

MP1:
 # Modules: 148
 Tilt/Azimuth: 9.72°/209°
 Roofing: TPO
 System Size: 51.06 kW

LEGEND

SHEET SUMMARY

PV E1.1	SITE PLAN & GENERAL NOTES
PV E2.1	ARRAY LAYOUT
PV E3.1	STRUCTURAL LAYOUT
PV E4.1	SINGLE LINE DIAGRAM
PV E5.1	ELECTRICAL CALCULATIONS
PV E6.1	GENERAL NOTES
PV E7.1	RACKING SCHEMATIC
PV E8.1	RACKING SCHEMATIC
PV E9.1	SAFETY PLACARD
PV E10.1	SAFETY PLACARD

PROJECT INFORMATION

Project Latitude	42.1°	Min. Ambient Temperature	-6°C
Project Longitude	72°	Max. Ambient Temperature	35°C
Interconnection Voltage	208/120V	Meter Number	
		North Direction	0°
		AHJ	Augusta

ARRAY INFORMATION

MP 1			
Module Name	(148) Canadian Solar CS6U-345M		
Inverter	(3) Fronius Symo 15.0-3		
Tilt Angle 9.72°	No. of Modules 148		No. of Strings 12



SCALE: 1/4"=1'

Rev	Description	Date	Drawn By	Engineering Stamp
0	FULL DESIGN SET	5/2/2017	GTE	
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Company Contact Info		COMPANY LOGO	
Company Name:	Entero Energy		
Company Address:	4501 Spicewood Springs Road, Suite 1022		
Company Phone:	(703) 357-7133		
Company E-mail:	matt@enteroenergy.com		

Customer	HomeWood Suites
Project	Commercial Solar PV Project
Location	2169 Gordon Highway, Augusta Georgia 30909

Sheet Name			
ARRAY LAYOUT			
Designed By		Sheet Title	
		PV E2.1	
Project number 01	Sheets 10	Issue	Sheet Number

DC CIRCUIT CALCULATIONS											
Circuit #	Module	# mods per string	# strings	I _{mp}	I _{sc}	V _{oc}	V _{mp} at STC	Temp Derate	Conduit Fill Derate	Max. 1 way length (ft)	%Vdrop
STR-01	Canadian Solar CS6X-345P	12	4	36.24	38.24	556.8	457.2	0.82	0.8	50	0.97%
STR-02	Canadian Solar CS6X-345P	12	4	36.24	38.24	556.8	457.2	0.82	0.8	50	0.91%
STR-03	Canadian Solar CS6X-345P	13	4	36.24	38.24	603.2	495.3	0.82	0.8	50	0.84%
CB-01	Canadian Solar CS6X-345P	12	4	36.24	38.24	556.8	457.2	0.82	0.8	240	1.73%
CB-02	Canadian Solar CS6X-345P	12	4	36.24	38.24	556.8	457.2	0.82	0.8	240	1.73%
CB-03	Canadian Solar CS6X-345P	13	4	36.24	38.24	603.2	495.3	0.82	0.8	240	1.59%

DC CIRCUIT SCHEDULE										
Circuit #	Conductor Metal	# of Conduits	# CC Conductors	Conductor Size	EGC Size	Max. 1 way length (ft)	Wire Insul.	Min EMT Size (in)	Min PVC Size (in)	Min RMC Size (in)
STR-01	Cu	1	2	AWG 10	AWG 10	50	PVWire	-	-	-
STR-02	Cu	1	2	AWG 10	AWG 10	50	PVWire	1	1	1
STR-03	Cu	1	2	AWG 10	AWG 10	50	PVWire	1	1	1
CB-01	Cu	1	2	AWG 06	AWG 10	240	THWN2	1	1	1
CB-02	Cu	1	2	AWG 06	AWG 10	240	THWN2	1	1	1
CB-03	Cu	1	2	AWG 06	AWG 10	240	THWN2	1	1	1

AC CIRCUIT SCHEDULE																		
Circuit #	Icont per conductor	V _{mp}	Temp Derate	Conduit Fill Derate	Conductor Metal	# of Conduits	# Phase Conductors Per Conduit	Phase Conductor Size	Neutral Conductor Size	EGC Size	GEC-CU ONLY	Min. Circuit Length	Max. Circuit Length	%V Drop	Wire Insul.	Min EMT Size (in)	Min PVC Size (in)	Min RMC Size (in)
IN-01	41.6	208.0	0.96	0.8	Al	1	3	AWG 01	AWG 08	AWG 08	AWG 04	5	120	0.99%	THWN2	1 1/4	1 1/4	1 1/4
Circuit #	Icont per conductor	V _{mp}	Temp Derate	Conduit Fill Derate	Conductor Metal	# of Conduits	# Phase Conductors Per Conduit	Conductor Size	Neutral Conductor Size	EGC Size	GEC - CU only	Min. Circuit Length	Circuit Length	%V Drop	Wire Insul.	Min EMT Size (in)	Min PVC Size (in)	Min RMC Size (in)
LC-01	124.8	208.0	0.96	0.8	Al	1	3	250 KCMIL	AWG 06	AWG 06	AWG 02	105	105	0.90%	THWN2	2	2	2

Photovoltaic Module Electrical Specifications:				Model: SPR-E20-327			
V _{oc} =	37.8	V at STC					
V _{mp} =	31.4	V at STC					
I _{sc} =	8.66	A at STC		Temperature Data			
I _{mp} =	8.15	A at STC		ASHRAE Mean Low Temp	-16	deg C	
T _{voc} =	-0.1134	V/deg C		ASHRAE 2% Dry Bulb Temp	33	deg C	
T _{isc} =	0.3464	mA/deg C					
T _{vmp} =	-0.0942	V/deg C					
Sample Calculation #1: Maximum System DC Voltage per art 690.7							
V _{max} =	# of series connected modules x (V _{oc} at STC - (25 deg C - Low Temp) x T _{voc} V/deg C)						
	=7 x (37.8V - (25 - -16) deg C x -0.1134 V/deg C)						
	=297V						

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---	---	---	---					Project number 01		Issue		
									Sheets	10	Issue	Sheet Number

1.1.1 PROJECT NOTES
1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690.2014, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES. ALL WORK SHALL BE PERFORMED PER (NEC 2014).
1.1.3 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE INVERTER IN ACCORDANCE WITH (NEC 690.5(A)).
1.1.4 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
1.1.5 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH (NEC 690.64 (B)).
1.1.6 ALL PV SYSTEM COMPONENTS, MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY (NEC 690.4) & (NEC 690.60).
PV MODULES:UL 1703 CERTIFIED, NFPA 70 CLASS C FIRE INVERTERS:UL 1741 CERTIFIED, IEEE 1547, 929, 519
COMBINER BOX(S):UL 1703 OR UL 1741 ACCESSORY

1.2.1 SCOPE OF WORK
PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ON-SITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT.
1.2.2 WORK INCLUDES:
1.2.3 PV ROOF ATTACHMENTS
1.2.4 PV RACKING SYSTEM INSTALLATION
1.2.5 PV MODULE AND INVERTER INSTALLATION
1.2.6 PV EQUIPMENT GROUNDING
1.2.7 PV SYSTEM WIRING TO A ROOF-MOUNTED OR INTERIOR JUNCTION BOX
1.2.8 PV INSTALLING SYSTEM MONITORING EQUIPMENT
1.2.9 PV LOAD CENTERS (IF NEC.)
1.2.10 PV METERING (IF NEC.)
1.2.11 PV DISCONNECTS
1.2.12 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
1.2.13 PV FINAL COMMISSIONING
1.2.14 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
1.2.15 MAIN SERVICE PANEL UPGRADE (IF NEC.)

2.1.2 SITE NOTES
2.1.2 A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2.1.3 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS AN UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
2.1.4 THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
2.1.5 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION (NEC 110.26).
2.1.6 ALTERNATE POWER SOURCE PLACARD SHALL BE PLASTIC, ENGRAVED IN A CONTRASTING COLOR TO THE PLAQUE. THIS PLAQUE WILL BE ATTACHED USING AN APPROVED METHOD. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC.
2.1.7 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 250-64(B). THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT PER (NEC 250.64(C)).
2.1.8 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.
2.1.9 RIGID CONDUIT (AND/OR NIPPLES) MUST HAVE A FULL BUSHING TO PROTECT WIRES.
2.1.10 BOLTED CONNECTION REQUIRED IN DC DISCONNECTS ON THE WHITE GROUNDING CONDUCTOR (USE POLARIS BLOCK OR NEUTRAL BAR).
2.1.11 ANY CONNECTION ABOVE LIVE PARTS MUST BE WATERTIGHT. REDUCING WASHERS DISALLOWED ABOVE LIVE PARTS. MEYERS HUBS RECOMMENDED.

2.2.1 SOLAR CONTRACTOR
2.2.2 MODULE CERTIFICATIONS WILL INCLUDE UL1703, IEC61646, IEC61730.
2.2.3 IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
2.2.4 AS INDICATED BY DESIGN, OTHER NRTL LISTED MODULE GROUNDING DEVICES MAY BE USED IN PLACE OF STANDARD.
2.2.5 CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
2.2.6 CONDUIT POINT OF PENETRATION FROM EXTERIOR TO INTERIOR TO BE INSTALLED AND SEALED WITH A SUITABLE SEALING COMPOUND.
2.2.7 DC WIRING LIMITED TO MODULE FOOTPRINT W/ EMPHASE AC SYSTEM.
2.2.8 ALL WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS. ALL WIRING SHALL BE COMPLETELY SUPPORTED AND REMAIN OFF THE ROOF STRUCTURE.
2.2.9 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VDC UNLESS NOT AVAILABLE.
2.2.10 ALL INVERTERS, MOTOR GENERATORS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AC PHOTOVOLTAIC MODULES, SOURCE CIRCUIT COMBINERS, AND CHARGE CONTROLLERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER (NEC 690.4(D)).
2.2.11 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE.

2.3.1 EQUIPMENT LOCATIONS
2.3.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY (NEC 110.26).
2.3.3 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)(2)(C)).
2.3.4 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.
2.3.5 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC 2014 APPLICABLE CODES.
2.3.6 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

2.4.1 WIRING & CONDUIT NOTES
2.4.2 ALL CONDUIT SIZES AND TYPES, SHALL BE LISTED FOR ITS PURPOSE AND APPROVED FOR THE SITE APPLICATIONS.
2.4.3 ALL PV CABLES AND HOMERUN WIRES BE #10AWG #USE-2, PV WIRE, OR PROPRIETARY SOLAR CABLING SPECIFIED BY MFR, OR EQUIVALENT; ROUTED TO SOURCE CIRCUIT COMBINER BOXES AS REQUIRED.
2.4.4 ALL CONDUCTORS AND DCPD SIZES AND TYPES SPECIFIED ACCORDING TO (NEC 690.8 (A)(1) & (B)(1)), (NEC 240) (NEC 690.7) FOR MULTIPLE CONDUCTORS.
2.4.5 ALL PV DC CONDUCTORS IN CONDUIT EXPOSED TO SUNLIGHT SHALL BE DERATED ACCORDING TO (NEC TABLE 310.15 (B)(2)(C)) BLACK ONLY***

FOR 600V, UV RATED SPIRAL WRAP SHALL BE USED TO PROTECT WIRE FROM SHARP EDGES

IDENTIFIED BY OTHER EFFECTIVE MEANS
2.4.9 ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION
2.4.10 VOLTAGE DROP LIMITED TO 2% FOR DC CIRCUITS AND 1% FOR AC CIRCUITS
2.4.11 NEGATIVE GROUNDED SYSTEMS DC CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:
DC POSITIVE- RED (OR MARKED RED)
DC NEGATIVE- GREY (OR MARKED GREY)
2.4.12 POSITIVE GROUNDED SYSTEMS DC CONDUCTORS COLOR CODED: DC POSITIVE- GREY (OR MARKED GREY)
DC NEGATIVE- BLACK (OR MARKED BLACK)
2.4.13 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

2.5.1 STRUCTURAL NOTES:
2.5.2 RACKING SYSTEM & PV ARRAY SHALL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL.
2.5.3 ROOF-MOUNTED STANDARD RAIL REQUIRES ONE THERMAL EXPANSION GAP FOR EVERY RUN OF RAIL GREATER THAN 40'.
2.5.4 ARRAY SHALL BE A MIN. HEIGHT OF 3' ABOVE THE COMPOSITION ROOF.
2.5.5 JUNCTION BOX (IF ROOF-MOUNTED) SHALL BE OF TYPE SOLADECK J-BOX (OR EQUIVALENT). ALL ROOF PENETRATIONS SHALL BE FLASHED ACCORDING TO (IRC M2303.2.2).
2.5.6 ROOFTOP PENETRATIONS PERTAINING TO SOLAR RACKING WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
2.5.7 ALL PV RELATED RACKING ATTACHMENTS WILL BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER. I.C. FINAL ATTACHMENT LOCATIONS MAY BE ADJUSTED IN THE FIELD AS NECESSARY.
2.5.8 ALL PV RELATED RACKING ATTACHMENTS SHALL BE STAGGERED BY ROW AMONGST THE ROOF FRAMING MEMBERS.

2.6.1 GROUNDING NOTES
2.6.2 A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH (NEC 690.47) AND (NEC 250.50) THROUGH (NEC 250.166) 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.
2.6.3 GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #10 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
2.6.4 PV SYSTEM SHALL BE GROUNDED IN ACCORDANCE TO (NEC 250.20), (NEC TABLE 250.122) AND ALL METAL PARTS OR MODULE FRAMES. GROUND CONNECTION TO THE MOUNTING RAILS SHALL BE VIA ILSCO GBL4 DBT LUGS (OR EQUIVALENT, BURNDY CL50.1TL / WEEB LUG) (NEC 690.43).
2.6.5 MODULE SOURCE CIRCUITS SHALL BE GROUNDED IN ACCORDANCE TO (NEC 690.42).
2.6.6 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.
2.6.7 EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTIONS POINTS IDENTIFIED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2.6.8 ENCLOSURES SHALL BE PROPERLY PREPARED WITH REMOVAL OF PAINT/FINISH AS APPROPRIATE WHEN GROUNDING EQUIPMENT WITH TERMINATION GROUNDING LUGS.
2.6.9 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR DIRECT BURIAL.
2.6.10 GROUNDING AND BONDING CONDUCTORS SHALL BE COPPER, SOLID OR STRANDED, AND BARE WHEN EXPOSED.
2.6.11 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).
2.6.12 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN (OR MARKED GREEN IF #4 AWG OR LARGER).
2.6.13 ALL CONDUIT BETWEEN THE UTILITY AC DISCONNECT AND THE POINT OF CONNECTION SHALL HAVE GROUNDED BUSHINGS AT BOTH ENDS.
2.6.14 AC SYSTEM GEC SIZED ACCORDING TO (NEC 690.47), (NEC TABLE 250.66), DC SYSTEM GEC SIZED ACCORDING TO (NEC 250.166), MINIMUM #6AWG WHEN EXPOSED.
2.6.15 EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENTS, AND CONDUCTOR ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH (NEC 250.134) OR (NEC 250.136(A)) REGARDLESS OF VOLTAGE.
2.7.1 INTERCONNECTION NOTES
2.7.2 PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED AT THE OPPOSITE END OF THE BUS FROM THE MAIN SERVICE BREAKER OR TRANSFORMER INPUT FEEDER IN ACCORDANCE WITH (NEC 690.64(B)(7)).
2.7.3 SUM OF BREAKER RATINGS SUPPLYING THE BUS MAY NOT EXCEED 120% OF THE THE BUSBAR RATING PER (NEC 690.64(B)(2)) AND/OR (NEC 705.12(D)(1)).
2.7.4 GROUND FAULT PROTECTION IN ACCORDANCE WITH (NEC 215.9) & (NEC 230.95) ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
2.7.5 SUPPLY SIDE INTERCONNECTION ACCORDING TO (NEC 690.64(A)) AND/OR (NEC 705.12(A)) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH (NEC 230.42(B)).
2.7.6 MICROINVERTER BRANCHES (IF INSTALLED) SHALL BE CONNECTED TO A SINGLE BREAKER DCPD IN ACCORDANCE WITH (NEC 110.3(B)).

2.8.1 DISCONNECT NOTES
2.8.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS
2.8.3 AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH.
2.8.4 DC CURRENT CONDUCTORS ARE TO REMAIN OUTSIDE OF BUILDING PRIOR TO EITHER A FUSEABLE SOURCE CIRCUIT COMBINER BOX OR A LOAD-BREAK DISCONNECTING DEVICE.
2.8.5 A RAPID SHUTDOWN DEVICE WILL BE INSTALLED AS PART OF THIS SYSTEM IF THIS FEATURE IS NOT ALREADY INCLUDED IN THE INVERTER (NEC 690.12).
RESISTANT, RATED FOR 600V PER (NEC 690.7)
2.4.9 4-WIRE DELTA CONNECTED SYSTEMS HAVE THE PHASE WITH THE HIGHER VOLTAGE TO GROUND MARKED ORANGE OR

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EcoFoot2 + Installer Feedback = EcoFoot2+™

Our design enhancements help you master the most challenging site and rooftop conditions



System Benefits

- Low part count
 - Rapid system deployment
 - Preassembled Universal Clamp
 - Increased design flexibility
 - More ballast capacity
 - Simplified logistics
- (up to 50kW per pallet)

Validation Summary

- Certified to UL2703 Fire Class A for Type I and II modules
- Certified to UL2703 Grounding and Bonding
- Wind tunnel tested to 150mph
- SEAOC seismic compliant
- CFD and structurally tested DNV GL rated at 13.5 panels per installer-hour

Technical Specifications

Dimensions: 26.5"L x 18.25"H
 Typical System Weight: 3.5-6 lbs. per sq. ft.
 Module orientation: Landscape/Portrait
 Tilt angle: Landscape 10°/Portrait 5°

Module inter-row spacing: 18.9"
 Roof pitch: 0° to 7°
 Ballast requirements: 4" x 8" x 16"
 Warranty: 25 years

244 W. State Street, Athens OH 45701 | 740-249-1877 | www.ecolibriumsolar.com

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								Designed By	Sheet Title		
								Project number 01	PV E8.1		
									Sheets 10	Issue	Sheet Number

WARNING!

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE
UNGROUNDDED
AND MAY BE ENERGIZED

LABEL 1 : AT EACH JUNCTION, COMBINER DISCONNECT AND DEVICE WHERE ENERGIZED UNGROUNDDED CONDUCTORS MAY BE EXPOSED DURING SERVICE [NEC 690.35(F)]

PHOTOVOLTAIC AC DISCONNECT

OPERATING CURRENT: 200AAC
OPERATING VOLTAGE: 208/120VAC

LABEL 2 : AT POINT OF INTERCONNECTION, MARKED AT DISONNECTING MEANS [NEC 690.54]

INTERACTIVE PHOTOVOLATIC SYSTEM
DISCONNECT LOCATED ON SIDE OF HOUSE

LABEL 3: AT UTILITY METER [NEC 690.56(B)]

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 4: AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION WHERE SEPERATED BY ENCLOSURES, WALLS PARTITIONS, CEILINGS, OR FLOORS. [NEC 690.31(E)]
LETTERS AT LEAST $\frac{3}{8}$ INCH; WHITE ON RED BACKGROUND; REFLECTIVE [IFC 605.11.1.1]

WARNING!

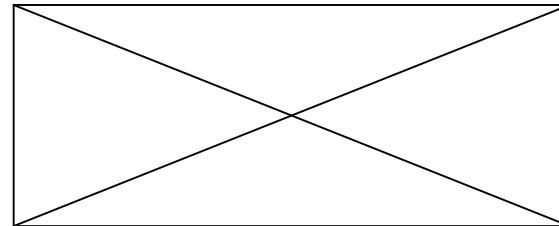
ELECTRIC SHOCK HAZARD DO
NOT TOUCH TERMINALS.
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

LABEL 5 : AT EACH DISCONNECTING MEANS FOR PHOTOVOLATIC EQUIPMENT [NEC 690.17]

WARNING!

DUAL POWER SOURCES
SECOND SOURCE IS PV
SYSTEM

LABEL 6 : AT POINT OF INTERCONNECTION; LABEL MUST INDETIFY PHOTOVOLATIC SYSTEM [NEC 705.12(D)(4)]



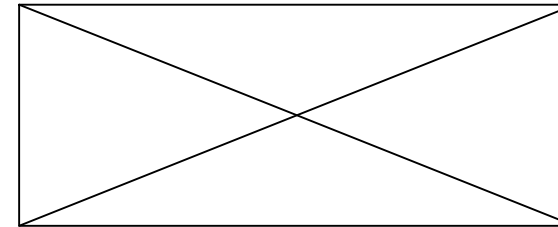
LABEL 7: AT EACH DC DISCONNECTING MEANS [NEC 690(C)(2)] T

PHOTOVOLTAIC AC DISCONNECT

LABEL 8: AT EACH DC DISCONNECTING MEANS [NEC 690(C)(2)]

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 9: AT SERVICE EQUIPMENT: [NEC 690.56(C)]
LETTERS AT LEAST 3/8 INCH; WHITE ON RED
BACKGROUND REFLECTIVE [IFC 605.11.1.1]



LABEL 10: AT EACH DC DISCONNECTING MEANS [NEC 690.53]

CAUTION!

PHOTOVOLTAIC SYSTEM
CIRCUIT IS BACKFED

LABEL 11: AT POINT OF INTERCONNECTION;
LABEL MUST IDENTIFY PHOTOVOLTAIC SYSTEM
[NEC 705.12(D)(4)]

SHEET SUMMARY

PV E1.1	SITE PLAN & GENERAL NOTES
PV E2.1	ARRAY LAYOUT
PV E3.1	STRUCTURAL LAYOUT
PV E4.1	SINGLE LINE DIAGRAM
PV E5.1	ELECTRICAL CALCUALTIONS
PV E6.1	GENERAL NOTES
PV E7.1	RACKING SCHEMATIC
PV E8.1	RACKING SCHEMATIC
PV E9.1	SAFETY PLACARD
PV E10.1	SAFETY PLACARD

PROJECT INFORMATION

Project Latitude	42.1°	Min. Ambient Temperature	-6°C
Project Longitude	72°	Max. Ambient Temperature	35°C
Interconnection Voltage	208/120V	Meter Number	
		North Direction	0°
		AHJ	Augusta

ARRAY INFORMATION

MP 1			
Module Name	(148) Canadian Solar CS6U-345M		
Inverter	(3) Fronius Symo 15.0-3		
Tilt Angle 9.72°	No. of Modules 148		No. of Strings 12

SAFETY PLACARD

Designed By	Sheet Title	PV E9.1	
Project number 01	Sheets 10	Issue	Sheet Number

Rev	Description	Date	Drawn By	Engineering Stamp	Company Contact Info	COMPANY LOGO	Customer	Sheet Name
0	FULL DESIGN SET	5/2/2017	GTE		Company Name: Entero Energy Company Address: 4501 Spicewood Springs Road, Suite 1022 Company Phone: (703) 357-7133 Company E-mail: matt@enteroenergy.com		HomeWood Suites Commercial Solar PV Project 2169 Gordon Highway, Augusta Georgia 30909	
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WARNING!

INVERTER OUTPUT CONNECTION.
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LABEL 13: AT POINT OF
INTERCONNECTION OVERCURRENT
DEVICE [NEC 705.12(D)(7)]

INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED
PHOTOVOLTAIC SYSTEM DISCONNECT LOCATED ON SIDE
OF BUILDING

PLAQUE

DIRECTORY:

PERMANENT PLAQUE OR DIRECTORY
PROVIDING THE LOCATION OF THE
SERVICE DISCONNECTING MEANS AND
THE PHOTOVOLTAIC SYSTEM
DISCONNECTING MEANS IF NOT IN THE
SAME LOCATION [NEC 690.56(B)]
WHERE THE INVERTERS ARE REMOTELY
LOCATED FROM EACH OTHER, A
DIRECTORY IN ACCORDANCE WITH 705.10
SHALL BE INSTALLED AT EACH DC PV
SYSTEM DISCONNECTING MEANS, AT
EACH AC DISCONNECTING MEANS, AND
AT THE MAIN SERVICE DISCONNECTING
MEANS SHOWING THE LOCATION OF ALL
AC AND DC PV SYSTEM DISCONNECTING
MEANS IN THE BUILDING [NEC 690.4(H)]

[NEC 110.21(B),A]

1.5 LABELS TO BE A MINIMUM LETTER
HEIGHT OF 3/8 " AND PERMANENTLY
AFFIXED

LABELING NOTES:

1.1 LABELING REQUIREMENTS BASED ON
THE NFPA 70: NATION ELECTRICAL
CODE (NEC), 2014; INTERNATIONAL FIRE
CODE 605.11; OSHA STANDARD 1910.145;
ANSI Z535.

1.2 MATERIAL BASED ON THE
REQUIREMENTS OF THE AUTHORITY
HAVING JURISDICTION

1.3 LABELS TO BE SUFFICIENT
DURABILITY TO WITHSTAND THE
ENVIRONMENT INVOLVED [NEC
110.21(B)].

1.4 SIGNAGE IS NOT PERMITTED TO BE
HAND WRITTEN (UNLESS IT IS
NECESSARY DUE TO THE INFORMATION
ON THE SIGN BEING SUBJECT TO
CHANGE)

SHEET SUMMARY

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PV E10.1	SAFETY PLACARD

PROJECT INFORMATION

Project Latitude	42.1°	Min. Ambient Temperature	-6°C
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Interconnection Voltage	208/120V	Meter Number	
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		AHJ	Augusta

ARRAY INFORMATION

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Rev	Description	Date	Drawn By	Engineering Stamp	Company Contact Info	COMPANY LOGO	Customer	HomeWood Suites	Sheet Name	SAFETY PLACARD		
0	FULL DESIGN SET	5/2/2017	GTE		Company Name: Entero Energy Company Address: 4501 Spicewood Springs Road, Suite 1022 Company Phone: (703) 357-7133 Company E-mail: matt@enteroenergy.com		Project	Commercial Solar PV Project	Designed By			
							Location	2169 Gordon Highway, Augusta Georgia 30909	Sheet Title			
									PV E10.1			
									Project number 01	Sheets 10	Issue	Sheet Number