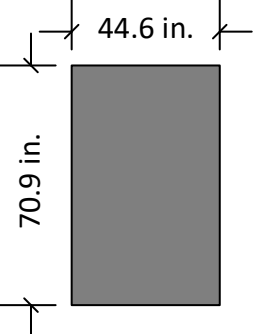
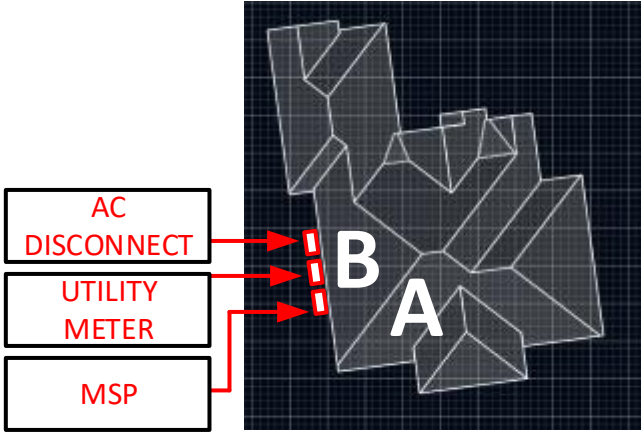


PHOTOVOLTAIC ROOF MOUNT SYSTEM			SR.#	PROJECT INFORMATION		 5112 Departure Drive, Raleigh NC 27616 O: 919.948.6474 E: info@8msolar.com
CODE AND STANDARDS THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES: 2020 NATIONAL ELECTRICAL CODE 2018 NORTH CAROLINA RESIDENTIAL CODE 2018 NORTH CAROLINA BUILDING CODE - ALL OTHER ORDINANCE ADOPTED BY THE LOCAL GOVERNING AGENCIES SITE NOTES / OSHA REGULATION - A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS. - THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS. - ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED AND IDENTIFIED BY RECOGNIZED ELECTRICAL TESTING LABORATORY. - MODULES AND SUPPORT STRUCTURES SHALL BE GROUNDED - SOLAR INVERTER SHALL BE LISTED TO UL1741 - ALL CONDUCTORS SHALL BE COPPER AND SHOULD BE 75 AND 90 DEG RATED - REMOVAL OF AN INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR, THE PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT GROUNDED CONDUCTORS. - LIVE PARTS OF PV SOURCE CIRCUITS AND PV OUTPUT CIRCUITS OVER 150V TO GROUND SHALL NOT BE ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS WHILE ENERGIZED. - ALL PV MODULES AND ASSOCIATED EQUIPMENT AND WIRING SHALL BE PROTECTED FROM PHYSICAL DAMAGE. SOLAR CONTRACTOR - MODULE CERTIFICATIONS INCLUDE UL1703, IEC61646, IEC61370. - IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURERS INSTALLATION REQUIREMENTS. - 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. - ALL MICROINVERTERS, PHOTOVOLTAIC MODULES, AC COMBINERS, DC-AC CONVERTERS AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER NEC690.4(B). - ALL SIGNAGE TO BE INSTALLED IN ACCORDANCE WITH LOCAL BUILDING CODE. - TERMINALS AND LUGS WILL BE TIGHTENED TO MANUFACTURER TORQUE SPECIFICATIONS (WHEN PROVIDED) IN ACCORDANCE WITH NEC CODE 110.14(D) ON ALL ELECTRICAL CONNECTIONS. - MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC UNLESS NOT AVAILABLE.	1	PV MODULES	06 x CANADIAN SOLAR CS6.1-54TM-460H			
	2	INVERTERS	01 x SE11400H – US (RGM)			
	3	OPTIMIZERS	30 x SOLAREEDGE S500B			
	4	ROOF TYPE	ASPHALT SHINGLES			
	5	RACKING	PSR-B84 RAILS (BLACK)			
	6	MOUNTING TYPE	INSTAFLASH2 (BLACK)			
	7	DC SIZE	2.76 KW			
	8	AC SIZE	11.4 KVA			
	SR.#	PROJECT INFORMATION		Customer Information:		
1	PV1	DRAWING INDEX				
2	PV2	SITE LAYOUT				
3	PV3	STRING MAPPING				
4	PV4	ELECTRICAL ONE LINE DIAGRAM				
5	PV5	DETAILED ELECTRICAL WIRING SCHEMATIC				
6	PV6	PV LABELS				
7	PV7	BILL OF MATERIALS				
8	PV8	ATTACHMENT DETAILS				
						
DESIGN CRITERIA WIND SPEED: 120 MPH GROUND SNOW LOAD: 10 PSF WIND EXPOSURE FACTOR: B	UTILITY COMPANY: DUKE ENERGY PERMIT ISSUER (AHJ): HARNETT COUNTY	SCOPE OF WORK INSTALLATION OF UTILITY INTERACTIVE PHOTOVOLTAIC SOLAR SYSTEM.	VICINITY MAP		TOP VIEW OF THE BUILDING	 PV Installation Professional Ali Buttar PVIP #031310-32

Revision:

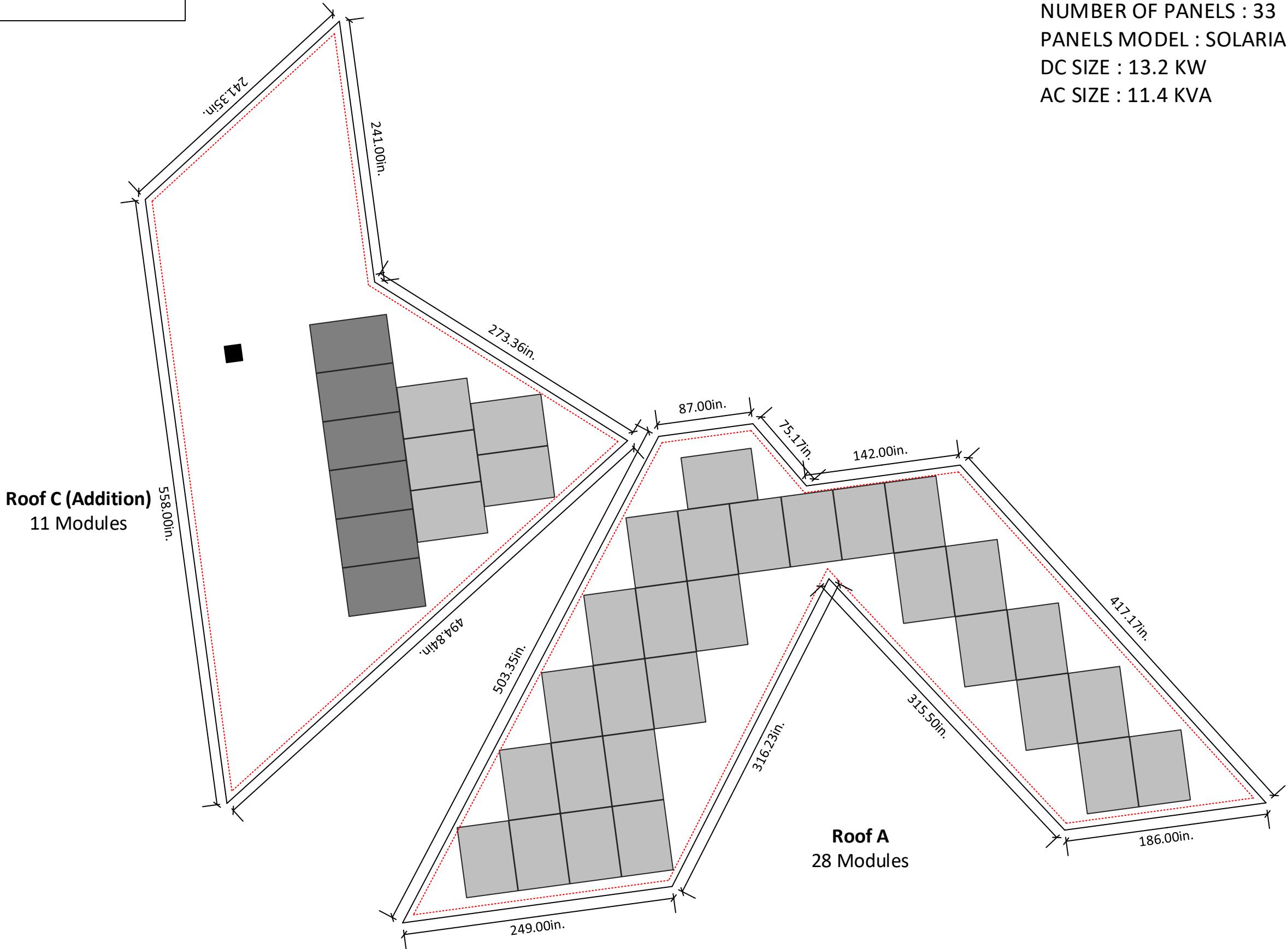
ROOF DESCRIPTION				MODULE DIMENSIONS	PV System Dead Load (Panel + Racking weight) / PV System Area (No. of panels x Weight of panel(lbs.) +Length of racking(ft.) x 1.15 lb.ft) / (No. of panels x Height x Width) = Total psf				
ROOF	PITCH	AZIMUTH	NO. OF MODULES		ROOF	A	B		
A	45°	174°	28		DEAD LOAD (PSF)	2.59	2.63		
B	45°	262°	11						



Vent		- There is no vent on roof A. - No vent will be covered by PV modules during the installation.
	Pre – Installed PV Panels	
	New PV Panels	

NEW ADDITION SYSTEM DETAILS
NUMBER OF PANELS : 06
PANELS MODEL : CANADIAN SOLAR CS6.1-54TM-460H
DC SIZE : 2.76 KW
AC SIZE : 11.4 KVA

PRE-INSTALLED SYSTEM DETAILS
NUMBER OF PANELS : 33
PANELS MODEL : SOLARIA POWERXT 400R-PM
DC SIZE : 13.2 KW
AC SIZE : 11.4 KVA



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Customer Signature:

Sheet Name:

Site Layout

JOB NUMBER:

25-584-KG

Date:

08/19/2025

Revision:

A

Sheet Size:

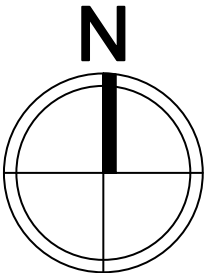
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17" X 22"

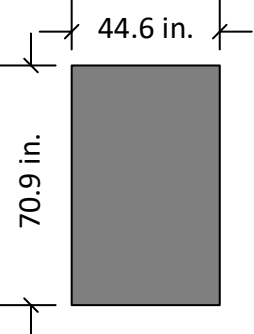
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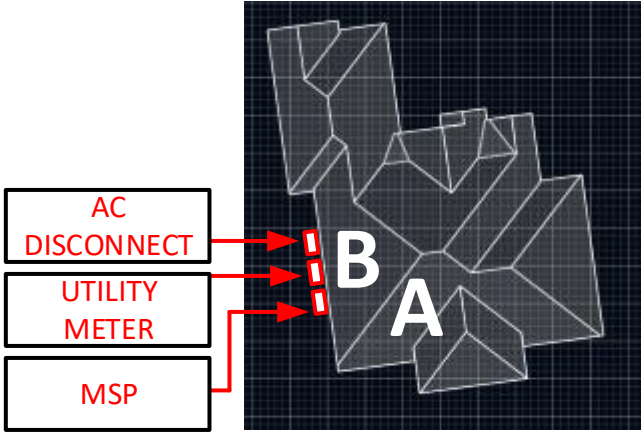
PV2



SITE LAYOUT
SCALE: 1/8" - 1'



ROOF DESCRIPTION				MODULE DIMENSIONS	STRING LAYOUT					
ROOF	PITCH	AZIMUTH	NO. OF MODULES		Inverter-A SE7600H-US(RGM) Existing			Q. HOME COMBINER New Addition		
					Strings #	No. of Modules	Color	Strings #	No. of Modules	Color
A	45°	174°	28		String 1	14				
B	45°	262°	11		String 2	14				
					String 3	11				



Note: We are doing re-stringing here

NEW ADDITION SYSTEM DETAILS
NUMBER OF PANELS : 06
PANELS MODEL : CANADIAN SOLAR CS6.1-54TM-460H
DC SIZE : 2.76 KW
AC SIZE : 11.4 KVA

PRE-INSTALLED SYSTEM DETAILS
NUMBER OF PANELS : 33
PANELS MODEL : SOLARIA POWERXT 400R-PM
DC SIZE : 13.2 KW
AC SIZE : 11.4 KVA



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Sheet Name:

String Mapping

JOB NUMBER:

25-584-KG

Date:

08/19/2025

Revision:

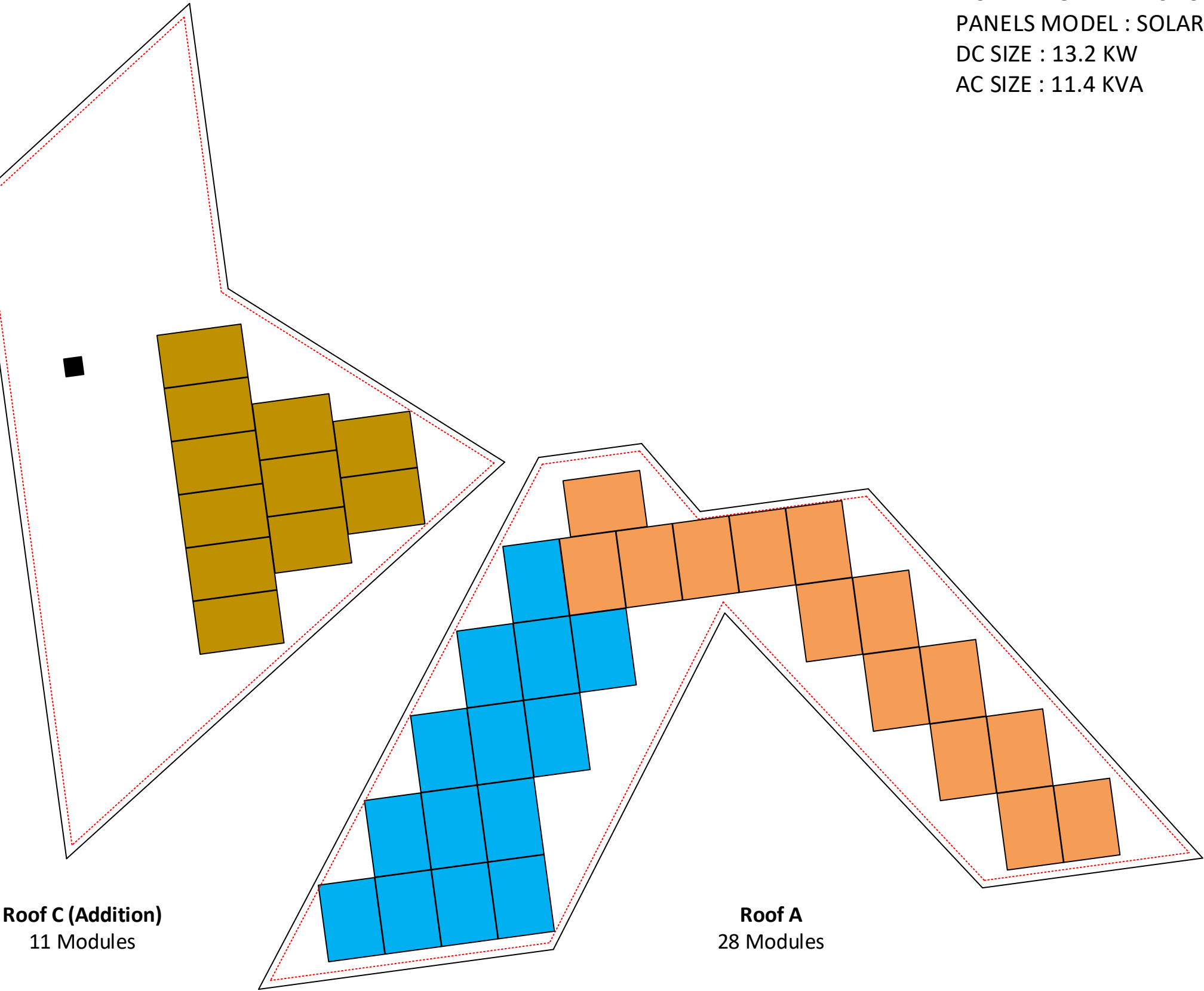
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PV3

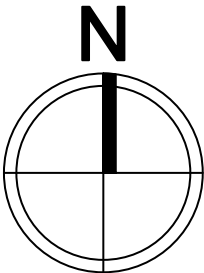


Roof C (Addition)
11 Modules

Roof A
28 Modules

6in setback from
sides of the roof

STRING MAPPING
SCALE: 1/8" - 1'



STRING CALCULATION						
String #	No of Modules	Estimated Power	I _{max}	I _{mpp}	V _{oc}	V _{mpp}
1,2	14	5,600W	23.4 Adc	15 Adc	14 Vdc	400 Vdc
3	11	4,760W	23.4 Adc	15 Adc	11 Vdc	400 Vdc

New Addition System Details

06 X CANADIAN SOLAR CS6.1-54TM-460H 460W

06 X SOLAREEDGE S500 OPTIMIZER

RAPID SHUTDOWN EQUIPPED

String 1

String 2

String 3

Panels Addition

Sola Deck

Attic

INTEGRATED DC DISCONNECT

60/60AF AC DISCONNECT

60/60AF AC DISCONNECT

Backup Gateway 2

200A/2P

200A/2P

100A/2P

MAIN LOAD PANEL (B)

SUB LOAD PANEL

Tesla Powerwall 2

Tesla Powerwall 2

CRAWL SPACE

Utility Meter

FROM UTILITY

60A breaker connection inside the back up gateway 2

CTs installed upstream of the Main Breaker

Note: Solar system is pre-installed and we are only installing 6 CANADIAN SOLAR CS6.1-54TM-460H.

Sr.No	#Wire	Conduit Size	Ground Wire	Amperage
1	2 x #10 PV		#10 Bare Cu	23.4
2	6 x #10 THHN Cu	3/4" LFMC	#10 Green	23.4

Existing System Details

- System Size: 13,200W DC
- (33) SOLARIA POWERXT 400R-PM
- (33) SOLAREEDGE P401 OPTIMIZERS
- (01) SOLAREEDGE SE11400H-US (RGM)
- Output: 47.5A max @ 240 VAC
- 11.4 kVA AC output max

New System Details

- System Size: 15,960W DC
- (06) Canadian Solar CS6.1-54TM-460H **New Panels Addition**
- (06) SOLAREEDGE S500 OPTIMIZER **New Optimizers Addition**
- (33) SOLARIA POWERXT 400R-PM
- (33) SOLAREEDGE P401 OPTIMIZERS
- (01) SOLAREEDGE SE11400H-US (RGM)
- Output: 47.5A max @ 240 VAC
- 11.4 kVA AC output max

- Grounding will be done via Pegasus grounding lugs and mid-clamps to ensure the rail and panels are continuously grounded.
- Rapid Shutdown is included in the micro inverter , refer to Mid Circuit Interrupter and Inverter attached datasheets.
- The load center/disconnect will be visible, lockable, accessible to utility linesmen, and properly labeled per NEC requirements. It will be located on the exterior wall next to the utility meter.
- Prepare cable in usual manner.
- Stretch tape and apply half-lapped to form void-free joint. Degree of stretch is not critical and may vary in different sections of joint to accomplish void-free application.
- Protect the joint with two half-lapped layers of any scotch vinyl plastic electrical tape.

NEC Code (2020) and UL Standard References			
Rapid Shut Down	NEC 690.12 (A-D), UL1741	Grounding	NEC Article 250.30(A)
Disconnecting Means	NEC 690.13	Conduit Fill	NEC Table C.9, 310.15(B)(3)(a)
Feeder Sizing	NEC Table 310, 15(B)(16, 17)	Interconnection	NEC 705.12
Over current Protection	NEC 690.9		

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Sheet Name:

Electrical One Line Diagram

JOB NUMBER:

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Date:	Revision:
08/19/2025	A

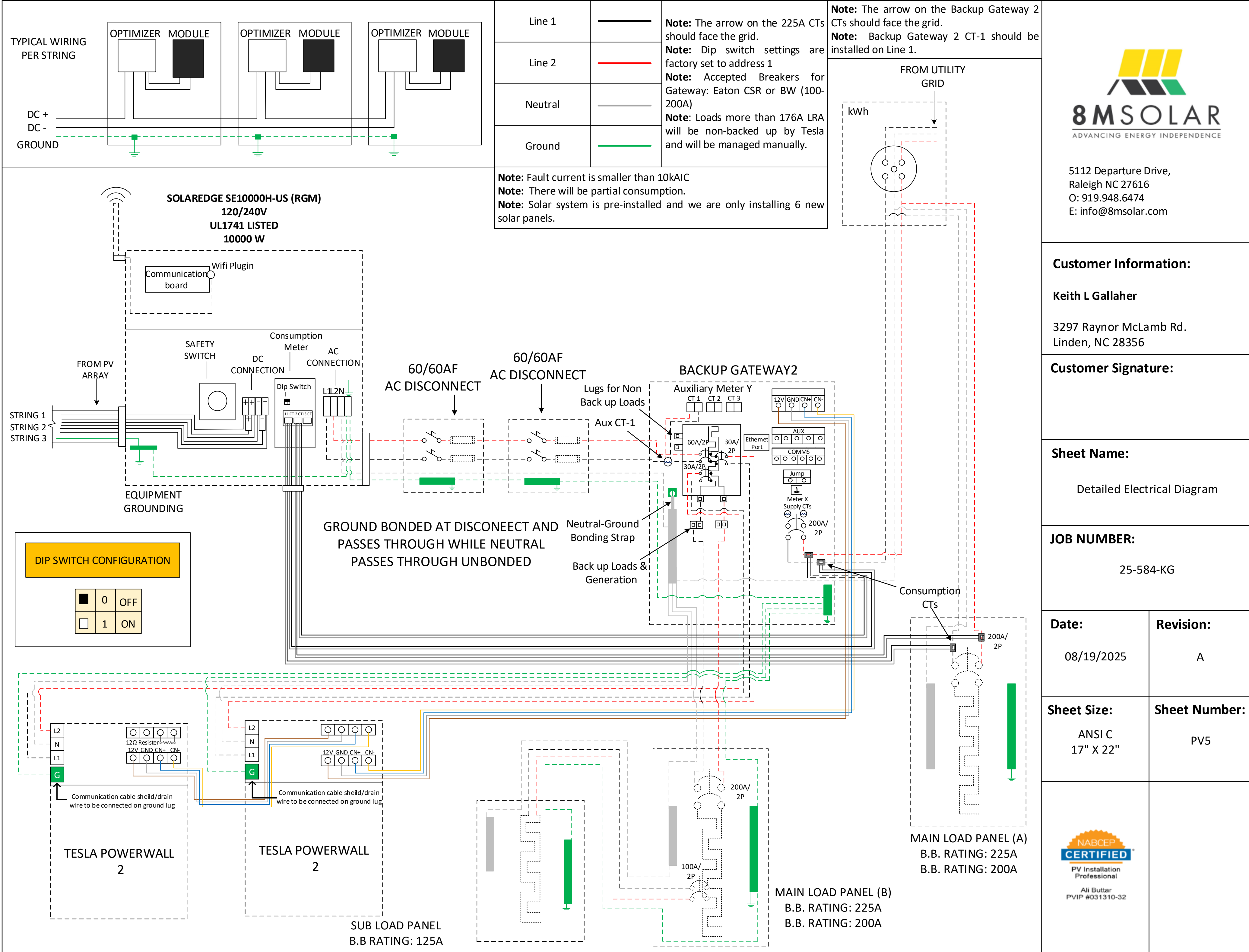
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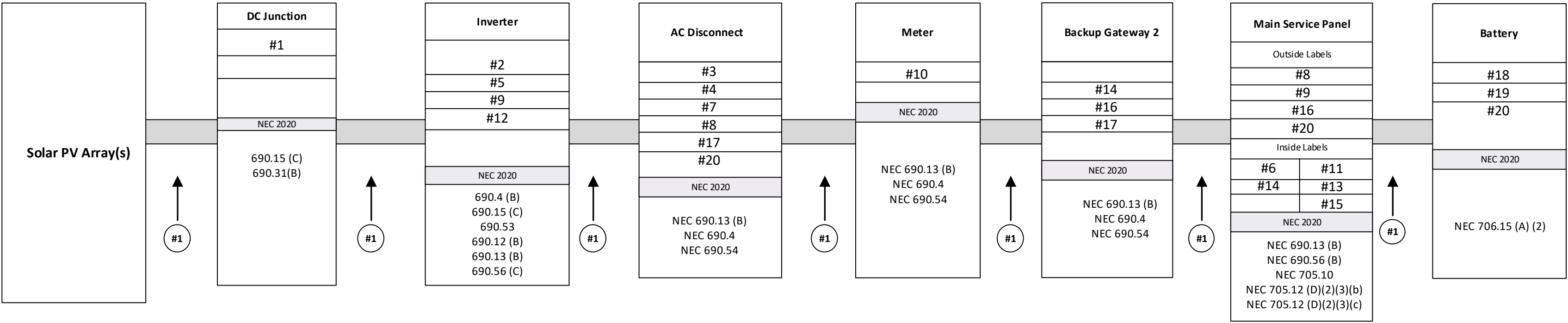
NABCEP CERTIFIED

PV Installation Professional

Ali Buttar

PVIP #031310-32





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**LABELING AND WARNING
SIGNS: NEC 2020**

A. PURPOSE
PROVIDE EMERGENCY RESPONDERS WITH APPROPRIATE WARNING AND GUIDANCE WITH RESPECT TO ISOLATING THE SOLAR ELECTRIC SYSTEM. THIS CAN FACILITATE IDENTIFYING ENERGIZED ELECTRICAL LINES THAT CONNECT THE SOLAR PANELS TO THE INVERTER, AS SHOULD NOT BE CUT WHEN VENTING FOR SMOKE REMOVAL.

- B. MAIN SERVICE DISCONNECT:
- 1. RESIDENTIAL BUILDINGS- THE MARKING MAY BE PLACED WITHIN THE MAIN SERVICE DISCONNECT. THE MARKING SHALL BE PLACED ON THE OUTSIDE COVER IF THE MAIN SERVICE DISCONNECT IS OPERABLE WITH THE SERVICE PANEL CLOSED.
 - 2. COMMERCIAL BUILDINGS- THE MARKINGS SHALL BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECT CLEARLY VISIBLE FROM THE LOCATION WHERE THE LEVER IS OPERATED
 - 3. MARKINGS, VERBIAGE, FORMAT AND TYPE OF MATERIAL

- a. VERBIAGE: CAUTION; SOLAR ELECTRIC SYSTEM CONNECTED
- b. FORMAT:

- (1) WHITE LETTERING ON A RED BACKGROUND
- (2) MINIMUM 3/8 INCH LETTER HEIGHT
- (3) ALL LETTERS SHALL BE CAPITALIZED
- (4) ARIAL OR SIMILAR FONT, NON-BOLD

- c. MATERIAL:

- (1) REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (USE UL-969) AS STANDARD FOR WEATHER RATING); DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT.

C. MARKING REQUIREMENTS ON DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, DC COMBINERS AND JUNCTION BOXES;
1. MARKING: PLACEMENT, VERBIAGE, FORMAT AND TYPE OF MATERIAL.

- a. PLACEMENT: MARKINGS SHALL BE PLACED EVERY 10 (TEN) FEET ON ALL INTERIOR AND EXTERIOR DC CONDUITS, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLIES, AT TURNS ABOVE AND/OR BELOW PENETRATIONS, ALL DC COMBINERS AND JUNCTION BOXES.

- b. VERBIAGE: CAUTION SOLAR CIRCUIT
- c. THE FORMAT AND TYPE OF MATERIAL SHALL ADHERE TO SECTION B-3.B & C ABOVE

D. INVERTERS ARE NOT REQUIRED TO HAVE CAUTION MARKINGS

#1

WARNING:PHOTOVOLATIC
POWER SOURCE

#2

PHOTOVOLATIC

DC DISCONNECT

#3

PHOTOVOLATIC

AC DISCONNECT

#4

RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYSTEM

#5

MAXIMUM VOLTAGE400Vdc

MAX. RATED CIRCUIT CURRENT23.4Adc

OF THE CHARGE CONTOLLER OR

DC-TO-DC CONVERTER (IF INSTALLED)

#6

PHOTOVOLTIVC POWER SOURCE

OPERATING AC VOLTAGE240V

MAXIMUN OPERATING
AC OUTPUT CURRENT47.5A

#7

AC DISCONNECT
PHOTOVOLTAIC SYSTEM
POWER SOURCE

RATED AC
OUTPUT CURRENT47.5AMPS

NOMINAL OPERATING
AC VOLTAGE240VOLTS

#8

WARNING

ELECTRIC SHOCK HAZARD
TERMINAL ON THE LINE AND LOAD
SIDES MAY BE ENERGIZED IN THE
OPEN POSITION

#9

WARNING

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

#10

WARNING

THREE POWER SOURCES
SOURCES: UTILITY GRID, BATTERY AND
PV SOLAR ELECTRIC SYSTEM

#11

WARNING

TURN OFF PHOTOVOLTAIC
AC DISCONNECT PRIOR TO
WORKING INSIDE PANEL

#12

WARNING

BIPOLAR PHOTOVOLTAIC ARRAY
DISCONNECT OF NEUTRAL
GROUNDED CONDUCTORS MAY
RESULT IN OVERVOLTAGE ON
ARRAY OR INVERTER

#13

WARNING

POWER SOURCE
OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

#14

WARNING

SOLAR ELECTRIC
CIRCUIT BREAKER
IS BACKFEED

#15

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

#16

SOLAR AC DISCONNECT
LOCATED AT WEST SIDE WALL
OF THE HOUSE BESIDE THE
UTILITY METER

#17

SERVICE DISCONNECT LOCATED
IN THE BACKUP GATEWAY2
PANEL

#18

BATTERY

#19

MAIN BATTERY
SYSTEM DISCONNECT

#20

BATTERY DISCONNECT LOCATED
IN THE BACKUP GATEWAY 2
PANEL

Customer Information:

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Customer Signature:

Sheet Name:

PV Labels

JOB NUMBER:

25-584-KG

Date:

08/19/2025

Revision:

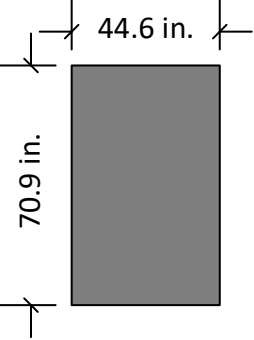
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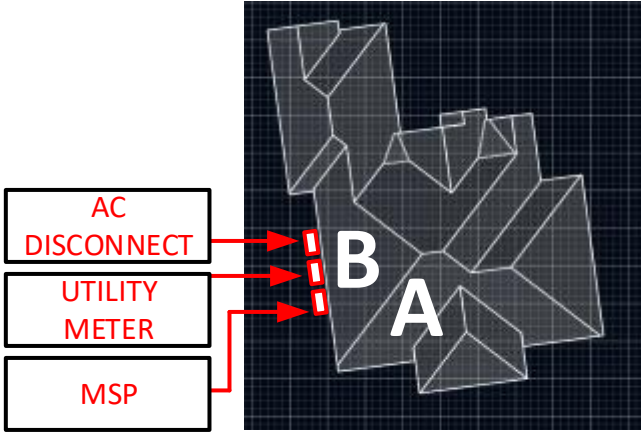
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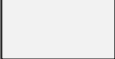
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PV6

ROOF DESCRIPTION				MODULE DIMENSIONS	Rails and Splices : PSR-B84 (BLACK)	Roof Attachment: InstaFlash 2
ROOF	PITCH	AZIMUTH	NO. OF MODULES			
A	45°	174°	28		Rafter Spacing : 16 in.	There is one layer of shingles Roofing material is asphalt shingles
B	45°	262°	11		Attachment Span: 5 ft. 4 in.	The roof is located in 120mph wind zone

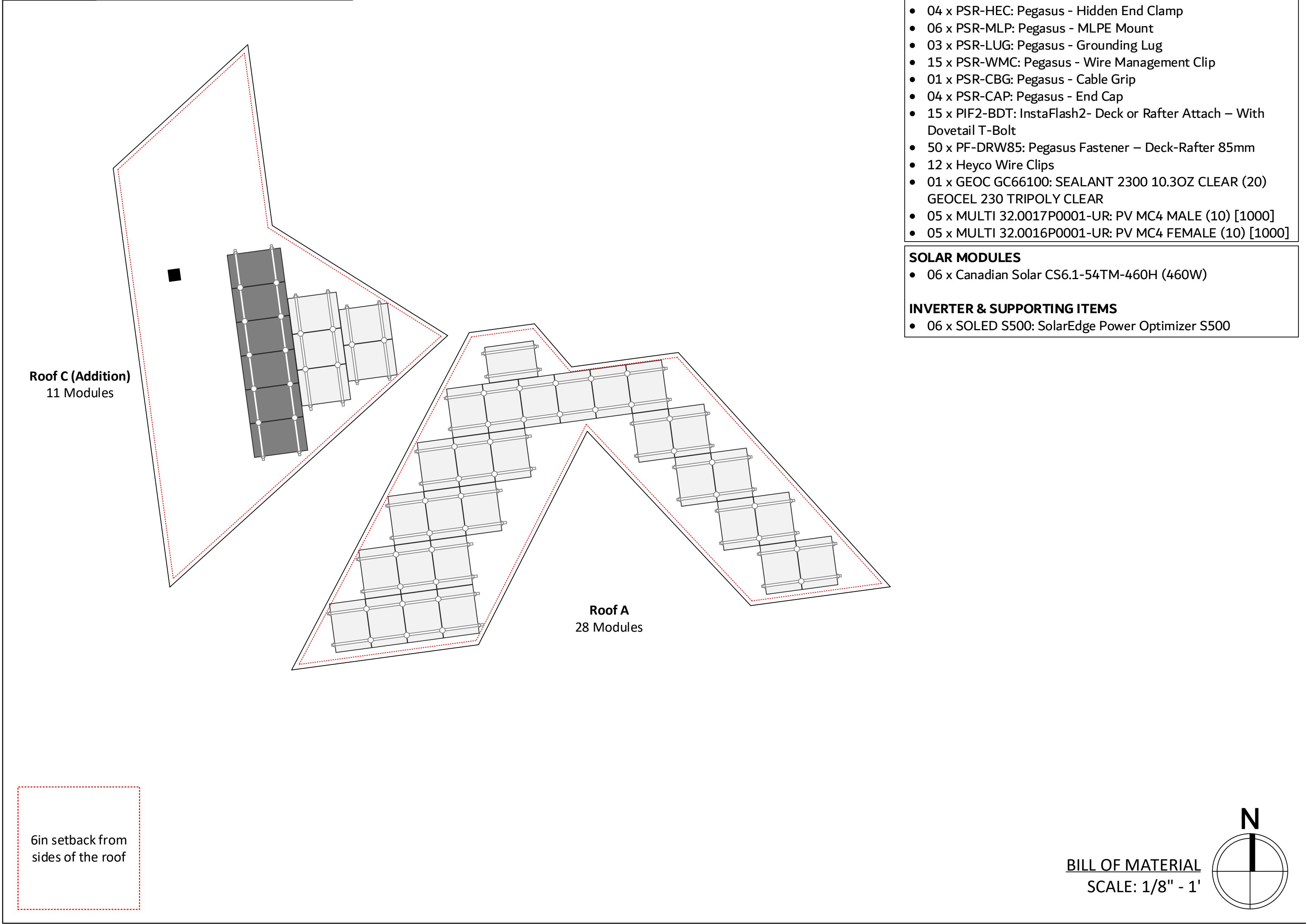


	Pre – Installed PV Panels
	New PV Panels

PV LABELS		
Sr No	Code	Qty
01	02-314	12

- RAILS AND MOUNTING SYSTEM**
- 08 x PSR-B84: Pegasus Rail, Black, 84" (7 Feet)
 - 06 x PSR-SPLS: Pegasus - Bonded, Structural Splice
 - 10 x PSR-MCB: Pegasus - Multiclamp, Mid/End, 30 to 40 mm, Black
 - 04 x PSR-HEC: Pegasus - Hidden End Clamp
 - 06 x PSR-MLP: Pegasus - MLPE Mount
 - 03 x PSR-LUG: Pegasus - Grounding Lug
 - 15 x PSR-WMC: Pegasus - Wire Management Clip
 - 01 x PSR-CBG: Pegasus - Cable Grip
 - 04 x PSR-CAP: Pegasus - End Cap
 - 15 x PIF2-BDT: InstaFlash2- Deck or Rafter Attach – With Dovetail T-Bolt
 - 50 x PF-DRW85: Pegasus Fastener – Deck-Rafter 85mm
 - 12 x Heyco Wire Clips
 - 01 x GEOC GC66100: SEALANT 2300 10.3OZ CLEAR (20) GEOCEL 230 TRIPOLY CLEAR
 - 05 x MULTI 32.0017P0001-UR: PV MC4 MALE (10) [1000]
 - 05 x MULTI 32.0016P0001-UR: PV MC4 FEMALE (10) [1000]

- SOLAR MODULES**
- 06 x Canadian Solar CS6.1-54TM-460H (460W)
- INVERTER & SUPPORTING ITEMS**
- 06 x SOLED S500: SolarEdge Power Optimizer S500



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Customer Information:

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Customer Signature:

Sheet Name:

Bill of Material

JOB NUMBER:

25-584-KG

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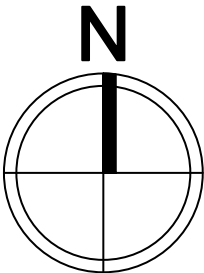
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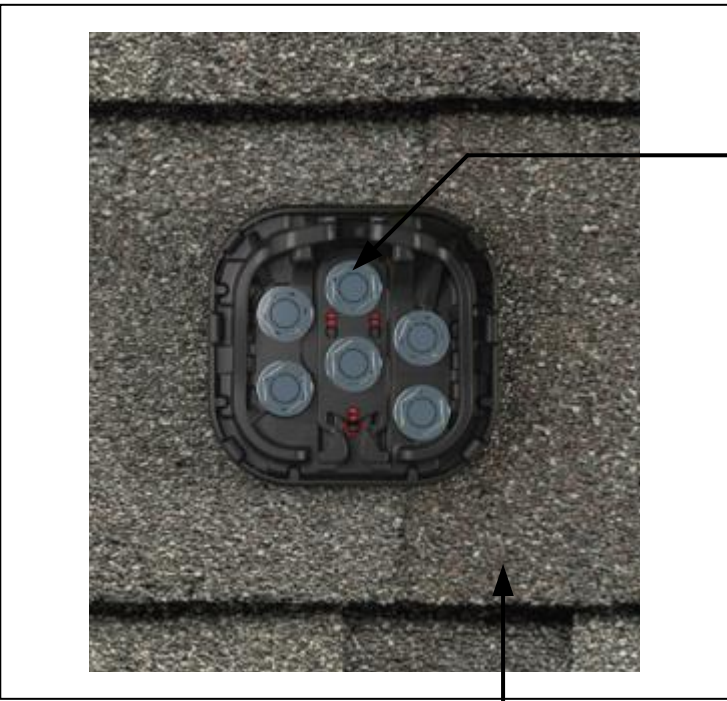
PV7



BILL OF MATERIAL
SCALE: 1/8" - 1'

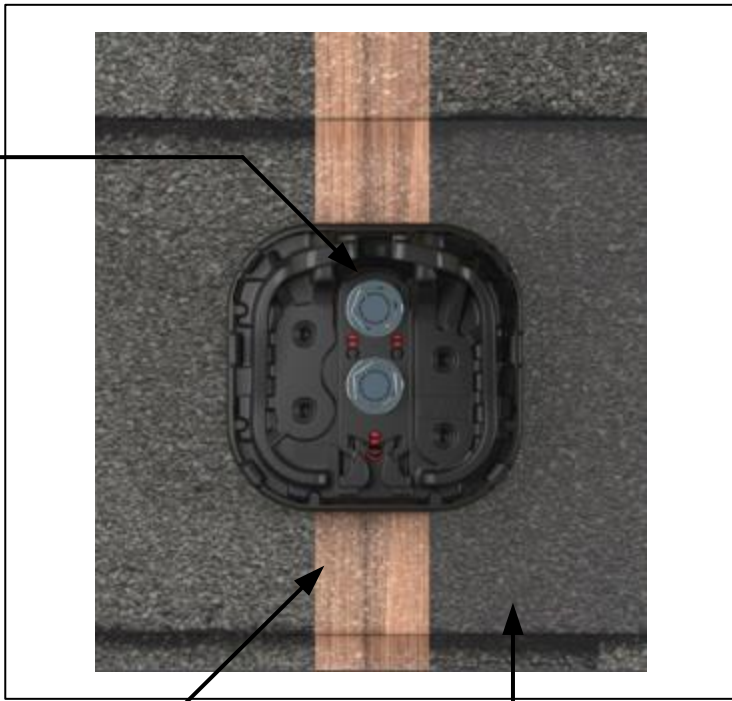


Deck Attach – 6 Fasteners

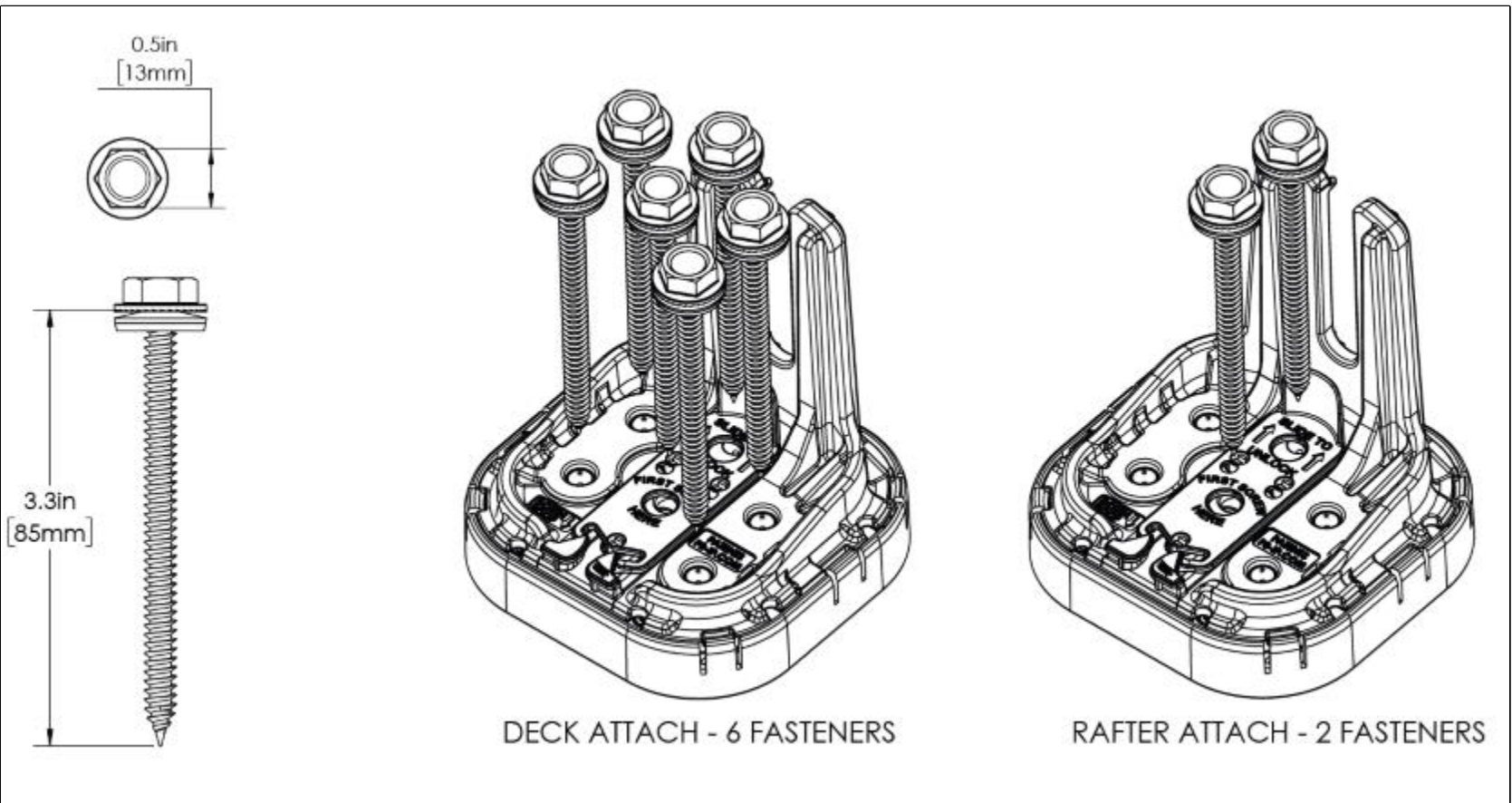


Asphalt
Shingle Roof

Rafter Attach – 2 Fasteners



Rafter
Asphalt
Shingle Roof



DECK ATTACH - 6 FASTENERS

RAFTER ATTACH - 2 FASTENERS



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Attachment Details

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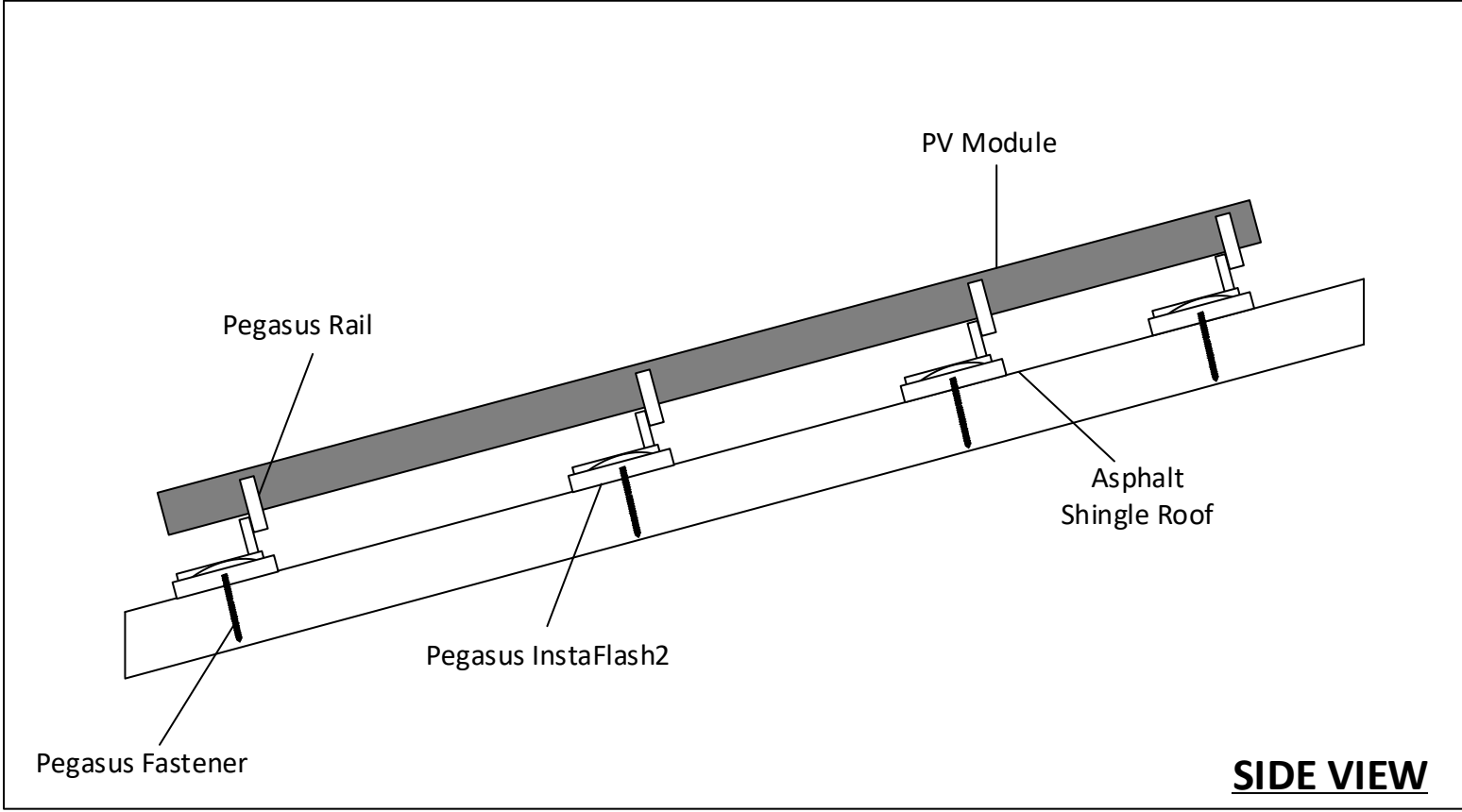
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Sheet Number:

PV8



Multi-Clamp	Hidden End Clamp	MLPE Mount	Dovetail T-Bolt	Ground Lug	Cable Grip
Torque Value 100 in-lbs.	Torque Value 135 in-lbs.	Torque Value 135 in-lbs.	Torque Value 300 in-lbs.	Torque Value 135 in-lbs.	Torque Value 135 in-lbs.



SIDE VIEW

PV Dead Load	
Roof A	PV System Dead Load (Panel + Racking weight) / PV System Area (28 panels x 48 lbs./panel + 223 ft. of racking x 1.17 lb.ft) / (28 panels x 5.393' x 3.95') = 2.59 psf
Roof B	PV System Dead Load (Panel + Racking weight) / PV System Area (11 panels x 48 lbs./panel + 40 ft. of racking x 1.17 lb.ft) / (11 panels x 5.393' x 3.95') = 2.63 psf