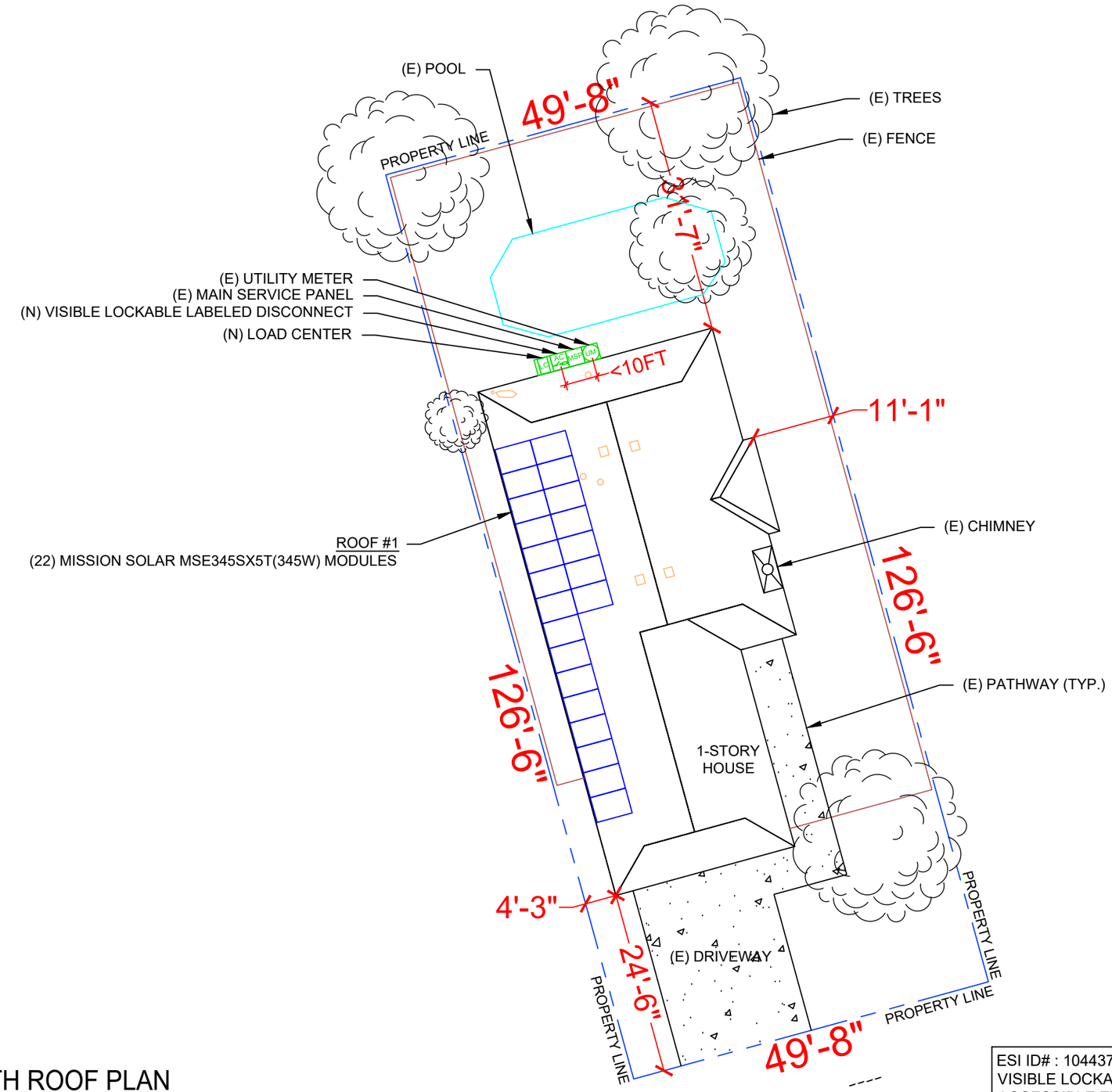
SITE NOTES

- A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS AN UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
- THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION [NEC 110.26]



1 PLOT PLAN WITH ROOF PLAN

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

ESI ID# : 10443720004763845
VISIBLE LOCKABLE LABELED DISCONNECT LOCATED ON ACCESSIBLE EXTERIOR WALL WITHIN 10 FEET OF ONCOR METER

SYSTEM INFO.
(22)MISSION SOLAR MSE345SX5T(345W)
(22) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 7.59 KWDC
AC SYSTEM SIZE: 5.50 KWAC

REVISIONS		
DESCRIPTION	DATE	REV

Signature with Seal

DATE: 11/12/2021

PROJECT NAME & ADDRESS

DONNA TODD RESIDENCE

SHEET NAME

SITE PLAN

SHEET SIZE

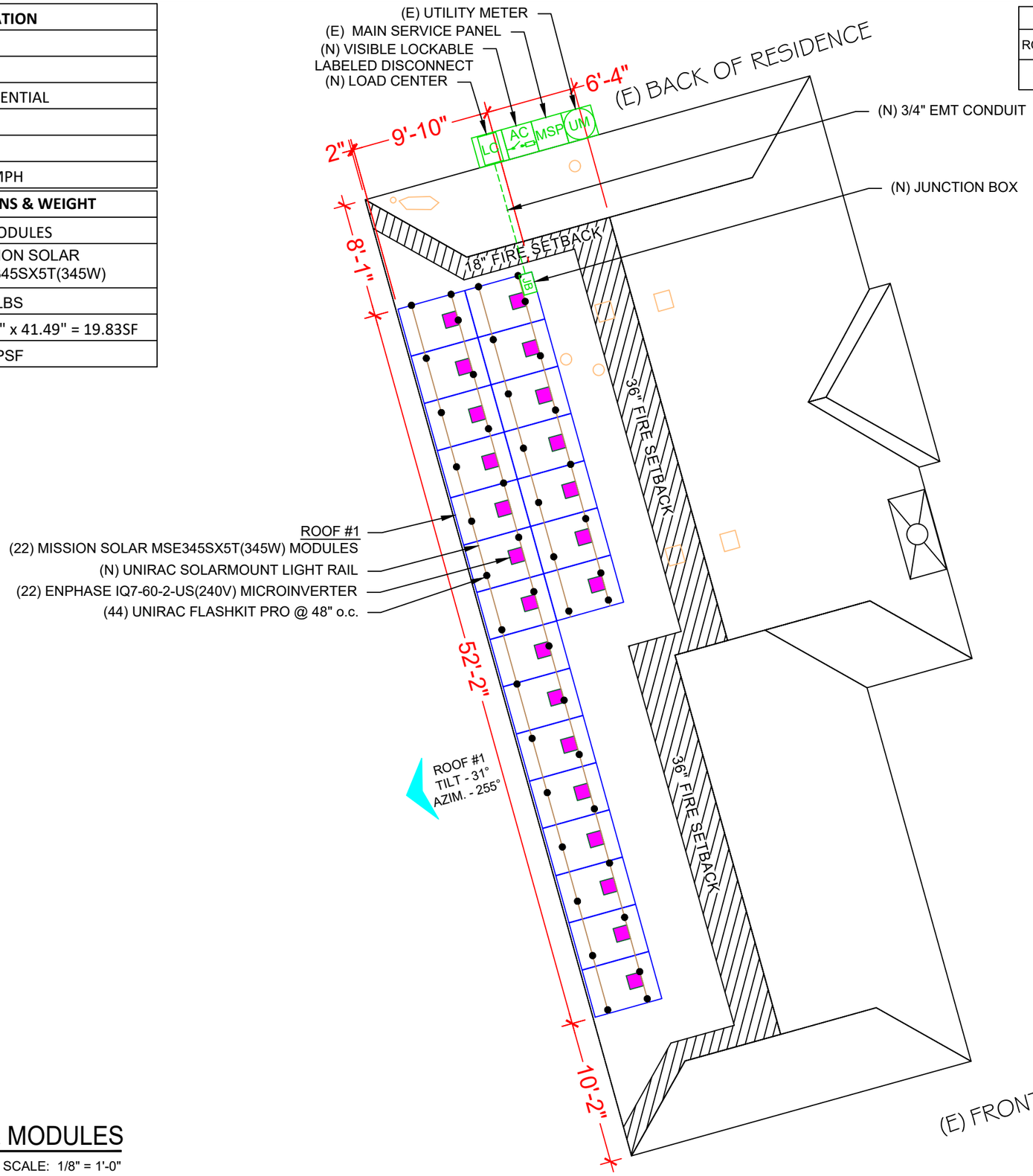
ANSI B
11" X 17"

SHEET NUMBER

PV-1

DESIGN SPECIFICATION	
RISK CATEGORY:	II
CONSTRUCTION:	SFD
ZONING:	RESIDENTIAL
SNOW LOAD (ASCE 7-16):	5 PSF
EXPOSURE CATEGORY:	C
WIND SPEED (ASCE 7-16):	107 MPH

MODULE TYPE, DIMENSIONS & WEIGHT	
NUMBER OF MODULES:	22 MODULES
MODULE TYPE:	MISSION SOLAR MSE345SX5T(345W)
MODULE WEIGHT:	44.8 LBS
MODULE DIMENSIONS:	68.82" x 41.49" = 19.83SF
UNIT WEIGHT OF AREA:	2.26 PSF



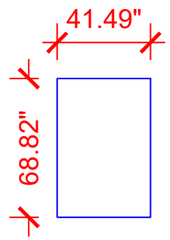
ROOF #1
(22) MISSION SOLAR MSE345SX5T(345W) MODULES
(N) UNIRAC SOLARMOUNT LIGHT RAIL
(22) ENPHASE IQ7-60-2-US(240V) MICROINVERTER
(44) UNIRAC FLASHKIT PRO @ 48" o.c.

ROOF DESCRIPTION					
ROOF	ROOF TILT	AZIMUTH	RAFTER SIZE	RAFTER SPACING	ROOF MATERIAL
#1	31°	255°	2"X6"	24" o.c.	COMP. SHINGLE

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	22	376.53	892.28	42

LEGEND

- JB — (N) JUNCTION BOX
- UM — (E) UTILITY METER
- MSP — (E) MAIN SERVICE PANEL (MSP)
- AC — (N) VISIBLE LOCKABLE LABELED DISCONNECT
- LC — (N) LOAD CENTER (COMBINER PANEL)
- ○ □ — VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ● — ROOF ATTACHMENT
- ---------- — CONDUIT



MISSION SOLAR
MSE345SX5T(345W)
MODULES

1 ROOF PLAN & MODULES
PV-2
SCALE: 1/8" = 1'-0"

SYSTEM INFO.
(22)MISSION SOLAR MSE345SX5T(345W)
(22) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 7.59 KWDC
AC SYSTEM SIZE: 5.50 KWAC

REVISIONS		
DESCRIPTION	DATE	REV

Signature with Seal

DATE: 11/12/2021

PROJECT NAME & ADDRESS

DONNA TODD
RESIDENCE

SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

BILL OF MATERIALS

EQUIPMENT	QTY	ITEM	DESCRIPTION
SOLAR PV MODULE	22	110-1272	MISSION, 345W PV MODULES, MC4, 1.0M (-39.4") PV WIRE, 40MM BLACK FRAME, BLACK BACK SHEET, BOB, 60 CELL MONO-PERC, 20A FUSE, 1000VDC, 688, BAA, 321.4 PTC, 25/25 WARRANTY (WITH REGISTRATION), MSE345SX5T
INVERTER	22	321-0215	ENPHASE, IQ 7 MICRO INVERTER, COMPATIBLE WITH 60-CELL PV, MODULES, 208/240 VOLT, 250VA PEAK POWER, IQ7-60-2-US
MOUNTING KIT	22	270-052	IRONRIDGE, MOUNTING KIT FOR MICROINVERTER & OPTIMIZER, INCLUDE ONE BONDING 1/4" X 3/4" SS T - BOLT AND HARDWARE, UFO SERIES, QTY. 1, BHW-M1-01-A1
JUNCTION BOX	1		JUNCTION BOX, NEMA 3R, UL LISTED
COMBINER BOX	1	570-1196	ENPAHSE, AC COMBINER-3 WITH IQ ENVOY AND 2 SPLIT CORE CONSUMPTION CTS, SINGLE PHASE, REVENUE GRADE ACCURACY (ANSI C12.20 +/-0.5%) WITH CALIBRATED SOLID CORE PRODUCTION CT, SPACE FOR 4 EATON BR 2 POLE BREAKER NOT INCLUDED, 80A INCLUDES SILVER SOLAR SHIELD, X-IQ-AM1-240-3-ES
VISIBLE LOCKABLE LABELED DISCONNECT	1		60A FUSED AC DISCONNECT, (2) 60A FUSES, 240V, NEMA 3R, UL LISTED
ATTACHMENT	44	210-1074	UNIRAC, FLASH-KIT-PRO, 8X12" FLASHING, SLOTTED L-FOOT, LAG BOLT, & RAIL MOUNTING HARDWARE, MILL FINISH, 1 EA, 004055M
ENPHASE Q CABLE	24	360-0329	IQ, Q-CABLE, 240 VOLT FOR 60 CELL 1.7M LANDSCAPE MODULE PITCH. CONNECTOR PITCH IS 2.0M (78.7"), CONTINUOUS LENGTH, ORDER BY NUMBER OF CONNECTORS, Q-12-17-240
BRANCH TERMINATOR	2		BRANCH TERMINATOR
IQ WATER TIGHT CAP	2	360-0333	IQ WATER TIGHT CAPS, ENPHASE, IQ TERMINATOR CAP FOR Q-CABLE, QTY-1, Q-TERM-10
RAILS	15	210-1030	UNIRAC, SOLARMOUNT LIGHT RAIL, 168", MILL FINISH, QTY. 1,315168M
BONDED SPLICE	12	211-0494	SPLICE KIT, UNIRAC, SOLARMOUNT SPLICE-BAR, INTEGRATED BONDING, MILL, QTY. 1, 303019M
MID CLAMP	40	260-286	UNIVERSAL SELF STANDING MID CLAMPS, UNIRAC, UNIVERSAL AESTHETIC FASTENER (UNIVERSAL-AF) MID CLAMP, 30-46MM, PREASSEMBLED INTEGRATED BONDING, DARK FINISH, QTY. 1, 302045D
END CLAMP	8		CONCEALED UNIVERSAL END CLAMPS
GROUNDING LUG	2	590-0117	UNIRAC GROUNDING LUG, IRONRIDGE, GROUNDING LUG, LOW PROFILE, WITH 1/4" T-BOLT AND NUT, UFO SERIES, QTY-1, XR-LUG-03-A1

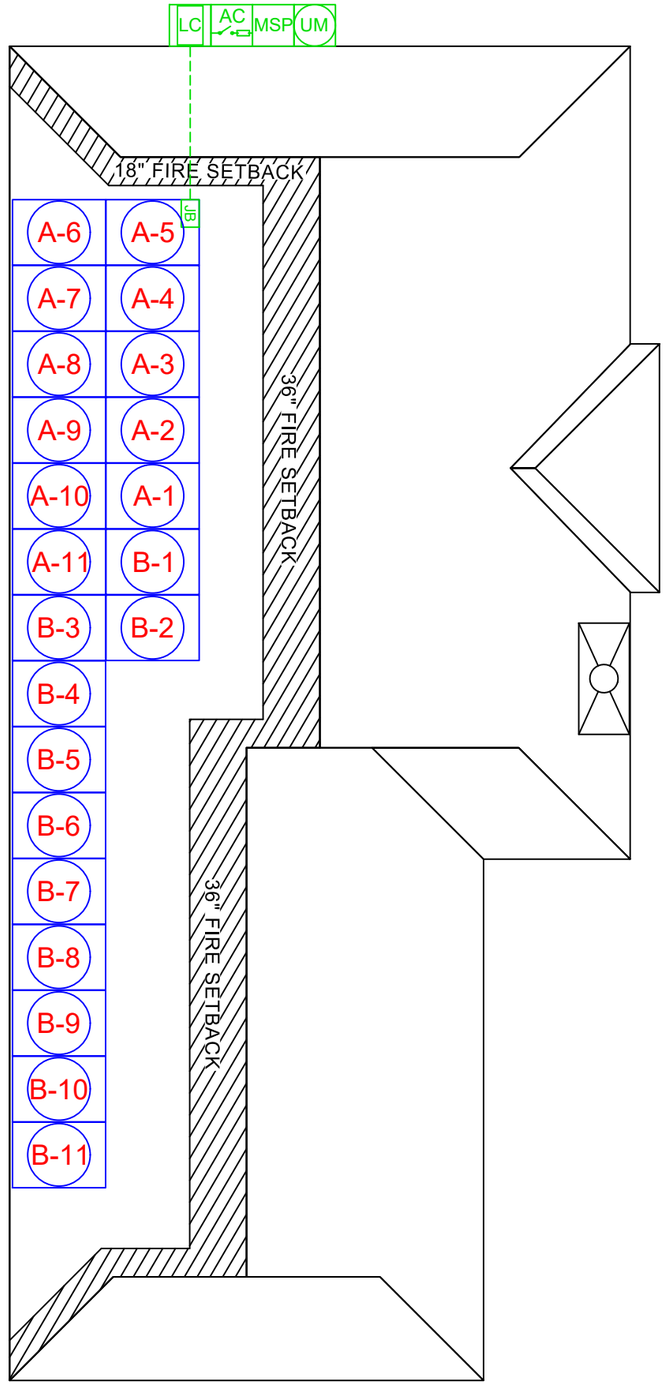
A B - MODULE STRINGING

1 ROOF PLAN WITH STRING LAYOUT & BOM

PV-2A

SCALE: 1/8" = 1'-0"

(E) BACK OF RESIDENCE



(E) FRONT OF RESIDENCE

SYSTEM INFO.

(22)MISSION SOLAR MSE345SX5T(345W)

(22) ENPHASE IQ7-60-2-US(240V)

DC SYSTEM SIZE: 7.59 KWDC

AC SYSTEM SIZE: 5.50 KWAC

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE: 11/12/2021

PROJECT NAME & ADDRESS

DONNA TODD RESIDENCE

SHEET NAME

STRING LAYOUT & BOM

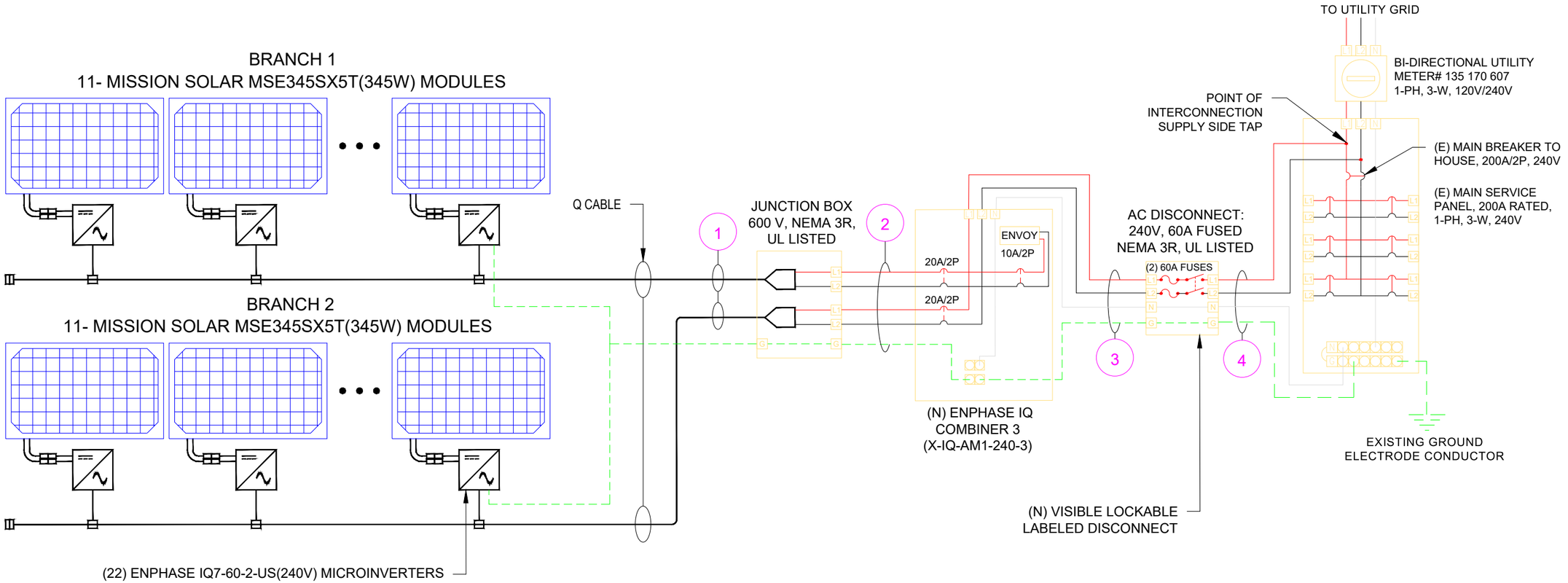
SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-2A

ID	TYPICAL	INITIAL CONDUCTOR LOCATION	FINAL CONDUCTOR LOCATION	CONDUCTOR			CONDUIT	# OF PARALLEL CIRCUITS	CURRENT-CARRYING CONDUCTORS IN CONDUIT	CONDUIT FILL PERCENT	OCPD	EGC		TEMP. CORR. FACTOR		CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	LENGTH	VOLTAGE DROP
1	2	ARRAY	JUNCTION BOX	12 AWG	Q CABLE	-	-	1	2	N/A	N/A	6 AWG	BARE COPPER	0.71	(60°C)	N/A	11.0A	13.8A	N/A	N/A	90°C	55FT	0.46%
2	1	JUNCTION BOX	IQ COMBINER BOX	10 AWG	THWN-2	COPPER	MIN 0.75" Dia EMT	2	4	19.09%	20A	8 AWG	THWN-2, COPPER	0.91	(38°C)	0.8	11.0A	13.8A	40A	29.1A	90°C	19FT	0.22%
3	1	IQ COMBINER BOX	FUSED AC DISCONNECT	6 AWG	THWN-2	COPPER	MIN 0.75" Dia EMT	1	3	36.53%	60A	8 AWG	THWN-2, COPPER	0.91	(38°C)	1	22.0A	27.5A	75A	68.3A	90°C	5FT	0.05%
4	1	FUSED AC DISCONNECT	MSP	6 AWG	THWN-2	COPPER	MIN 0.75" Dia EMT	1	3	36.53%	N/A	6 AWG	THWN-2, COPPER	0.91	(38°C)	1	22.0A	27.5A	75A	68.3A	90°C	5FT	0.05%



1 ELECTRICAL LINE DIAGRAM
PV-4 SCALE: NTS

ESI ID# : 10443720004763845
VISIBLE LOCKABLE LABELED DISCONNECT LOCATED ON ACCESSIBLE EXTERIOR WALL WITHIN 10 FEET OF ONCOR METER

SERVICE INFO.

UTILITY PROVIDER:	ONCOR
MAIN SERVICE VOLTAGE:	240V
MAIN BREAKER RATING:	200A
MAIN SERVICE PANEL:	200A
MAIN SERVICE LOCATION:	NORTH
SERVICE FEED SOURCE:	UNDERGROUND

SYSTEM INFO.

(22)MISSION SOLAR MSE345SX5T(345W)
(22) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 7.59 KWDC
AC SYSTEM SIZE: 5.50 KWAC

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE: 11/12/2021

PROJECT NAME & ADDRESS

DONNA TODD
RESIDENCE

SHEET NAME
ELECTRICAL LINE & CALCS.

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL	MISSION SOLAR MSE345SX5T(345W)
VMP	33.37 V
IMP	10.34 A
VOC	41.00 V
ISC	10.92 A
TEMP. COEFF. VOC	-0.262 %/°C
PTC RATING	321.24 W
MODULE DIMENSION	68.82" (L) x 41.49" (W)
PANEL WATTAGE	345W

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL	ENPHASE IQ7-60-2-US(240V)
MAX DC SHORT CIRCUIT CURRENT	15 A
CONTINUOUS OUTPUT CURRENT	1.0A (240V)

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-12°C
AMBIENT TEMP (HIGH TEMP 2%)	38°C
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	90°C
CONDUCTOR TEMPERATURE RATE	60°C
MODULE TEMPERATURE COEFFICIENT OF VOC	-0.262 %/°C

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
0.80	4-6
0.70	7-9
0.50	10-20

Voltage rise in Q Cable from the Microinverters to the Junction Box

For branch circuit #1 of 11 IQ 7 Micros, the voltage rise on the 240 VAC Q Cable is 0.46%

For branch circuit #2 of 11 IQ 7 Micros, the voltage rise on the 240 VAC Q Cable is 0.46%

Voltage rise from the Junction Box to the IQ Combiner box

VRise = (amps/inverter × number of inverters) × (resistance in Ω/ft) × (2-way wire length in ft)
= (1 amp ×11) × (0.00129 Ω/ft) × (19 ft × 2)
= 11 amps × 0.00129 Ω/ft × 38 ft
= 0.54 volts
%VRise = 0.54 volts ÷ 240 volts = 0.22%
The voltage rise from the Junction Box to the IQ Combiner Box is 0.22%

Voltage rise from the IQ Combiner box to AC Disconnect

VRise = (amps/inverter × number of inverters) × (resistance in Ω/ft.) × (2-way wire length in ft.)
= (1 amp × 22) × (0.000491 Ω/ft) × (5 ft. × 2)
= 22 amps × 0.000491 Ω/ft × 10 ft.
= 0.11 volts
%VRise = 0.11 volts ÷ 240 volts = 0.05%
The voltage rise from the IQ Combiner Box to the AC Disconnect is 0.05%

Voltage rise from the AC Disconnect to the Main Service Panel

VRise = (amps/inverter × number of inverters) × (resistance in Ω/ft) × (2-way wire length in ft)
= (1 amp × 22) × (0.000491 Ω/ft) × (5 ft × 2)
= 22 amps × 0.000491 Ω/ft × 10 ft
= 0.11 volts
%VRise = 0.11 volts ÷ 240 volts = 0.05%
The voltage rise from the AC Disconnect to the Main Panel is 0.05%

Total system voltage rise for all three wire sections

0.46 % + 0.22% + 0.05% + 0.05% = 0.78%

SYSTEM INFO.
(22)MISSION SOLAR MSE345SX5T(345W)
(22) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 7.59 KWDC
AC SYSTEM SIZE: 5.50 KWAC

REVISIONS		
DESCRIPTION	DATE	REV

Signature with Seal

DATE: 11/12/2021

PROJECT NAME & ADDRESS

DONNA TODD
RESIDENCE

SHEET NAME
SPECIFICATIONS & CALC.

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4A