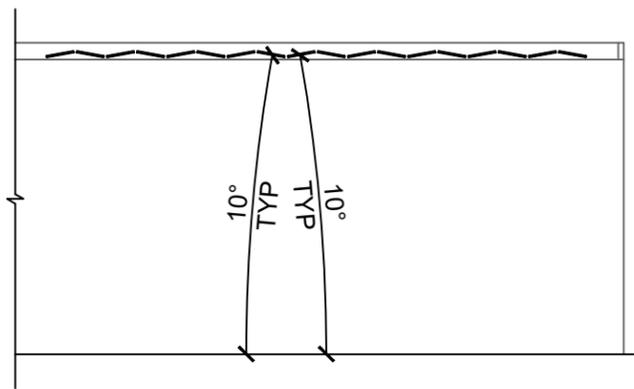
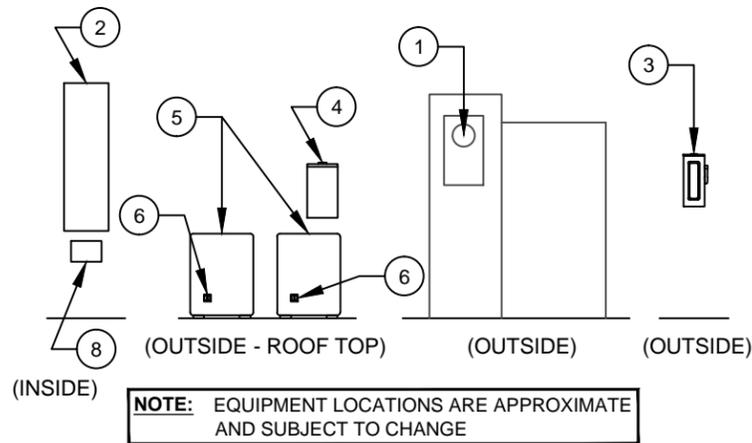


VICINITY MAP



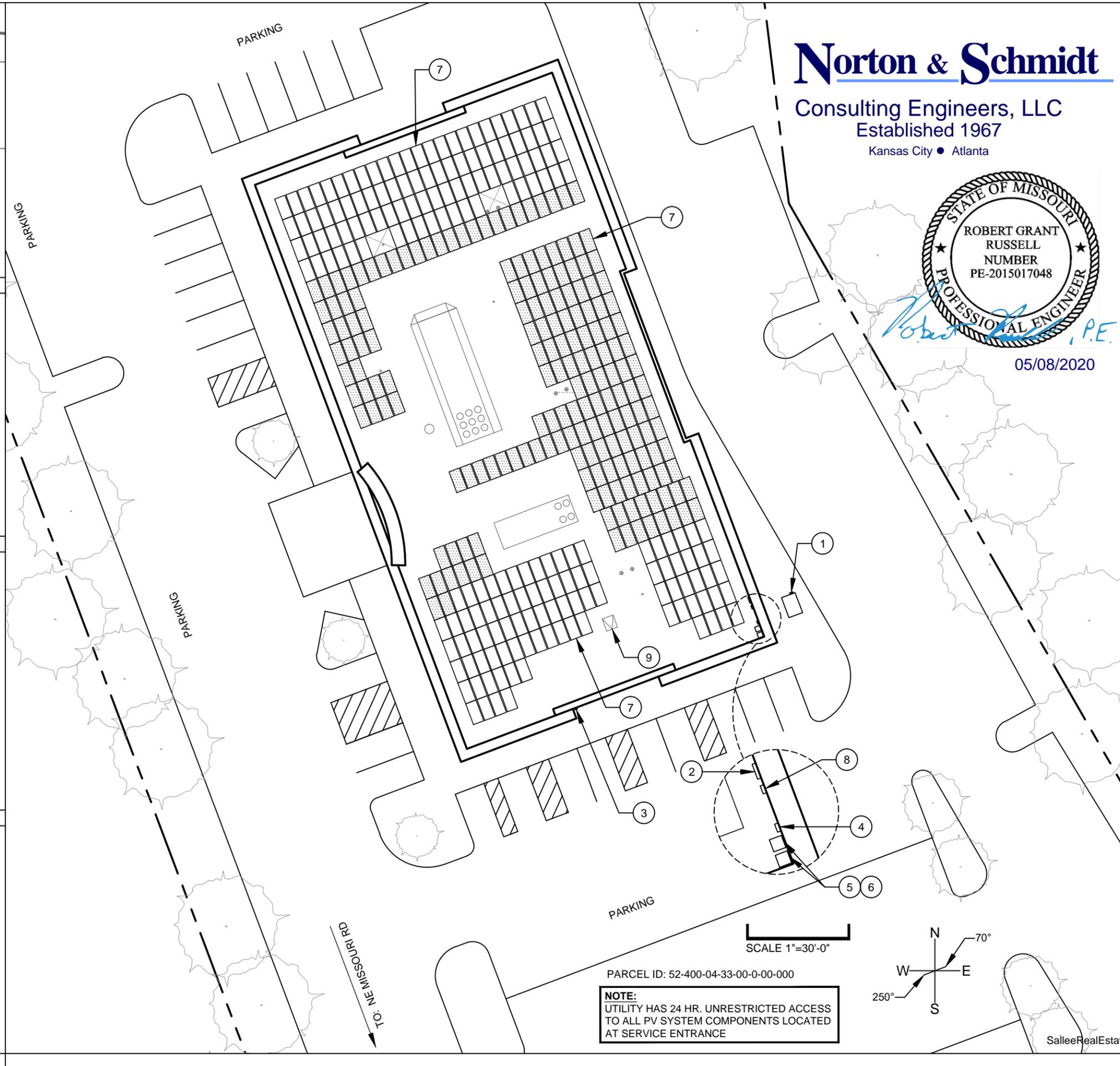
PANEL ELEVATION



EQUIPMENT LOCATION ELEVATION

- ① ELECTRICAL SERVICE ENTRANCE AND UTILITY REVENUE METER # 18 599 454
- ② EXISTING ELECTRICAL LOAD CENTER (MDP PANEL)
- ③ PHOTOVOLTAIC SYSTEM DISCONNECT FOR UTILITY OPERATION
- ④ DEDICATED PHOTOVOLTAIC SYSTEM AC COMBINER PANEL
- ⑤ INVERTER (2 TOTAL)
- ⑥ PV ARRAY DC DISCONNECT (2 TOTAL)
- ⑦ PHOTOVOLTAIC MODULE ARRAY MOUNTED ON FLAT ROOF (362 TOTAL SOLAR PANELS)
- ⑧ JUNCTION BOX FOR EGUAGE MONITORING SYSTEM
- ⑨ EXISTING ROOF ACCESS HATCH

GENERAL NOTES



# Norton & Schmidt

Consulting Engineers, LLC  
Established 1967  
Kansas City • Atlanta



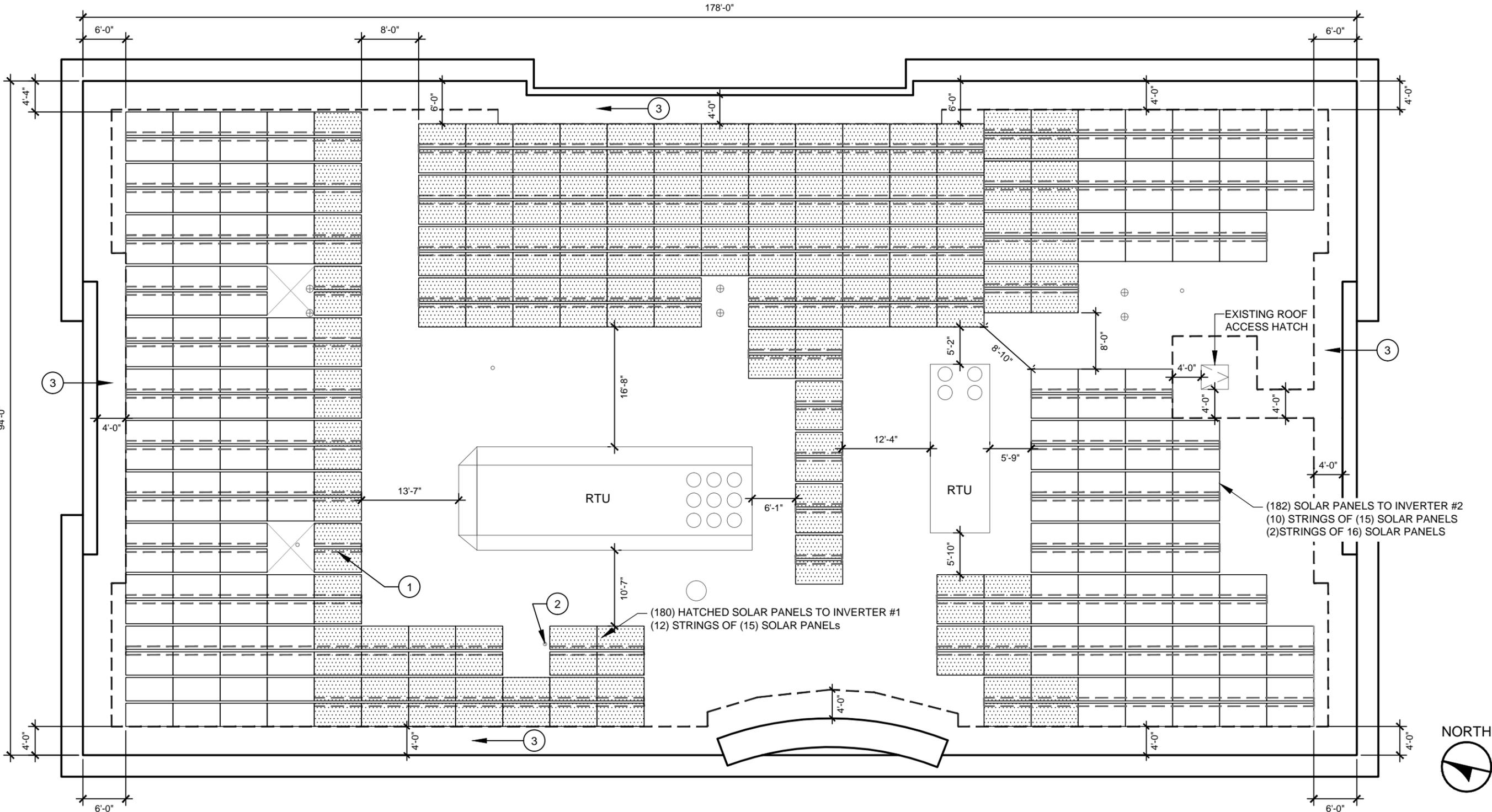
05/08/2020

Prepared For:  
**SUNSMART TECHNOLOGIES**  
701 NE 76th Street  
Gladstone, MO 64118  
816-388-9486

ISSUED FOR REVIEW	NO.	REVISION	DATE	BY	APPR.
A			05-06-2020		

144.8 KW DC PV SYSTEM  
124.0 KW AC PV SYSTEM  
**SOLAR ROOF PLAN**  
200 NE MISSOURI ROAD  
LEES SUMMIT, MO 64086

Utility Company:  
**EVERGY**  
Drawn By:  
**M. Sucharski**  
Checked By:  
**P. Meiers**  
Date:  
**05/06/2020**  
Project:  
**SalleeRealEstateInvestments200-MO**  
Scale:  
**1" = 30'-0"**  
Sheet:  
**01**



**PV PANEL ARRAY PLAN**

LANDSCAPE MOUNTED PANELS      FLAT TPO ROOF

- ① ROOF TOP BALLASTED RACKING, REFER TO DETAIL SHEET 04
- ② VENTS (TYP.)
- ③ 4' CLEAR PATH FOR FIRE DEPT. ACCESS

**NOTE:**  
 ALL CONSTRUCTION / INSTALLATION IS TO COMPLY WITH THE FOLLOWING:  
 2018 IBC    2018 IFC    2017 NEC  
 ALL DIMENSIONS ARE APPROXIMATE

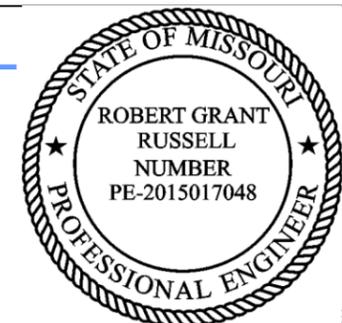
**NOTE:**  
 REFER TO SUPPLEMENTAL STRUCTURAL ANALYSIS REPORT FOR STRUCTURAL CALCULATIONS AND ROOF STRUCTURE DETAILS.

**Norton & Schmidt**

Consulting Engineers, LLC

Established 1967

Kansas City • Atlanta



Prepared For:  
**SUNSMART TECHNOLOGIES**  
 701 NE 76th Street  
 Gladstone, MO 64118  
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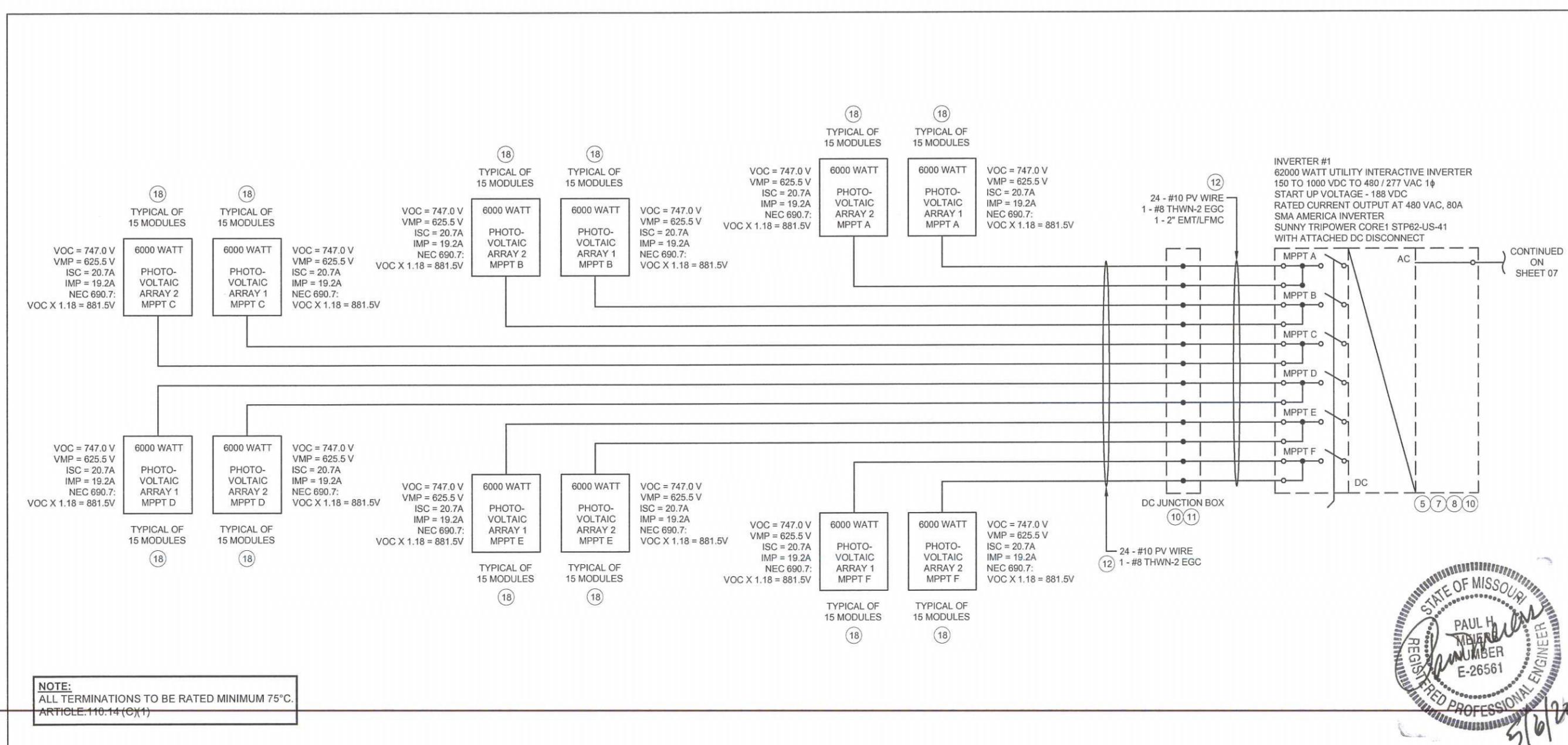
PM	MES	ISSUED FOR REVIEW	NO.	REVISION	DATE	BY	APPR.
		A					

144.8 KW DC PV SYSTEM  
 124.0 KW AC PV SYSTEM  
**PV LAYOUT DETAILS**  
 200 NE MISSOURI ROAD  
 LEES SUMMIT, MO 64086

Utility Company: EVERGY  
 Drawn By: M. Sucharski  
 Checked By: P. Meiers  
 Date: 05/06/2020  
 Project: SalleeRealEstateInvestments200-MO  
 Scale: Sheet: 02







KEY NOTES	EQUIPMENT NOTES
<p>1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 2017 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.</p> <p>2. BI-DIRECTIONAL UTILITY METER TO BE INSTALLED BY UTILITY COMPANY (WHEN REQUIRED)</p> <p>3. PER NEC 705.10, A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION (UTILITY METER).</p> <p>4. LISTED OR LABELED EQUIPMENT SHALL BE INSTALLED AND USED IN ACCORDANCE WITH ANY INSTRUCTIONS INCLUDED IN THE LISTING OR LABELING PER NEC 110.3(B).</p> <p>5. FUNCTIONALLY GROUNDED PHOTOVOLTAIC SYSTEM SHALL COMPLY WITH THE GROUND AND BONDING REQUIREMENTS OF NEC 690.47(A).</p> <p>6. LABEL AS "PHOTOVOLTAIC SYSTEM AC DISCONNECT" WITH MAXIMUM SYSTEM CURRENT AND OPERATING VOLTAGE.</p> <p>7. ANTI-ISLANDING PROTECTION ENSURES THE SYSTEM WILL NOT EXPORT POWER INTO A BALANCED 60 Hz RESONANT LOAD WHILE THE UTILITY IS DISCONNECTED.</p> <p>8. LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D).</p> <p>9. PROVIDE WARNING SIGN PER NEC 690.17 READING "WARNING-ELECTRICAL SHOCK HAZARD- DO NOT TOUCH TERMINALS- TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION."</p> <p>10. PER NEC 690.35(F): THE PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED, UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE: "WARNING-ELECTRIC SHOCK HAZARD- THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED."</p> <p>11. LABEL "WARNING: PHOTOVOLTAIC POWER SOURCE". PER THE INTERNATIONAL FIRE CODE 2018 EDITION, SECTION 1204 AND NEC 2017 SECTION 690.31(G)(3) (4). MARKING IS REQUIRED ON INTERIOR AND EXTERIOR DC CONDUIT, ENCLOSURES, RACEWAYS, CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS, JUNCTION BOXES,</p>	<p>COMBINER BOXES AND DISCONNECTS. THE MATERIALS USED FOR MARKING SHALL BE REFLECTIVE, WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT. THE MARKING SHALL ALSO BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECT IN A LOCATION CLEARLY VISIBLE FROM THE LOCATION WHERE THE DISCONNECT IS OPERATED.</p> <p>12. WHERE PV SYSTEM DC CIRCUITS RUN INSIDE A BUILDING, THEY SHALL BE CONTAINED IN METAL RACEWAYS PER NEC 690.31(G).</p> <p>13. PER NEC 705.12(B)(2): THE SUM OF THE AMPERE RATINGS OF OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUS BAR SHALL NOT EXCEED 120% THE RATING OF THE BUS BAR OR CONDUCTOR FOR A DWELLING UNIT.</p> <p>14. DEDICATED 3 POLE 20 AMP BRANCH FEEDER CIRCUIT FOR E-GAUGE SYSTEMS MONITOR. REVENUE GRADE ELECTRICITY CONSUMPTION AND PRODUCTION MONITORING SYSTEM.</p> <p>15. EQUAGE MONITORING SYSTEM WILL REQUIRE (3) CT(S) FOR THE SERVICE BREAKERS AND (3) CT FOR THE L1 PHASE OF THE PV SYSTEM.</p> <p>16. PER NEC 690.54 LABEL THE OVERCURRENT DEVICE "PHOTOVOLTAIC ELECTRIC POWER SOURCE" WITH THE RATED AC OUTPUT CURRENT AND THE NOMINAL OPERATING AC VOLTAGE. PER NEC 705.12(B)(2)(3)(b) LABEL DEVICE "WARNING POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE".</p> <p>17. LABEL "DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL" AND "DO NOT ADD LOADS TO THIS PANEL".</p> <p>18. PER NEC 690.12(B)(2)(1): THE PV ARRAY SHALL BE LISTED OR FIELD LABELED AS RAPID SHUTDOWN PV ARRAY.</p> <p>19. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH NEC 690.12(A) THROUGH (D). PER NEC 690.56(C)(3): A RAPID SHUTDOWN SWITCH SHALL HAVE A LABEL LOCATED ON OR NO MORE THAN 3 FEET FROM THE SWITCH THAT INCLUDES THE FOLLOWING WORDING: "RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM".</p> <p>20. SUNSMART TO CONFIRM A GROUND ROD IS INSTALLED. IF THERE IS NOT, SUNSMART SHALL INSTALL ONE PER THE NEC.</p> <p>21. ALL WIRE TO BE COPPER CONDUCTOR UNLESS OTHERWISE NOTED</p>
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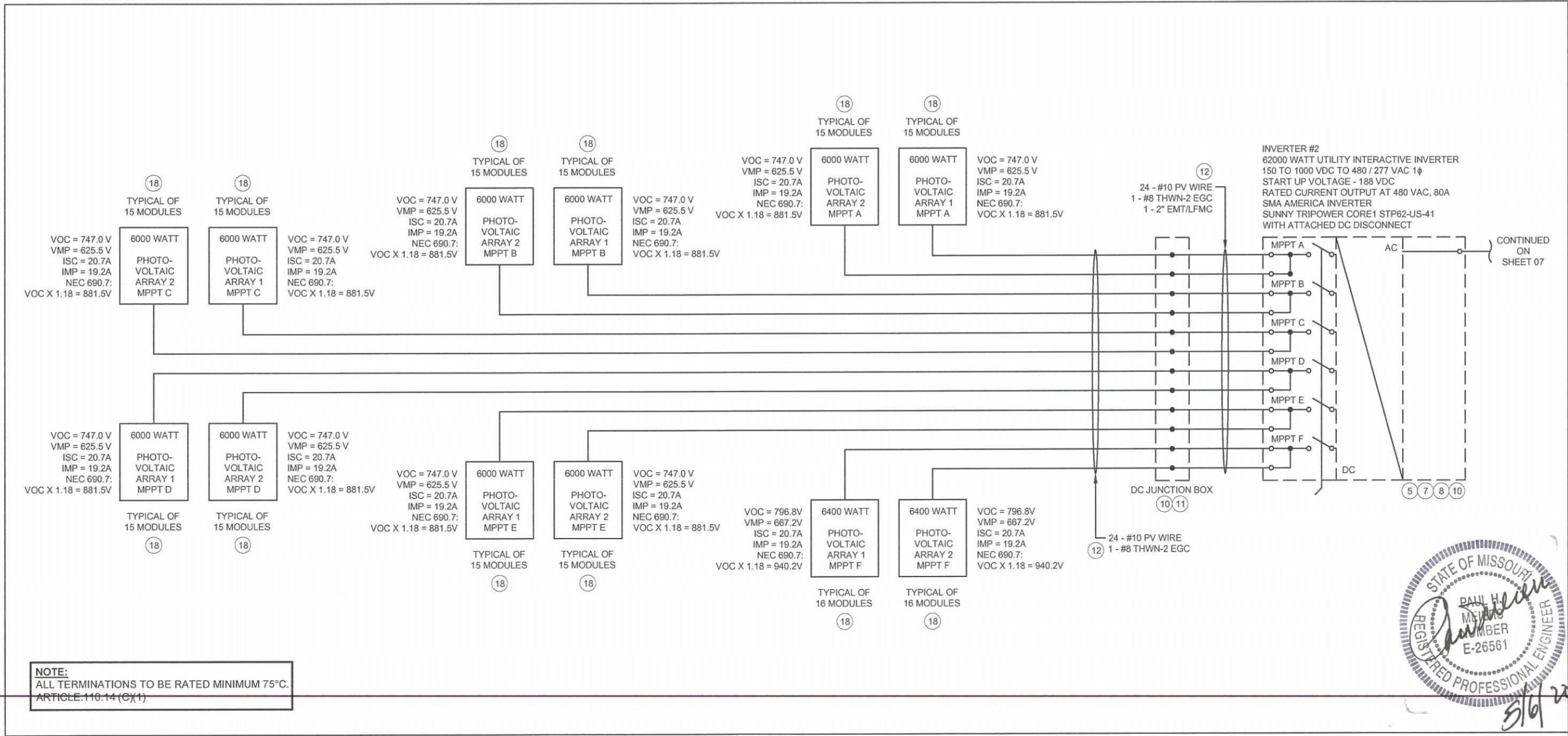
Prepared For: **SUNSMART TECHNOLOGIES**  
701 NE 76th Street  
Gladstone, MO 64118  
816-388-9486

NO.	REVISION	DATE	BY	APPR.
A	ISSUED FOR REVIEW	05-06-2020		

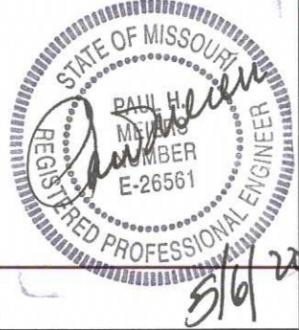
144.8 KW DC PV SYSTEM  
124.0 KW AC PV SYSTEM  
**ONE LINE WIRING DIAGRAM #1**  
200 NE MISSOURI ROAD  
LEES SUMMIT, MO 64086

Utility Company: **EVERGY**  
Drawn By: **M. Sucharski**  
Checked By: **P. Meiers**  
Date: **05/06/2020**  
Project: **SalleeRealEstateInvestments200-MO**  
Scale: **NTS** Sheet: **05**

Professional Engineer Seal: **STATE OF MISSOURI**  
**PAUL H. MEIERS**  
REGISTERED PROFESSIONAL ENGINEER  
NUMBER **E-26561**  
5/6/20



**NOTE:**  
ALL TERMINATIONS TO BE RATED MINIMUM 75°C.  
ARTICLE 110.14 (C)(1)

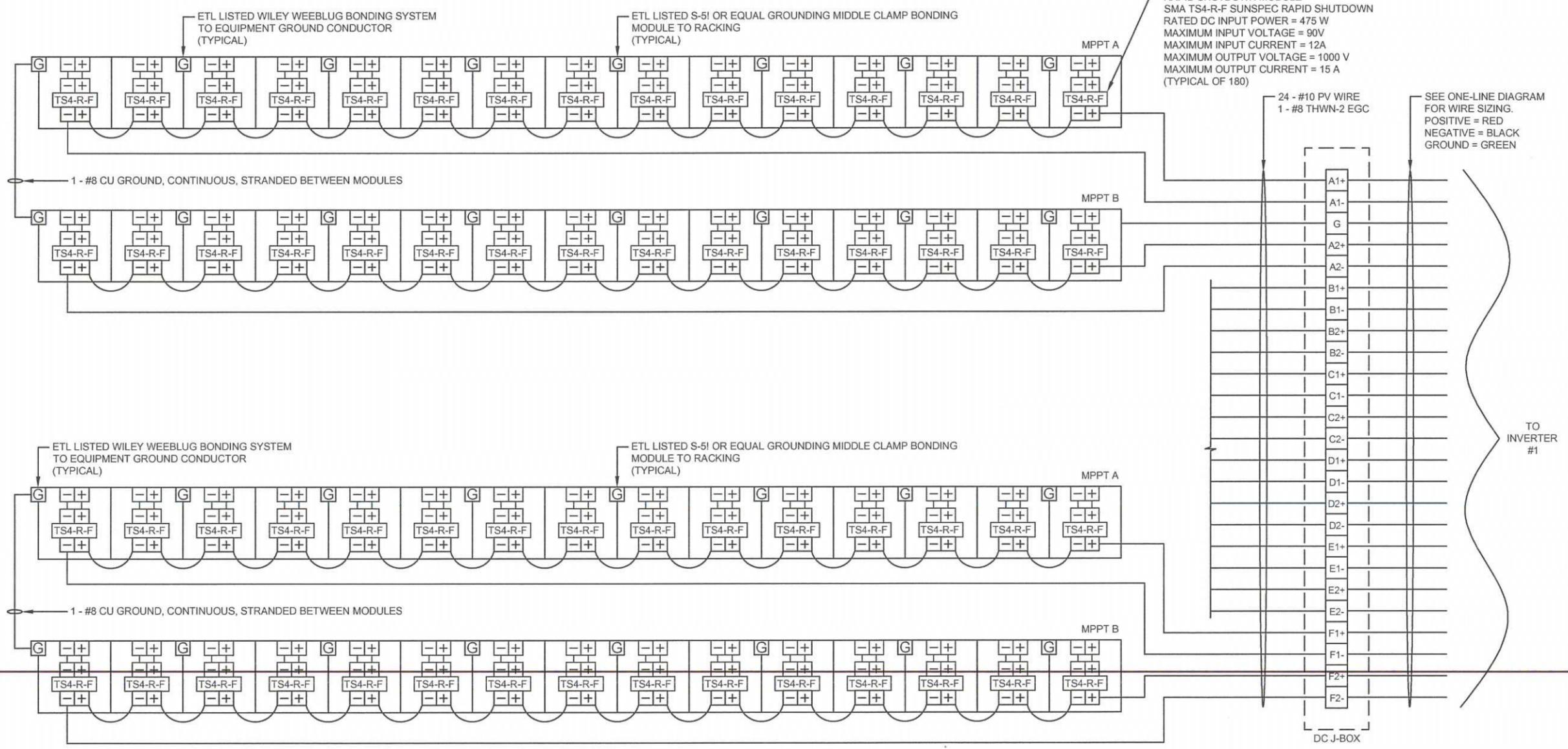


KEY NOTES	EQUIPMENT NOTES
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<p>Prepared For: <b>SUNSMART TECHNOLOGIES</b> 701 NE 76th Street Gladstone, MO 64118 816-388-9486</p>	
PM	APPR.
05-06-2020	DATE
MES	BY
ISSUED FOR REVIEW	REVISION
A	NO.
<p>144.8 KW DC PV SYSTEM 124.0 KW AC PV SYSTEM <b>ONE LINE WIRING DIAGRAM #2</b> 200 NE MISSOURI ROAD LEES SUMMIT, MO 64086</p>	
Company:	EVERGY
Drawn By:	M. Sucharski
Checked By:	P. Meiers
Date:	05/06/2020
Project:	SalleeRealEstateInvestments200-MO
Scale:	NTS
Sheet:	06



TYPICAL OF (6) MPPT INPUTS (A, B, C, D, E, F)



Prepared For:  
**SUNSMART TECHNOLOGIES**  
 701 NE 76th Street  
 Gladstone, MO 64118  
 816-389-9486

PM	ISSUED FOR REVIEW	MES	NO.	BY	DATE	APPR.
	A					

TO INVERTER #1

144.8 KW DC PV SYSTEM  
 124.0 KW AC PV SYSTEM  
**ARRAY WIRING DIAGRAM #1**  
 200 NE MISSOURI ROAD  
 LEES SUMMIT, MO 64086

DIAGRAM

ALL BACK COATED MULTICRYSTALLINE

- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2017 NEC AND ALL APPLICABLE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
- GROUND WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW FOR PANEL REMOVAL WITHOUT DISRUPTING "CONTINUITY". ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690-4 (C).
- FOLLOW MANUFACTURERS SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
- WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT TEMPERATURES.
- PER NEC 690.35(F): THE PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED, UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE: "WARNING ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED."

MODULE INFORMATION:

MODEL NUMBER = JINKO SOLAR EAGLE JKM400-72HL-V  
 NOMINAL POWER (P<sub>nom</sub>) = 400W  
 OPEN CIRCUIT VOLTAGE (V<sub>oc</sub>) = 49.8V  
 MAX POWER VOLTAGE (V<sub>mp</sub>) = 41.7V  
 SHORT CIRCUIT CURRENT (I<sub>sc</sub>) = 10.36A  
 MAX POWER CURRENT (I<sub>mp</sub>) = 9.6A  
 SERIES FUSE RATING = 20A

NUMBER OF STRINGS = 12  
 NUMBER OF MODULES PER STRING = 15  
 TOTAL NUMBER OF MODULES = 180  
 SYSTEM POWER DC (STC) = 72000 W  
 V<sub>oc</sub> = 747.0 V  
 V<sub>mp</sub> = 625.5 V  
 I<sub>sc</sub> = 20.7A  
 I<sub>mp</sub> = 19.2A  
 NEC 690.7:  
 V<sub>oc</sub> X 1.18 = 881.5V

Utility Company: EVERGY

Drawn By: M. Sucharski

Checked by: P. Meiers

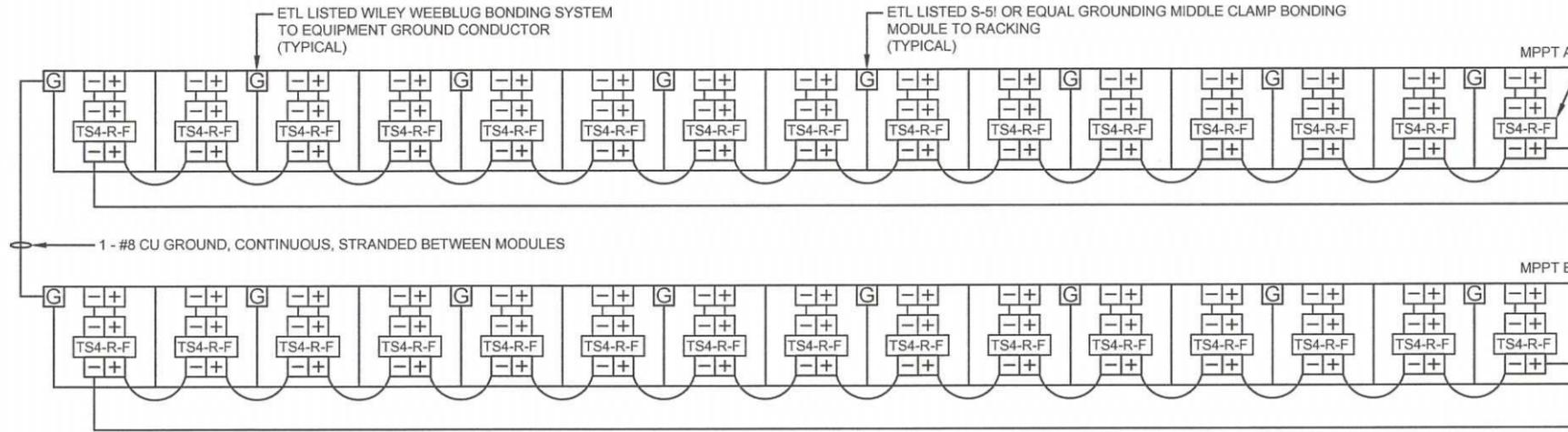
Date: 05/06/2020

Project: SalleeRealEstateInvestments200-MO

Scale: NTS Sheet: 08

5/6/20

TYPICAL OF (5) MPPT INPUTS (A, B, C, D, E)

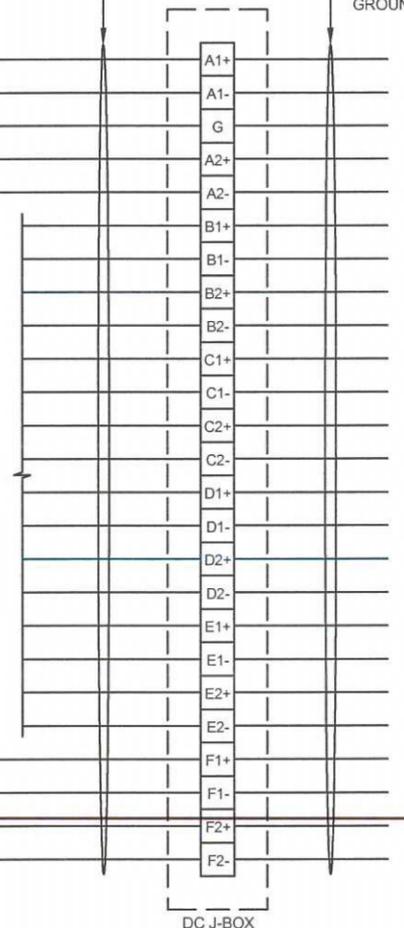
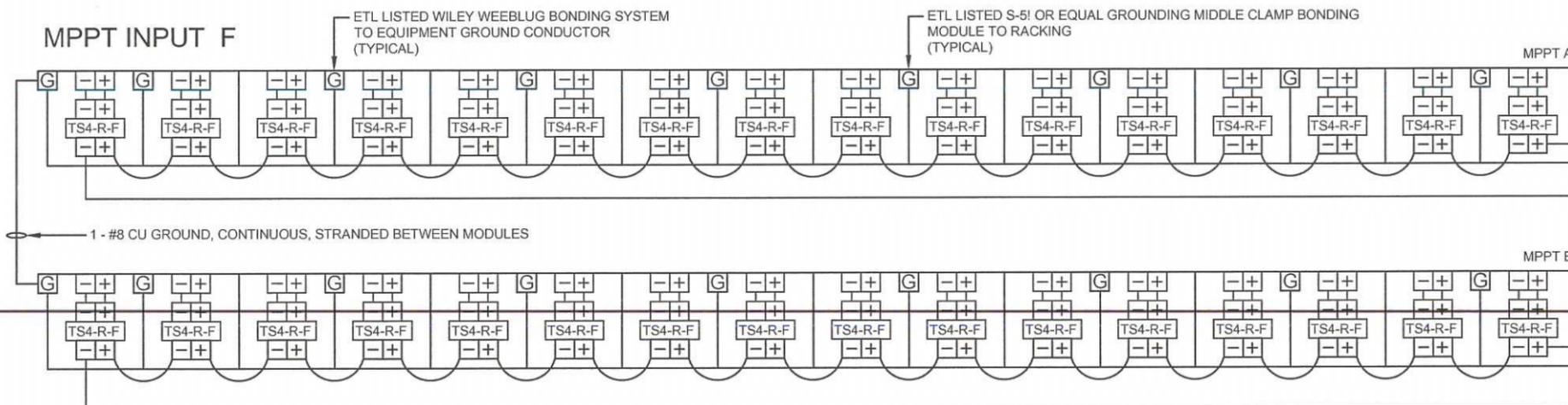


RAPID SHUTDOWN MODULE  
SMA TS4-R-F SUNSPEC RAPID SHUTDOWN  
RATED DC INPUT POWER = 475 W  
MAXIMUM INPUT VOLTAGE = 90V  
MAXIMUM INPUT CURRENT = 12A  
MAXIMUM OUTPUT VOLTAGE = 1000 V  
MAXIMUM OUTPUT CURRENT = 15 A  
(TYPICAL OF 182)

24 - #10 PV WIRE  
1 - #8 THWN-2 EGC

SEE ONE-LINE DIAGRAM FOR WIRE SIZING.  
POSITIVE = RED  
NEGATIVE = BLACK  
GROUND = GREEN

MPPT INPUT F



TO INVERTER #2

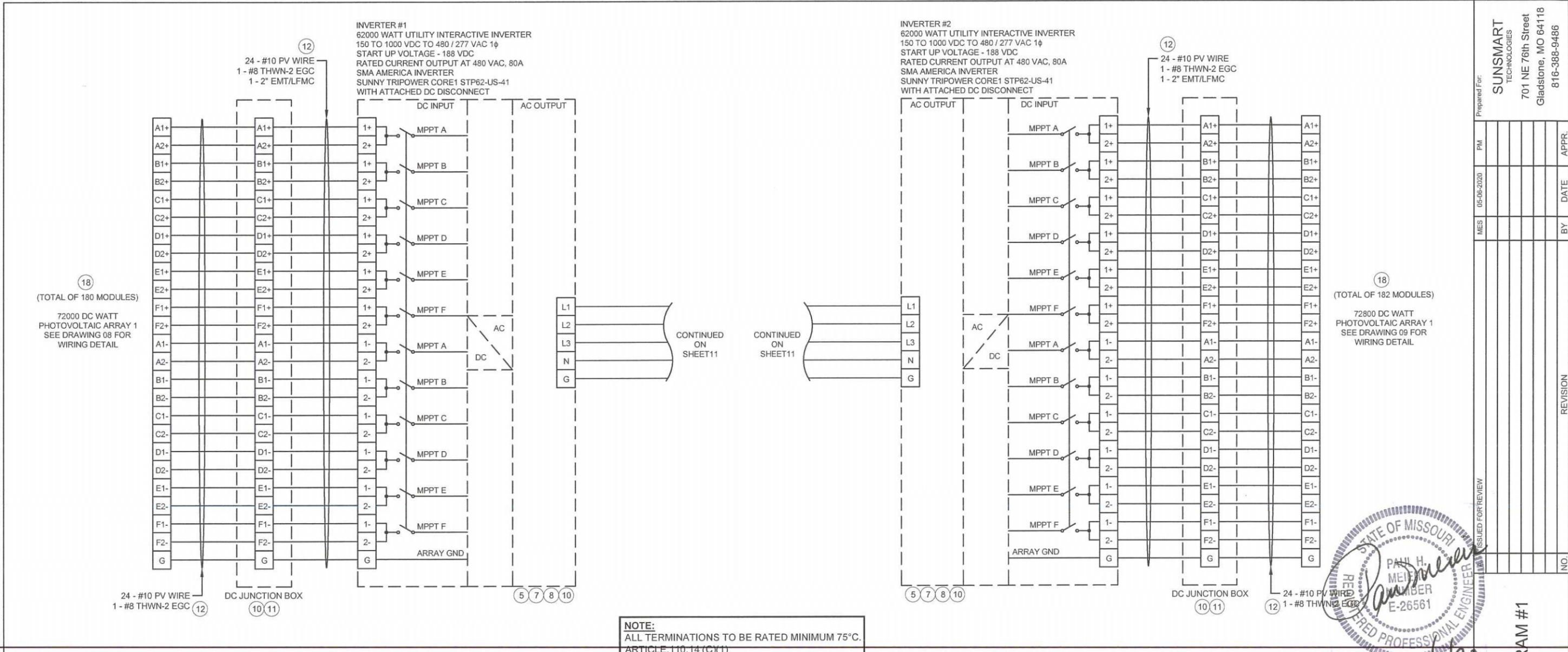
DC J-BOX

<p>DIAGRAM</p> <p>ALL BACK COATED MULTICRYSTALLINE</p> <ol style="list-style-type: none"> <li>EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2017 NEC AND ALL APPLICABLE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.</li> <li>GROUND WIRE MUST BE CONTINUOUS AND INSTALLED TO ALLOW FOR PANEL REMOVAL WITHOUT DISRUPTING CONTINUITY. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC 690-4 (C).</li> <li>FOLLOW MANUFACTURERS SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.</li> <li>WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT TEMPERATURES</li> <li>PER NEC 690.35(F): THE PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED, UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE: "WARNING ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED."</li> </ol>	<p>MODULE INFORMATION:</p> <p>MODEL NUMBER = JINKO SOLAR EAGLE JKM400-72HL-V NOMINAL POWER (P<sub>nom</sub>) = 400W OPEN CIRCUIT VOLTAGE (V<sub>oc</sub>) = 49.8V MAX POWER VOLTAGE (V<sub>mp</sub>) = 41.7V SHORT CIRCUIT CURRENT (I<sub>sc</sub>) = 10.36A MAX POWER CURRENT (I<sub>mp</sub>) = 9.6A SERIES FUSE RATING = 20A</p>	<p>NUMBER OF STRINGS = 10 NUMBER OF MODULES PER STRING = 15 TOTAL NUMBER OF MODULES = 150 SYSTEM POWER DC (STC) = 60000 W VOC = 747.0 V VMP = 625.5 V ISC = 20.7A IMP = 19.2A NEC 690.7: VOC X 1.18 = 881.5V</p>	<p>NUMBER OF STRINGS = 2 NUMBER OF MODULES PER STRING = 16 TOTAL NUMBER OF MODULES = 32 SYSTEM POWER DC (STC) = 12800 W VOC = 796.8V VMP = 667.2V ISC = 20.7A IMP = 19.2A NEC 690.7: VOC X 1.18 = 940.2V</p>	<p>144.8 KW DC PV SYSTEM 124.0 KW AC PV SYSTEM</p> <p><b>ARRAY WIRING DIAGRAM #2</b></p> <p>200 NE MISSOURI ROAD LEES SUMMIT, MO 64086</p> <p>EVERGY</p> <p>Checked By: M. Sucharski P. Meiers Date: 05/06/2020 Project: SalleeRealEstateInvestments200-MO</p> <p>Scale: NTS Sheet: 09</p>
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SUNSMART TECHNOLOGIES  
701 NE 76th Street  
Gladstone, MO 64118  
816-388-9486

Prepared For:	PM	APPR.
05-06-2020		
MES	BY	DATE
A	ISSUED FOR REVIEW	NO.
	REVISION	



DIAGRAM

- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 2017 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.
- BI-DIRECTIONAL UTILITY METER TO BE INSTALLED BY UTILITY COMPANY (WHEN REQUIRED)
- PER NEC 705.10, A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION (UTILITY METER).
- LISTED OR LABELED EQUIPMENT SHALL BE INSTALLED AND USED IN ACCORDANCE WITH ANY INSTRUCTIONS INCLUDED IN THE LISTING OR LABELING PER NEC 110.3(B).
- FUNCTIONALLY GROUNDED PHOTOVOLTAIC SYSTEM SHALL COMPLY WITH THE GROUND AND BONDING REQUIREMENTS OF NEC 690.47(A).
- LABEL AS "PHOTOVOLTAIC SYSTEM AC DISCONNECT" WITH MAXIMUM SYSTEM CURRENT AND OPERATING VOLTAGE.
- ANTI-ISLANDING PROTECTION ENSURES THE SYSTEM WILL NOT EXPORT POWER INTO A BALANCED 60 Hz RESONANT LOAD WHILE THE UTILITY IS DISCONNECTED.
- LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D).
- PROVIDE WARNING SIGN PER NEC 690.17 READING "WARNING-ELECTRICAL SHOCK HAZARD- DO NOT TOUCH TERMINALS- TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION."
- PER NEC 690.35(F): THE PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED, UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE: "WARNING-ELECTRIC SHOCK HAZARD- THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED."
- LABEL "WARNING: PHOTOVOLTAIC POWER SOURCE". PER THE INTERNATIONAL FIRE CODE 2018 EDITION, SECTION 1204 AND NEC 2017 SECTION 690.31(G)(3) (4). MARKING IS REQUIRED ON INTERIOR AND EXTERIOR DC CONDUIT, ENCLOSURES, RACEWAYS, CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS, JUNCTION BOXES,

- COMBINER BOXES AND DISCONNECTS. THE MATERIALS USED FOR MARKING SHALL BE REFLECTIVE, WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT. THE MARKING SHALL ALSO BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECT IN A LOCATION CLEARLY VISIBLE FROM THE LOCATION WHERE THE DISCONNECT IS OPERATED.
- WHERE PV SYSTEM DC CIRCUITS RUN INSIDE A BUILDING, THEY SHALL BE CONTAINED IN METAL RACEWAYS PER NEC 690.31(G).
- PER NEC 705.12(B)(2): THE SUM OF THE AMPERE RATINGS OF OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUS BAR SHALL NOT EXCEED 120% THE RATING OF THE BUS BAR OR CONDUCTOR FOR A DWELLING UNIT.
- DEDICATED 3 POLE 20 AMP BRANCH FEEDER CIRCUIT FOR E-GAUGE SYSTEMS MONITOR. REVENUE GRADE ELECTRICITY CONSUMPTION AND PRODUCTION MONITORING SYSTEM.
- E-GAUGE MONITORING SYSTEM WILL REQUIRE (3) CT(S) FOR THE SERVICE BREAKERS AND (3) CT FOR THE L1 PHASE OF THE PV SYSTEM.
- PER NEC 690.54 LABEL THE OVERCURRENT DEVICE "PHOTOVOLTAIC ELECTRIC POWER SOURCE" WITH THE RATED AC OUTPUT CURRENT AND THE NOMINAL OPERATING AC VOLTAGE. PER NEC 705.12(B)(2)(3)(b) LABEL DEVICE "WARNING POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE".
- LABEL "DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL" AND "DO NOT ADD LOADS TO THIS PANEL".
- PER NEC 690.12(B)(2)(1): THE PV ARRAY SHALL BE LISTED OR FIELD LABELED AS RAPID SHUTDOWN PV ARRAY.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH NEC 690.12(A) THROUGH (D). PER NEC 690.56(C)(3): A RAPID SHUTDOWN SWITCH SHALL HAVE A LABEL LOCATED ON OR NO MORE THAN 3 FEET FROM THE SWITCH THAT INCLUDES THE FOLLOWING WORDING: "RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM".
- SUNSMART TO CONFIRM A GROUND ROD IS INSTALLED. IF THERE IS NOT, SUNSMART SHALL INSTALL ONE PER THE NEC.
- ALL WIRE TO BE COPPER CONDUCTOR UNLESS OTHERWISE NOTED

EQUIPMENT NOTES

CONDUCTOR SIZING PER NEC TABLE 310.15(B)(16) AND 310.15(B)(2)(A) AND ADJUSTMENT FACTORS 0.58 (56-60°C) AND 0.82 (41-45°C). OVERCURRENT DEVICE SIZING PER NEC 240.4(B) AND 240.6(A):

AC CALCS:  
 PER NEC 690.8(A)(3) AND (B)(1):  $1 \times 1.25$   
 INVERTER #1 =>  $80.0A \times 1.25 = 100.0A$   
 INVERTER #2 =>  $80.0A \times 1.25 = 100.0A$   
 SYSTEM =>  $[1 + 2] = 200.0A$

NEC 2011 705.12(D)(2)(b)  
 BUS RATING  $\times 120\% \geq$  PV BKR(A) + MAIN BKR(A)  
 BUS RATING =>  $1600A \times 1.20 = 1920A$   
 SOURCE BKR RATINGS =>  $600A + 200A = 800A$   
 $1920A \geq 800A$

ALL SUPPLIED EQUIPMENT IS UL LISTED  
 EQUIPMENT TO BE INSTALLED PER LISTING AND / OR LABELING TO 2011 NEC REQUIREMENTS

GROUNDING CONDUCTORS CONNECTED TO EACH MODEL FRAME AND RACK ASSEMBLY

ALL SOLAR PANELS ARE UL LISTED TO UL1703 AND HAVE A CLASS C FIRE RATING

MODULE INFORMATION:  
 MODEL NUMBER = HYUNDAI HIS-S290RG  
 NOMINAL POWER (P<sub>nom</sub>) = 290W  
 OPEN CIRCUIT VOLTAGE (V<sub>oc</sub>) = 38.8V  
 MAX POWER VOLTAGE (V<sub>mp</sub>) = 32.0V  
 SHORT CIRCUIT CURRENT (I<sub>sc</sub>) = 9.7A  
 MAX POWER CURRENT (I<sub>mp</sub>) = 9.1A  
 SERIES FUSE RATING = 15A

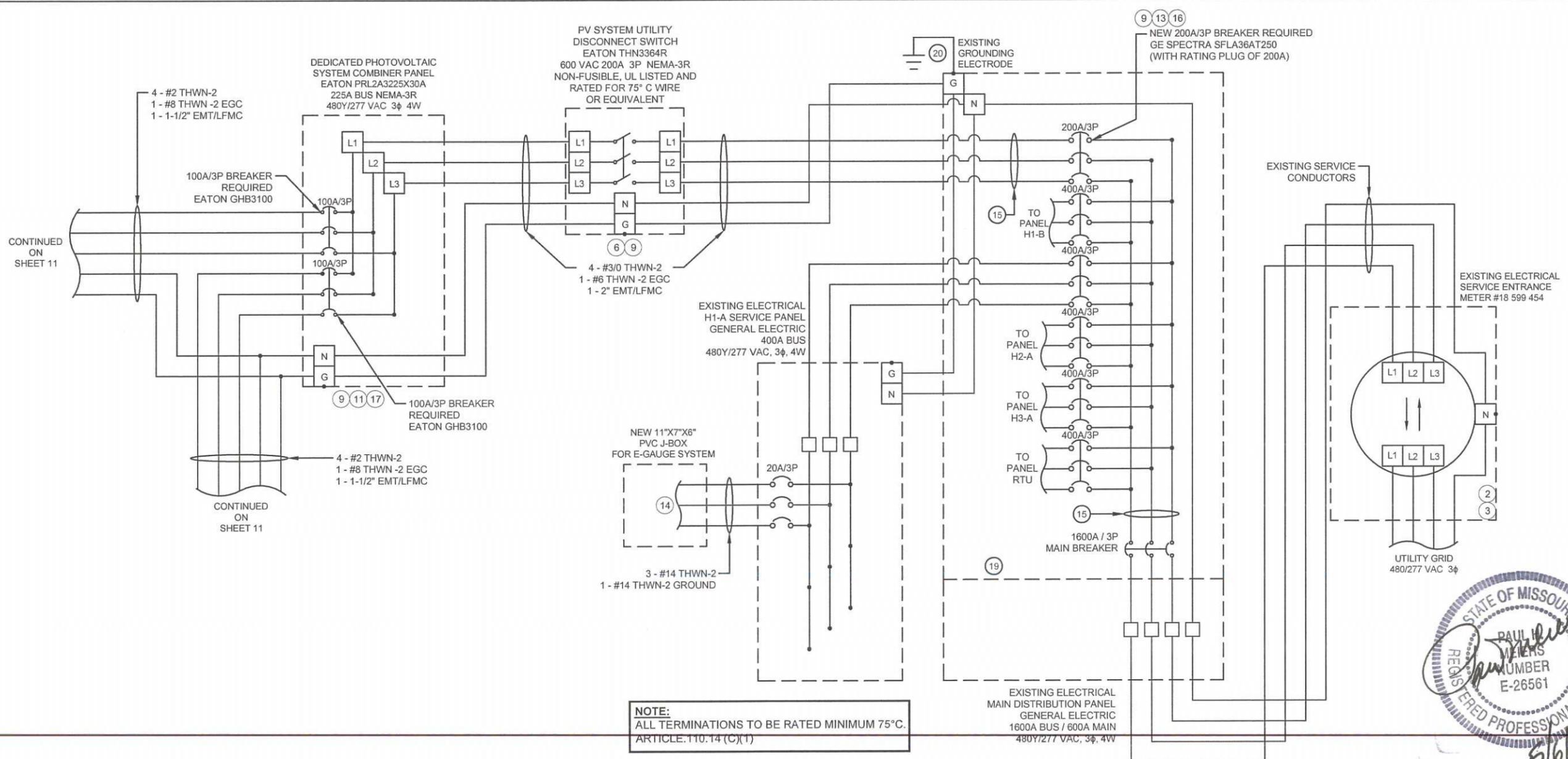
Utility Company: EVERGY  
 Drawn By: M. Sucharski  
 Checked By: P. Meiers  
 Date: 05/06/2020  
 Project: SalleeRealEstateInvestments200-MO  
 Scale: NTS Sheet: 10

Prepared For:	SUNSMART TECHNOLOGIES
Address:	701 NE 76th Street Gladstone, MO 64118
Phone:	816-388-9486
Project No.:	
Revision:	
By:	
Date:	
Appr.:	

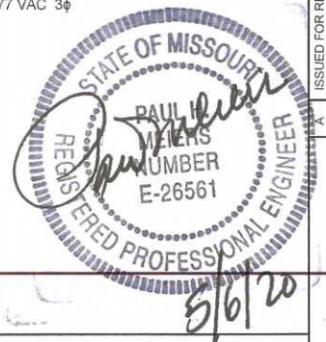
THREE LINE WIRING DIAGRAM #1

144.8 KW DC PV SYSTEM  
 124.0 KW AC PV SYSTEM

200 NE MISSOURI ROAD  
 LEES SUMMIT, MO 64086



**NOTE:**  
ALL TERMINATIONS TO BE RATED MINIMUM 75°C.  
ARTICLE 110.14 (C)(1)



Prepared For:	SUNSMART TECHNOLOGIES
Address:	701 NE 76th Street Gladstone, MO 64118 816-388-9486
PM	
MES	05-06-2020
ISSUED FOR REVIEW	
BY	
DATE	
APPR.	
NO.	

<p>DIAGRAM</p> <ol style="list-style-type: none"> <li>EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC 2017 AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRICAL UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.</li> <li>BI-DIRECTIONAL UTILITY METER TO BE INSTALLED BY UTILITY COMPANY (WHEN REQUIRED)</li> <li>PER NEC 705.10, A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION (UTILITY METER).</li> <li>LISTED OR LABELED EQUIPMENT SHALL BE INSTALLED AND USED IN ACCORDANCE WITH ANY INSTRUCTIONS INCLUDED IN THE LISTING OR LABELING PER NEC 110.3(B).</li> <li>FUNCTIONALLY GROUNDED PHOTOVOLTAIC SYSTEM SHALL COMPLY WITH THE GROUND AND BONDING REQUIREMENTS OF NEC 690.47(A).</li> <li>LABEL AS "PHOTOVOLTAIC SYSTEM AC DISCONNECT" WITH MAXIMUM SYSTEM CURRENT AND OPERATING VOLTAGE.</li> <li>ANTI-ISLANDING PROTECTION ENSURES THE SYSTEM WILL NOT EXPORT POWER INTO A BALANCED 60 Hz RESONANT LOAD WHILE THE UTILITY IS DISCONNECTED.</li> <li>LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT SWITCH" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D).</li> <li>PROVIDE WARNING SIGN PER NEC 690.17 READING "WARNING-ELECTRICAL SHOCK HAZARD- DO NOT TOUCH TERMINALS- TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION."</li> <li>PER NEC 690.35(F): THE PHOTOVOLTAIC POWER SOURCE SHALL BE LABELED WITH THE FOLLOWING WARNING AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED, UNGROUNDED CIRCUITS MAY BE EXPOSED DURING SERVICE: "WARNING-ELECTRIC SHOCK HAZARD- THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED."</li> <li>LABEL "WARNING: PHOTOVOLTAIC POWER SOURCE". PER THE INTERNATIONAL FIRE CODE 2018 EDITION, SECTION 1204 AND NEC 2017 SECTION 690.31(G)(3) (4). MARKING IS REQUIRED ON INTERIOR AND EXTERIOR DC CONDUIT, ENCLOSURES, RACEWAYS, CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS, JUNCTION BOXES,</li> </ol>	<p>COMBINER BOXES AND DISCONNECTS. THE MATERIALS USED FOR MARKING SHALL BE REFLECTIVE, WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT. THE MARKING SHALL ALSO BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECT IN A LOCATION CLEARLY VISIBLE FROM THE LOCATION WHERE THE DISCONNECT IS OPERATED.</p> <ol style="list-style-type: none"> <li>WHERE PV SYSTEM DC CIRCUITS RUN INSIDE A BUILDING, THEY SHALL BE CONTAINED IN METAL RACEWAYS PER NEC 690.31(G).</li> <li>PER NEC 705.12(B)(2); THE SUM OF THE AMPERE RATINGS OF OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUS BAR SHALL NOT EXCEED 120% THE RATING OF THE BUS BAR OR CONDUCTOR FOR A DWELLING UNIT.</li> <li>DEDICATED 3 POLE 20 AMP BRANCH FEEDER CIRCUIT FOR E-GAUGE SYSTEMS MONITOR. REVENUE GRADE ELECTRICITY CONSUMPTION AND PRODUCTION MONITORING SYSTEM.</li> <li>EGUAGE MONITORING SYSTEM WILL REQUIRE (3) CT(S) FOR THE SERVICE BREAKERS AND (3) CT FOR THE L1 PHASE OF THE PV SYSTEM.</li> <li>PER NEC 690.54 LABEL THE OVERCURRENT DEVICE "PHOTOVOLTAIC ELECTRIC POWER SOURCE" WITH THE RATED AC OUTPUT CURRENT AND THE NOMINAL OPERATING AC VOLTAGE. PER NEC 705.12(B)(2)(3)(b) LABEL DEVICE "WARNING POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE".</li> <li>LABEL "DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL" AND "DO NOT ADD LOADS TO THIS PANEL".</li> <li>PER NEC 690.12(B)(2)(1): THE PV ARRAY SHALL BE LISTED OR FIELD LABELED AS RAPID SHUTDOWN PV ARRAY.</li> <li>PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH NEC 690.12(A) THROUGH (D). PER NEC 690.56(C)(3): A RAPID SHUTDOWN SWITCH SHALL HAVE A LABEL LOCATED ON OR NO MORE THAN 3 FEET FROM THE SWITCH THAT INCLUDES THE FOLLOWING WORDING: "RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM".</li> <li>SUNSMART TO CONFIRM A GROUND ROD IS INSTALLED. IF THERE IS NOT, SUNSMART SHALL INSTALL ONE PER THE NEC.</li> <li>ALL WIRE TO BE COPPER CONDUCTOR UNLESS OTHERWISE NOTED</li> </ol>	<p>CONDUCTOR SIZING PER NEC TABLE 310.15(B)(16) AND 310.15(B)(2)(A) AND ADJUSTMENT FACTORS 0.58 (56-60°C) AND 0.82 (41-45°C). OVERCURRENT DEVICE SIZING PER NEC 240.4(B) AND 240.6(A).</p> <p><b>AC CALCS:</b></p> <p>PER NEC 690.8(A)(3) AND (B)(1): 1 x 1.25</p> <p>INVERTER #1 =&gt; 80.0A x 1.25 = 100.0A INVERTER #2 =&gt; 80.0A x 1.25 = 100.0A</p> <p>SYSTEM =&gt; [1 + 2] = 200.0A</p> <p><b>NEC 2011 705.12(D)(2)(b)</b></p> <p>BUS RATING x 120% ≥ PV BKR(A) + MAIN BKR(A) BUS RATING =&gt; 1600A x 1.20 = 1920A SOURCE BKR RATINGS =&gt; 600A + 200A = 800A 1920A ≥ 800A</p> <p>ALL SUPPLIED EQUIPMENT IS UL LISTED EQUIPMENT TO BE INSTALLED PER LISTING AND / OR LABELING TO 2011 NEC REQUIREMENTS</p> <p>GROUNDING CONDUCTORS CONNECTED TO EACH MODEL FRAME AND RACK ASSEMBLY</p> <p>ALL SOLAR PANELS ARE UL LISTED TO UL1703 AND HAVE A CLASS C FIRE RATING</p> <p><b>MODULE INFORMATION:</b> MODEL NUMBER = HYUNDAI HIS-S290RG NOMINAL POWER (P<sub>nom</sub>) = 290W OPEN CIRCUIT VOLTAGE (V<sub>oc</sub>) = 38.8V MAX POWER VOLTAGE (V<sub>mp</sub>) = 32.0V SHORT CIRCUIT CURRENT (I<sub>sc</sub>) = 9.7A MAX POWER CURRENT (I<sub>mp</sub>) = 9.1A SERIES FUSE RATING = 15A</p>
KEY NOTES	EQUIPMENT NOTES	

144.8 KW DC PV SYSTEM  
124.0 KW AC PV SYSTEM

**THREE LINE WIRING DIAGRAM #2**

200 NE MISSOURI ROAD  
LEES SUMMIT, MO 64086

Utility Company:	EVERGY
Drawn By:	M. Sucharski
Checked By:	P. Meiers
Date:	05/06/2020
Project:	SalleeRealEstateInvestments200-MO
Scale:	NTS
Sheet:	11

### PV LOAD CENTER/ COMBINER PANEL

PHOTOVOLTAIC SYSTEM  
COMBINER PANEL  
DO NOT ADD LOADS

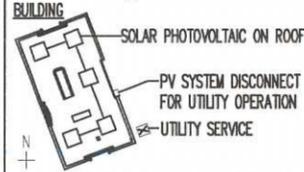
#### WARNING

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

### DIRECTORY

#### CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED  
FROM THE FOLLOWING SOURCES WITH  
DISCONNECT(S) LOCATED AS SHOWN



### JBOX

WARNING: PHOTOVOLTAIC  
POWER SOURCE

### CONDUIT

WARNING: PHOTOVOLTAIC  
POWER SOURCE

### UTILITY METER

#### WARNING

THIS SERVICE METER  
IS ALSO SERVED BY A  
PHOTOVOLTAIC SYSTEM

### MDP PANEL

#### WARNING

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

#### WARNING

POWER SOURCE OUTPUT  
CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

#### WARNING

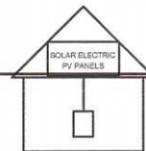
- ELECTRIC SHOCK HAZARD -  
TERMINALS ON THE LINE AND  
LOAD SIDES MAY BE ENERGIZED  
IN THE OPEN POSITION

PHOTOVOLTAIC  
SOLAR BREAKER

### 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



### PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT	41.6	AAC
NOMINAL OPERATING AC VOLTAGE	240	VAC

### AC DISCONNECT

PV SYSTEM DISCONNECT

#### WARNING

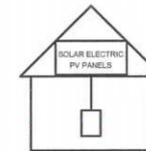
- ELECTRIC SHOCK HAZARD -  
TERMINALS ON THE LINE AND  
LOAD SIDES MAY BE ENERGIZED  
IN THE OPEN POSITION

### PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT	41.6	AAC
NOMINAL OPERATING AC VOLTAGE	240	VAC

### 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



RAPID SHUTDOWN SWITCH FOR  
SOLAR PV SYSTEM

### SUBPANEL

E-GAUGE BREAKER

### DC DISCONNECT/INVERTER

#### PHOTOVOLTAIC SYSTEM #1 DC DISCONNECT

RATED MPP CURRENT	120	AMPS
RATED MPP VOLTAGE	800	VOLTS
MAX SYSTEM VOLTAGE	881.5	VDC
MAX CIRCUIT CURRENT	20.7	AMPS

#### WARNING

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

#### WARNING

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

#### WARNING

- ELECTRIC SHOCK HAZARD -  
IF A GROUND FAULT IS INDICATED, NORMALLY  
GROUNDED CONDUCTORS MAY BE UNGROUNDED  
AND ENERGIZED

#### PHOTOVOLTAIC SYSTEM #2 DC DISCONNECT

RATED MPP CURRENT	120	AMPS
RATED MPP VOLTAGE	800	VOLTS
MAX SYSTEM VOLTAGE	940.2	VDC
MAX CIRCUIT CURRENT	20.7	AMPS

SUNSMART  
TECHNOLOGIES  
701 NE 76th Street  
Gladstone, MO 64118  
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ISSUED FOR REVIEW	
A	
NO.	

EQUIPMENT LABELING  
200 NE MISSOURI ROAD  
LEES SUMMIT, MO 64086



5/6/20

NOTE:  
ALL LABELS TO BE ENGRAVED AND MECHANICALLY  
BONDED UNLESS OTHERWISE STATED

Utility Company:	EVERGY
Drawn By:	M. Sucharski
Checked By:	P. Meiers
Date:	05/06/2020
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