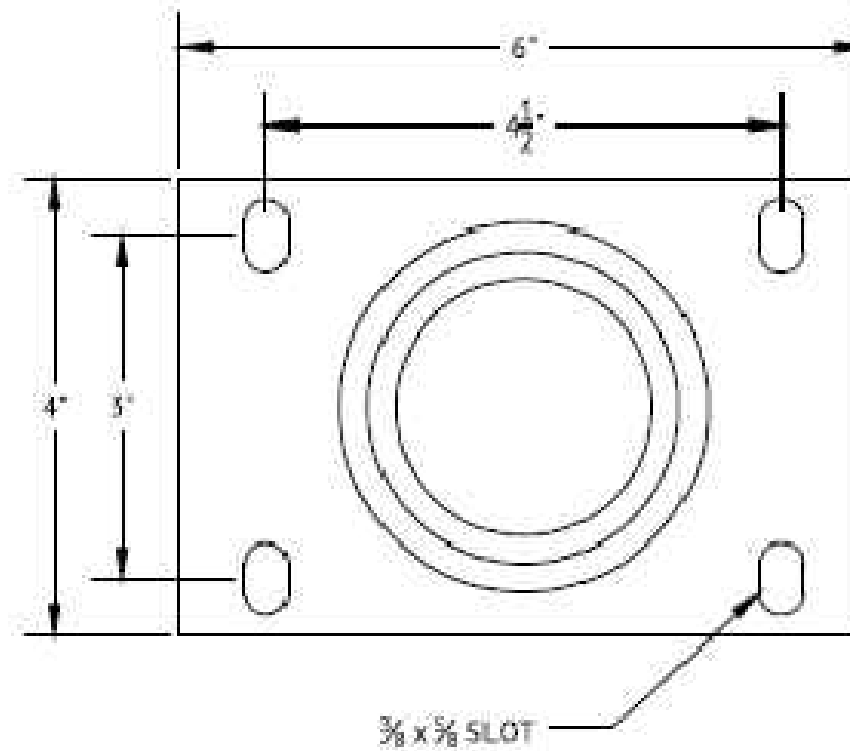
DRAWN DATE	12/29/2021
DRAWN BY	VI

SHEET NUMBER

R-010

2 $\frac{3}{8}$ INCH DIAMETER PIPE THREAD
(11.5 THREADS PER INCH)

$\frac{3}{16}$ "



UNIRAC

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

PRODUCT LINE: ULA

DRAWING TYPE: PART

DESCRIPTION: STEEL THREADED FOOT

REVISION DATE: APRIL 2016

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE
OR MORE US PATENTS

LEGAL NOTICE

ULA-P01

SHEET

CONTRACTOR

SUNPRO

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS

WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY: COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC

SHEET TITLE

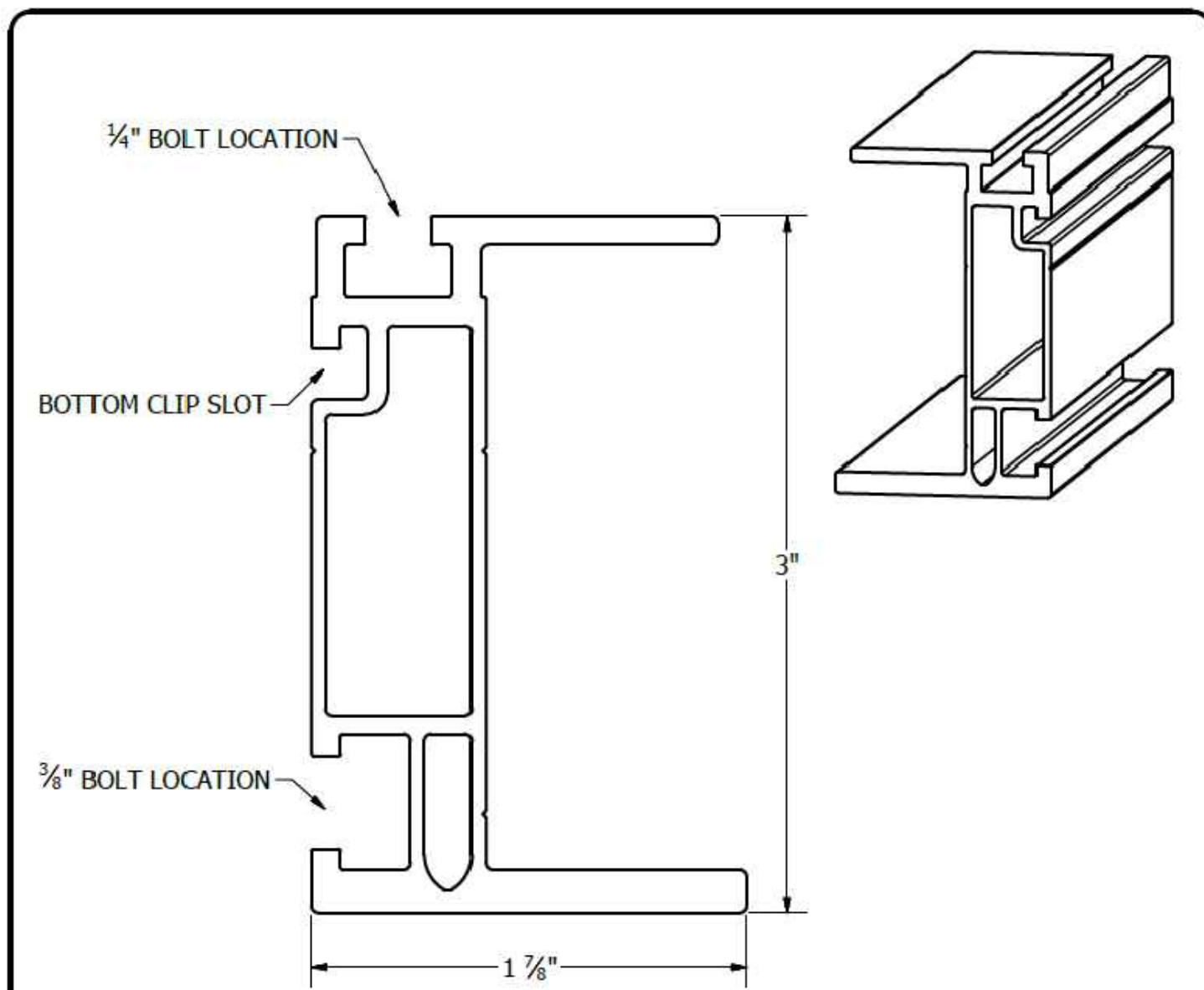
**RESOURCE
DOCUMENT**

DRAWN DATE 12/29/2021

DRAWN BY VI

SHEET NUMBER

R-011



PART # TABLE		
P/N	DESCRIPTION	LENGTH
410144M	SMHD, RAIL 144" MILL	144"
410168M	SMHD, RAIL 168" MILL	168"
410204M	SMHD, RAIL 204" MILL	204"
410240M	SMHD, RAIL 240" MILL	240"



1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	PART DETAIL
DESCRIPTION:	HD RAIL
REVISION DATE:	9/11/2017

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

PRODUCT PROTECTED BY
ONE OR MORE US PATENTS

LEGAL NOTICE

SM-P03

SHEET

CONTRACTOR



22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

635 SW GRAPE
ST, LAKE CITY,
FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC

SHEET TITLE

RESOURCE
DOCUMENT

DRAWN DATE

12/29/2021

DRAWN BY

VI

SHEET NUMBER

R-012

SUNPRO

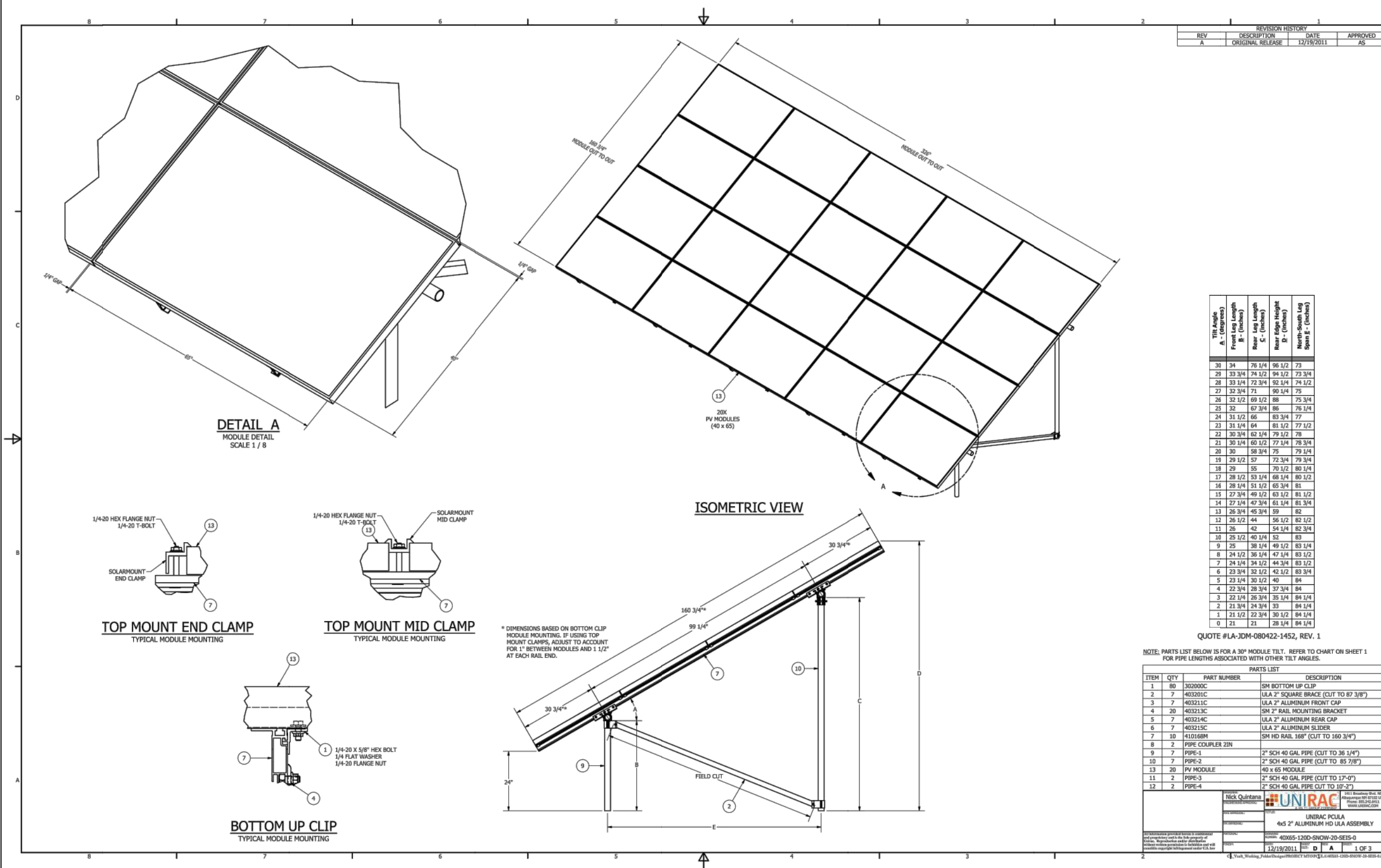
PHONE: 9152011490

WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY:-COLUMBIA COUNTY

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	ORIGINAL RELEASE	12/19/2011	AS

	Title Angle A - (degrees)	Front Leg Length B - (inches)	Rear Leg Length C - (inches)	Rear Edge Height D - (inches)	North-South Leg
30	34	76 1/4	96 1/2	73	
29	33 3/4	74 1/4	94 1/2	73	
28	33 1/4	72 3/4	92 1/4	74	
27	32 3/4	71	90 1/4	75	
26	32 1/2	69 1/2	88	75	
25	32	67 3/4	86	76	
24	31 1/2	66	83 3/4	77	
23	31 1/4	64	81 1/2	77	
22	30 3/4	62 1/4	79 1/2	78	
21	30 1/4	60 1/2	77 1/4	78	
20	30	58 3/4	75	79	
19	29 1/2	57	72 3/4	79	
18	29	55	70 1/2	80	
17	28 1/2	53 1/4	68 1/4	80	
16	28 1/4	51 1/2	65 3/4	81	
15	27 3/4	49 1/2	63 1/2	81	
14	27 1/4	47 3/4	61 1/4	81	
13	26 3/4	45 3/4	59	82	
12	26 1/2	44	56 1/2	82	
11	26	42	54 1/4	83	
10	25 1/2	40 1/4	52	83	
9	25 1/4	38 1/4	49 1/2	83	
8	24 1/2	36 1/4	47 1/4	83	
7	24 1/4	34 1/2	44 3/4	83	
6	24 1/4	32 1/2	42 1/2	83	
5	23 1/4	30 1/4	40	84	
4	22 3/4	28 3/4	37 3/4	84	
3	22 1/4	26 3/4	35 1/4	84	
2	21 3/4	24 3/4	33	84	
1	21 1/2	22 3/4	30 1/2	84	
0	21	21	28 1/4	84	

QUOTE #LA-JDM-080422-1452. REV.

NOTE: PARTS LIST BELOW IS FOR A 30° MODULE TILT. REFER TO CHART ON SHEET FOR PIPE LENGTHS ASSOCIATED WITH OTHER TILT ANGLES.

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	80	302000D	SM BOTTOM UP CLIP
2	7	403201C	ULA 2" SQUARE BRACE (CUT TO 87 3/8")
3	7	403211C	ULA 2" ALUMINUM FRONT CAP
4	20	403213C	SM 2" RAIL MOUNTING BRACKET
5	7	403214C	ULA 2" ALUMINUM REAR CAP
6	7	403215C	ULA 2" ALUMINUM SLIDER
7	10	410168M	SM HD RAIL 168" (CUT TO 160 3/4")
8	2	PIPE COUPLER ZIN	
9	7	PIPE-1	2" SCH 40 GAL PIPE (CUT TO 36 1/4")
10	7	PIPE-2	2" SCH 40 GAL PIPE (CUT TO 85 7/8")
13	20	PV MODULE	40 x 65 MODULE
15	2	PIPE-3	2" SCH 40 GAL PIPE (CUT TO 17'-0")
12	2	PIPE-4	2" SCH 40 GAL PIPE (CUT TO 10'-2")

[illegible]

SHEET TITLE
**RESOURCE
DOCUMENT**

DRAWN DATE	12/29/2021
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DRAWN BY	VI
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SHEET NUMBER

R-013



SUNPRO

WILLIAM BRADLEY

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



NOTE: PARTS LIST BELOW IS FOR A 30° MODULE TILT. REFER TO CHART ON SHEET 1 FOR PIPE LENGTHS ASSOCIATED WITH OTHER TILT ANGLES.

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FORM	DATE	DATE RECD	REV	USED	
	12/19/2011		D A	2 OF 3	

R-014

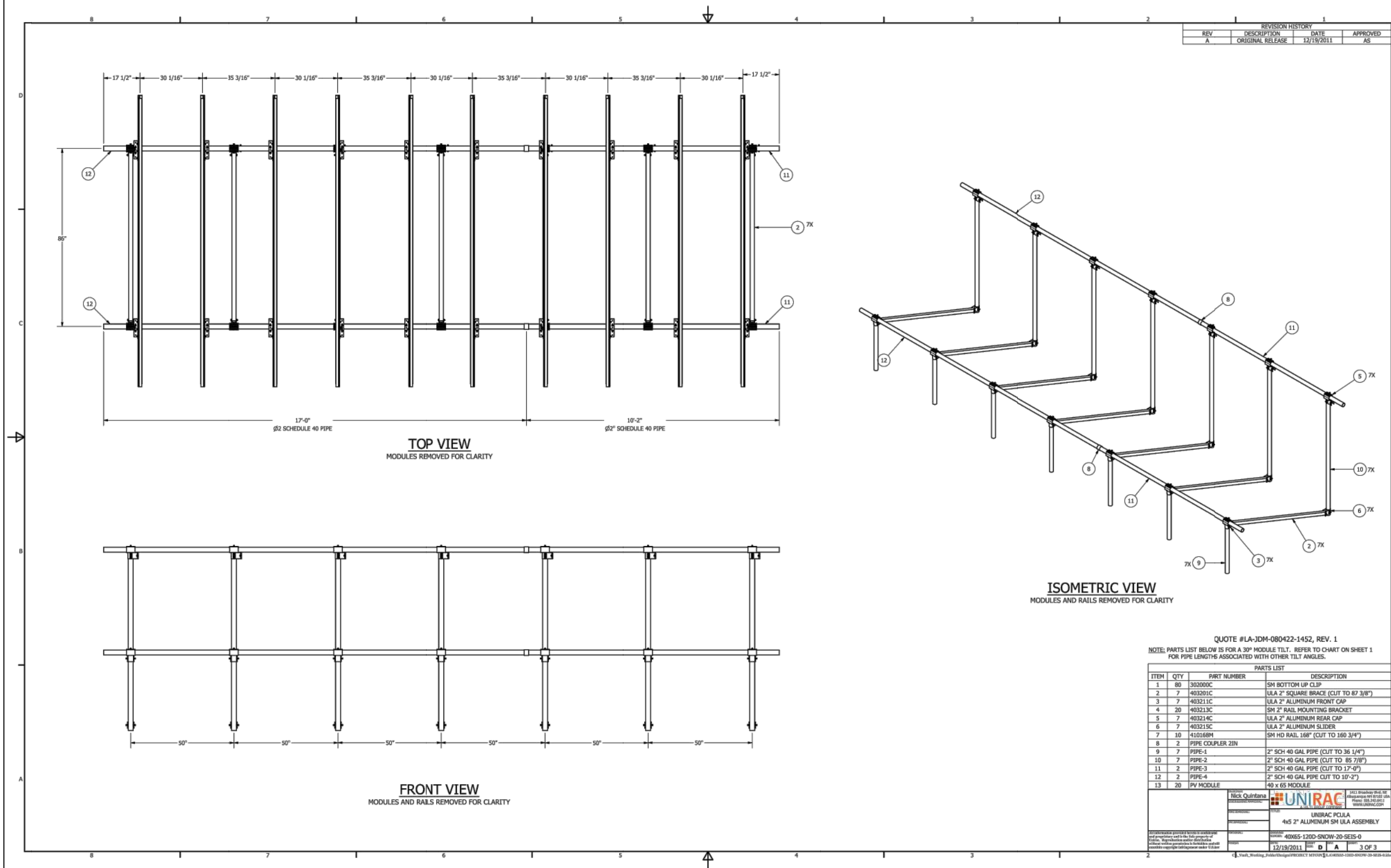
22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS
WILLIAM BRADLEY

**635 SW GRAPE
ST, LAKE CITY,
FL 32024**

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE
DC SIZE: 15.000 KW DC-(STC)
AC SIZE: 11.600 KW AC



SHEET TITLE
**RESOURCE
DOCUMENT**

DRAWN DATE 12/29/2021
DRAWN BY VI

SHEET NUMBER
R-015