PHOTOVOLTAIC SYSTEM - 6.576kWAC / 7.56kWDC

DRAWING SHEET INDEX

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APPLICABLE CODES

2015	INTERNATIONAL RESIDENTIAL CODE
2015	INTERNATIONAL BUILDING CODE
2015	INTERNATIONAL FIRE CODE
2014	NATIONAL ELECTRICAL CODE

PENINSULA ELECTRICAL SERVICES, LLC
* PHOTOVOLTAIC DESIGN * ELECTRICAL PLAN REVIEW * ELECTRICAL INSPECTIONS *
GILBERT, ARIZONA 85296
623-570-5727
WWW.PENINSULAELECTRICALSERVICES.COM

2820 S. ALMA SCHOOL RD.
SUITE 18-113
CHANLDER, ARIZONA 85286
480-454-5609

WWW.ECOMANAGEMENTSYSTEMS.COM

LICENSE: AZ-ROC283461

DESIGNER	DATE
AT	12-10-2019
REVISIONS	DATE
REV. #1: PET	01-06-2020

AHJ: PARADISE VALLEY

UTILITY: SRP

SHEET INDEX & CODES

6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE:	DRAWING #:
11 x 17	EM19-0052-SI

PROPERTY OWNER(S): MELLEN, GRACE

PARCEL NO: 169-22-039

SCALE: DRAWING NOT TO SCALE | SHEET #: 1

NOTES:

1. PHOTOVOLTAIC SYSTEM EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH NEC 2014 ARTICLES 690 AND 705 (AND THE RAPID SHUTDOWN REQUIREMENTS OF THE 2014 NEC), AND THE 2015 IRC/IBC & 2015 IFC, AND APPLICABLE REQUIREMENTS OF THE SERVING UTILITY AND AUTHORITY HAVING JURISDICTION. PHOTOVOLTAIC SYSTEM EQUIPMENT WILL BE POSTED WITH APPLICABLE WARNINGS, SIGNAGE AND PLAQUES PER NEC ARTICLES 690 & 705.
2. PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUITS SHALL COMPLY WITH THE WIRING METHODS AND INSTALLATION AND MARKING REQUIREMENTS OF NEC 690.31.
3. BREAKER LABELED "PHOTOVOLTAIC ELECTRIC POWER SOURCE" AND "BREAKERS ARE BACK FED" PER NEC 705.12. BREAKER ALSO LABELED "MAXIMUM AC OUTPUT CURRENT AND OPERATING AC VOLTAGE" PER NEC 690.54. BREAKER SHALL BE POSITIONED AT THE OPPOSITE (LOAD) END FROM THE INPUT FEEDER OR MAIN CIRCUIT BREAKER LOCATION, AND LABELED "WARNING INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE", PER NEC 705.12(D)(2)(3)(b).
4. WARNING SIGN PER NEC 690.17(E) READING "WARNING - ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS - TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION."
5. LABEL "PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH." SWITCH TO BE LOCKED PER 2014 NEC 690.7(D). SWITCH TO BE VISIBLE BLADE DISCONNECT PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22.
6. LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.13(B). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH LOCKED PER NEC 690.7(D).
7. LISTING AGENCY NAMES AND NUMBERS TO BE INDICATED ON POWER INVERTER(S) AND SOLAR MODULES PER NEC 110.3 (B).
8. LABELED PHOTOVOLTAIC SYSTEM DEDICATED KWH METER.
9. BI-DIRECTIONAL METER TO BE INSTALLED BY UTILITY.
10. DEDICATED PHOTOVOLTAIC COMBINER SUB-PANEL. LABEL "LOADS NOT TO BE ADDED TO THIS PANEL."
11. ALL LABELS EXPOSED TO SUNLIGHT MUST BE ENGRAVED AND ATTACHED PER APPROVED METHOD.
12. GEC INSTALLED AS REQUIRED BY MANUFACTURER INSTRUCTIONS AND NEC 690.47.
13. LABEL "BREAKER HAS BEEN DE-RATED PER NEC 705.12(D)(2)." NO NEW LOADS.
14. EXISTING EQUIPMENT IS NOTED WITH A DASHED LINE. SOLID LINES DENOTE EQUIPMENT INSTALLED BY ELECTRICAL CONTRACTOR.
15. WIRE MAY BE RUN SHORT DISTANCES OUTSIDE OF CONDUIT IF WIRE READS "SUNLIGHT RESISTANT."
16. THE GROUNDING ELECTRODE CONDUCTOR SHALL BE CONTINUOUS AND TERMINATE WITH AN IRREVERSIBLE CONNECTION TO THE AC GROUNDING ELECTRODE SYSTEM PER NEC 250.64.
17. AMBIENT TEMPERATURE ADJUSTED FOR CONDUITS EXPOSED TO SUNLIGHT ON OR ABOVE ROOFTOPS PER TABLE 310.15 (B)(3)(c). CONDUIT ELEVATED MIN. 3 1/2"; ADDER 30 DEG F.
18. ALL EXTERIOR EQUIPMENT TO BE NEMA 3R.
19. THE PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT AND DEVICE WHERE ENERGIZED,

    UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE, PER NEC 690.35(F):

    WARNING: ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED
20. DC CIRCUITS SHALL BE PROTECTED BY A LISTED (DC) ARC-FAULT CIRCUIT INTERRUPTER AND SHALL COMPLY WITH NEC 690.11.
21. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION THAT CONTROLS SPECIFIC CONDUCTORS IN ACCORDANCE WITH NEC 690.12. THE RAPID SHUTDOWN METHOD SHALL BE LABELED IN ACCORDANCE WITH 2014 NEC 690.56(C).
22. GROUNDED PV ARRAYS SHALL BE PROVIDED WITH DC GROUND-FAULT PROTECTION MEETING THE REQUIREMENTS OF NEC 690.5. UNGROUNDED PV POWER SYSTEMS SHALL INCLUDE GROUND FAULT PROTECTION FOR ALL PV SOURCE & OUTPUT CIRCUITS PER NEC 690.35.

KEYS:

⊢	- IRREVERSIBLE CRIMP
•	- WIRE SPLICE
GFDI	- GROUND FAULT DETECTOR & INTERRUPTER
GFPD	- GROUND FAULT PROTECTION DEVICE
MCB	- MAIN CIRCUIT BREAKER
OCPD	- OVERCURRENT PROTECTION DEVICE
MLO	- MAIN LUG ONLY
PV	- PHOTOVOLTAIC
SES	- SERVICE ENTRANCE SECTION
GND	- GROUND
NEU	- NEUTRAL
GEC	- GROUNDING ELECTRODE CONDUCTOR

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DESIGNER	DATE
AT	12-10-2019

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REV. #1:	

AHJ: PARADISE VALLEY

UTILITY: SRP

NOTES & KEYS

6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17

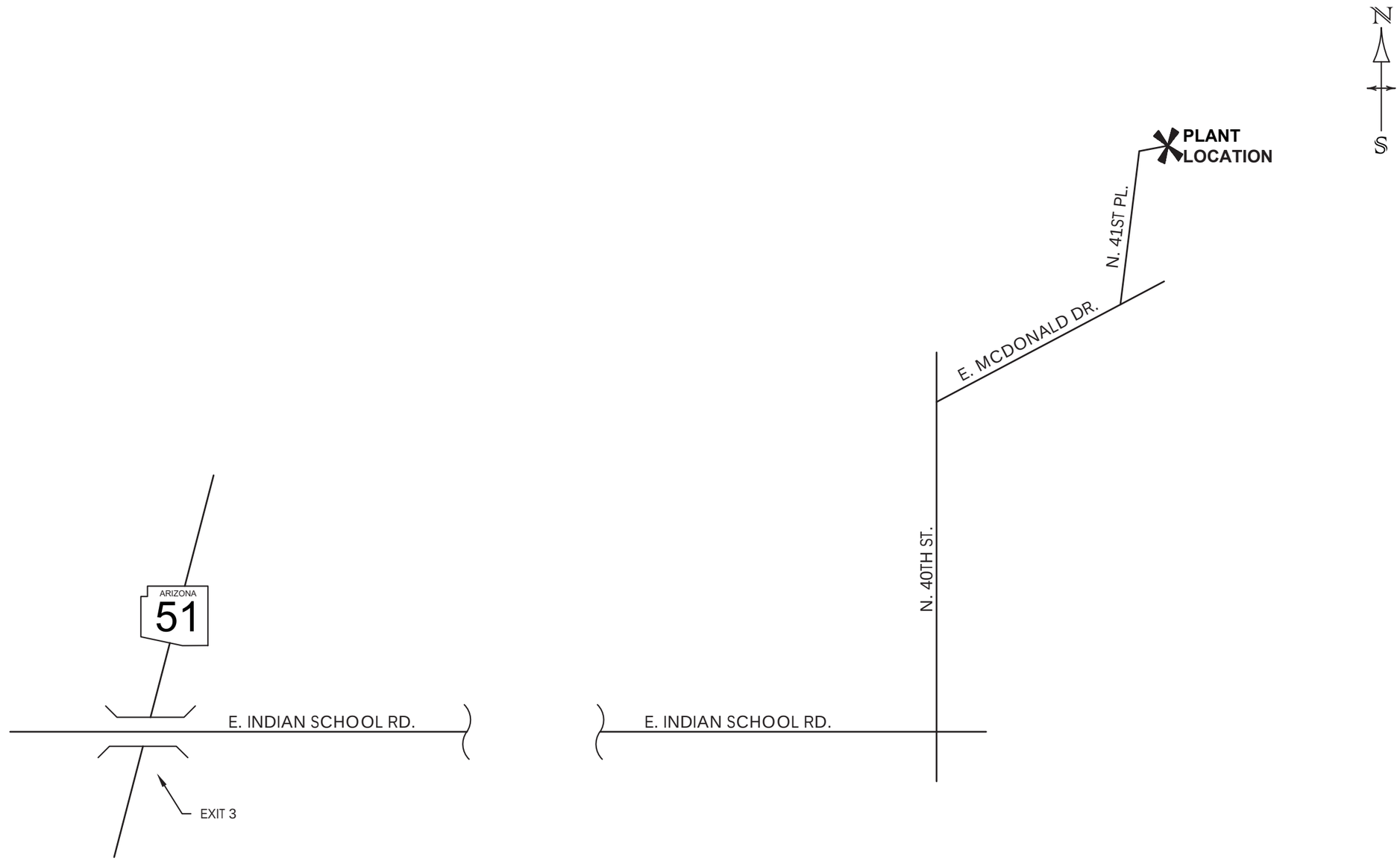
DRAWING #: EM19-0052-PL

PROPERTY OWNER(S): MELLEN, GRACE

PARCEL NO: 169-22-039

SCALE: DRAWING NOT TO SCALE

SHEET #: 2



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UTILITY: SRP

PLANT LOCATION
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17

DRAWING #: EM19-0052-PL

PROPERTY OWNER(S): MELLEN, GRACE

PARCEL NO: 169-22-039

SCALE: DRAWING NOT TO SCALE

SHEET #: 3

SEE SHEET #5 FOR ENLARGED EQUIPMENT LAYOUT PLAN

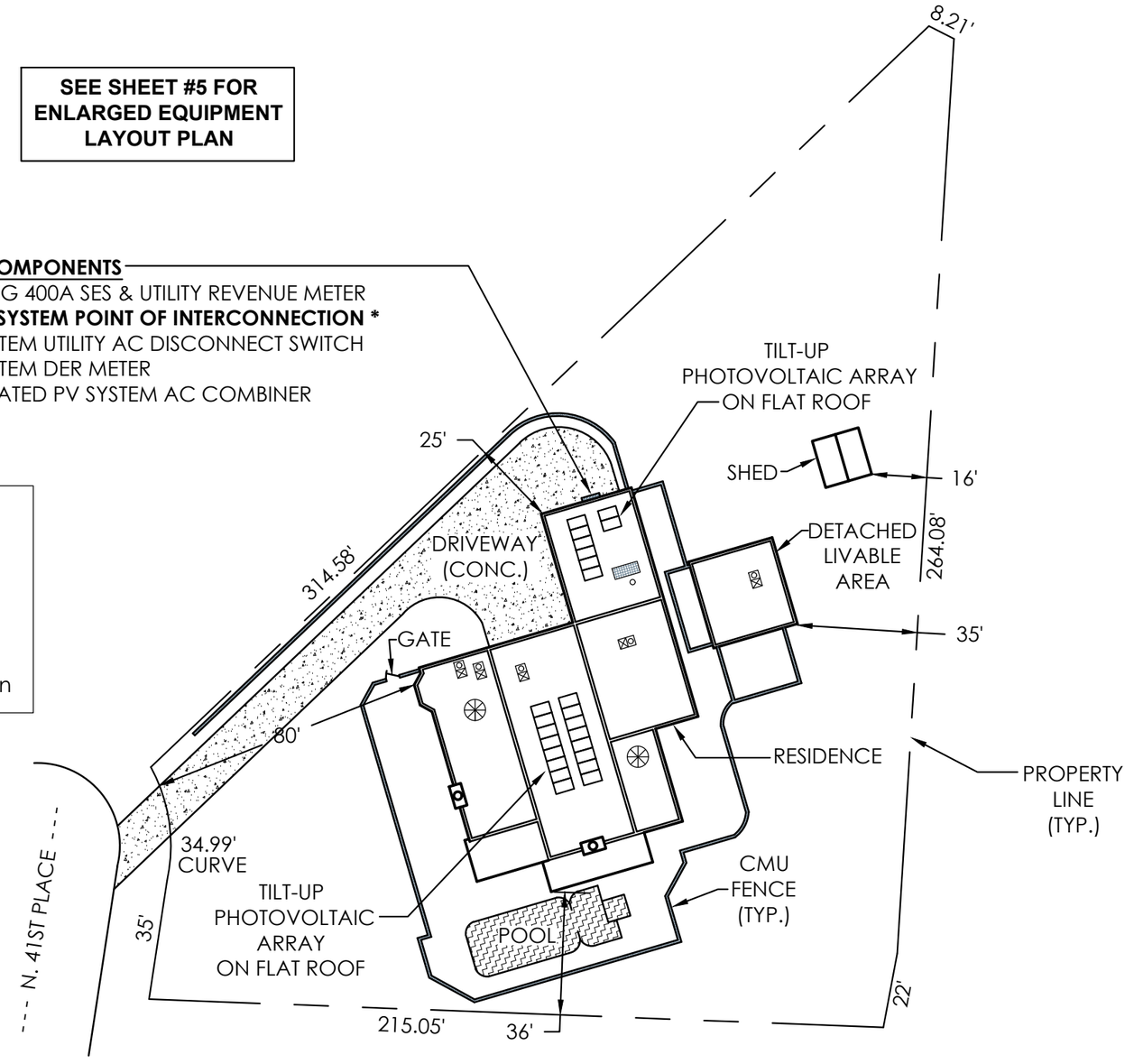
SES & PV COMPONENTS

- EXISTING 400A SES & UTILITY REVENUE METER
  *** PV SYSTEM POINT OF INTERCONNECTION ***
- PV SYSTEM UTILITY AC DISCONNECT SWITCH
- PV SYSTEM DER METER
- DEDICATED PV SYSTEM AC COMBINER

Reflective - 3/8" High White Letters
On Red Background - All CAPS

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

(Per 2014 NEC 690.12 & 690.56(C))
Place Plaque At Electrical Service Location



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FOR FLAT ROOF AREAS
ROOF PITCH LESS THAN 2:12
NO FIRE ACCESS ZONES REQUIRED PER 2015 IFC

ROOF INFO:
TYPE: 2X4 MANUFACTURED TRUSS
TRUSS SPACING: 24" O.C.
MATERIAL: FOAM
PITCH: 0°

SOLAR ARRAYS:
AZIMUTH: 254° (ALL MODULES)
FINAL TILT: 18° (NORTH ARRAY)
18° (SOUTH ARRAY)

VENTS OR OTHER ROOF OBSTRUCTIONS:
HVAC:
EXISTING SOLAR WATER HEATING SYSTEM:
CHIMNEY:

PHOTOVOLTAIC SYSTEM
7,560 WATT (7.56kW) (DC) PV ARRAY
(24) PEIMAR SG315M (BF) 315W MODULES
(12) AP SYSTEMS YC600 MICRO-INVERTERS
2 BRANCHES OF 12 MODULES & 6 MICRO-INVERTERS

SITE PLAN NOTES:
- MODULES SHALL NOT BE PLACED OVER ANY TYPE OF ROOF VENT
- ALL ROOF STANCHIONS WILL BE INSTALLED AND SEALED BY APPROVED METHODS AND USING APPROVED MATERIALS
- UTILITY HAS 24-HOUR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE
- WORKSPACE IN FRONT OF THE AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH UTILITY & NEC REQUIREMENTS.

FENCES / GATES DO NOT RESTRICT ACCESS TO SES, PV METER OR UTILITY DISCONNECT

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SUITE 18-113
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DESIGNER	DATE
AT	12-10-2019
REVISIONS	DATE
REV. #1: PET	01-06-2020

AHJ: PARADISE VALLEY
UTILITY: SRP

SITE PLAN
6.576 KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE:	DRAWING #:
11 x 17	EM19-0052-SP

PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: 1" = 40' | SHEET #: 4

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GILBERT, ARIZONA 85296
623-570-5727
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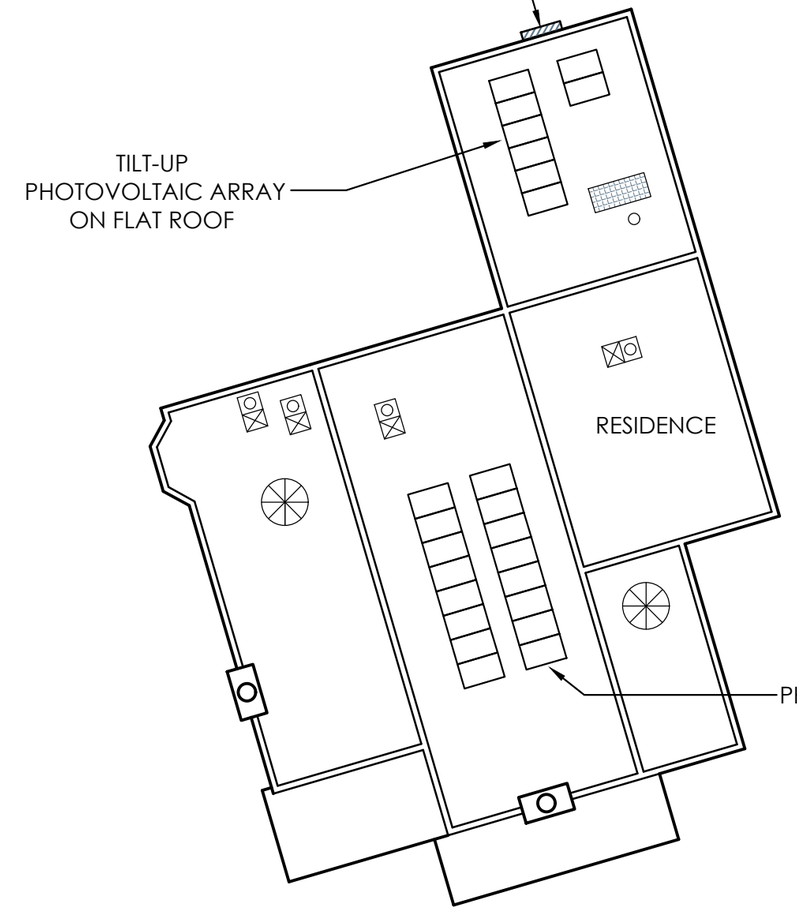
SES & PV COMPONENTS

- EXISTING 400A SES & UTILITY REVENUE METER
  *** PV SYSTEM POINT OF INTERCONNECTION ***
- PV SYSTEM UTILITY AC DISCONNECT SWITCH
- PV SYSTEM DER METER
- DEDICATED PV SYSTEM AC COMBINER



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SEE SHEET #4 FOR FULL SITE PLAN

FOR FLAT ROOF AREAS
ROOF PITCH LESS THAN 2:12
NO FIRE ACCESS ZONES REQUIRED PER 2015 IFC

VENTS OR OTHER ROOF OBSTRUCTIONS:

HVAC:

EXISTING SOLAR WATER HEATING SYSTEM:

CHIMNEY:

ROOF INFO:
TYPE: 2X4 MANUFACTURED TRUSS
TRUSS SPACING: 24" O.C.
MATERIAL: FOAM
PITCH: 0°

SOLAR ARRAYS:
AZIMUTH: 254° (ALL MODULES)
FINAL TILT: 18° (NORTH ARRAY)
18° (SOUTH ARRAY)

Reflective - 3/8" High White Letters
On Red Background - All CAPS

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

(Per 2014 NEC 690.12 & 690.56(C))
Place Plaque At Electrical Service Location

PHOTOVOLTAIC SYSTEM
7,560 WATT (7.56kW) (DC) PV ARRAY
(24) PEIMAR SG315M (BF) 315W MODULES
(12) AP SYSTEMS YC600 MICRO-INVERTERS
2 BRANCHES OF 12 MODULES & 6 MICRO-INVERTERS

SITE PLAN NOTES:
- MODULES SHALL NOT BE PLACED OVER ANY TYPE OF ROOF VENT
- ALL ROOF STANCHIONS WILL BE INSTALLED AND SEALED BY APPROVED METHODS AND USING APPROVED MATERIALS
- UTILITY HAS 24-HOUR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE
- WORKSPACE IN FRONT OF THE AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH UTILITY & NEC REQUIREMENTS.

FENCES / GATES DO NOT RESTRICT ACCESS TO SES, PV METER OR UTILITY DISCONNECT

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GILBERT, ARIZONA 85296
623-570-5727
WWW.PENINSULAELECTRICALSERVICES.COM

2820 S. ALMA SCHOOL RD.
SUITE 18-113
CHANLDER, ARIZONA 85286
480-454-5609
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LICENSE: AZ-ROC283461

DESIGNER	DATE
AT	12-10-2019
REVISIONS	DATE
REV. #1: PET	01-06-2020

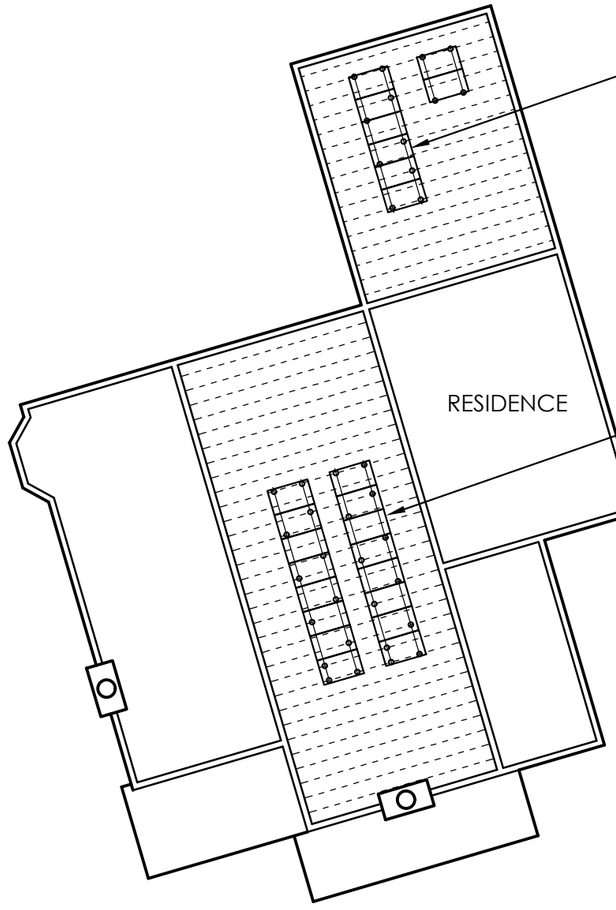
AHJ: PARADISE VALLEY
UTILITY: SRP

ENLARGED EQUIPMENT LAYOUT PLAN
6.576 KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE:	DRAWING #:
11 x 17	EM19-0052-ELP

PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: 1" = 20'
SHEET #: 5

FOR FLAT ROOF AREAS
ROOF PITCH LESS THAN 2:12
NO FIRE ACCESS ZONES
REQUIRED PER 2015 IFC



MODULE GROUPING #1 USED
FOR STRUCTURAL CALCULATIONS
(ROW OF 6)

SEE CALCS ON SHEET #7
SEE MOUNTING DETAIL ON SHEET #8A

MODULE GROUPING #2 USED
FOR STRUCTURAL CALCULATIONS
(ROW OF 8)

SEE CALCS ON SHEET #7
SEE MOUNTING DETAIL ON SHEET #8B

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- ROOF ATTACHMENT POINT

- 24" O.C. 2X4 MANUFACTURED TRUSS

- PEIMAR SG315M (BF) (315W) MODULE

NOTES:

- ARRAY WEIGHT DOES NOT EXCEED 5 LBS PER SQUARE FOOT AND DOES NOT EXCEED A POINT LOAD OF 40 LBS.
- ROOF ATTACHMENT POINTS SPACED AT 6' INTERVALS.

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ROOF LAYOUT PLAN
6.576 KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE:	DRAWING #:
11 x 17	ES19-0052-RL

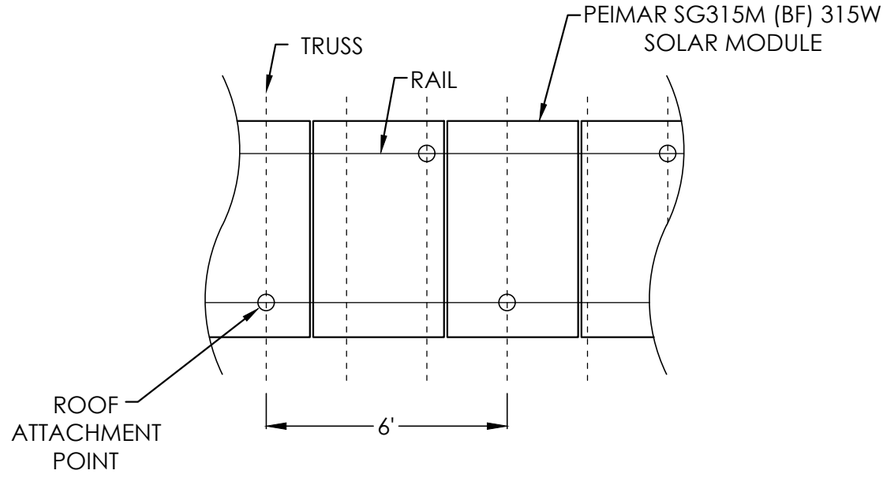
PROPERTY OWNER(S): MELLEN, GRACE

PARCEL NO: 169-22-039

SCALE: 1" = 20' | SHEET #: 6

Module Grouping #1	
Solar Module:	Peimar SG315M (BF) 315W
Layout Orientation:	Tilt-Up - Portrait
Truss/Rafter:	2x4 Manufactured Truss
Spacing:	24" O.C.
Roof Type:	Flat
Roof Material:	Foam
Load Distribution	
Total Modules In Array:	6
Module weight (lbs): w/Inverter	42.55
Racking Weight per module (lbs):	14.0
Total weight per module (lbs):	56.6
Total Array Weight (lbs):	339.3
Module Area (sf):	17.47
Total Array Area (sf):	104.8
Distributed Load (psf):	**3.2**
Total Number of vertical supports:	9
Point Load (psf):	**37.70**
Uplift Connections:	
Panel grouping area (sf):	104.8
Total Load @ 21 psf max. wind load:	2,201
Required pullout strength per vert. support:	244.6
Connector Type:	5/16" x 3 1/2" lag bolts

Module Grouping #2	
Solar Module:	Peimar SG315M (BF) 315W
Layout Orientation:	Tilt-Up - Portrait
Truss/Rafter:	2x4 Manufactured Truss
Spacing:	24" O.C.
Roof Type:	Flat
Roof Material:	Foam
Load Distribution	
Total Modules In Array:	8
Module weight (lbs): w/Inverter	42.55
Racking Weight per module (lbs):	14.0
Total weight per module (lbs):	56.6
Total Array Weight (lbs):	452.4
Module Area (sf):	17.47
Total Array Area (sf):	139.8
Distributed Load (psf):	**3.2**
Total Number of vertical supports:	12
Point Load (psf):	**37.70**
Uplift Connections:	
Panel grouping area (sf):	139.8
Total Load @ 21 psf max. wind load:	2,935
Required pullout strength per vert. support:	244.6
Connector Type:	5/16" x 3" lag bolts



RACKING INFORMATION - (TILT-UP MOUNT - PORTRAIT)

- UNIRAC SOLARMOUNT RAIL
- UNIRAC 2 PIECE STANDOFFS (WITH TILT KITS)
- MAX. RAIL CANTILEVER = 24" PER MANUFACTURER
- TRUSS SPACING = 24" O.C.
- ROOF ATTACHMENT POINTS = 6' SPACING (STAGGERED)

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AHJ: PARADISE VALLEY

UTILITY: SRP

STRUCTURAL CALCS & DETAILS

6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE:	DRAWING #:
11 x 17	EM19-0052-SC

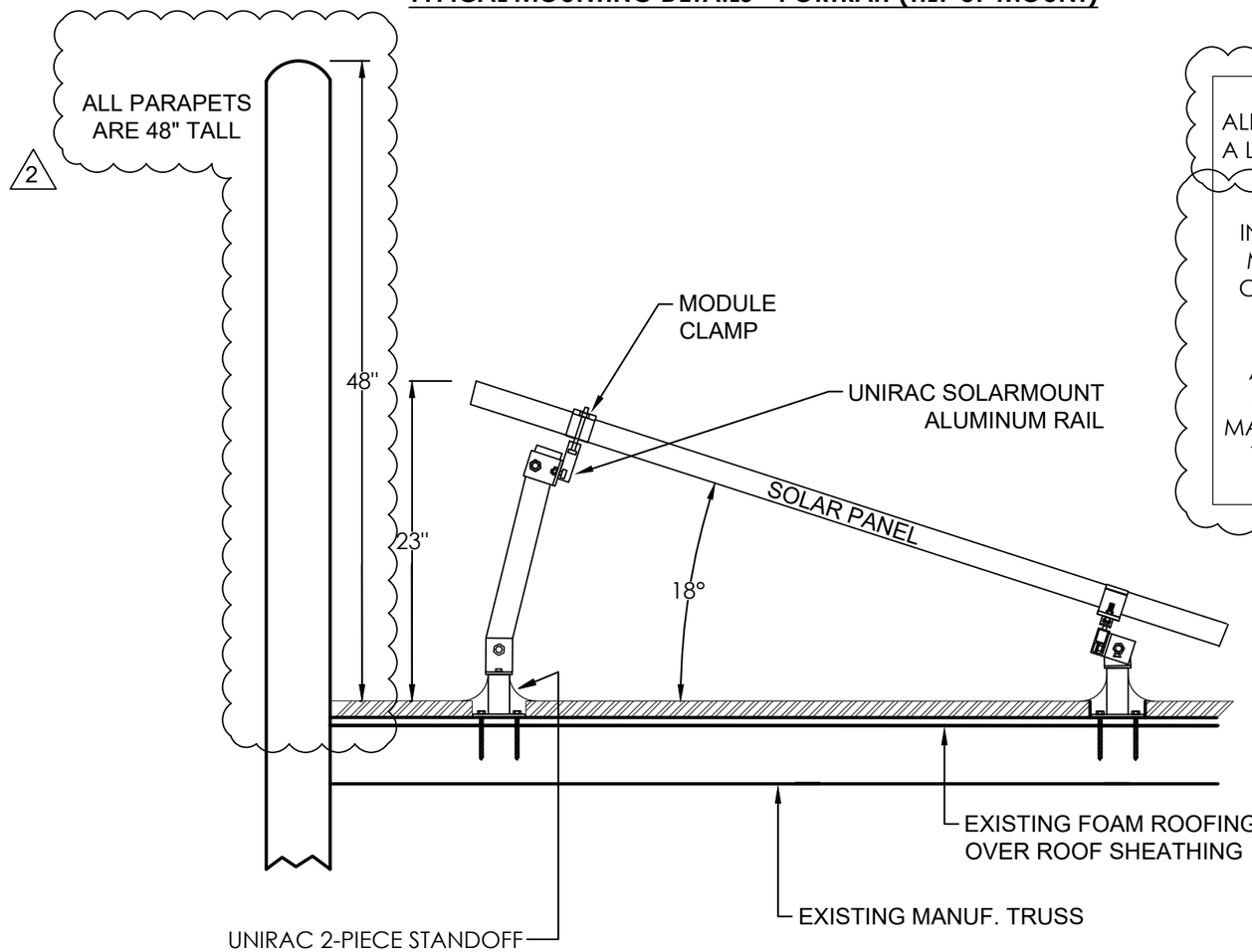
PROPERTY OWNER(S): MELLEN, GRACE

PARCEL NO: 169-22-039

SCALE: DRAWING NOT TO SCALE | SHEET #: 7

ROOF INFO:
TYPE: 2X4 MANUFACTURED TRUSS
TRUSS SPACING: 24" O.C.
MATERIAL: FOAM
ROOF PITCH: 0°
FINAL TILT: 18°

TYPICAL MOUNTING DETAILS - PORTRAIT (TILT-UP MOUNT)



NOTE
ALL RACKING COMPONENTS HAVE A LIGHT REFLECTANCE VALUE OF 5.

2

RACKING COMPONENTS, INCLUDING BUT NOT LIMITED TO MOUNTING RAILS, STANDOFFS, CROSSRAILS, ETC. ARE BLACK IN COLOR.

3

ALL ELECTRICAL EQUIPMENT & CONDUIT WILL BE PAINTED TO MATCH EXISTING PAINT COLOR OF THE RESIDENCE, AS PERMITTED BY UTILITY COMPANY.

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REV. #2:	PET	01-24-2020
REV. #3:	PET	01-31-2020

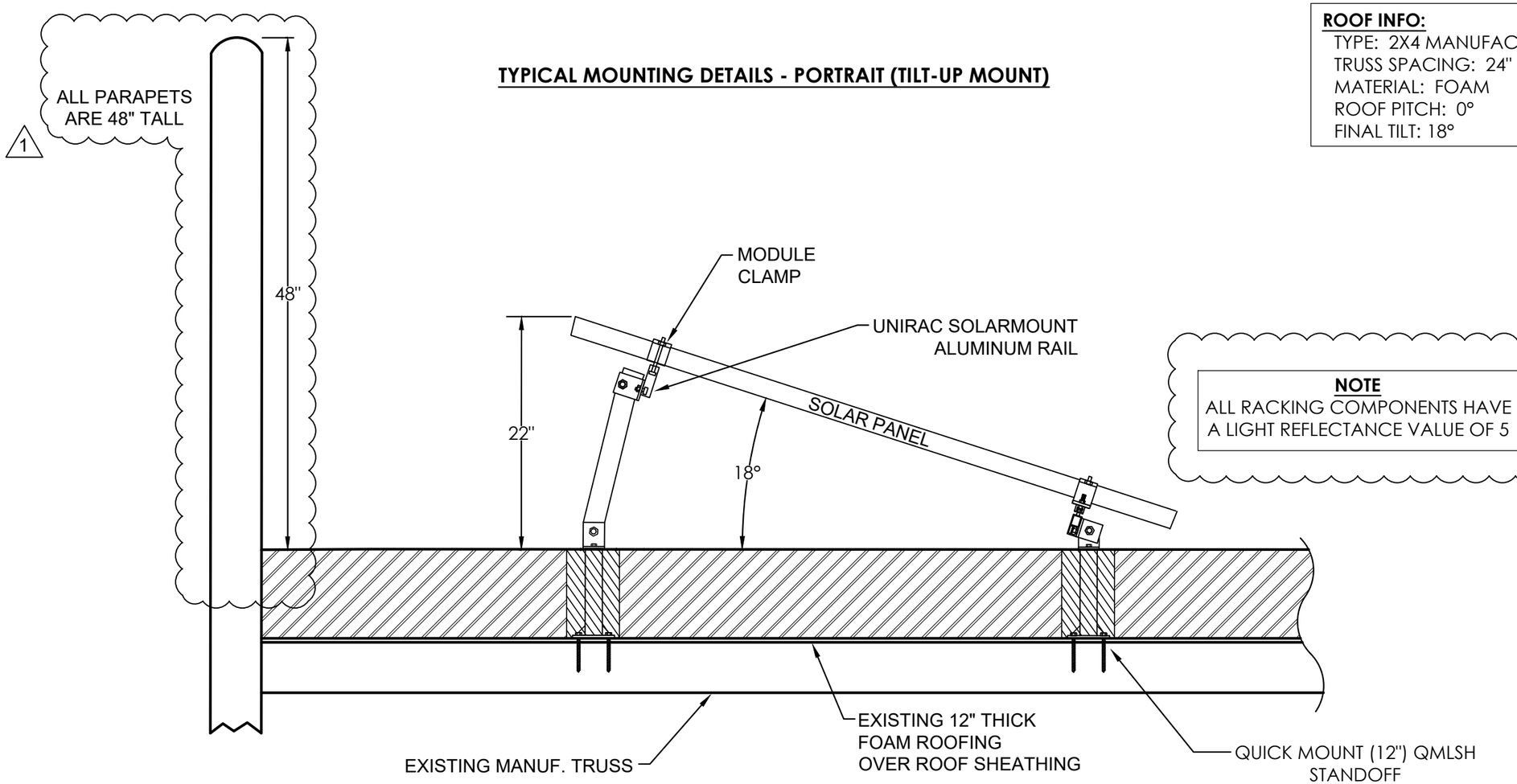
AHJ: PARADISE VALLEY
UTILITY: SRP

MOUNTING DETAIL - NORTH ARRAY
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17
DRAWING #: EM19-0052-MD1
PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: DRAWING NOT TO SCALE
SHEET #: 8A

TYPICAL MOUNTING DETAILS - PORTRAIT (TILT-UP MOUNT)

ROOF INFO:
TYPE: 2X4 MANUFACTURED TRUSS
TRUSS SPACING: 24" O.C.
MATERIAL: FOAM
ROOF PITCH: 0°
FINAL TILT: 18°



NOTE
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1

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DESIGNER	DATE
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REVISIONS	DATE
REV. #1: PET	01-24-2020

AHJ: PARADISE VALLEY

UTILITY: SRP

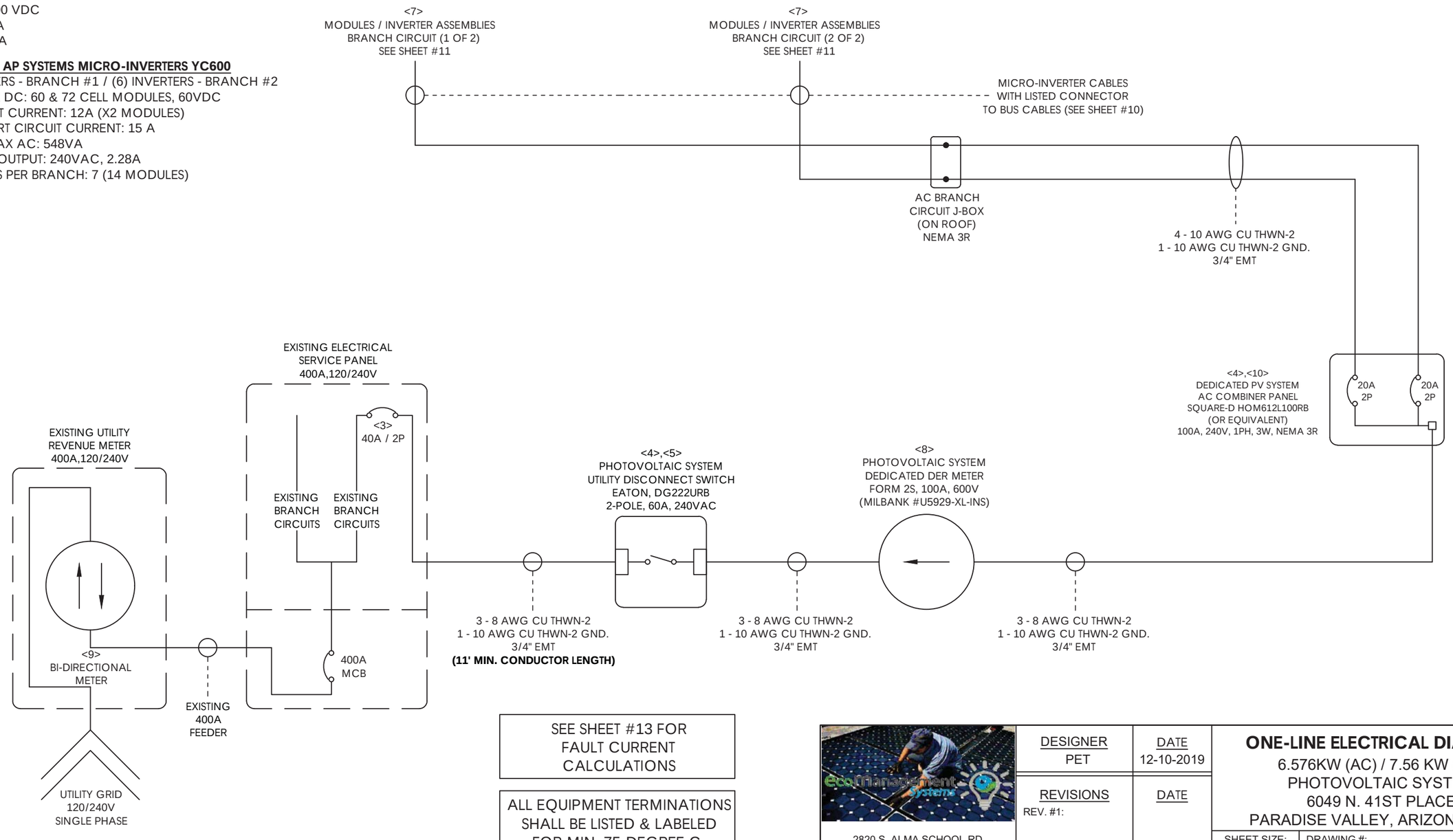
MOUNTING DETAIL - SOUTH ARRAY
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17
DRAWING #: EM19-0052-MD2
PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: DRAWING NOT TO SCALE
SHEET #: 8B

TOTAL SYSTEM WATTAGE: 6,576 (6.576 KWAC) / 7,560 (7.56KWDC)

SOLAR MODULES
(12) MODULES - BRANCH #1 / (12) MODULES - BRANCH #2
PEIMAR SG315M (BF) 315W MODULES
PMAX = 315 W DC
VOC = 40.93 VDC
VMP = 33.00 VDC
ISC = 9.82 A
IMP = 9.57 A

INVERTERS AP SYSTEMS MICRO-INVERTERS YC600
(6) INVERTERS - BRANCH #1 / (6) INVERTERS - BRANCH #2
INPUT-MAX DC: 60 & 72 CELL MODULES, 60VDC
MAX. INPUT CURRENT: 12A (X2 MODULES)
MAX. SHORT CIRCUIT CURRENT: 15 A
OUTPUT-MAX AC: 548VA
NOMINAL OUTPUT: 240VAC, 2.28A
MAX. UNITS PER BRANCH: 7 (14 MODULES)



SEE SHEET #13 FOR FAULT CURRENT CALCULATIONS

ALL EQUIPMENT TERMINATIONS SHALL BE LISTED & LABELED FOR MIN. 75-DEGREE C.

SEE NOTES ON SHEET #2
SEE LABELS ON SHEET #12

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SUITE 18-113
CHANLDER, ARIZONA 85286
480-454-5609

WWW.ECOMANAGEMENTSYSTEMS.COM

LICENSE: AZ-ROC283461

DESIGNER	DATE
PET	12-10-2019

REVISIONS	DATE
REV. #1:	

AHJ: PARADISE VALLEY
UTILITY: SRP

ONE-LINE ELECTRICAL DIAGRAM
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17
DRAWING #: EM19-0052-1L
PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: DRAWING NOT TO SCALE
SHEET #: 9

PENINSULA ELECTRICAL SERVICES, LLC
* PHOTOVOLTAIC DESIGN * ELECTRICAL PLAN REVIEW * ELECTRICAL INSPECTIONS *
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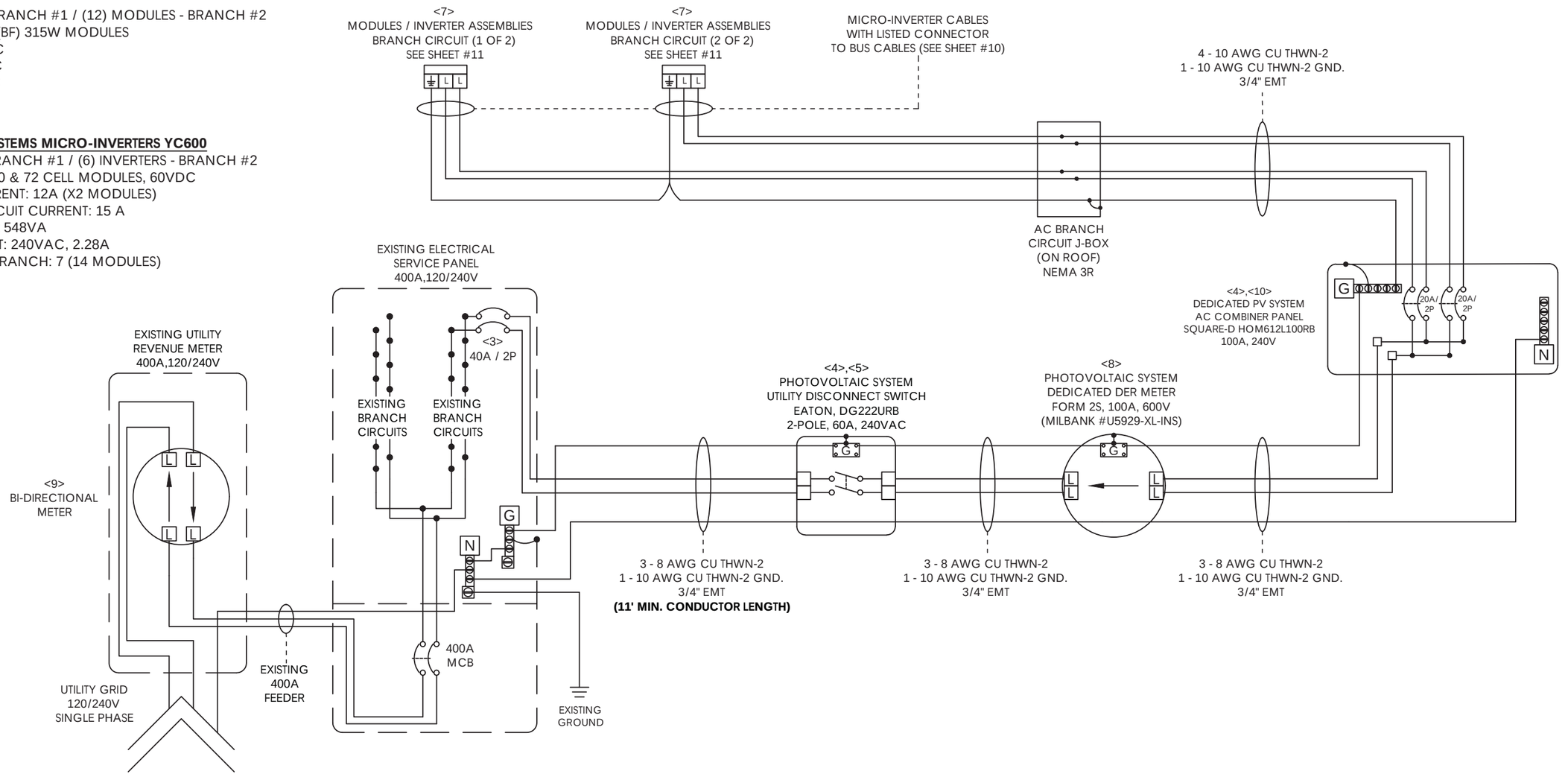
623-570-5727
WWW.PENINSULAELECTRICALSERVICES.COM

TOTAL SYSTEM WATTAGE: 6,576 (6.576 KWAC) / 7,560 (7.56KWDC)

SOLAR MODULES
(12) MODULES - BRANCH #1 / (12) MODULES - BRANCH #2
PEIMAR SG315M (BF) 315W MODULES
PMAX = 315 W DC
VOC = 40.93 VDC
VMP = 33.00 VDC
ISC = 9.82 A
IMP = 9.57 A

INVERTERS AP SYSTEMS MICRO-INVERTERS YC600
(6) INVERTERS - BRANCH #1 / (6) INVERTERS - BRANCH #2
INPUT-MAX DC: 60 & 72 CELL MODULES, 60VDC
MAX. INPUT CURRENT: 12A (X2 MODULES)
MAX. SHORT CIRCUIT CURRENT: 15 A
OUTPUT-MAX AC: 548VA
NOMINAL OUTPUT: 240VAC, 2.28A
MAX. UNITS PER BRANCH: 7 (14 MODULES)



AC PV CIRCUIT CONDUCTOR SIZING CALCULATIONS
(6) Inverters - Maximum Output Current = 548VA X 6 / 240V = 13.70A
Adjust for Continuous Load: 13.70A x 125% = 17.13A PER BRANCH
(12) Inverters = 34.25A TOTAL

8 AWG THWN-2 = 50A (WITH 75 DEG. C INSULATION)
8 AWG THWN-2 = 55A (WITH 90 DEG. C INSULATION)
55A x .87 (Ambient Temperature Correction) = 47.85A
8 AWG THWN-2 Maximum Ampacity = 47.85A
Adjust for # of Conductors in Conduit: 47.85 X 1 = 47.85A
47.85A > 34.25A
34.25A <= 40A Overcurrent Protection Device at SES

CONCLUSION: 8 AWG THWN-2 is of Adequate Ampacity

SEE SHEET #13 FOR FAULT CURRENT CALCULATIONS

ALL EQUIPMENT TERMINATIONS SHALL BE LISTED & LABELED FOR MIN. 75-DEGREE C.

SEE NOTES ON SHEET #2
SEE LABELS ON SHEET #12

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PET	12-10-2019
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AHJ: PARADISE VALLEY
UTILITY: SRP

THREE-LINE ELECTRICAL DIAGRAM
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17
DRAWING #: EM19-0052-3L
PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: DRAWING NOT TO SCALE
SHEET #: 10

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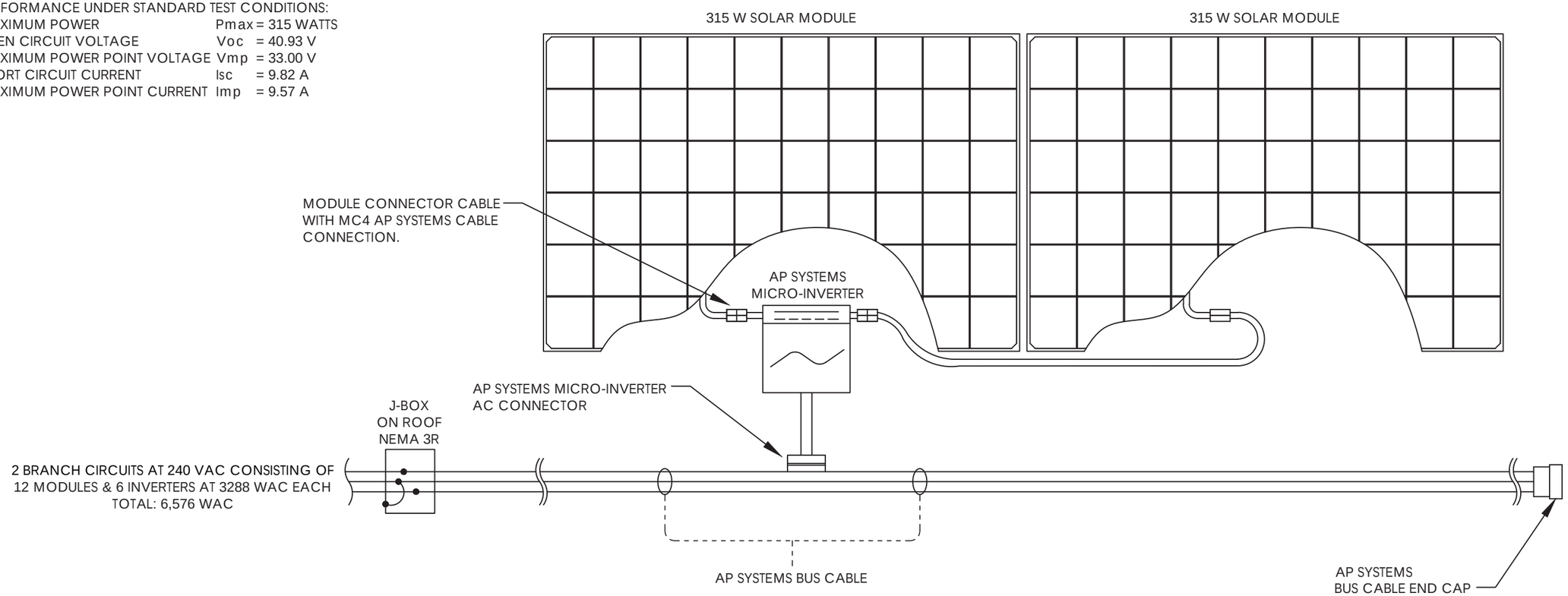
TOTAL SYSTEM WATTAGE: 6,576 (6.576 KWAC) / 7,560 (7.56KWDC)

(12) AP SYSTEMS MICRO-INVERTERS YC600
INPUT-MAX DC: 60 & 72 CELL MODULES, 60VDC
MAX. INPUT CURRENT: 12A (X2 MODULES)
MAX. SHORT CIRCUIT CURRENT: 15 A
OUTPUT-MAX AC: 548VA
NOMINAL OUTPUT: 240VAC, 2.28A
MAX. UNITS PER BRANCH: 7 (14 MODULES)

(24) PEIMAR SG315 (BF) 315W MODULES

PERFORMANCE UNDER STANDARD TEST CONDITIONS:		
MAXIMUM POWER	Pmax	= 315 WATTS
OPEN CIRCUIT VOLTAGE	Voc	= 40.93 V
MAXIMUM POWER POINT VOLTAGE	Vmp	= 33.00 V
SHORT CIRCUIT CURRENT	Isc	= 9.82 A
MAXIMUM POWER POINT CURRENT	Imp	= 9.57 A



NOTE 1: SOLAR MODULE/AP SYSTEMS MICRO-INVERTER ASSEMBLY. 2 MODULES (MAX.) ARE CONNECTED TO A MICRO-INVERTER MOUNTED DIRECTLY BENEATH THE MODULE. MODULES AND INVERTERS ARE CONNECTED TOGETHER TO FORM A BRANCH CIRCUIT WITH AC OUTPUT.

NOTE 2: EACH BRANCH CIRCUIT TERMINATES TO A JUNCTION BOX MOUNTED AT ROOF LOCATION.

NOTE 3: AP SYSTEMS MICRO-INVERTER IS MOUNTED TO THE MODULE RACK ASSEMBLY USING MANUFACTURER-PROVIDED STAINLESS STEEL BOLTS AND NUTS, PROVIDING BONDING TO RAIL.

NOTE 4: LISTED WEEB GROUNDING CLIPS BOND MODULES TO RAIL. SEPARATE GEC TO INVERTER IS NOT REQUIRED.

NOTE 5: MICRO-INVERTERS COMPLY WITH NEC FOR BOTH ARC-FAULT & RAPID SHUT-DOWN PROTECTION. NO SEPARATE RSD DEVICES REQUIRED.

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SUITE 18-113
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LICENSE: AZ-ROC283461

DESIGNER	DATE
PET	12-10-2019
REVISIONS	DATE
REV. #1:	

AHJ: PARADISE VALLEY
UTILITY: SRP

ARRAY DIAGRAM
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17
DRAWING #: EM19-0052-AD
PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: DRAWING NOT TO SCALE
SHEET #: 11

Photovoltaic System Labeling Requirements

The following labels will be applied to solar systems per applicable portions of Articles 690 and 705 of the National Electric Code (NEC)

LOCATED AT PRODUCTION METER

1" ∘ DEDICATED DER METER ∘ (Metal)

3 1/2 "

LOCATED AT AC DISCONNECT

1" ∘ UTILTY AC DISCONNECT SWITCH ∘ (Metal)

3 1/2 "

Maximum Output Current: 27.4A
Nominal Operating Voltage: 240V

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

LOCATED AT SES

WARNING - DUAL POWER SOURCE
SECOND SOURCE IS PV SYSTEM

LOCATED INSIDE SES

WARNING
Inverter Output Connection
Do not relocate this
Overcurrent Device

Maximum Output Current: 27.4A
Nominal Operating Voltage: 240V

(At PV Backfeed Breaker)

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AHJ: PARADISE VALLEY

UTILITY: SRP

ELECTRICAL EQUIPMENT LABELS

6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE:	DRAWING #:
11 x 17	EM19-0052-LB

PROPERTY OWNER(S): MELLEN, GRACE

PARCEL NO: 169-22-039

SCALE: DRAWING NOT TO SCALE | SHEET #: 12

Grace Mellen

6049 N. 41st Place - Paradise Valley, AZ 85253

Fault Current Calculation

Available Fault Current 22,000 amperes
(Available Fault Current at SES, Per SRP Table)

kVA =
E = 240
trans. FLA = 0

I = kVA x 1000 / E = trans. FLA

I_{sca} = trans. FLA x 100 x PF / transformer Z =

PF =
Z =

I_{sca} = ampere short-circuit current RMS symmetrical.

I_{sca} = 0 amperes

Point to Point Method

Single Phase 240/120

Length (distance) FEET — L = 11 — Copper in Metal Raceway

'f ' factor = 2 x L x I / N x C x E_{L-N}

(ASC) I_{sca} = 22,000

conductors per phase N = 1

Phase conductor constant C = 1,559 **Phase Conductor** 8

Volt Line to Line E_{L-L} = **240** Volt

f = 1.294

Neutral conductor constant C = 1,559 **Neutral Conductor** 8

Multiplier Volt Line to Neutral E_{L-N} = **120** Volt

f = 3.881

M = 1 / 1 + f

Line to Line M = 0.436

Line to Neutral M = 0.205

Fault Current Available At Line Side Of Utility Disconnect

(L-L) I_{sca} x M = → **9,591 amperes**

(L-N) I_{sca} x M = → **4,507 amperes**

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AHJ: PARADISE VALLEY

UTILITY: SRP

FAULT CURRENT CALCULATIONS
6.576KW (AC) / 7.56 KW (DC)
PHOTOVOLTAIC SYSTEM
6049 N. 41ST PLACE
PARADISE VALLEY, ARIZONA 85253

SHEET SIZE: 11 x 17
DRAWING #: EM19-0052-FC
PROPERTY OWNER(S): MELLEN, GRACE
PARCEL NO: 169-22-039
SCALE: DRAWING NOT TO SCALE
SHEET #: 13