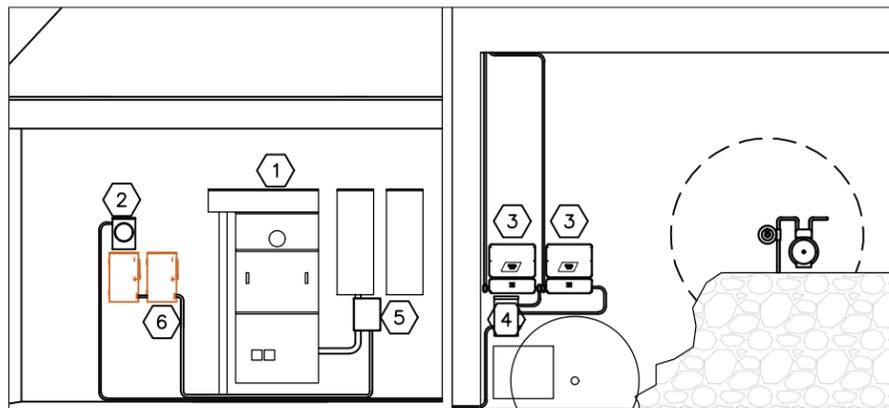


SITE LOCATION



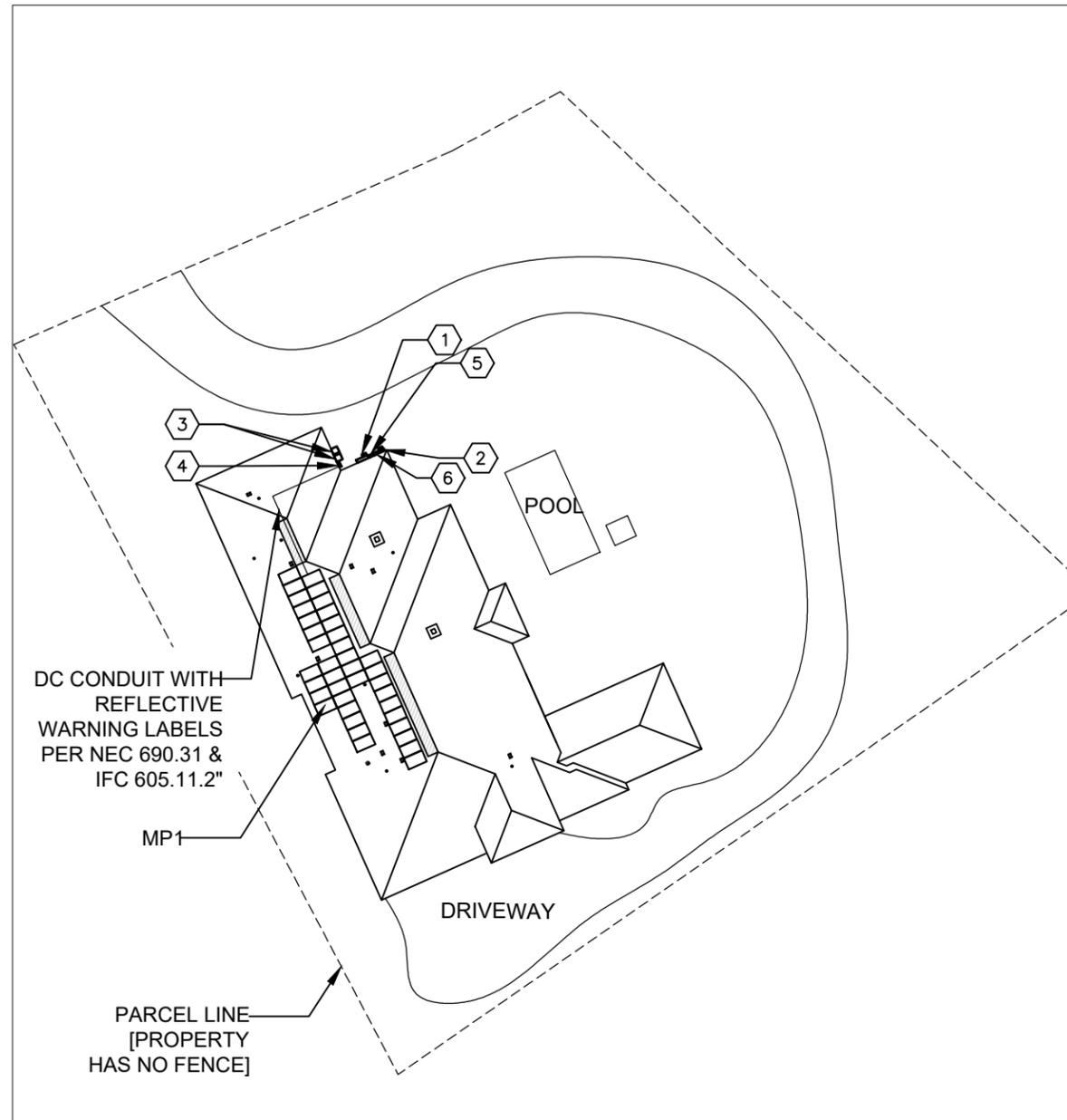
AERIAL VIEW



NOTE: All equipment (excluding the inverters due to warranty) will be painted to match the exterior.

NOTE: EQUIPMENT LOCATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE

EQUIPMENT ELEVATION



SITE PLAN

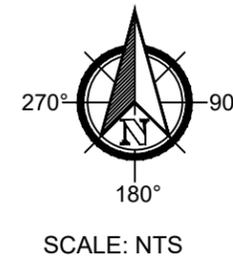
Project Manager:
Kaleina Eden

ONE ARRAY

MP1	PITCH: 18	AZIMUTH: 245
	MATERIAL: Metal Roof	
	MOUNTING: Flush Mounted	
	3FT FIRE CODE ACCESS PATH	

ROOF LEGEND	
	GAS VENT
	T-TOP VENT
	DORMER VENT

PARCEL INFO	
PARCEL #:	169-11-069
SQUARE FOOTAGE:	5,063
CONST. YEAR:	1994



NOTE:

- UTILITY HAS 24-HR 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 APS & NEC REQUIREMENTS. FOR APS REQUIREMENTS, REFERENCE SECTION 300 OF THE APS ESRM & SECTION 8.2 OF THE APS INTERCONNECTION REQUIREMENTS.
- REFERENCE SECTION 301.15 OF THE APS ESRM FOR ELECTRIC METER SEPARATION BETWEEN WATER & GAS.

SCOPE OF WORK

TO INSTALL A PHOTOVOLTAIC (PV) SYSTEM AT THE Nute, Howard Residence

LOCATED AT

4517 E Foothill Drive
Paradise Valley, AZ 85253

THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.

SHEET INDEX

- PV1 SITE MAP / SITE PLAN
- PV2 ROOF PLAN
- E1 THREE LINE DIAGRAM
- L1 LABELING

ATTACHMENTS: CUT-SHEETS

GOVERNING CODES

LOCAL JURISDICTION - Paradise Valley

UTILITY - APS

- 2014 NATIONAL ELECTRICAL CODE
- 2015 INTERNATIONAL BUILDING CODE
- 2015 INTERNATIONAL RESIDENTIAL CODE
- 2015 INTERNATIONAL FIRE CODE
- CITY AMENDMENTS

SITE PLAN NOTES

- 1 (EXISTING) ELECTRICAL SERVICE ENTRANCE 400A SPLIT MAIN SERVICE PANEL WITH TWO 200A MCB and UTILITY REVENUE METER
- 2 (NEW) DEDICATED PV SYSTEM KWH METER and UTILITY DISCONNECT SWITCH
- 3 (NEW) INVERTER WITH INTEGRATED DC DISCONNECT
- 4 (NEW) COMBINER PANEL
- 5 (NEW) TAP BOX
- 6 (NEW) FUSED DISCONNECT

EQUIPMENT SUMMARY

- 39 Hanwha Q CELLS Q.PEAK G4.1 305
- 01 SolarEdge SE7600H-US
- 01 SolarEdge SE7600H-US
- 01 Milbank 100A Meter Base
- 39 SolarEdge Power Optimizer P320
- 01 EATON, 100A, DG223URB, 2P
- 01 EATON, 100A, DG223NRB, 2P, Fused
- 01 EATON BR48L125RP (2 BREAKERS)

SHEET:
PV1

DATE:
2/19/2019

Revision: 0

Designer: Alex Meehl

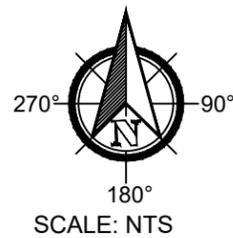
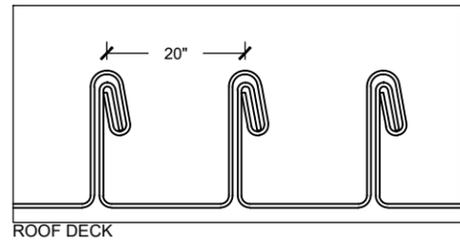
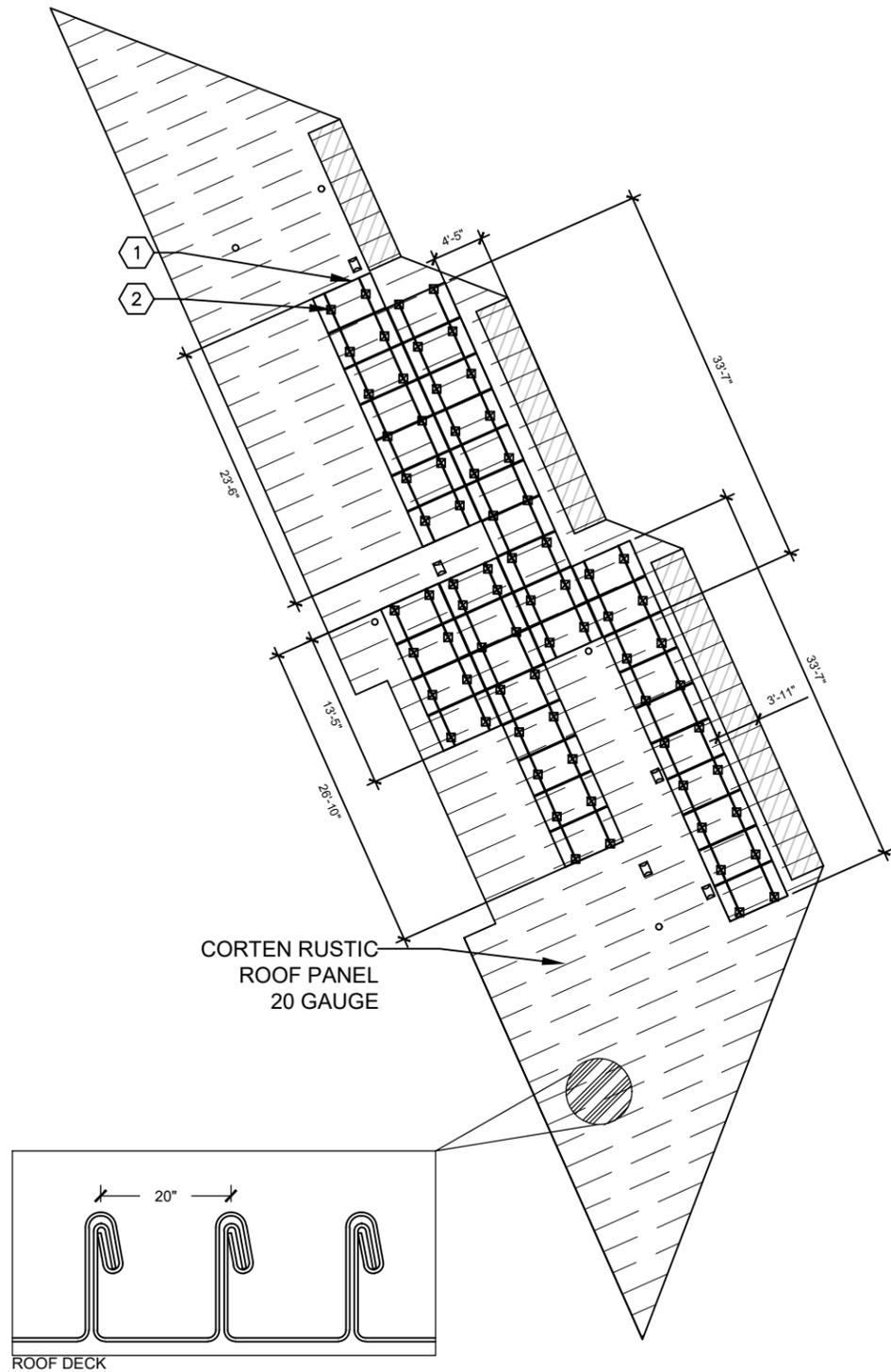
TITLE: SITE PLAN 15.200 kW-AC
Nute, Howard Residence 11,895 W-DC
4517 E Foothill Drive, Paradise Valley, AZ 85253

Sun Valley Solar Solutions LLC

3225 N Colorado St. Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com



ROOF PLAN



NOTE: EXPOSED PV ROOFTOP CONDUCTORS THAT ARE NOT LOCATED UNDER THE ARRAY MODULES, SHALL BE INSTALLED IN A LISTED RACEWAY, AND SHALL INCLUDE LISTED JUNCTION BOXES AT BOTH ENDS OF THE RACEWAY TO TRANSITION FROM EXPOSED CONDUCTORS TO THE LISTED RACEWAYS. 2011 NEC ARTICLE 690.31(A) AND (B) EXCEPTION

PITCH: 18 AZIMUTH: 245
 MP1 MATERIAL: Metal Roof
 MOUNTING: Flush Mounted

ROOF LEGEND	
	GAS VENT
	T-TOP VENT
	DORMER VENT

ROOF PLAN NOTES:

- ① (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 18DEG PITCH
- ② RACKING INFORMATION
 - EVEREST MOUNTING RAIL - **Black**
 - S-5! | S-5-S
 - TRUSS SPACING = 20" O.C.
 - PENETRATION POINTS = 4' SPACING
 - MOUNTING DETAIL
 - **Light Reflective Value- 5-8%**
 - **Conduit will be painted to match roof/exterior wall color (see site plan for location)**

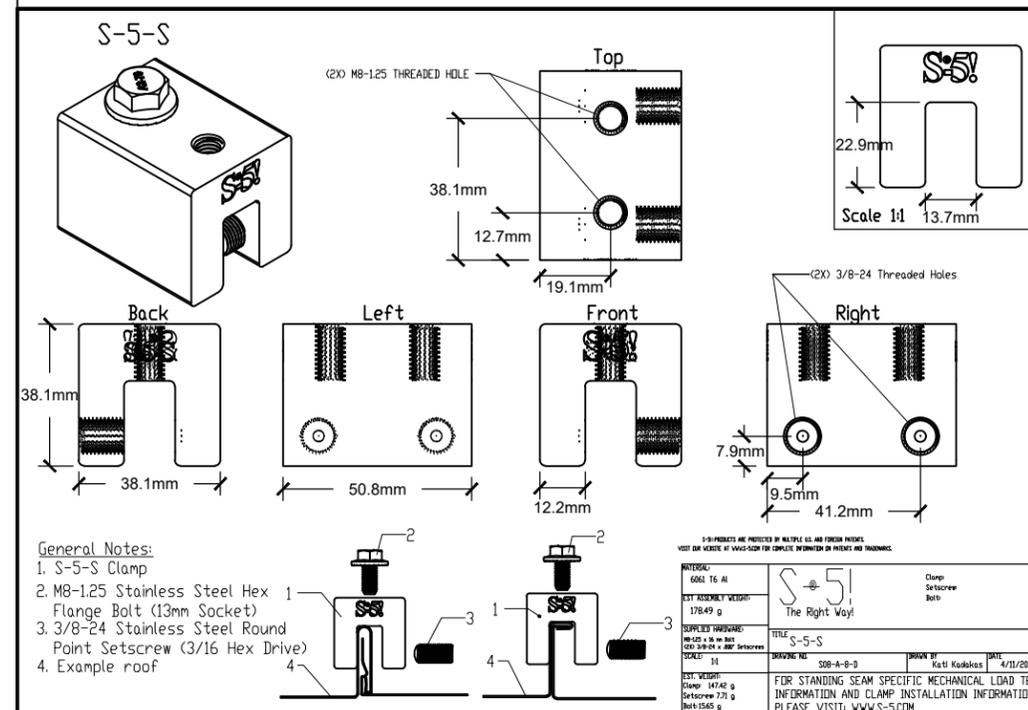
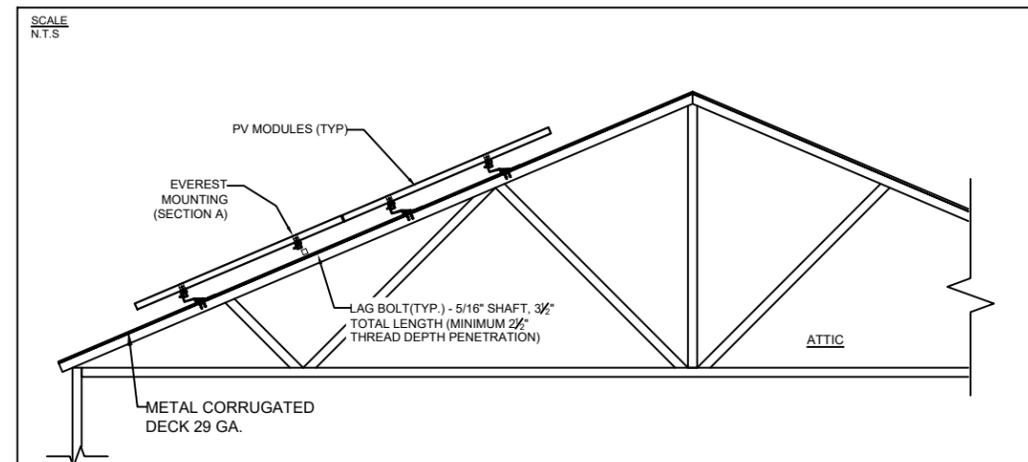
ROOF 1 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
 SOLAR MODULE WEIGHT = 41.45 LBS.
 EXPOSURE CATEGORY = B
 BASIC WIND SPEED = 115 MPH

STRUCTURAL NOTES:

- 1) TOTAL ASSEMBLY WEIGHT: 1880.5 LBS
- 2) TOTAL AREA COVERED BY MODULES: 735.6 FT2
- 3) DEAD LOAD = 1880.5 / 735.6 = 2.6 LBS/FT2
- 4) POINT LOAD CALCULATIONS [# OF POINTS (72)] - 26.1 lb/point
- 5) TOTAL DESIGN LOAD (DOWNFORCE) = 14.0 psf
- 6) TOTAL DESIGN LOAD (UPFORCE) = -28.6 psf

RAILS TO BE BONDED TO GROUND (EGC) - 690.4 (C)
 RAIL SPLICES TO BE ELECTRICALLY BONDED
 FLASHING REQUIRED FOR STANDOFF PENETRATIONS
 FOLLOW MODULE INSTRUCTION ON FRAME MOUNTING POINT



SHEET:
PV2

DATE:
10/10/2018

Revision: 0
 Designer: Alex Meehl

TITLE: ROOF PLAN 15.200 kW-AC
 Nute, Howard Residence 11,895 W-DC
 4517 E Foothill Drive, Paradise Valley, AZ 85253

Sun Valley Solar Solutions LLC
 3225 N Colorado St, Chandler, AZ 85225
 T: (480) 689-5000 / F: (480) 659-3429
 www.sunvalleysolar.com



One Array

(SEE ARRAY PAGE)
 PV MODULE = 305 WATTS
 21 MODULES = 6405 WATTS
 1 STRING OF 11 PV MODULES
 1 STRING OF 10 PV MODULES
 ROOF TOP CONDUIT MIN. INSTALL
 1/2" FROM ROOF SURFACE

(SEE ARRAY PAGE)
 PV MODULE = 305 WATTS
 18 MODULES = 5490 WATTS
 1 STRING OF 18 PV MODULES
 ROOF TOP CONDUIT MIN. INSTALL
 1/2" FROM ROOF SURFACE

6 #10 CU PV WIRE
 SUNLIGHT RESISTANT
 1 #10 GROUND
 PV WIRE IN FREE AIR or
 PV WIRE IN 3/4" EMT

4 #10 CU PV WIRE
 SUNLIGHT RESISTANT
 1 #10 GROUND
 PV WIRE IN FREE AIR or
 PV WIRE IN 3/4" EMT

7600 WATT TRANSFORMERLESS INVERTER
 SolarEdge SE7600H-US
 400 - 480 VDC TO 240 VAC 1 PHASE
 DC DISCONNECT ON INVERTER,
 MAX AC OUTPUT 32A, UL LISTED

7600 WATT TRANSFORMERLESS INVERTER
 SolarEdge SE7600H-US
 400 - 480 VDC TO 240 VAC 1 PHASE
 DC DISCONNECT ON INVERTER,
 MAX AC OUTPUT 32A, UL LISTED

10 #10 AWG CU THWN-2
 1 #10 AWG CU EGC
 in 2 RUNS OF 3/4" EMT CONDUIT
 OR
 in 1 RUN OF 1" EMT CONDUIT
 CREW TO DECIDE

MODULE INFO
 Module: Hanwha Q CELLS Q.PEAK G4.1 305
 Pmax: 305 W
 Voc: 40.05 VDC
 Vmp: 32.62 VDC
 Imp: 9.35 Amp
 Isc: 9.84 Amp
 Low Amb Temp (C): -9
 Avg High Temp (C): 42

(NEW) DEDICATED PV SYSTEM
 COMBINER PANEL 125A
 [EATON - BR48L125RP - 125A]
 240VAC, NEMA 3R, 1PH, 10K AIC

(NEW) PV PRODUCTION METER
 [MILBANK U7490-RL-TG]
 125A, 600VAC, 600V, 10 SCCR
 FORM 2S, NEMA 3R, RING TYPE
 (OR EQUIVALENT)

(NEW) UTILITY AC DISCONNECT
 [EATON DG223URB - 100A]
 2-POLE, NON-FUSED, 240 VAC
 10K AIC, NEMA 3R LOCKABLE
 (OR EQUIVALENT)

(NEW) PV AC DISCONNECT
 [EATON DG223NRB - 100A]
 2-POLE, FUSED, 240 VAC
 100K AIC, NEMA 3R LOCKABLE
 80A, 240VAC FUSES (RK5-TYPE)

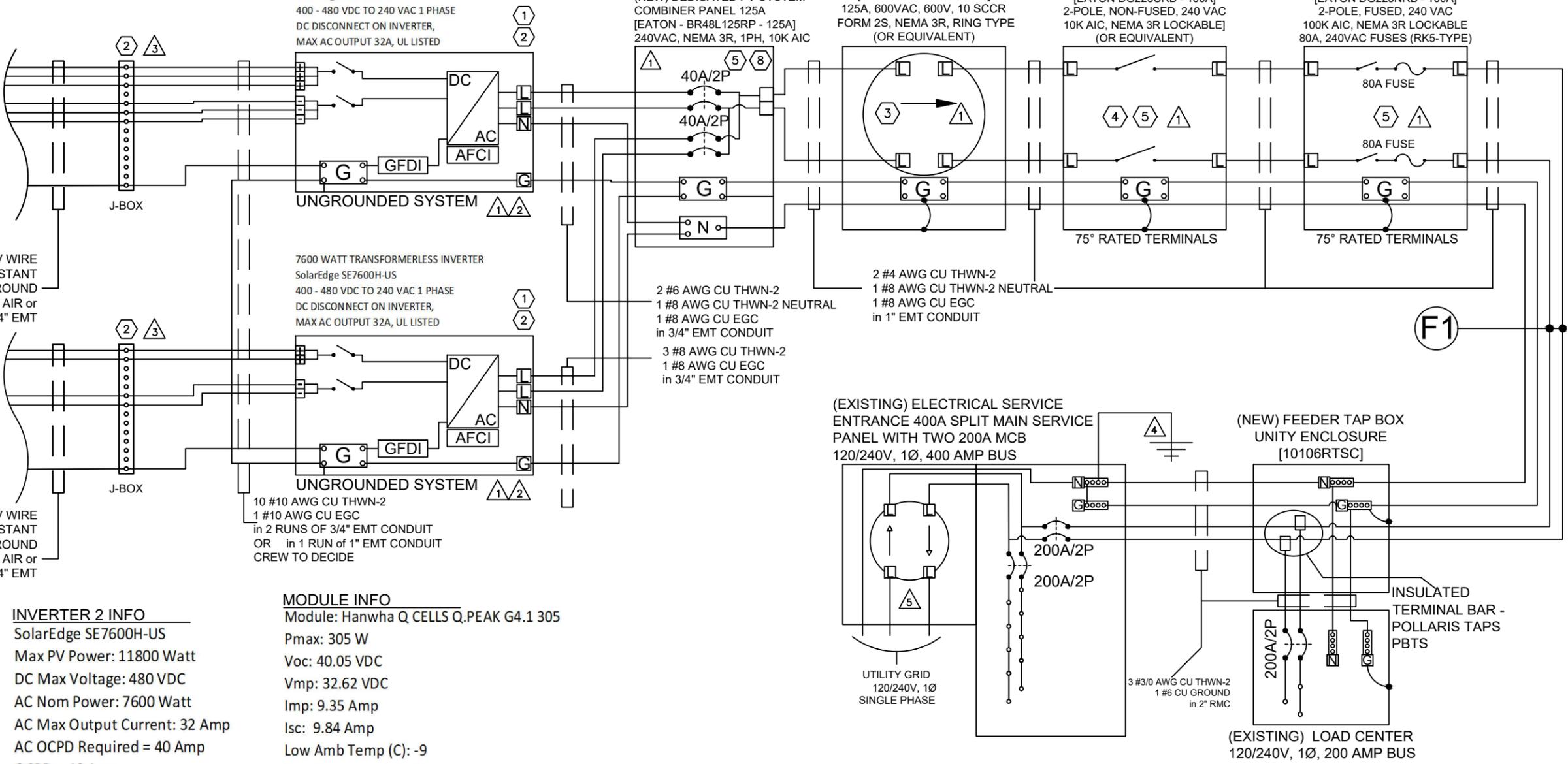
2 #6 AWG CU THWN-2
 1 #8 AWG CU THWN-2 NEUTRAL
 1 #8 AWG CU EGC
 in 3/4" EMT CONDUIT

2 #4 AWG CU THWN-2
 1 #8 AWG CU THWN-2 NEUTRAL
 1 #8 AWG CU EGC
 in 1" EMT CONDUIT

(EXISTING) ELECTRICAL SERVICE
 ENTRANCE 400A SPLIT MAIN SERVICE
 PANEL WITH TWO 200A MCB
 120/240V, 1Ø, 400 AMP BUS

(NEW) FEEDER TAP BOX
 UNITY ENCLOSURE
 [10106RTSC]

(EXISTING) LOAD CENTER
 120/240V, 1Ø, 200 AMP BUS



INVERTER 1 INFO
 SolarEdge SE7600H-US
 Max PV Power: 11800 Watt
 DC Max Voltage: 480 VDC
 AC Nom Power: 7600 Watt
 AC Max Output Current: 32 Amp
 AC OCPD Required = 40 Amp
 OCPD = 40 Amp

INVERTER 2 INFO
 SolarEdge SE7600H-US
 Max PV Power: 11800 Watt
 DC Max Voltage: 480 VDC
 AC Nom Power: 7600 Watt
 AC Max Output Current: 32 Amp
 AC OCPD Required = 40 Amp
 OCPD = 40 Amp

LABEL REQUIREMENTS

- 1 - LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAX SYSTEM VOLTAGE AND SHORT CIRCUIT CURRENT PER NEC 690.53.
- 2 - LABEL WARNING SIGN PER NEC 690.35 READING "WARNING - ELECTRIC SHOCK HAZARD - THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED"
- 3 - LABEL "PHOTOVOLTAIC POWER SYSTEM DEDICATED KWH METER"
- 4 - LABEL "PHOTOVOLTAIC SYSTEM AC UTILITY DISCONNECT SWITCH". SWITCH COVER TO BE LOCKABLE. SWITCH TO BE VISIBLE BLADE AND ACCESSIBLE PER UTILITY REQUIREMENTS AND CONFORM TO NEC 705.22.
- 5 - LABEL WARNING SIGN PER NEC 690.17 READING "WARNING - ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS. TERMINAL ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION".
- 6 - LABEL WARNING SIGN PER NEC 705.12(D)(7) READING "WARNING INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCORRECT PROTECTION DEVICE". LOCATE AT OPPOSITE END OF BUS FROM MAIN BREAKER LOCATION
- 7 - LABEL BREAKER "PHOTOVOLTAIC ELECTRIC POWER SOURCE" PER NEC 705.10, AND "BREAKERS ARE BACKFED" PER NEC 705.12 (D)(5). LABELED WITH THE MAX AC OUTPUT OPERATION CURRENT AND THE OPERATING VOLTAGE PER NEC 690.54.
- 8 - LABEL COMBINER PANEL "DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL" AND "LOADS NOT TO BE ADDED TO THIS PANEL"
- 9 - LABEL "BREAKER HAS BEEN DE-RATED PER NEC 705.12 (D)(2)"

SYSTEM REQUIREMENTS

- 1 -EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 2011 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
- 2 -LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B).
- 3 -METALLIC CONDUIT SHALL BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 110.3(B).
- 4 -GEC TO BE INSTALLED AS REQUIRED BY MANUFACTURER AND NEC 690.47
- 5 -BI-DIRECTIONAL UTILITY METER TO BE INSTALLED BY UTILITY COMPANY

NOTE: SYSTEM DESIGN
 IN ACCORDANCE WITH
 THE 2014 N.E.C.

NEUTRAL IS USED
 EXCLUSIVELY FOR PHASE
 AND VOLTAGE DETECTION
 PER NEC 705.95 (B)

SOLAREEDGE OPTIMIZERS FUNCTION AS
 DISCONNECTING CONDUCTORS TO
 DE-ENERGIZE PV SOURCE CIRCUITS IN
 COMPLIANCE WITH NEC SECTION 690.12
 (RAPID SHUTDOWN)

FAULT CALCULATIONS

F1

AVAILABLE = 9,879 AIC
 D = 25'
 F = 1.121
 M = .471
 Isc = 20,955 AIC
#4 AWG CU CONDUCTORS

CALCULATIONS IN
 ACCORDANCE WITH
 NEC 110.9 & 110.10

*CURRENT LIMITED BY FUSE

INVERTER 1

PV MODULE = 305 WATTS
 21 MODULES = 6405 WATTS
 1 STRING OF 11 PV MODULES
 1 STRING OF 10 PV MODULES

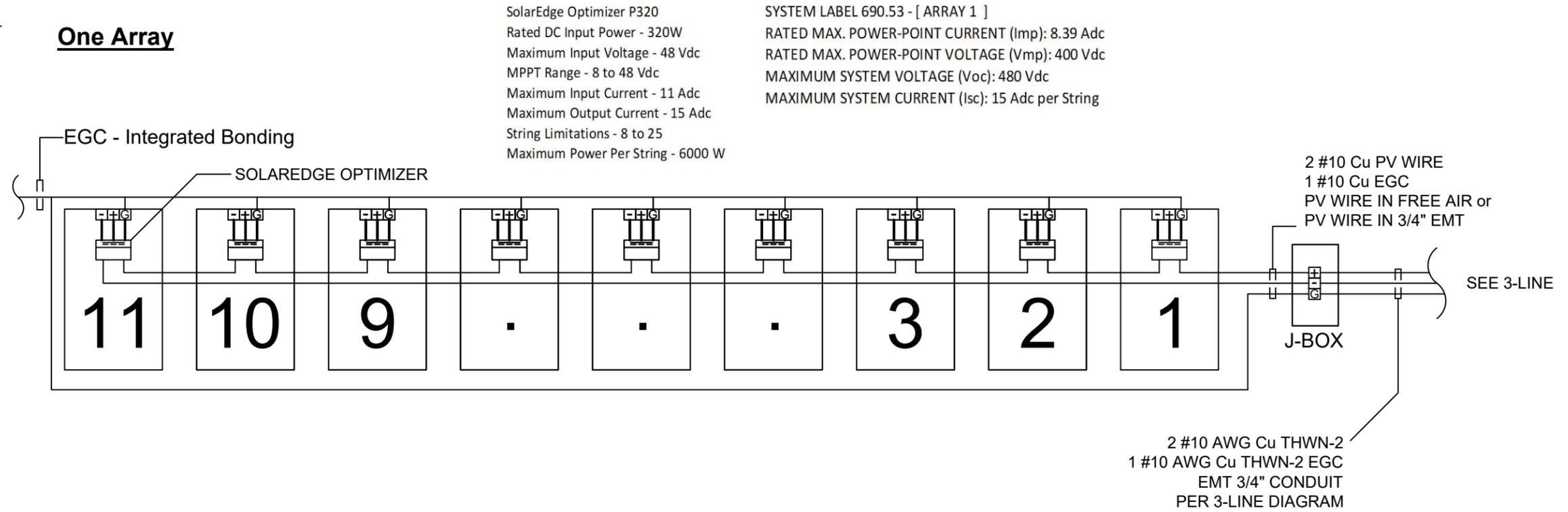
MODULE INFO

Module: Hanwha Q CELLS Q.PEAK G4.1 305
 Pmax: 305 W
 Voc: 40.05 VDC
 Vmp: 32.62 VDC
 Imp: 9.35 Amp
 Isc: 9.84 Amp
 Low Amb Temp (C): -9
 Avg High Temp (C): 42

INVERTER 1 INFO

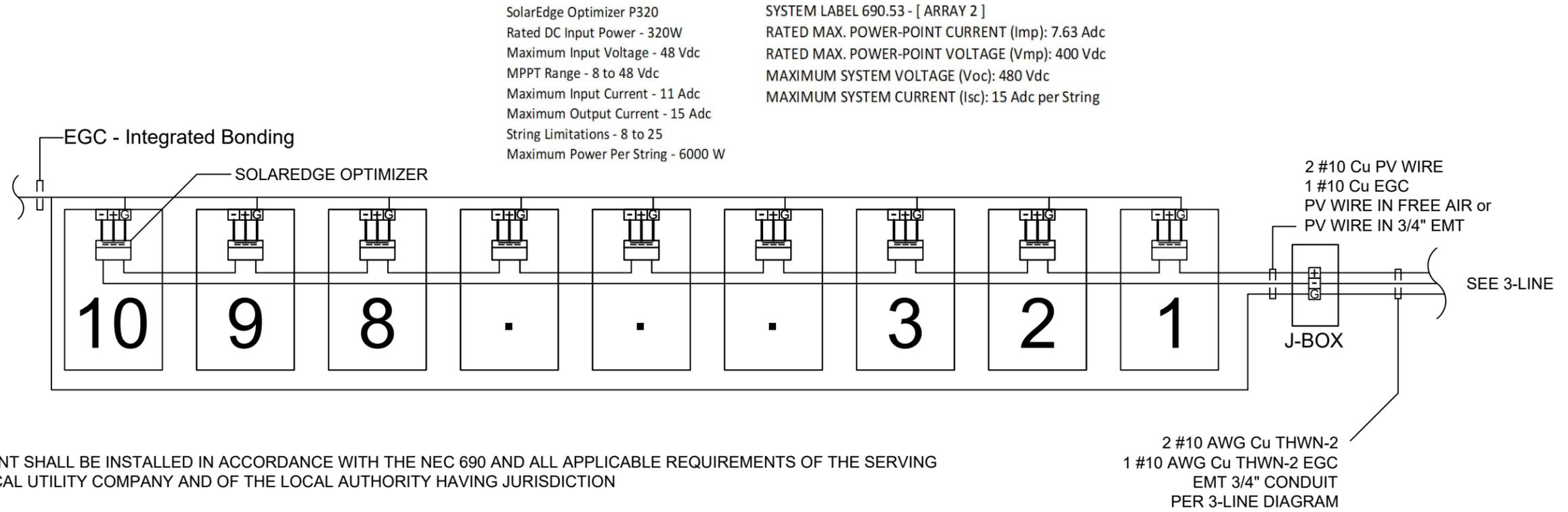
SolarEdge SE7600H-US
 Max PV Power: 11800 Watt
 DC Max Voltage: 480 VDC
 AC Nom Power: 7600 Watt
 AC Max Output Current: 32 Amp
 AC OCPD Required = 40 Amp
 OCPD = 40 Amp

One Array



SolarEdge Optimizer P320
 Rated DC Input Power - 320W
 Maximum Input Voltage - 48 Vdc
 MPPT Range - 8 to 48 Vdc
 Maximum Input Current - 11 Adc
 Maximum Output Current - 15 Adc
 String Limitations - 8 to 25
 Maximum Power Per String - 6000 W

SYSTEM LABEL 690.53 - [ARRAY 1]
 RATED MAX. POWER-POINT CURRENT (Imp): 8.39 Adc
 RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
 MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
 MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



SolarEdge Optimizer P320
 Rated DC Input Power - 320W
 Maximum Input Voltage - 48 Vdc
 MPPT Range - 8 to 48 Vdc
 Maximum Input Current - 11 Adc
 Maximum Output Current - 15 Adc
 String Limitations - 8 to 25
 Maximum Power Per String - 6000 W

SYSTEM LABEL 690.53 - [ARRAY 2]
 RATED MAX. POWER-POINT CURRENT (Imp): 7.63 Adc
 RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
 MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
 MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

NOTES

- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
- EGC WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE EGC CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)
- FOLLOW MANUFACTURER'S SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
- CONDUCTORS SHALL BE RATED AND LABELED
- LISTING AGENCY NAME AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B)
- METALLIC CONDUIT TO BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 250.97

SHEET:
E2.1

DATE:
10/10/2018

Revision: 0
Designer: Alex Meehl

TITLE: ARRAY
15.200 kW-AC
Nute, Howard Residence 11,895 W-DC
4517 E Foothill Drive, Paradise Valley, AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St, Chandler, AZ 85225
T: (480) 689-5000 / F: (480) 659-3429
www.sunvalleysolar.com



INVERTER 2

PV MODULE = 305 WATTS
 18 MODULES = 5490 WATTS
 1 STRING OF 18 PV MODULES

MODULE INFO

Module: Hanwha Q CELLS Q.PEAK G4.1 305

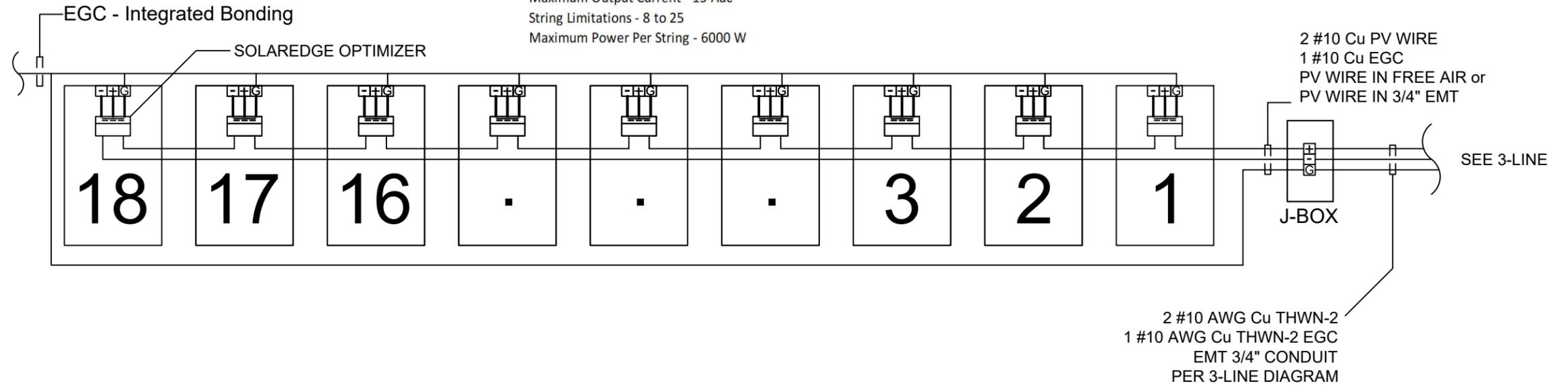
Pmax: 305 W
 Voc: 40.05 VDC
 Vmp: 32.62 VDC
 Imp: 9.35 Amp
 Isc: 9.84 Amp
 Low Amb Temp (C): -9
 Avg High Temp (C): 42

INVERTER 2 INFO

SolarEdge SE7600H-US
 Max PV Power: 11800 Watt
 DC Max Voltage: 480 VDC
 AC Nom Power: 7600 Watt
 AC Max Output Current: 32 Amp
 AC OCPD Required = 40 Amp
 OCPD = 40 Amp

SolarEdge Optimizer P320
 Rated DC Input Power - 320W
 Maximum Input Voltage - 48 Vdc
 MPPT Range - 8 to 48 Vdc
 Maximum Input Current - 11 Adc
 Maximum Output Current - 15 Adc
 String Limitations - 8 to 25
 Maximum Power Per String - 6000 W

SYSTEM LABEL 690.53 - [ARRAY 1]
 RATED MAX. POWER-POINT CURRENT (Imp): 13.73 Adc
 RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
 MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
 MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String



NOTES

- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 690 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION
- EGC WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE EGC CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690.4(C)
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- METALLIC CONDUIT TO BE USED WITHIN BUILDINGS PER NEC 690.31(E). EMT BONDED PER NEC 250.97

SHEET:
E2

DATE:
10/10/2018

Revision: 0
 Designer: Alex Meehl

TITLE: ARRAY 15.200 kW-AC
 Nute, Howard Residence 11,895 W-DC
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