

SCOPE OF WORK:

TO INSTALL A ROOF MOUNTED SOLAR PHOTOVOLTAIC SYSTEM AT THE OWNER RESIDENCE LOCATED AT 3607 MILLBROOK DR. SAN ANGELO, TX 76904
THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.
THE PV SYSTEM DOES NOT INCLUDE STORAGE BATTERIES

EQUIPMENT SUMMARY
34 MISSION SOLAR MSE345SX5T(345W) MODULES
34 ENPHASE IQ7-60-2-US(240V) MICROINVERTERS

GENERAL NOTES:

- THESE CONSTRUCTION DOCUMENTS HAVE BEEN BASED ON FIELD INSPECTIONS AND OTHER INFORMATION AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS.
- ARCHITECT HAS NOT BEEN RETAINED TO SUPERVISE ANY CONSTRUCTION OR INSTALLATION OF ANY EQUIPMENT AT SITE.
- CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, EQUIPMENT, TOOLS, OBTAINS ALL PERMITS, LICENSES AND PAY ALL REQUIRED FEES AND COMPLETE INSTALLATION.
- CONTRACTOR HAS THE FULL RESPONSIBILITY TO CHECK AND VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. ANY WORK STARTED BEFORE CONSULTATION AND ACCEPTANCE BY THE ENGINEER SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE SUBJECT TO CORRECTION BY THEM WITHOUT ADDITIONAL COMPENSATION.
- DAMAGE CAUSED TO THE EXISTING STRUCTURE, PIPES, DUCTS, WINDOWS, WALL, FLOORS, ETC. SHALL BE REPAIRED TO THE ORIGINAL CONDITION OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR THE PROPER INSTALLATION AND COMPLETION OF THE WORK WITH APPROVED MATERIALS.
- NO CHANGES ARE TO BE MADE WITHOUT THE CONSULTATION AND APPROVAL OF THE ARCHITECT.
- CONTRACTOR SHALL OBTAIN BUILDING PERMIT. NO WORK TO START UNLESS BUILDING PERMIT IS PROPERLY DISPLAYED.
- ALL WORKMANSHIP AND MATERIALS SHALL BE OF FIRST QUALITY AND IN COMPLIANCE WITH THE REQUIREMENTS OF THE TX BUILDING CODE, THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ALL PERTINENT AGENCIES.
- IT IS ESSENTIAL THAT ALL WORK PROCEED WITH THE MAXIMUM COOPERATION OF ALL PARTIES AND WITH MINIMUM INTERFERENCE TO THE OCCUPANTS WITHIN THE BUILDING. THE OWNER'S DIRECTIONS IN THIS REGARD SHALL BE FULLY COMPLIED WITH.
- ALL EXPOSED PLUMBING, HVAC, ELECTRICAL DUCTWORK, PIPING AND CONDUITS ARE TO BE PAINTED BY GENERAL CONTRACTOR.
- THE CONTRACTOR SHALL PERFORM THE WORK IN STRICT CONFORMANCE WITH THE LOCAL LAWS, REGULATIONS AND THE NATIONAL ELECTRIC CODE.
- THE CONTRACTOR SHALL OBTAIN ALL PERMITS, APPROVALS, AFFIDAVITS, CERTIFICATIONS, ETC. AND PAY ALL FEES AS REQUIRED BY THE LOCAL AUTHORITIES.
- CONTRACTORS SHALL OBTAIN FIRE CERTIF. UPON COMPLETION OF WORK.

ELECTRICAL NOTES:

- THE EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE INSTALLED ONLY BY QUALIFIED PEOPLE. A QUALIFIED PERSON IS ONE WHO HAS SKILLS AND KNOWLEDGE RELATED TO THE CONSTRUCTION AND OPERATION OF THE ELECTRICAL EQUIPMENT AND INSTALLATIONS AND HAS RECEIVED SAFETY TRAINING TO RECOGNIZE AND AVOID THE HAZARDS INVOLVED. (NEC 690.4(E) AND 705.6)
- LOCAL UTILITY PROVIDER SHALL BE NOTIFIED PRIOR TO USE AND ACTIVATION OF ANY SOLAR PHOTOVOLTAIC INSTALLATION. FOR A LINE SIDE TAP CONNECTION, UTILITY NEEDS TO BE NOTIFIED WELL IN ADVANCE TO COORDINATE BUILDING ELECTRICAL SHUT OFF.
- NEW CONDUIT ROUTING SHOWN IS ESSENTIALLY SCHEMATIC. SUBCONTRACTOR SHALL LAY OUT RUNS TO SUIT FIELD CONDITIONS AND THE COORDINATION REQUIREMENTS OF OTHER TRADES.
- ARRAY WIRING SHOULD NOT BE READILY ACCESSIBLE EXCEPT TO QUALIFIED PERSONNEL.
- ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE WATERTIGHT AND APPROVED FOR USE IN WET LOCATIONS. (NEC 314.15A).
- WIRING METHODS FOR PV SYSTEM CONDUCTORS AREN'T PERMITTED WITHIN 10 IN. OF THE ROOF DECKING OR SHEATHING EXCEPT WHERE LOCATED DIRECTLY BELOW THE ROOF SURFACE THAT'S COVERED BY PV MODULES AND ASSOCIATED EQUIPMENT WIRING
- BACK-FED BREAKER MUST BE AT THE OPPOSITE END OF BUS BAR FROM THE MAIN BREAKER OR MAIN LUG SUPPLYING CURRENT FROM THE UTILITIES.
- ALL CONDUCTORS AND WIRE TIES EXPOSED TO SUNLIGHT ARE LISTED AS UV RESISTANT.
- CONTRACTOR SHALL FOLLOW ALL ELECTRICAL EQUIPMENT LABELING REQUIREMENTS IN NEC 690 AND IFC 2015
- PV SOURCE, OUTPUT AND INVERTER CIRCUITS SHALL BE IDENTIFIED AT ALL POINTS OF TERMINATION, CONNECTION, AND SPLICES. THE MEANS OF ID CAN BE SEPARATE COLOR CODING, MARKING TAPE, TAGGING ETC. (NEC 690.4).
- MEASURE THE LINE-TO-LINE AND LINE-TO-NEUTRAL VOLTAGE OF ALL SERVICE ENTRANCE CONDUCTORS PRIOR TO INSTALLING ANY SOLAR EQUIPMENT. THE VOLTAGES FOR THE 240VAC RATED.

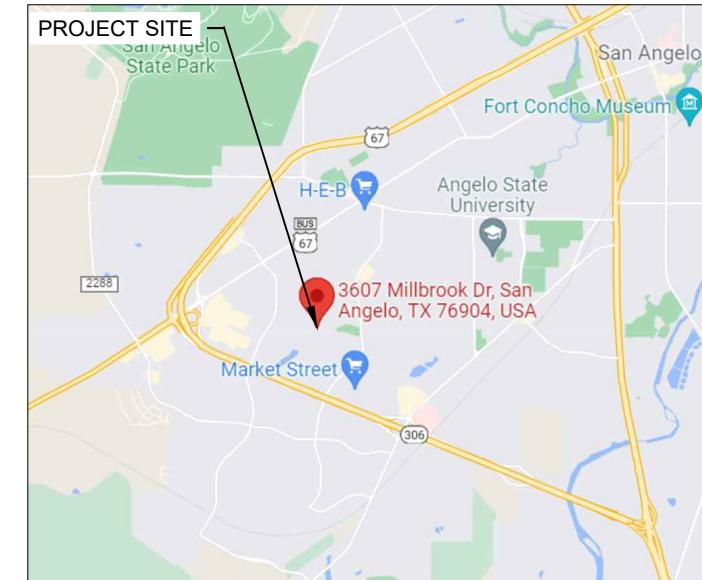
GOVERNING CODES
2015 INTERNATIONAL RESIDENTIAL CODE
2015 INTERNATIONAL FIRE CODE
2017 NATIONAL ELECTRICAL CODE

SYSTEM RATING
11.73 KWDC
8.50 KWAC

SHEET INDEX	
PV-0	COVER PAGE
PV-1	SITE PLAN
PV-2	ROOF PLAN & MODULES
PV-2A	STRING LAYOUT & BOM
PV-3	ATTACHMENT DETAIL
PV-3A	ATTACHMENT DETAIL
PV-4	ELECTRICAL LINE DIAGRAM & CALCS.
PV-4A	SPECIFICATIONS & CALCULATION
PV-5	SIGNAGE
PV-6+	EQUIPMENT SPECIFICATIONS



1 PV-0 HOUSE PHOTO SCALE: NTS



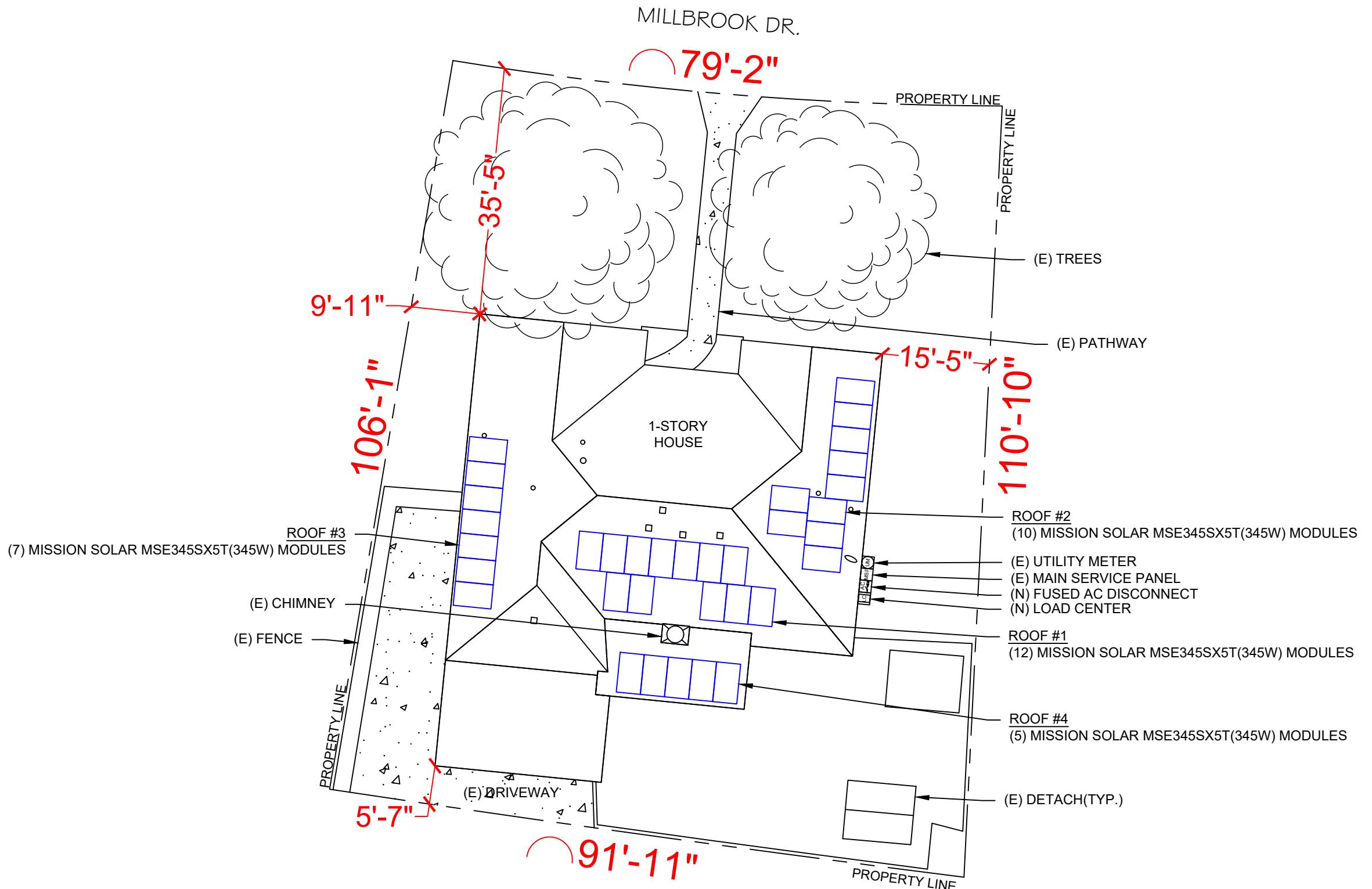
1 PV-0 VICINITY MAP SCALE: NTS

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
COVER PAGE
SHEET SIZE
ANSI B
11" X 17"
SHEET NUMBER
PV-0

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]



SYSTEM INFO.
 (34) MISSION SOLAR MSE345SX5T(345W)
 (34) ENPHASE IQ7-60-2-US(240V)
 DC SYSTEM SIZE: 11.73 KWDC
 AC SYSTEM SIZE: 8.50 KWAC

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal
 DATE:

PROJECT NAME & ADDRESS

ASTERIA POLANCO RESIDENCE
 3607 MILLBROOK DR.
 SAN ANGELO, TX 76904

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 7-10):	5 PSF
EXPOSURE CATEGORY:	B
WIND SPEED (ASCE 7-10):	115 MPH
MODULE TYPE, DIMENSIONS & WEIGHT	
NUMBER OF MODULES:	34 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

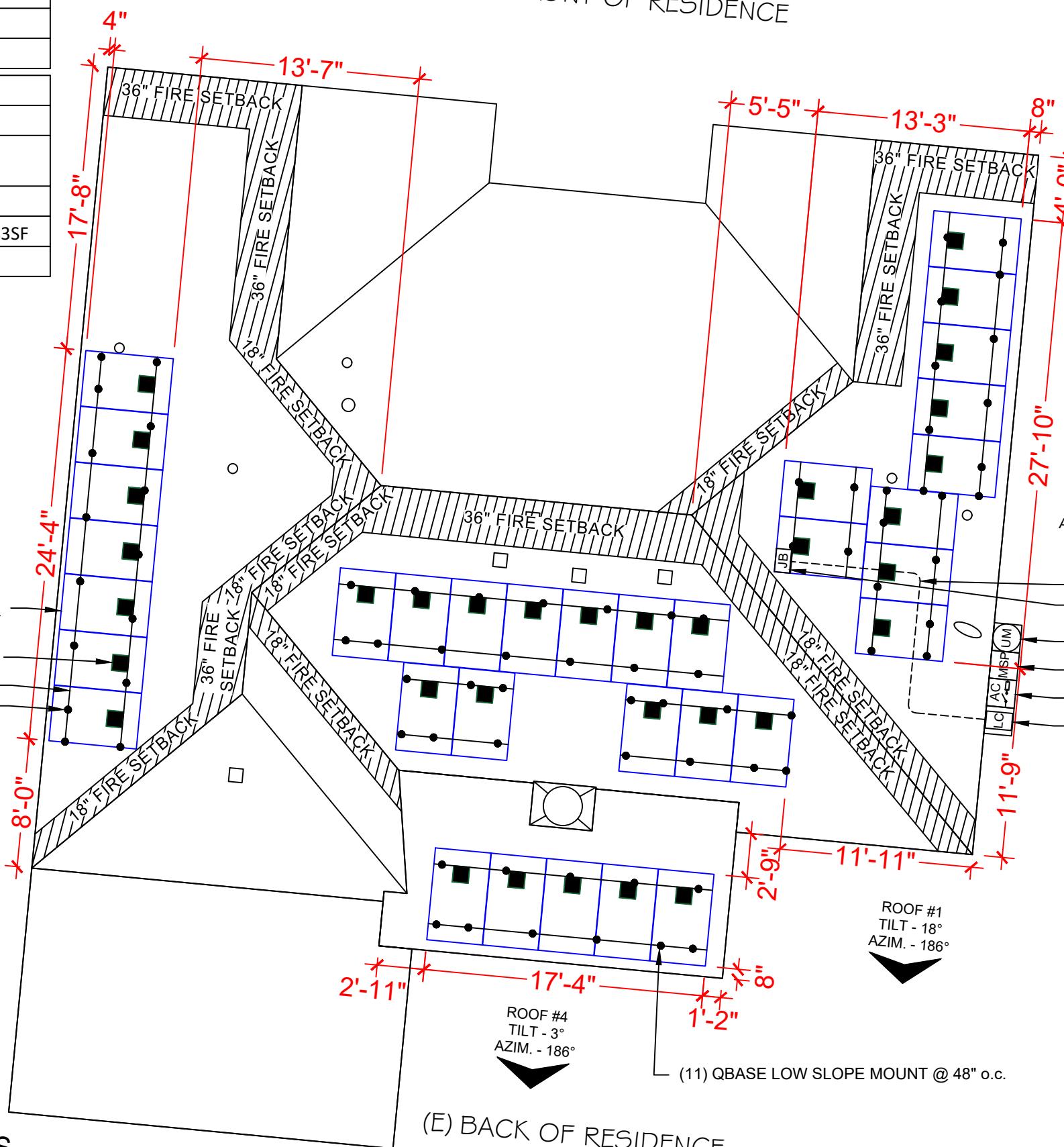
(34) MISSION SOLAR MSE345SX5T(345W) MODULES
 (34) ENPHASE IQ7-60-2-US(240V) MICROINVERTER
 (N) UNIRAC SOLARMOUNT LIGHT RAIL
 (66) UNIRAC FLASHKIT PRO @ 48" o.c.



1 ROOF PLAN & MODULES

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

MILLBROOK DR. (E) FRONT OF RESIDENCE



ROOF DESCRIPTION					
ROOF	ROOF TILT	AZIMUTH	RAFTER SIZE	RAFTER SPACING	ROOF MATERIAL
#1	18°	186°	2"X6"	24" o.c.	COMP. SHINGLE
#2	18°	96°	2"X6"	24" o.c.	COMP. SHINGLE
#3	18°	276°	2"X6"	24" o.c.	COMP. SHINGLE
#4	3°	186°	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	12	227.62	567.55	40
#2	10	189.59	475.60	40
#3	7	132.71	583.40	23
#4	5	99.50	218.66	46

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

SYSTEM INFO.		
(34) MISSION SOLAR MSE345SX5T(345W)		
(34) ENPHASE IQ7-60-2-US(240V)		
DC SYSTEM SIZE: 11.73 KWDC		
AC SYSTEM SIZE: 8.50 KWAC		
REVISIONS		
DESCRIPTION	DATE	REV
Signature with Seal		
DATE:		
PROJECT NAME & ADDRESS		
ASTERIA POLANCO RESIDENCE 3607 MILLBROOK DR. SAN ANGELO, TX 76904		
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	34	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	34	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	34	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
FUSED AC DISCONNECT	1		60A FUSED AC DISCONNECT, (2) 60A FUSES, 240V, NEMA 3R, UL LISTED
ATTACHMENT	66	210-1074	UNIRAC, FLASH-KIT-PRO, 8X12" FLASHING, SLOTTED L-FOOT, LAG BOLT, & RAIL MOUNTING HARDWARE, MILL FINISH, 1 EA, 004055M
ATTACHMENT	11		CAP SCREW, HEX HEAD, 5/16"-18 X 3/4", QBASE, 1-1/4" ID, FOR 5/16" HARDWARE, POST, 1.25" OD X 6.5", WASHER, SEALING, 5/16" ID X 1-1/4" OD, CAP SCREW, HEX HEAD, 5/16"-18" X 1"
ATTACHMENT	22		LAG SCREW, HEX HEAD, 5/16" X 3"
ENPHASE Q CABLE	49	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	3		BRANCH TERMINATOR
IQ WATER TIGHT CAP	15	360-0333	IQ WATER TIGHT CAPS, ENPHASE, IQ TERMINATOR CAP FOR Q-CABLE, QTY-1, Q-TERM-10
RAILS	26	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	52	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	32		CONCEALED UNIVERSAL END CLAMPS
GROUNDING LUG	8	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) (C) - MODULE STRINGING

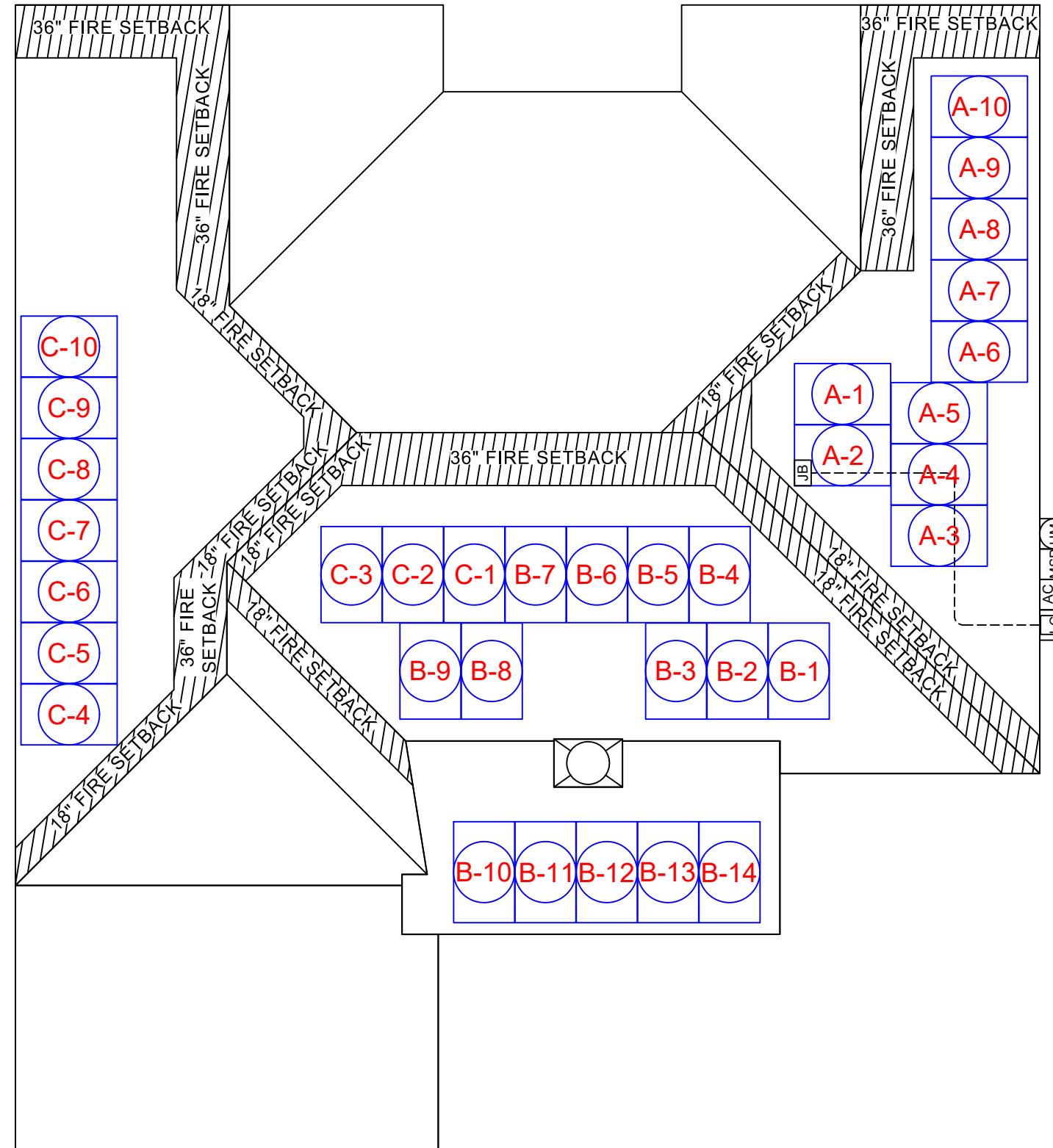


1

ROOF PLAN WITH STRING LAYOUT & BOM

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

MILLBROOK DR. (E) FRONT OF RESIDENCE



(E) BACK OF RESIDENCE

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
**STRING
LAYOUT & BOM**

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER
PV-2A

SYSTEM INFO.
(34)MISSION SOLAR MSE345SX5T(345W)
(34) ENPHASE IQ7-60-2-US(240V)

DC SYSTEM SIZE: 11.73 KWDC
AC SYSTEM SIZE: 8.50 KWAC

REVISIONS

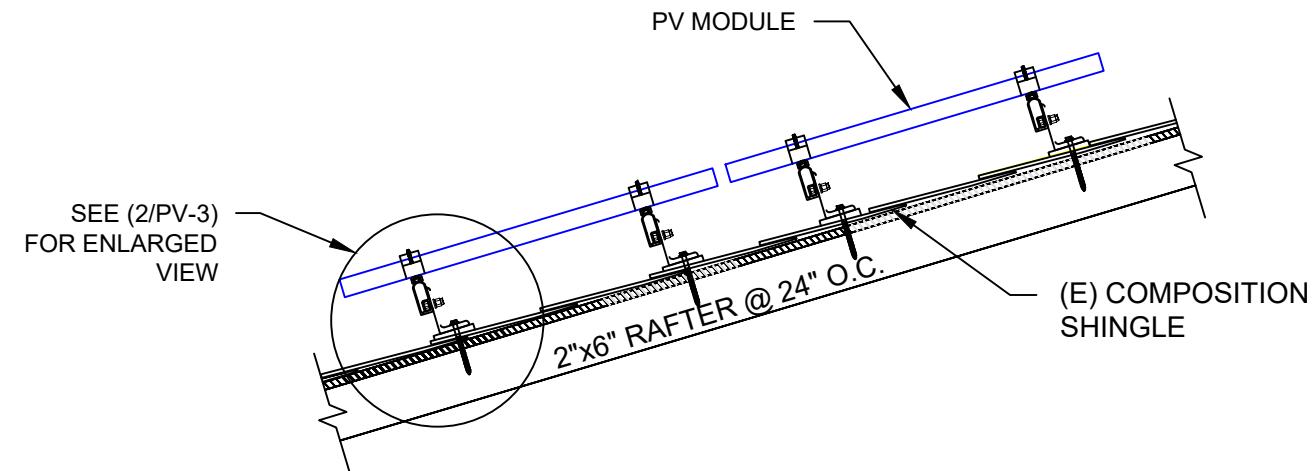
DESCRIPTION	DATE	REV
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Signature with Seal

DATE:

PROJECT NAME & ADDRESS

PV-2A



SYSTEM INFO.
(34) MISSION SOLAR MSE345SX5T(345W)
(34) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 11.73 KWDC
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REVISIONS
DESCRIPTION DATE REV

Signature with Seal

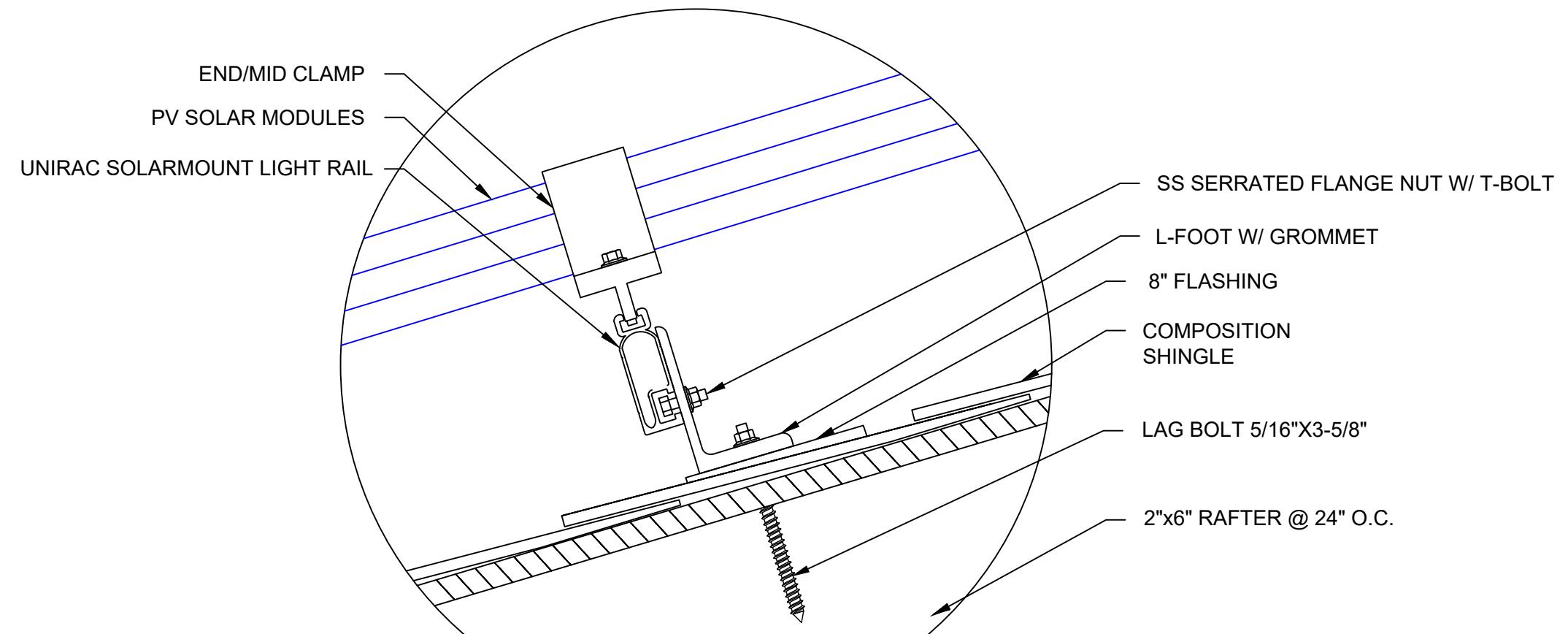
DATE:

PROJECT NAME & ADDRESS

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

1 ATTACHMENT DETAILS

PV-3



2 ENLARGED VIEW OF ATTACHMENT

PV-3

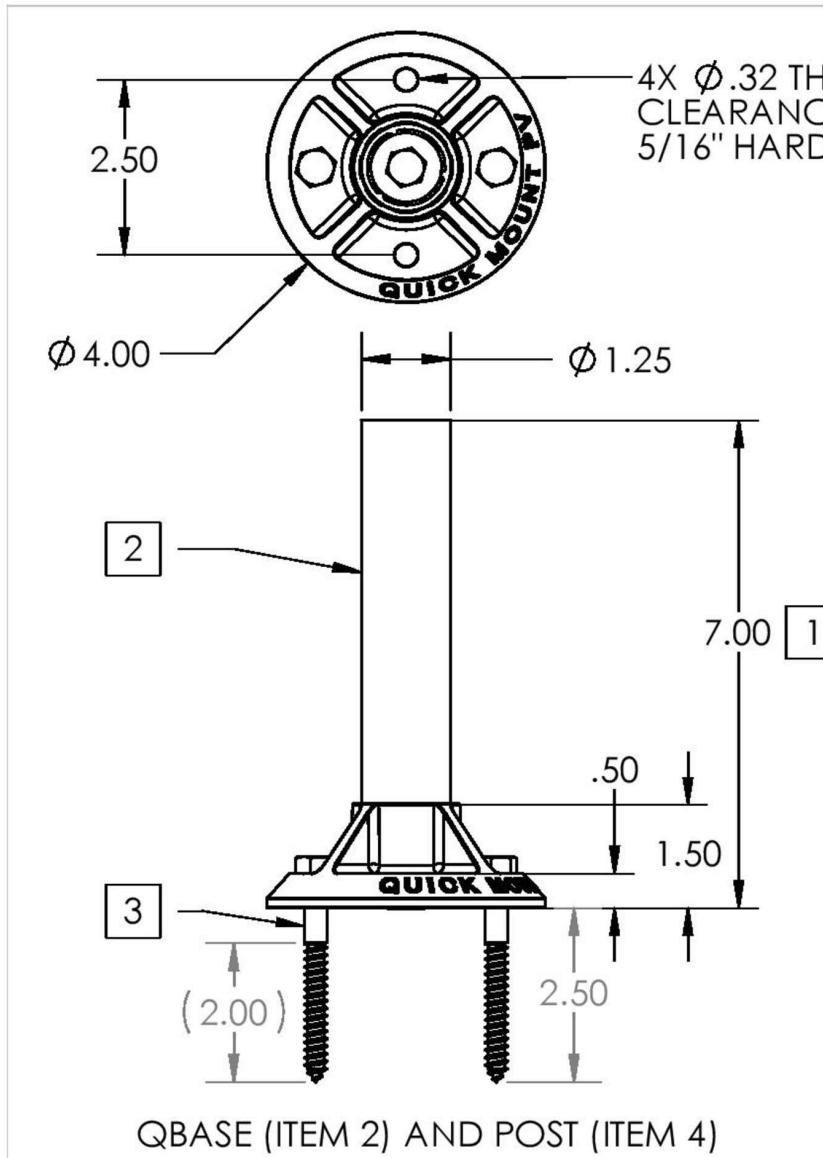
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SHEET NAME
ATTACHMENT
DETAIL

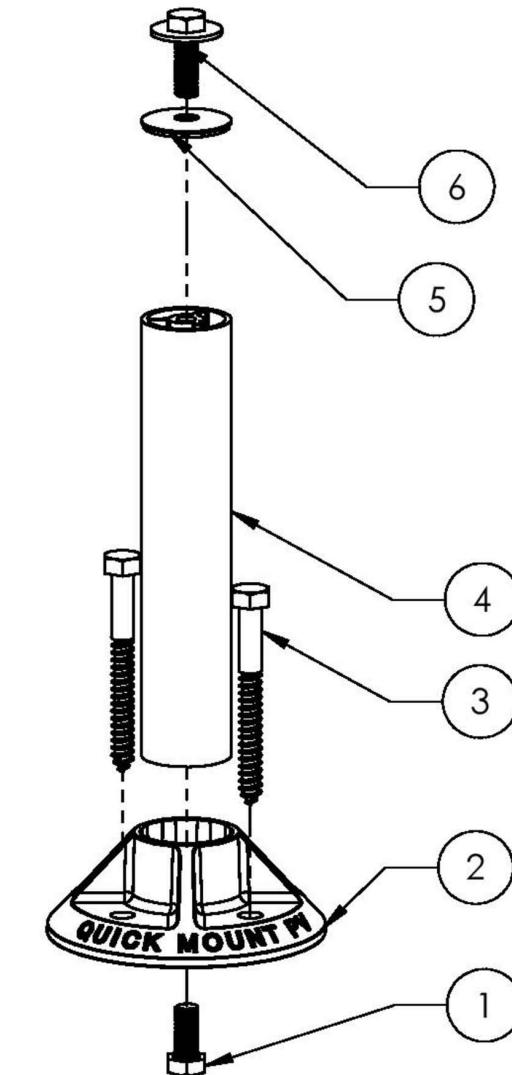
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

QBase Low Slope Mount | QMLSH



- [1] AVAILABLE IN 3.75", 5", 7", 9", AND 12" HEIGHTS
- [2] AVAILABLE IN MILL FINISH AND BRONZE ANODIZED FINISH
- [3] STAINLESS STEEL LAG SCREWS INCLUDED WITH ANODIZED FINISH



ITEM NO.	DESCRIPTION	QTY.
1	CAP SCREW, HEX HEAD, 5/16"-18 X 3/4" UNC-2A, GRADE 8, MAGNI	1
2	QBASE, 1-1/4" ID, FOR 5/16" HARDWARE, A360 CAST AL	1
3	LAG SCREW, HEX HEAD, 5/16" X 3", ZINC	2
4	POST, 1.25" OD X 6.5", 6063-T5/6063-T6, MILL	1
5	WASHER, SEALING, 5/16" ID X 1-1/4" OD, EPDM BONDED SS	1
6	CAP SCREW, HEX HEAD, 5/16"-18 X 1" UNC-2A, NYLON PATCH, W/ CAPTIVE WASHER, 1"OD, 18-8 SS	1

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DO NOT SCALE DRAWING

Quick Mount PV			
TITLE: QMLSH: QBASE LOW SLOPE MOUNT			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/8$ TWO PLACE DECIMAL $\pm .19$ THREE PLACE DECIMAL $\pm .094$	SIZE A	DRAWN BY: RAD	REV 10
		DATE: 8/9/2019	
	SCALE: 1:3	WEIGHT: 1.02	SHEET 1 OF 1

SYSTEM INFO.
(34)MISSION SOLAR MSE345SX5T(345W)
(34) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 11.73 KWDC
AC SYSTEM SIZE: 8.50 KWAC

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DESCRIPTION DATE REV

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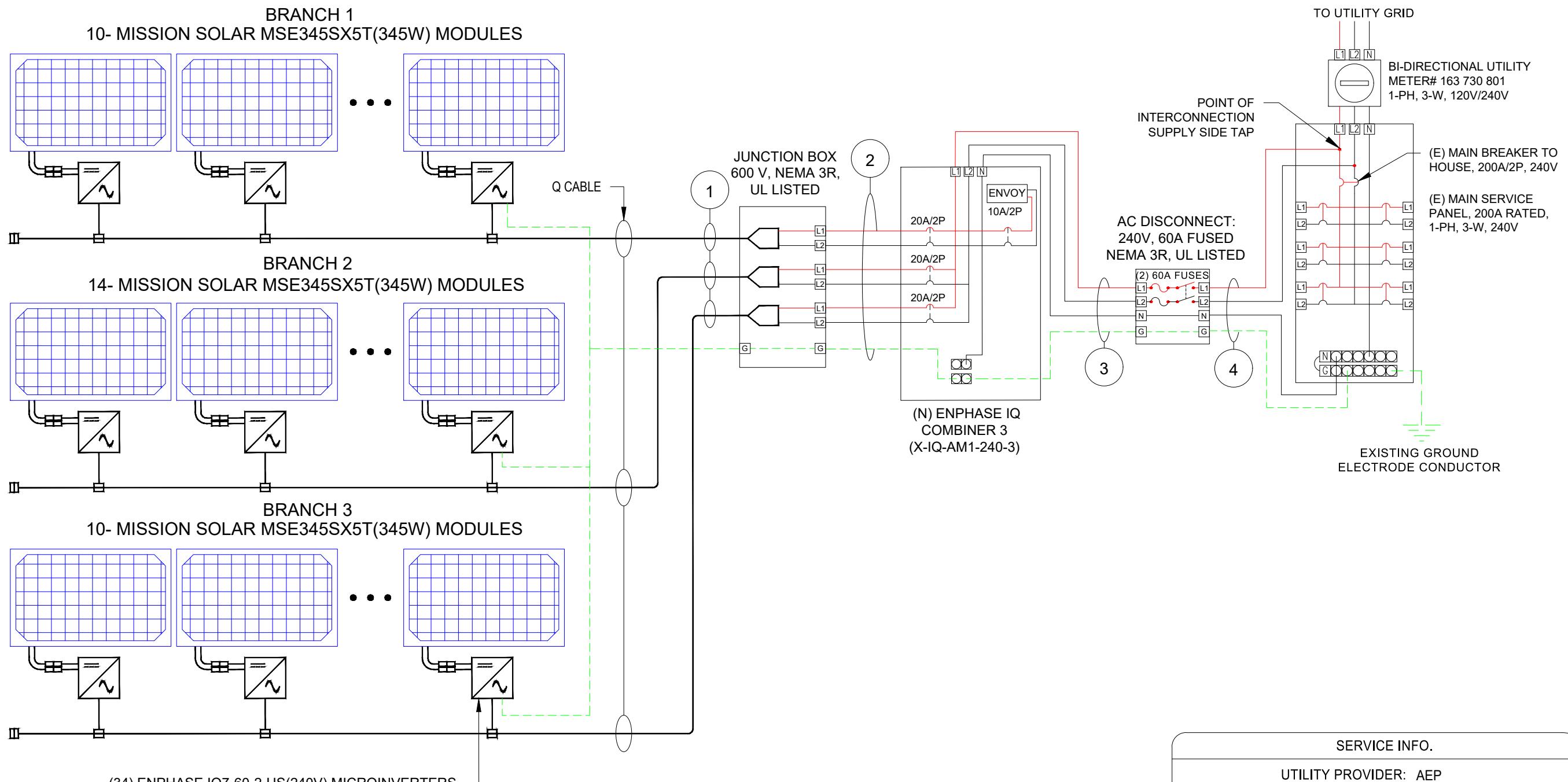
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ATTACHMENT DETAIL

SHEET SIZE

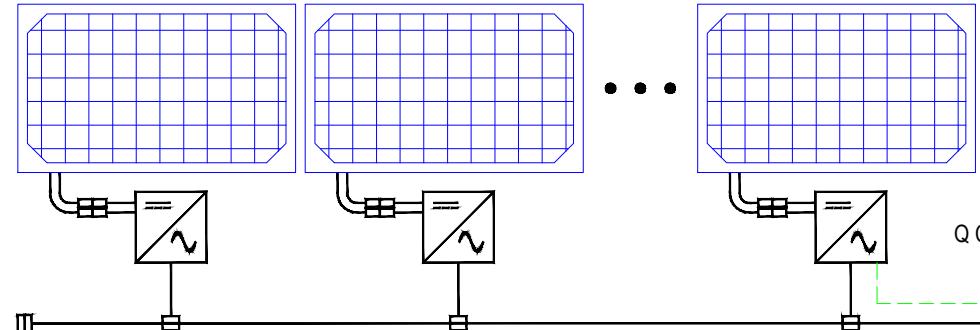
ANSI B
11" X 17"

SHEET NUMBER
PV-3A

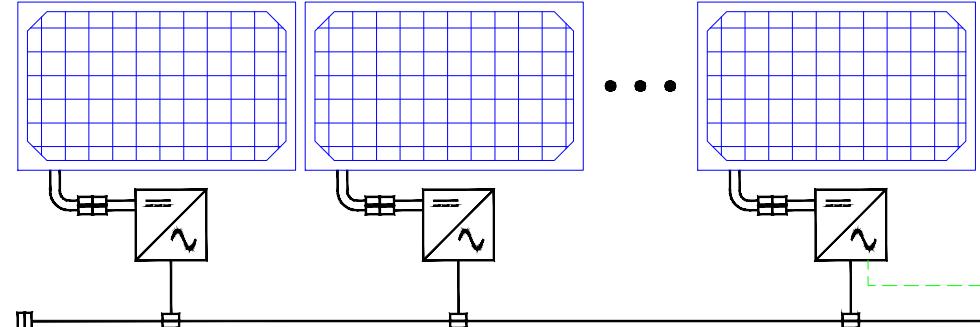
ID	TYPICAL	INITIAL CONDUCTOR LOCATION	FINAL CONDUCTOR LOCATION	CONDUCTOR			CONDUIT	# OF PARALLEL CIRCUITS	CURRENT-CARRYING CONDUCTORS IN CONDUIT	CONDUIT FILL PERCENT	OCPD	EGC		TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	LENGTH	VOLTAGE DROP
1	3	ARRAY	JUNCTION BOX	12 AWG	Q CABLE	-	-	1	2	N/A	N/A	6 AWG	BARE COPPER	0.71 (59°C)	N/A	14.0A	17.5A	N/A	N/A	90°C	70FT	0.74%
2	1	JUNCTION BOX	IQ COMBINER BOX	10 AWG	THWN-2	COPPER	MIN 0.75" Dia EMT	3	6	26.72%	20A	8 AWG	THWN-2, COPPER	0.91 (37°C)	0.8	14.0A	17.5A	40A	29.1A	90°C	32FT	0.48%
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 (37°C)	1	34.0A	42.5A	75A	68.3A	90°C	5FT	0.07%
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 (37°C)	1	34.0A	42.5A	75A	68.3A	90°C	5FT	0.07%



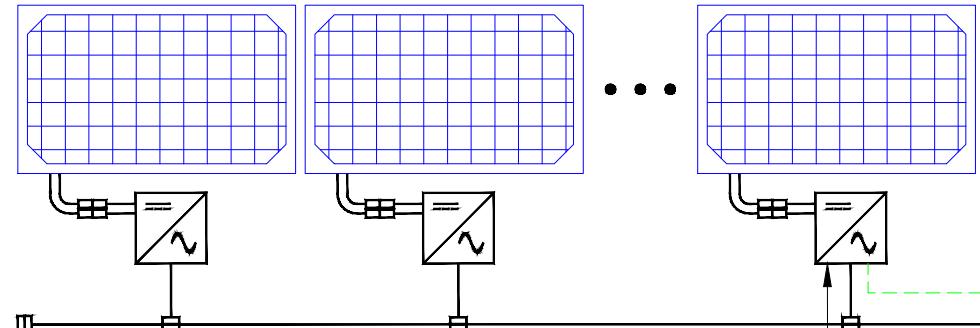
BRANCH 1
10- MISSION SOLAR MSE345SX5T(345W) MODULES



BRANCH 2
14- MISSION SOLAR MSE345SX5T(345W) MODULES



BRANCH 3
10- MISSION SOLAR MSE345SX5T(345W) MODULES



(34) ENPHASE IQ7-60-2-US(240V) MICROINVERTERS

SYSTEM INFO.

(34)MISSION SOLAR MSE345SX5T(345W)

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

DC SYSTEM SIZE: 11.73 KWDC

AC SYSTEM SIZE: 8.50 KWAC

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DATE:

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RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SERVICE INFO.

UTILITY PROVIDER: AEP

MAIN SERVICE VOLTAGE: 240V

MAIN SERVICE PANEL: 200A

MAIN BREAKER RATING: 200A

MAIN SERVICE LOCATION: EAST

SERVICE FEED SOURCE: UNDERGROUND

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	-10°C
AMBIENT TEMP (HIGH TEMP 2%)	37°C
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	90°C
CONDUCTOR TEMPERATURE RATE	59°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 10 IQ 7 Micros, the voltage rise on the 240 VAC Q Cable is 0.39%

For branch circuit #2 of 14 IQ 7 Micros, the voltage rise on the 240 VAC Q Cable is 0.74%

For branch circuit #3 of 10 IQ 7 Micros, the voltage rise on the 240 VAC Q Cable is 0.39%

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)

$$= (1 \text{ amp} \times 14) \times (0.00129 \Omega/\text{ft}) \times (32 \text{ ft} \times 2)$$

$$= 14 \text{ amps} \times 0.00129 \Omega/\text{ft} \times 64 \text{ ft}$$

$$= 1.16 \text{ volts}$$

$$\%VRise = 1.16 \text{ volts} \div 240 \text{ volts} = 0.48\%$$

The voltage rise from the Junction Box to the IQ Combiner Box is 0.48%

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.)

$$= (1 \text{ amp} \times 34) \times (0.000491 \Omega/\text{ft}) \times (5 \text{ ft.} \times 2)$$

$$= 34 \text{ amps} \times 0.000491 \Omega/\text{ft} \times 10 \text{ ft.}$$

$$= 0.17 \text{ volts}$$

$$\%VRise = 0.17 \text{ volts} \div 240 \text{ volts} = 0.07\%$$

The voltage rise from the IQ Combiner Box to the AC Disconnect is 0.07%

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)

$$= (1 \text{ amp} \times 34) \times (0.000491 \Omega/\text{ft}) \times (5 \text{ ft} \times 2)$$

$$= 34 \text{ amps} \times 0.000491 \Omega/\text{ft} \times 10 \text{ ft}$$

$$= 0.17 \text{ volts}$$

$$\%VRise = 0.17 \text{ volts} \div 240 \text{ volts} = 0.07\%$$

The voltage rise from the AC Disconnect to the Main Panel is 0.07%

Total system voltage rise for all three wire sections

$$0.74 \% + 0.48\% + 0.07\% + 0.07\% = 1.36\%$$

SYSTEM INFO.
(34)MISSION SOLAR MSE345SX5T(345W)
(34) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 11.73 KWDC
AC SYSTEM SIZE: 8.50 KWAC

REVISIONS
DESCRIPTION DATE REV

Signature with Seal

DATE:

PROJECT NAME & ADDRESS

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
SPECIFICATIONS & CALC.

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4A

1



LABEL LOCATION:
POINT OF INTERCONNECTION,
(PER CODE: NEC 690.17(E))

2



LABEL LOCATION:
INVERTER, JUNCTION BOXES (ROOF),
(PER CODE: NEC690.13.G.3 & NEC 690.13.G.4)

3



LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(D)(4))

4

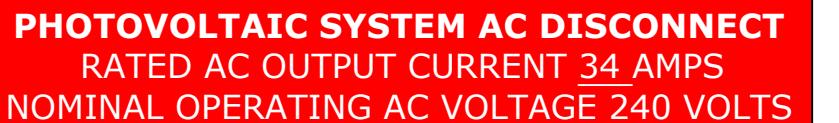


LABEL LOCATION:
CONDUIT, COMBINER BOX
(PER CODE: NEC690.31(G)(3)(4) & NEC 690.13(G)(4))

ADHESIVE FASTENED SIGNS:

- THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
- WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].
- ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT [IFC 605.11.3]

5



LABEL LOCATION:
POINT OF INTERCONNECTION,
(PER CODE: NEC 690.17(E))

6



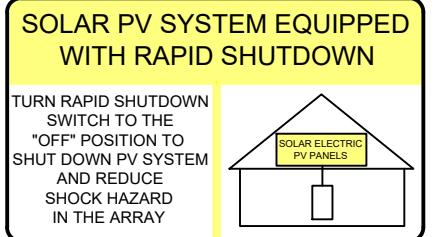
LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(D)(7))
[Not required if panelboard is rated not less than sum of ampere ratings of all overcurrent devices supplying it]

7



LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC690.15, 690.13(B))
INVERTER

8



LABEL PER NEC 690.56(C)- PROVIDE AT
AC DISCONNECT FOR RAPID
SHUTDOWN COMPLIANT SYSTEM

9



LABEL LOCATION:
MARKINGS PLACED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS,
ENCLOSURES, AND CABLE ASSEMBLIES AT LEAST EVERY 10 FT, AT TURNS AND
ABOVE/Below PENETRATIONS AND ALL COMBINER/JUNCTION BOXES. (PER CODE:
IFC 605.11.4)

SYSTEM INFO.

(34) MISSION SOLAR MSE345SX5T(345W)

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

DC SYSTEM SIZE: 11.73 KWDC

AC SYSTEM SIZE: 8.50 KWAC

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE:

PROJECT NAME & ADDRESS

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
SIGNAGE

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

SHEET NUMBER
PV-5

AMERICA'S MODULE COMPANY™



MISSION SOLAR
ENERGY



MSE PERC 60



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1(888)-515-6199



CERTIFIED RELIABILITY

- Tested to UL 61730 & IEC standards
- PID resistant
- Resistance to salt mist corrosion

ADVANCED TECHNOLOGY

- PERC and 6 busbar drive >18.7% module efficiency
- Ideal for all applications

EXTREME WEATHER RESILIENCE

- 5600 Pa front and 4800 Pa back load
- Tested load to UL 61730

BAA COMPLIANT FOR GOVERNMENT PROJECTS

- Buy American Act
- American Recovery & Reinvestment Act

FRAME-TO-FRAME WARRANTY

Degradation guaranteed not to exceed 2.5% in year one and 0.7% annually from years two to 30 with 80.7% guaranteed in year 25.

CLASS LEADING POWER OUTPUT

330 – 345 W

POSITIVE POWER TOLERANCE

-0 to +3 %

The True American Brand

Mission Solar Energy is headquartered in San Antonio, Texas, where we manufacture our modules. We produce American, high quality solar modules ensuring the highest in class power output and best in-class reliability. Our product line is tailored for residential, commercial and utility applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, proving excellent performance over the long-term. Demand the best, demand Mission Solar Energy.

CERTIFICATIONS

UL 61730
IEC 61215 - IEC 61730
IEC 61701



CEC



Please contact Mission Solar Energy if you have questions or concerns about certification of our products in your area.

*Standard 12-year product warranty extendable to 25 years with registration:

www.missionsolar.com/warranty/

PERC 60

CLASS-LEADING 330-345 W

ELECTRICAL SPECIFICATION

Product Type	MSExxxSX5T (xxx=P _{max})	330	335	340	345	
Power Output	P _{max}	W _p	330	335	340	345
Module Efficiency	%	17.9	18.2	18.5	18.7	
Tolerance	%	0/+3	0/+3	0/+3	0/+3	
Short Circuit Current	I _{sc}	V	10.72	10.78	10.86	10.92
Open Circuit Voltage	V _{oc}	A	40.40	40.58	40.82	41.00
Rated Current	I _{mp}	V	10.05	10.14	10.24	10.34
Rated Voltage	V _{mp}	V	32.85	33.03	33.20	33.37
Fuse Rating	A	20	20	20	20	
System Voltage	V	1000	1000	1000	1000	

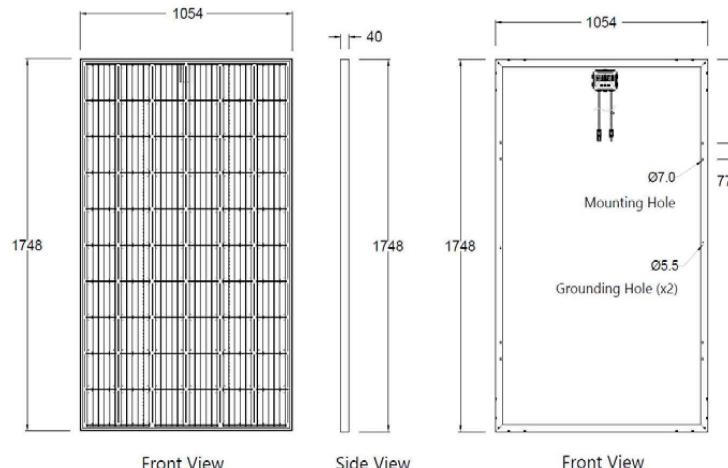
TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	44.43°C ($\pm 3.7\%$)
Temperature Coefficient of P _{max}	-0.361%/°C
Temperature Coefficient of V _{oc}	-0.262%/°C
Temperature Coefficient of I _{sc}	0.039%/°C

OPERATING CONDITIONS

Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°C (-40°F) to +85°C (185°F)
Maximum Series Fuse Rating	20A
Fire Safety Classification	Type 1
Front & Back Load (UL Standard)	5600 Pa front and 4800 Pa back load Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

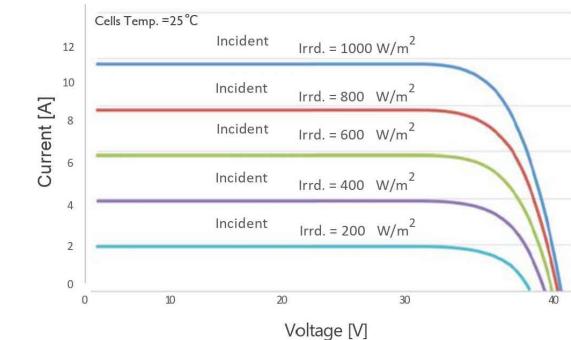
BASIC DIMENSIONS (UNITS: mm)



MECHANICAL DATA

Solar Cells	P-type mono-crystalline silicon
Cell Orientation	60 cells (6x10)
Module Dimension	1748mm x 1054mm x 40mm
Weight	20.3 kg (44.8 lbs.)
Front Glass	3.2mm, tempered, low-iron, anti-reflective
Frame	Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cable	1.0m, Wire 4mm ² (12AWG)
Connector	Stäubli MC4, Renne 05-8

MSE345SX5T: 345WP, 60 CELL SOLAR MODULE CURRENT - VOLTAGE CURVE



Current-voltage characteristics with dependence on irradiance and module temperature

CERTIFICATIONS & TESTS

IEC 61215, 61730, 61701
UL 61730



CEC



SHIPPING INFORMATION

Container FT	Pallets	Panels	345 W Bin
53'	Double Stack	36	936 322.92 kW
40'	Double Stack	28	728 251.16 kW

Pallet [26 Panels]			
Weight 1263 lbs. (573 kg)	Height 47.5 in (120.65 cm)	Width 46 in (116.84 cm)	Length 70.25 in (178.43 cm)

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-6

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
Oversupply 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 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 ³	16 (240 VAC)	13 (208 VAC) 13 (240 VAC) 11 (208 VAC)
Oversupply 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
Peak efficiency	97.6 %	97.6 %
CEC weighted efficiency	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



ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
EQUIPMENT SPECIFICATION

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

SHEET NUMBER
PV-7

SYSTEM INFO.
(34)MISSION SOLAR MSE345SX5T(345W)
(34) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 11.73 KWDC
AC SYSTEM SIZE: 8.50 KWAC

REVISIONS
DESCRIPTION DATE REV

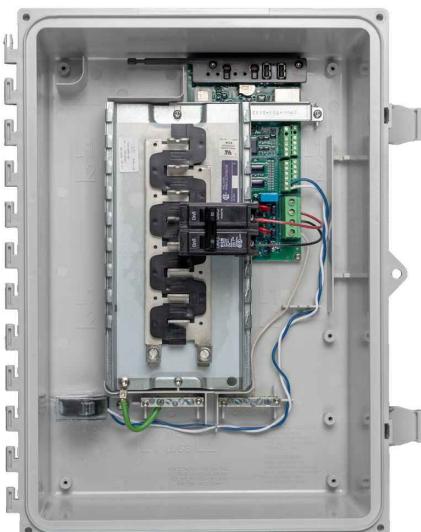
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DATE:

PROJECT NAME & ADDRESS

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

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.

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

Wireless USB adapter COMMS-KIT-01	Installed at the IQ Envoy. For communications with Enphase Encharge™ storage and Enphase Empower™ smart switch. Includes USB cable for connection to IQ Envoy or Enphase IQ Combiner™ and allows redundant wireless communication with Encharge and Empower.
--------------------------------------	--

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
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EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
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)	80A of distributed generation / 90A with IQ Envoy breaker 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	<ul style="list-style-type: none"> 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 <p>Always follow local code requirements for conductor sizing. To 2000 meters (6,560 feet)</p>

INTERNET CONNECTION OPTIONS

Integrated Wi-Fi	802.11b/g/n
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMODEM-M1 (4G based LTE-M) (not included)

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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2019-11-04

ENPHASE.

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-8

FLASHKIT PRO



FLASHKIT PRO is the complete attachment solution for composition shingle roofs. Featuring Unirac's patented **SHED & SEAL** technology, a weather proof system which provides the ultimate protection against roof leaks. Kitted in 10 packs for maximum convenience, flashings and hardware are available in Mill or Dark finishes. With **FLASHKIT** pro, you have everything you need for a quick, professional installation.



TRUSTED WATER SEAL FLASHINGS
FEATURING SHED & SEAL TECHNOLOGY



YOUR COMPLETE SOLUTION
Flashings, lags, continuous slot L-Foots and hardware



CONVENIENT 10 PACKS
Packaged for speed and ease of handling

THE COMPLETE ROOF ATTACHMENT SOLUTION

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

FLASHKIT PRO

INSTALLATION GUIDE

FLASHKIT PRO IS THE COMPLETE FLASHING AND ATTACHMENT SOLUTION FOR COMPOSITION ROOFS.



INSTALL FLASHKIT PRO FLASHING



INSTALL L-FOOT



ATTACH L-FOOT TO RAIL

PRE-INSTALL

- Locate roof rafters and snap chalk lines to mark the installation point for each roof attachment.
- Drill a 7/32" pilot hole at each roof attachment. Fill each pilot hole with sealant.

STEP 1 INSTALL FLASHKIT PRO FLASHING

- Add a U-shaped bead of roof sealant to the underside of the flashing with the open side of the U pointing down the roof slope. Slide the aluminum flashing underneath the row of shingles directly up slope from the pilot hole as shown. Align the indicator marks on the lower end of the flashing with the chalk lines on the roof to center the raised hole in the flashing over the pilot hole in the roof. When installed correctly, the flashing will extend under the two courses of shingles above the pilot hole.

STEP 2 INSTALL L-FOOT

- Fasten L-foot and Flashing into place by passing the included lag bolt and pre-installed stainless steel-backed EPDM washer through the L-foot EPDM grommet, and the raised hole in the flashing, into the pilot hole in the roof rafter.

- Drive the lag bolt down until the L-foot is held firmly in place. It is normal for the EPDM on the underside of the stainless steel backed EPDM washer to compress and expand beyond the outside edge of the steel washer when the proper torque is applied.

TIP:

- Use caution to avoid over-torqueing the lag bolt if using an impact driver.
- Repeat Steps 1 and 2 at each roof attachment point.

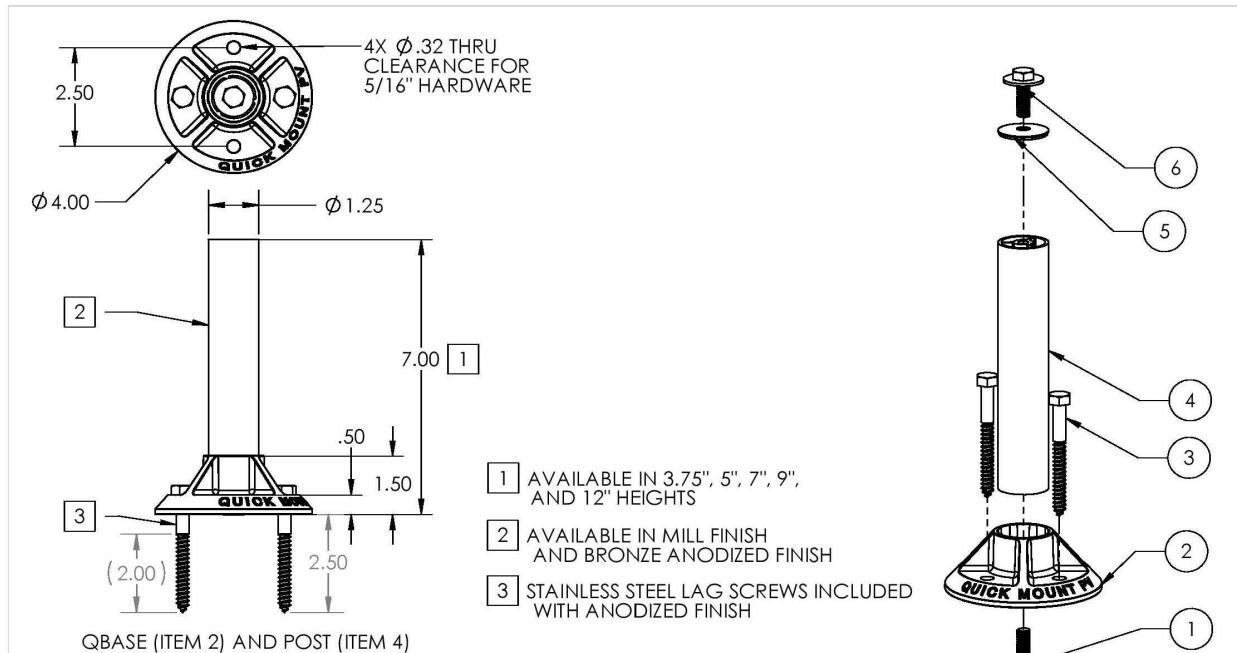
STEP 3 ATTACH L-FOOT TO RAIL

- Insert the included 3/8"-16 T-bolts into the lower slot on the Rail (sold separately), spacing the bolts to match the spacing between the roof attachments.
- Position the Rail against the L-Foot and insert the threaded end of the T-Bolt through the continuous slot in the L-Foot. Apply anti-seize to bolt threads to prevent galling of the T-bolt and included 3/8" serrated flange nut. Place the 3/8" flange nut on the T-bolt and finger tighten. Repeat STEP 3 until all L-Foots are secured to the Rail with a T-bolt. Adjust the level and height of the Rail and torque each bolt to 30ft-lbs.

ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
EQUIPMENT
SPECIFICATION
SHEET SIZE
ANSI B 11" X 17"
SHEET NUMBER
PV-9

QBase Low Slope Mount | QMLSH



ITEM NO.	DESCRIPTION	QTY.
1	CAP SCREW, HEX HEAD, 5/16"-18 X 3/4" UNC-2A, GRADE 8, MAGNI	1
2	QBASE, 1-1/4" ID, FOR 5/16" HARDWARE, A360 CAST AL	1
3	LAG SCREW, HEX HEAD, 5/16" X 3", ZINC	2
4	POST, 1.25" OD X 6.5", 6063-T5/6063-T6, MILL	1
5	WASHER, SEALING, 5/16" ID X 1-1/4" OD, EPDM BONDED SS	1
6	CAP SCREW, HEX HEAD, 5/16"-18 X 1" UNC-2A, NYLON PATCH, W/ CAPTIVE WASHER, 18-8 SS	1

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Lag pull-out (withdrawal) capacities (lbs) in typical lumber:

	Lag Bolt Specifications		
	Specific Gravity	2/ea 5/16" shaft per 2.5" thread depth	5/16" shaft per 1" thread depth
Douglas Fir, Larch	.50	1330	266
Douglas Fir, South	.46	1175	235
Engelmann Spruce, Lodgepole Pine (MSR 1650 f & higher)	.46	1175	235
Hem, Fir	.43	1060	212
Hem, Fir (North)	.46	1175	235
Southern Pine	.55	1535	307
Spruce, Pine, Fir	.42	1025	205
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	.50	1330	266

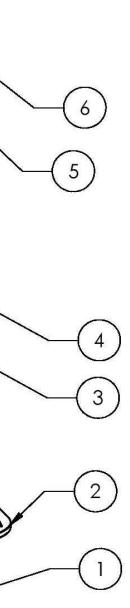
Sources: American Wood Council, NDS 2005, Table 11.2 A, 11.3.2 A

Notes:

- 1) Thread must be embedded in a rafter or other structural roof member.
- 2) See IBC for required edge distances.

Quick Mount PV®
RESPECT THE ROOF

BI 7.2.3-5



QBase Low Slope Mount Instructions

WARNING: Quick Mount PV products are NOT designed and should NOT be used to anchor fall protection equipment.

Installation Tools Required: Drill with 7/32" bit, impact gun with 1/2" socket, 1 tube of sealant compatible with roofing materials, pencil, chalk line

CAUTION: Prior to installation, check that proper screw embedment will be achieved for the necessary site load and roofing configurations.



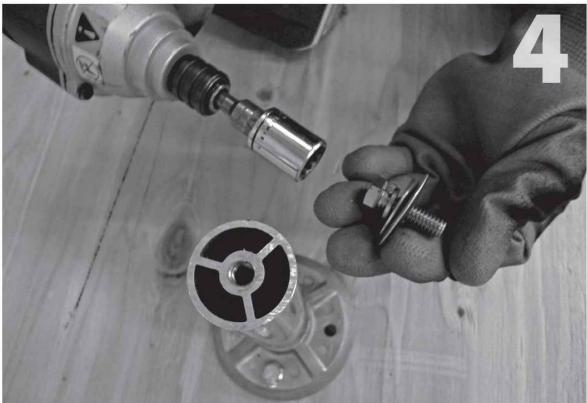
Locate the desired mount placement over a rafter (or custom wood blocking). Using the base as a template, mark the two penetration points with either a pen or light drilling. Use two opposing holes on the base plate, parallel to the structural member.



Drill both pilot holes with a 7/32-inch bit. Make sure to hold the drill square to the rafter. The lag bolts must be anchored into a structural member, so it is very important to hit the center of the rafter with your pilot holes. Fill the pilot holes with a sealant compatible with roofing materials.



Prior to attaching the base to the roof, place the grade-8 hex bolt (item 1) in the bottom of the base (item 2) and screw the post (item 4) in. This is easier than adding the post after securing the base to the roof. Attach the base/post assembly to the roof with two lag bolts (item 3).



Attach the hardware (items 5-8) to the top of the post. (Be sure to seal off the post from weather exposure with the sealing washer (item 5), in the interim before racks are installed.) You are now ready to flash the mount, roof around it, and attach racking. Aluminum flashings for built-up roofs are available from Quick Mount PV in 4" and 8" cones (sold separately). For membrane roofs, be sure to use manufacturer-specified flashing and utilize the services of a certified roofer.

LA RESEARCH REPORTS (LARR): Approved for use in the City of Los Angeles per LARR #26194

Quick Mount PV®

925-478-8269 | www.quickmountpv.com | tech@quickmountpv.com

2700 Mitchell Dr. | Walnut Creek, CA 94598

Aug-2019, Rev10

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ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
EQUIPMENT SPECIFICATION
SHEET SIZE
**ANSI B
11" X 17"**
SHEET NUMBER
PV-9A

Aug-2019, Rev 10

BI 7.2.3-5

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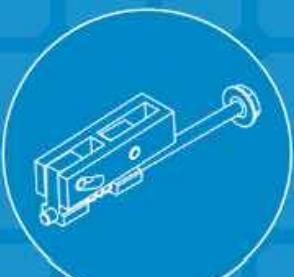
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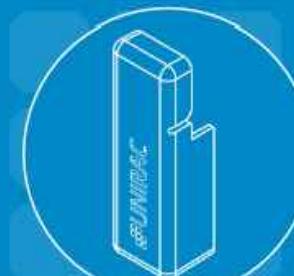
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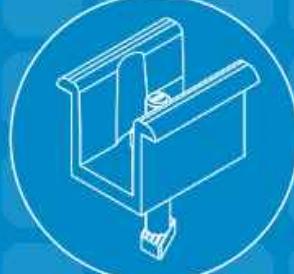
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ASTERIA POLANCO
RESIDENCE
3607 MILLBROOK DR.
SAN ANGELO, TX 76904

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

SYSTEM INFO.
(34)MISSION SOLAR MSE345SX5T(345W)
(34) ENPHASE IQ7-60-2-US(240V)
DC SYSTEM SIZE: 11.73 KWDC
AC SYSTEM SIZE: 8.50 KWAC

REVISIONS
DESCRIPTION DATE REV

Signature with Seal

DATE:

PROJECT NAME & ADDRESS

SOLARMOUNT

UNIRAC

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Now Featuring:
THE NEW FACE OF SOLAR RACKING

Superior Aesthetics Package



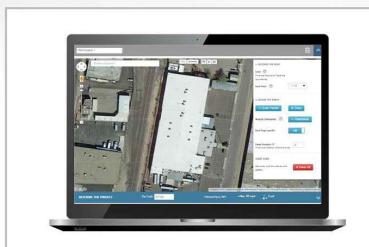
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System grounding through Enphase microinverters and trunk cables



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Featuring Google Map Capabilities within U-Builder

FAST INSTALLATION. SUPERIOR AESTHETICS

OPTIMIZED COMPONENTS • VERSATILITY • DESIGN TOOLS • QUALITY PROVIDER

SOLARMOUNT

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OPTIMIZED COMPONENTS

INTEGRATED BONDING & PRE-ASSEMBLED PARTS

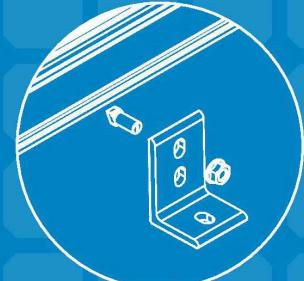
Components are pre-assembled and optimized to reduce installation steps and save labor time. Our new grounding & bonding process eliminates copper wire and grounding straps or bonding jumpers to reduce costs. Utilize the microinverter mount with a wire management clip for an easier installation.



INTEGRATED BONDING
MIDCLAMP



INTEGRATED BONDING
SPLICE BAR



INTEGRATED BONDING
L-FOOT w/ T-BOLT



INTEGRATED BONDING
MICROINVERTER MOUNT w/
WIRE MANAGEMENT

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EXPERIENCE



CERTIFIED
QUALITY



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EXCELLENCE



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WARRANTY



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TOOLS



PERMIT
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PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

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