

GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH 2014 NATIONAL ELECTRIC CODE (NEC), 2015 INTERNATIONAL RESIDENTIAL CODE (IRC), 2014 NATIONAL BUILDING CODE (NBC), 2009 INTERNATIONAL BUILDING CODE (IBC), 2015 INTERNATIONAL PLUMBING CODE (IPC), AND ALL STATE AND LOCAL BUILDING, ELECTRICAL, AND PLUMBING CODES.
2. DRAWINGS HAVE BEEN DETAILED ACCORDING TO UL LISTING REQUIREMENTS.

SITE NOTES

1. A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS AN UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
3. THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
4. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION [NEC 110.26]
5. THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6 AWG COPPER WIRE PER NEC 250-64B. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT PER [NEC 250.64C.]
6. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SHALL SERVE TO PROTECT THE BUILDING OR STRUCTURE.
7. RIGID CONDUIT (AND/OR NIPPLES) MUST HAVE A PULL BUSHING TO PROTECT WIRES.
8. BOLTED CONNECTION REQUIRED IN DC DISCONNECTS ON THE WHITE GROUNDED CONDUCTOR (USE POLARIS BLOCK OR NEUTRAL BAR)
9. ANY CONNECTION ABOVE LIVE PARTS MUST BE WATERTIGHT. REDUCING WASHERS DISALLOWED ABOVE LIVE PARTS, MEYERS HUBS RECOMMENDED
10. UV RESISTANT CABLE TIES(NOT ZIP TIES) USED FOR PERMANENT WIRE MANAGEMENT OFF THE ROOF SURFACE IN ACCORDANCE WITH NEC 110.2,110.3(A-B). 300.4
11. SOLADECK JUNCTION BOXES MOUNTED FLUSH W/ROOF SURFACE TO BE USED FOR WIRE MANAGEMENT AND AS FLASHED ROOF PENETRATIONS FOR INTERIOR CONDUIT RUNS.

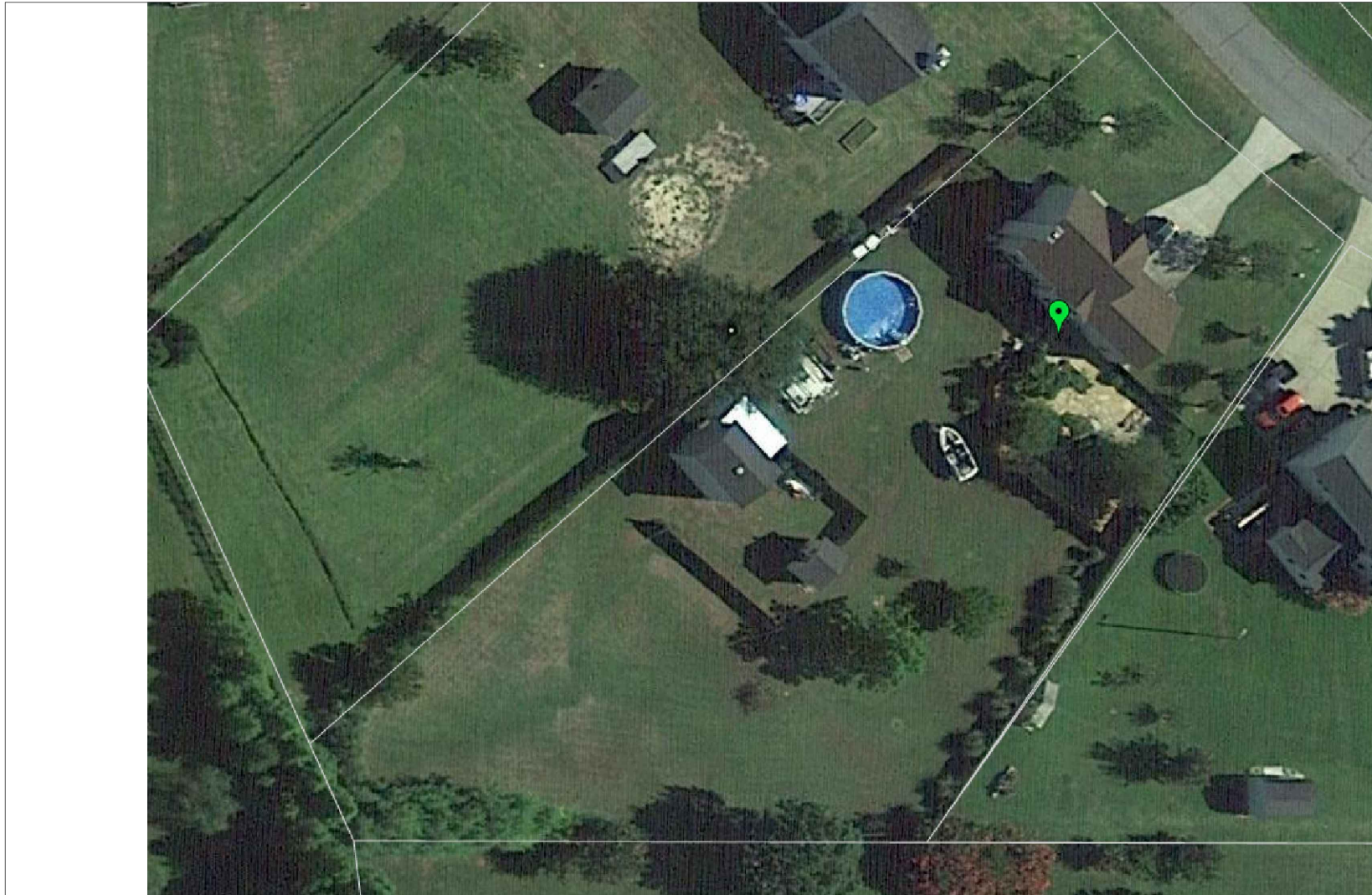
SOLAR CONTRACTOR

1. MODULE CERTIFICATIONS WILL INCLUDE UL1703, IEC61646, IEC61730.
2. IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
3. AS INDICATED BY DESIGN, OTHER NRTL LISTED MODULE GROUNDING DEVICES MAY BE USED IN PLACE OF STANDARD GROUNDING LUGS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ.
4. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
5. CONDUIT POINT OF PENETRATION FROM EXTERIOR TO INTERIOR TO BE INSTALLED AND SEALED WITH A SUITABLE SEALING COMPOUND.
6. DC WIRING LIMITED TO MODULE FOOTPRINT W/ ENPHASE AC SYSTEM.
7. ENPHASE WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.
8. MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC UNLESS NOT AVAILABLE.
9. ALL INVERTERS, MOTOR GENERATORS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AC PHOTOVOLTAIC MODULES, DC COMBINERS, DC-TO-DC CONVERTERS, SOURCE CIRCUIT COMBINERS, AND CHARGE CONTROLLERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (B).
10. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE.

EQUIPMENT LOCATIONS

1. ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY [NEC 110.26].
2. EQUIPMENT INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY [NEC 690.31 (A)-(B)] AND [NEC TABLE 310.15 (B)].
3. ADDITIONAL AC DISCONNECTS SHALL BE PROVIDED WHERE THE INVERTER IS NOT ADJACENT TO THE UTILITY AC DISCONNECT, OR NOT WITHIN SIGHT OF THE UTILITY AC DISCONNECT.
4. ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
5. ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

AERIAL VIEW



1220 S. 630 E STE. 430
AMERICAN FORK, UT 84003

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PROJECT MANAGER:
SCOTT GURNEY
385-498-4401

CONTRACTOR:
BLUE RAVEN SOLAR
800.377.4480

ASCE 7-05 WIND SPEED: 90 MPH
GROUND SNOW LOAD: 15 PSF
EXPOSURE CATEGORY: C
SEISMIC DESIGN CATEGORY: D

OCCUPANCY - R3
CONSTRUCTION - V-B
ZONING: RESIDENTIAL

SHEET INDEX

- PV1 - COVER SHEET
- PV2 - PROPERTY PLAN
- PV3 - SITE PLAN
- PV4 - EQUIPMENT & ATTACHMENT DETAIL
- PV5 - ELECTRICAL SINGLE LINE DIAGRAM & STRING DIAGRAM
- PV6 - ELECTRICAL CALCULATIONS
- PV7 - MBD CALCS. (IF NEEDED)
- PV8 - LABELS & LOCATIONS
- PV9 - STRING & SE OPTIMIZER
- PV10 - PLACARD (IF NEEDED - NEC 690.56(B))

SCOPE OF WORK

DC SYSTEM SIZE: 7.2 kW DC
ROOF TYPE: Comp Shingle
MODULES: (24) Trinasolar 300 TSM-DD05A.05(II)
INVERTER(S): SolarEdge SE7600H-US,----
RACKING: Unirac SolarMount LT Mounting & Racking System

ANCHORED ON MAX 72 INCH CENTERS USING UL LISTED RACKING SYSTEM TO SPEC.

SITE INFORMATION:

Vern Gambrell
23 Aspen Lane
Lillington, North Carolina 27546

DC SYSTEM SIZE:
7.2 kW DC

DRAWING BY

Nick Liles

DATE

December 13, 2018

PROJECT NUMBER

48332435

SHEET NAME

COVER SHEET

PAGE NUMBER

PV1

REVISION

A



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SITE INFORMATION:

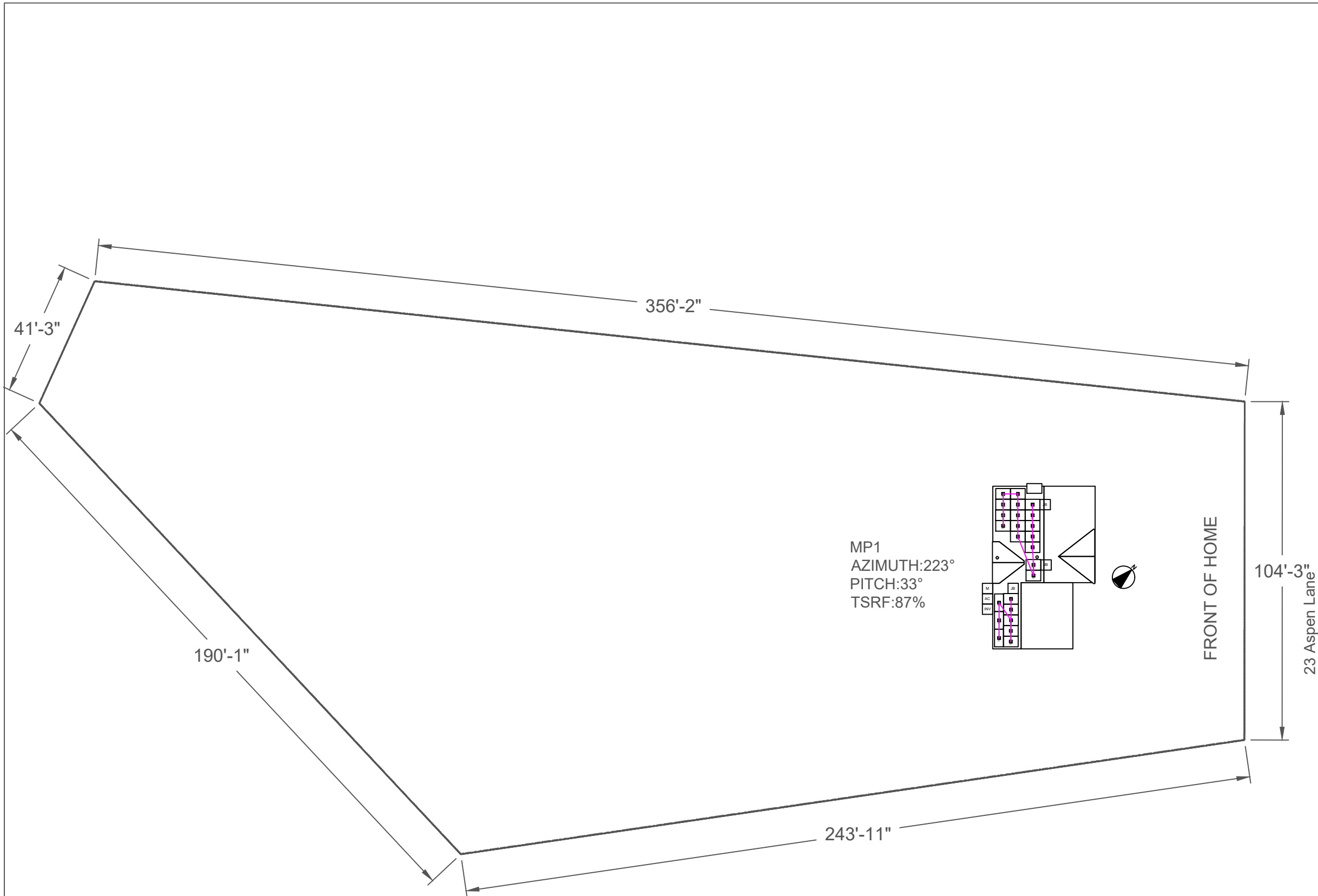
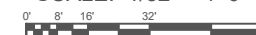
Vern Gambrell
23 Aspen Lane
Lillington, North Carolina 27546

DC SYSTEM SIZE:
7.2 kW DC

LEGEND

- INV INVERTER & DC DISCONNECT
- SUB (E) SUBPANEL
- LC (N) LOAD CENTER
- AC AC DISCONNECT
- M UTILITY METER / SERVICE PANEL
- JB JUNCTION BOX
- C COMBINER BOX
- PV PV REVENUE METER
- FIRE SETBACK
- EMT CONDUIT RUN (TO BE DETERMINED IN FIELD)
- PV WIRE STRING
- PROPERTY LINE

SCALE: 1/32" = 1'-0"



DC SYSTEM SIZE: 7.2 kW DC
ROOF TYPE: Comp Shingle

(24) Trinasolar 300 TSM-DD05A.05(II)
SolarEdge SE7600H-US,----INVERTER

DRAWING BY

Nick Liles

DATE

December 13, 2018

PROJECT NUMBER

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SHEET NAME

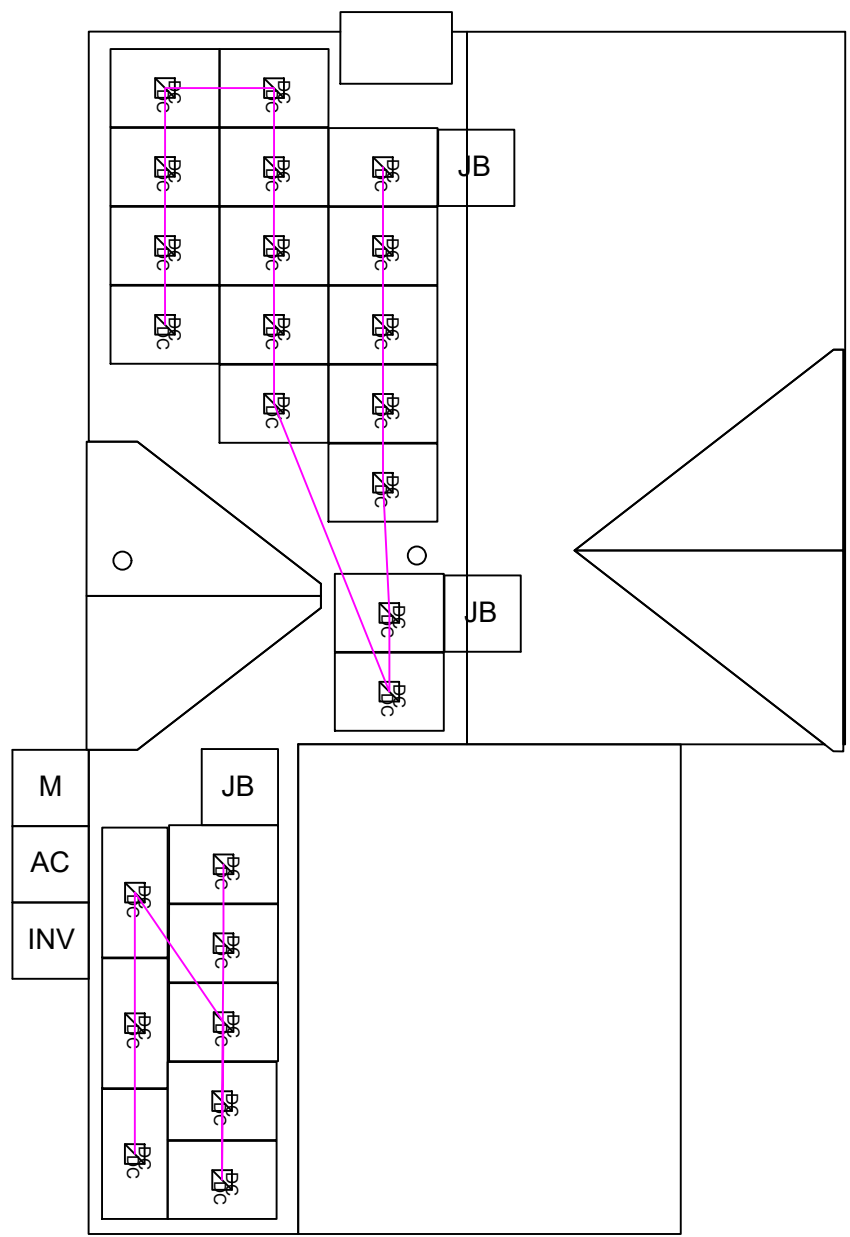
PROPERTY PLAN

PAGE NUMBER

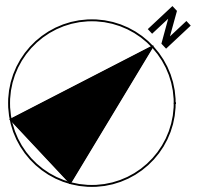
PV2

REVISION

A



MP1
 AZIMUTH:223°
 PITCH:33°
 TSRF:87%



FRONT OF HOME

LEGEND

- INV INVERTER & DC DISCONNECT
- SUB (E) SUBPANEL
- LC (N) LOAD CENTER
- AC AC DISCONNECT
- M UTILITY METER / SERVICE PANEL
- JB JUNCTION BOX
- C COMBINER BOX
- PV PV REVENUE METER
- [Hatched Box] FIRE SETBACK
- [Green Line] EMT CONDUIT RUN (TO BE DETERMINED IN FIELD)
- [Pink Line] PV WIRE STRING
- [Dashed Line] PROPERTY LINE

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

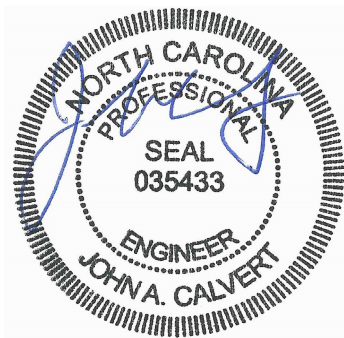


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Firm No. : D-0369

SITE INFORMATION:
 Vern Gambrell
 23 Aspen Lane
 Lillington, North Carolina 27546
 DC SYSTEM SIZE:
 7.2 kW DC

DRAWING BY
 Nick Liles

DATE
 December 13, 2018

PROJECT NUMBER
 48332435

SHEET NAME
SITE PLAN

PAGE NUMBER PV3	REVISION A
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DC SYSTEM SIZE: 7.2 kW DC
 ROOF TYPE: Comp Shingle

(24) Trinasolar 300 TSM-DD05A.05(II)
 SolarEdge SE7600H-US,----INVERTER

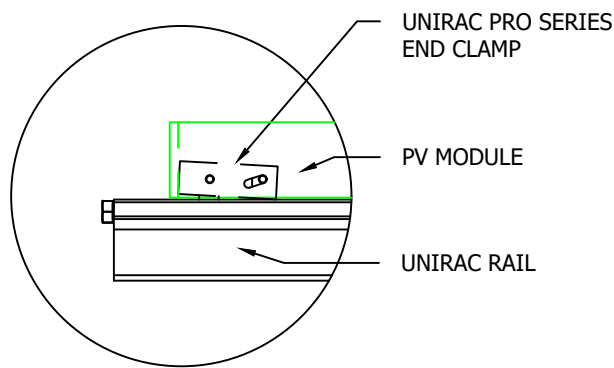
PV ARRAY STRUCTURAL CRITERIA

PV MODULE COUNT:	24 MODULES
# OF ATTACHMENT POINTS:	55
ARRAY AREA:	Module Count X 17.51ft ² = 420.2ft ²
ROOF AREA:	1826.7ft ²
% OF ARRAY/ROOF:	23.0%
ARRAY WEIGHT:	Module Count x 50lbs = 1200.0lbs
DISTRIBUTED LOAD:	Array Weight ÷ Array Area = 2.86 lbs/ft ²
POINT LOAD:	Array Weight ÷ Attachments = 21.8lbs/attachment

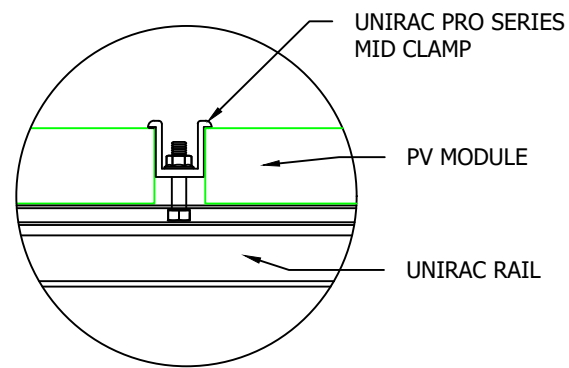
SITE CRITERIA

ASCE 7-05 WIND SPEED: 90 MPH
GROUND SNOW LOAD: 15 PSF

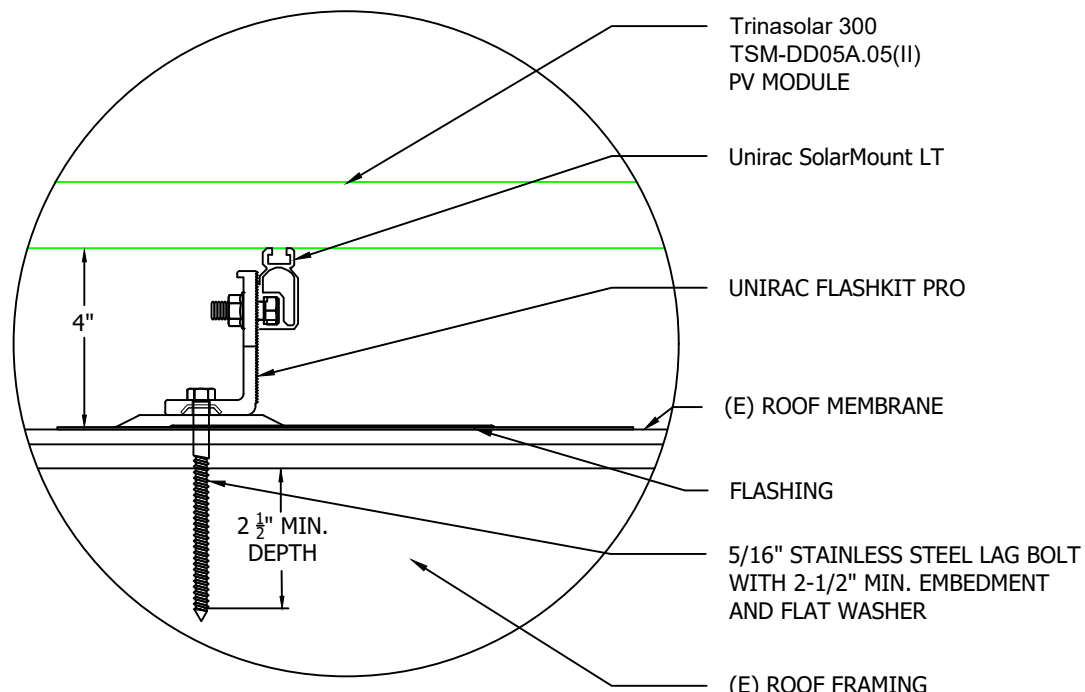
EXPOSURE CATEGORY: B
SEISMIC DESIGN CATEGORY: D



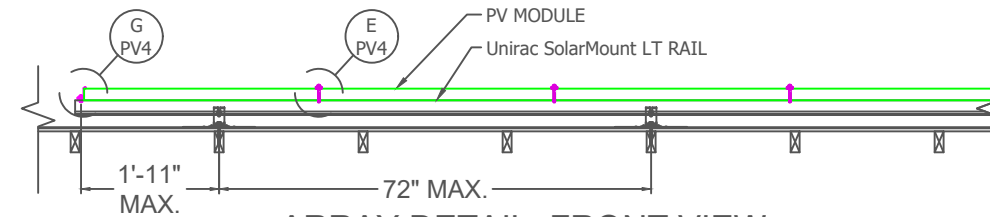
G DETAIL, END CLAMP FRONT
Scale: 3" = 1'-0"



E DETAIL, MID CLAMP FRONT
Scale: 3" = 1'-0"

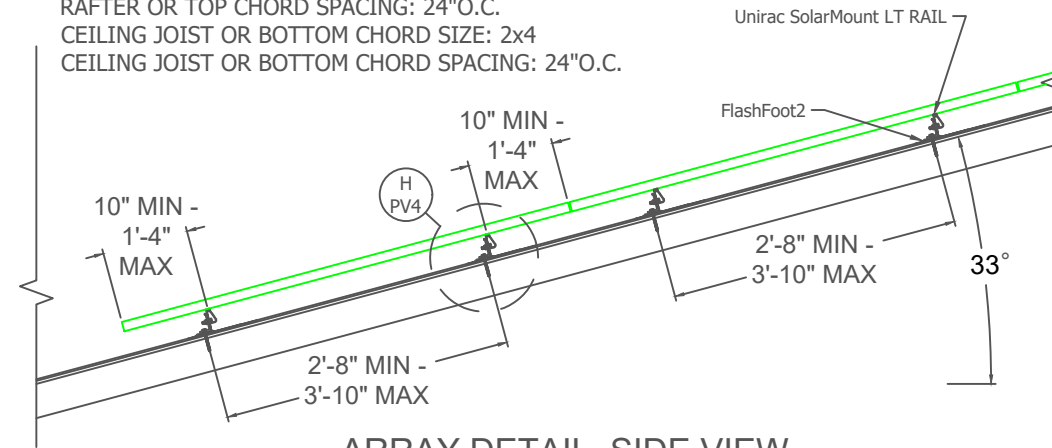


H DETAIL, STANDOFF
Scale: 3" = 1'-0"



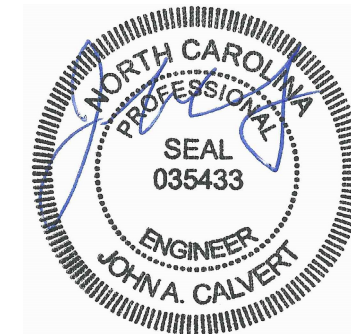
ARRAY DETAIL, FRONT VIEW
Scale: 3/8" = 1'-0"

ROOF TYPE: Comp Shingle
ROOF FRAMING TYPE: Manufactured Truss
RAFTER OR TOP CHORD SIZE: 2x4
RAFTER OR TOP CHORD SPACING: 24"O.C.
CEILING JOIST OR BOTTOM CHORD SIZE: 2x4
CEILING JOIST OR BOTTOM CHORD SPACING: 24"O.C.



ARRAY DETAIL, SIDE VIEW
Scale: 3/8" = 1'-0"

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SITE INFORMATION:
Vern Gambrell
23 Aspen Lane
Lillington, North Carolina 27546

DC SYSTEM SIZE:
7.2 kW DC

DRAWING BY
Nick Liles

DATE
December 13, 2018

PROJECT NUMBER
48332435

SHEET NAME
EQUIP. DETAIL

PAGE NUMBER PV4	REVISION A
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15	(1) 10 AWG THWN-2, COPPER, BLACK (LINE 1)	21 A AC	3	(2) 10 AWG THWN-2, COPPER, RED (POSITIVE)	MAX IMP = 12.6 A DC	2	(1) 10 - 2 MC W/G, THHN/THWN, SOLID COPPER	MAX IMP = 12.6 A DC	1	(2) 10 AWG USE-2 PV WIRE, 90C, COPPER	MAX IMP = 12.6 A DC
	(1) 10 AWG THWN-2, COPPER, RED (LINE 2)	240 V AC		(2) 10 AWG THWN-2, COPPER, BLACK (NEGATIVE)	ISC = 15.0 A DC		(1) 6 AWG BARE, COPPER (GROUND)	ISC = 15.0 A DC			
	(1) 10 AWG THWN-2, COPPER, WHITE (NEUTRAL)				VMP = 380 V DC			VMP = 380 V DC			
	(1) 10 AWG THWN-2, COPPER, GREEN (GROUND)			(1) 10 AWG THWN-2, COPPER, GREEN (EGC)	VOC = 480 V DC			VOC = 480 V DC			
(1) 3/4 INCH EMT CONDUIT			(1) 3/4 INCH EMT CONDUIT								



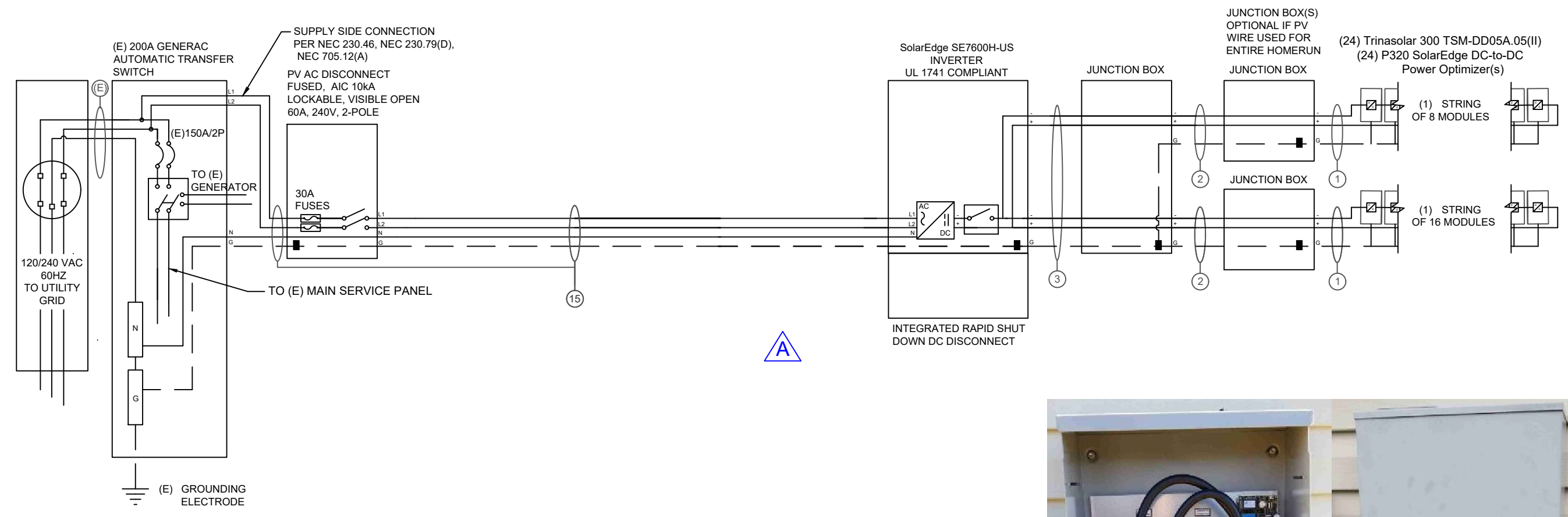
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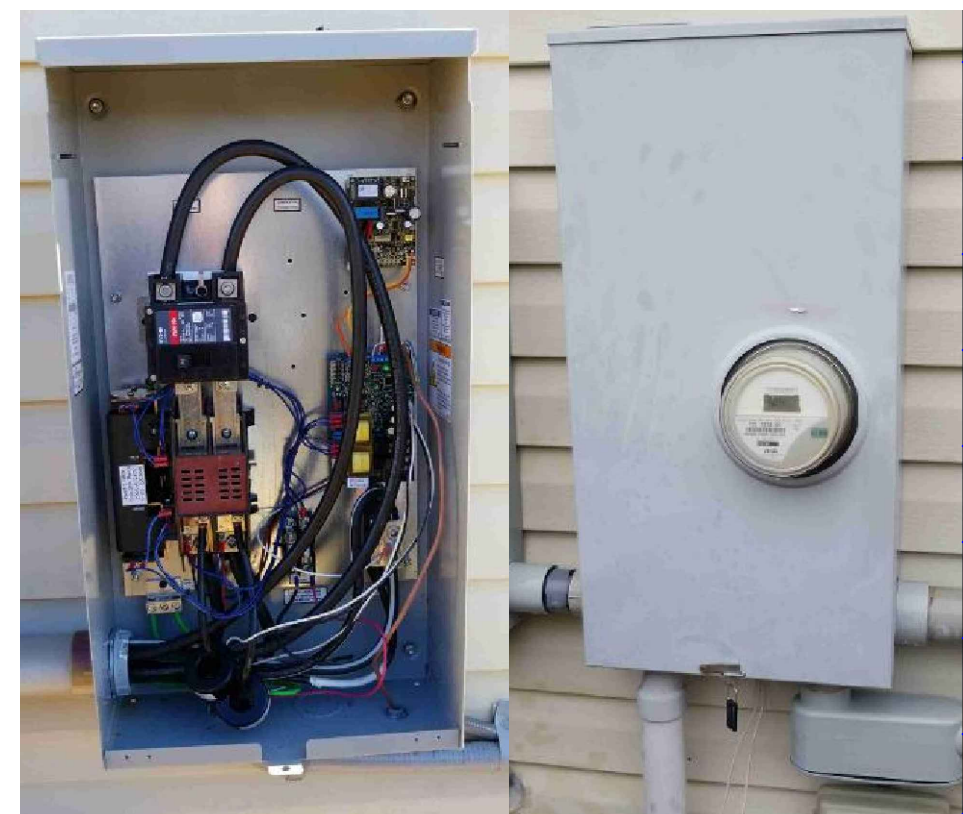


INTERCONNECTION NOTES

- GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9] & [NEC 230.95]
- ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
- SUPPLY SIDE INTERCONNECTION ACCORDING TO [NEC705.12(A)] WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH [NEC 240.21(B)]

DISCONNECT NOTES

- DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
- AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
- DC CURRENT CONDUCTORS ARE TO REMAIN OUTSIDE OF BUILDING PRIOR TO EITHER A FUSEABLE SOURCE CIRCUIT



SITE INFORMATION:

Vern Gambrell
23 Aspen Lane
Lillington, North Carolina 27546

DC SYSTEM SIZE:
7.2 kW DC

DRAWING BY Nick Liles	
DATE December 13, 2018	
PROJECT NUMBER 48332435	
SHEET NAME ELEC. 3 LINE DIAG.	
PAGE NUMBER PV5	REVISION A

MODULE SPECIFICATIONS	Trinasolar 300 TSM-DD05A.05(II)
RATED POWER (STC)	300 W
MODULE VOC	39.9 V DC
MODULE VMP	32.6 V DC
MODULE IMP	9.19 A DC
MODULE ISC	9.64 A DC
VOC CORRECTION (%/°C)	-0.29 °C
VMP CORRECTION (%/°C)	-0.39 °C
SERIES FUSE RATING	20 A DC
ADJ. MODULE VOC @ ASHRAE LOW TEMP	44.3 V DC
ADJ. MODULE VMP @ ASHRAE 0.4% HIGH TEMP	27.1 V DC

SOLAREEDGE OPTIMIZER	SolarEdge P320
RATED POWER INPUT (STC)	320 W
MAX INPUT VOC	48 V DC
VOLTAGE OPERATING RANGE	8 - 48 V DC
MAXIMUM CONT. INPUT CURRENT ISC	11 A DC
MAXIMUM OUTPUT VOLTAGE	60 V DC
MAXIMUM OUTPUT CURRENT	15 A DC
MAX ALLOWED SYSTEM VOLTAGE VOC	1000 V DC
CEC WEIGHTED EFFICIENCY	98.8 %

INVERTER SPECIFICATIONS	SolarEdge SE7600H-US
NUMBER OF MPPTS	2
MAXIMUM INPUT VOLTAGE	480 V DC
NOMINAL INPUT VOLTAGE	400 V DC
MAXIMUM INPUT SHORT CIRCUIT CURRENT (ISC)	45 A DC
MAXIMUM INPUT CURRENT	20 A DC
MAXIMUM USABLE DC INPUT POWER	11800 W
MAXIMUM OUTPUT CURRENT	32 A AC
AC OVERCURRENT PROTECTION	40 A
MAXIMUM OUTPUT POWER	7600 W
CEC WEIGHTED EFFICIENCY	99 %

DESIGN LOCATION AND TEMPERATURES	ASHRAE 0.4% HIGH TEMP
TEMPERATURE DATA SOURCE	ASHRAE 0.4% HIGH TEMP
STATE	North Carolina
CITY	Lexington
WEATHER STATION	WINSTON-SALEM REYNOLDS A
ASHRAE EXTREME LOW TEMP (°C)	-13
ASHRAE 0.4% HIGH TEMP (°C)	36

SYSTEM ELECTRICAL SPECIFICATIONS	STR 1	STR 2	STR 3
DC CIRCUIT STRING	8	16	
STRINGS IN PARALLEL	1	1	
NUMBER OF MODULES PER MPPT	8	16	
POWER RATING PER MPPT (STC)	2400	4800	
TOTAL MODULE NUMBER	24 MODULES		
STC RATING OF ARRAY (WATTS)	7200		
ADJ. ARRAY VMP @ ASHRAE 0.4% HIGH TEMP.	400	400	
DC DISCONNECT CALCS AT OPTIMIZER:			
MAX. SYSTEM VOC @ ASHRAE LOW TEMP.	480	480	
VOLTAGE @ RATED MAX. POWER (VMP)	400	400	
MAX. SHORT CIRCUIT CURRENT (ISC)	15	15	
CURRENT @ MAX. POWER POINT (IMP)	6.0	12.0	

PHOTOVOLTAIC AC DISCONNECT OUTPUT LABEL	
AC OUTPUT CURRENT	32 A AC
NOMINAL AC VOLTAGE	240 V AC

PHOTOVOLTAIC DC DISCONNECT OUTPUT LABEL	
MAXIMUM SYSTEM VOLTAGE (VOC)	480 V DC
MAXIMUM POWER POINT VOLTAGE (VMP)	400 V DC
SHORT-CIRCUIT CURRENT (ISC)	30.0 A DC
RATED MAX POWER POINT CURRENT (IMP)	18.0 A DC

CONDUCTOR SIZE CALCULATIONS	
PV MODULES TO SE OPTIMIZER	MAX. SHORT CIRCUIT CURRENT (ISC) = 9.6 A DC
	MAX. CURRENT (ISC X1.25) = 12.1 A DC
	CONDUCTOR (COPPER, PV WIRE, (90°C)) = 10 AWG
	CONDUCTOR RATING = 40 A
	AMB. TEMP. AMP. CORRECTION = 0.71
	ADJUSTED AMP. = 28.4 > 12.1
SE OPTIMIZER TO JUNCTION BOX	MAX. DC-TO-DC CONT. OUTPUT CURRENT= 15.0 A DC
	MAX. CURRENT X1.25) = 18.8 A DC
	CONDUCTOR (COPPER, PV WIRE, (90°C)) = 10 AWG
	CONDUCTOR RATING = 40 A
	AMB. TEMP. AMP. CORRECTION = 0.71
	ADJUSTED AMP. = 28.4 > 18.8
EGC	MAX. CHANNEL(X1.25) ISC = 18.8 A DC
	CONDUCTOR (COPPER, THWN-2, (90°C))= 10 AWG
	EGC CONDUCTOR RATING = 60 A
	CONDUIT FILL DERATE = 1
	AMB. TEMP. AMP. CORRECTION = 0.71
	ADJUSTED AMP. = 42.6 > 18.8
JUNCTION BOX TO INVERTER INPUT	MAX. DC-TO-DC CONT. OUTPUT CURRENT= 15.0 A DC
	MAX. CURRENT (ISC X1.25) = 18.8 A DC
	CONDUCTOR (COPPER, THWN-2, (90°C)) = 10 AWG
	CONDUCTOR RATING = 40 A
	CONDUIT FILL DERATE = 1
	AMB. TEMP. AMP. CORRECTION = 0.71
	ADJUSTED AMP. = 28.4 > 18.8
INVERTER OUTPUT TO OCPD	INVERTER RATED AMPS = 32.0 A AC
	MAX. CURRENT (RATED AMPS X1.25) = 40.0 A AC
	CONDUCTOR (COPPER, THWN-2, (90°C)) = 8 AWG
	CONDUCTOR RATING = 55 A
	CONDUIT FILL DERATE = 1
	AMB. TEMP. AMP. CORRECTION = 0.91
	ADJUSTED AMP. = 50.1 > 40.0

GROUNDING NOTES

1. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH [NEC 690-47] AND [NEC 250-50] THROUGH [NEC 250-60] SHALL BE PROVIDED. PER NEC, GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, OR IS ONLY METALLIC WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT GROUND ROD WITH ACORN CLAMP.
2. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
3. PV SYSTEM SHALL BE GROUNDED IN ACCORDANCE TO [NEC 250.21], [NEC TABLE 250.122], AND ALL METAL PARTS OR MODULE FRAMES ACCORDING TO [NEC 690.46].
4. MODULE SOURCE CIRCUITS SHALL BE GROUNDED IN ACCORDANCE TO [NEC 690.42].
5. THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER MODULE.
6. EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTIONS POINTS IDENTIFIED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
7. ENCLOSURES SHALL BE PROPERLY PREPARED WITH REMOVAL OF PAINT/FINISH AS APPROPRIATE WHEN GROUNDING EQUIPMENT WITH TERMINATION GROUNDING LUGS.
8. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR DIRECT BURIAL.
9. GROUNDING AND BONDING CONDUCTORS SHALL BE COPPER, SOLID OR

STRANDED, AND BARE WHEN EXPOSED.

10. EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZE ACCORDING TO [NEC 690.45] AND BE A MINIMUM OF #10AWG WHEN NOT EXPOSED TO DAMAGE (#6AWG SHALL BE USED WHEN EXPOSED TO DAMAGE).
11. GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN (OR MARKED GREEN IF #4 AWG OR LARGER)
12. ALL CONDUIT BETWEEN THE UTILITY AC DISCONNECT AND THE POINT OF CONNECTION SHALL HAVE GROUNDED BUSHINGS AT BOTH ENDS.
13. SYSTEM GEC SIZED ACCORDING TO [NEC 690.47], [NEC TABLE 250.66], DC SYSTEM GEC SIZED ACCORDING TO [NEC 250.166], MINIMUM #8AWG WHEN INSULATED, #6AWG WHEN EXPOSED TO DAMAGE.
14. EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENTS, AND CONDUCTOR ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH 250.134 OR 250.136(A) REGARDLESS OF VOLTAGE.

WIRING & CONDUIT NOTES

1. ALL CONDUIT SIZES AND TYPES, SHALL BE LISTED FOR ITS PURPOSE AND APPROVED FOR THE SITE APPLICATIONS
2. ALL PV CABLES AND HOMERUN WIRES BE TYPE USE-2, AND SINGLE-CONDUCTOR CABLE LISTED AND IDENTIFIED AS PV WIRE, TYPE TC-ER, OR EQUIVALENT; ROUTED TO SOURCE CIRCUIT COMBINER BOXES AS REQUIRED
3. ALL CONDUCTORS AND OCPD SIZES AND TYPES SPECIFIED ACCORDING TO [NEC 690.8] FOR MULTIPLE CONDUCTORS
4. ALL PV DC CONDUCTORS IN CONDUIT EXPOSED TO SUNLIGHT SHALL BE DERATED ACCORDING TO [NEC TABLE 310.15 (B)(2)(a), NEC TABLE 310.15(B)(3)(a), & NEC 310.15(B)(3)(c)]
5. EXPOSED ROOF PV DC CONDUCTORS SHALL BE USE-2, 90°C RATED, WET AND UV RESISTANT, AND UL LISTED RATED FOR 600V, UV RATED SPIRAL WRAP SHALL BE

USED TO PROTECT WIRE FROM SHARP EDGES.

6. PHASE AND NEUTRAL CONDUCTORS SHALL BE DUAL RATED THHN/THWN-2 INSULATED, 90°C RATED, WET AND UV RESISTANT, RATED FOR 600V
7. 4-WIRE DELTA CONNECTED SYSTEMS HAVE THE PHASE WITH THE HIGHER VOLTAGE TO GROUND MARKED OR IDENTIFIED BY OTHER EFFECTIVE MEANS.
8. ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION
9. VOLTAGE DROP LIMITED TO 2% FOR DC CIRCUITS AND 3% FOR AC CIRCUITS
10. NEGATIVE GROUNDED SYSTEMS DC CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS: DC POSITIVE- RED (OR MARKED RED), DC NEGATIVE- GREY (OR MARKED GREY)
11. POSITIVE GROUNDED SYSTEMS DC CONDUCTORS COLOR CODED: DC POSITIVE- GREY (OR MARKED GREY), DC NEGATIVE- BLACK (OR MARKED BLACK)
12. AC CONDUCTORS >4AWG COLOR CODED OR MARKED: PHASE A OR L1- BLACK, PHASE B OR L2- RED, PHASE C OR L3- BLUE, NEUTRAL- WHITE/GRAY
- * USE-2 IS NOT INDOOR RATED BUT PV CABLE IS RATED THWN/THWN-2 AND MAY BE USED INSIDE
- ** USE-2 IS AVAILABLE AS UV WHITE
13. IF CONDUIT DETERMINED TO BE RAN THROUGH ATTIC IN FIELD THEN CONDUIT WILL BE EITHER EMT, FMC, OR MC CABLE IF DC CURRENT COMPLYING WITH NEC 690.31, NEC 250.118(10). DISCONNECTING MEANS SHALL COMPLY WITH 690.13 AND 690.15
14. CONDUIT RAN THROUGH ATTIC WILL BE AT LEAST 18" BELOW ROOF SURFACE COMPLYING WITH NEC 230.6(4) AND SECURED NO GREATER THAN 6' APART PER NEC 330.30(B).



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385-498-4401

CONTRACTOR:
BLUERAVEN SOLAR
800.377.4480

SITE INFORMATION:
Vern Gambrell
23 Aspen Lane
Lillington, North Carolina 27546

DC SYSTEM SIZE:
7.2 kW DC

DRAWING BY
Nick Liles

DATE
December 13, 2018

PROJECT NUMBER
48332435

SHEET NAME
ELEC. CALCS.

PAGE NUMBER
PV6

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LABELS

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

LABEL 1
AT EACH DIRECT CURRENT JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED UNGROUNDED CONDUCTORS MAY BE EXPOSED DURING SERVICE.
[NEC. 690.35(F)]

⚠ WARNING
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 2
FOR PV DISCONNECTING MEANS WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION.
[NEC 690.17(E), NEC 705.22]

PHOTOVOLTAIC SYSTEM
⚠ DC DISCONNECT ⚠

RATED MPP CURRENT	AMPS
RATED MPP VOLTAGE	VOL TS
MAX SYSTEM VOLTAGE	VDC
MAX CIRCUIT CURRENT	AMPS

LABEL 3
AT EACH DC DISCONNECTING MEANS, INCLUDING THE DC DISCONNECT AT THE INVERTER.
[NEC 690.53, NEC 690.13(B)]

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠

RATED AC OUTPUT CURRENT	A
NOMINAL OPERATING AC VOLTAGE	V

LABEL 4
AT POINT OF INTERCONNECTION, MARKED AT AC DISCONNECTING MEANS.
[NEC 690.54, NEC 690.13 (B)]

⚠ WARNING
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL 5
AT POINT OF INTERCONNECTION FOR EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTOR SUPPLIED FROM MULTIPLE SOURCES, EACH SERVICE EQUIPMENT AND ALL ELECTRIC POWER PRODUCTION SOURCE LOCATIONS.
[NEC 705.12(D)(3)]

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 6
AT DIRECT-CURRENT EXPOSED RACEWAYS, CABLE TRAYS, COVERS AND ENCLOSURES OF JUNCTION BOXES, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.
[NEC 690.31(G)(3&4)]

⚠ WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 7
PLACED ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER IF TIE IN CONSISTS OF LOAD SIDE CONNECTION TO BUSBAR.
[NEC 705.12(D)(2)(3)(b)]

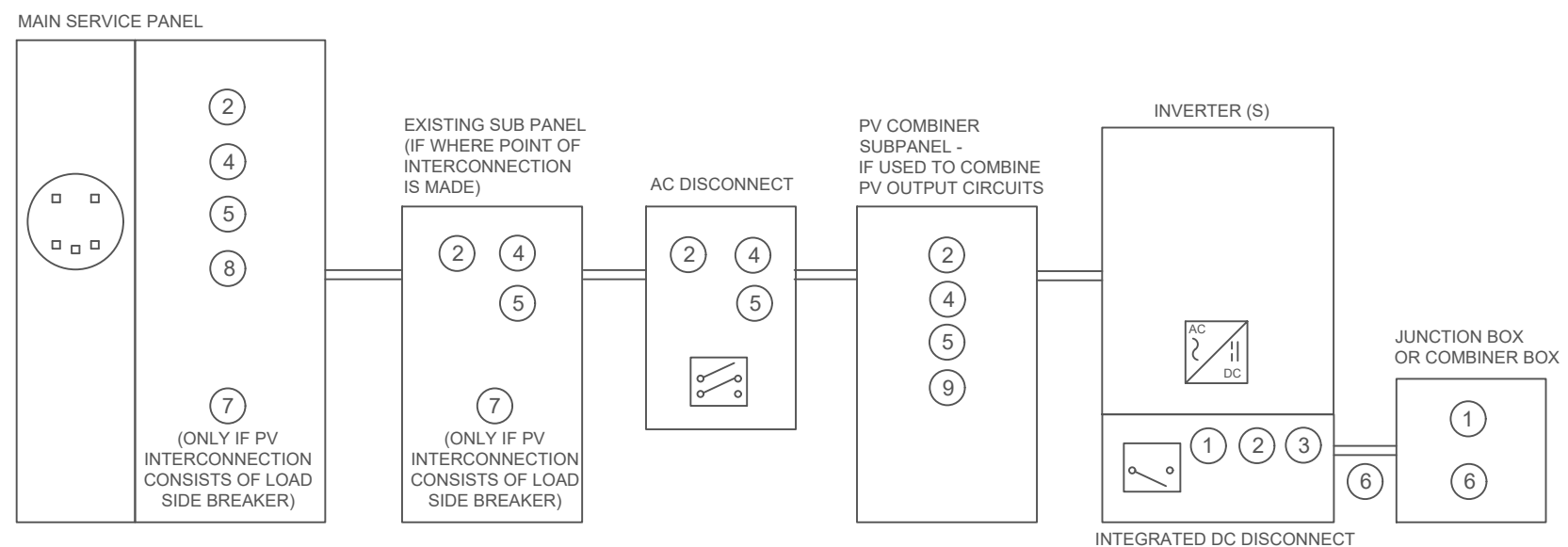
PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

LABEL 8
SIGN LOCATED AT UTILITY SERVICE EQUIPMENT.
[NEC 690.56(C)]

⚠ WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

LABEL 9 (ONLY IF 3 OR MORE SUPPLY SOURCES TO A BUSBAR)
SIGN LOCATED AT LOAD CENTER IF CONTAINS 3 OR MORE POWER SOURCES.
[NEC 705.12(D)(2)(3)(C)]

LABELING DIAGRAM:



*ELECTRICAL DIAGRAM SHOWN ABOVE IS FOR LABELING PURPOSES ONLY. NOT AN ACTUAL REPRESENTATION OF EQUIPMENT AND CONNECTIONS TO BE INSTALLED. LABEL LOCATIONS PRESENTED MAY VARY DEPENDING ON TYPE OF INTERCONNECTION METHOD AND LOCATION PRESENTED ON PV5 OF 3 LINE DIAGRAM. PV5 LINE DIAGRAM TO REFLECT ACTUAL REPRESENTATION OF PROPOSED SCOPE OF WORK.

- LABELING NOTES:**
1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
 2. LABELING REQUIREMENTS BASED ON THE 2014 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
 3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
 4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21]
 5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]



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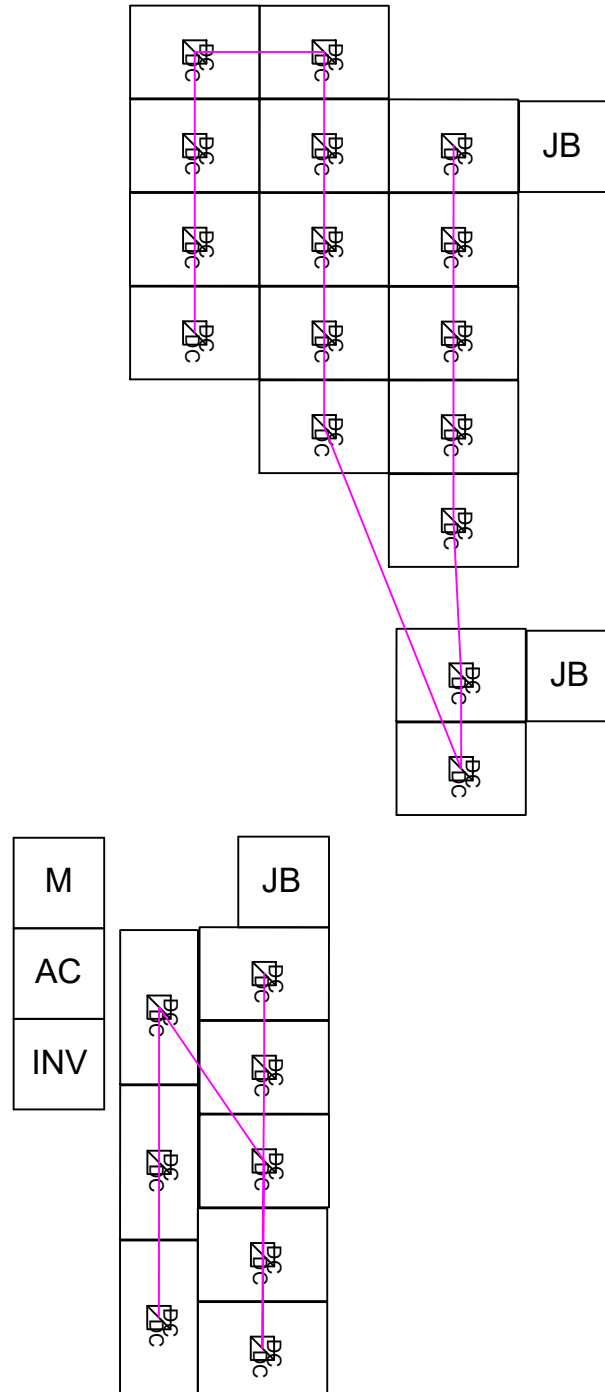
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FRONT OF HOME



Single Phase Inverter with HD-Wave Technology for North America

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



Single Phase Inverter with HD-Wave Technology for North America

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

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	
OUTPUT							
Rated AC Power Output	3000	3800 @ 240V	5000	6000 @ 240V	7600	10000	VA
Max. AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	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	A
GFD Threshold	-	-	-	1	-	-	A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
INPUT							
Maximum DC Power	4650	5900	7750	9300	11800	15500	W
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	Adc
Max. Input Short Circuit Current	-	-	45	-	-	-	Adc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600ka Sensitivity						
Maximum Inverter Efficiency	99	-	-	99.2	-	-	%
CEC Weighted Efficiency	-	-	99	-	-	-	%
Nighttime Power Consumption	< 2.5						
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 AFCEI according to T.I.L. M-07						
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (H)						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	3/4" minimum / 20-4 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	
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6	lb / kg		
Noise	< 25			< 50			
Cooling	Natural Convection			Natural convection			
Operating Temperature Range	-13 to +140 / -25 to +60 ⁽³⁾ (-40°F / -40°C option) ⁽⁴⁾						
Protection Rating	NEMA 3R (Inverter with Safety Switch)						

⁽¹⁾ For other regional settings please contact SolarEdge support
⁽²⁾ Revenue grade Inverter P/N: SExxxx-H-US000NC2
⁽³⁾ For power derating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>
⁽⁴⁾ -40 version P/N: SExxxx-H-US000NU4



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SolarEdge Power Optimizer

Module Add-On For North America

P320 / P370 / P400 / P405



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

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SolarEdge Power Optimizer

Module Add-On for North America

P320 / P370 / P400 / P405

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)	
INPUT					
Rated Input DC Power ⁽¹⁾	320	370	400	405	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	60	80	125	Vdc
MPPT Operating Range	8 - 48	8 - 60	8 - 80	12.5 - 105	Vdc
Maximum Short Circuit Current (Isc)	11		10.1		Adc
Maximum DC Input Current	13.75		12.63		Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.8				%
Overvoltage Category	II				
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREGE INVERTER)					
Maximum Output Current	15				Adc
Maximum Output Voltage	60		85		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREGE INVERTER OR SOLAREGE 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	mm / in
Weight (including cables)	630 / 1.4		750 / 1.7		gr / lb
Input Connector	MC4 Compatible	MC4 / Amphenol AH4 Double Insulated;	MC4 Compatible		
Output Wire Type / Connector	Double Insulated; MC4 Compatible	MC4 / Amphenol AH4	Double Insulated; MC4 Compatible		
Output Wire Length	0.95 / 3.0		1.2 / 3.9		m / ft
Operating Temperature Range	-40 - +85 / -40 - +185				
Protection Rating	IP68 / NEMA6P				
Relative Humidity	0 - 100				

⁽¹⁾ Rated STC power of the module. Module of up to +5% power tolerance allowed.

PV SYSTEM DESIGN USING A SOLAREGE INVERTER ⁽²⁾⁽³⁾		SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V
Minimum String Length (Power Optimizers)	P320, P370, P400 P405	8 6	8	10 8	18 14
Maximum String Length (Power Optimizers)		25	25	25	50 ⁽⁴⁾
Maximum Power per String		5700 (6000 with SE7600H-US)	5250	6000	12750
Parallel Strings of Different Lengths or Orientations		Yes			

⁽²⁾ For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf.

⁽³⁾ It is not allowed to mix P405 with P320/P370/P400/P600/P700/P800 in one string.

⁽⁴⁾ A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement



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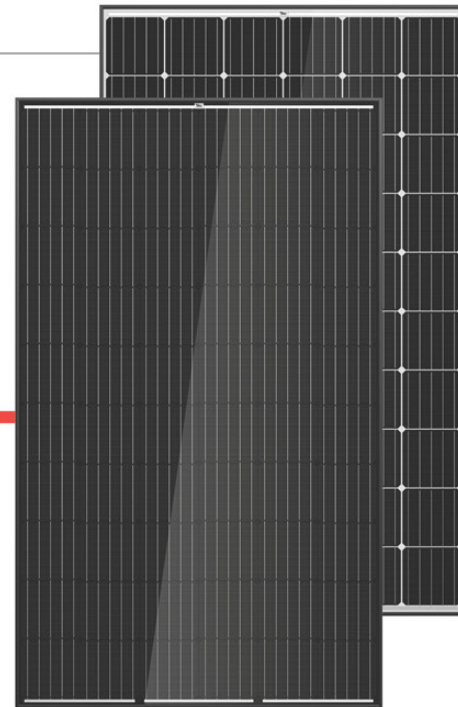
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THE ALLMAX^M PLUS⁺ FRAMED 60-CELL MODULE



60 CELL
MONOCRYSTALLINE MODULE

275-315W
POWER OUTPUT RANGE

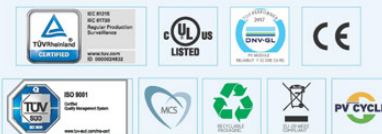
19.2%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading comprehensive solutions provider for solar energy. We believe close cooperation with our partners is critical to success. Trina Solar now distributes its PV products to over 60 countries all over the world. Trina is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners.

Comprehensive Products And System Certificates

IEC61215/IEC61730/UL1703/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse gases Emissions Verification
OHSAS 18001: Occupation Health and Safety Management System



Maximize limited space with top-end efficiency

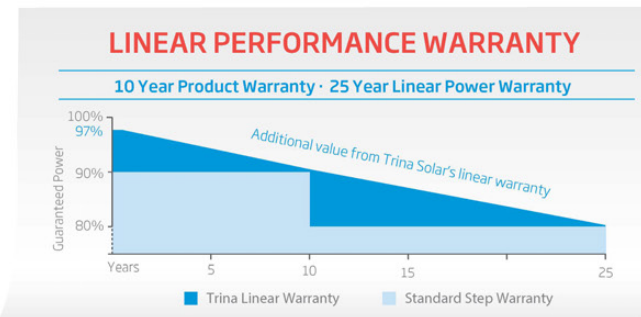
- Up to 192W/m² power density
- Low thermal coefficients for greater energy production at high operating temperatures

Highly reliable due to stringent quality control

- Over 30 in-house tests (UV, TC, HF, and many more)
- In-house testing goes well beyond certification requirements
- PID resistant
- 100% EL double inspection
- Selective emitter, advanced surface texturing

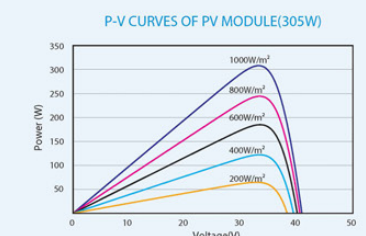
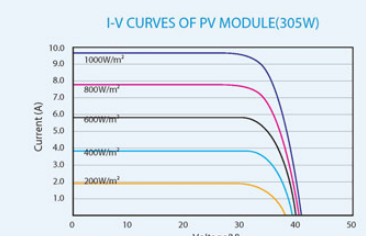
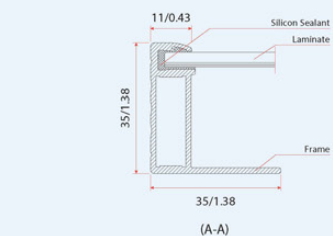
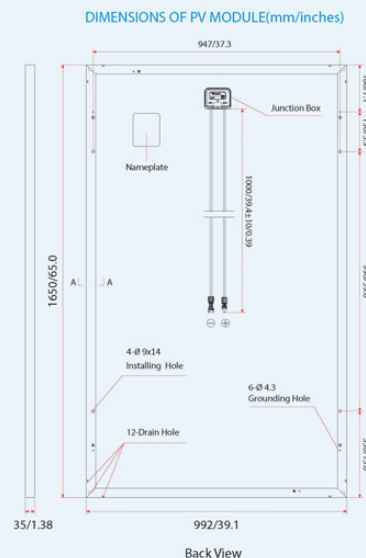
Certified to withstand the most challenging environmental conditions

- 2400 Pa wind load
- 5400 Pa snow load
- 35 mm hail stones at 97 km/h



FRAMED 60-CELL MODULE

PRODUCTS	POWER RANGE
TSM-DD05A.08(II)	280-315W
TSM-DD05A.05(II)	275-310W



ELECTRICAL DATA (STC)

	275	280	285	290	295	300	305	310	315
Peak Power Watts-P _{MAX} (Wp)*									
Power Output Tolerance-P _{MAX} (W)	0 ~ +5								
Maximum Power Voltage-V _{MPP} (V)	31.4	31.7	31.8	32.2	32.5	32.6	32.9	33.1	33.3
Maximum Power Current-I _{MPP} (A)	8.76	8.84	8.97	9.01	9.08	9.19	9.28	9.37	9.46
Open Circuit Voltage-V _{OC} (V)	38.4	38.4	38.5	38.9	39.6	39.8	40.0	40.2	40.5
Short Circuit Current-I _{SC} (A)	9.24	9.42	9.51	9.66	9.68	9.77	9.85	9.94	10.0
Module Efficiency η _m (%)	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AML5.
*Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

	205	209	212	216	220	223	227	231	235
Maximum Power-P _{MAX} (Wp)									
Maximum Power Voltage-V _{MPP} (V)	29.1	29.4	29.5	29.9	30.1	30.2	30.5	30.7	30.9
Maximum Power Current-I _{MPP} (A)	7.04	7.10	7.21	7.24	7.30	7.38	7.46	7.53	7.60
Open Circuit Voltage-V _{OC} (V)	35.7	35.7	35.8	36.2	36.8	37.0	37.2	37.4	37.6
Short Circuit Current-I _{SC} (A)	7.46	7.61	7.68	7.80	7.82	7.89	7.95	8.03	8.10

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline 156.75 × 156.75 mm (6 inches)
Cell Orientation	60 cells (6 × 10)
Module Dimensions	1650 × 992 × 35 mm (65.0 × 39.1 × 1.38 inches)
Weight	18.6 kg (41.0 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Tempered Glass
Backsheet	White [DD05A.08(II)]; Black [DD05A.05(II)]
Frame	Black Anodized Aluminium Alloy [DD05A.08(II), DD05A.05(II)]
J-Box	IP 67 or IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), 1000 mm (39.4 inches)
Connector	Trina TS4
Fire Type	Type 1 or Type 2

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	44°C (±2°C)
Temperature Coefficient of P _{MAX}	-0.39%/°C
Temperature Coefficient of V _{OC}	-0.29%/°C
Temperature Coefficient of I _{SC}	0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1000V DC (IEC) 1000V DC (UL)
Max Series Fuse Rating	15A (Power ≤285W) 20A (Power ≥290W)

(DO NOT connect Fuse in Combiner Box with two or more strings in parallel connection)

WARRANTY

- 10 year Product Workmanship Warranty
- 25 year Linear Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

- Modules per box: 30 pieces
- Modules per 40' container: 840 pieces



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SCOTT GURNEY
385-498-4401

CONTRACTOR:
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CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
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SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

Basic Features

- Stamped Seamless Construction
- 18 Gauge Galvanized Steel
- Powder Coated Surfaces
- Flashes into the roof deck
- 3 Roof deck knockouts .5", .75", 1"
- 5 Centering dimples for entry/exit fittings or conduit
- 2 Position Ground lug installed
- Mounting Hardware Included



SolaDeck Model SD 0783



SolaDeck UL50 Type 3R Enclosures

Available Models:

- Model SD 0783 - (3" fixed Din Rail)
- Model SD 0786 - (6" slotted Din Rail)



SolaDeck UL 1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.

Max Rated - 600VDC, 120AMPS

Model SD 0783-41 3" Fixed Din Rail fastened using Norlock System

**Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 1- Power Distribution Block 600VDC 175AMP
- 1- Bus Bar with UL lug

Model SD 0786-41 6" Slotted Din Rail fastened using steel studs

**Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 4- Din Rail Mounted Terminal Blocks
- Bus Bars with UL lug

**Fuse holders and terminal blocks added in the field must be UL listed or recognized and meet 600 VDC 30 AMP 110C for fuse holders, 600V 50 AMP 90C for rail mounted terminal blocks and 600 V 175 AMP 90C for Power Distribution Blocks. Use Copper Wire Conductors.



Cover is trimmed to allow conduit or fittings, base is center dimpled for fitting locations.



Model SD 0783-41, wired with Din Rail mounted fuse holders, bus bar and power distribution block.



Model SD 0786-41, wired with Din Rail mounted fuse holders, terminal blocks and bus bars.

RSTC Enterprises, Inc • 2219 Heimstead Road • Eau Claire, WI 54703
For product information call 1(866) 367-7782



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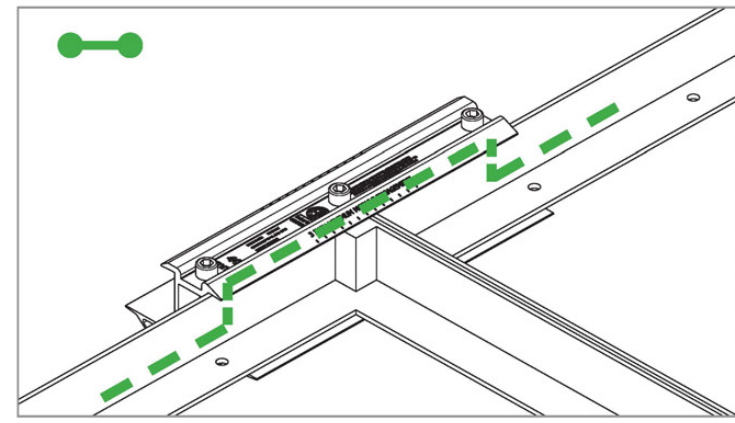
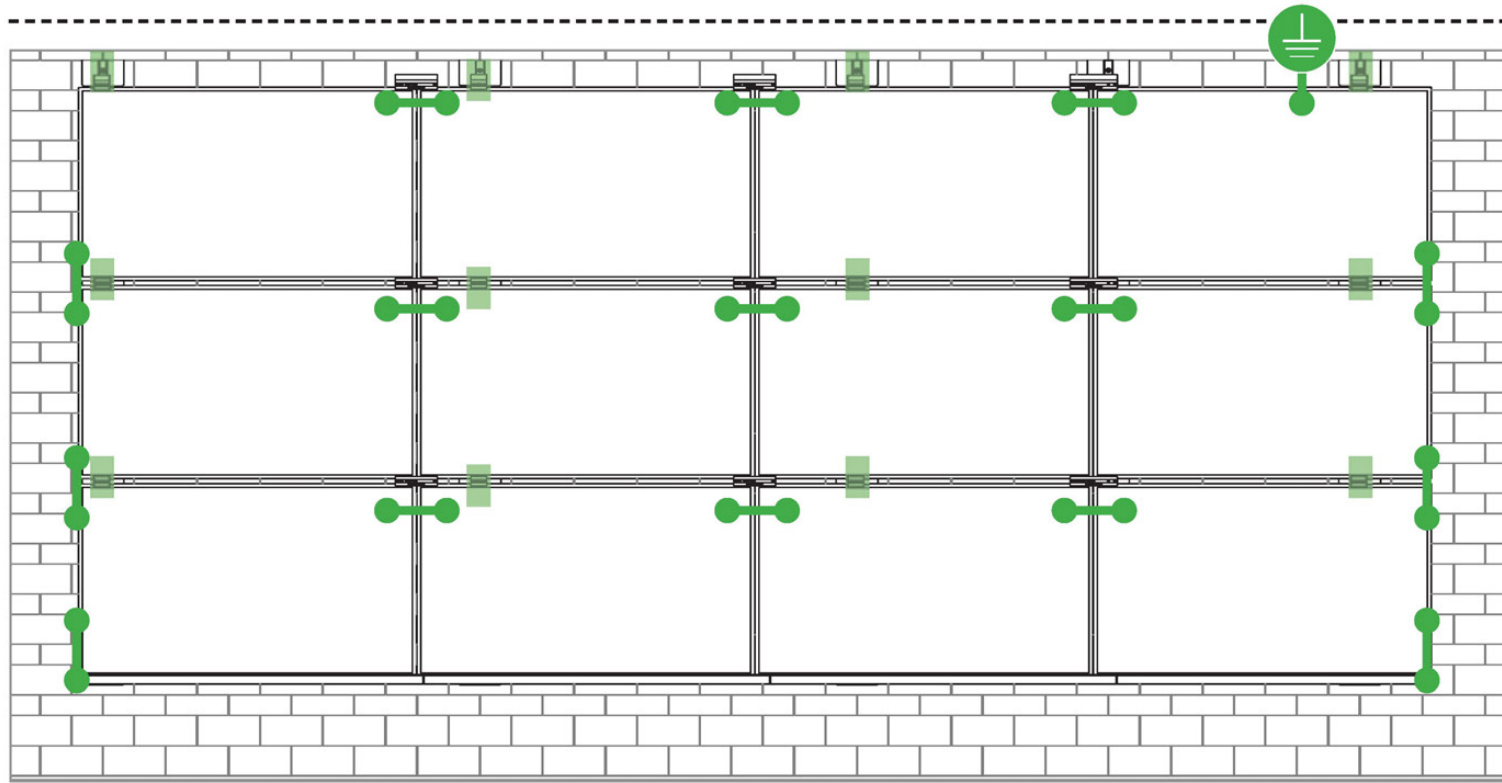
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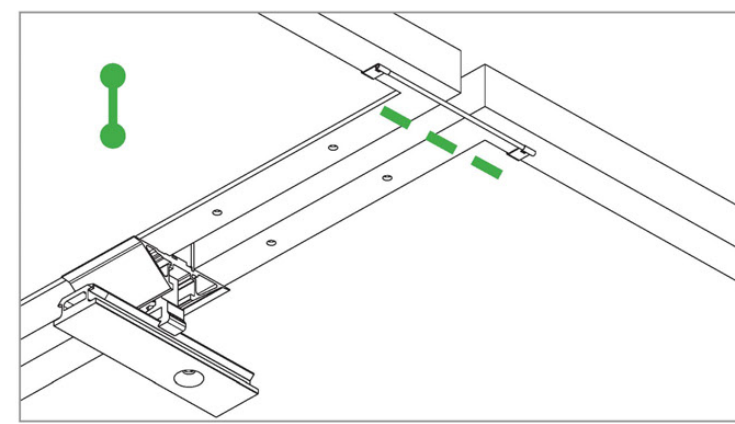
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E-W BONDING PATH: E-W module to module bonding is accomplished with 2 pre-installed bonding clips which engage on the secure side of the Microrail™ and splice.



N-S BONDING PATH: N-S system bonding is accomplished through a N-S bonding clip. Insert each end of the N-S bonding clip onto a module frame flange. **System is bonded with a single array edge, however it is recommended that N-S bonding clips be installed on both edges for ease of maintenance (see also: Maintenance Page 5)**

Star Washer is Single Use Only

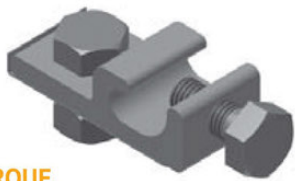


TERMINAL TORQUE, Install Conductor and torque to the following:
4-6 AWG: 35in-lbs
8 AWG: 25 in-lbs
10-14 AWG: 20 in-lbs



TERMINAL TORQUE, Install Conductor and torque to the following:
4-14 AWG: 35in-lbs

WEEBLUG Single Use Only



TERMINAL TORQUE, Install Conductor and torque to the following:
6-14 AWG: 7ft-lbs

LUG DETAIL & TORQUE INFO IlSCO Lay-In Lug (GBL-4DBT)

- 10-32 mounting hardware
- Torque = 5 ft-lb
- AWG 4-14 - Solid or Stranded

LUG DETAIL & TORQUE INFO IlSCO Flange Lug (SGB-4)

- 1/4" mounting hardware
- Torque = 75 in-lb
- AWG 4-14 - Solid or Stranded

LUG DETAIL & TORQUE INFO Wiley WEEBLUG (6.7)

- 1/4" mounting hardware
- Torque = 10 ft-lb
- AWG 6-14 - Solid or Stranded

NOTE: ISOLATE COPPER FROM ALUMINUM CONTACT TO PREVENT CORROSION

System bonding is accomplished through modules. System grounding accomplished by attaching a ground lug to any module at a location on the module specified by the module manufacturer.

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AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

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Country: USA	Country: China
Contact: Klaus Nicolaedis Jason Mayfield	Contact: Lili Zeng George Huang
Phone: 505-462-2190 505-400-2949	Phone: 510-979-1920 650-799-7627
FAX: NA	FAX: NA
Email: klaus.nicolaedis@unirac.com jasonm@unirac.com	Email: lizeng@ccmfg.com george@ccmfg.com

Party Authorized To Apply Mark: Same as Manufacturer
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545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	UL 2703 Issued: 2015/01/28 Ed: 1 Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
Product:	Photovoltaic Mounting System, Sun Frame Micro Rail- Installed Using Unirac Installation Manual, Rev PUB2017FEB16
Brand Name:	Unirac
Models:	Unirac SFM



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SUNFRAME MICRORAIL RAISED SEAL FLASHING INSTALLATION GUIDE



TABLE OF CONTENTS:	PG
Tools & Assembly Details	1
Quick Steps for Installation	2

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SUNFRAME MICRORAIL RAISED SEAL FLASHING

TOOLS REQUIRED OR RECOMMENDED FOR LAYOUT & INSTALLATION:

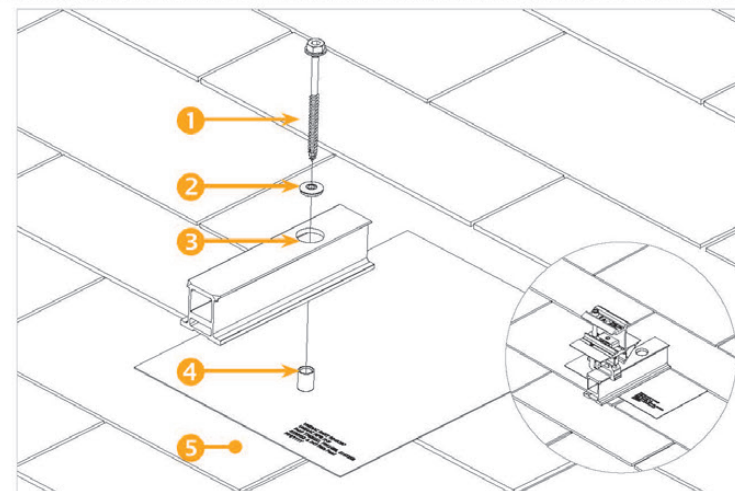
- TAPE MEASURE
- CHALK LINE
- ROOFING CRAYON
- HAMMER
- COMPATIBLE SEALANT AND DISPENSER
- DRILL WITH EITHER 1/8" BIT FOR GRK AND UNIRAC CUSTOM STRUCTURAL SCREW, OR 7/32" BIT FOR LAG BOLT
- IMPACT DRIVER WITH 1/2" SOCKET (OPTIONAL 1/4" HEX DRIVER FOR UNIRAC CUSTOM STRUCTURAL SCREW)

SFM RAISED SEAL FLASHING COMPONENTS:

1. FASTENER:
 - LAG BOLT, 5/16"
 - UNIRAC CUSTOM STRUCTURAL SCREW, 5/16"
 - GRK STRUCTURAL SCREW, 5/16"
2. 5/16" ID EDPM SEALING WASHER
3. SFM MOUNT ASSEMBLY (VARIOUS) WITH SLIDER
4. SFM RAISED SEAL FLASHING
5. COMP SHINGLE ROOF

TOOLS & ASSEMBLY DETAILS | 1

TECHNICAL DATA SHEET | PAGE



INSTALLATION NOTES:

- A. It is not necessary or advisable to use nails or other fasteners to secure the perimeter of the flashing.
- B. The SFM Raised Seal Flashing is made to work with standard and high-definition composition/asphalt and wood shingle roofs with 5" to 5-5/8" courses.
- C. Mounts should not be installed in areas of the roof susceptible to ice damming. Ponding water can travel upward under shingles and reach the bolt penetration.
- D. Fastener length specification and capacity verification are the responsibility of the installer.

SUNFRAME MICRORAIL RAISED SEAL FLASHING

QUICK INSTALLATION STEPS | 2

INSTALLATION GUIDE | PAGE



PREPARING SHINGLES: Use roofing bar to break seals between 1st and 2nd, and 2nd and 3rd shingle courses. Be sure to remove all nails to allow correct placement of flashing. See SFM installation guide for proper flashing placement.



DRILL PILOT HOLES: Holding the drill square to the rafter, drill 3" deep pilot hole into center of rafter using 1/8" aircraft extension bit for 5/16" GRK or Unirac Custom Structural Screw, or 7/32" aircraft extension bit for 5/16" lag.



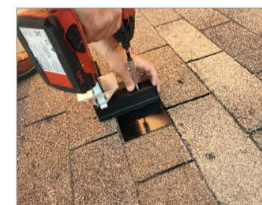
ROOF SEALANT: Fill pilot hole with appropriate sealant.



OPTIONAL SEALANT ON FLASHING: Apply a circle shaped bead of sealant around the attachment hardware hole of the flashing before insertion. Do not use excessive sealant.



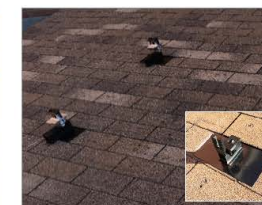
POSITION FLASHING: Slide the flashing up underneath the 2nd course of shingles, so that the bottom edge of the flashing does not overhang the downslope edge of the 1st course of shingles.



PLACE SLIDER: Place slider with assembly over the flashing flute, ensuring that the slider sits flat on the flashing surface.



INSTALL FASTENER & TIGHTEN: Install fastener with sealing washer. Swivel the slider to gauge proper torque when driving the fastener. Tighten until slider stops swiveling easily.



COMPLETE FLASHING INSTALLATION: Repeat previous steps to install all mounts.



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