GENERAL BUILDING NOTES

1. STRUCTURAL MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED AS NECESSARY FOR LAG BOLT PENETRATIONS BY CONTRACTOR.
2. SEAL CONNECTION POINTS WITH ROOF GRADE
3. ROOF PENETRATIONS ARE SEALED WITH FLASHING W/SCHNEE MOREHEAD 7108 SEALANT.
4. PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.

GENERAL ELECTRICAL NOTES

1. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D)
2. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.8(C)
3. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH THE NEC 110.26
4. EXACT CONDUIT RUN LOCATIONS SUBJECT TO CHANGE.
5. PROVIDE GROUND ELECTRODE SYSTEM FROM INVERTER TO EXISTING MAIN SERVICE GROUND ELECTRODE.
6. GROUND ELECTRODE CONDUCTOR FROM INVERTER TO GROUND ELECTRODE TO BE MINIMUM PROTECTION OF BARE ARMOR SHEATED CABLE FOR ALL CONDUCTOR SIZES.
7. ALL GROUND CONNECTED TO MAIN SERVICE GROUND IN MAIN SERVICE PANEL.
8. INVERTER IS LISTED TO UL-1741 "UTILITY INTERACTIVE"
9. ALL CONDUCTORS SHALL BE 600V, 75°C STANDARD COPPER.
10. ALL CONDUCTORS IN CONDUIT SHALL BE THWN-2.
11. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%
12. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.

NOTES FOR THE LOCAL JURISDICTION : Phoenix

1. UTILITY SHALL HAVE 24HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC COMPONENTS LOCATED AT SES EQUIPMENT.

2. NO LOCKED GATES, DOGS, ETC SHALL IMPEDE ACCESS TO SES EQUIPMENT.

3. WORKSPACE IN FRONT OF AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH APS AND NEC REQUIREMENTS. FOR APS REQUIREMENTS, REFERENCE SECTION 300 OF THE APS ESRM AND SECTION 8.2 OF THE APS INTERCONNECTION REQUIREMENTS.

4. REFERENCE SETION 301.15 OF THE APS ESRM FOR ELECTRIC METER SEPARATION BETWEEN WATER AND GAS.

5. PROJECT SHALL COMPLY WITH 2018 IFC, 2017 NEC, 2018 IBC, 2018 IRC.

6. THIS APPROVAL IS FOR COMPLIANCE TO THE CURRENT ADOPTED BUILDING CODES FOR THE PROPOSED SOLAR SYSTEM ONLY. IT IS THE OWNERS/APPLICANTS RESPONSIBILITY TO ENSURE THAT THE PROPOSED INSTALLATION OF SOLAR SYSTEMS AND ASSOCIATED EQUIPMENT IS ON LEGALLY PERMITTED STRUCTURES. IF DETERMINED BY INSPECTION STAFF THE PROPOSED SOLAR SYSTEM IS INSTALLED ON NON-PERMITTED STRUCTURES, ANY REQUIRED MODIFICATIONS NEEDED FOR CODE COMPLIANCE WILL BE AT THE OWNERS/APPLICANTS EXPENSE.

7. ALL ROOF TOP CONDUCTORS SHALL COMPLY WITH NEC 2017 690.31(A) & (B) EXCEPTION.

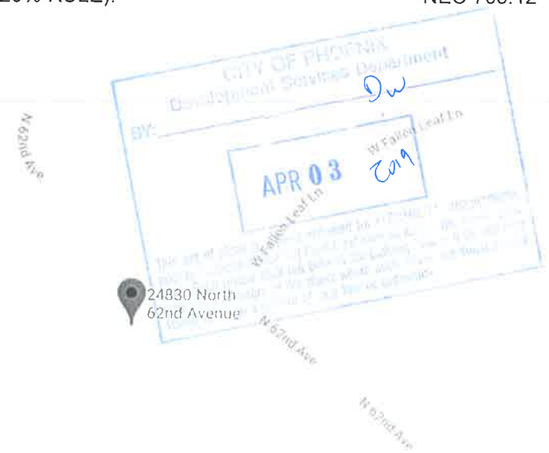
SHEET DESCRIPTION	SHEET
Project Notes	Cover
Plot Plan Photovoltaic Layout	PV-1.0
Roof Mounting Layout & Stringing Map	PV-2.0
Roof Mounting Details	PV-2.1
Fire Labels & Equipment Elevation	PV-3.0
Conduit Run & Grounding Details	PV-4.0
3 Line Diagram & 1 Line Diagram	PV-4.1 & PV-4.2
Safety Placard	PV-5.0
Manufacture Spec. Sheets	Attached

PROJECT INFORMATION
OCCUPANCY GROUP: R-3
TYPE OF CONSTRUCTION: TYPE V-B
AUTHORITY HAVING JURISDICTION: PHOENIX
ASSESSORS PARCEL NUMBER: #20112119

APPLICABLE CODES
2017 NATIONAL ELECTRICAL CODE W/AHJ AMENDMENTS
2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL FIRE CODE
2018 INTERNATIONAL RESIDENTIAL CODE

APPLICABLE ELECTRICAL CODES	
CODE BOOK:	2017 NEC®
BREAKER SIZES:	NEC 240.6(A)
WIRE AMPACITY TABLE:	NEC 310.15(B)(16)
MAX SYSTEM VOLTAGE CORRECTION:	NEC 690.7(A)
NUMBER OF CONDUCTORS CORRECTION:	NEC 310.15(B)(3)(A)
AMBIENT TEMPERATURE CORRECTION:	NEC 310.15(B)(2)(A)
AMBIENT TEMPERATURE ADJUSTMENT:	NEC 310.15(B)(3)(C)
DC GROUNDING ELECTRODE CONDUCTOR:	UNGROUNDED DC SYSTEM
AC GROUNDING ELECTRODE CONDUCTOR:	NEC 250.50
RACK GROUNDING ELECTRODE CONDUCTOR:	NEC 690.47(B)
MAXIMUM OCPD (120% RULE):	NEC 705.12

VICINITY MAP



TSP22513

CUSTOMER INFORMATION

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24830 N 62nd Ave
Glendale, AZ 85310
(602) 908-2471
APN #20112119

SYSTEM OVERVIEW

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11.4 kW AC System
(37) Silfab_solar SLA300M
(37) SolarEdge P320 Optimizers
SolarEdge_Technologies SE11400A/H-US (240V)

CONTRACTOR INFORMATION

Titan Solar Power
525 W. Baseline Rd
Mesa, AZ 85210
(480) 830-9290

CR11 #284331

TITAN SOLAR POWER

Designed By:

CNG SOLAR ENGINEERING

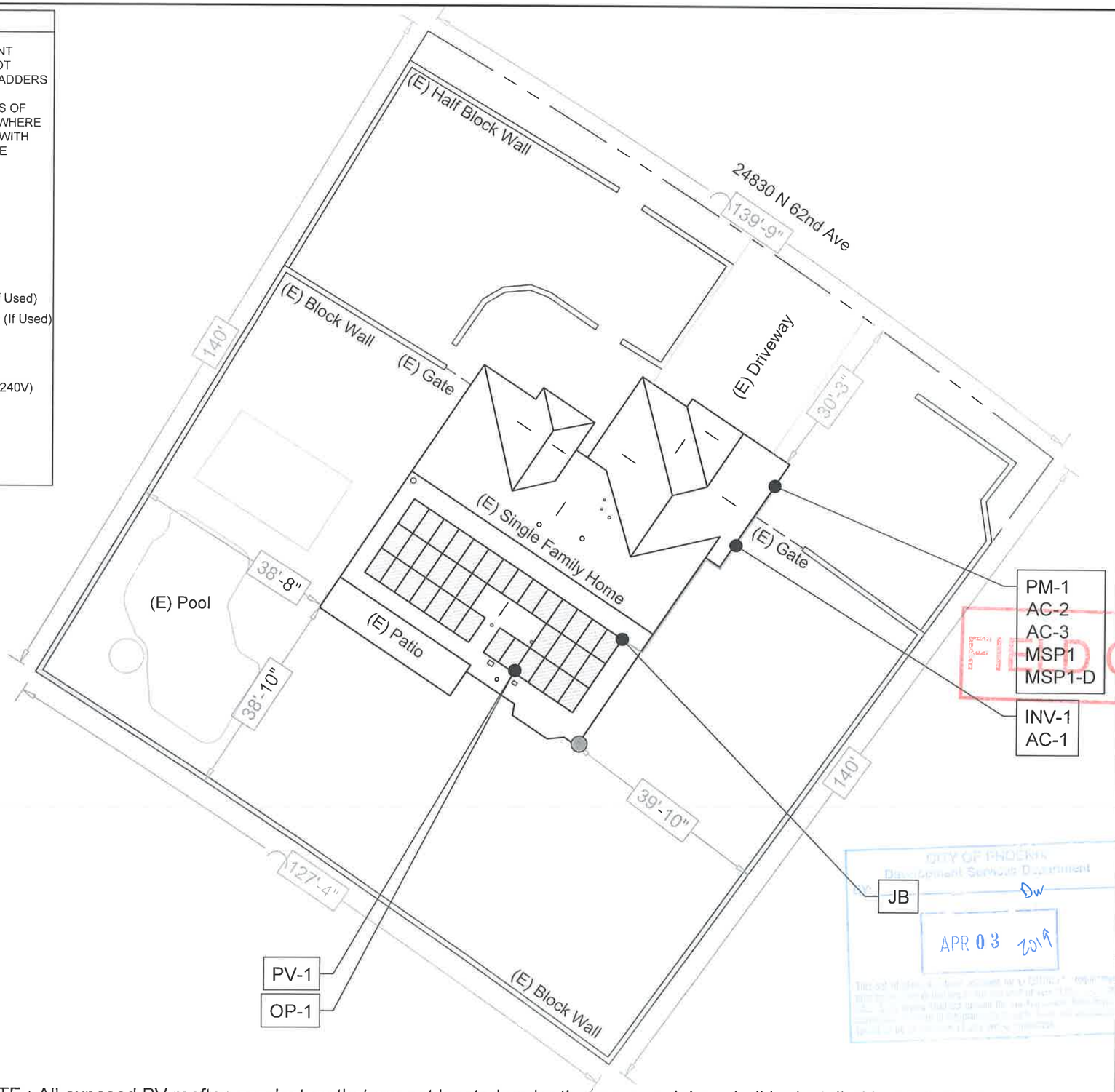
CNG Solar Engineering, INC.
1245 San Fernando Rd. #200
San Fernando, CA 91340
1-818-617-0420

DESCRIPTION	DATE
Initial Draft of Plans	3/13/19

DATE: 3/14/19
DRAFTER:TN/

SYSTEM OVERVIEW
COVER

TAG	DESCRIPTION
	ROOF ACCESS POINT: ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS,AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.
	PV SOLAR MODULES
	PROPERTY LINES
	Fence Line
	Block Wall
	Proposed PV Conduit Run Above Roof
	Proposed PV Conduit Run Through Attic (If Used)
	Proposed PV Conduit Run Through Trench (If Used)
PV-1	(N) (37) Silfab_solar SLA300M
OP-1	(N) (37) SolarEdge P320 Optimizers
JB	(N) Junction Box
INV-1	(N) SolarEdge_Technologies SE11400A/H-US (240V)
AC-1	(N) 60A Maint. AC Disconnect #1
PM-1	(N) Utility Performance Meter
AC-2	(N) 60A PV System Utility Disconnect Switch
AC-3	(N) 60A Utility Fused AC Disconnect #3
MSP1	(E) 200A MSP w/(E) 200A Main Breaker
MSP1-D	(N) 175A Main Breaker



APS Utility

NOTES:

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4. REFERENCE SECTION 301.15 OF THE APS ESRM FOR ELECTRIC METER SEPARATION BETWEEN WATER AND GAS.

Plot Plan
Scale: 1" = 20'

NOTE : All 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. 2017 NEC article 690.31(A) and (B) exception.

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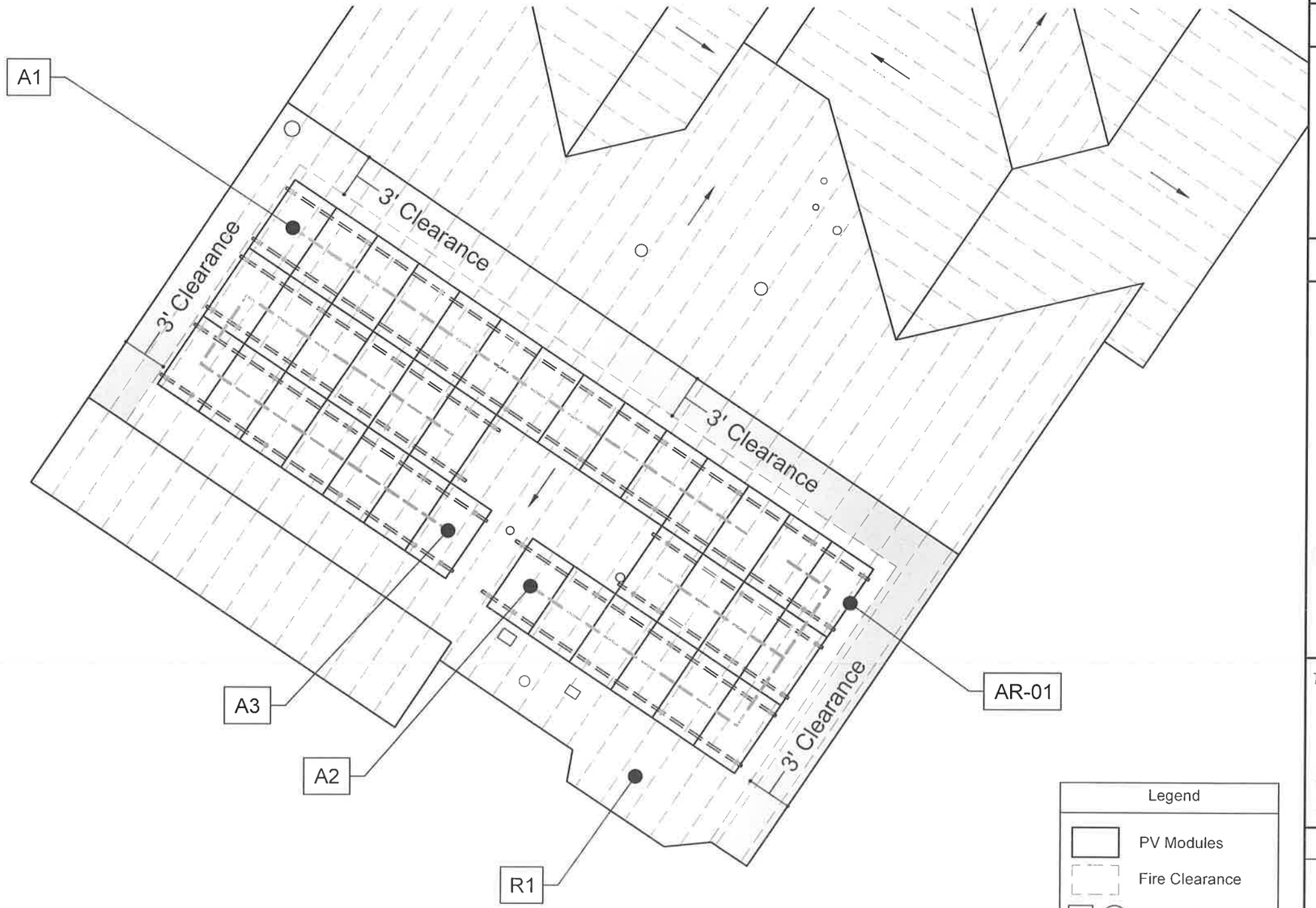
PLOT PLAN
PV-1

Array Call-Out Table					
Array	Quantity	Mounting Type	Array Tilt From 0°	Azimuth	Max Att. Spacing
AR-01	37	Flush Mounted	18°	214	72"

Roof Call-Out Table					
Roof	Roof Type	Roof Pitch	Framing Type	Framing Size	Framing Spacing
R1	W-Tile	18°	Engineered Trusses	2" x 4"	24"

ARRAY RACKING CALCULATIONS								
Array	Qty. of Modules	# of Att's	Array Area (Sq.Ft.)	Array Loading (Lbs.)	Array Loading (PSF.)	Uplift (Lbs.)	Pullout Strength (Lbs.)	Point Loading (Lbs.)
AR-01	37	57	17.58 X 37 = 650.5	41.89 X 37 = 1549.9	1549.9 / 650.5 = 2.4	650.5 X 25 = 16261	615 X 57 = 35055	1549.9 / 57 = 27.2

String Call-Out Table				
String	Quantity	Azimuth (°)	Inverter	Inverter Input
A1	12	214	Inv-1	MPPT 1
A2	12	214	Inv-1	MPPT 1
A3	13	214	Inv-1	MPPT 1



Legend
PV Modules
Fire Clearance
Obstructions
Penetration Points
Rafters
Rails
Stringing Map

Attachment Detail
Scale: 1/8" = 1'-0"

TSP22513

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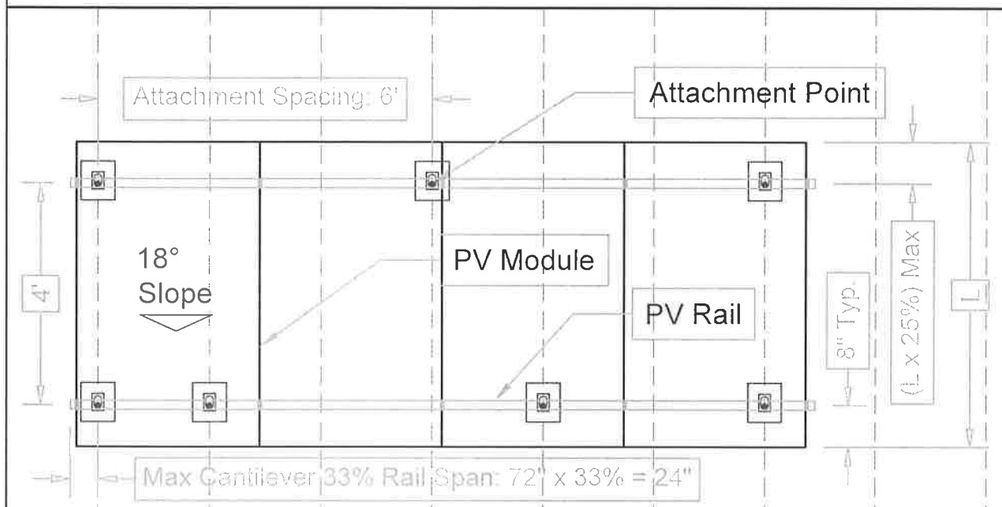
ATTACHMENT LAYOUT
PV-2

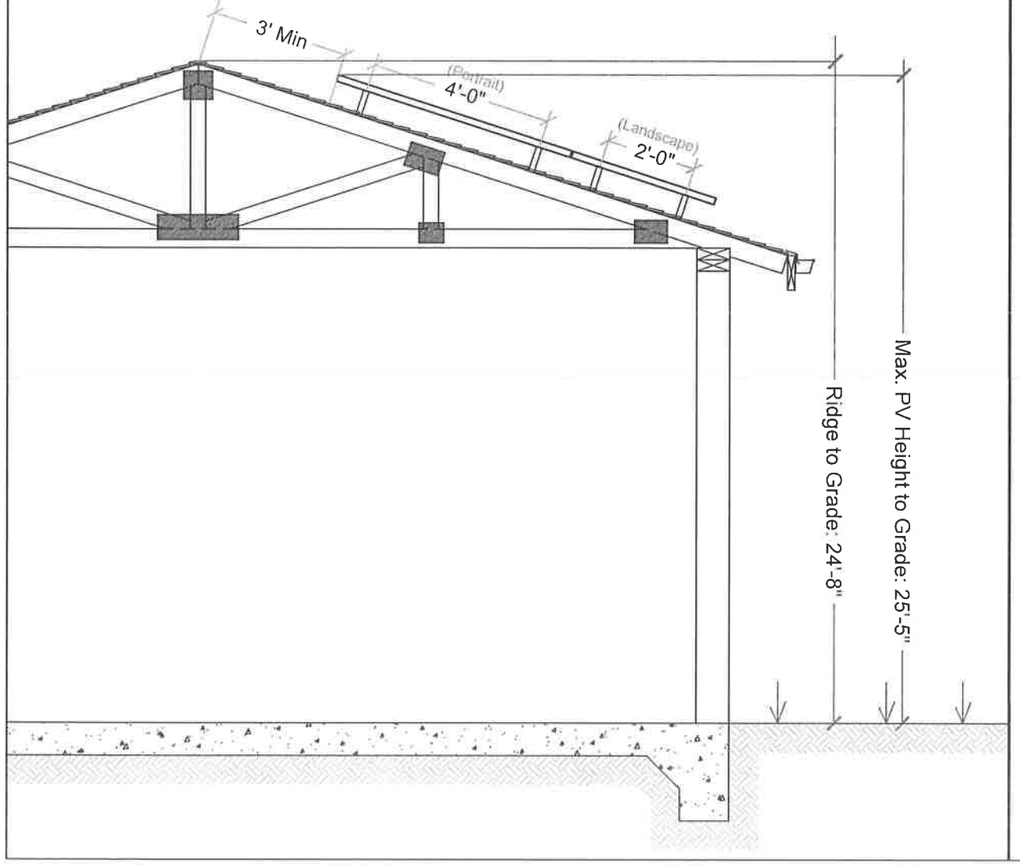
Attachment Spacing Layout



Roof Information & Calculations

Roof Information	
Roof Material:	**W-Tile**
Roof Framing:	**Engineered Trusses**
Framing Size & Spacing:	2" x 4", 24" O.C.
Framing Span & Roof Pitch:	6'-0", 18° Pitch
Framing Species & Grade:	Douglas Fir Larch #2
Racking Information	
Racking / Rail Manufacture:	SnapNrack 14 Ft. Rails
Attachment Manufacture:	SnapNrack TileHook
Number of Attachments:	**57 Attachments**
Racking Weight:	3.56 Lbs. / Module
Module Information	
Modules:	**(37) Silfab_solar SLA300M**
Module Dimensions:	64.96" x 38.98" x 1.5"
Module Weight & Sq.Ft. :	41.89 Lbs. , 17.58 Sq.Ft.
Array Sq.Ft. :	**650.46 Sq.Ft.**
Weight Calculations	
Weight w/Racking & Add Ons:	**1755.65 Lbs.**
Weight (Lbs.) / Attachment	30.8 Lbs. / Attachment
Distributed Weight on Roof:	**2.7 Lbs. / Square Foot**

Partial Framing Detail



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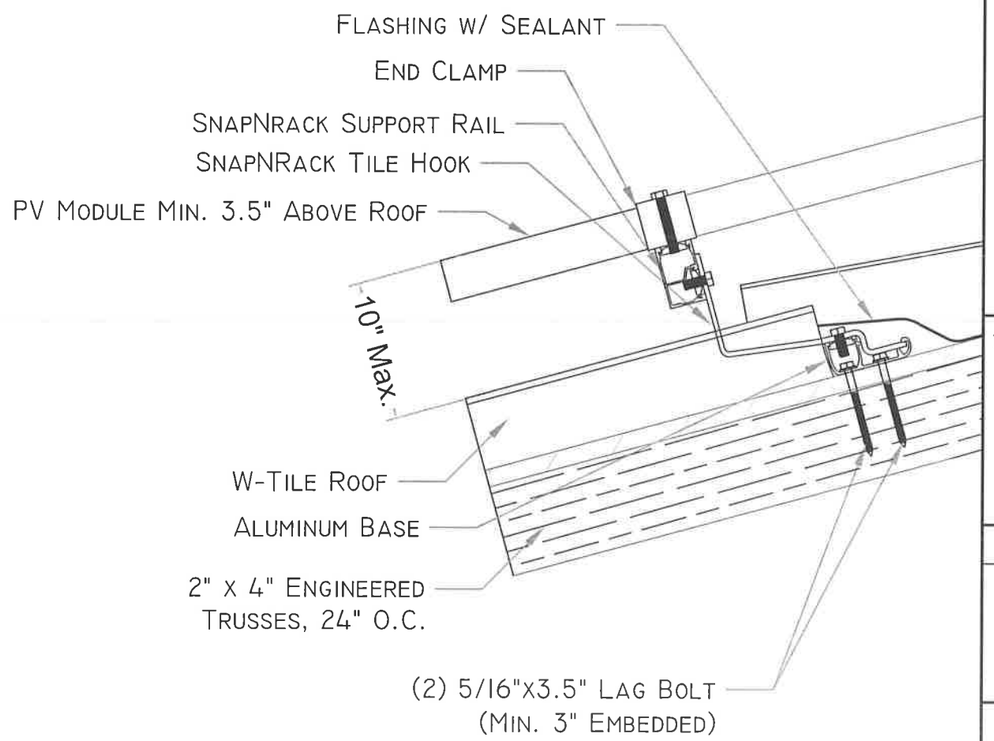

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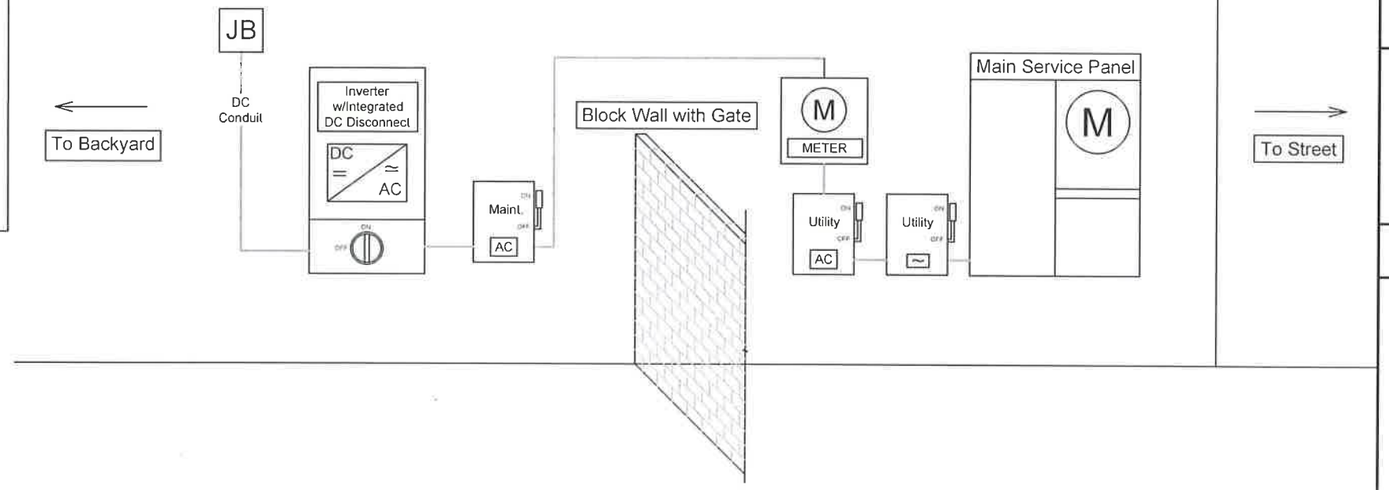
DRAFTER:TN/

ROOF TYPE 1 DETAILS

PV-2.1

LABEL PLACEMENT	LABELS
JUNCTION BOX	1, 2
DC CONDUIT	2
NVERTER	1, 3, 5, 11
AC DISCONNECT	4, 6, 7
MAINTENANCE DISCONNECT	4, 7
PERFORMANCE METER	8
MAIN SERVICE PANEL	4, 7, 10, 12



(1)
WARNING
ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

LOCATION : DC JUNCTION BOX
DC COMBINER BOX
DC DISCONNECT
CODE REF. : NEC 690.35(F)

(2)
WARNING PHOTOVOLTAIC POWER SOURCE

LOCATION : MAIN SERVICE DISCONNECT
DC CONDUIT
SEE IFC SPECIFIC NOTES SHEET 4/7
CODE REF. : NEC 690.31(E)(3)
IFC 605.11.1-4

(3)
PHOTOVOLTAIC DC DISCONNECT
VOC: _____VDC ISC: _____ADC
VMP: _____VDC IMP: _____ADC
REQUIRED PER NEC 690.53

LOCATION : DC DISCONNECT SWITCH
CODE REF. : NEC 690.14(C)(2)
NEC 690.53
(SEE SLD FOR VALUES)

(4)
WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LOCATION : PV SYSTEM DISCONNECT
AC DISCONNECT SWITCH
CODE REF. : NEC 690.17
UTILITY AND AHJ REQUIREMENTS

(5)
WARNING
ELECTRIC SHOCK HAZARD
IF A GROUND FAULT IS INDICATED NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

LOCATION : DC/AC INVERTER
(IF NOT INCLUDED BY MANUFACTURER GROUNDED ARRAYS ONLY)
CODE REF. : NEC 690.5(C)

(6)
PHOTOVOLTAIC SYSTEM
UTILITY DISCONNECT SWITCH

LOCATION : PV SYSTEM DISCONNECT SWITCH
CODE REF. : NEC 705.12
UTILITY AND AHJ REQUIREMENTS

(7)
PHOTOVOLTAIC AC DISCONNECT SWITCH
RATED OUTPUT CURRENT: 47.5A
NOMINAL OPERATING VOLTAGE: 240V

LOCATION : BACKFED BREAKER AT MAIN PANEL
CODE REF. : NEC 690.14(C)(2)

(8)
PHOTOVOLTAIC SYSTEM METER

LOCATION : PV REVENUE METER
CODE REF. : UTILITY AND AHJ REQUIREMENTS

(9)
DEDICATED PHOTOVOLTAIC SYSTEM
COMBINER PANEL
NO LOAD SHALL BE ADDED TO THIS PANEL

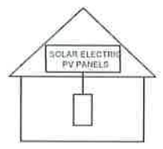
LOCATION : AC PHOTOVOLTAIC COMBINER PANEL
CODE REF. : NEC 690.64(B)(2)

(10)
WARNING
PHOTOVOLTAIC POWER SOURCE
BREAKER IS BACKFED

LOCATION : MAIN SERVICE PANEL
CODE REF. : NEC 705.10
NEC 690.45(B)(5)

(11)
SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



PER IFC 605.11.3.1(2) & NEC 690.56(C)(1)(a)
LOCATION : DC/AC INVERTER

(12)
THE MAIN BREAKER IN THIS PANEL HAS BEEN DE-RATED TO 175A.
DO NOT INSTALL LARGER BREAKER

LOCATION : MAIN SERVICE PANEL
ONLY WHEN DE-RATE THE MAIN BREAKER

TSP22513

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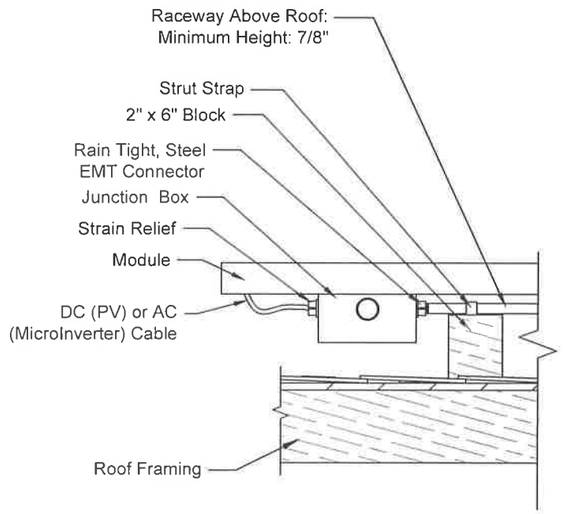
DRAFTER:TN/

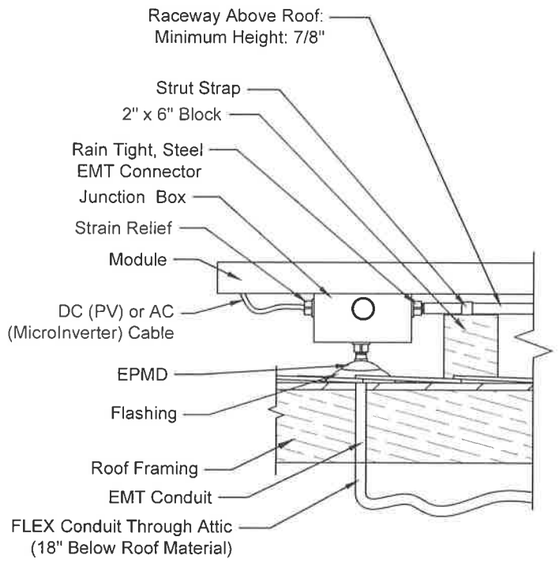
FIRE LABELS
PV-3.0

Conduit Details

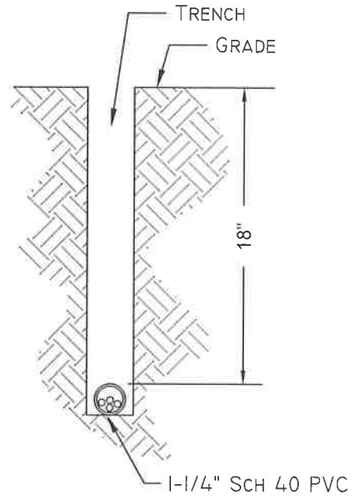
REFER TO THIS DETAIL FOR CONDUIT RUN ABOVE ROOF



REFER TO THIS DETAIL FOR CONDUIT RUN THROUGH ATTIC

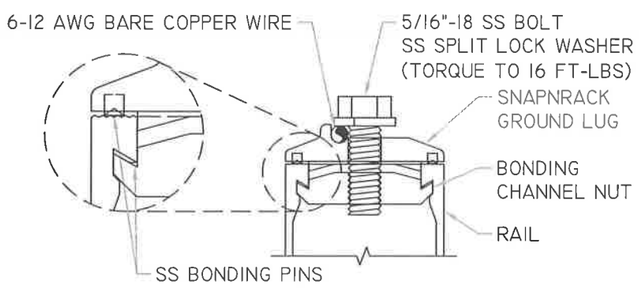


REFER TO THIS DETAIL FOR CONDUIT RUN THROUGH TRENCH



Grounding Detail

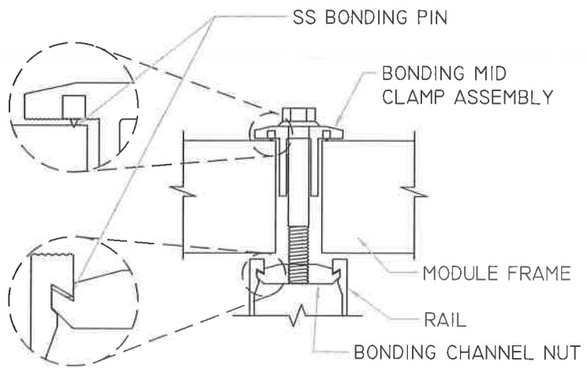
RAIL/RACKING GROUNDING



SNAP-N-RACK GROUNDING LUG

1. ALL HARDWARE IS INCLUDED FROM MANUFACTURER
2. A MINIMUM OF ONE GROUND LUG IS TO BE INSTALLED ON EVERY CONTINUOUS ROW OF MODULES
3. GROUND LUG MAY BE INSTALLED IN EITHER RAIL CHANNEL
4. GROUND LUG MAY BE INSTALLED SO GROUND WIRE IS PARALLEL OR PERPENDICULAR TO RAIL
5. ENSURE SPLIT LOCK WASHER IS INSTALLED ON TOP OF COPPER WIRE

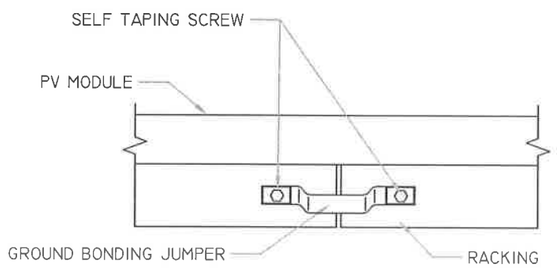
MODULE TO MODULE & MODULE TO RAIL



SNAP-N-RACK GROUNDING MID-CLAMP:

1. END CLAMPS USE SAME BONDING PIN DESIGN TO BOND MODULES TO RAIL

RAIL TO RAIL



NTS REMOVAL OF ONE PIECE OF EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN ANY OTHER PIECES.

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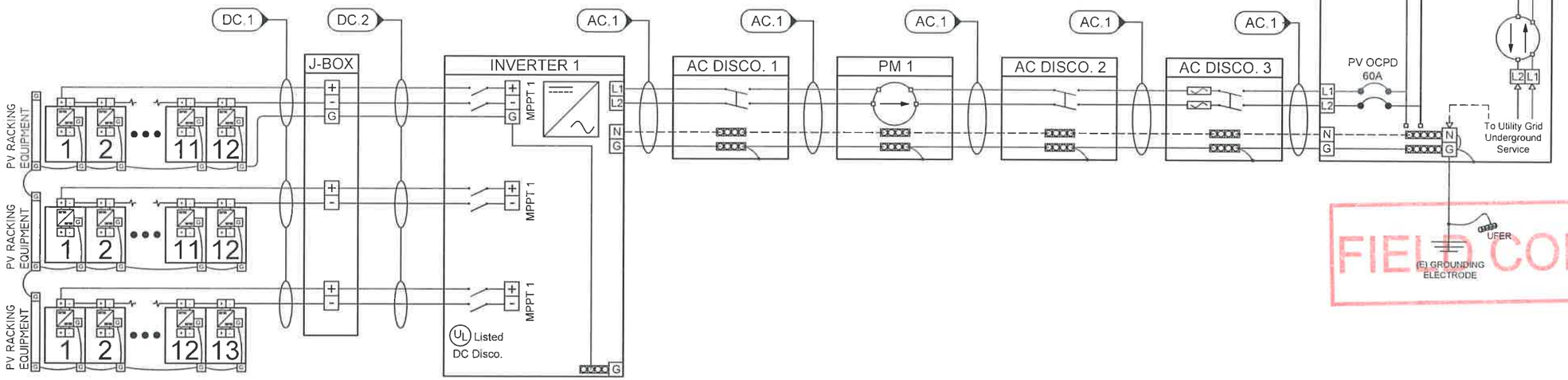
GROUNDING & CONDUIT DETAILS

PV-4.0

Wire Tag	Wire Sizes, Quantity & Type: Conductor Qty. Size & Type	Neutral Qty. Size & Type	Ground Qty., Size & Type	Raceway Size, Type, Location & Info.: Raceway Size & Type	Raceway Location	Raceway Height Above Roof	Wire Ampacity Calculations: Output Current	125% of Output Current	Min. OCPD	Wire De-Rate Calculation: Wire Rating	Ambient Temp	# of Cond.	Final Ampacity	Additional Information: Dist. (Ft)	Voltage	Voltage Drop %	Conduit Fill %
DC.1	(6) #10 AWG PV Wire		(1) #10 AWG Bare Copper	Not Applicable	Under Array	1"	15A	18.8A	20A	40A X	0.82 X	1 =	32.8A	10 Ft.	350V	0.11%	
DC.2	(6) #8 AWG THWN-2		(1) #10 AWG THWN-2	1" EMT Conduit	Above Roof	1"	15A	18.8A	20A	55A X	0.82 X	0.8 =	36.1A	20 Ft.	350V	0.13%	27.9%
AC.1	(2) #6 AWG THWN-2	(1) #6 AWG THWN-2	(1) #10 AWG THWN-2	3/4" EMT Conduit	Exterior Wall	"N/A"	47.5A	59.4A	60A	75A X	0.82 X	1 =	61.5A	5 Ft.	240V	0.1%	32.6%

APS Utility

NOTE:
- ALL TERMINALS SHALL BE MIN. 75° C RATED
- ALL ROOF MOUNTED CONDUIT SHALL BE MIN. 7/8" ABOVE ROOF SURFACE



PV Module 1
Manufacturer: **Silfab_solar**
Model: **SLA300M**
Quantity.....(37)
Power at STC.....300W
Power at PTC.....270.4W
V-oc (Open-Circuit Voltage).....39.85V
V-mp (Max-Power Voltage).....32.8V
I-sc (Short-Circuit Current).....9.71A
I-mp (Max-Power Current).....9.16A
Mnfr V-oc Temp Coefficient: -0.3%/°C
(I-sc x 1.25 x 1.25).....15.2A

Inverter 1
SolarEdge_Technologies SE11400A/H-US (240V)
Max Output Current.....47.5A
Safety Rating: (47.5A x 1.25) = 59.4A
Minimum OCPD.....60A
Max Number of Strings.....3
Number of MPPT's.....1
Maximum Input Voltage.....500V
Transformerless (Y/N).....Yes

Operating Current.....11.1A
Operating Voltage.....350V
Maximum System Voltage.....500V
Short Circuit Current.....15A

Performance Meter 1
Description: Utility Performance Meter
Type: 2 Pole, Feeder Entrance: Standard
Note: KWH METER FORM 2S,100A/240V, MILBANK CAT#U5929-XL OR EQUIV.

PV Optimizer 1
Manufacturer: **SolarEdge**
Model: **P320**
Quantity..... (37)
Maximum I-sc Input..... 11A
Maximum V-oc Input..... 48V
Maximum Power Per String..... 5250W
Inverter 1 (3900W/350V) = 11.1A

AC Disconnect #1
Description: 60A Maint. AC Disconnect #1
Type: 2 Pole, Knife-Blade Type
Note: NON-FUSED VISIBLE OPEN 60A/240V 2P 10KAIC EATON CAT# DG222URB OR EQUIV.

AC Disconnect #2
Description: 60A Utility PV System Utility AC Disconnect Switch
Type: 2 Pole, Knife-Blade Type
Note: NON-FUSED VISIBLE OPEN 60A/240V 2P 10KAIC EATON CAT# DG222URB OR EQUIV.

AC Disconnect #3
Description: 60A Utility Fused AC Disconnect #3
Type: 2 Pole, W/60A Fuses
Note: FUSED VISIBLE OPEN 60A/240V 2P 10KAIC EATON CAT# DG222NRB OR EQUIV.

Main Service Panel 1
Existing or New MSP: Existing
Rating: 200A MSP, Top-Fed
Voltage & Phase: 1Ø, 3W, 120/240V
Utility Company: Arizona Public Service
PV Interconnection: PV Breaker
Main Breaker De-Rated: Yes

Bus Bar 1 Rating: 200A
Main Breaker 1 Rating: 175A
PV Back Feed (Actual Load): 59.4A
PV OCPD: 60A
120% Rule: (60A + 175A) = 235A (<=) 240A

Ambient Temperature Information
Extreme Min Temp.....-2.89°C
Ambient Temp.....46°C

Ambient Temp. if Raceway is:
0" to 7/8" Above Roof.....79°C

Voltage Drop Information
Total DC Voltage Drop.....0.24%
Total AC Voltage Drop.....0.1%
Total System Voltage Drop.....0.34%

TSP22513

CUSTOMER INFORMATION

Heyen, Roger
24830 N 62nd Ave
Glendale, AZ 85310
(602) 908-2471
APN #20112119

SYSTEM OVERVIEW

11.1 kW DC System (STC)
11.4 kW AC System
(37) Silfab_solar SLA300M
(37) SolarEdge P320 Optimizers
SolarEdge_Technologies SE11400A/H-US (240V)

CONTRACTOR INFORMATION

Titan Solar Power
525 W. Baseline Rd
Mesa, AZ 85210
(480) 830-9290

CR11 #284331

TITAN SOLAR POWER

Designed By: CNG SOLAR ENGINEERING

CNG Solar Engineering, INC.
1245 San Fernando Rd. #200
San Fernando, CA 91340
1-818-617-0430

DESCRIPTION	DATE
Initial Draft of Plans	3/13/19

DATE: 3/14/19
DRAFTER:TN/

THREE LINE DIAGRAM
PV-4.1

Wire Tag	Wire Sizes, Quantity & Type: Conductor Qty. Size & Type	Neutral Qty. Size & Type	Ground Qty., Size & Type	Raceway Size, Type, Location & Info.: Raceway Size & Type	Raceway Location	Raceway Height Above Roof	Wire Ampacity Calculations: Output Current	125% of Output Current	Min. OCPD	Wire De-Rate Calculation: Wire Rating	Ambient Temp	# of Cond.	Final Ampacity	Additional Information: Dist. (Ft)	Voltage	Voltage Drop %	Conduit Fill %
DC.1	(6) #10 AWG PV Wire		(1) #10 AWG Bare Copper	Not Applicable	Under Array	1"	15A	18.8A	20A	40A X 0.82	X 1	=	32.8A	10 Ft.	350V	0.11%	
DC.2	(6) #8 AWG THWN-2		(1) #10 AWG THWN-2	1" EMT Conduit	Above Roof	1"	15A	18.8A	20A	55A X 0.82	X 0.8	=	36.1A	20 Ft.	350V	0.13%	27.9%
AC.1	(2) #6 AWG THWN-2	(1) #6 AWG THWN-2	(1) #10 AWG THWN-2	3/4" EMT Conduit	Exterior Wall	"N/A"	47.5A	59.4A	60A	75A X 0.82	X 1	=	61.5A	5 Ft.	240V	0.1%	32.6%

APS Utility

NOTE:
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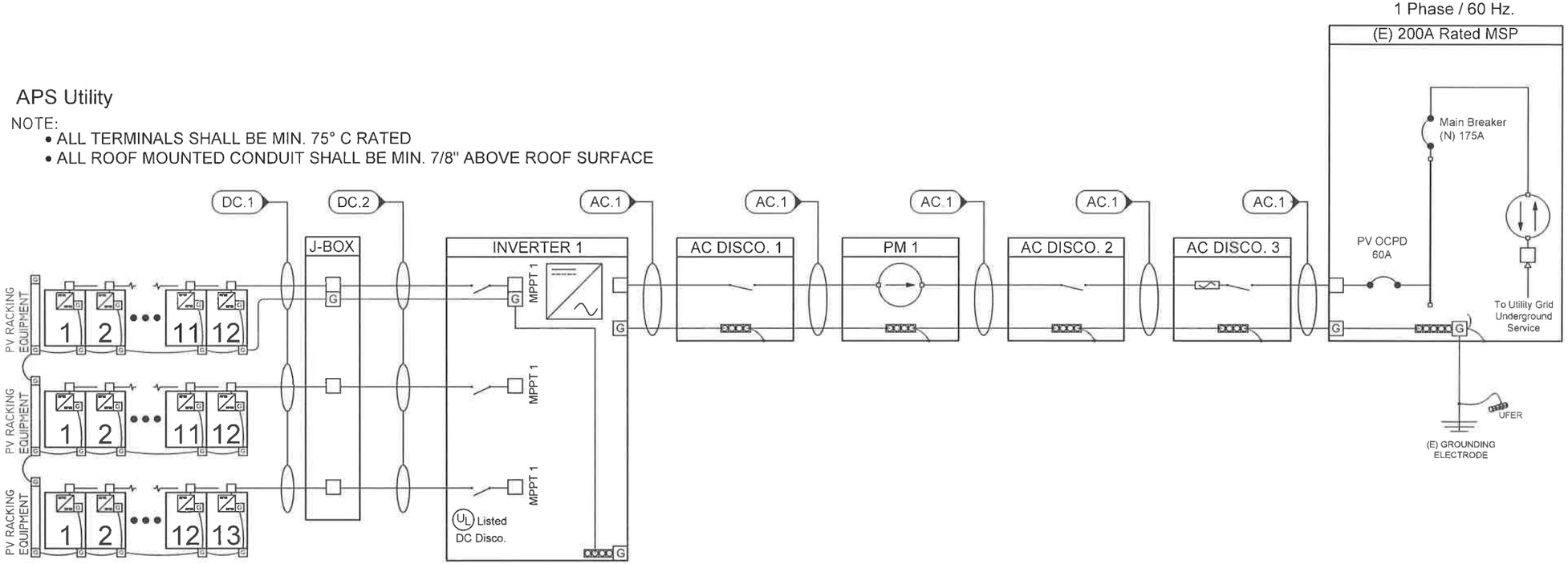

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Manufacturer: **Silfab_solar**
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Quantity ..... (37)
Power at STC 300W
Power at PTC 270.4W
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V-mp (Max-Power Voltage) 32.8V
I-sc (Short-Circuit Current) 9.71A
I-mp (Max-Power Current) 9.16A
Mnfr V-oc Temp Coefficient: -0.3%/°C
(I-sc x 1.25 x 1.25) 15.2A

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SolarEdge_Technologies SE11400A/H-US (240V)
Max Output Current 47.5A
Safety Rating: (47.5A x 1.25) = 59.4A
Minimum OCPD 60A
Max Number of Strings 3
Number of MPPT's 1
Maximum Input Voltage 500V
Transformerless (Y/N) ..... Yes

Operating Current	11.1A
Operating Voltage	350V
Maximum System Voltage	500V
Short Circuit Current	15A

Performance Meter 1
Description: Utility Performance Meter
Type: 2 Pole, Feeder Entrance: Standard
Note: KWH METER FORM 2S,100A/240V, MILBANK CAT#U5929-XL OR EQUIV.

PV Optimizer 1
Manufacturer: **SolarEdge**
Model: **P320**
Quantity ..... (37)
Maximum I-sc Input 11A
Maximum V-oc Input 48V
Maximum Power Per String 5250W
Inverter 1 (3900W/350V) = 11.1A

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Description: 60A Maint. AC Disconnect #1
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Total AC Voltage Drop 0.1%
Total System Voltage Drop 0.34%

TSP22513

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(37) Silfab_solar SLA300M
(37) SolarEdge P320 Optimizers
SolarEdge_Technologies SE11400A/H-US (240V)

CONTRACTOR INFORMATION

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525 W. Baseline Rd
Mesa, AZ 85210
(480) 830-9290

CR11 #284331

TITAN SOLAR POWER

Designed By: CNG SOLAR ENGINEERING

CNG Solar Engineering, INC.
1245 San Fernando Rd. #200
San Fernando, CA 91340
1-818-617-0420

DESCRIPTION	DATE
Initial Draft of Plans	3/13/19

DATE: 3/14/19
DRAFTER:TN/

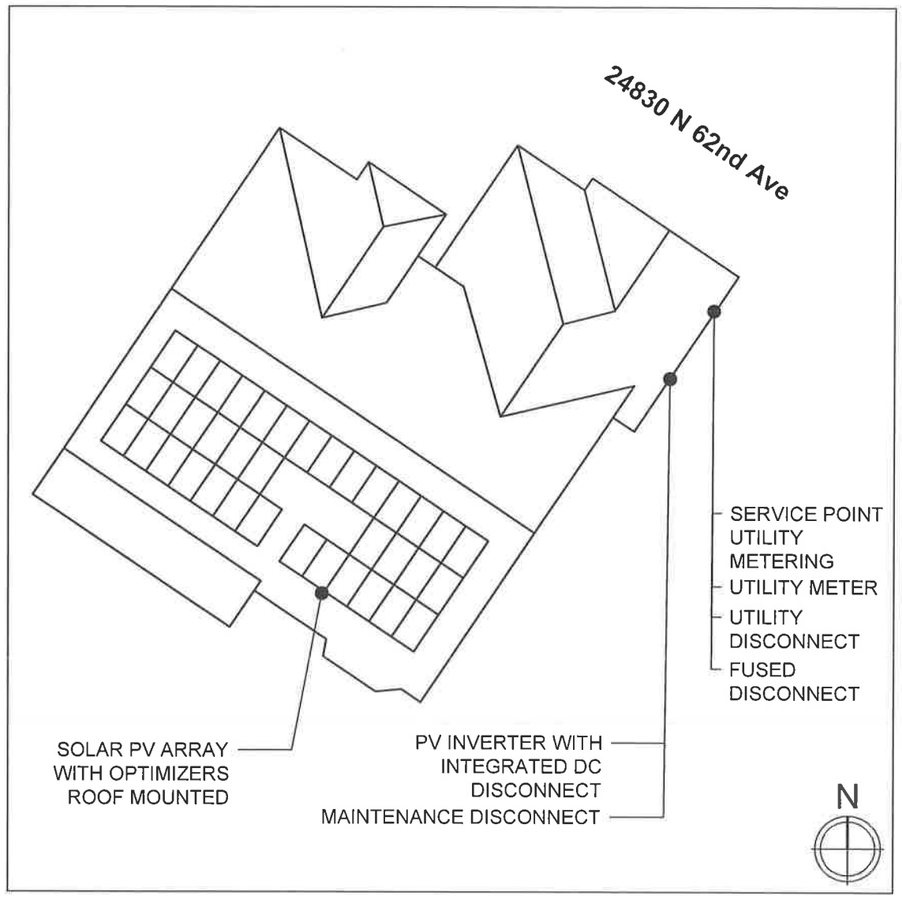
ONE LINE DIAGRAM
PV-4.2

SAFETY PLANS

NOTES:
INSTALLERS SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME.
INSTALLERS SHALL UPDATE NAME, ADDRESS, AND PHONE NUMBER OF NEAREST URGENT CARE FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK.

LOCATION OF NEAREST URGENT CARE FACILITY

NAME:
ADDRESS:
PHONE NUMBER:



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Safely Placard
PV-5.0

Silfab SOLAR

Proud Partner of TITAN SOLAR POWER

SLA-M
Monocrystalline

300 Wp 60 Cell

Monocrystalline PV Module

IEC · Fraunhofer ISE

100% MAXIMUM POWER DENSITY
Silfab's SLA-M 300 ultra-high-efficiency modules are optimized for both Residential and Commercial projects where maximum power density is preferred.

100% NORTH AMERICAN QUALITY MATTERS
Silfab's fully-automated manufacturing facility ensures precision engineering is applied at every stage. Superior reliability and performance combine to produce one of the highest quality modules with the lowest defect rate in the industry.

NORTH AMERICAN CUSTOMIZED SERVICE
Silfab's 100% North American based team leverages just-in-time manufacturing to deliver unparalleled service, on-time delivery and flexible project solutions.

ENSURES MAXIMUM EFFICIENCY
60 of the highest efficiency, premium quality monocrystalline cells result in a maximum power rating of 300Wp.

ADVANCED PERFORMANCE WARRANTY
25-year linear power performance guarantee to 82%

ENHANCED PRODUCT WARRANTY
12-year product/workmanship warranty

BUILT BY INDUSTRY EXPERTS
With over 35 years of industry experience, Silfab's technical team are pioneers in PV technology and are dedicated to an innovative approach that provides superior manufacturing processes including: infra-red cell sorting, glass washing, automated soldering and meticulous cell alignment.

POSITIVE TOLERANCE
(-0/+5W) All positive module sorting ensures maximum performance

LOWEST DEFECT RATE*
Total automation ensures strict quality control during each step of the process at our certified ISO manufacturing facility. *82.56 ppm as per December 2017

LIGHT AND DURABLE
Over-engineered to weather low load bearing structures up to 5400 Pa. Light-weight frame exclusively designed with wide-ranging racking compatibility and durability.

PID RESISTANT
Proven in accordance to IEC 62804-1

AVAILABLE IN
All Black

MADE IN NORTH AMERICA

Electrical Specifications		SILFAB SLA Monocrystalline	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	300	227
Maximum power voltage (Vpmax)	V	32.8	29.5
Maximum power current (Ipmax)	A	9.16	7.69
Open circuit voltage (Voc)	V	39.85	36.9
Short circuit current (Isc)	A	9.71	7.96
Module efficiency	%	18.4	17.3
Maximum system voltage (VDC)	V	1000	
Series fuse rating	A	20	
Power Tolerance	Wp	-0/+5	

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/+5.

Temperature Ratings		SILFAB SLA Monocrystalline
Temperature Coefficient Isc	%/K	0.03
Temperature Coefficient Voc	%/K	-0.30
Temperature Coefficient Pmax	%/K	-0.38
NOCT (± 2°C)	°C	45
Operating temperature	°C	-40/+85

Mechanical Properties and Components		SILFAB SLA Monocrystalline
Module weight (± 1 kg)	kg	19
Dimensions (H x L x D; ± 1mm)	mm	1650 x 990 x 38
Maximum surface load (wind/snow)*	N/m²	5400
Hail impact resistance		ø 25 mm at 83 km/h
Cells		60 - Si monocrystalline - 4 or 5 busbar - 156.75 x 156.75 mm
Glass		3.2 mm high transmittance, tempered, antireflective coating
Backsheet		Multilayer polyester-based
Frame		Anodized Al
Bypass diodes		3 diodes-45V/12A, IP67/IP68
Cables and connectors (See installation manual)		1200 mm ø 5.7 mm (4 mm2), MC4 compatible

Warranties	SILFAB SLA Monocrystalline
Module product warranty	12 years
Linear power performance guarantee	25 years ≥ 97% end of 1st year ≥ 90% end of 12th year ≥ 82% end of 25th year

Certifications	SILFAB SLA Monocrystalline
Product	ULC ORD C1703, UL 1703, IEC 61215, IEC 61730, IEC 61701, CEC listed IEC 62716 Ammonia Corrosion, IEC 61701:2011 Salt Mist Corrosion UL Fire Rating: Type 2 (Type 1 on request)
Factory	ISO9001:2015

Warning: Read the installation and User Manual before handling, installing and operating modules.

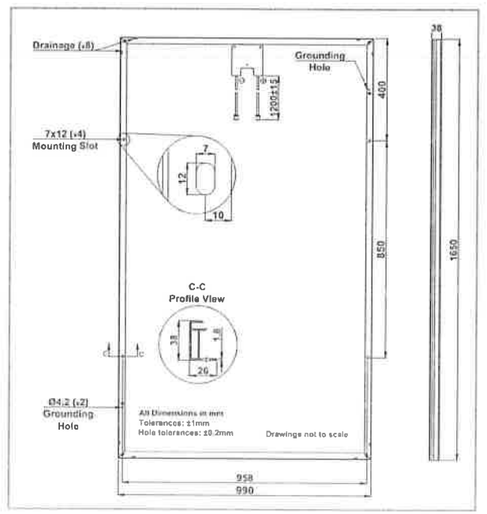
Third-party generated pan files from PV Evolution Labs available for download at: www.silfab.ca/downloads

TOP PERFORMER 2017 DNV·GL PV MODULE RELIABILITY SCORECARD

Pallet Count: 26
Container Count: 936

TITAN SOLAR POWER
Titan Solar Power
210 N. Sunway Dr.
Gilbert, AZ 85233
1-855-SAY-SOLAR

Silfab SOLAR
Silfab Solar Inc.
240 Courtneypark Drive East • Mississauga, Ontario Canada L5T 2S5
Tel +1 905-255-2501 • Fax +1 905-696-0267
info@silfab.ca • www.silfab.ca

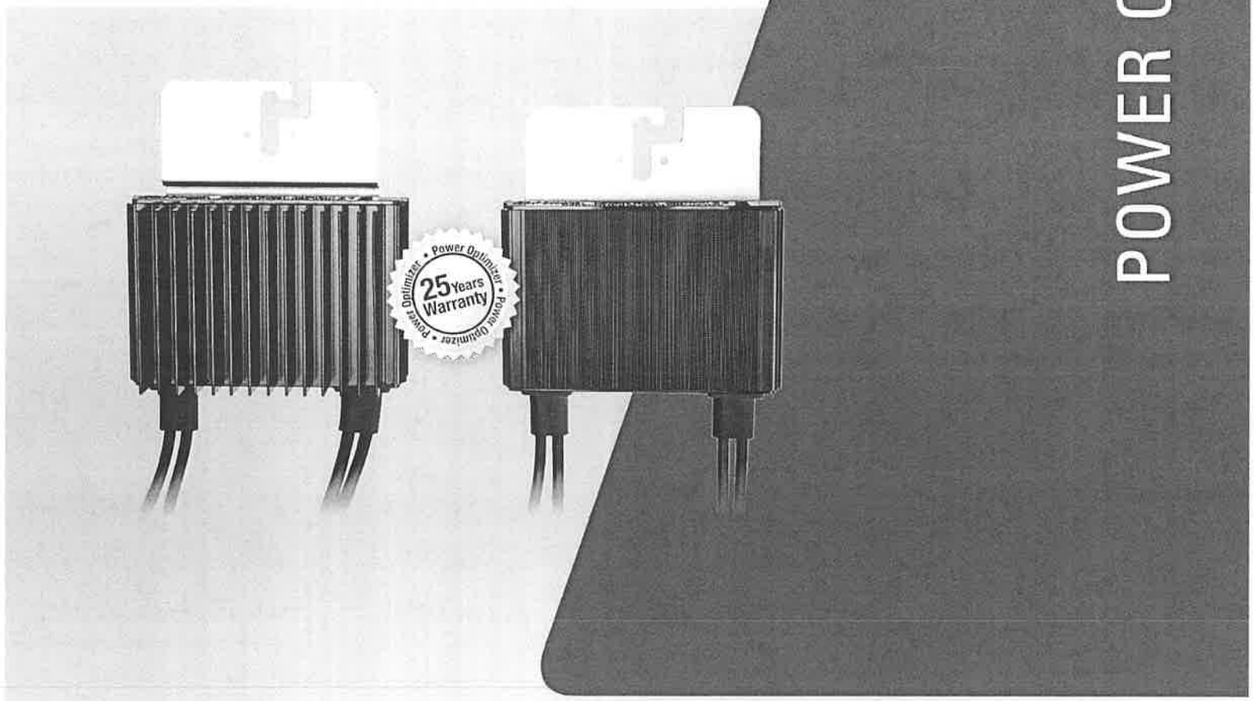


solaredge

Power Optimizer

P320 / P370 / P400 / P405 / 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
- Compliant with arc fault protection and rapid shutdown NEC requirements (when installed as part of the SolarEdge system)
- Module-level voltage shutdown for installer and firefighter safety

www.solaredge.us

solaredge

Power Optimizer

P320 / P370 / P400 / P405 / P505

OPTIMIZER MODEL (typical module compatibility)	P320 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
INPUT						
Rated Input DC Power[1]	320	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	60	80	125	83	Vdc
MPPT Operating Range	8 - 48	8 - 60	8 - 80	12.5 - 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11		10.1		14	Adc
Maximum DC Input Current	13.75		12.63		17.5	Adc
Maximum Efficiency	99.5					%
Weighted Efficiency	98.8				98.6	%
Overvoltage Category	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)						
Maximum Output Current	15					Adc
Maximum Output Voltage	60			85		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE 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					
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)	128 x 152 x 28 / 5 x 5.97 x 1.1		128 x 152 x 36 / 5 x 5.97 x 1.42	128 x 152 x 50 / 5 x 5.97 x 1.96	128 x 152 x 59 / 5 x 5.97 x 2.32	mm / in
Weight (including cables)	630 / 1.4		750 / 1.7	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4[2]					
Output Wire Type / Connector	Double Insulated; MC4					
Output Wire Length	0.95 / 3.0	1.2 / 3.9				m / ft
Operating Temperature Range	-40 - +85 / -40 - +185					°C / °F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					%

[1] Rated STC power of the module. Module of up to +5% power tolerance allowed.
[2] For other connector types please contact SolarEdge

PV SYSTEM DESIGN USING A SOLAREDGE INVERTER[3][4]		SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	P320, P370, P400	8		10	18	
	P405 / P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50[5]	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400-US)	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations		Yes				

[3] For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf.
[4] It is not allowed to mix P405/P505 with P320/P370/P400/P600/P700/P800 in one string.
[5] A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

CE ETL

solaredge

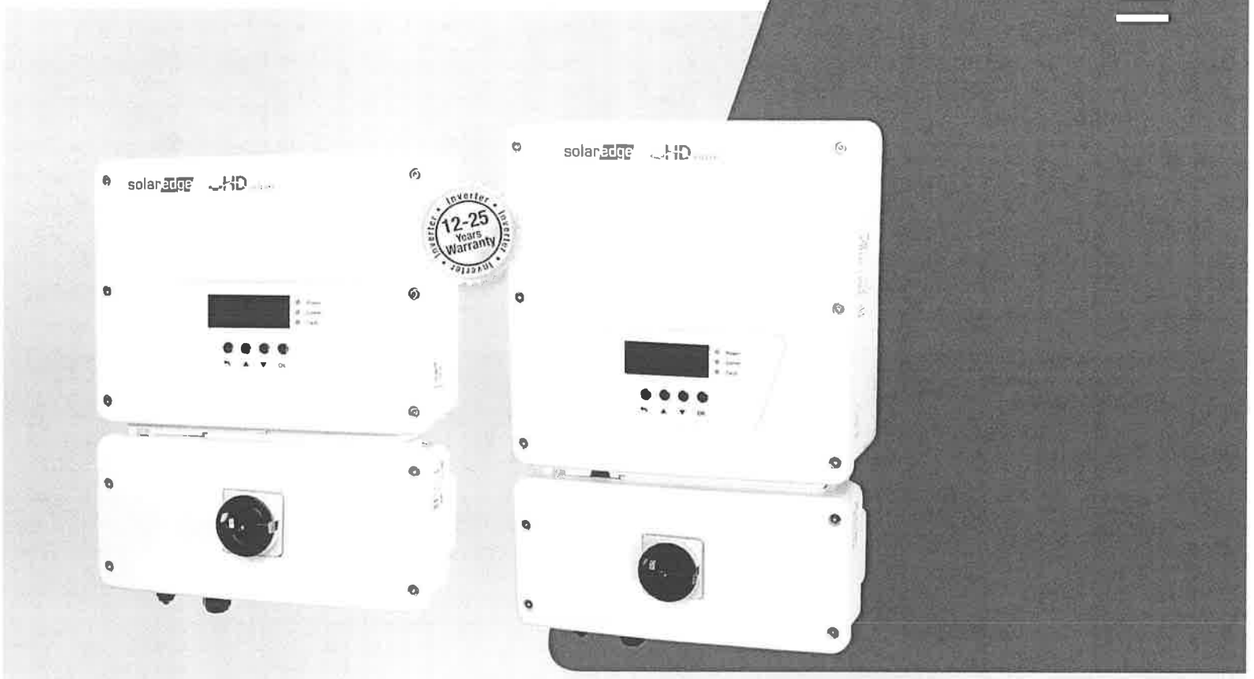
Single Phase Inverter

with HD-Wave Technology

for North America

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

INVERTERS



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
- High reliability without any electrolytic capacitors
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

HD wave

www.solaredge.us

solaredge

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	VA
Max. AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400	VA
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	-	Vac
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Frequency (Nominal)				59.3 - 60 - 60.5[1]				Hz
Maximum Continuous Output Current 208V	-	16	-	24	-	-	-	A
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	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	-	-	-	
Transformer-less, Ungrounded				Yes				
Maximum Input Voltage				480				Vdc
Nominal DC Input Voltage			380			400		Vdc
Maximum Input Current 208V	-	9	-	13.5	-	-	-	Adc
Maximum Input Current @240V	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Max. Input Short Circuit Current				45				
Reverse-Polarity Protection				Yes				
Ground-Fault Isolation Detection				600kΩ Sensitivity				
Maximum Inverter Efficiency	99			99.2				%
CEC Weighted Efficiency				99				%
Nighttime Power Consumption				< 2.5				W
ADDITIONAL FEATURES								
Supported Communication Interfaces				RS485, Ethernet, ZigBee (optional), Cellular (optional)				
Revenue Grade Data, ANSI C12.20				Optional[2]				
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			3/4" minimum / 14-6 AWG			3/4" minimum /14-4 AWG		
DC Input Conduit Size / # of Strings / AWG Range			3/4" minimum / 1-2 strings / 14-6 AWG			3/4" minimum / 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			Natural convection		
Operating Temperature Range			-13 to +140 / -25 to +60[3] (-40°F / -40°C option)[4]					°F / °C
Protection Rating			NEMA 3R (Inverter with Safety Switch)					

[1] For other regional settings please contact SolarEdge support
[2] Revenue grade inverter P/N: SExxxxH-US000NNC2
[3] For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf
[4] -A0 version P/N: SExxxxH-US000NNU4

RoHS

solaredge

SolarEdge Single Phase Inverters

For North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US

INVERTERS

The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Superior efficiency (98%)
- 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
- Small, lightweight and easy to install outdoors or indoors on provided bracket
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Fixed voltage inverter for longer strings
- Optional – revenue grade data, ANSI C12.1

solaredge

Single Phase Inverters for North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US

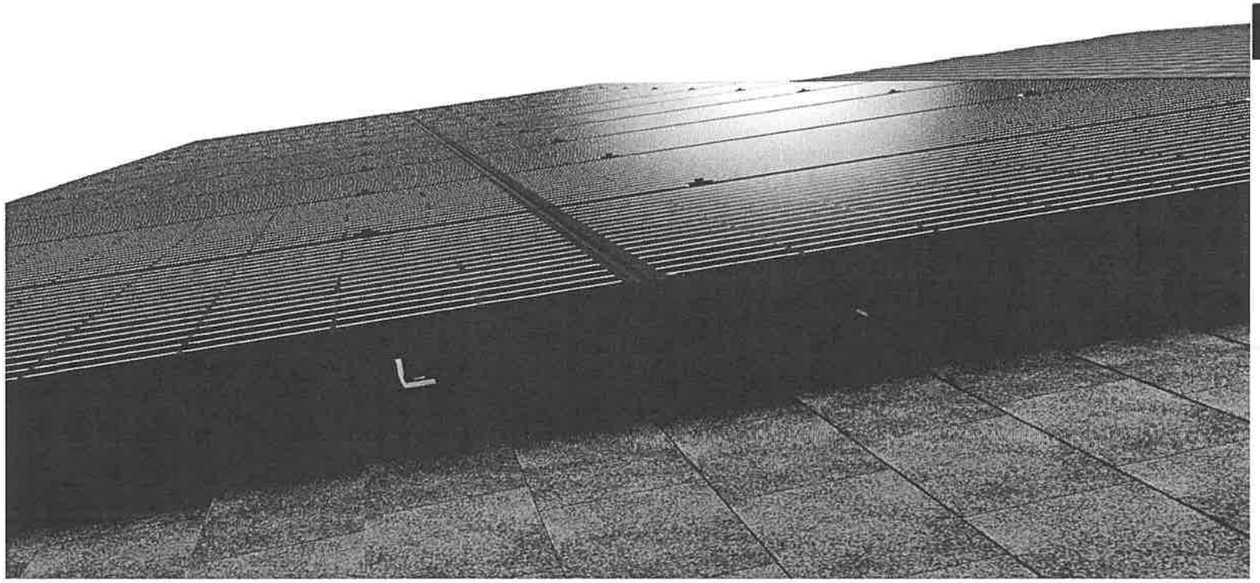
	SE3000A-US	SE3800A-US	SE5000A-US	SE6000A-US	SE7600A-US	SE10000A- US	SE11400A-US	
OUTPUT								
Nominal AC Power Output	3000	3800	5000	6000	7600	9980 @ 208V 10000 @240V	11400	VA
Max. AC Power Output	3300	4150	5400 @ 208V 5450 @240V	6000	8350	10800 @ 208V 10950 @240V	12000	VA
AC Output Voltage Min.-Nom.-Max.[1] 183 - 208 - 229 Vac	-	-	✓	-	-	✓	-	
AC Output Voltage Min.-Nom.-Max.[1] 211 - 240 - 264 Vac	✓	✓	✓	✓	✓	✓	✓	
AC Frequency Min.-Nom.-Max.[1]	59.3 - 60 - 60.5							Hz
Max. Continuous Output Current	12.5	16	24 @ 208V 21 @ 240V	25	32	48 @ 208V 42 @ 240V	47.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							Yes
INPUT								
Maximum DC Power (STC)	4050	5100	6750	8100	10250	13500	15350	W
Transformer-less, Ungrounded	Yes							
Max. Input Voltage	500							Vdc
Nom. DC Input Voltage	325 @ 208V / 350 @ 240V							Vdc
Max. Input Current[2]	9.5	13	16.5 @ 208V 15.5 @ 240V	18	23	33 @ 208V 30.5 @ 240V	34.5	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	97.7	98.2	98.3	98.3	98	98	98	%
CEC Weighted Efficiency	97.5	98	97 @ 208V 98 @ 240V	97.5	97.5	97 @ 208V 97.5 @ 240V	97.5	%
Nighttime Power Consumption	< 2.5					< 4		W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, RS232, Ethernet, ZigBee (optional)							
Revenue Grade Data, ANSI C12.1	Optional[3]							
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect[5]							
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 part15 class B							
INSTALLATION SPECIFICATIONS								
AC output conduit size / AWG range	3/4" minimum / 16-6 AWG					3/4" minimum / 8-3 AWG		
DC input conduit size / # of strings / AWG range	3/4" minimum / 1-2 strings / 16-6 AWG					3/4" minimum / 1-3 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 7.2 / 775 x 315 x 184					30.5 x 12.5 x 10.5 / 775 x 315 x 260		in / mm
Weight with Safety Switch	51.2 / 23.2		54.7 / 24.7			88 .4 / 40.1		lb / kg
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)	Fans (user replaceable)		
Noise	< 25					< 50		dBA
Min.-Max. Operating Temperature Range	-13 to +140 / -25 to +60 (-40 to +60 version available[4])							°F / °C
Protection Rating	NEMA 3R							

(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: SExxxxA-US000NNR2 (for 7600W inverter:SE7600A-US002NNR2).
(4) -40 version P/N: SExxxxA-US000NNU4 (for 7600W inverter:SE7600A-US002NNU4).
(5) P/Ns SExxxxA-US0xxxxxx have Manual Rapid Shutdown for NEC 2014 compliance (NEC 2017 compliance with outdoor installation)

RoHS

SnapNrack™
Solar Mounting Solutions

Series 100



The Installers Choice for Residential Solar Mounting

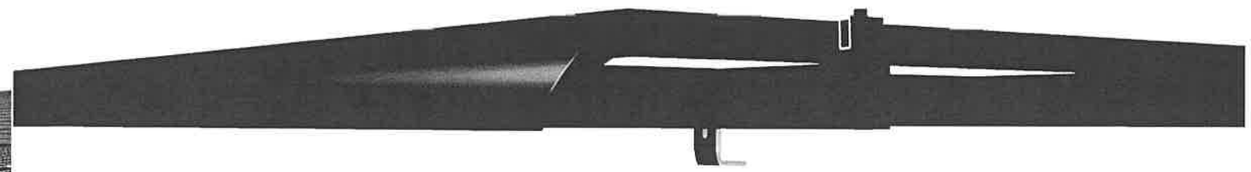
- Entire Mounting System from Single Manufacturer under 1 Warranty
- Snap-in features make the install process intuitive and fast
- Industry Leading Technical Support Services for Every Customer
- The Most Comprehensive UL 2703 Listing in the Industry

Start Mounting Solar on Your Roof Today

RESOURCES	snapnrack.com/resources
DESIGN	snapnrack.com/configurator
WHERE TO BUY	snapnrack.com/where-to-buy

The SnapNrack Series 100 Roof Mount System

is designed to provide the lowest total install cost of any residential mounting system.



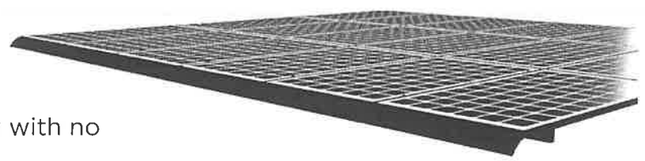
The top-of-the-line features of the SnapNrack mounting system reduce install times and labor cost while eliminating the need for service calls creating the lowest install lifecycle cost of any mounting system.

Wire Management

- Products such as the standard rail channel keep wires neatly organized providing a clean finished look to every install
- Industry's largest offering of wire management accessories include snap in junction box, 4-wire and trunk cable clamps, as well as conduit clamps for both composition shingle and tile roofs.

Undeniable Aesthetics

- Render the mounting system invisible by using Universal End Clamps that fasten modules while remaining hidden underneath the array
- Array skirt provides a sleek look and attractive design to the front of the array
- Rail-based system provides rigid structure tucked away underneath array with no unsightly mounts at the top or bottom



Quality. Performance. Innovation.

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack™
Solar Mounting Solutions

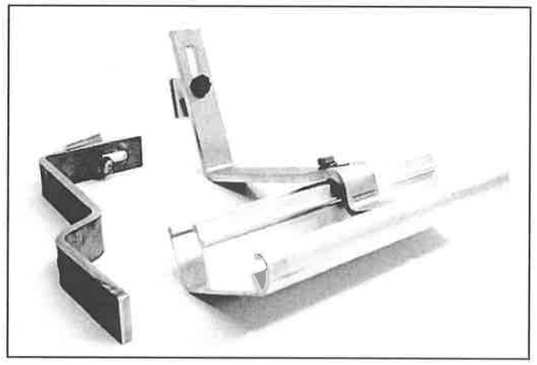
877-732-2860 www.snapnrack.com contact@snapnrack.com

Snap rack™
Solar Mounting Solutions

Series 100 Tile Roof Hook Solutions

SnapNrack Universal Tile Hooks are designed specifically for flat, S and W shaped tile roofs, while the Flat Tile Hooks are a lower cost solution for flat tile. The roof hooks are a strong, low-profile roof attachment solution for tile roofing that eliminates the need for cone flashings and cutting and drilling of tile. The hook arm is fabricated from 304 Stainless Steel for maximum stiffness and lowest possible thickness, typically allowing installation without cutting or grinding of tiles.

- Slotted attachment provides 1.25" of vertical adjustment for array leveling
- Strong and rigid design reduces the quantity of tile hooks and roof attachments required
- Universal hook features quick "drop-in" design, simply rock arm into base and secure with a single bolt
- Tile hook profiles are specifically designed for use with SnapNrack Standard Rail
- Flexible flashing available for flat tile roof hooks



242-02045 | 242-02044

Features Include

Snap in Hardware

Single Tool Installation

Easy Leveling

No Cutting or Drilling

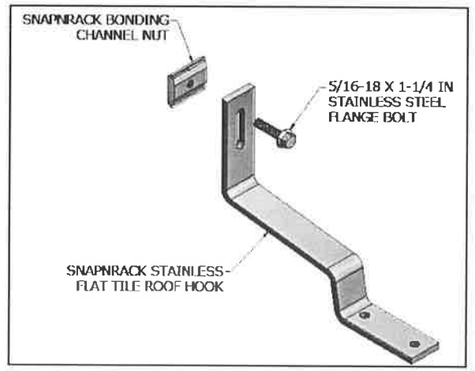
Preassembled hardware

Integrated bonding

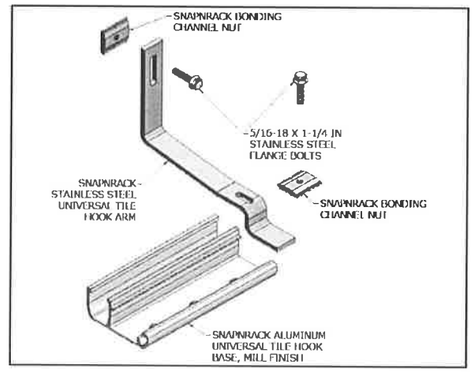
UL 2703 Certified

Snap rack™
Solar Mounting Solutions

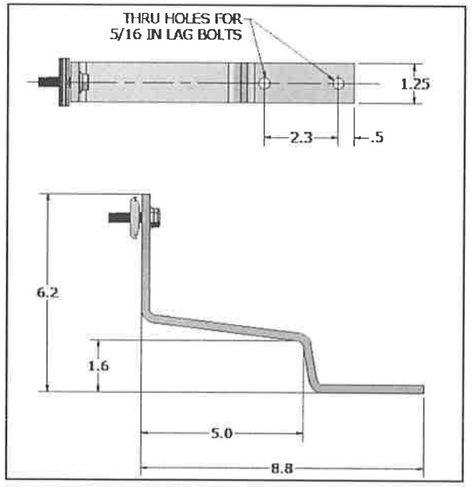
Flat Tile Hook Assembly



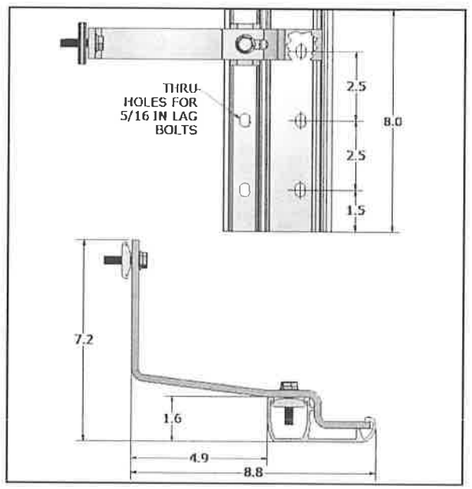
Universal Tile Hook Assembly



Flat Tile Hook Dimensions



Universal Tile Hook Dimensions



TILE ROOF HOOK TECHNICAL DATA

	Universal Tile Hook	Flat Tile Hook
Materials	• Aluminum base • Stainless steel tile hook arm • Silver anodized Channel Nut • Stainless steel hardware	• Stainless steel tile hook arm • Silver anodized Channel Nut • Stainless steel hardware
Material Finish	Mill finish	
Design Uplift Load	318 lbs	
Rail Spans	Limited to rail spans no greater than 72". No tilt ups.	
Torque Specification	Universal Tile Hook arm to base: 10-16 ft lbs Rail attachment: 10-16 ft-lbs	

877-732-2860 **www.snapnrack.com** **contact@snapnrack.com**