



Planning & Building Department
6280 W 800N
McCordsville, IN 46055
Phone: 317.335.3604
Email: building@mccordsville.org

PUBLIC HEARING INFORMATION

Case #: BZA-20-003

Title: 6295 W. Chelmsford Dr. Solar Panel Request for Development Standards Variances

Meeting Date: this zoning petition is currently scheduled to be heard at the April 1st Board of Zoning Appeals (BZA) meeting.

¹Please note, due to COVID-19 virus spread, Town meetings may be cancelled or postponed. Any agenda items on agenda which is cancelled or postponed is automatically continued to the next available meeting. Please continue to check the Town's website for updates.

²Meeting agenda and staff report will be available on the website by end of business day on the Friday preceding the applicable meeting. Go to www.mccordsville.org and click on "Agendas & Minutes".



McCCORDSVILLE BOARD OF ZONING APPEALS
VARIANCE APPLICATION

Zoning Ordinance Section 10.03

Applicant Information

Name: _____

Current Address: _____
(Number) (Street)

(City) (State) (Zip)

Phone No.: _____ E-mail Address: _____

Property Owner Information (the "owner" does not include tenants or contract buyers)

Name: _____

Current Address: _____
(Number) (Street)

(City) (State) (Zip)

Phone No.: _____ E-mail Address: _____

Property Information

Current Address: _____
(Number) (Street)

Subdivision Name (if applicable): _____

OR General Location (if no address has been assigned, please provide a street corner, subdivision lot number, or attach a legal description)

Administrative Officer Use Only:

Existing Zoning: _____

Future Land Use: _____

Date Application Filed: _____

Docket No.: _____

Present Use of Property: _____

Size of the Lot/Parcel in Question: _____

Are there any restrictions, laws, covenants, variances, special exceptions, or appeals filed in connection with this property that would relate or affect its use for the specific purpose of this application? If yes, please list date and docket number, decision rendered and pertinent explanation:

Variance Information

Describe the variance requested: _____

Development Standards Variance Requested:

- | | |
|--|--|
| <input type="checkbox"/> Building Height | <input type="checkbox"/> Entrance / Drive |
| <input type="checkbox"/> Building Setback | <input type="checkbox"/> Sight Visibility |
| <input type="checkbox"/> Lot Coverage | <input type="checkbox"/> Fence and Wall |
| <input type="checkbox"/> Lot Width | <input type="checkbox"/> Landscaping |
| <input type="checkbox"/> Lot Area | <input type="checkbox"/> Buffering and Screening |
| <input type="checkbox"/> Parking | <input type="checkbox"/> Exterior Lighting |
| <input type="checkbox"/> Loading | <input type="checkbox"/> Sign |
| <input type="checkbox"/> Other (please specify): _____ | |

Describe reasons supporting the variance requested: _____

Development Standards Variance Criteria

The McCordsville Zoning Ordinance establishes specific design criteria that must be met in order for a variance to be approved. Please answer each question below and if the response is "NO", please describe why the variance requested does not meet the required criteria.

Will the variance provide safe conditions that will not be injurious to the public health, safety, morals, and general welfare of the community?

YES NO, Please Explain (attach additional pages as necessary): _____

Will the use and value of the area adjacent to the property included in the variance not be affected in a substantially adverse manner?

YES NO, Please Explain (attach additional pages as necessary): _____

Will the strict application of the terms of this Ordinance result in a practical difficulty in the use of the property? This situation shall not be self-imposed, nor be based on a perceived reduction of, or restriction on, economic gain.

YES NO, Please Explain (attach additional pages as necessary): _____

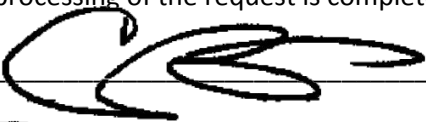
Applicant's Signature

The information included in and with this application is completely true and correct to the best of my knowledge and belief.

_____  _____
(Applicant's Signature) (Date)

Owner's Signature (the "owner" does not include tenants or contract buyers)

I authorize the filing of this application and will allow the Town staff to enter this property for the purpose of analyzing this request. Further, I will allow a public notice sign to be placed and remain on the property until the processing of the request is complete.

_____  _____
(Owner's Signature) (Date)

_____  _____
(Owner's Signature) (Date)

VARIANCE PERMIT - APPLICATION CHECKLIST

(McCordsville Zoning Ordinance: Section 10.03 Variance)

The following shall be included in the Variance Application. The applicant is responsible for contacting the Administrative Officer to identify any information that is not applicable. The applicant is also required to provide any other information requested by the Administrative Officer or his/her designee to demonstrate compliance with the requirements of the McCordsville Zoning Ordinance.

Variance Application Checklist:

- Pre-Application Meeting (required)
- Variance Application
- Affidavit & Consent of Property Owner(s) (if owner is someone other than applicant), 5 hard copies in a recordable format plus one electronic submittal in a format acceptable to the Administrative Officer
- Copy of Deed for Property Involved, including any covenants or commitments, 5 hard copies in a recordable format plus one electronic submittal in a format acceptable to the Administrative Officer
- Filing Fee
- Supporting Information, 5 hard copies in a recordable format plus one electronic submittal in a format acceptable to the Administrative Officer of each of the following (where appropriate)
 - Site Plan (signed, dated, drawn to scale and/or fully dimensioned and clearly showing entire layout of property and all features relevant to the variance request).
 - Statement of Intent

Gateway Crossing, HOA

1547 N State Street #210, Greenfield, IN 46140

January 10, 2020
Christopher Berry
6295 W. Chelmsford Dr.
Mccordsville, In 46055

Re: Architectural Request Approved!

Dear Homeowner,

Congratulations, your request for architectural changes to your **house (installation of utility interactive photovoltaic solar system)** has been approved by the Gateway Crossing, HOA architectural committee!

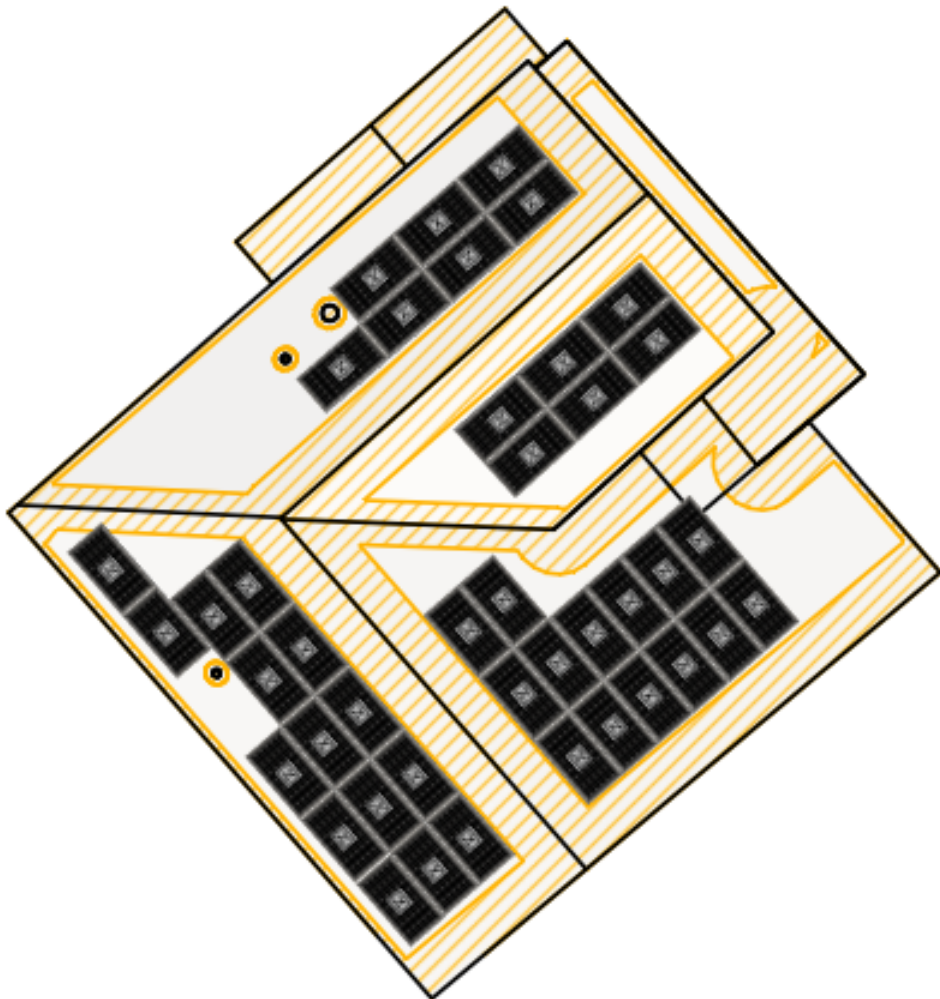
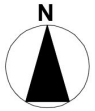
You may secure your permit (if required) and begin work immediately. Remember to **call "811"** before you dig. "811" is a free service to assist you in determining the location of utility lines and prepare you for a safe and successful project.

Again, congratulations on your project approval. Please retain a copy of this approval for future reference, and/or real estate sale or transfer.

Should you have additional questions or concerns, please do not hesitate to contact me.

Sincerely,

Board of Directors
Gateway Crossing, HOA
1547 N State Street #210
Greenfield, IN 46140
Phone: (317) 682-0571
info@yourhoahelp.com



Jennifer & Christopher Berry

01/18/2020



1403 N Research Way, Building J
Orem, UT 84097

800-377-4480
WWW.BLUERAVENSOLAR.COM

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CONTRACTOR:
BLUE RAVEN SOLAR
800.377.4480

SITE INFORMATION:
Christopher Berry
6295 W Chelmsford Dr
McCordsville, Indiana 46055

DC SYSTEM SIZE:
12.81 kW DC

MODULE QTY:
42

ANNUAL PRODUCTION:
15,108 kWh



DATE:
January 6th, 2020

GENERAL NOTES

CODES AND STANDARDS

1. ALL WORK SHALL COMPLY WITH 2009 Indiana Electric Code, 2012 INTERNATIONAL BUILDING CODE (IBC), 2018 INTERNATIONAL RESIDENTIAL CODE (IRC), 2006 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 / OSHA REGULATION

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. 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.

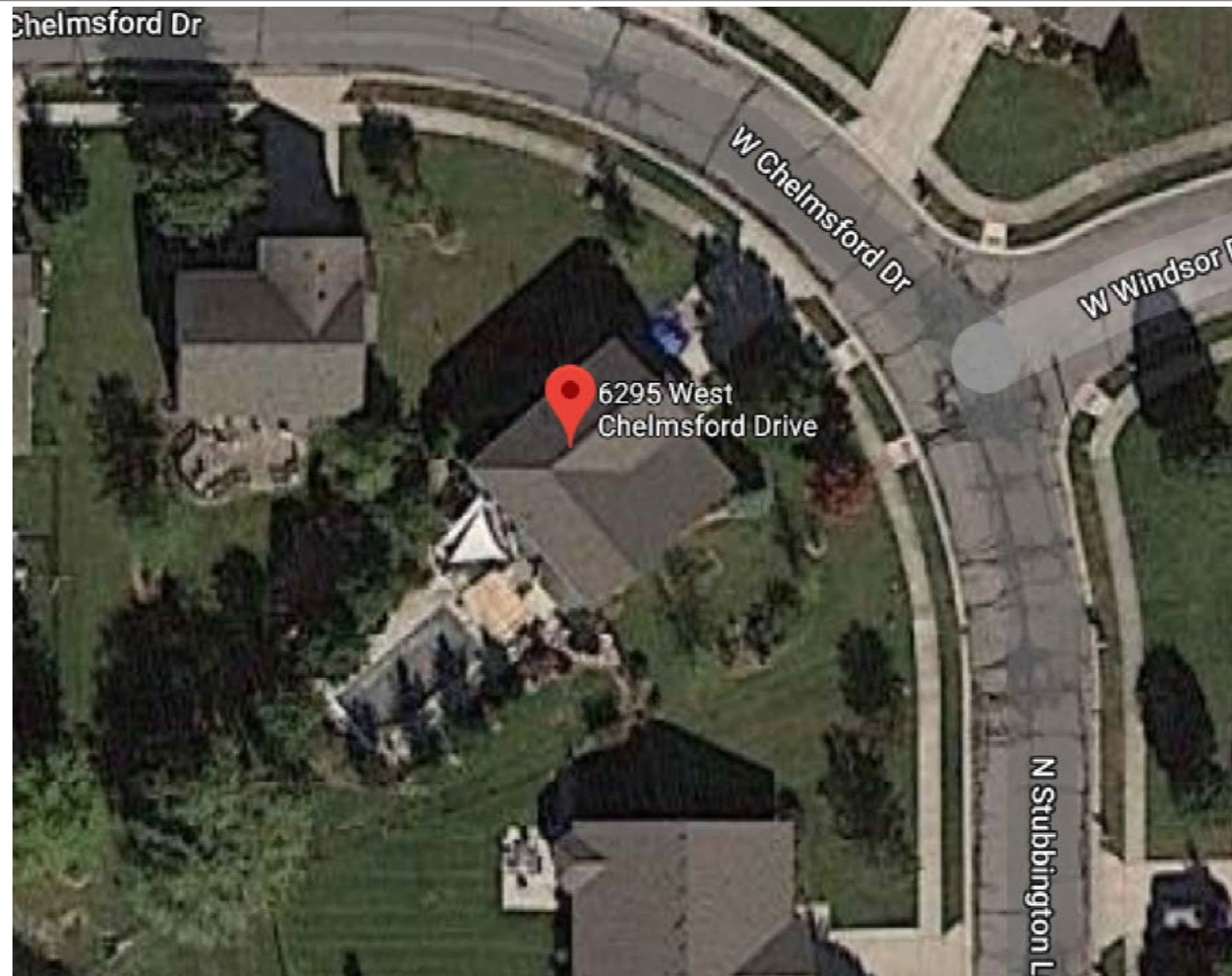
SOLAR CONTRACTOR

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.
11. TERMINALS AND LUGS WILL BE TIGHTENED TO MANUFACTURER TORQUE SPECIFICATIONS (WHEN PROVIDED) IN ACCORDANCE WITH NEC CODE 110.14(D) ON ALL ELECTRICAL CONNECTIONS.

EQUIPMENT LOCATIONS

1. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION [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



DESIGN CRITERIA
 WIND SPEED: 115 MPH
 GROUND SNOW LOAD: 20 PSF
 WIND EXPOSURE FACTOR: C
 SEISMIC DESIGN CATEGORY: B

SITE SPECIFICATIONS
 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
 PV6 - ELECTRICAL CALCULATIONS & ELECTRICAL NOTES
 PV7 - MAIN BREAKER DERATE CALCS. (IF NEEDED)
 PV8 - LABELS & LOCATIONS
 PV9 - CUSTOM DIRECTORY PLACARD (IF NEEDED - NEC 690.56(B))

SCOPE OF WORK
 INSTALLATION OF UTILITY INTERACTIVE PHOTOVOLTAIC SOLAR SYSTEM
 12.81 kW DC PHOTOVOLTAIC SOLAR ARRAY
 ROOF TYPE: Comp Shingle
 MODULES: (42) Seraphim SEG-6MB-305BB
 INVERTER(S): Enphase IQ7-60-2-US,----
 RACKING: Unirac SFM Infinity



1403 N RESEARCH WAY, BUILDING J
 OREM, UT 84097
 800-377-4480
 WWW.BLUERAVENSOLAR.COM

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CONTRACTOR:
 BRS FIELD OPS
 385.498.6700

SITE INFORMATION:
 CHRISTOPHER BERRY
 6295 W Chelmsford Dr
 McCordsville, Indiana 46055
 DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY
 Eric Thomas

DATE
 November 26, 2019

PROJECT NUMBER
 71205263

SHEET NAME
 COVER SHEET

PAGE NUMBER PV1	REVISION 0
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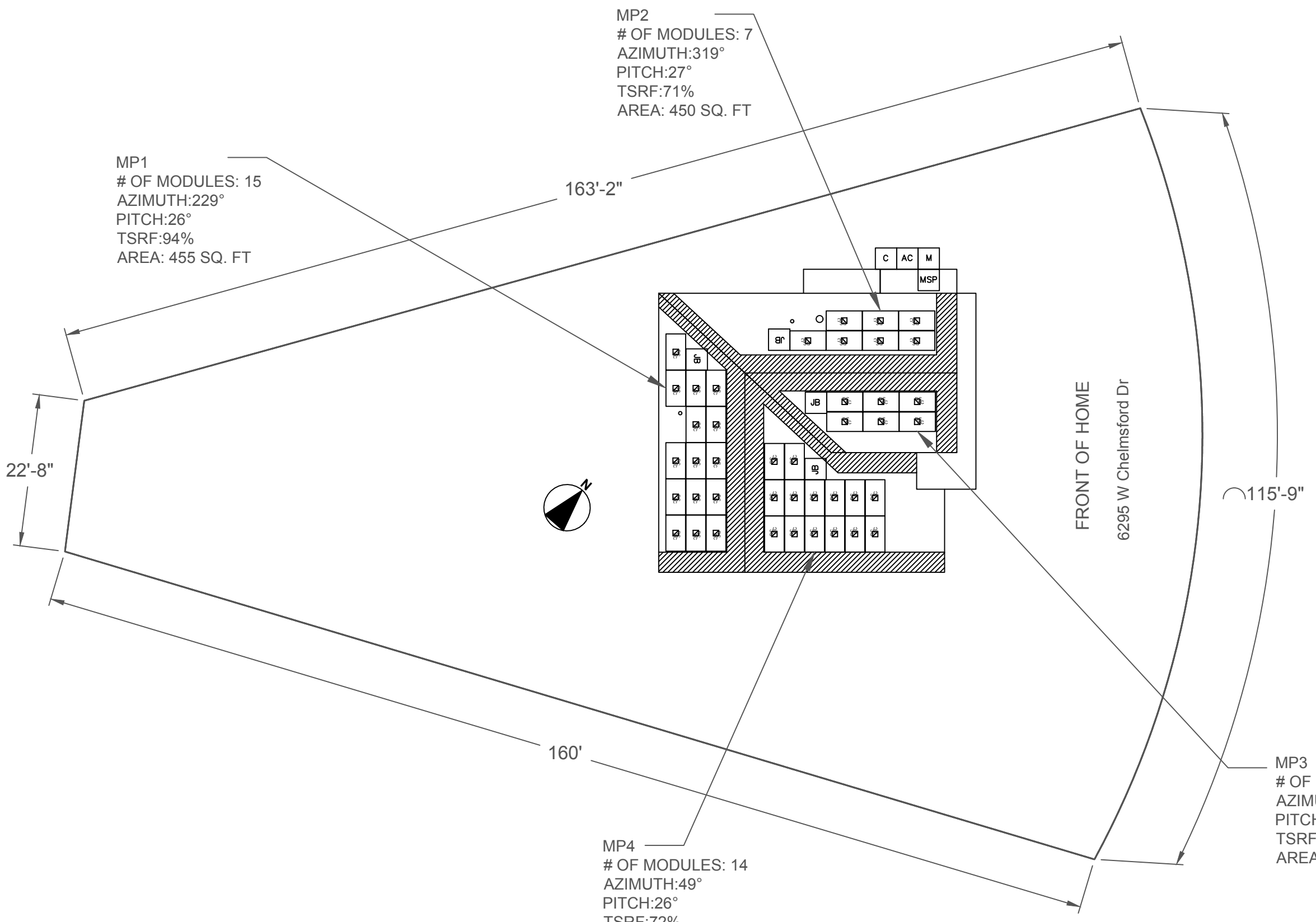


CONTRACTOR:
BRS FIELD OPS
385.498.6700

LEGEND

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

SCALE: 1/16" = 1'-0"
0' 4' 8' 16' 32'



MP2
OF MODULES: 7
AZIMUTH:319°
PITCH:27°
TSRF:71%
AREA: 450 SQ. FT

MP1
OF MODULES: 15
AZIMUTH:229°
PITCH:26°
TSRF:94%
AREA: 455 SQ. FT

MP3
OF MODULES: 6
AZIMUTH:138°
PITCH:27°
TSRF:95%
AREA: 300 SQ. FT

MP4
OF MODULES: 14
AZIMUTH:49°
PITCH:26°
TSRF:72%
AREA: 585 SQ. FT

DC SYSTEM SIZE: 12.81 kW DC
ROOF TYPE: Comp Shingle

(42) Seraphim SEG-6MB-305BB
Enphase IQ7-60-2-US,----INVERTER

SITE INFORMATION:
CHRISTOPHER BERRY
6295 W Chelmsford Dr
McCordsville, Indiana 46055
DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY
Eric Thomas

DATE
November 26, 2019

PROJECT NUMBER
71205263

SHEET NAME
PROPERTY PLAN

PAGE NUMBER PV2	REVISION 0
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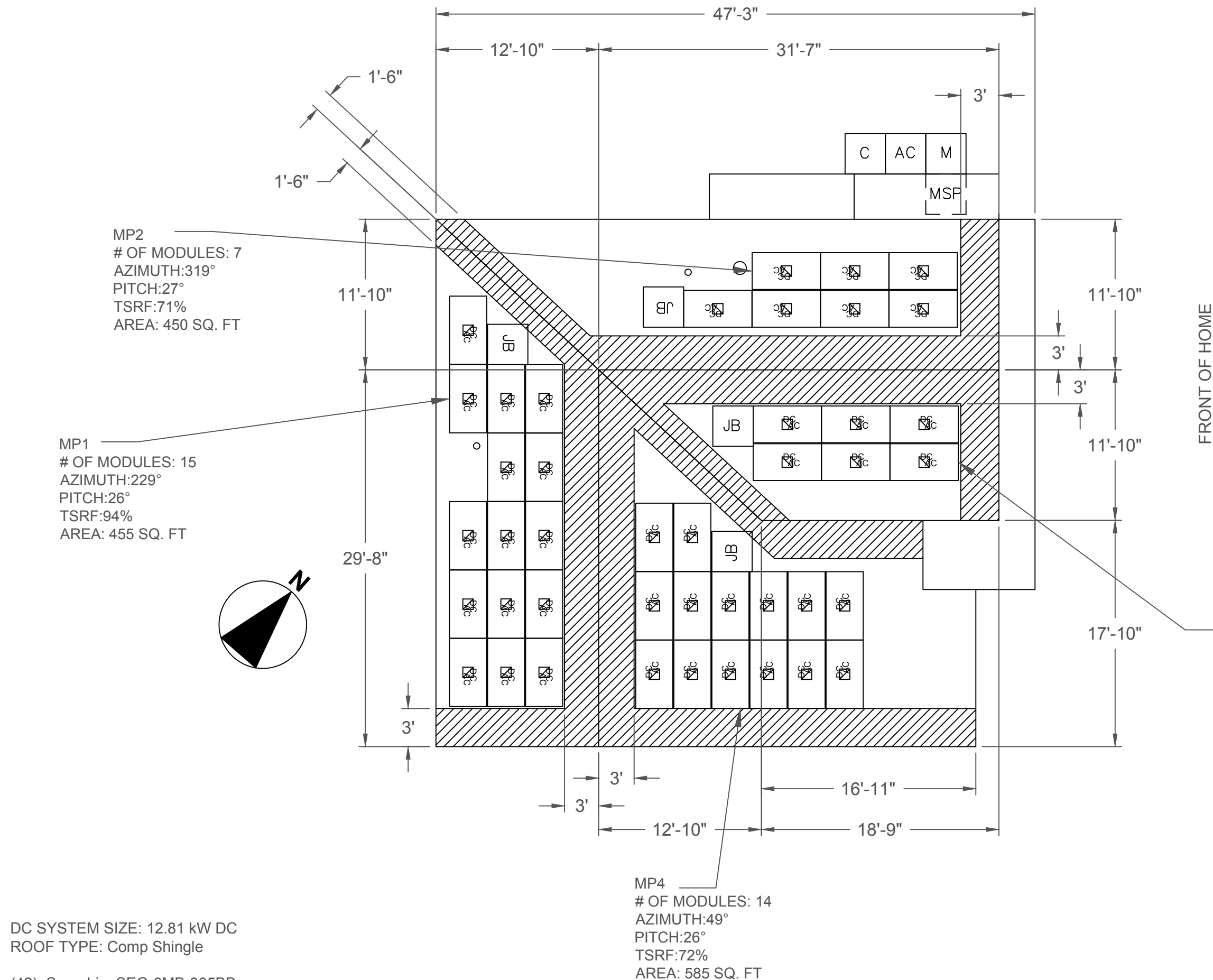
Scott Gurney
PV-011719-015866

CONTRACTOR:
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385.498.6700

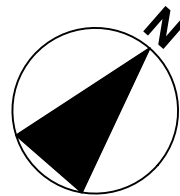
LEGEND

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

SCALE: 1/8" = 1'-0"
0' 2' 4' 8' 16'



FRONT OF HOME



DC SYSTEM SIZE: 12.81 kW DC
ROOF TYPE: Comp Shingle
(42) Seraphim SEG-6MB-305BB
Enphase IQ7-60-2-US,----INVERTER

SITE INFORMATION:
CHRISTOPHER BERRY
6295 W Chelmsford Dr
McCordsville, Indiana 46055
DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY
Eric Thomas

DATE
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PROJECT NUMBER
71205263

SHEET NAME
SITE PLAN

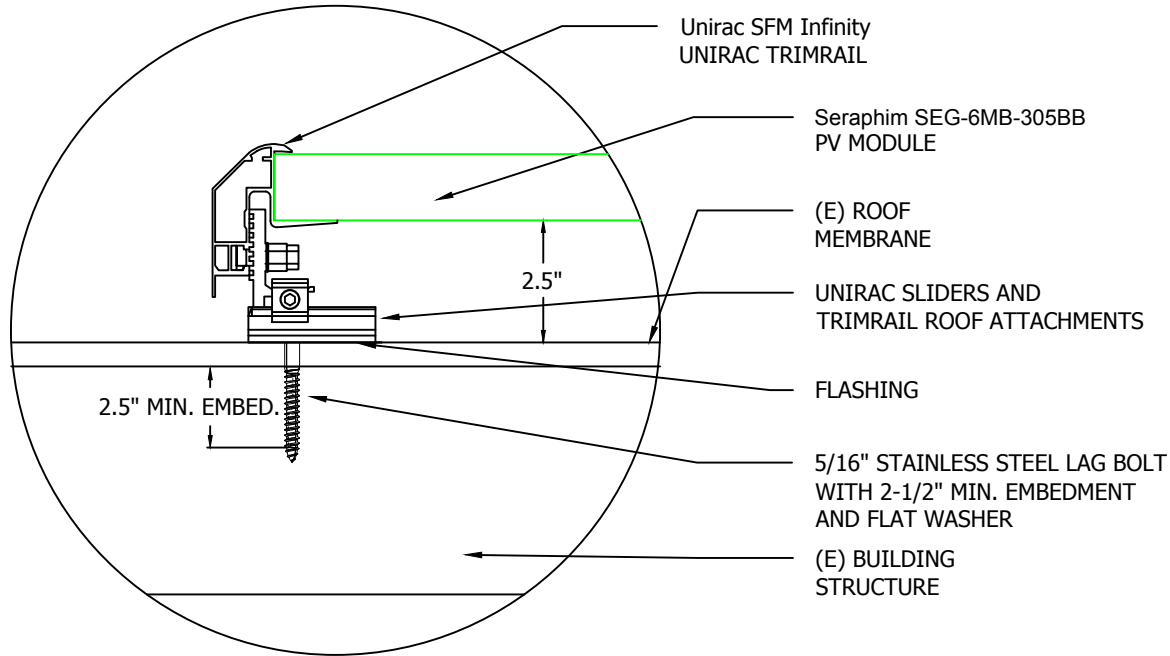
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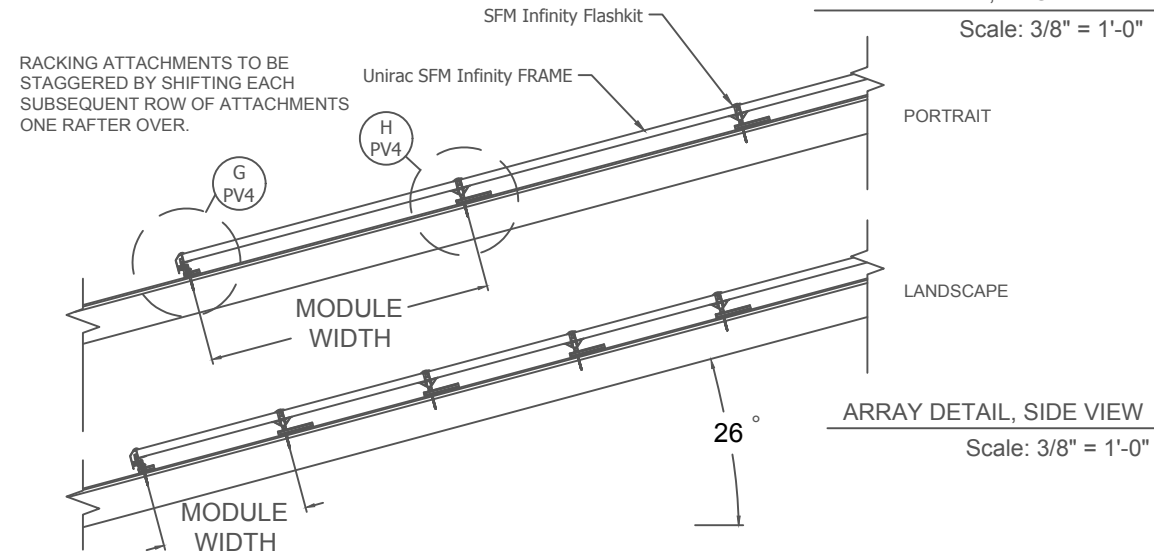
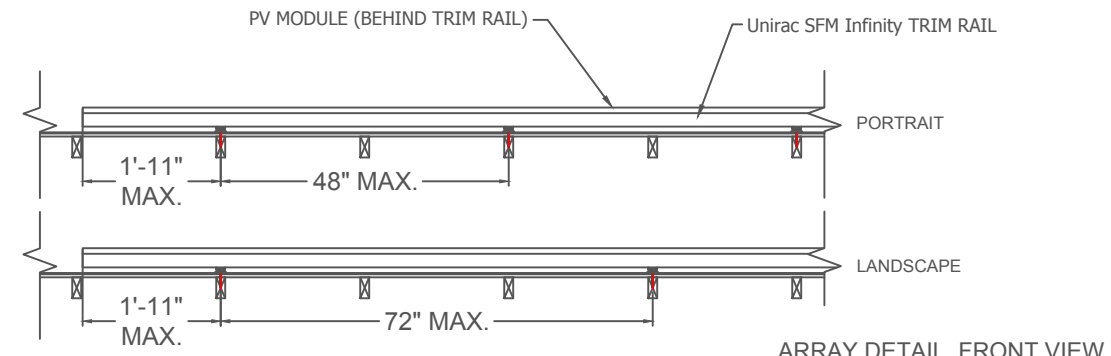
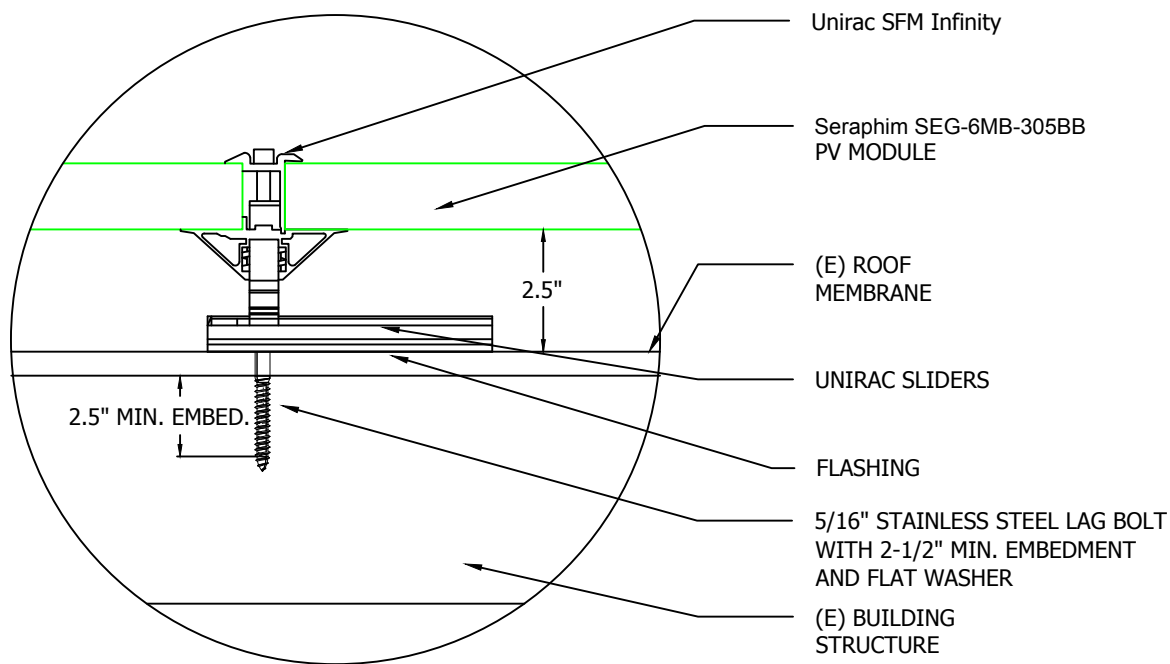
PV ARRAY INFORMATION

PV MODULE COUNT: 42 MODULES
 # OF ATTACHMENT POINTS: 76
 ARRAY AREA: Module Count x 17.51ft² = 735.4ft²
 ROOF AREA: 1990.0ft²
 % OF ARRAY/ROOF: 37.0%
 ARRAY WEIGHT: Module Count x 50lbs = 2100.0lbs
 DISTRIBUTED LOAD: Array Weight ÷ Array Area = 2.86 lbs/ft²
 POINT LOAD: Array Weight ÷ Attachments = 27.6lbs/attachment

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



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



ROOF TYPE: Comp Shingle
 ROOF FRAMING TYPE: Manufactured Truss
 RAFTER OR TOP CHORD(TRUSS) 2x4 @ 24"O.C.
 CEILING JOIST OR BOTTOM CHORD(TRUSS) 2x4 @ 24"O.C.



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SITE INFORMATION:
 CHRISTOPHER BERRY
 6295 W Chelmsford Dr
 McCordsville, Indiana 46055
 DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY Eric Thomas	
DATE November 26, 2019	
PROJECT NUMBER 71205263	
SHEET NAME EQUIP. DETAIL	
PAGE NUMBER PV4	REVISION 0

15	(1) 6 AWG THHN/THWN-2, CU., BLACK (L1)	42.0 A AC	3	(3) 10 AWG THHN/THWN-2, CU., BLACK (L1)	MAX 15.0 A AC	2	(1) 10 - 2 UF-B W/G, THHN/THWN-2, SOLID CU.	MAX 15.0 A AC	1	(1) 12-2 TC-ER, THHN/THWN-2, CU.	MAX 15.0 A AC
	(1) 6 AWG THHN/THWN-2, CU., RED (L2)	240 V AC		(3) 10 AWG THHN/THWN-2, CU., RED (L2)	240 V AC		(1) 6 AWG BARE, CU (EGC)	240 V AC			
	(1) 10 AWG THHN/THWN-2, CU., WHITE (N)			(1) 10 AWG THHN/THWN-2, CU., GREEN (EGC)							
	(1) 3/4 INCH EMT	EXTERIOR		(1) 3/4 INCH EMT	EXTERIOR			INTERIOR		(1) 3/4 INCH EMT	EXTERIOR
16	(1) 6 AWG THHN/THWN-2, CU., BLACK (L1)	42.0 A AC									
	(1) 6 AWG THHN/THWN-2, CU., RED (L2)	240 V AC									
	(1) 10 AWG THHN/THWN-2, CU., WHITE (N)										
	(1) 3/4 INCH EMT	EXTERIOR									



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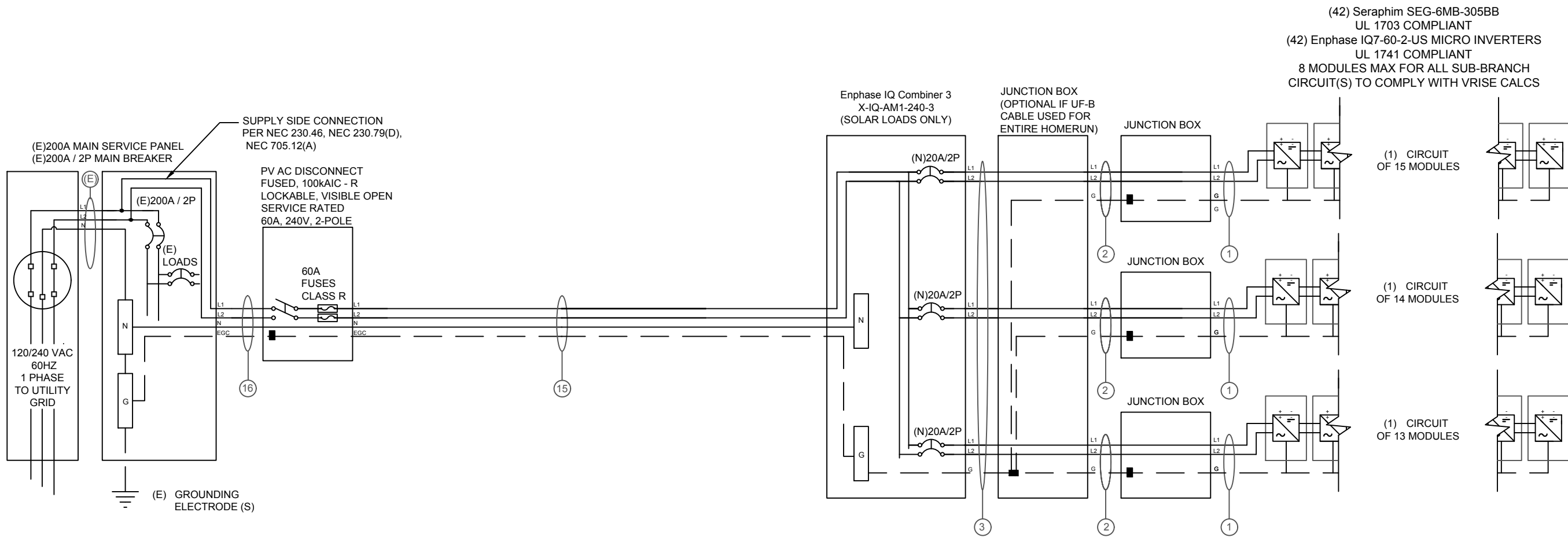
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DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY Eric Thomas	
DATE November 26, 2019	
PROJECT NUMBER 71205263	
SHEET NAME ELEC. 3 LINE DIAG.	
PAGE NUMBER PV5	REVISION 0

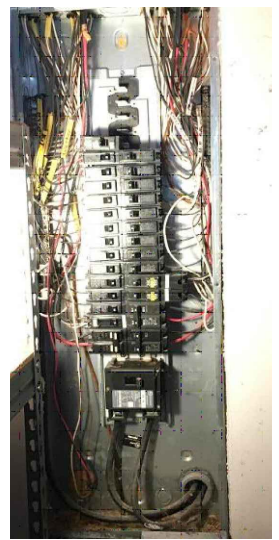


INTERCONNECTION NOTES

1. SUPPLY SIDE INTERCONNECTION ACCORDING TO [NEC705.12(A)] WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH [NEC 240.21(B)]

DISCONNECT NOTES

1. 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)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH



MODULE SPECIFICATIONS Seraphim SEG-6MB-305BB

RATED POWER (STC)	305 W
MODULE VOC	39.9 V DC
MODULE VMP	32.3 V DC
MODULE IMP	9.45 A DC
MODULE ISC	9.76 A DC
VOC CORRECTION	-0.28 %/°C
VMP CORRECTION	-0.38 %/°C
SERIES FUSE RATING	20 A DC
ADJ. MODULE VOC @ ASHRAE LOW TEMP	45.2 V DC
ADJ. MODULE VMP @ ASHRAE 2% AVG. HIGH TEMP	27.5 V DC

MICROINVERTER SPECIFICATIONS Enphase IQ7-60-2-US

POWER POINT TRACKING (MPPT) MIN/MAX	22 - 48 V DC
MAXIMUM INPUT VOLTAGE	48 V DC
MAXIMUM DC SHORT CIRCUIT CURRENT	15 A DC
MAXIMUM USABLE DC INPUT POWER	350 W
MAXIMUM OUTPUT CURRENT	1 A AC
AC OVERCURRENT PROTECTION	20 A
MAXIMUM OUTPUT POWER	240 W
CEC WEIGHTED EFFICIENCY	97 %

AC PHOTOVOLTAIC MODULE MARKING (NEC 690.52)

NOMINAL OPERATING AC VOLTAGE	240 V AC
NOMINAL OPERATING AC FREQUENCY	47 - 68 HZ AC
MAXIMUM AC POWER	240 VA AC
MAXIMUM AC CURRENT	1.0 A AC
MAXIMUM OCPD RATING FOR AC MODULE	20 A AC

DESIGN LOCATION AND TEMPERATURES

TEMPERATURE DATA SOURCE	ASHRAE 2% AVG. HIGH TEMP
STATE	Indiana
CITY	McCordsville
WEATHER STATION	INDIANAPOLIS INTL AP
ASHRAE EXTREME LOW TEMP (°C)	-22
ASHRAE 2% AVG. HIGH TEMP (°C)	32

SYSTEM ELECTRICAL SPECIFICATIONS

	CIR 1	CIR 2	CIR 3	CIR 4	CIR 5	CIR 6
NUMBER OF MODULES PER MPPT	15	14	13			
DC POWER RATING PER CIRCUIT (STC)	4575	4270	3965			
TOTAL MODULE NUMBER	42 MODULES					
STC RATING OF ARRAY	12810W DC					
AC CURRENT @ MAX POWER POINT (IMP)	15.0	14.0	13.0			
MAX. CURRENT (IMP X 1.25)	18.75	17.5	16.25			
OCPD CURRENT RATING PER CIRCUIT	20	20	20			
MAX. COMB. ARRAY AC CURRENT (IMP)	42.0					
MAX. ARRAY AC POWER	10080W AC					

AC VOLTAGE RISE CALCULATIONS DIST (FT) COND. √RISE(V) VEND(V) %VRISE IQ7-8

VRISE SEC. 1 (MICRO TO JBOX)	28.8	12 Cu.	0.93	240.93	0.39%
VRISE SEC. 2 (JBOX TO COMBINER BOX)	65	10 Cu.	2.48	242.48	1.03%
VRISE SEC. 3 (COMBINER BOX TO POI)	10	6 Cu.	0.43	240.43	0.18%
TOTAL VRISE			3.84	243.84	1.60%

PHOTOVOLTAIC AC DISCONNECT OUTPUT LABEL (NEC 690.54)

AC OUTPUT CURRENT	42.0 A AC
NOMINAL AC VOLTAGE	240 V AC

CONDUCTOR SIZE CALCULATIONS

MICROINVERTER TO JUNCTION BOX (1)	MAX. SHORT CIRCUIT CURRENT (ISC) = 15.0 A AC
	MAX. CURRENT (ISC X1.25) = 18.8 A AC
	CONDUCTOR (TC-ER, COPPER (90°C)) = 12 AWG
	CONDUCTOR RATING = 30 A
	AMB. TEMP. AMP. CORRECTION = 0.96
	ADJUSTED AMP. = 28.8 > 18.8

JUNCTION BOX TO JUNCTION BOX (2)	MAX. SHORT CIRCUIT CURRENT (ISC) = 15.0 A AC
	MAX. CURRENT (ISC X1.25) = 18.8 A AC
	CONDUCTOR (UF-B, COPPER (60°C)) = 10 AWG
	CONDUCTOR RATING = 30 A
	CONDUIT FILL DERATE = 1
	AMB. TEMP. AMP. CORRECTION = 0.96
	ADJUSTED AMP. = 28.8 > 18.8

JUNCTION BOX TO COMBINER BOX (3)	MAX. SHORT CIRCUIT CURRENT (ISC) = 15.0 A AC
	MAX. CURRENT (ISC X1.25) = 18.8 A AC
	CONDUCTOR (UF-B, COPPER (60°C)) = 10 AWG
	CONDUCTOR RATING = 30 A
	CONDUIT FILL DERATE = 0.8
	AMB. TEMP. AMP. CORRECTION = 0.96
	ADJUSTED AMP. = 23.04 > 18.8

COMBINER BOX TO MAIN PV OCPD (15)	INVERTER RATED AMPS = 42.0 A AC
	MAX. CURRENT (RATED AMPS X1.25) = 52.5 A AC
	CONDUCTOR (THWN-2, COPPER (75°C TERM.)) = 6 AWG
	CONDUCTOR RATING = 65 A
	CONDUIT FILL DERATE = 1
	AMB. TEMP. AMP. CORRECTION = 0.96
	ADJUSTED AMP. = 62.4 > 52.5



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CONTRACTOR:
BRS FIELD OPS
385.498.6700

GROUNDING NOTES

- 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.
- 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].
- 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.
- 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].
- MODULE SOURCE CIRCUITS SHALL BE GROUNDED IN ACCORDANCE TO [NEC 690.42].
- 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.
- EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTIONS POINTS IDENTIFIED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- ENCLOSURES SHALL BE PROPERLY PREPARED WITH REMOVAL OF PAINT/FINISH AS APPROPRIATE WHEN GROUNDING EQUIPMENT WITH TERMINATION GROUNDING LUGS.
- GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR DIRECT BURIAL.
- GROUNDING AND BONDING CONDUCTORS SHALL BE COPPER, SOLID OR

STRANDED, AND BARE WHEN EXPOSED.

- 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).
- GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN (OR MARKED GREEN IF #4 AWG OR LARGER)
- ALL CONDUIT BETWEEN THE UTILITY AC DISCONNECT AND THE POINT OF CONNECTION SHALL HAVE GROUNDED BUSHINGS AT BOTH ENDS.
- 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.
- 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

- ALL CONDUIT SIZES AND TYPES, SHALL BE LISTED FOR ITS PURPOSE AND APPROVED FOR THE SITE APPLICATIONS
- BOLTED CONNECTION REQUIRED IN DC DISCONNECTS ON THE WHITE GROUNDED CONDUCTOR (USE POLARIS BLOCK OR NEUTRAL BAR)
- ANY CONNECTION ABOVE LIVE PARTS MUST BE WATERTIGHT. REDUCING WASHERS DISALLOWED ABOVE LIVE PARTS, MEYERS HUBS RECOMMENDED
- 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
- SOLADECK JUNCTION BOXES MOUNTED FLUSH W/ROOF SURFACE TO BE USED FOR WIRE MANAGEMENT AND AS FLASHED ROOF PENETRATIONS FOR INTERIOR CONDUIT RUNS.
- 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
- ALL CONDUCTORS AND OCPD SIZES AND TYPES SPECIFIED ACCORDING TO [NEC

690.8] FOR MULTIPLE CONDUCTORS

- ALL PV DC CONDUCTORS IN CONDUIT EXPOSED TO SUNLIGHT SHALL BE INSTALLED AT LEAST 7/8" ABOVE THE ROOF SURFACE AND DERATED ACCORDING TO [NEC TABLE 310.15 (B)(2)(a), NEC TABLE 310.15(B)(3)(a), & NEC 310.15(B)(3)(c)].
- 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
- PHASE AND NEUTRAL CONDUCTORS SHALL BE DUAL RATED THHN/THWN-2 INSULATED, 90°C RATED, WET AND UV RESISTANT, RATED FOR 600V
- 4-WIRE DELTA CONNECTED SYSTEMS HAVE THE PHASE WITH THE HIGHER VOLTAGE TO GROUND MARKED ORANGE OR IDENTIFIED BY OTHER EFFECTIVE MEANS.
- ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION
- VOLTAGE DROP LIMITED TO 2% FOR DC CIRCUITS AND 3% FOR AC CIRCUITS
- NEGATIVE GROUNDED SYSTEMS DC CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS: DC POSITIVE- RED (OR MARKED RED), DC NEGATIVE- GREY (OR MARKED GREY)
- POSITIVE GROUNDED SYSTEMS DC CONDUCTORS COLOR CODED: DC POSITIVE- GREY (OR MARKED GREY), DC NEGATIVE- BLACK (OR MARKED BLACK)
- 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
- RIGID CONDUIT, IF INSTALLED, (AND/OR NIPPLES) MUST HAVE A PULL BUSHING TO PROTECT WIRES.
- 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
- 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).

SITE INFORMATION:

CHRISTOPHER BERRY
6295 W Chelmsford Dr
McCordsville, Indiana 46055
DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY
Eric Thomas

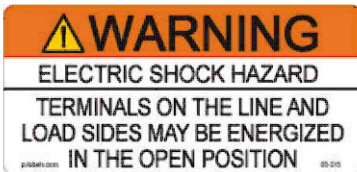
DATE
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PROJECT NUMBER
71205263

SHEET NAME
ELEC. CALCS.

PAGE NUMBER
PV6

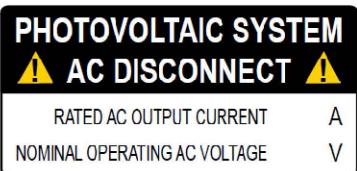
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LABEL 1
FOR PV DISCONNECTING MEANS WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION.
[NEC 690.13(B), NEC 705.22]



LABEL 2
AT EACH DC DISCONNECTING MEANS, INCLUDING THE DC DISCONNECT AT THE INVERTER.
[NEC 690.53, NEC 690.13(B)]



LABEL 3
AT POINT OF INTERCONNECTION, MARKED AT AC DISCONNECTING MEANS.
[NEC 690.54, NEC 690.13 (B)]



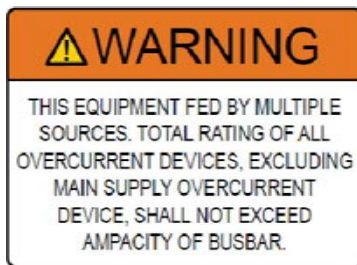
LABEL 4
AT POINT OF INTERCONNECTION FOR EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTOR SUPPLIED FROM MULTIPLE SOURCES, EACH SERVICE EQUIPMENT AND ALL ELECTRIC POWER PRODUCTION SOURCE LOCATIONS.
[NEC 705.12(B)(3)]



LABEL 5
PLACED ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER IF TIE IN CONSISTS OF LOAD SIDE CONNECTION TO BUSBAR.
[NEC 705.12(B)(2)(3)(b)]



LABEL 9
SIGN LOCATED AT RAPID SHUT DOWN DISCONNECT SWITCH [NEC 690.56(C)(3)].



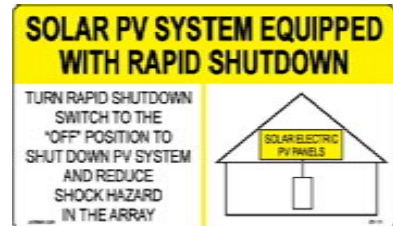
LABEL 10
(ONLY IF 3 OR MORE SUPPLY SOURCES TO A BUSBAR)
SIGN LOCATED AT LOAD CENTER IF IT CONTAINS 3 OR MORE POWER SOURCES.
[NEC 705.12(B)(2)(3)(C)]

LABELING NOTES:

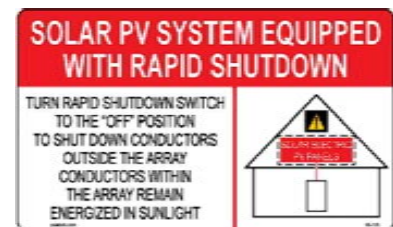
- 1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
- 2. LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
- 3. MATERIAL 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]



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)]



LABEL 7
FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY:
SIGN TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATION OF ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT AT THE SAME LOCATION.
[NEC 690.56(C)(1)(A)]

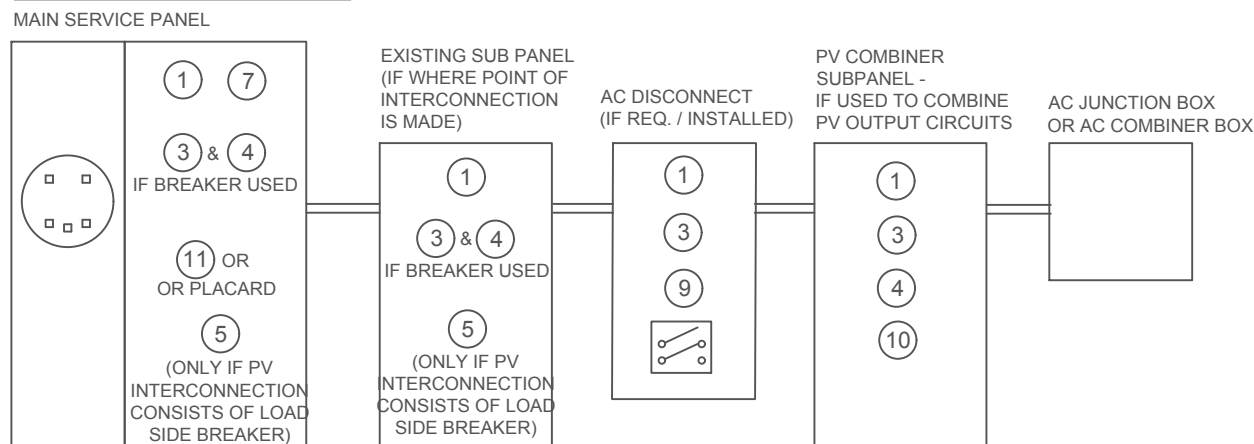


LABEL 8
FOR PV SYSTEMS THAT ONLY SHUT DOWN CONDUCTORS LEAVING THE ARRAY:
SIGN TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATION OF ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT AT THE SAME LOCATION.
[NEC 690.56(C)(1)(B)]

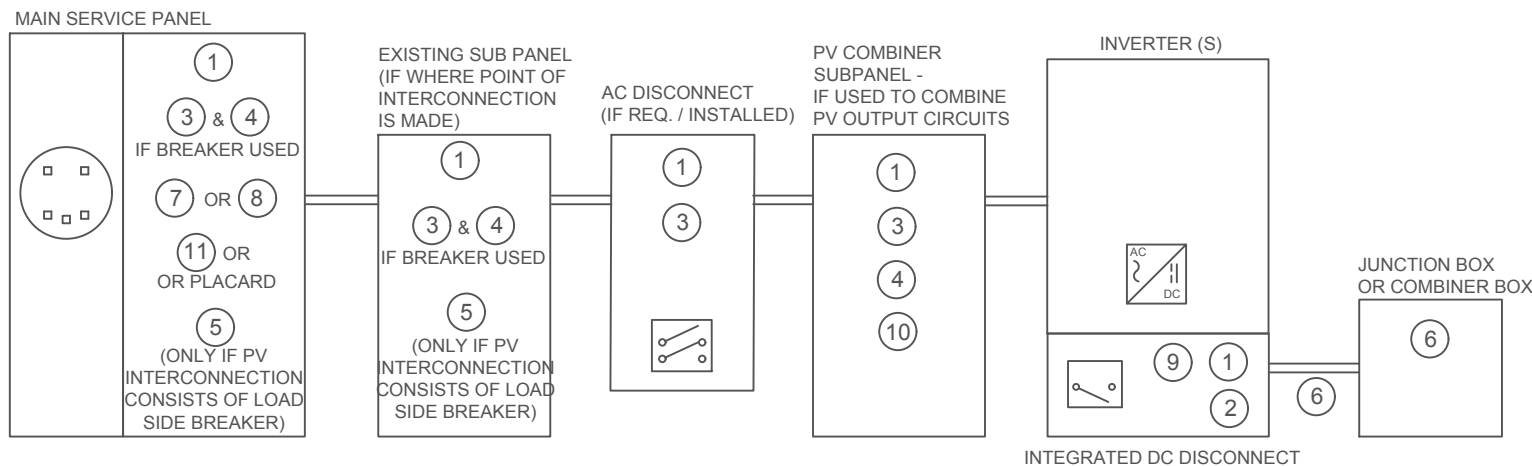


LABEL 11
PERMANENT DIRECTORY TO BE LOCATED AT MAIN SERVICE EQUIPMENT LOCATION IF ALL ELECTRICAL POWER SOURCE DISCONNECTING MEANS (SOLAR ARRAY RAPID SHUTDOWN SWITCH) ARE GROUPED AND IN LINE OF SITE OF MAIN SERVICE DISCONNECTING MEANS.
[NEC 690.56(C) & NEC 705.10].

LABELING DIAGRAM FOR MICRO INV.:



LABELING DIAGRAM FOR STRING INV. / DC OPTIMIZER INV.:



*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.



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CONTRACTOR:
BRS FIELD OPS
385.498.6700

SITE INFORMATION:

CHRISTOPHER BERRY

6295 W Chelmsford Dr

McCordsville, Indiana 46055

DC SYSTEM SIZE: 12.81 kW DC

DRAWING BY
Eric Thomas

DATE
November 26, 2019

PROJECT NUMBER
71205263

SHEET NAME
LABELS

PAGE NUMBER
PV8

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Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US / IQ7-60-B-US		PLUS-72-2-US / IQ7PLUS-72-B-US	
Commonly used module pairings ¹	235 W - 350 W +		350 W - 440 W +	
Module compatibility	60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage	48 V		48 V	
Peak power tracking voltage	27 V - 37 V		27 V - 45 V	
Operating range	16 V - 48 V		16 V - 60 V	
Min/Max start voltage	22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)	15 A		15 A	
Overvoltage class DC port	II		II	
DC port backfeed current	0 A		0 A	
PV array configuration	1 x 1 ungrounded array; No additional surge protection required;		1 x 1 ungrounded array; No additional surge protection required;	
	AC side protection requires max 20A per branch circuit		AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		250 VA	
Maximum continuous output power	240 VA		240 VA	
Nominal (L-L) voltage/range ²	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)	1.0 A (240 V)	1.39 A (208 V)
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit	16 (240 VAC)	13 (208 VAC)	16 (240 VAC)	11 (208 VAC)
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.7 leading ... 0.7 lagging		0.7 leading ... 0.7 lagging	
EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak CEC efficiency	97.6 %	97.6 %	97.6 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA				
Ambient temperature range	-40°C to 70°C			
Relative humidity range	4% to 100% (condensing)			
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)			
Connector type (IQ7-60-B-US & IQ7PLUS-72-B-US)	Friends PV2 (MC4 intermateable). Adaptors for modules with MC4 or UTX connectors: - PV2 to MC4: order ECA-S20-S22 - PV2 to UTX: order ECA-S20-S25			
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)			
Weight	1.08 kg (2.38 lbs)			
Cooling	Natural convection - No fans			
Approved for wet locations	Yes			
Pollution degree	PD3			
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure			
Environmental category / UV exposure rating	NEMA Type 6 / outdoor			
FEATURES				
Communication	Power Line Communication (PLC)			
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.			
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.			

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.
 2. Nominal voltage range can be extended beyond nominal if required by the utility.
 3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com



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Enphase IQ Combiner 3 (X-IQ-AM1-240-3)

The **Enphase IQ Combiner 3™** with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring

Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- Supports back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty
- UL listed

Enphase IQ Combiner 3

MODEL NUMBER	
IQ Combiner 3 X-IQ-AM1-240-3	IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES and REPLACEMENT PARTS (not included, order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan) CELLMODEM-M1 (4G based LTE-M / 5-year data plan)	Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)
Consumption Monitoring* CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering (+/- 2.5%).
Circuit Breakers BRK-10A-2-240 BRK-15A-2-240 BRK-20A-2P-240	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220
EPLC-01	Power line carrier (communication bridge pair), quantity 2
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Envoy printed circuit board (PCB) for Combiner 3

ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80A of distributed generation / 90A with IQ Envoy breaker included
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy

MECHANICAL DATA	
Dimensions (WxHxD)	49.5 x 37.5 x 16.8 cm (19.5" x 14.75" x 6.63"). Height is 21.06" (53.5 cm with mounting brackets).
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	<ul style="list-style-type: none"> • 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)

INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMODEM-M1 (4G based LTE-M) (not included)

COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 60601-1/CANCSA 22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit enphase.com

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2018-09-13



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SEG-6MB-xxxBB
SERIES 6 INCH 60 CELLS



Safety



Resistance to salt mist corrosion at your request



Resistance to ammonia corrosion at your request



Product is certified by UL1703

Reliability



Anti-PID products using advanced module technology



World 1st company to pass "Thresher Test" and "On-site Power Measurement Validation" certificate



Bankable products

Performance



High efficiency and enhanced module durability

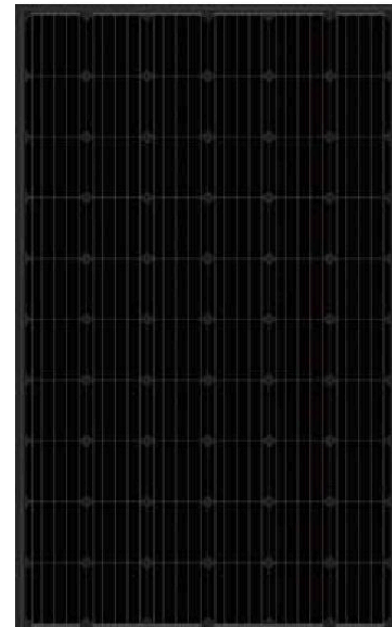


Outstanding power output capability at low irradiance

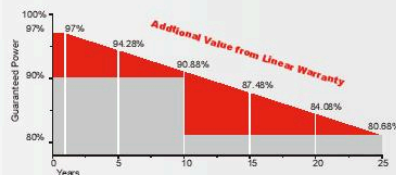


Withstand up to 2400Pa wind and 5400Pa snow loads(IEC), long lasting

295~310W PERC



WARRANTY



10 YEARS

Guarantee on product material and workmanship

25 YEARS

Linear power output warranty

MANAGEMENT SYSTEM

ISO 9001: Quality management system
ISO 14001: Standard for environmental management system
OHSAS 18001: International standard for occupational health and safety assessment system

PRODUCT CERTIFICATES



INSURANCE



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SERAPHIM ENERGY GROUP, INC.

SEG-6MB-XXXBB SERIES 6 INCH 60 CELLS



BB: BLACK BACK-SHEET / BLACK FRAME PRODUCTS

Electrical Characteristics(STC)

Module Type	SEG-6MB-295BB	SEG-6MB-300BB	SEG-6MB-305BB	SEG-6MB-310BB
Maximum Power at STC -P _{mp} (W)	295	300	305	310
Open Circuit Voltage -V _{oc} (V)	39.5	39.7	39.9	40.2
Short Circuit Current -I _{sc} (A)	9.56	9.65	9.76	9.82
Maximum Power Voltage -V _{mp} (V)	31.9	32.1	32.3	32.6
Maximum Power Current -I _{mp} (A)	9.25	9.35	9.45	9.51
Module Efficiency STC-η _m (%)	18.13	18.44	18.75	19.05
Power Tolerance (W)	(0,+4.99)			
Maximum System Voltage (V)	1000 or 1500(UL)			
Maximum Series Fuse Rating (A)	20			
Fire Performance	Type2 or Type1(UL)			

Electrical Characteristics(NOCT)

Module Type	SEG-6MB-295BB	SEG-6MB-300BB	SEG-6MB-305BB	SEG-6MB-310BB
Maximum Power at NOCT -P _{mp} (W)	219	223	226	230
Open Circuit Voltage -V _{oc} (V)	36.5	36.7	36.8	37.1
Short Circuit Current -I _{sc} (A)	7.73	7.82	7.91	7.96
Maximum Power Voltage -V _{mp} (V)	30.1	30.3	30.4	30.7
Maximum Power Current -I _{mp} (A)	7.28	7.36	7.45	7.50

Temperature Characteristics

Pmax Temperature Coefficient	-0.38%/°C
Voc Temperature Coefficient	-0.28%/°C
Isc Temperature Coefficient	+0.05%/°C
Operating Temperature	-40~+85 °C
Nominal Operating Cell Temperature (NOCT)	45±2 °C

Packing Configuration

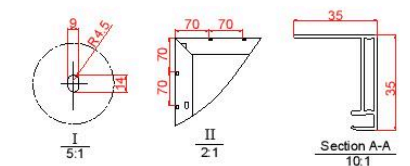
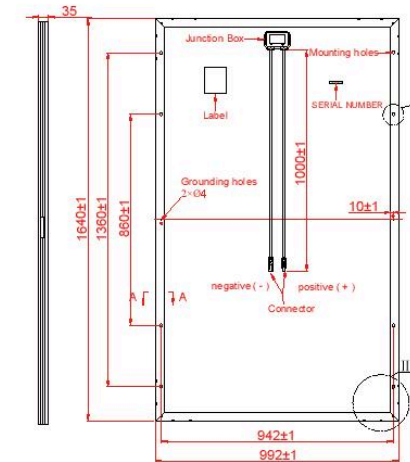
	1640x 992 x 35mm(64.57x39.06x1.37 inch)	
Container	20'GP	40'GP
Pieces per Pallet	30	30
Pallets per Container	12	28
Pieces per Container	360	840

Mechanical Specifications

External Dimensions	1640 x 992 x 35 mm(64.57x39.06x1.37 inch)
Weight	17.5 kg(38.5 lbs)
Solar Cells	Monocrystalline, 6 inch (60pcs.)
Front Glass	3.2mm AR coating tempered glass, low iron
Frame	Anodized aluminium alloy
Junction Box	IP67
Output Cables	12AWG,cable length:1000mm
Connector	MC4 Compatible

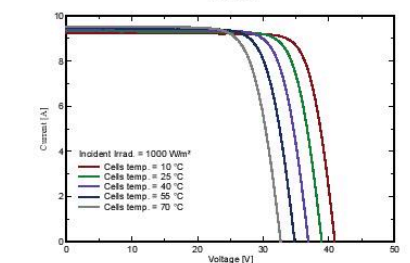
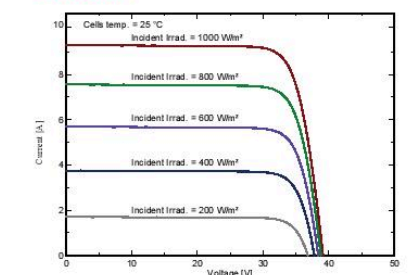
STC: Irradiance 1000 W/m², module temperature 25°C, AM=1.5
NOCT: Irradiance 800 W/m², ambient temperature 20°C, wind speed :1m/s
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* All Dimensions in mm
* The above drawing is a graphical representation of the product.

I-V Curve



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Scott Gurney
PV-011719-015866

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SERAPHIM ENERGY GROUP, INC.

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)



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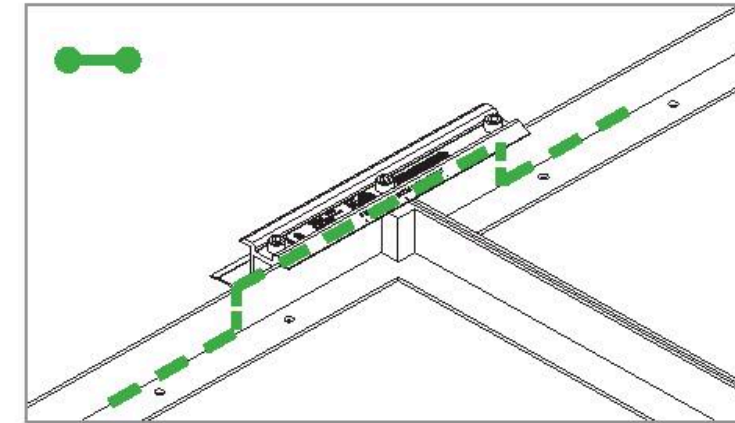
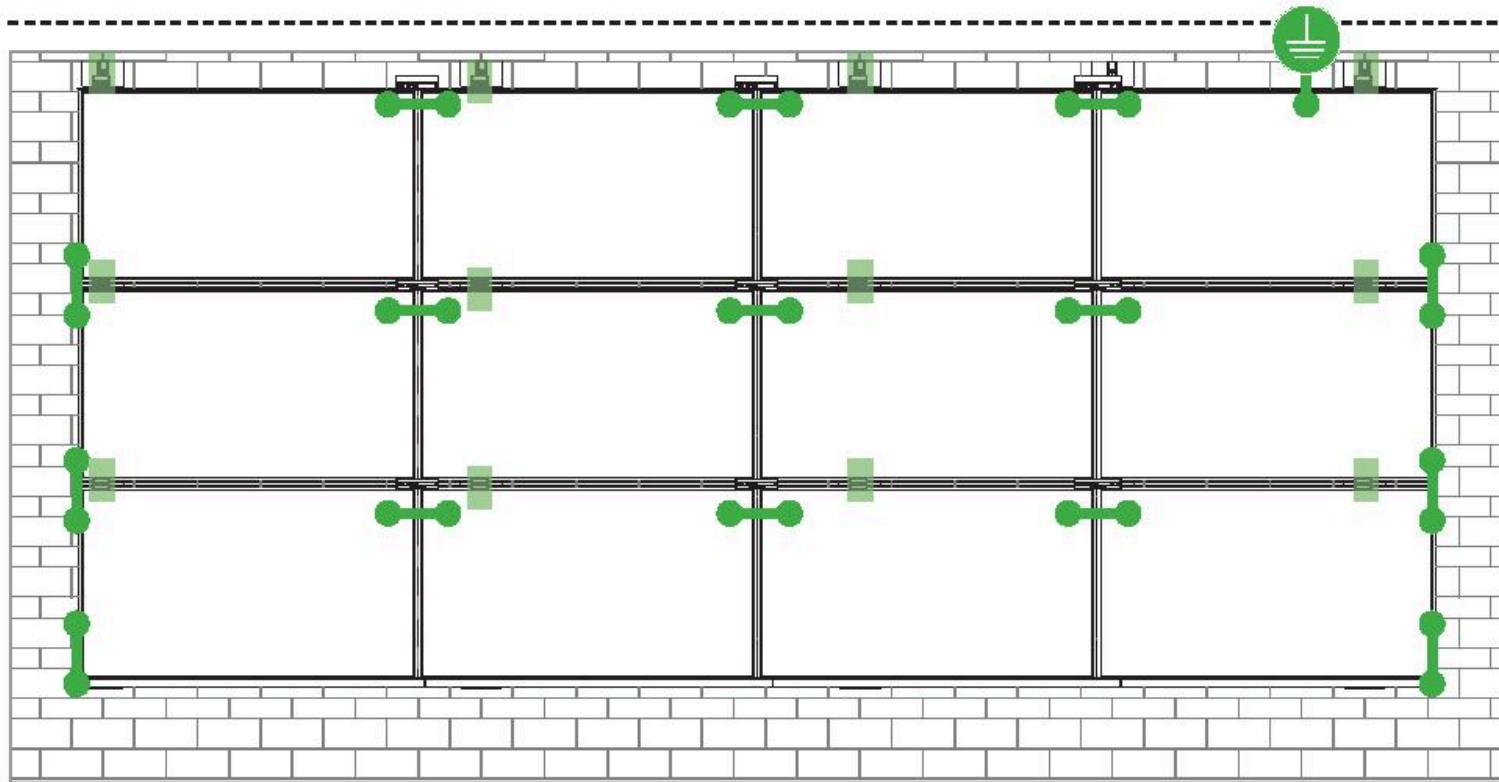
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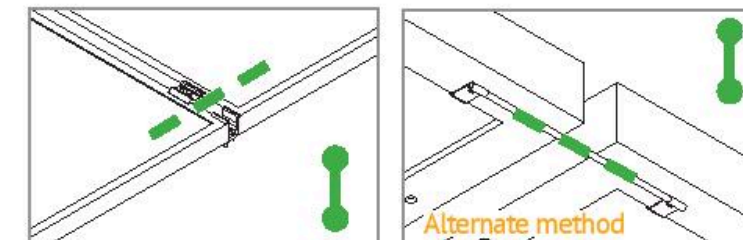
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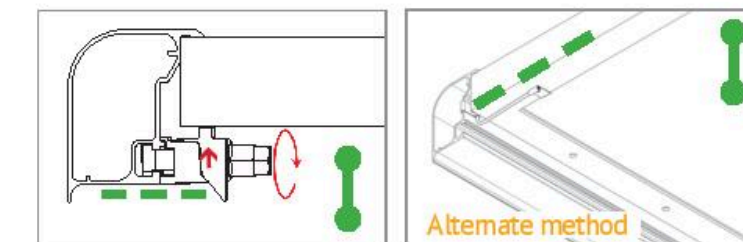
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E-W BONDING PATH:
E-W module to module bonding is accomplished with 2 pre-installed bonding pins which engage on the secure side of the Microrail™ and splice.



N-S BONDING PATH:
N-S module to module bonding is accomplished with bonding clamp with 2 integral bonding pins. (refer also to alternate method)



TRIMRAIL BONDING PATH:
Trimrail to module bonding is accomplished with bonding clamp with integral bonding pin and bonding T-bolt. (refer also to alternate method)

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.

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 Tom Young	Contact: Jia Liu Robin Luo
Phone: 505-462-2190 505-843-1418	Phone: +86-15267030962 +86-13621785753
FAX: NA klaus.nicolaedis@unirac.com	FAX: NA
Email: toddg@unirac.com	Email: jia.liu@cxymj.com buwan.luo@cxymj.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Lake Forest, CA U.S.A.

Control Number: 5003705 **Authorized by:** *Natalie Johnson*
for Dean Davidson, Certification Manager



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Standard(s):	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703: 2015 Ed.1]
Product:	Photovoltaic Mounting System, Sun Frame Microrail - Installed Using Unirac Installation Guide, Rev PUB2019MAR01 with Annex North Row Extension Installation Guide Rev PUB2019FEB20
Brand Name:	Unirac
Models:	Unirac SFM

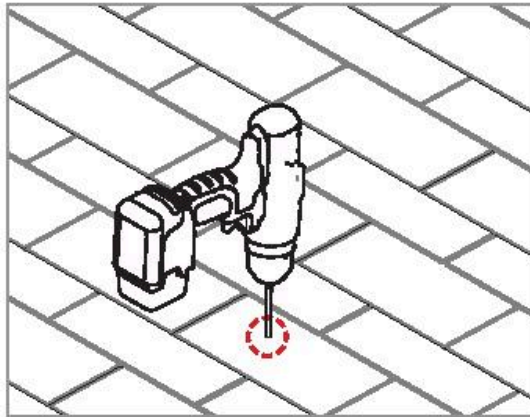


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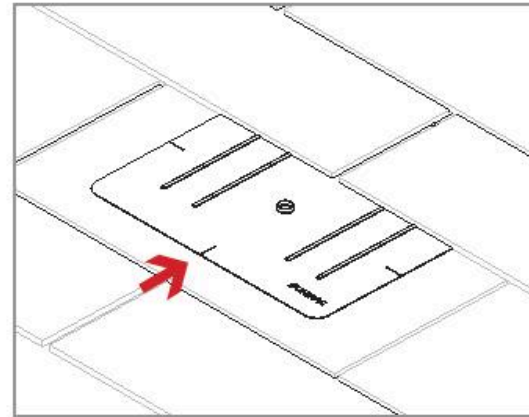


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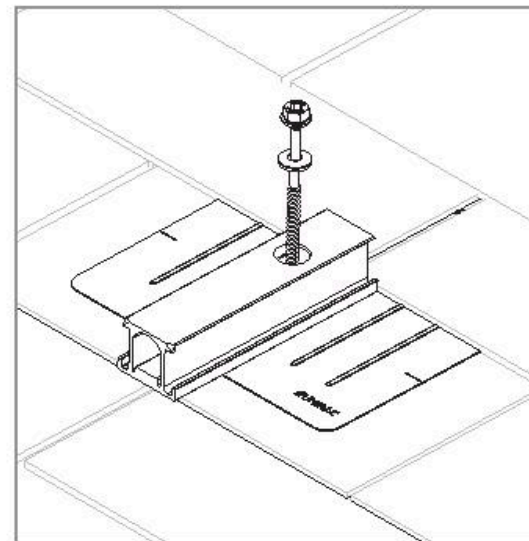
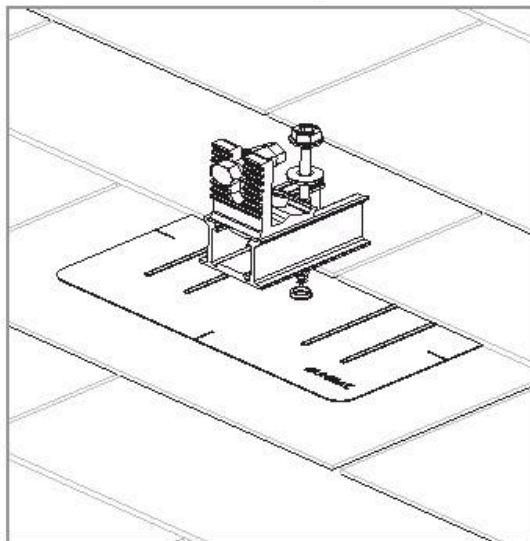
PILOT HOLES:

Drill pilot holes for lag screws or structural screws (as necessary) at marked attachment points



FLASHINGS:

Place flashings



INSTALL SLIDERS AND TRIMRAIL ROOF ATTACHMENTS:

- Insert flashings per manufacturer instructions
- NOTE: Use Lag screw or structural fastener with a maximum diameter of 5/16"**
- Attach sliders to rafters
- Verify proper row to row spacing for module size (Mod NS + 1")
- Ensure that Trimrail™ roof attachments in each row have sufficient engagement with slider dovetails for proper attachment.

