



To whom it may concern,

Enclosed is the Hillside pre application for Solar review for homeowners Jerome Barnier and Julie Johnson at 4141 E. Keim Dr. Paradise Valley, AZ 85253. Following the application page are the site plan for the solar system, with roof mounting pages. Also included are picture of the site, with potential array overlay, pictures of the home from 4 directional points of view, and a picture of the enclosed side of house where electrical equipment is to be located. The scope of work is to include the installation of a 23kW solar photovoltaic system and batteries.

We look forward to working with you for this review process, please let me know if there are documents that need to be included in order to move this to the next step in the review process.

Thank you,

Rebecca Van Horn

3225 N. Colorado Street, Chandler, AZ 85225

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Variance:

1. *“Such variance... will serve not merely as a convenience to the applicant, but [is] necessary to alleviate some demonstrable hardship or difficulty so great as to warrant a variance under the circumstances...”*

- A. Application is seeking to reduce the cost of electricity that their home requires to run in a reasonable fashion. The only way to reduce the size of said power bills is for the applicant to generate power at the location in lieu of purchasing it solely from the local utility company. As such, the addition of a power generating system along with energy storage battery units is required for the applicant to reduce the hardship of electric bills.
- B. This proposed project is seeking review of the property hardship. With the addition of the surrounding houses, adjacent to this, it has created a basin and natural wash that cannot be built on or disrupted. To build an alternative solution, the space would need to be cleared of the native landscape and the current topography would need to be rerouted and reinforced.

2. *The “special circumstances, hardship, or difficulty [do not] arise out of misunderstanding or mistake...”*

- A. The applicant did not have a misunderstanding of make a mistake regarding the cost of electricity and their power bills associated with it.

3. *“Such variance from ... the strict application of the terms of [the Zoning Ordinance] ... are in harmony with its general purposes and intents...”*

- A. The installation of roof mounted solar panels meets the intent of the Hillside ordinance, in that it will not obstruct line of site or visibility for neighboring properties. It will be aesthetically appealing and non-disruptive to the overall aesthetic of the area. Location of some arrays will be shielded from neighboring view by trees that will not in turn reduce the efficiency of the arrays. By adding them to the existing tilted roof, these arrays are utilizing the minimum amount of surface area that is needed for this hardship. Changing locations of the arrays would change their production therefore unable to accommodate the hardship and requiring the addition of more arrays. The system has also been designed using high efficiency solar modules to also aid in reducing the amount that is needed to offset hardships.
- B. Mounting solar panels on the roof of the home will also not hurt the natural habitat and natural aesthetic of the surrounding property, as would the installation of a ground mounted array system would cause. The steepness of the property topography will cause a ground mounted system to disturb the property in a negative way by needing to have tree and bush coverage removed that would be in the way. A ground mounted system would also be more visible to the adjacent lots. The location of this property to the neighbors will also allow for the array to be less visible to neighbors on adjacent lots that are lower than this residence. The street

- view approaching the house is also lower than the planned location of the solar panels and therefore less visible from passing traffic. Homeowner is prepared to provide surveying diagrams to show that allowable disturbances have been met and therefore this property will not allow for more.
- C. Solar tiles are not a viable option as they are a far less effective product. This would increase the amount of space needed to install the same amount of power for the residence, increasing any visual impact. Because of the nature of the design of solar tiles, they do not allow for proper airflow between the tile and the roof structure. This can pose as a safety hazard to the home, especially in the Arizona heat, due to electrical failure and damage to the roof. In order for the system to be the same amount of offset for the homeowners, the system would need to be sized much larger, which would create negative visual affects to the surrounding hillside property.

4. "The special circumstances, hardship or difficulty applicable to the property are [not] self-imposed by the property owner, or predecessor..."

- A. A certain amount of energy is needed for the residence to operate in a manner that is considered reasonable and normal. This requirement is by nature of the residence and not through the intentional actions of the owners outside of normal power consumption of living in the residence.
- B. There are no flat roof areas at this location, therefore tilted arrays are the only option available for a roof mounted solar system. The solar panels will not cause any additional disturbances to the surrounding hillside and will utilize existing tilted roof surfaces.

5. Because of special circumstances applicable to the property, including its size, shape, topography, location, or surroundings, the strict application of the Zoning Ordinance will deprive such property of privileges enjoyed by other property of the same classification in the same zoning district."

- A. As stated before, the property doesn't contain any flat roof surfaces that can be utilized for solar array installation. It is also not possible to utilize screening devices as it would negatively impact the aesthetic of the home but also negatively impact the production of the solar arrays to a degree that would make them ineffective at providing sufficient power generation. Ground mounting a system will also negatively impact the natural desert habitat of the property, since the property is located on uneven topography.
- B. The owners are seeking an installation that is similar to that of other houses within the Hillside community. This will allow them to enjoy similar privileges as others within the same zoning areas.

6. The variance would not "constitute a grant of special privilege inconsistent with the limitations upon other properties in the vicinity and zone in which such

property is located.”

A: The request will not violate the primary purpose of the Hillside ordinance. The installation will occur in a manner that will maintain the aesthetic appeal of the property and not inhibit views to the hillside, while making sure not to harm any surrounding natural habitats. It is the plan for the installation to not keep trucks or dumpsters overnight and will removed all trucks and trailers each day. Therefore this variance is not granting a special privilege that is inconsistent with the existing zoning limitations for the area.

Johnson/ Barnier Residence: 4141 E. Keim Dr. Paradise Valley AZ, 85253

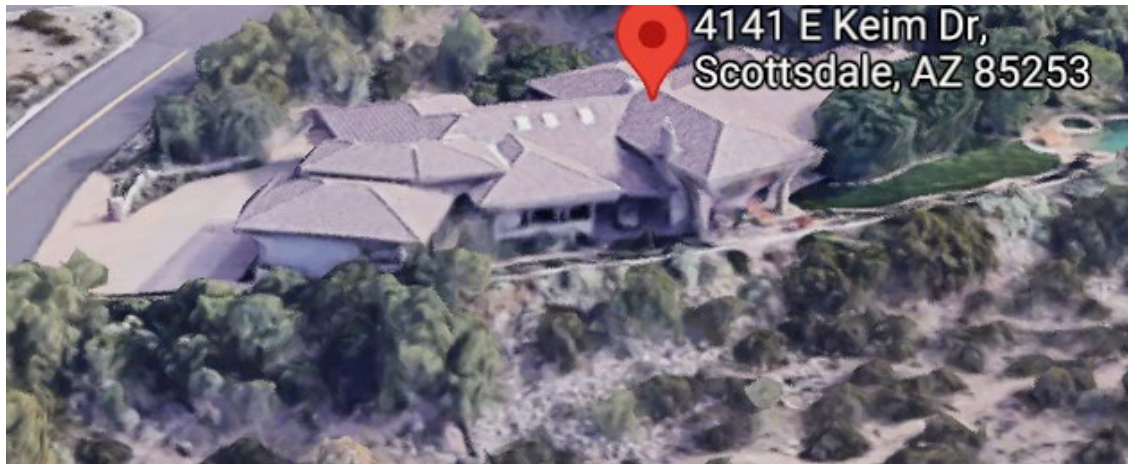
Property has natural vegetation which increases the aesthetic view of the hillside location.



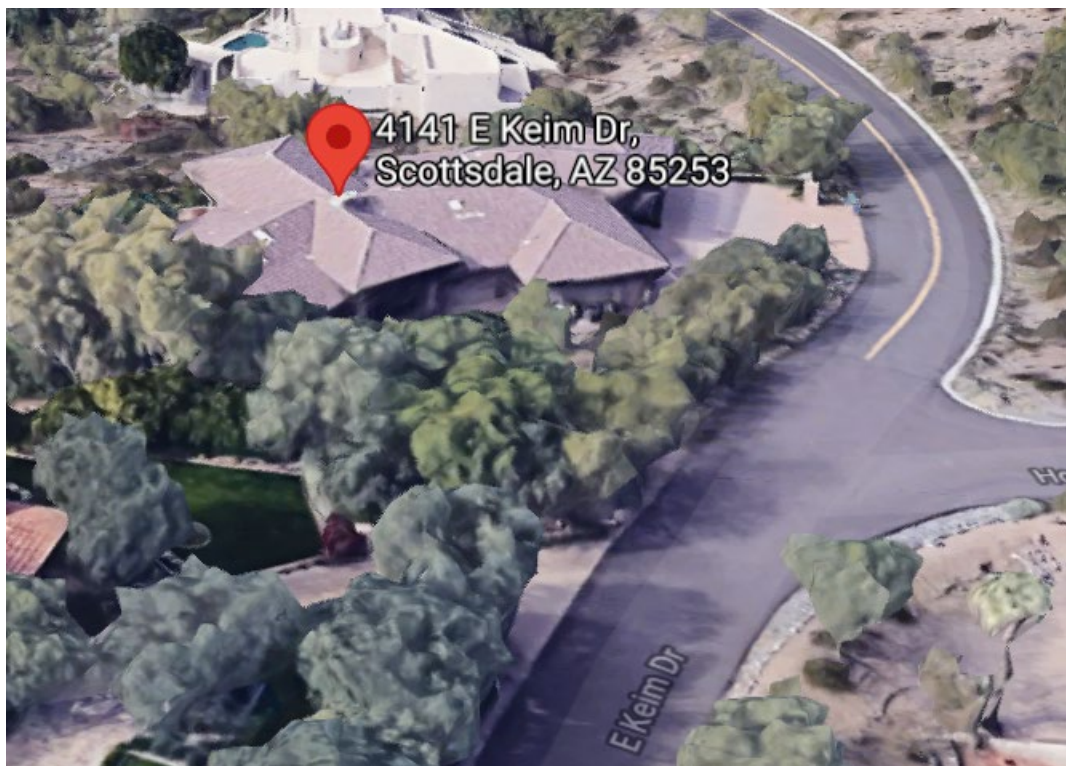
View from north: This view shows that there is natural vegetation that will shield arrays from neighboring property. Property is also located above neighboring house, which will help to shield array from their view.



View from the West:



View from the east:

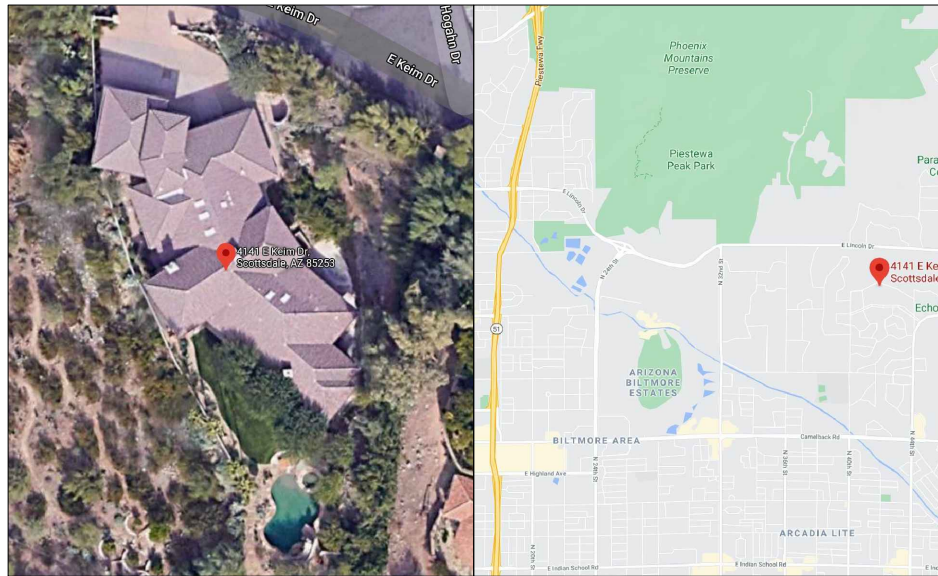


View from the south:



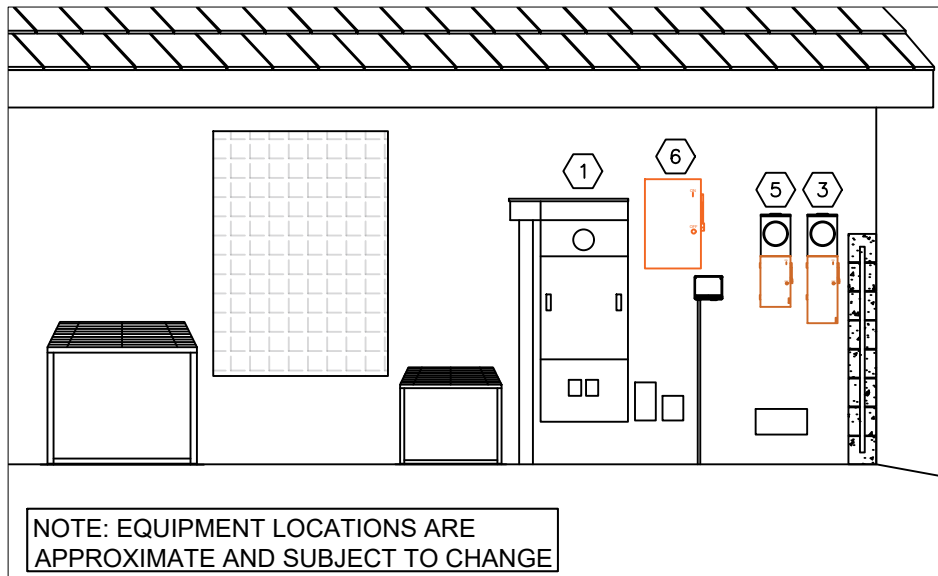
Equipment locations:



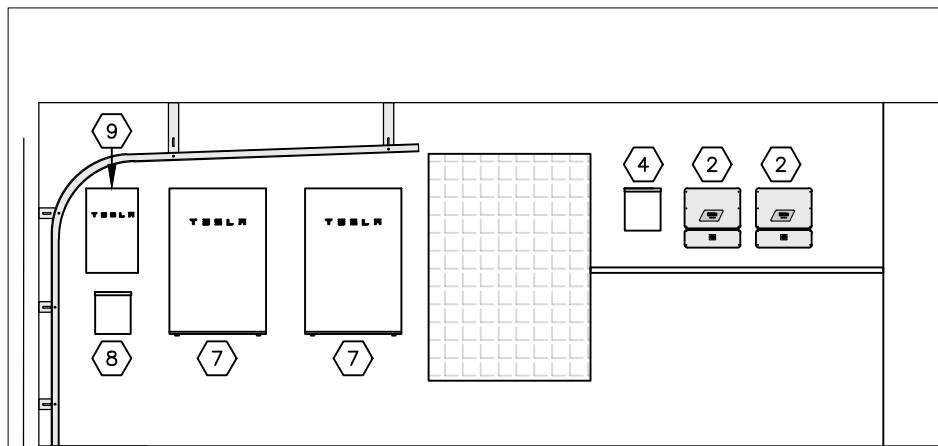


AERIAL VIEW

SITE LOCATION

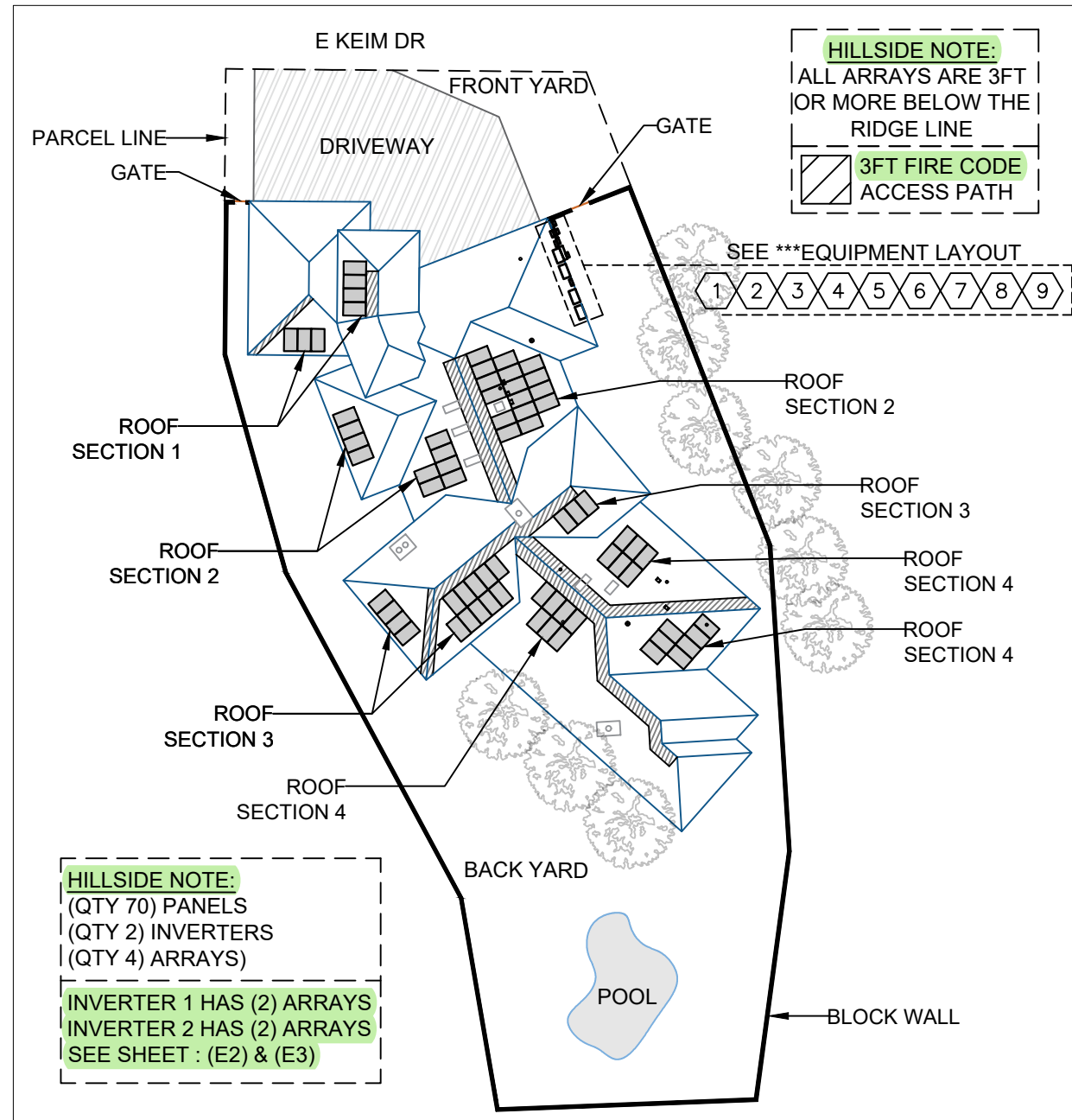


BACKYARD - ***EQUIPMENT LAYOUT



NOTE: EQUIPMENT LOCATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE

GARAGE - ***EQUIPMENT LAYOUT

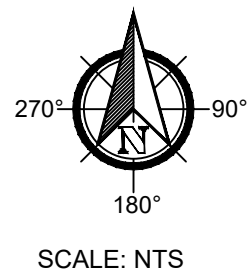


SITE PLAN

ROOF SECTION 1: FLAT-TILE AZIMUTH: 180 & 270 PITCH : 18
ROOF SECTION 2: FLAT-TILE AZIMUTH: 70 & 250 PITCH : 18
ROOF SECTION 3: FLAT-TILE AZIMUTH: 140 & 230 PITCH : 18
ROOF SECTION 4: FLAT-TILE AZIMUTH: 42 & 125 & 215 PITCH : 18

SOLAR MODULES
3FT FIRE CODE ACCESS PATH
ROOF LEGEND
GAS VENT
T-TOP VENT
VENT

PARCEL INFO
PARCEL #: 169-22-040
SQUARE FOOTAGE: 5,146
CONST. YEAR: 1989



NOTE:

1. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
2. WORKSPACE IN FRONT OF THE AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH SRP & NEC REQUIREMENTS. FOR SRP REQUIREMENTS, REFERENCE SRP E.S.S.
3. REFERENCE SRP E.S.S FOR ELECTRIC METER SEPARATION BETWEEN WATER & GAS.

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

SCOPE OF WORK

TO INSTALL A PHOTOVOLTAIC (PV) SYSTEM AT THE
Johnson, Julie Residence

LOCATED AT

4141 E Keim Dr
Paradise Valley , AZ 85253

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 - SRP

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 FUSE PULLOUTS and UTILITY REVENUE METER
- 2 (NEW) INVERTER WITH INTEGRATED DC DISCONNECT MOUNTED IN GARAGE
- 3 (NEW) DEDICATED PV SYSTEM KWH METER and UTILITY DISCONNECT SWITCH
- 4 (NEW) PV SYSTEM COMBINER PANEL MOUNTED IN GARAGE
- 5 (NEW) DER STORAGE KWH METER and UTILITY DISCONNECT SWITCH
- 6 (NEW) DER SYSTEM UTILITY DISCONNECT SWITCH (FUSED)
- 7 (NEW) TESLA POWER WALL 2 ENERGY STORAGE SYSTEM MOUNTED IN GARAGE
- 8 (NEW) STORAGE SYSTEM COMBINER PANEL MOUNTED IN GARAGE
- 9 (NEW) TESLA GATEWAY 2 AUTOMATIC ISOLATION SWITCH (WITH INTERNAL BUSSING) MOUNTED IN GARAGE

EQUIPMENT SUMMARY

70	Silfab SIL-330-BL
70	SolarEdge Power Optimizer P340
02	SolarEdge SE-7,600H-US
02	MILBANK, 100A, METER BASE
01	EATON, 100A, DG223URB
01	EATON, 60A, DG222URB
02	EATON, 125A, BR48L125RP
01	EATON, 200A, DG224NRK (FUSED)
02	TESLA POWERWALL 2
01	TESLA GATEWAY 2 (WITH INTERNAL BUSSING)

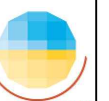
SHEET:
PV1

DATE:
9/11/2021

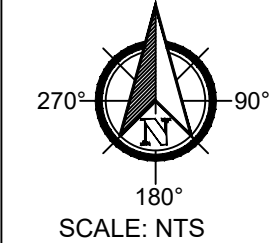
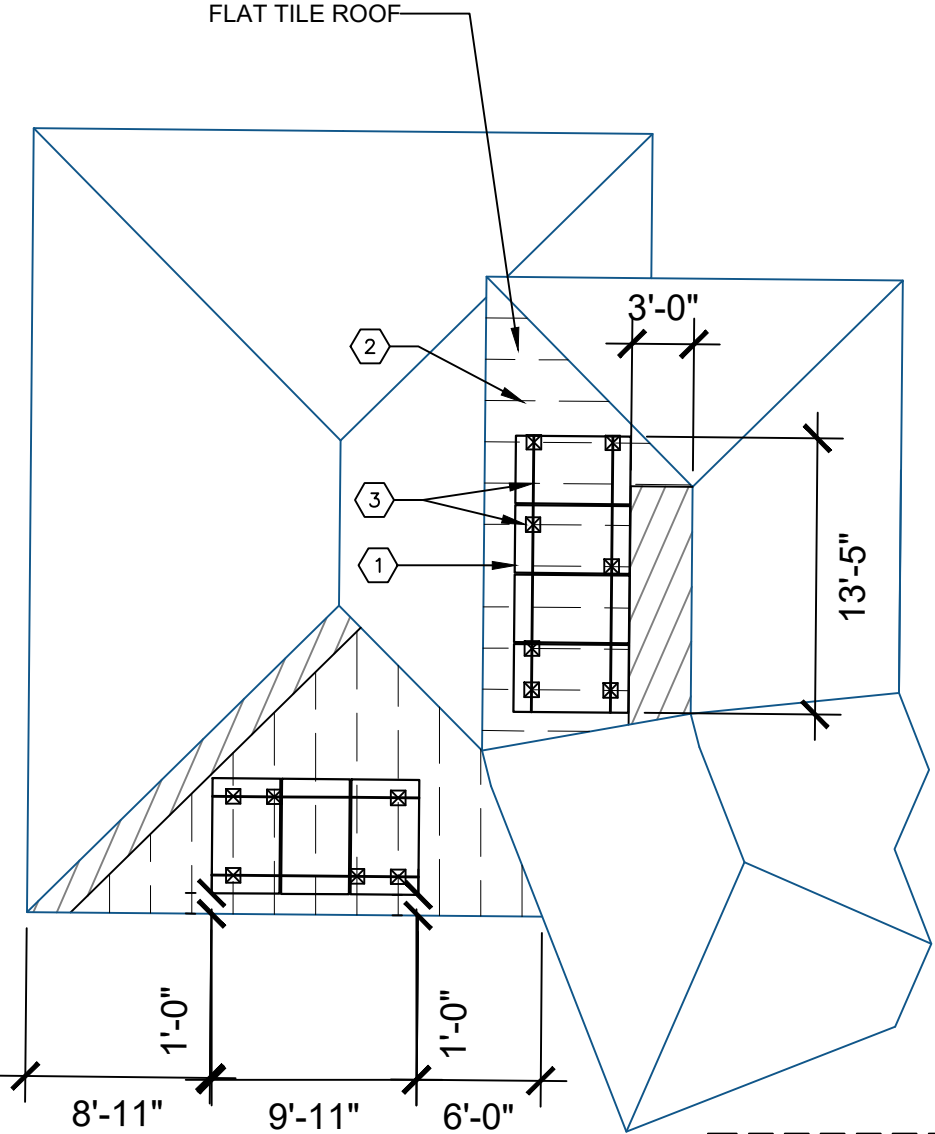
Revision: 0
Designer: Brian Hoffa

TITLE: SITE PLAN 15,200 kW-AC
Johnson, Julie Residence 23,100 W-DC
4141 E Keim Dr, Paradise Valley , AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St, Chandler, AZ 85225
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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. NEC ARTICLE 690.31(A) AND (B) EXCEPTION

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

HILLSIDE NOTE:
ALL ARRAYS ARE 3FT OR MORE BELOW THE RIDGE LINE

3FT FIRE CODE ACCESS PATH

3FT FIRE CODE ACCESS PATH

ROOF SECTION 1: FLAT-TILE
AZIMUTH: 180 & 270
PITCH: 18

ROOF LEGEND

- ⊗ GAS VENT
- ⊠ T-TOP VENT
- VENT

ROOF PLAN NOTES:

- 1 (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 18DEG PITCH
- 2 2" x 4" TRUSS @ 24" O.C.
- 3 RACKING INFORMATION – FLAT TILE
 - EVEREST MOUNTING RAIL
 - QUICKMOUNT – TILE HOOK
 - TRUSS SPACING = 24" O.C.
 - PENETRATION POINTS = 6' SPACING
 - MOUNTING DETAIL

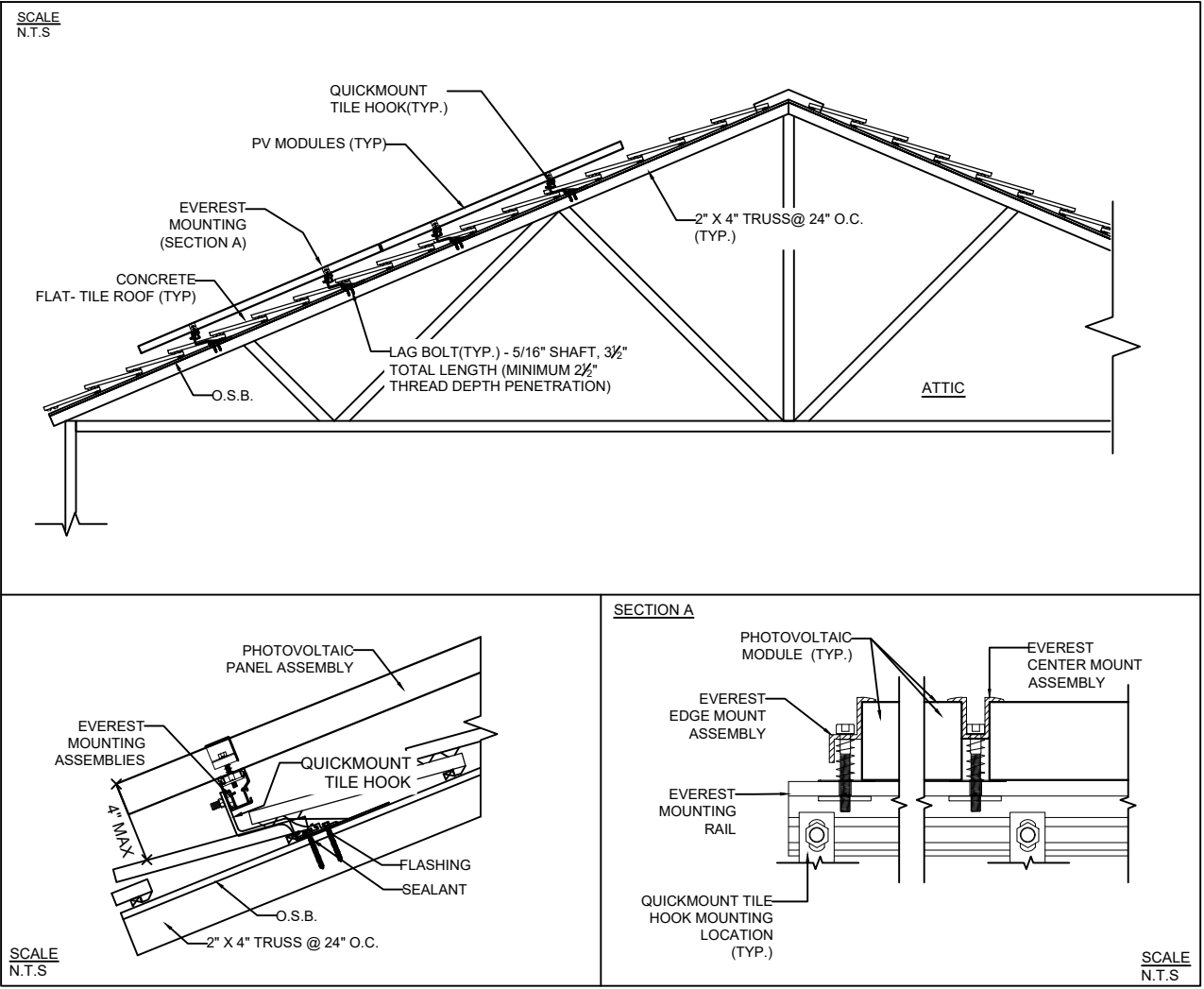
ROOF 1 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.1 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH

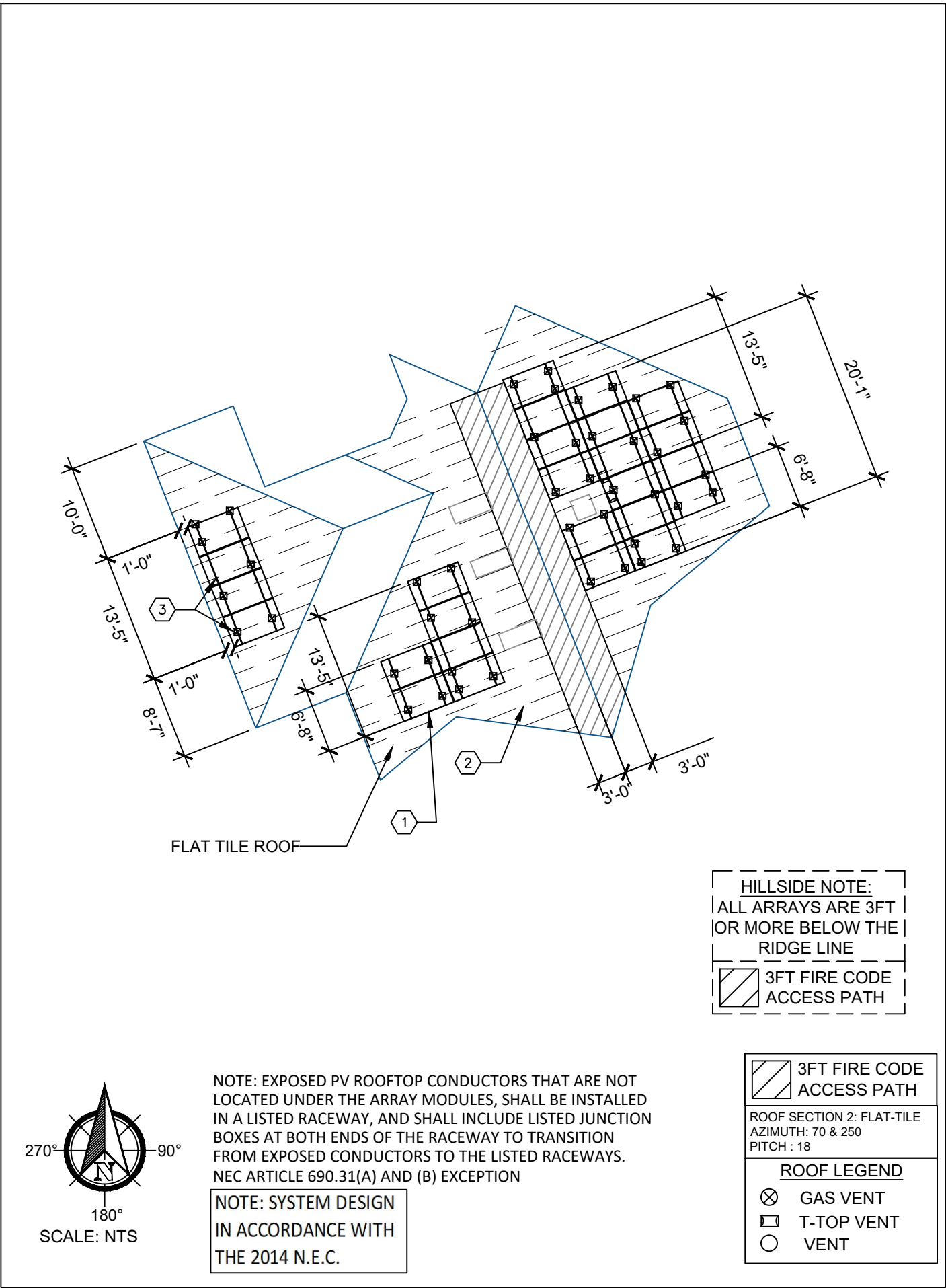
STRUCTURAL NOTES:

- 1) TOTAL ASSEMBLY WEIGHT: 328.1 LBS
- 2) TOTAL AREA COVERED BY MODULES: 134.4 FT2
- 3) DEAD LOAD = 328.1 / 134.4 = 2.4 LBS/FT2
- 4) POINT LOAD CALCULATIONS [# OF POINTS (13)] - 25.2 lb/point
- 5) TOTAL DESIGN LOAD (DOWNFORCE) = 13.8 psf
- 6) TOTAL DESIGN LOAD (UPFORCE) = -28.7 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



ROOF PLAN



ROOF PLAN NOTES:

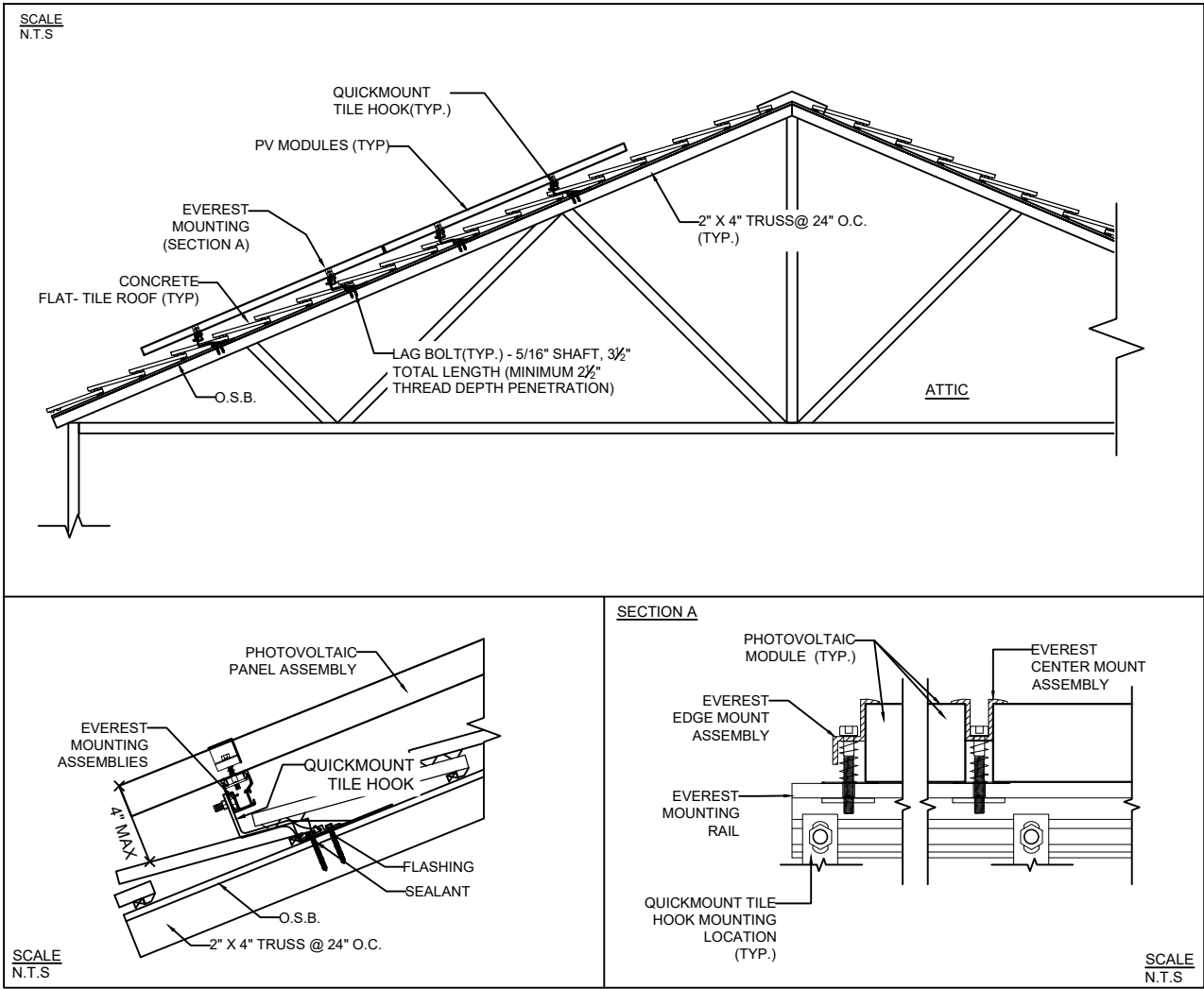
- 1 (NEW) PHOTOVOLTAIC PANEL
ARRAY MOUNTED FLUSH TO
ROOF WITH 18DEG PITCH
- 2 2" x 4" TRUSS @ 24" O.C.
- 3 RACKING INFORMATION – FLAT TILE
 - EVEREST MOUNTING RAIL
 - QUICKMOUNT – TILE HOOK
 - TRUSS SPACING = 24" O.C.
 - PENETRATION POINTS = 6' SPACING
 - MOUNTING DETAIL

ROOF 2 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.1 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH

STRUCTURAL NOTES:
1) TOTAL ASSEMBLY WEIGHT: 1218.5 LBS
2) TOTAL AREA COVERED BY MODULES: 499.2 FT²
3) DEAD LOAD = 1218.5 / 499.2 = 2.4 LBS/FT²
4) POINT LOAD CALCULATIONS [# OF POINTS (45)] - 27.1 lb/point
5) TOTAL DESIGN LOAD (DOWNFORCE) = 13.8 psf
6) TOTAL DESIGN LOAD (UPFORCE) = -28.7 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:
PV3

DATE:
9/11/2021

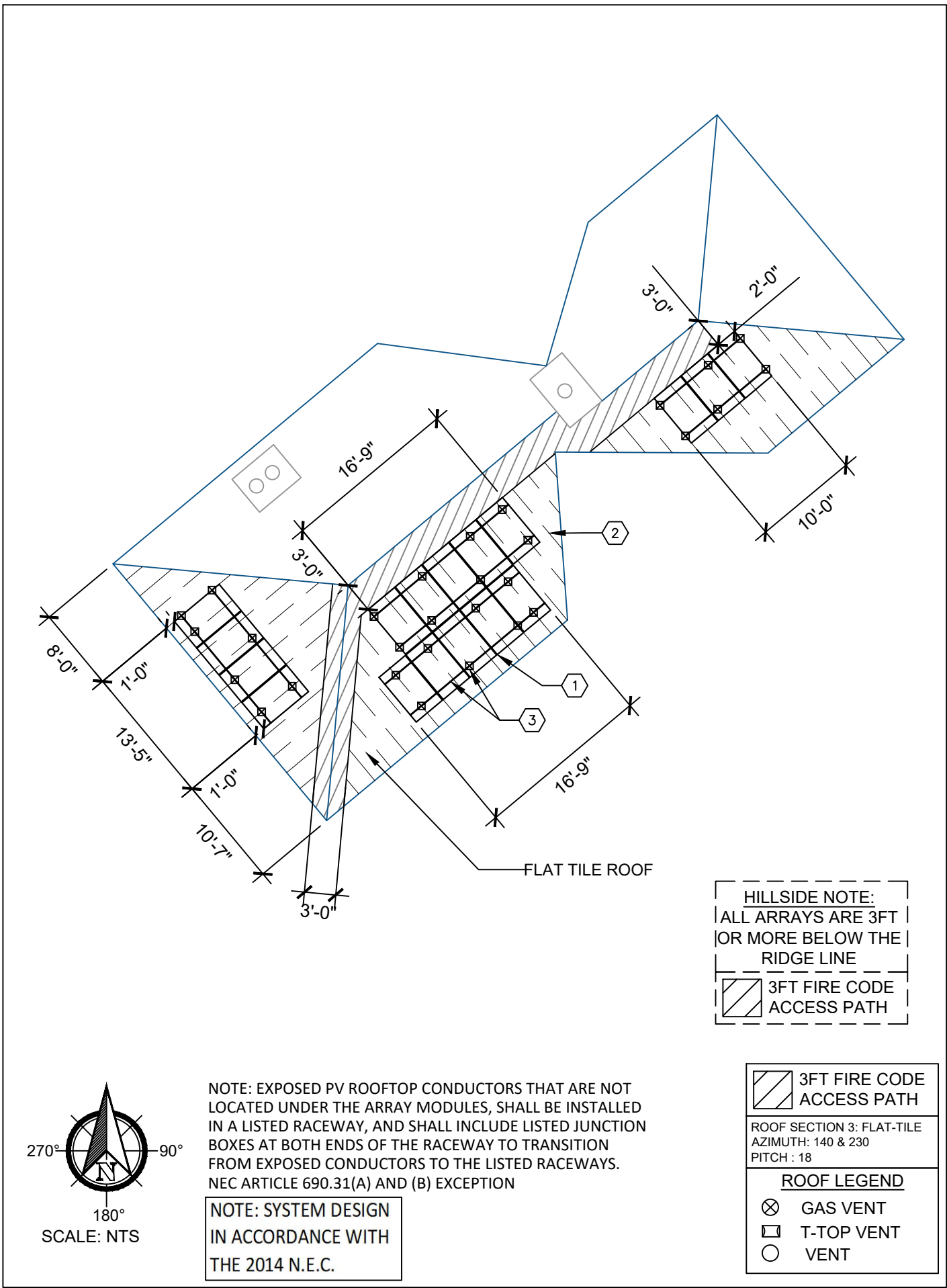
Revision: 0
Designer: Brian Hoffa

TITLE: ROOF PLAN 15.200 kW-AC
Johnson, Julie Residence 23,100 W-DC
4141 E Keim Dr, Paradise Valley, AZ 85253

Sun Valley Solar Solutions LLC
3225 N Colorado St, Chandler, AZ 85225
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www.sunvalleysolar.com



ROOF PLAN



ROOF PLAN NOTES:

- (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 18DEG PITCH
- 2" x 4" TRUSS @ 24" O.C.
- RACKING INFORMATION – FLAT TILE
 - EVEREST MOUNTING RAIL
 - QUICKMOUNT – TILE HOOK
 - TRUSS SPACING = 24" O.C.
 - PENETRATION POINTS = 6' SPACING
 - MOUNTING DETAIL

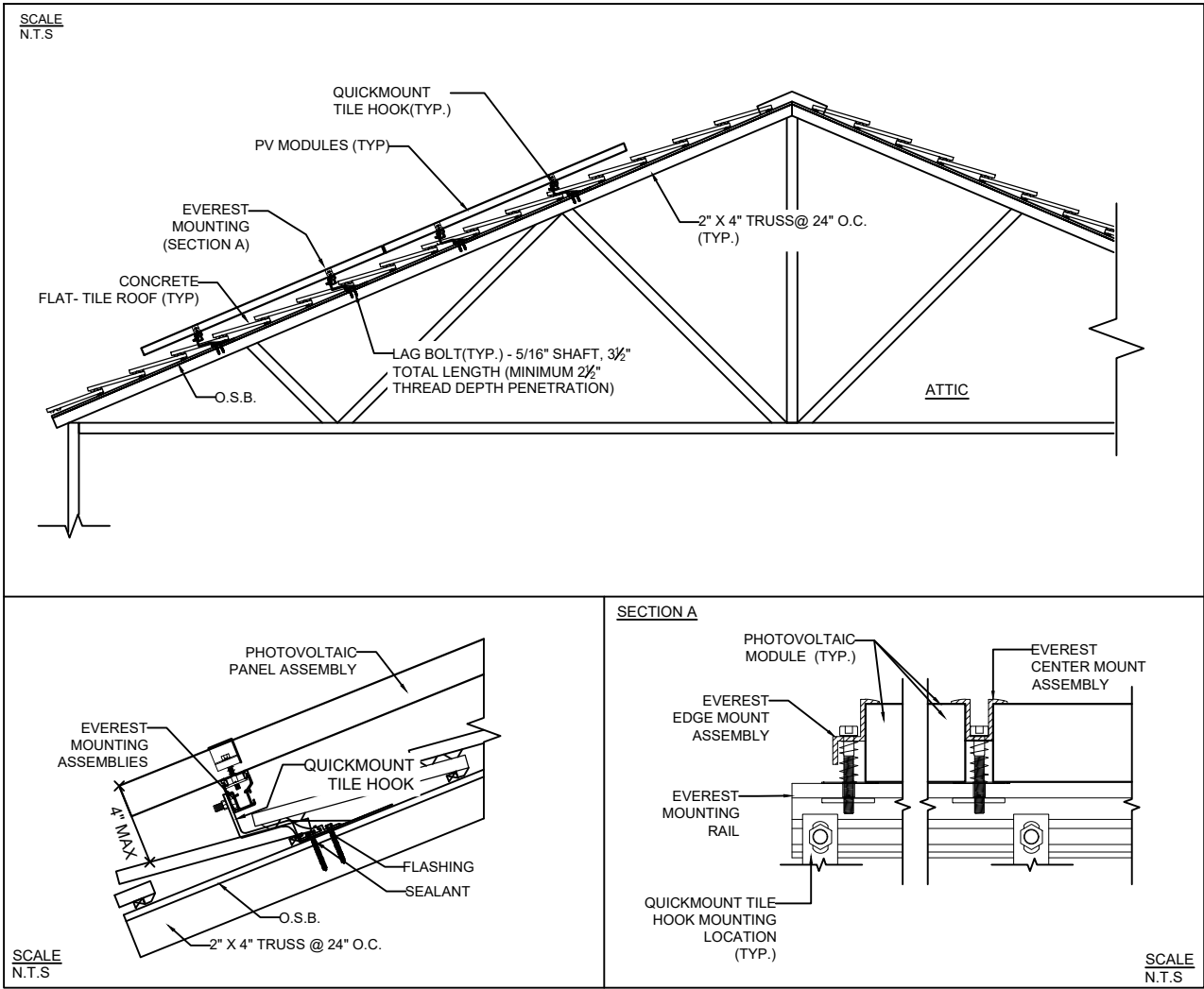
ROOF 3 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.1 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH

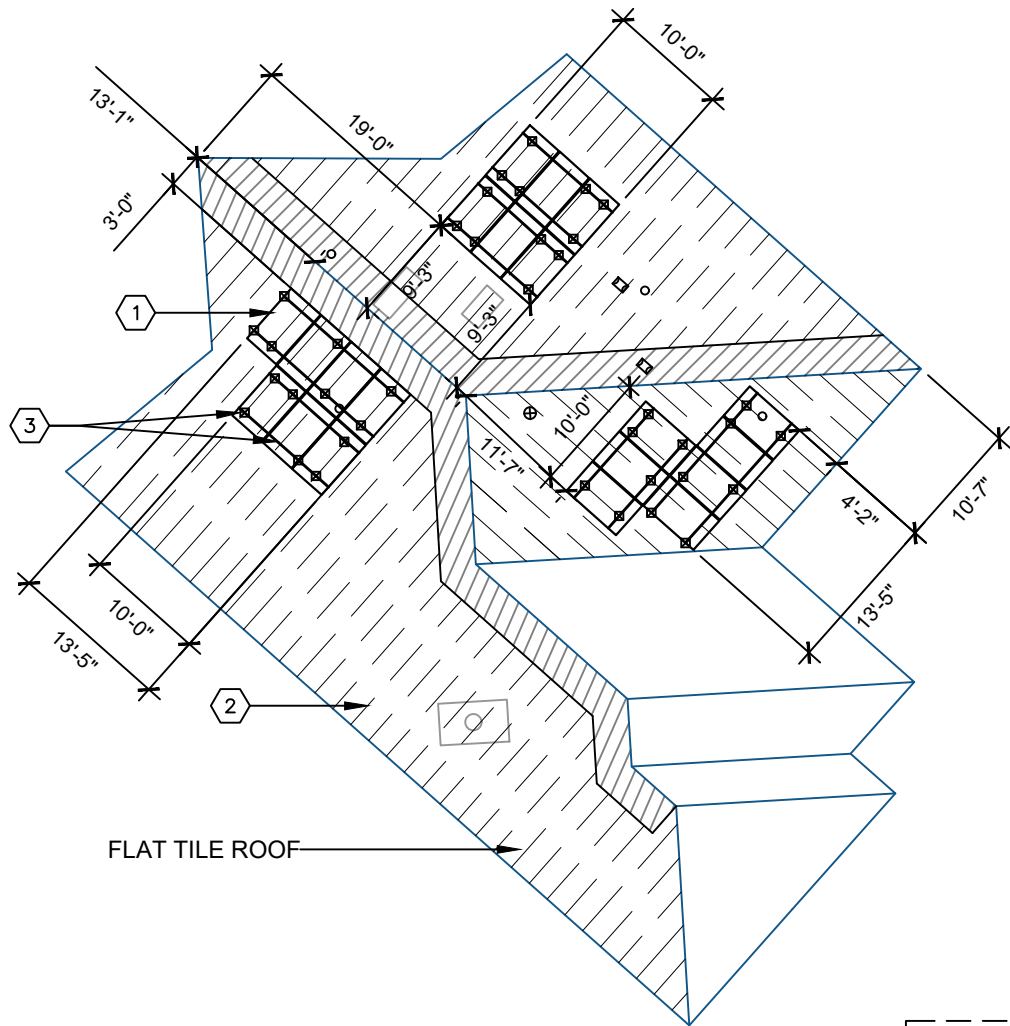
STRUCTURAL NOTES:

- 1) TOTAL ASSEMBLY WEIGHT: 796.7 LBS
- 2) TOTAL AREA COVERED BY MODULES: 326.4 FT²
- 3) DEAD LOAD = 796.7 / 326.4 = 2.4 LBS/FT²
- 4) POINT LOAD CALCULATIONS [# OF POINTS (29)] - 27.5 lb/point
- 5) TOTAL DESIGN LOAD (DOWNFORCE) = 13.8 psf
- 6) TOTAL DESIGN LOAD (UPFORCE) = -28.7 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



ROOF PLAN



HILLSIDE NOTE:
ALL ARRAYS ARE 3FT
OR MORE BELOW THE
RIDGE LINE

3FT FIRE CODE
ACCESS PATH

3FT FIRE CODE
ACCESS PATH

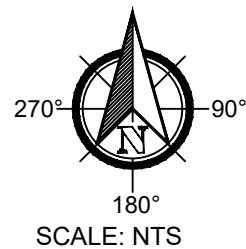
ROOF SECTION 4: FLAT-TILE
AZIMUTH: 42 & 125 & 215
PITCH : 18

ROOF LEGEND

- ⊗ GAS VENT
- ⊠ T-TOP VENT
- VENT

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. NEC ARTICLE 690.31(A) AND (B) EXCEPTION

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



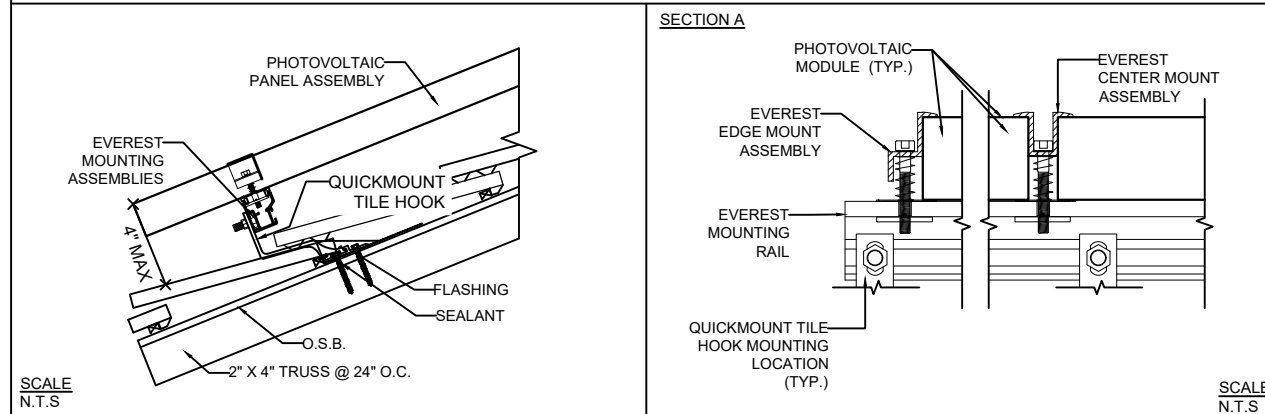
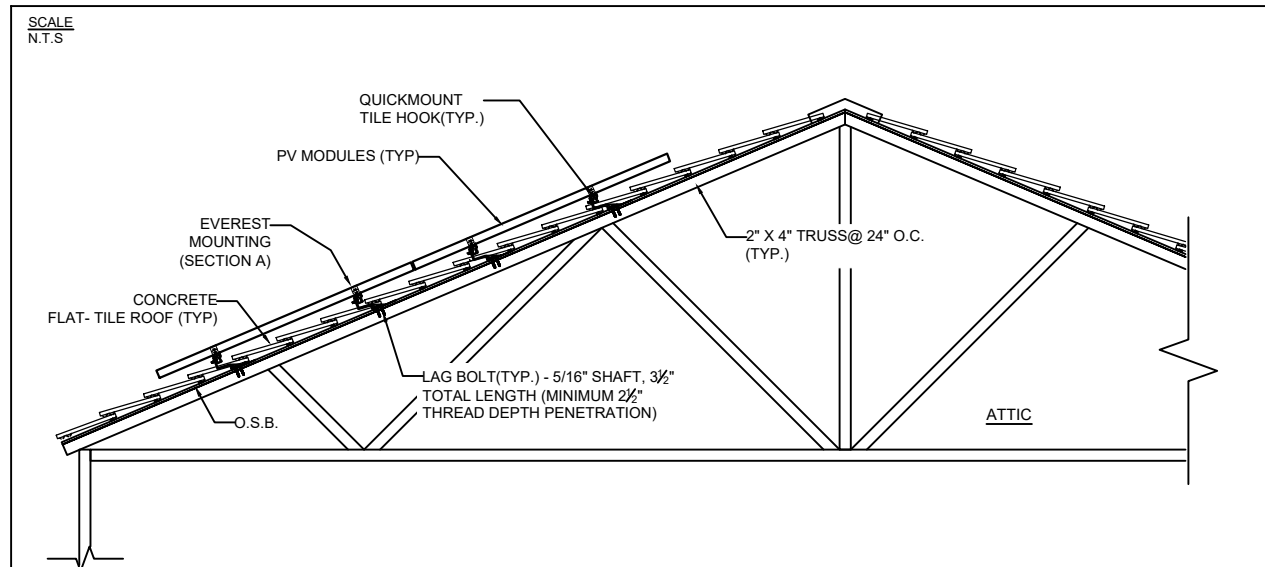
ROOF PLAN NOTES:

- 1 (NEW) PHOTOVOLTAIC PANEL ARRAY MOUNTED FLUSH TO ROOF WITH 18DEG PITCH
- 2 2" x 4" TRUSS @ 24" O.C.
- 3 RACKING INFORMATION – FLAT TILE
 - EVEREST MOUNTING RAIL
 - QUICKMOUNT – TILE HOOK
 - TRUSS SPACING = 24" O.C.
 - PENETRATION POINTS = 6' SPACING
 - MOUNTING DETAIL

ROOF 4 CALCULATIONS:

DESIGN PER ASCE 7-10 2.4.1 & IBC 2015
SOLAR MODULE WEIGHT = 40.1 LBS.
EXPOSURE CATEGORY = B
BASIC WIND SPEED = 115 MPH
STRUCTURAL NOTES:
1) TOTAL ASSEMBLY WEIGHT: 937.3 LBS
2) TOTAL AREA COVERED BY MODULES: 384.0 FT2
3) DEAD LOAD = 937.3 / 384.0 = 2.4 LBS/FT2
4) POINT LOAD CALCULATIONS [# OF POINTS (38)] - 24.7 lb/point
5) TOTAL DESIGN LOAD (DOWNFORCE) = 13.8 psf
6) TOTAL DESIGN LOAD (UPFORCE) = -28.7 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



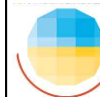
SHEET:
PV5

DATE:
9/11/2021

Revision: 0
Designer: Brian Hoffa

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Module: Silfab Solar SIL-330-BL

Pmax: 330 W
Voc: 42.24 VDC
Vmp: 34.72 VDC
Imp: 9.51 Amp
Isc: 9.83 Amp
Low Amb Temp (C): -9
Avg High Temp (C): 42

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

SYSTEM LABEL 690.53 - [ARRAY 1]

RATED MAX. POWER-POINT CURRENT (Imp): 14.85 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

SYSTEM LABEL 690.53 - [ARRAY 2]

RATED MAX. POWER-POINT CURRENT (Imp): 14.03 Adc
 RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
 MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
 MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

SRP LABELS

- ① UTILITY AC DISCONNECT SWITCH
- ③ DER METER DISCONNECT SWITCH
- ④ DEDICATED DER METER
- ⑦ OVERCURRENT PROTECTION DEVICE
- ⑧ DER STORAGE DISCONNECT SWITCH
- ⑨ DER STORAGE METER

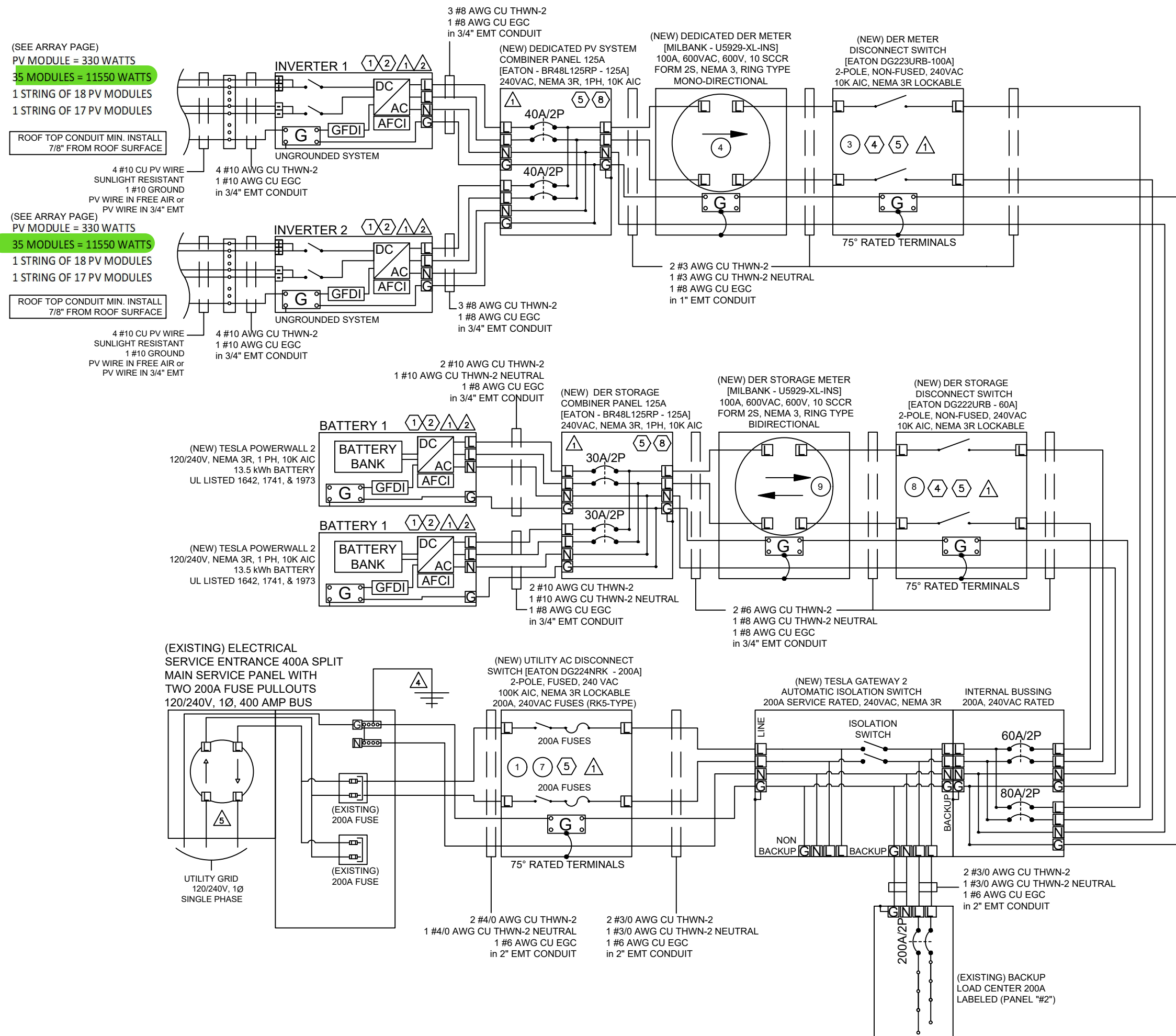
NOTE: SEE LABEL PAGE FOR DIMENSIONS

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

SEE SHEET E1-A FOR
CONSTRUCTION LABELING

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

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



SHEET:
E1

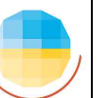
DATE: 6/7/2021

Revision: 0

Designer: Brian Hotta

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MODULE INFO

Module: Silfab Solar SIL-330-BL
Pmax: 330 W
Voc: 42.24 VDC
Vmp: 34.72 VDC
Imp: 9.51 Amp
Isc: 9.83 Amp
Low Amb Temp (C): -9
Avg High Temp (C): 42

INVERTER 1 & 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

INVERTER 1 & 2 - ARRAY 1 INFO

SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 14.85 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

INVERTER 1 & 2 - ARRAY 2 INFO

SYSTEM LABEL 690.53 - [ARRAY 2]
RATED MAX. POWER-POINT CURRENT (Imp): 14.03 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

SRP LABELS

- 1 UTILITY AC DISCONNECT SWITCH
- 3 DER METER DISCONNECT SWITCH
- 4 DEDICATED DER METER
- 7 OVERCURRENT PROTECTION DEVICE
- 8 DER STORAGE DISCONNECT SWITCH
- 9 DER STORAGE METER

NOTE: SEE LABEL PAGE FOR DIMENSIONS

SEE SHEET E1-A FOR
CONSTRUCTION LABELING

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)

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 PHOTOVOLATIC 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 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



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

TITLE: 3-LINE 15,200 kW-AC
Johnson, Julie Residence 23,100 W-DC
4141 E Keim Dr, Paradise Valley , AZ 85253

Revision: 0
Designer: Brian Hoffa

DATE:
4/13/2021

SHEET:
E1-A

INVERTER 1

PV MODULE = 330 WATTS
35 MODULES = 11550 WATTS
1 STRING OF 18 PV MODULES
1 STRING OF 17 PV MODULES

MODULE INFO
Module: Silfab Solar SIL-330-BL
Pmax: 330 W
Voc: 42.24 VDC
Vmp: 34.72 VDC
Imp: 9.51 Amp
Isc: 9.83 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

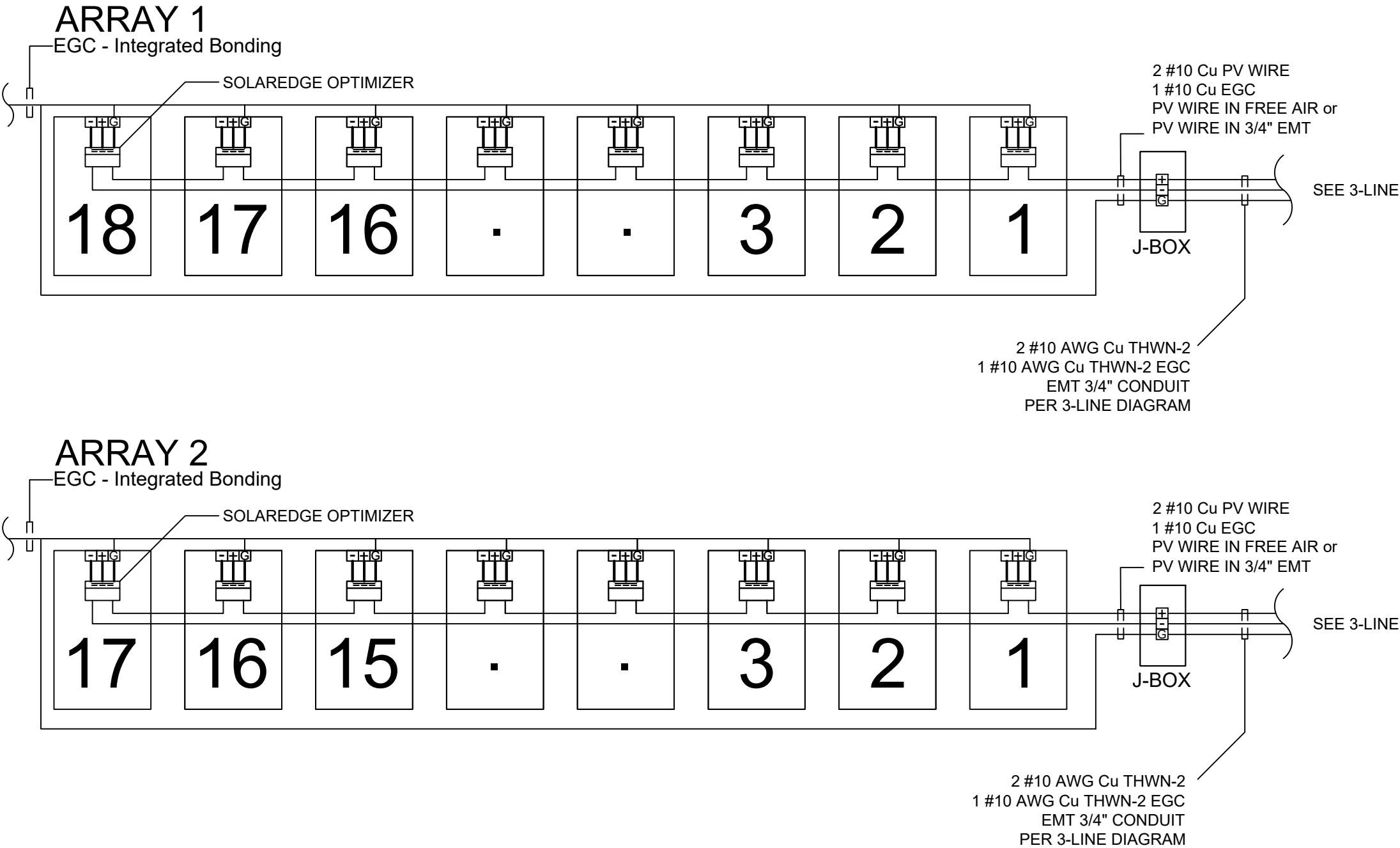
ARRAY 1 INFO
SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 14.85 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

ARRAY 2 INFO
SYSTEM LABEL 690.53 - [ARRAY 2]
RATED MAX. POWER-POINT CURRENT (Imp): 14.03 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

OPTIMIZER INFO
SolarEdge Optimizer P340
Rated DC Input Power - 340W
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 - 6000W

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

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



- 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



INVERTER 2

PV MODULE = 330 WATTS
35 MODULES = 11550 WATTS
1 STRING OF 18 PV MODULES
1 STRING OF 17 PV MODULES

MODULE INFO
Module: Silfab Solar SIL-330-BL
Pmax: 330 W
Voc: 42.24 VDC
Vmp: 34.72 VDC
Imp: 9.51 Amp
Isc: 9.83 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

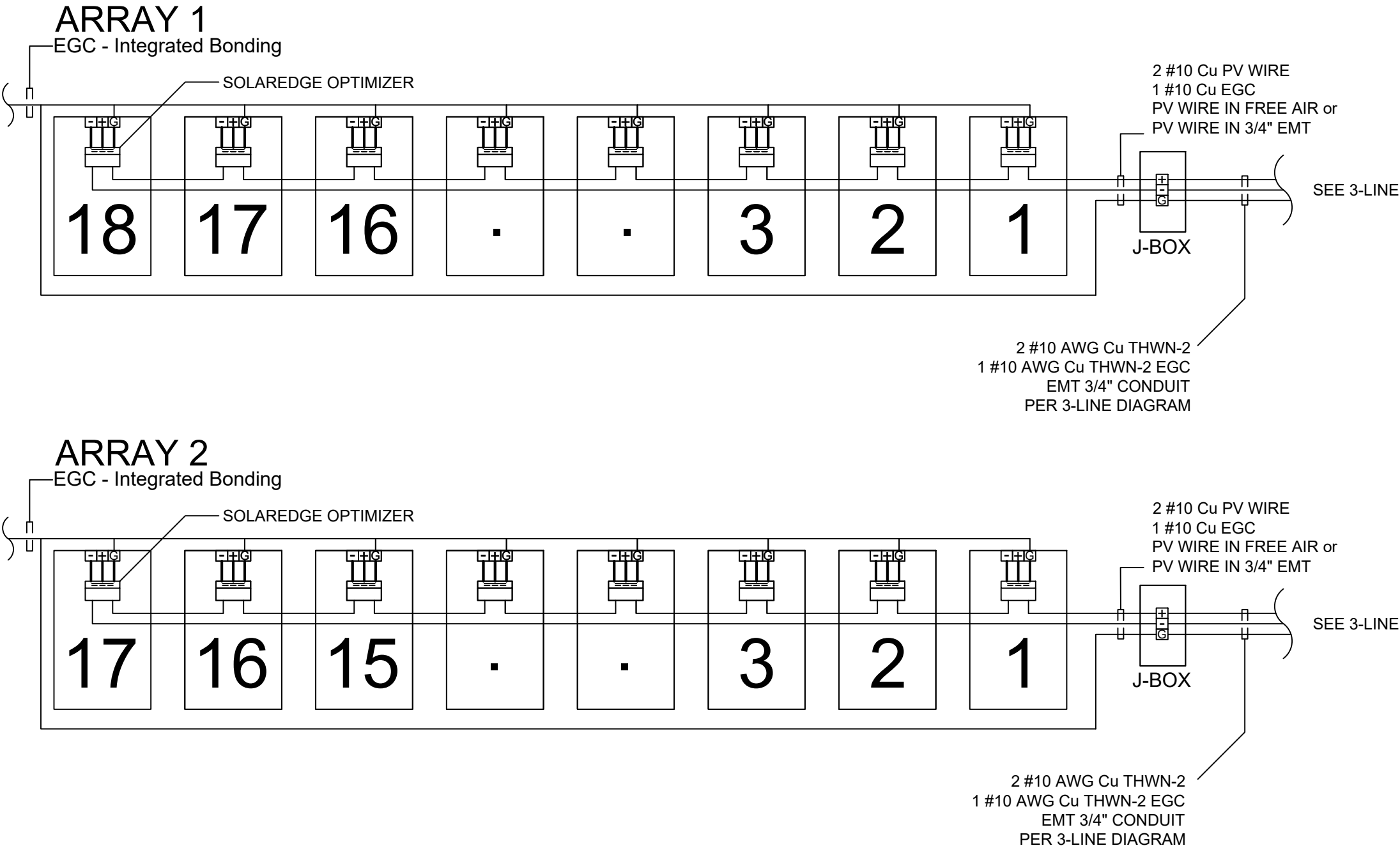
ARRAY 1 INFO
SYSTEM LABEL 690.53 - [ARRAY 1]
RATED MAX. POWER-POINT CURRENT (Imp): 14.85 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

ARRAY 2 INFO
SYSTEM LABEL 690.53 - [ARRAY 2]
RATED MAX. POWER-POINT CURRENT (Imp): 14.03 Adc
RATED MAX. POWER-POINT VOLTAGE (Vmp): 400 Vdc
MAXIMUM SYSTEM VOLTAGE (Voc): 480 Vdc
MAXIMUM SYSTEM CURRENT (Isc): 15 Adc per String

OPTIMIZER INFO
SolarEdge Optimizer P340
Rated DC Input Power - 340W
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 - 6000W

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

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



- 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



STRING DIAGRAM

INVERTER 1 = SE-7,600H-US

1 STRING OF 18

1 STRING OF 17

INVERTER 2 = SE-7,600H-US

1 STRING OF 18

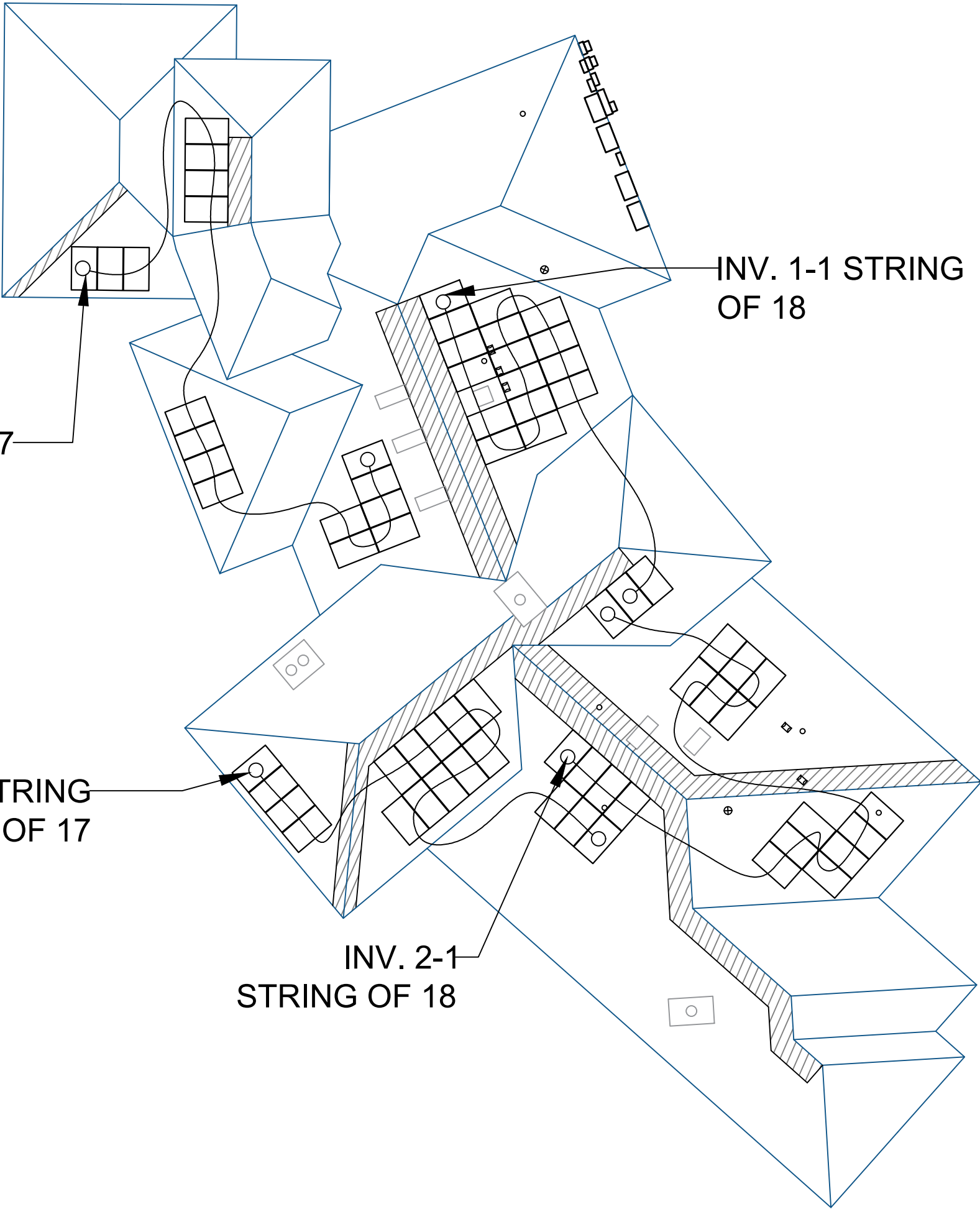
1 STRING OF 17

INV. 1-1 STRING OF 17

INV. 2-1 STRING OF 17

INV. 2-1 STRING OF 18

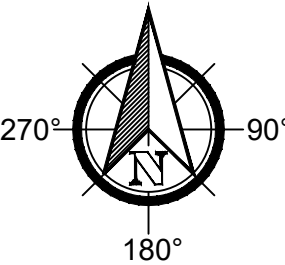
INV. 1-1 STRING OF 18



ROOF LEGEND

- ⊗ GAS VENT
- ▢ T-TOP VENT
- VENT

3FT FIRE CODE ACCESS PATH



SYSTEM EQUIPMENT TAG LIST

REQ'D BY: NEC 690.5 (C)
APPLY TO: TRANSFORMERLESS
INVERTERS / DC J-BOX / DC
DISCONNECTS
RED WITH WHITE 3/8 LETTERS

REQ'D BY: NEC 690.54
APPLY TO: AC PANEL
BLACK WITH WHITE 3/8 LETTERS

REQ'D BY:
APPLY TO: PV KWH METER
BLACK WITH WHITE 3/8 LETTERS

REQ'D BY: NEC 690.14(C)(2)
APPLY TO: AC DISCONNECT
BLACK WITH WHITE 3/8 LETTERS

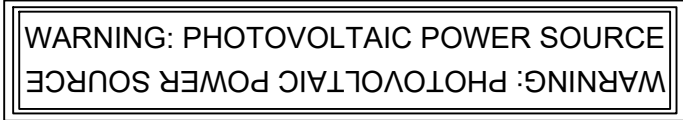
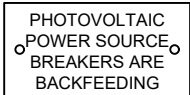
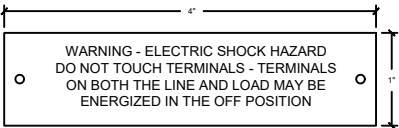
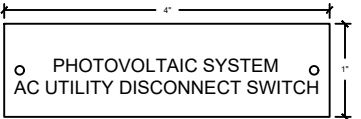
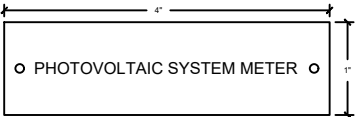
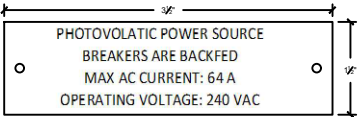
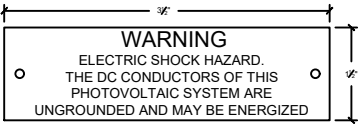
REQ'D BY: NEC 690.17
APPLY TO: DISCONNECT,
COMBINER PANELS
RED WITH WHITE 3/8 LETETRS

REQ'D BY:
APPLY TO: DEAD FRONT
BLACK WITH WHITE 3/8 LETTERS

REQ'D BY: IFC 605.11.1.1 -605.11.1.4
NEC 690.31 (E)(3)

- LABEL WITH CAPITALIZED LETTERS
MINIMUM HEIGHT 3/8 INCH WHITE
LETTERS ON RED BACKGROUND
- LABEL MUST BE REFLECTIVE AND
WEATHER RESISTANT
- LABEL PLACED ON INTERIOR AND
EXTERIOR DC CONDUIT,
RACEWAYS, ENCLOSURES AND
CABLE ASSEMBLIES EVERY 10 FEET,
WITHIN 1 FOOT OF TURNS OR
BENDS AND WITHIN 1 FOOT ABOVE
AND BELOW PENETRATIONS OF
ROOF/CELINGS ASSEMBLIES, WALL
OR BARRIERS.

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



REQ'D BY: NEC 705.12 (D)(2)
APPLY TO: ABOVE MAIN BREAKER
BLACK WITH WHITE 3/8 LETTERS

REQ'D BY: UTILITY & NEC 2014 - 705.10
APPLY TO:
RED WITH WHITE 3/8 LETTERS

REQ'D BY:
APPLY TO: FRONT COMBINER PANEL
BLACK WITH WHITE 3/8 LETTERS

REQ'D BY: SUN VALLEY SOLAR
APPLY TO: INVERTERS
BLUE WITH WHITE 3/8 LETTERS

REQ'D BY : NEC 2017 - 690.56(c)
The title "SOLAR PV SYSTEM IS EQUIPPED WITH RAPID
SHUTDOWN" shall utilize capitalized characters with a minimum
height of 9.5 mm (3/8 in.) in black on yellow background, and the
remaining characters shall be capitalized with a minimum height of
4.8 mm (3/16 in.) in black on white background.

REQ'D BY: SRP
APPLY TO: UTILITY AC DISCONNECT SWITCH

REQ'D BY: SRP
APPLY TO: DER METER DISCONNECT SWITCH

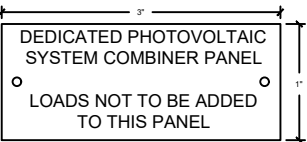
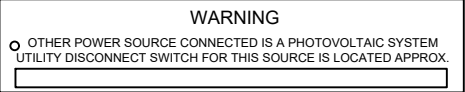
REQ'D BY: SRP
APPLY TO: DEDICATED DER METER

REQ'D BY: SRP
APPLY TO: OVERCURRENT PROTECTION DEVICE

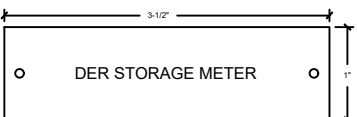
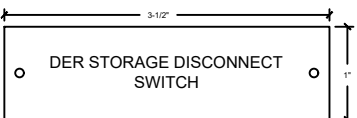
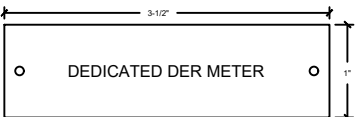
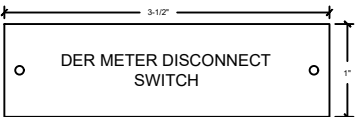
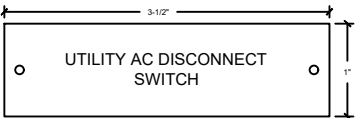
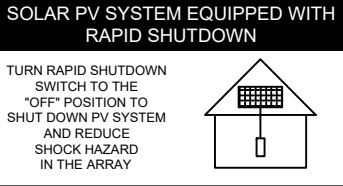
REQ'D BY: SRP
APPLY TO: DER STORAGE DISCONNECT SWITCH

REQ'D BY: SRP
APPLY TO: DER STORAGE METER

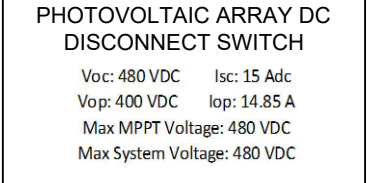
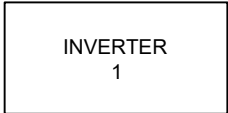
BREAKER HAS BEEN DE-RATED
PER NEC 705.12 (D)(2)



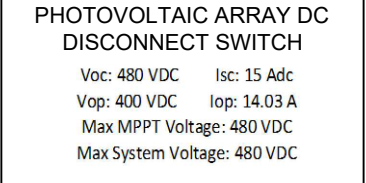
QUALITY INSTALLATION BY:
**SUN VALLEY SOLAR
SOLUTIONS**
3225 N Colorado St
Chandler, AZ 85225
PHONE: 1 888 5 SOLAR UP



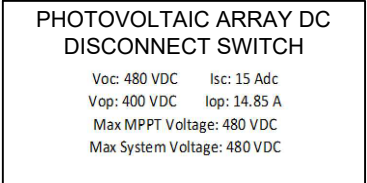
REQ'D BY: NEC 690.53
APPLY TO: DC DISCONNECT
BLACK WITH WHITE 3/8 LETTERS



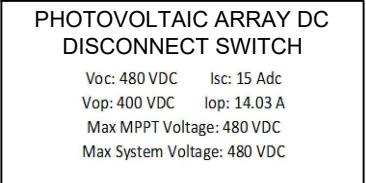
MPPT 1
STRING 1



MPPT 2
STRING 2



MPPT 1
STRING 1



MPPT 2
STRING 2

TITLE: LABELS - SAFETY 5.200 kW-AC
Johnson, Julie Residence 23,100 W-DC
4141 E Keim Dr, Paradise Valley , AZ 85253

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



SHEET:
L1

DATE:
4/13/2021

Revision: 0
Designer: Brian Hoffa

Notes:

-
-
-

Competent Person: _____

Crew Lead: _____

NEAREST HOSPITAL



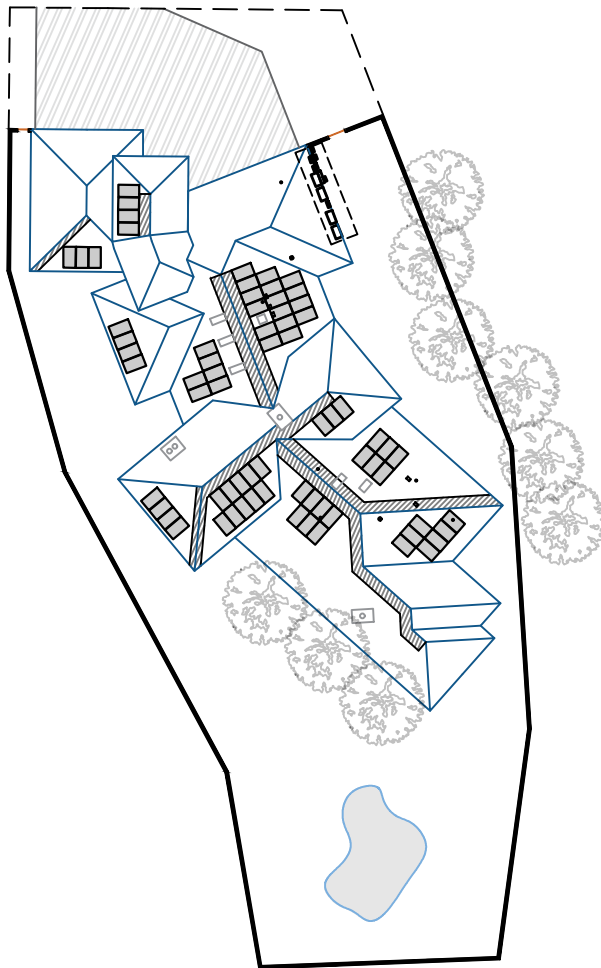
SHEET:
L1

DATE:
6/7/2021

Revision: 0
Designer: Brian Hoffa

TITLE: SAFETY PLAN 15,200 kW-AC
Johnson, Julie Residence 23,100 W-DC
4141 E Keim Dr, 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



REQUIRED PPE

- ☐ STEEL TOE BOOTS
- ☐ HARD HAT
- ☐ HARNESS/FALL PROTECTION
- ☐ SAFETY GLASSES
- ☐ GLOVES
- ☐ HIGH VOLTAGE GLOVES
- ELECTRICAL PPE CAT
- ☐ -0
- ☐ -1
- ☐ -2
- ☐ -3
- ☐ -4
- SPECIALTY

Mark Up Key

- (P) Permanent Anchor
- (T) Temporary Anchor
- (D) Warning Line Delineator
- (G) Guard Rail Stanchion
- [IL] Installer Ladder
- [AL] Auditor Ladder
- [CB] Combiner Box
- [SO] Stubout
- [X] SkyLight
- No Ladder Access
- [] Restricted Area
- [] Conduit

Installer Signatures:

Print

Signature

1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____

OSHA SECTIONS PURSUANT TO JOB TASKS:

- ☐ PPE & Life Saving Equip-1926 Subpart E
- ☐ Lifelines & Lanyards-1926.104
- ☐ Tools-Hand and Power-1926-Subpart I
- ☐ Toxic Substances-1926 Subpart Z
- ☐ Steel Erection- 1926 Subpart R
- ☐ Ladders-1926 Subpart X
- ☐ Fall Protection-1926 Subpart M
- ☐ Electrical-1926 Subpart K
- ☐ Excavation-1926 Subpart P
- ☐ First Aid & Medical-1926.23



BC Series SIL-330 BL



HIGH EFFICIENCY PREMIUM MONO-PERC PV MODULE Back Contact Technology



CHUBB®

* Chubb provides error and omission insurance to Silfab Solar Inc.

INDUSTRY LEADING WARRANTY

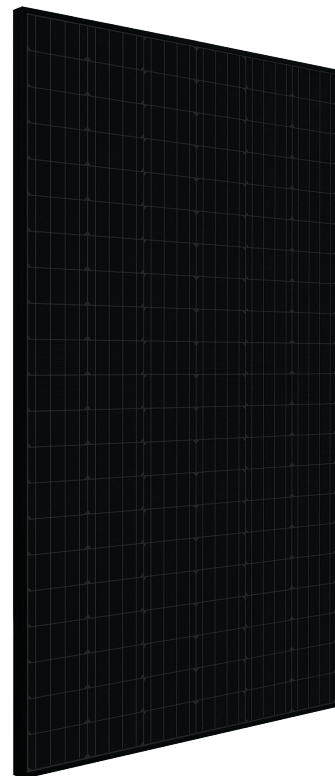
All our products include an industry leading 25-year product workmanship and 30-year performance warranty.

MAXIMUM ENERGY OUTPUT

Silfab BC Series utilizes next generation Back Contact technology to reduce production/manufacturing steps and improve quality while maximizing power. Ideal for residential and commercial projects where maximum power density is preferred.

NORTH AMERICAN QUALITY

Silfab is the leading automated solar module manufacturer in North America. Utilizing premium quality materials and strict quality control management to deliver the highest efficiency, premium quality PV modules 100% made in North America.



PROVIDES MAXIMUM EFFICIENCY

High-efficiency half-cut cells combined with a black conductive back-sheet resulting in a maximum power rating of 330Wp.

35+ YEARS OF SOLAR INNOVATION

Leveraging over 35+ years of worldwide experience in the solar industry, Silfab is dedicated to superior manufacturing processes and innovations such as Bifacial and Back Contact technologies to ensure our partners have the latest in solar innovation.

BAA / ARRA COMPLIANT

Silfab panels are designed and manufactured to meet Buy American Act Compliance. The US State Department, US Military and FAA have all utilized Silfab panels in their solar installations.

LIGHT AND DURABLE

Engineered to accommodate high wind load conditions for test loads validated up to 4000Pa uplift. The light-weight frame is exclusively designed for wide-ranging racking compatibility and durability.

QUALITY MATTERS

Total automation ensures strict quality controls during the entire manufacturing process at our ISO certified facilities.

DOMESTIC PRODUCTION

Silfab Solar manufactures PV modules in two automated locations within North America. Our 500+ North American team is ready to help our partners win the hearts and minds of customers, providing customer service and product delivery that is direct, efficient and local.

SUPERIOR POWER

Super power achieved through relocation of tabbing ribbon to reduce shading on module front service and circuit resistance.

AESTHETICALLY PLEASING

Sleek aesthetics from black cells to black back-sheet without tabbing or bus-bar ribbons, ideal for residential applications.

STABLE PERFORMANCE

Enhanced life-time performance through reduced thermal stresses and increased current flow paths.

PID RESISTANT

PID Resistant due to advanced cell technology and material selection. In accordance to IEC 62804-1.

Electrical Specifications		SIL-330 BL mono PERC MWT Technology	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	330	246.8
Maximum power voltage (Vpmax)	V	34.72	32.51
Maximum power current (Ipmax)	A	9.51	7.59
Open circuit voltage (Voc)	V	42.24	39.6
Short circuit current (Isc)	A	9.83	7.92
Module efficiency	%	19.4	18.14
Maximum system voltage (VDC)	V	1000	
Max series fuse rating	A	20	
Power Tolerance	Wp	0 to +10	
Measurement conditions: STC 1000 W/m² • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3% • Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10W.			
Temperature Ratings		SIL-330 BL mono PERC MWT Technology	
Temperature Coefficient Isc		+0.046 %/°C	
Temperature Coefficient Voc		-0.279 %/°C	
Temperature Coefficient Pmax		-0.377 %/°C	
NOCT (± 2°C)		43.5 °C	
Operating temperature		-40/+85 °C	
Mechanical Properties and Components		SIL-330 BL mono PERC MWT Technology	
		Metric	Imperial
Module weight		18.2 kg	40.1±0.4 lbs
Dimensions (H x L x D)		1700 mm x 1000 mm x 38 mm	66.9 in x 39.4 in x 1.5 in
Maximum surface load (wind/snow)*		4000 Pa rear load / 5400 Pa front load	83.5/112.8 lb/ft^2
Hail impact resistance		ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells		126 high-efficiency half-cut mono-PERC MWT c-Si cells	126 high-efficiency half-cut mono-PERC MWT c-Si cells
Glass		3.2 mm high transmittance, tempered, DSM anti-reflective coating	0.126 in high transmittance, tempered, DSM anti-reflective coating
Cables and connectors (refer to installation manual)		Positive (1000 mm), Negative (1500 mm), ø 5.7 mm, MC4 from Staubli	Positive (39.4 in), Negative (59 in), ø 0.22 in (12AWG), MC4 from Staubli
Backsheet		Multilayer, integrated insulation film and electrically conductive backsheet, superior hydrolysis and UV resistance, fluorine-free PV backsheet	
Frame		Anodized Aluminum (Black)	
Bypass diodes		3 diodes-30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box		UL 3730 Certified, IP67 rated	
Warranties		SIL-330 BL mono PERC MWT Technology	
Module product workmanship warranty		25 years**	
Linear power performance guarantee		30 years	
		≥ 97.1% end 1 st year	≥ 91.6% end 12 th year ≥ 85.1% end 25 th year ≥ 82.6% end 30 th year
Certifications		SIL-330 BL mono PERC MWT Technology	
Product		ULC ORD C1703, UL1703, CEC listed, UL 61215-1/-1-1/-2, UL 61730-1/-2, IEC 61215-1/-1-1/-2***, IEC 61730-1/-2***, CSA C22.2#61730-1/-2***, IEC 62716 Ammonia Corrosion; IEC61701:2011 Salt Mist Corrosion Certified, UL Fire Rating: Type 2	
Factory		ISO9001:2015	

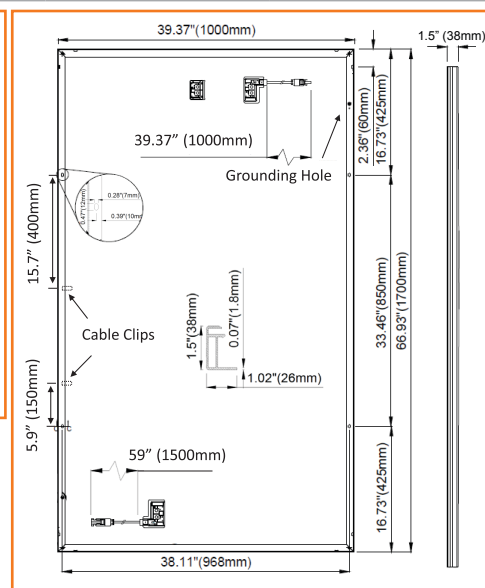
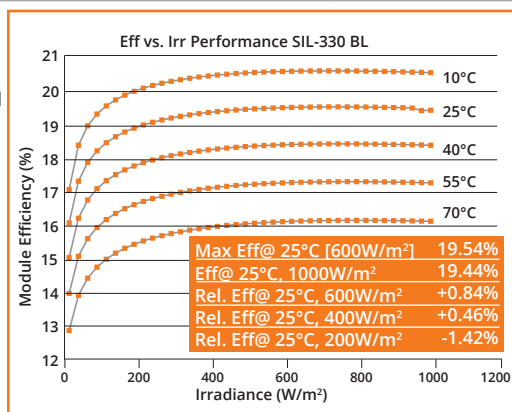
- Modules Per Pallet: 26
- Pallets Per Truck: 36
- Modules Per Truck: 936

*⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.

**12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at www.silfabsolar.com.

***Certification in progress. August 2020 expected completion date for IEC 61730/61215 and CSA C22.2#61730-1/-2.

Third-party generated pan files from Fraunhofer-Institute for Solar Energy Systems ISE are available for download at: www.silfabsolar.com/downloads



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Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /
SE7600H-US / SE10000H-US / SE11400H-US



Optimized installation with HD-Wave technology

- / Specifically designed to work with power optimizers
- / Record-breaking efficiency
- / Fixed voltage inverter for longer strings
- / Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- / UL1741 SA certified, for CPUC Rule 21 grid compliance
- / Extremely small
- / Built-in module-level monitoring
- / Outdoor and indoor installation
- / Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

/ Single Phase Inverter

with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /
SE7600H-US / SE10000H-US / SE11400H-US

SE3000H-US SE3800H-US SE5000H-US SE6000H-US SE7600H-US SE10000H-US SE11400H-US								
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 ⁽¹⁾							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k Ω Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional ⁽³⁾							
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect							
STANDARD COMPLIANCE								
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)							
Emissions	FCC Part 15 Class B							
INSTALLATION SPECIFICATIONS								
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG					1" Maximum /14-4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG					1" Maximum / 1-3 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174					21.3 x 14.6 x 7.3 / 540 x 370 x 185		in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4		26.2 / 11.9		38.8 / 17.6	lb / kg
Noise	< 25				<50			dBA
Cooling	Natural Convection							
Operating Temperature Range	-13 to +140 / -25 to +60 ⁽⁴⁾ (-40°F / -40°C option) ⁽⁵⁾							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

⁽¹⁾ For other regional settings please contact SolarEdge support

⁽²⁾ A higher current source may be used; the inverter will limit its input current to the values stated

⁽³⁾ Revenue grade inverter P/N: SExxxxH-US000NNC2

⁽⁴⁾ For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>

⁽⁵⁾ -40 version P/N: SExxxxH-US000NNU4

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

POWER OPTIMIZER



PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P505 (for higher current modules)	
INPUT									
Rated Input DC Power ⁽¹⁾	320	340	370	400		405	485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	60	125 ⁽²⁾		83 ⁽²⁾	Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	8-60	12.5 - 105		12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11			10.1	11.75	11		14	Adc
Maximum Efficiency	99.5								%
Weighted Efficiency	98.8							98.6	%
Overvoltage Category	II								
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)									
Maximum Output Current	15								Adc
Maximum Output Voltage	60					85			Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)									
Safety Output Voltage per Power Optimizer	1 ± 0.1								Vdc
STANDARD COMPLIANCE									
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3								
Safety	IEC62109-1 (class II safety), UL1741								
Material	UL94 V-0 , UV Resistant								
RoHS	Yes								
INSTALLATION SPECIFICATIONS									
Maximum Allowed System Voltage	1000								Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters								
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1			129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9		129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	630 / 1.4			750 / 1.7	655 / 1.5	845 / 1.9		1064 / 2.3	gr / lb
Input Connector	MC4 ⁽³⁾						Single or dual MC4 ⁽³⁾⁽⁴⁾	MC4 ⁽³⁾	
Input Wire Length	0.16 / 0.52								m / ft
Output Wire Type / Connector	Double Insulated / MC4								
Output Wire Length	0.9 / 2.95		1.2 / 3.9						m / ft
Operating Temperature Range ⁽⁵⁾	-40 - +85 / -40 - +185								°C / °F
Protection Rating	IP68 / NEMA6P								
Relative Humidity	0 - 100								%

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed

(2) NEC 2017 requires max input voltage be not more than 80V

(3) For other connector types please contact SolarEdge

(4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals.

(5) For ambient temperature above +85°C / +185°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter ⁽⁶⁾⁽⁷⁾	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401	8	10	18	
	P405, P485, P505	6	8	14	
Maximum String Length (Power Optimizers)		25	25	50 ⁽⁸⁾	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 ⁽⁹⁾	12750 ⁽¹⁰⁾	W
Parallel Strings of Different Lengths or Orientations	Yes				

(6) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf

(7) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string

(8) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

(9) For 208V grid: it is allowed to install up to 7,200W per string when the maximum power difference between each string is 1,000W

(10) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

POWERWALL

Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, time-based control, and backup.

Powerwall's electrical interface provides a simple connection to any home or building. Its revolutionary compact design achieves market-leading energy density and is easy to install, enabling owners to quickly realize the benefits of reliable, clean power.



PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240 V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Total Energy ¹	14 kWh
Usable Energy ¹	13.5 kWh
Real Power, max continuous ²	5 kW (charge and discharge)
Real Power, peak (10 s, off-grid/backup) ²	7 kW (charge and discharge)
Apparent Power, max continuous	5.8 kVA (charge and discharge)
Apparent Power, peak (10 s, off-grid/backup)	7.2 kVA (charge and discharge)
Maximum Supply Fault Current	10 kA
Maximum Output Fault Current	32 A
Overcurrent Protection Device	30 A
Imbalance for Split-Phase Loads	100%
Power Factor Output Range	+/- 1.0 adjustable
Power Factor Range (full-rated power)	+/- 0.85
Internal Battery DC Voltage	50 V
Round Trip Efficiency ^{1,3}	90%
Warranty	10 years

¹Values provided for 25°C (77°F), 3.3 kW charge/discharge power.

²In Backup mode, grid charge power is limited to 1.67 kW.

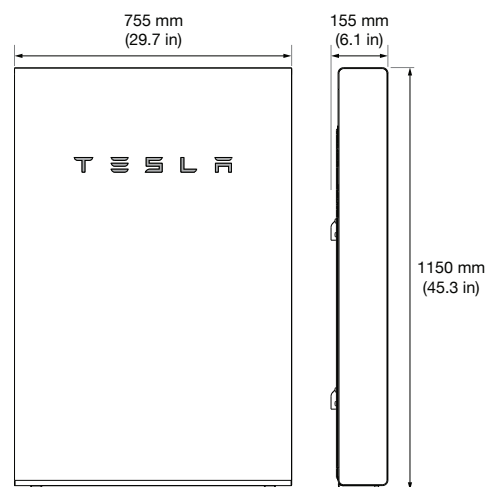
³AC to battery to AC, at beginning of life.

COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, UL 1973, UL 9540, IEEE 1547, UN 38.3
Grid Connection	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)

MECHANICAL SPECIFICATIONS

Dimensions	1150 mm x 755 mm x 155 mm (45.3 in x 29.7 in x 6.1 in)
Weight	125 kg (276 lbs)
Mounting options	Floor or wall mount

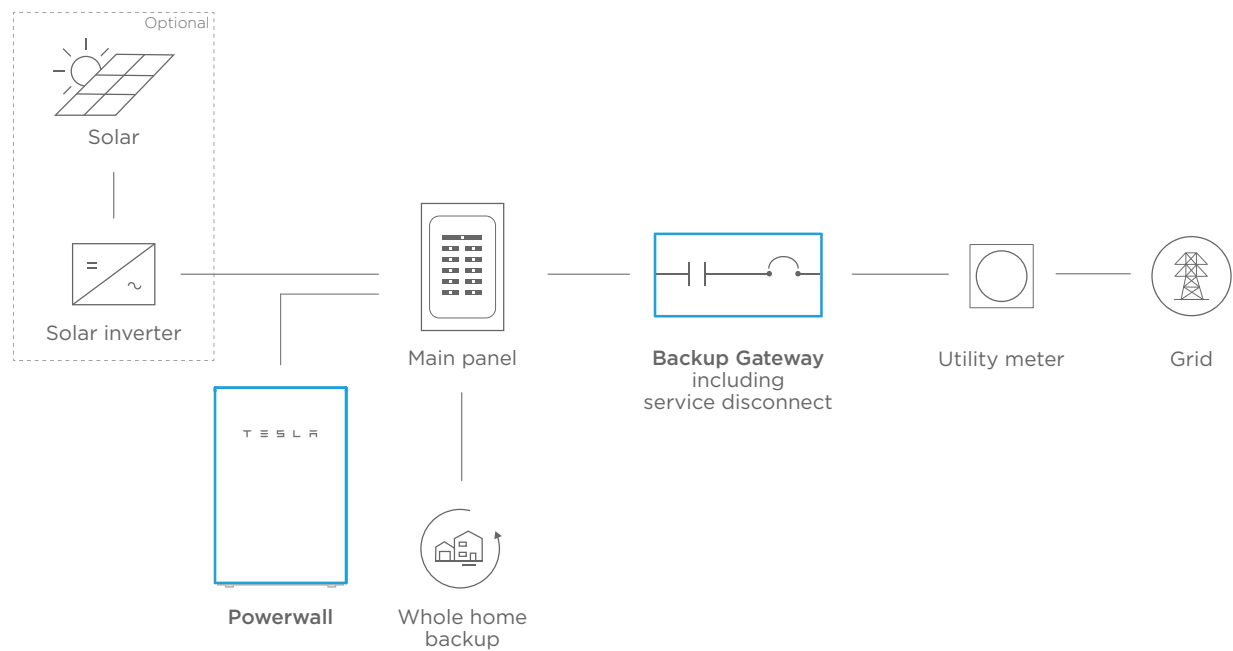


ENVIRONMENTAL SPECIFICATIONS

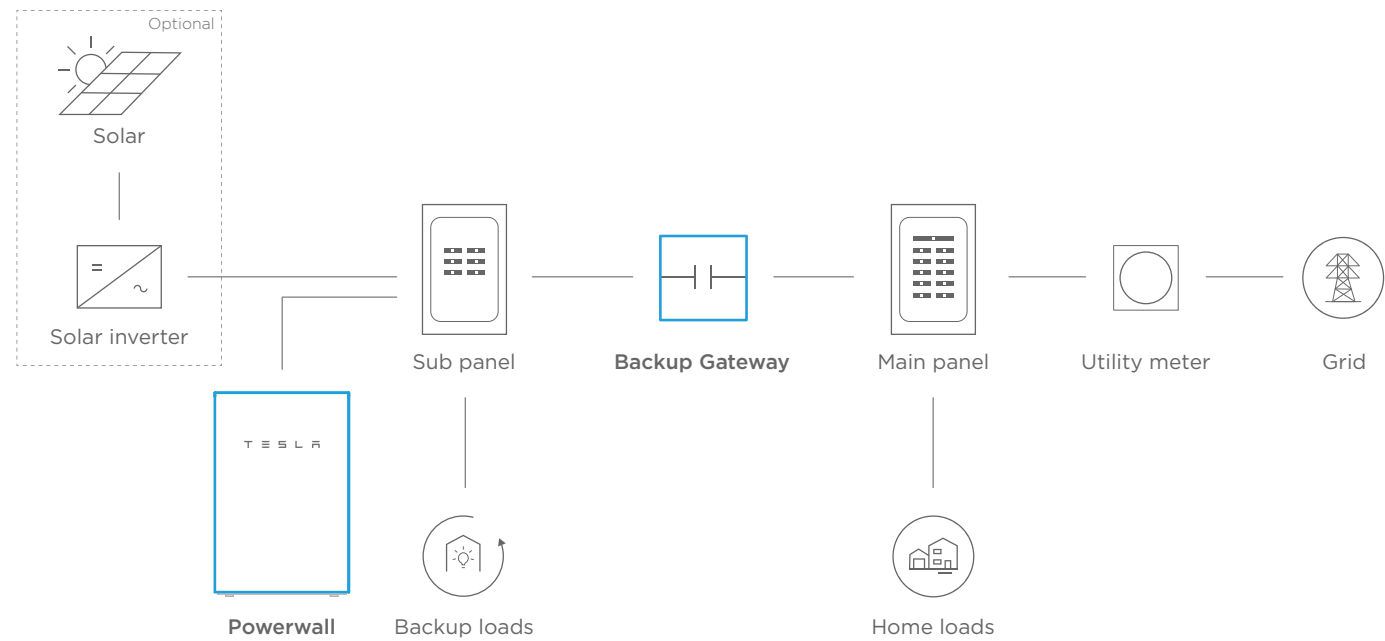
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Optimum Temperature	0°C to 30°C (32°F to 86°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	-20°C to 30°C (-4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP56 (Wiring Compartment)
Wet Location Rating	Yes
Noise Level @ 1m	< 40 dBA at 30°C (86°F)

TYPICAL SYSTEM LAYOUTS

WHOLE HOME BACKUP



PARTIAL HOME BACKUP



POWERWALL

Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Input Short Circuit Current	10 kA ¹
Overcurrent Protection Device	100-200A; Service Entrance Rated ¹
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.2 %)
Primary Connectivity	Ethernet, Wi-Fi
Secondary Connectivity	Cellular (3G, LTE/4G) ²
User Interface	Tesla App
Operating Modes	Support for solar self-consumption, time-based control, and backup
Backup Transition	Automatic disconnect for seamless backup
Modularity	Supports up to 10 AC-coupled Powerwalls
Optional Internal Panelboard	200A 6-space / 12 circuit Eaton BR Circuit Breakers
Warranty	10 years

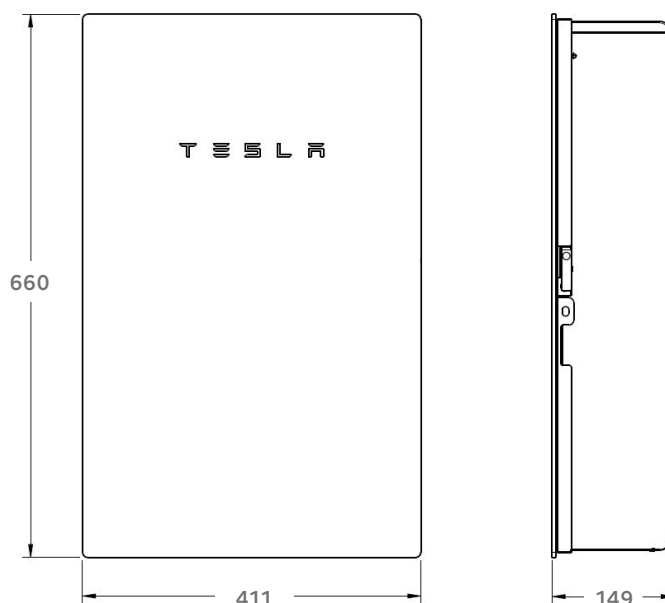
¹ When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.
² The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

COMPLIANCE INFORMATION

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
Emissions	FCC Part 15, ICES 003

MECHANICAL SPECIFICATIONS

Dimensions	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
Weight	20.4 kg (45 lb)
Mounting options	Wall mount, Semi-flush mount

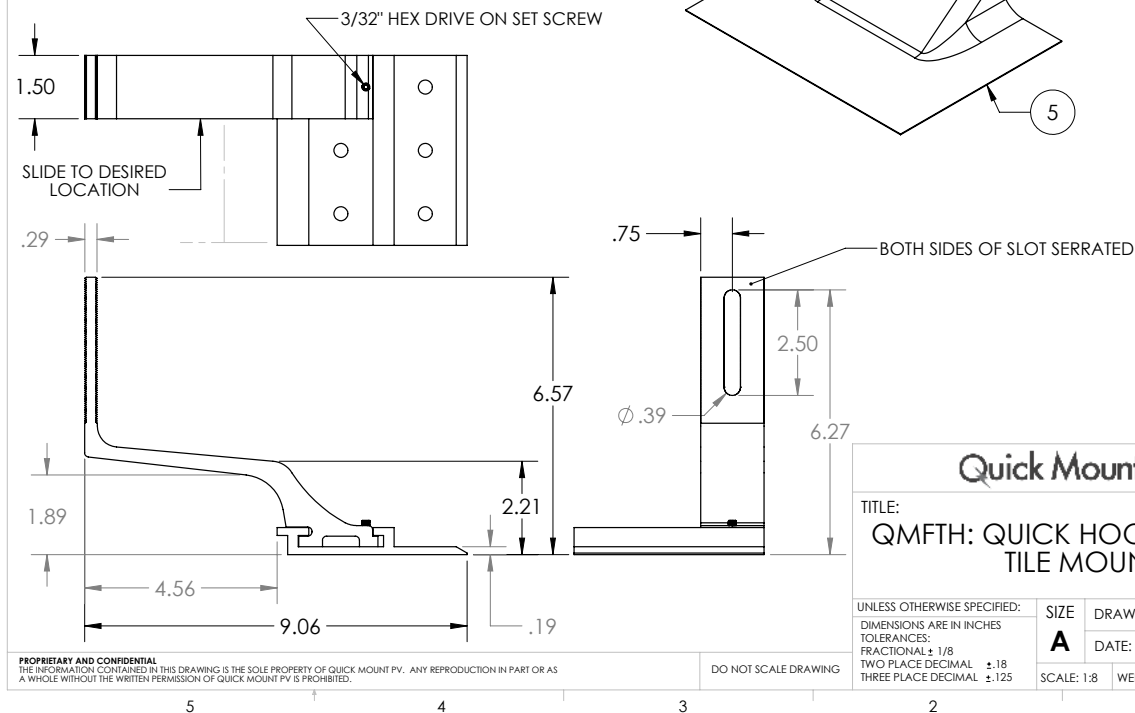
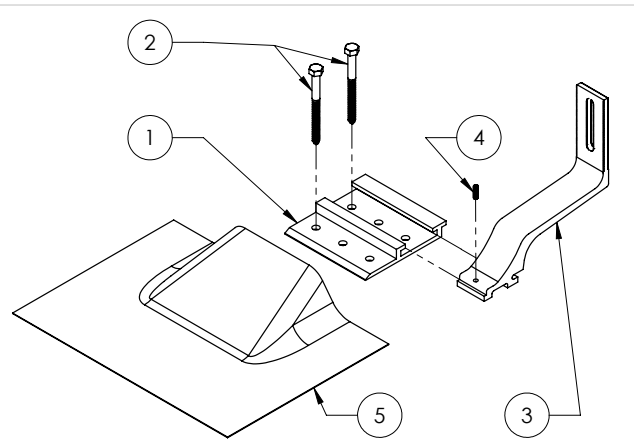


ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Quick Hook USA® – Flat Tile Mount | QMFTH

ITEM NO.	DESCRIPTION	QTY.
1	BASE PLATE, QUICK HOOK USA, 4-1/2" WIDE - 6063-T6, MILL	1
2	LAG SCREW, HEX HEAD, 5/16" x 3-1/2", 18-8SS	2
3	QUICK HOOK USA, VERTICAL, 6061-T6, MILL	1
4	SET SCREW, HEX SOCKET, 10-32X5/8", 18-8 SS	1
5	SUBFLASHING, QUICK HOOK USA V2-4.5" BASE, 9" X 12" X .032"-3003-MILL	1



Quick Mount PV®			
TITLE: QMFTH: QUICK HOOK USA-FLAT TILE MOUNT			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 1/8 TWO PLACE DECIMAL ± .18 THREE PLACE DECIMAL ± .125	SIZE A	DRAWN BY: RAD DATE: 2/5/2013	REV 4
SCALE: 1:8	WEIGHT: 1.62	SHEET 1 OF 2	

Quick Hook USA Failure Test Results

Configuration	Source Document	Average Ultimate Load Capacities (lbf) in Douglas Fir			
		Pullout	Compression	Shear Parallel to Rafter	Shear Perpendicular to Rafter
Centered: All base plate sizes with hook positioned directly over the lag screws (see Appendix A & B of referenced report for test setup)	AME Report #112640C "Quick Hook USA-Flat Tile Mount" with 1.5 Base Plate <i>This report shows results for Quick Hook USA, both Flat and Curved Tile models, when the hook is positioned directly over the lag screws</i>	876	685	1058	583
Offset 4.5" Base Plate: 4.5" wide base plate with hook positioned at opposite end of base plate from lag screws (see Appendix A & B of referenced report for test setup)	AME Report #112640C "Quick Hook USA-Curved Tile Mount with 4.5" Base Plate <i>This report shows results for our Quick Hook USA-Flat Tile Mount</i>	1084	712	1219	532
Offset 6" Base Plate: 6" wide base plate with hook positioned at opposite end of base plate from lag screws (see Appendix A & B of referenced report for test setup)	AME Report #112640C "Quick Hook USA-Curved Tile Mount with 6" Base Plate <i>This report shows results for our Quick Hook USA-Curved Tile Mount</i>	1246	692	1341	584

Notes:

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

IMPORTANT: To maintain waterproofing of substrate it is important to make sure the aluminum sub-flashing is properly placed over the base plate and under the course of paper above. If the paper above does not reach, due to layout, place an additional piece of roofing paper over the sub-flashing and under the next course of paper above. (See instructions on reverse)



Quick Hook USA®

Flat Tile Mounting Instructions - Rafter Installation

Installation Tools Required: stud finder, tape measure, utility knife, 3/32" hex key, drill with 7/32" bit, impact drill with 1/2" socket, caulking gun, one tube of sealant compatible with roofing materials, roofing bar, hand broom, stapler, 18" wide piece of underlayment or materials for 3-course method during deck flashing installation.

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



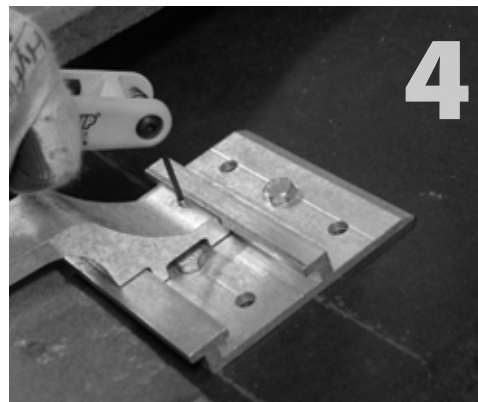
Remove the tile at selected location of the mount. Locate and mark the center of the rafter.



Rest the base plate over center of rafter and mark center of holes. Drill two 7/32" pilot holes and fill with sealant compatible with roofing material.



Drive lag screws into rafter through the two holes to a solid, snug fit. DO NOT over tighten lag screws, this may compromise their holding strength.



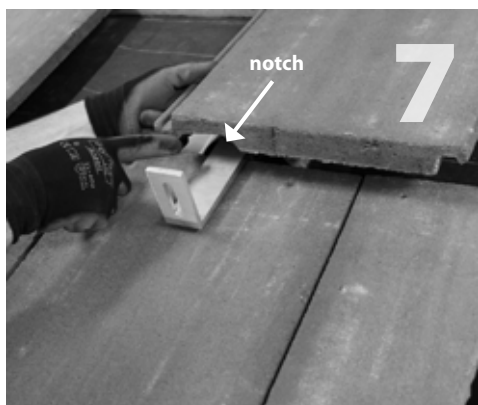
Slide hook into position on base plate. The hook must not overhang the side edges of the base plate. Tighten set screw with hex key.



Carefully clean the underlayment, then apply bead of compatible sealant in the shape of an upside down U on the backside of the sub-flashing and install flashing over mount. Fasten sub-flashing to deck with one roofing nail in each top corner. Do not nail bottom corners.



Proceed with weatherproofing using three-course method or lapped paper method.* When using paper method, cut a piece of underlayment 18" wide to slide under the course above and over the sub-flashing. If course above is too high, you must use additional underlayment to ensure proper overlapping.



Replace the tile above the hook. If necessary, notch the bottom of the tile to make space for the raised hook.



Bolt the side-mounted rail of your choice to the hook, using the rail manufacturer's hardware.

You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer.

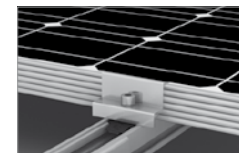
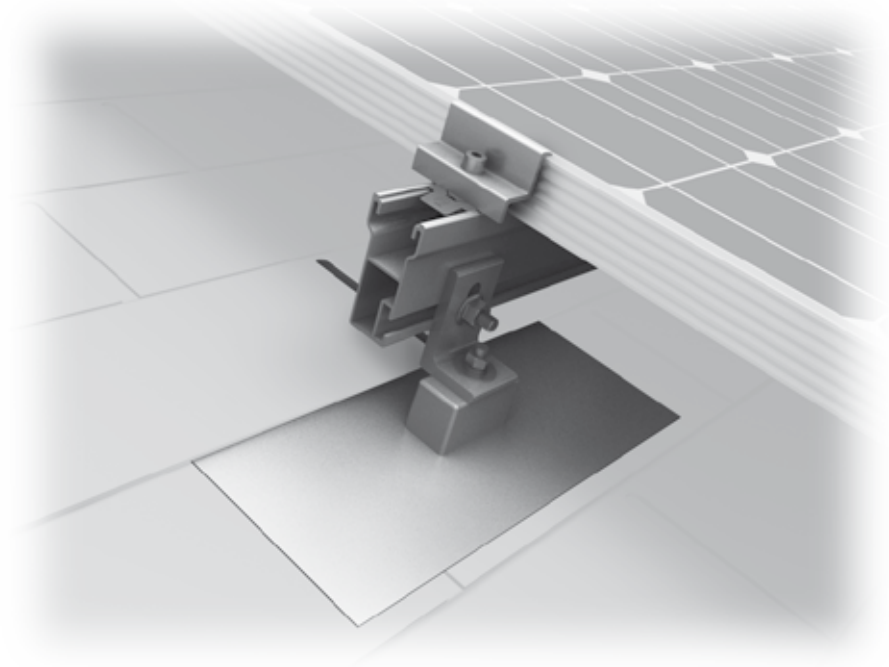
All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Please consult the roof manufacturer's specs and instructions prior to touching the roof.

* For more details on underlayment waterproofing please visit: <http://www.quickmountpv.com/tile-waterproofing>

Quick Mount PV®

925-478-8269 • www.quickmountpv.com • info@quickmountpv.com
2700 Mitchell Dr., Bldg. 2 • Walnut Creek, CA 94598

Mounting systems for solar technology



Everest Solar Systems, LLC
3809 Ocean Ranch Blvd., Suite 111
Oceanside, CA 92056
Service-Hotline +1.760.301.5300
info@everest-solarsystems.com
www.everest-solarsystems.com

Produktblatt QuickMount-CrossRail | US3 | 1113
Product images are for illustrative purposes only. Specifications are subject to change without notice. All sales of our products shall be subject to Everest Solar Systems terms and conditions, including the exclusive limited warranty set forth therein.

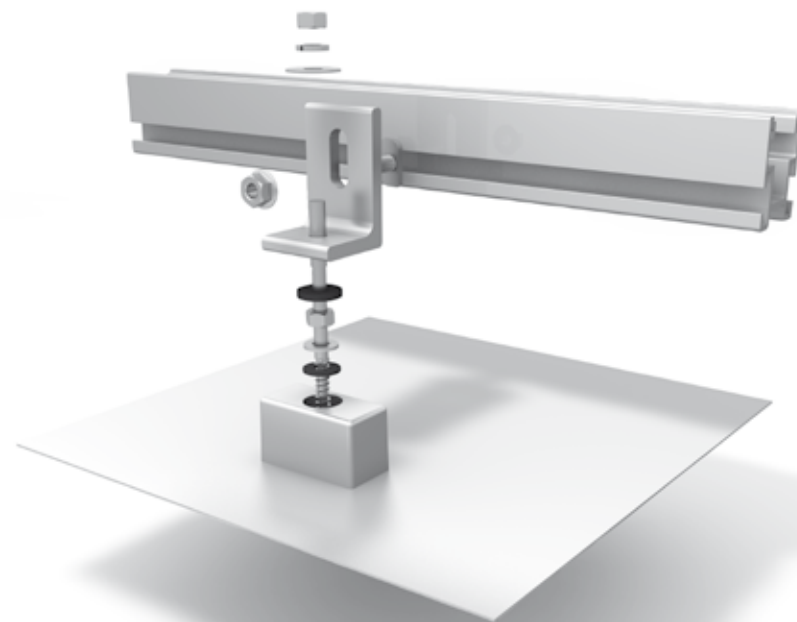
EVEREST SOLAR SYSTEMS
RESIDENTIAL ROOF SOLUTIONS
CROSSRAIL SYSTEM

CROSSRAIL SYSTEM

- High quality, German engineered system optimized for residential installation
- Everest M K2 mounting hardware simplifies module installation – fast, easy, and secure
- Easily integrates with third party roof attachment products, such as QuickMountPV
- L-foot provides adjustability and compatibility with common roof interfaces (Comp, Tile & Metal)
- No shingle cutting, won't void roof manufacturer's warranty
- 100% code-compliant, structural validation for all solar states
- Two rail sizes available to suit all structural conditions
- Fast installation, minimal component count result in low total installed cost
- Simple to design and permit using code compliant "Everest Base" software

Technical data

Applicable Roof Types	composition shingle, tile, flat tile
Flexibility	modular construction, suitable for any system size, height adjustable
PV-Modules	for all common module types
Module orientation	portrait and landscape
Material	high corrosion resistance, stainless steel and high grade aluminum
Roof attachment	screw connection into rafter
Structural Validity	IBC compliant, stamped engineering letters available for all solar states
Warranty	10 years
System components	CrossRail 36, 48 or 80, L-Foot, mid and end clamp sets, M K2, third-party roof attachment products such as QuickMountPV



Flashing System with CrossRail 48 for asphalt shingle roofs