



1057 SHORE ROAD  
NAPERVILLE, IL 60563

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SYSTEM SIZE: 14.88kW

SYSTEM MODEL TYPE: CSUN 310-72P

TOTAL No. PANEL 48

PROJECT NO. 5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
**1210 E. UNIVERSITY AVE.**  
URBANA, IL

PROFESSIONAL CERTIFICATION HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS LICENSED STATE No

REV	DESCRIPTION	DATE
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01	AS-BUILT	10/05/17

DESIGNED BY:	DEW	03/10/17
DRAWN BY:	M. PARAYNO	03/10/17
REVIEWED BY:	ASAD BAJWA	03/10/17
SCALE:	NOT TO SCALE	

DRAWING TITLE:

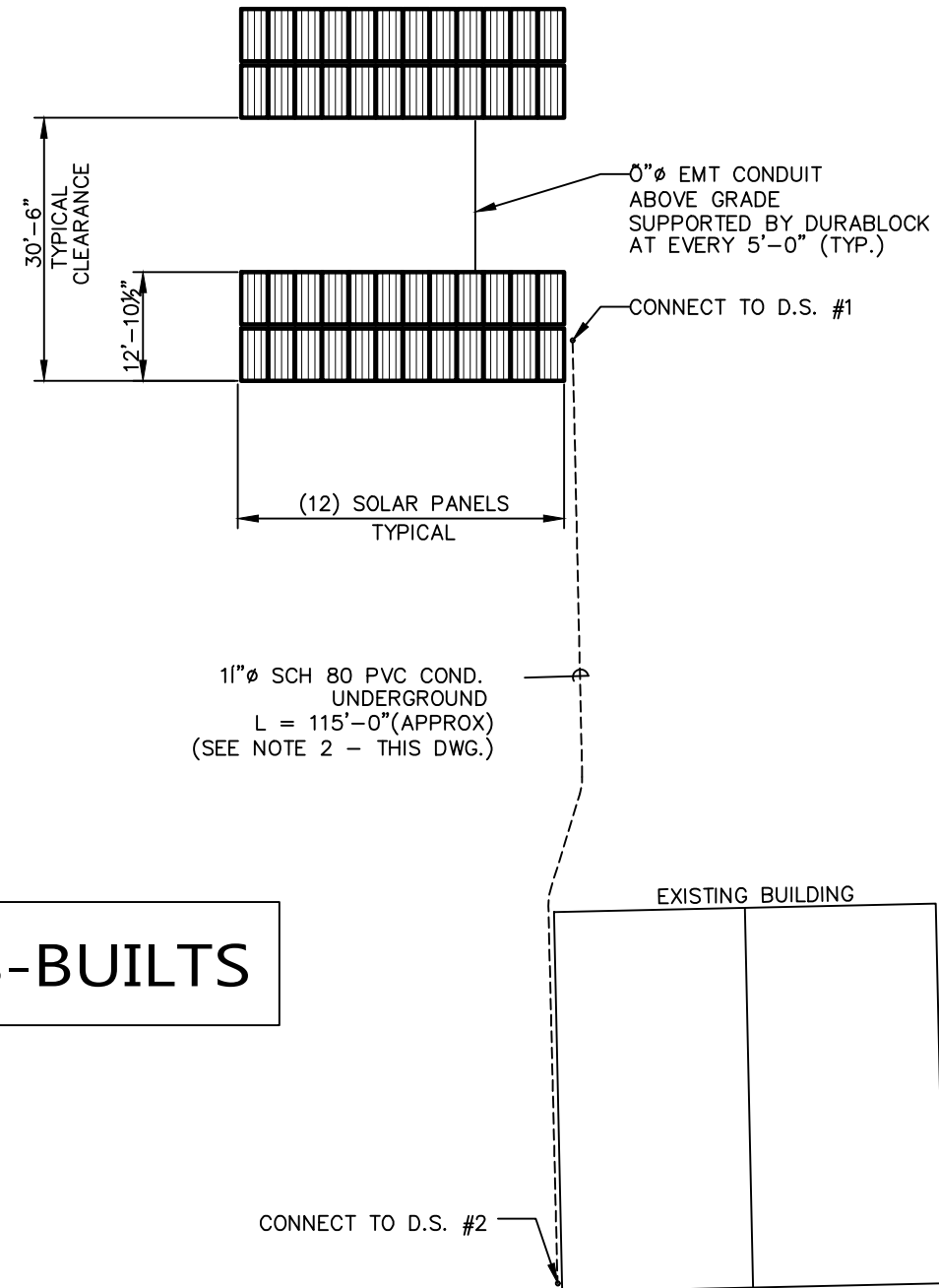
**SITE PLAN**

DRAWING NUMBER:

**GA-100**



LOCATION PLAN



SOLAR PANEL ARRANGEMENT

**NOTES:**

1. D.S. DENOTED AS DISCONNECT SWITCH
2. ALL CONDUITS, INVERTER, SOLAR PANELS, AND OPTIMIZERS ARE FIELD ROUTED.

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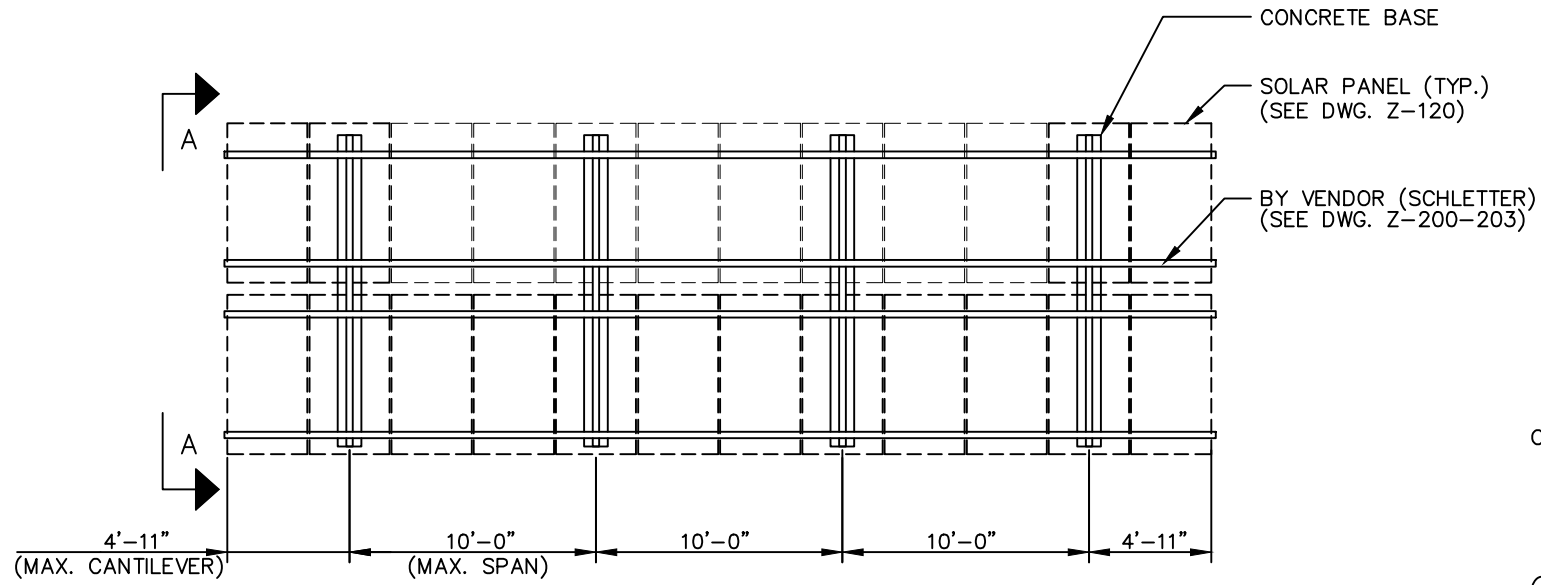
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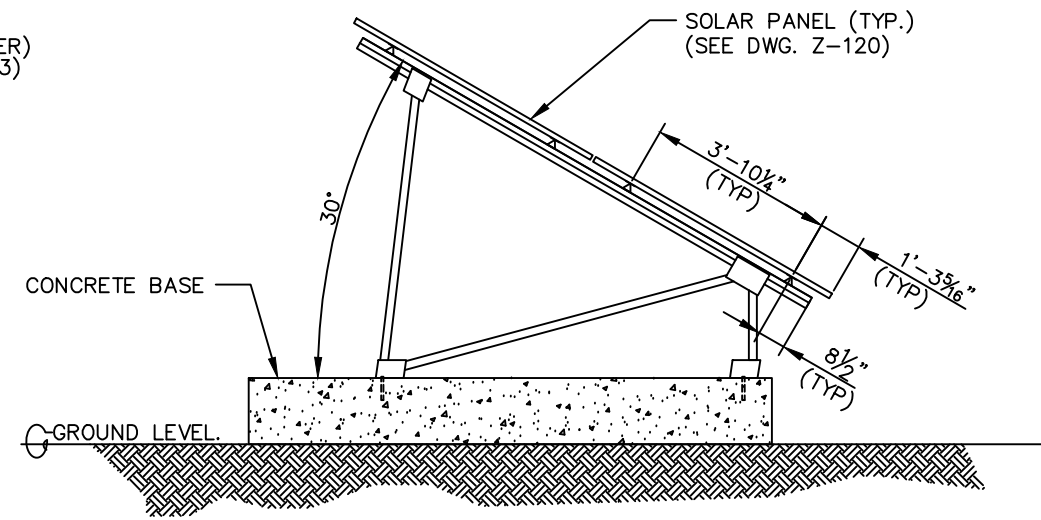
DRAWING TITLE:

**GROUND MOUNTING**

DRAWING NUMBER:  
**GA-300**



TYPICAL MOUNTING RACK LAYOUT



SECTION A-A  
TYPICAL MOUNTING RACK  
(REF. DWG. Z-200-203)

**ELECTRICAL INSTALLATION NOTES:**

1. THE INTENT OF THIS DRAWING IS TO LIST NOTES FOR GIVEN INSTALLATION ACTIVITY.
2. THE DESIGNATION "ASTM" REFERENCE IN THE FOLLOWING INDICATES THE AMERICAN SOCIETY FOR TESTING MATERIALS SPECIFICATION.
3. WHEN METAL CONDUIT IS SPECIFIED, ONLY RIGID STEEL CONDUIT, HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE (INCLUDING THREAD), SHOULD BE USED (UNLESS NOTED OTHERWISE). WHEN RIGID NON-METALLIC CONDUIT PVC IS SPECIFIED, IT SHOULD MEET NEMA AND NEC REQUIREMENTS. WHEN USING METAL CONDUIT, MANUFACTURER'S EXPANSION AND CONTRACTION TABLE SHOULD BE CONSULTED AND EXPANSION TYPE COUPLING INSTALLED, IF NECESSARY.
4. PRECAST MULTIPLE DUCT AND PRECASTMANHOLE SECTION SHOULD BE CONSIDERED FOR USE IN ALL SITUATIONS WHICH ARE NOT COMPROMISED BY OTHER PROJECT DESIGN REQUIREMENTS OR LIMITATIONS, SUCH AS SEISMIC REQUIREMENTS OR AREAS INVOLVING EXCAVATION FOR CURRENT WORK OR FUTURE EXCAVATION.

PRODUCT	MATERIAL	GALVANIZED FINISHED
P1000, P1001, AND P1004A	ASTM A456 GRADE A OR EQUIVALENT	G-90 CONFORMING TO ASTM A-525 OR ASTM A-153 OR EQUIVALENT
HEX HEAD CAP SCREW	ASTM A307 GRADE A OR SAE GRADE 2	ELECTRICAL GALVANIZED CONFORMING TO FEDERAL SPECIFICATION QQ-Z-A325A OR TO ASTM A164 OR A591
SPRING NUT	ASTM A576	

CONDUIT FILL (%) =  $\frac{\text{SUM OF CABLE CROSS SECTIONAL AREA} \times 100}{\text{INSIDE CROSS SECTIONAL AREA OF CONDUIT}}$

SINGLE CABLE	- 53%
TWO CABLES	- 31%
THREE CABLES OR MORE	- 40%

6. CONDUIT SUPPORTS SHALL BE INSTALLED PER WCP SOLAR DETAIL UNLESS SPECIFIED ON THIS DRAWINGS.
7. THE MAXIMUM AMOUNT OF CABLE THAT CAN BE INSTALLED IN A CONDUIT OR DUCT IS BASED ON 1 OF CHAPTER 9 OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE LIMITS IS CALLED THE "CONDUIT FILL" RATIO AND EXPRESSED AS A PERCENTAGE. THIS IS THE RATIO OF THE SUM OF THE CROSS SECTIONAL AREAS OF ALL THE CABLES, DIVIDED BY THE CROSS SECTIONAL AREA OF THE INSIDE OF THE CONDUIT OR DUCT, TIMES 100.
8. FOR CONDUITS USED AS WALL SLEEVES AND STRAIGHT CONDUITS UNDER 48 INCHES IN LENGTH, THE CONDUIT FILL SHALL NOT EXCEED 60%.
9. IF A POTENTIAL FOR JAMMING EXIST, THE CONDUIT SIZED SHOULD BE INCREASE ACCORDINGLY.
10. FLEXIBLE METALLIC CONDUIT SHALL BE USED TO INTERFACE THE RIGID CONDUIT SYSTEM WITH ELECTRIC EQUIPMENT THAT IS FREE STANDING, ROTATES, VIBRATES, OR IS SUBJECT TO THERMAL MOVEMENT, OR WHERE SEISMIC CONSIDERATION MUST BE TAKEN INTO ACCOUNT. LIQUID TIGHT FLEXIBLE METAL CONDUIT IS GENERALLY SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE 12 INCHES FROM BOXES (JUNCTIONBOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART (NEC 350.30).
11. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE

**CON'T. ELECTRICAL NOTES:**

- CONTAINED IN THE SAME RACEWAY, CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
12. UNLESS MARKED AS UV RESISTANT, PVC IS NOT APPROVED FOR INSTALLATION IN LOCATIONS SUBJECT TO DIRECT SUNLIGHT AND SHALL NOT BE EMPLOYED IN ANY SUCH LOCATION.
  13. LONG, STRAIGHT EXPOSED CONDUIT RUNS, 100 FEET OR MORE, SHALL HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B). EXPANSION FITTINGS SHALL ALSO BE USED WHEN CONDUIT SPANS AN EXPANSION JOINT.
  14. FUSES AND WIRES SUBJECT TO TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
  15. ALL D.C. MATERIALS SHALL BE UL LISTED FOR 1000V DC.
  16. WHEN TRANSITIONING UNDERGROUND PVC CONDUIT TO ABOVE GROUND RMC, IMC OR EMT CONDUIT, USE 20 MIL PIPE WRAP TAPE HALF-LAPPED FROM 6" PAST TRANSITION POINT ON PVC TO 6" ABOVE GROUND ON METALLIC CONDUIT. AN EXPANSION JOINT SHALL BE USED IN THE TRANSITION TO ABOVE GROUND CONDUIT WHERE REQUIRED BY NEC 300.5(J)
  17. METALLIC CONDUIT. AN EXPANSION JOINT SHALL BE USED IN THE TRANSITION TO ABOVE GROUND CONDUIT WHERE REQUIRED BY NEC 300.5(J).
  18. ANY METAL DEBRIS RESULTING FROM SITE WORK SHALL BE CLEANED FROM ENCLOSURE INTERIORS, TOP SURFACES OF ENCLOSURE, ROOF SURFACE, AND ANY ADDITIONAL AREAS WHERE OXIDATION OR CONDUCTIVE METAL DEBRIS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUIT OR OTHER DAMAGE.
  19. CONDUITS LONGER THAN 200' WITH NEGATIVE SLOPE TOWARD ELECTRICAL EQUIPMENT SHALL HAVE A PULL BOX OR VAULT ADJACENT TO THE ENTRY POINT INTO THE ELECTRICAL EQUIPMENT.
  20. WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT, A LISTED FITTING AND DRIP LOOP SHALL BE USED TO PREVENT THE ENTRY OF MOISTURE.
  21. METALLIC L AND T CONDUIT BODIES SHALL NOT BE USED.
  22. ALL AC AND DC COPPER TERMINATIONS SHALL HAVE KOPR-SHIELD OR EQUIVALENT APPLIED.
  23. MEGGER TESTING SHALL BE PERFORMED AT 500 VDC FOR ALL AC CIRCUITS 480 V OR BELOW AND DC CIRCUITS 600 V OR BELOW. MEGGER TESTING WILL BE PERFORMED AT 1000 VDC FOR DC CIRCUITS IN 1000 VDC SYSTEMS. A MINIMUM OF 50 MEGA OHMS RESISTANCE TO GROUND IS REQUIRED. DO NOT MEGGER THE SOLAR MODULES AS IT WILL LIKELY DAMAGE THEIR INTERNAL DIODES.
  24. BENDS SHALL NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAY.
  25. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 300.19.
  26. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS. CONNECTORS ARE TO BE

**CON'T. ELECTRICAL NOTES:**

- MARKED WITH PERMANENT MARKING PAINT, AFTER TORQUING. THE CONDUIT SYSTEM SHALL BE INSTALLED SNUG TIGHT, WHERE SNUG TIGHT IS DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF THE INSTALLER WITH PROPERLY SIZED WRENCH (OR OTHER APPROPRIATE CONSTRUCTION TOOLS.)
27. ALL BARE CU WIRES SHALL BE INSTALLED TO NOT COME INTO CONTACT WITH DISSIMILAR METALS.
  28. SPLICES/CONNECTORS SHALL BE INSULATED AND WILL REQUIRE PROJECT ENGINEER APPROVAL. UL LISTED ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATION MEANS. FOLLOW MANUFACTURERS INSTRUCTIONS FOR INSTALLATION, AND APPLICATION OF INSULATING PRODUCT.
  29. ALL DISCONNECTING COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES SHALL BE LISTED FOR ITS PURPOSE. OUTDOOR PULL BOXES SHALL BE NEMA 3 OR 4 ENCLOSURE UNLESS OTHERWISE NOTED IN THE ELECTRICAL INSTALLATION DRAWINGS.
  30. EQUIPMENT SHALL BE INSTALLED IN A SECURE AREA. INVERTER PERFORMANCE MAY BE AFFECTED IF INSTALLED IN DIRECT SUNLIGHT.
  31. CONDUITS AND CABLES SHALL NOT ENTER THE TOP OF ANY OUTDOOR ENCLOSURE WITHOUT WRITTEN APPROVAL FROM PROJECT ENGINEER.
  32. CONDUIT ENTRANCES SHALL BE LOCATED TO ALLOW THE CABLE TO BE TRAINED WITH MORE THAN THE MINIMUM ALLOWABLE BENDING RADIUS.
  33. USE MEYERS(OR APPROVED EQUIVALENT)HUB LISTED TO PROVIDE MOISTURE PROTECTION FOR CONDUIT ENTRANCES IN ALL APPLICABLE LOCATIONS AS REQUIRED BY NEC 314.15.
  34. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
  35. MODULE LEAD CONNECTORS SHALL BE INSTALLED SUCH THAT THEY ARE EASILY ACCESSIBLE AND PROTECTED FROM EXPOSURE TO DIRECT SUNLIGHT OR RAIN. THEY SHALL NOT BE INSTALLED WITHIN TUBING, CONDUIT OR MODULE GAPS.
  36. THE STRING SOURCE CIRCUIT WIRING NEEDS TO BE SUPPORTED ADEQUATELY IN LENGTHS NOT TO EXCEED 24". THE MODULE TO MODULE INTERCONNECTION LEADS NEED TO BE SUPPORTED AT A MINIMUM OF 12" FROM THE J-BOX AND THE MODULE TO MODULE CONNECTION POINT.
  37. POLARIS (OR SIMILAR) POWER DISTRIBUTION BLOCKS ARE NOT TO BE USED TO CONNECT CURRENT CARRYING CONDUCTORS. INSULATED POLARIS (OR SIMILAR) CABLE CONNECTORS / TAP BLOCKS AND REDUCERS ARE PERMITTED.
  38. MODULE TO SOURCE CIRCUIT CONNECTORS MUST BE OF THE SAME MAKE AND MODEL AS THE MODULE TO MODULE CONNECTORS. THE CONNECTION TO SOURCE CIRCUITS MUST BE PER THE MODULE MANUFACTURER AND CONNECTOR MANUFACTURER INSTRUCTIONS. CONTRACTOR TO VERIFY THAT THE STRING CONDUCTOR DIAMETER IS COMPATIBLE WITH THE STRING CIRCUIT HOME-RUN CONNECTORS.
  39. ALL FITTING FOR METALLIC RACEWAYS SHALL BE THREADED / COMPRESSION TYPE. NO SET-SCREW FITTINGS PERMITTED

**GROUNDING**

1. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS WILL BE USED FOR SYSTEM GROUNDING (NEC 690.42) (REFERENCED TO THE SAME POINT).
  2. EQUIPMENT GROUNDING CONDUCTORS AND SYSTEM GROUNDING CONDUCTORS WILL HAVE AS SHORT A DISTANCE TO GROUND AS POSSIBLE AND A MINIMUM NUMBER OF TURNS.
  3. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER GROUNDING; NOTING THAT TERMINAL LUGS BOLTED ON AN ENCLOSURE'S FINISHED SURFACE MAY BE INSULATED BECAUSE OF PAINT/FINISH. PAINT/FINISH AT POINT OF CONTACT SHALL BE PROPERLY REMOVED.
  4. RACKING COMPONENTS AND STRUCTURAL SUPPORTS MUST BE ELECTRICALLY BONDED TOGETHER BY AN ACCEPTABLE MEANS.
  5. MODULES SHALL BE GROUNDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
  6. THE CONNECTION TO THE MODULE OR PANEL OF THIS PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE SO ARRANGED THAT REMOVAL OF A MODULE OR A PANEL FROM THE PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT. SETS OF MODULES INTERCONNECTED AS SYSTEMS RATED AT 50 VOLTS OR LESS WITH OR WITHOUT BLOCKING DIODES, AND HAVING A SINGLE OVER CURRENT DEVICE SHALL BE CONSIDERED AS A SINGLE SOURCE CIRCUIT.
  7. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
  8. ALL GROUNDING CONNECTIONS SHALL BE RATED FOR DIRECT BURIAL (DB RATED) , CONTRACTOR IS TO SUPPLY DOCUMENTATION PROVING THIS DURING PRODUCT SUBMITTALS
  9. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE NOTED.
- GROUND FAULT PROTECTION**
1. PHOTOVOLTAIC INVERTERS SHALL BE EQUIPPED WITH D.C. GROUND FAULT PROTECTION TO REDUCE FIRE HAZARDS. INVERTERS ARE ALSO EQUIPPED WITH ANTI-ISLANDING CIRCUITRY.



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SYSTEM SIZE:	14.88kW
SYSTEM MODEL TYPE:	CSUN 310-72P
TOTAL No. PANEL	48
PROJECT NO.	5001UC

PROJECT NAME AND ADDRESS:

URBANA  
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DRAWN BY:	M. PARAYNO	03/10/17
REVIEWED BY:	ASAD BAJWA	03/10/17
SCALE:	NOT TO SCALE	

DRAWING TITLE:

**ELECTRICAL NOTES**

DRAWING NUMBER:

**E-100**



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DRAWING TITLE:

GENERAL NOTES

DRAWING NUMBER:  
**E-101**

**REQUIRED SAFETY, SIGNS AND LABELS**

REQUIRED SAFETY SIGNS AND LABELS SHALL BE ETCHED PLACARDS PERMANENTLY ATTACHED BY ADHESIVE, OR OTHER MECHANICAL MEANS. LABELS SHALL COMPLY WITH ARTICLE 690 OF THE NEC OR OTHER APPLICABLE STATE AND LOCAL CODES. SEE LABELS AND MARKING PAGE FOR MORE INFORMATION.

WEAR PERSONAL PROTECTIVE EQUIPMENT(PPE) APPROPRIATE FOR THE HAZARD: INSULATED GLOVES WITH PROTECTORS, PROTECTIVE GOGGLES, SAFETY SHOES, INSULATED MATS AND TOOLS WHILE AT THE CONSTRUCTION SITE.

1. ANY SWITCH, FUSES, OR CIRCUIT BREAKERS THAT CAN BE ENERGIZED IN EITHER DIRECTION SHALL BE LABELED AS FOLLOWS:

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

2. THIS PHOTOVOLTAIC SYSTEM WILL BE EQUIPPED WITH AN A.C. DISCONNECT WHICH WILL BE LABELED AS FOLLOWS:

PHOTOVOLTAIC  
DISCONNECTING MEANS  
A.C. DISCONNECT

3. A MARKING SPECIFYING THE PHOTOVOLTAIC POWER SOURCE RATED AS FOLLOWS SHALL BE PROVIDED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTION MEANS FOR THE POWER SOURCE:

OPERATING CURRENT  
OPERATING VOLTAGE  
MAXIMUM SYSTEM VOLTAGE  
SHORT CIRCUIT CURRENT  
COMBINER

4. ANY DC JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED UNGROUNDED DC CIRCUITS MAYBE EXPOSED DURING SERVICE:

WARNING:  
ELECTRICAL SHOCK HAZARD  
THE CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

**PRODUCT AND SUBSTITUTIONS**

1. DEVIATIONS IN DESIGN OR MATERIALS SHALL BE PERMITTED ONLY WITH THE WRITTEN REVIEW OF THE ARCHITECT.
2. WHEN PROVIDING NON-SPECIFIED EQUIPMENT, REVIEW ALL PARAMETERS FOR CONFORMANCE AND SUBMIT SHOP DRAWINGS OR PRODUCT LITERATURE TO THE ARCHITECT FOR REVIEW.
3. NO SUBSTITUTIONS WITHOUT SPECIFIC WRITTEN DIRECTION FROM THE OWNER & ARCHITECT WILL BE ALLOWED.
4. ALL MANUFACTURERS PRODUCT SPECIFICATIONS AND/OR WARNINGS FOR PRODUCTS OR MATERIALS, USED IN CONSTRUCTION, MUST BE STRICTLY OBSERVED. IT IS THE OWNER'S RESPONSIBILITY TO DETERMINE THE APPROPRIATENESS OF ALL PRODUCTS SUBSTITUTED.

**LEGEND:**

- ① -No. OF OPTIMIZER
- ① -No. OF SETS PER STRINGS
- -STRING CONNECTIONS



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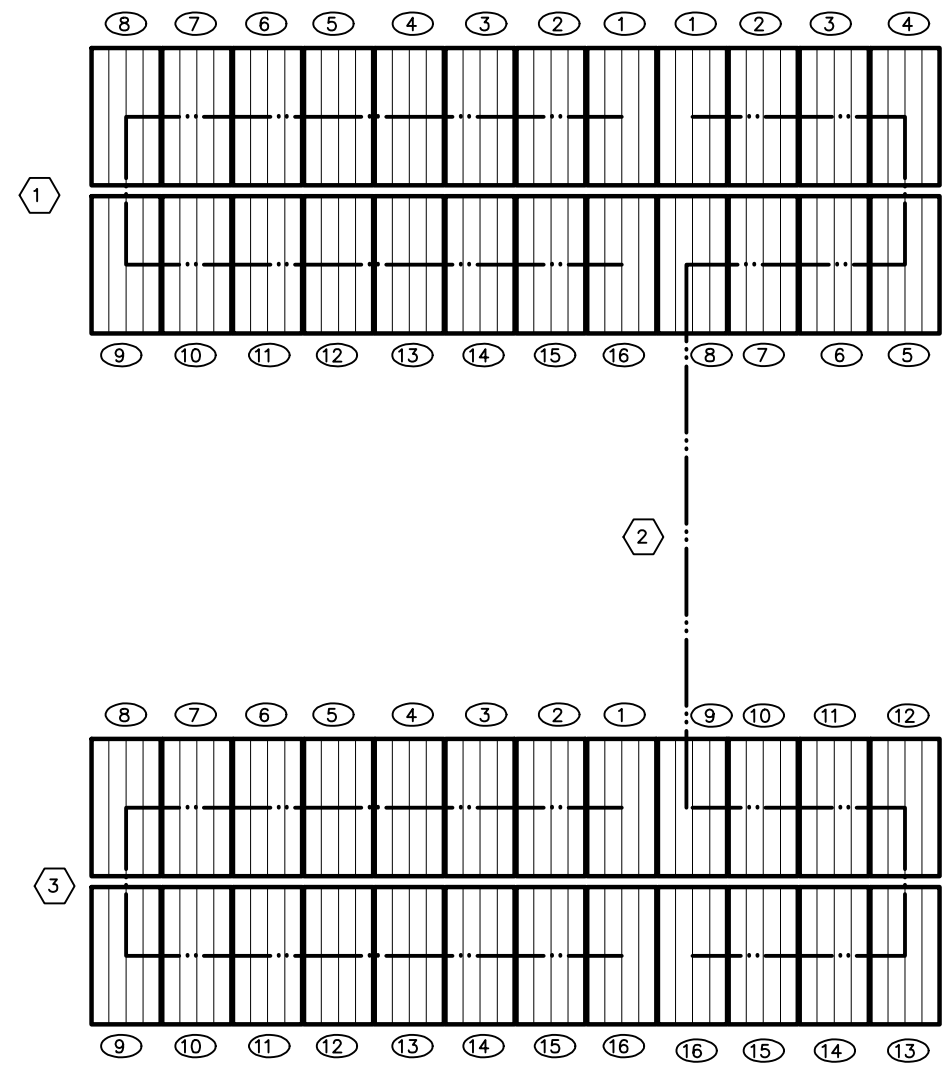
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






**SOLAR PANEL STRING CONNECTION LAYOUT**

**NOTES:**

1. STRING CONNECTIONS SHOWN ON THIS DRAWING IS FOR DIAGRAMMATIC PURPOSE ONLY.
2. INSTALLER SHOULD FOLLOW MANUFACTURER'S RECOMMENDATION

**LEGEND:**

- PV - PHOTOVOLTAIC MODULE
- S.W. - SAFETY SWITCH
-  - METER
-  - SOLAREEDGE P320 OPTIMIZER
-  - 240V 60A NEMA 3R DISCONNECT SWITCH
-  - OPTIMIZER NUMBER
-  - No. OF SETS PER STRINGS
-  - INVERTER

**NOTE:**

1. DISCONNECT SW2 TO BE INSTALLED WITHIN 5' OF METER



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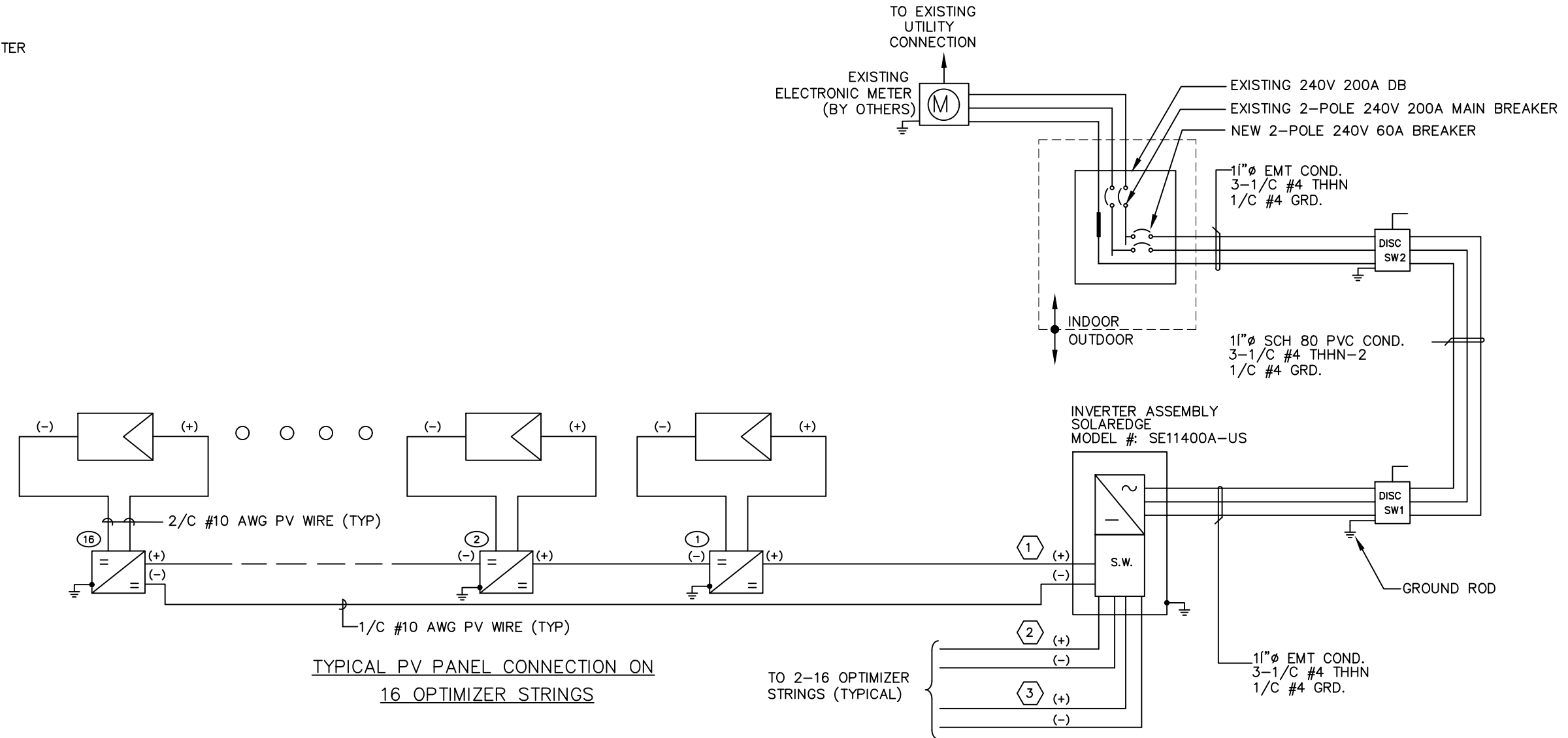
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REV	DESCRIPTION	DATE
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01	AS-BUILT	10/05/17
DESIGNED BY: DEW		03/10/17
DRAWN BY: JOSUE OCON		10/05/17
REVIEWED BY: ASAD BAIJWA		03/10/17
SCALE:		NOT TO SCALE

DRAWING TITLE:

**WIRING DIAGRAM**

DRAWING NUMBER:  
**E-300**



**GENERAL REQUIREMENTS CODES AND ORDINANCES**

1. ALL CODES HAVING JURISDICTION SHALL BE OBSERVED STRICTLY IN THE CONSTRUCTION OF THE PROJECT, INCLUDING, BUT NOT LIMITED TO, ALL APPLICABLE STATE, LOCAL, AND COUNTY BUILDING, ZONING, ELECTRICAL, MECHANICAL, PLUMBING AND FIRE CODES. THE CONTRACTOR SHALL VERIFY ALL CODE REQUIREMENTS BEFORE COMMENCEMENT OF CONSTRUCTION AND BRING DISCREPANCIES IN THE DOCUMENTS TO THE ATTENTION OF THE PROJECT ENGINEER.
2. GOVERNING BUILDING CODE ARE AS FOLLOWS:
  - a. IBC (INTERNATIONAL BUILDING CODE), 2012
  - b. NEC (NATIONAL ENERGY CODE), 2014
3. WORK SHALL BE DONE IN ACCORDANCE WITH O.S.H.A. CONSTRUCTION SAFETY STANDARDS.
4. CONTRACTORS SHALL MAKE NECESSARY ARRANGEMENTS WITH AUTHORITIES AND OBTAIN REQUIRED PERMITS.
5. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR SAFETY AND CONSTRUCTION PROCEDURES, TECHNIQUES, OR THE FAILURE OF THE BUILDER TO CARRY OUT THE WORK IN ACCORDANCE WITH THE DRAWINGS OR REQUIRED CODES.
6. ALL CODES, TRADE STANDARDS, AND MANUFACTURERS INSTRUCTIONS REFERENCED IN THE CONTRACT DOCUMENTS SHALL BE THE LATEST EDITION.

**GENERAL CONDITIONS**

1. DIMENSIONS AND EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED PRIOR TO CONSTRUCTION. ON SITE VERIFICATION IS THE RESPONSIBILITY OF EACH CONTRACTOR. CONTRACTORS SHALL INCLUDE IN THEIR BID ANY ALTERATIONS, RELOCATION, REMOVAL, REROUTING, ETC. OF EXISTING FACILITIES. NOTIFY ARCHITECT IMMEDIATELY IN WRITING OF ANY DISCREPANCIES.
2. CONTRACTORS SHALL KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK SHOWN ON THE PLANS AND THAT, WHICH IS ACTUALLY PERFORMED. TURN RECORD DRAWING OVER TO ARCHITECT PRIOR TO PROJECT CLOSE-OUT.
3. DO NOT SCALE DRAWINGS. USE DIMENSIONS GIVEN ON THE DRAWINGS AT ALL TIMES. UNLESS NOTED OTHERWISE, DIMENSIONS ARE SHOWN TO THE FACE OF THE BRICK, PLASTER, WOOD OR DRYWALL FINISH.
4. DETAILS AND SECTIONS ON THE DRAWINGS ARE SHOWN AT SPECIFIC LOCATIONS AND ARE INTENDED TO SHOW GENERAL REQUIREMENTS THROUGHOUT. DETAILS NOTED "TYPICAL" OR "TYP" IMPLY THAT ALL CONDITIONS ARE TREATED SIMILARLY.
5. ALL DRAWINGS SHALL BE FULLY COORDINATED BY THE CONTRACTOR TO VERIFY ALL DIMENSIONS. LOCATE ALL SPECIAL CONDITIONS, SLOPES, DRAINS, OUTLETS, REGLETS, FLASHING, STRUCTURAL FASTENERS, SLEEVES, ETC.
6. THE CONTRACTOR SHALL MAKE NO STRUCTURAL CHANGES WITHOUT THE WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.

**PROJECT COORDINATION**

1. CONTRACTORS SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID, VERIFY DIMENSIONS AND CONDITIONS, AND REPORT CONFLICTS TO THE ARCHITECT IN WRITING OR BE RESPONSIBLE FOR SAME.
2. CONTRACTORS SHALL COORDINATE THEIR WORK AND THE WORK OF ADJOINING TRADES. ALL TRADES SHALL ASSIST IN WORKING OUT SPACE CONDITIONS TO MAKE SATISFACTORY ADJUSTMENTS AND MODIFICATIONS IN THE WORK INCLUDING RE-ROUTING AS REQUIRED BY INTERFERENCE WITH STRUCTURAL, GENERAL, AND WORK OF OTHER TRADES, AND FOR PROPER EXECUTION OF THE WORK. WORK INSTALLED PRIOR TO COORDINATING WITH OTHER TRADES SO AS TO CAUSE INTERFERENCE WITH THE WORK OF OTHER TRADES SHALL BE CHANGED TO CORRECT SUCH CONDITION WITHOUT ADDITIONAL COST TO THE OWNER AND AT THE DIRECTION OF THE PROJECT ENGINEER.
3. PROTECT WORK, MATERIALS, AND EQUIPMENT FROM DAMAGE OR LOSS DUE TO ANY CAUSE.

**CUTTING AND PATCHING**

1. CONTRACTORS SHALL DO THE REQUIRED CUTTING AND PATCHING NECESSARY FOR THE PASSAGE OF THEIR WORK.
2. PROVIDE SLEEVES AT DUCT, PIPE, CONDUIT, AND CABLE PENETRATIONS THROUGH THE BUILDING CONSTRUCTION. SEAL ALL OPENINGS AS REQUIRED TO MAINTAIN FIRE RATING, WATER PENETRATION RESISTANCE, AND AIR PENETRATION RESISTANCE OF THE BUILDING CONSTRUCTION.
3. CUTTING OF STRUCTURAL MEMBERS SHALL BE PROHIBITED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ARCHITECT OR STRUCTURAL ENGINEER.

**DEFINITIONS AND STANDARDS**

1. WORK SHALL BE PERFORMED BY SKILLED TRADESMEN IN THE FIELDS IN WHICH THEY REGULARLY PRACTICE.
2. MATERIALS AND EQUIPMENT SHALL BE NEW AND INSTALLED PER THE MANUFACTURERS INSTRUCTIONS.
3. THE TERM "PROVIDE" MEANS TO FURNISH, INSTALL, AND HOOK-UP ITEMS FULLY OPERATIONAL AND IN PLACE.
4. EQUIPMENT SHALL BE LEFT IN OPERATING CONDITION.

**QUALITY CONTROL**

1. CONTRACTORS SHALL COMPLETELY TEST ALL SYSTEMS AND EQUIPMENT, AND ALTER AS REQUIRED FOR PROPER OPERATION PRIOR TO PROJECT COMPLETION.
2. CONTRACTORS SHALL MAKE ALL NECESSARY PROVISIONS TO PERFORM THEIR WORK IN A MANNER WHICH WILL ASSURE THAT THE OPERATION OF THE BUILDING AND THE CONSTRUCTION SCHEDULE IS MINIMALLY IMPAIRED. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, DELIVERY OF SUPPLIES AND EQUIPMENT, TEMPORARY UTILITY CONNECTIONS, ETC.

**DAMAGE PROTECTION:**

1. THE ELECTRICAL CONTRACTOR SHALL CONSIDER THE WEATHERING OF EQUIPMENT OVER TIME AND ELIMINATE THE POSSIBILITY OF DEGRADATION DUE TO CORROSION, WATER ENTRY AND UV EXPOSURE. AS A RESULT, THE USE OF UNISTRUT OR SIMILAR MOUNTING SYSTEMS IS REQUIRED TO MOUNT ENCLOSURES, PULL BOXES, LOAD CENTERS, FUSE BOXES, OR OTHER EQUIPMENT.
2. ALL NEMA 4 BOXES SHALL BE EQUIPPED WITH LISTED DRAIN PLUGS TO ALLOW WATER TO DRAIN. ANY MODIFICATION TO AS-MANUFACTURED EQUIPMENT SHOULD BE DONE IN SUCH A WAY AS TO MAINTAIN ALL LISTED RATINGS.
3. ALL NEMA 3R BOXES SHALL BE EQUIPPED WITH A WEEP HOLE OR LISTED DRAIN PLUGS TO ALLOW WATER TO DRAIN.
4. ALL OUTDOOR ENCLOSURES REQUIRE AN APPROVED MEANS OF DRAINAGE AND VENTILATION.
5. ALL ELECTRICAL CONDUIT, EQUIPMENT AND COMPONENTS MUST BE ADEQUATELY PROTECTED FROM DAMAGE AND VANDALISM BY THE USE OF BOLLARDS, SHIELDS, GUARDS OR OTHER ACCEPTABLE MEANS.
6. ALL CIRCUIT BREAKERS INSTALLED THAT ARE SUBJECT TO REVERSE POWER FLOW SHALL BE LISTED AND LABELED AS BACKFEED COMPATIBLE.

**EQUIPMENT:**

1. EQUIPMENT AND COMPONENTS SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING LABORATORY (NRTL) SUCH AS UL OR ETL, WHERE SUCH LISTING IS AVAILABLE FOR THE APPLICATION.
2. PROVIDE DANGER, WARNING, AND CAUTION LABELS AS REQUIRED BY NESC, NEC OR OSHA STANDARDS ON EQUIPMENT ENCLOSURES, DOORS, ACCESS PLATES AND BARRIERS.
3. DOORS PROVIDING ACCESS TO PARTS NORMALLY ENERGIZED AT OVER 600V SHALL BE PADLOCKABLE CLOSED. REMOVABLE PANELS PROVIDING ACCESS TO PARTS NORMALLY ENERGIZED AT OVER 600V SHALL REQUIRE TOOLS FOR REMOVAL OR BE PADLOCKABLE CLOSED.
4. WHERE REQUIRED, EQUIPMENT SHALL BE ANCHORED TO CONCRETE PADS OR FOUNDATIONS PER MANUFACTURER'S INSTRUCTIONS USING GALVANIZED STEEL ANCHOR BOLTS EMBEDDED IN PAD OR WITH 6 INCH DEEP EPOXY ANCHOR BOLTS. ANCHOR BOLT SIZE PER MANUFACTURER RECOMMENDATION.
5. ALL OPENINGS INTO EQUIPMENT SHALL BE SEALED WITH GALVANIZED STEEL PLATE OR SCREEN TO PREVENT ENTRY OF INSECTS AND RODENTS.
6. CAULK ALONG BOTTOM PERIMETER OF EQUIPMENT MOUNTED ON CONCRETE PADS, OR TOP AND SIDE PERIMETERS OF WALL-MOUNTED EQUIPMENT, TO PREVENT WATER ENTRY BETWEEN ENCLOSURE AND MOUNTING SURFACE. MIXING OF NON-SHRINK GROUT AND CONCRETE REPAIR PRODUCT SHALL BE DONE AS PER MANUFACTURER'S RECOMMENDATION.
7. PROVIDE 12 INCHES OF CLASS 5 GRAVEL DRAINAGE BEDDING IN THE BOTTOM OF ALL BOTTOM CONDUIT ENTRIES TO OPEN CABLE COMPARTMENTS.
8. ALL CONDUCTORS SHALL ROUTED TO MAINTAIN ACCESS TO INDICATORS, VALVES, SAMPLE PORTS, SWITCHES, TAP CHANGES, FUSE WELLS, AND OTHER COMPONENTS AND ACCESSORIES REQUIRING OPERATOR ACCESS.



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SYSTEM SIZE:	14.88kW
SYSTEM MODEL TYPE:	CSUN 310-72P
TOTAL No. PANEL	48
PROJECT NO.	5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
  
1210 E. UNIVERSITY AVE.  
URBANA, IL

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DESIGNED BY:	DEW	03/10/17
DRAWN BY:	M. PARAYNO	03/10/17
REVIEWED BY:	ASAD BAJWA	03/10/17
SCALE:	NOT TO SCALE	

DRAWING TITLE:

**GENERAL NOTES**

DRAWING NUMBER:  
**GA-200**



# SolarEdge Single Phase Inverters For North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US / SE7600A-US / SE10000A-US / SE11400A-US



### The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Integrated arc fault protection for NEC 2011 690.11 compliance
- Rapid shutdown for NEC 2014 690.12
- Superior efficiency (98%)
- Small, lightweight and easy to install on provided bracket
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Outdoor and indoor installation
- Fixed voltage inverter, DC/AC conversion only
- Pre-assembled Safety Switch for faster installation
- Optional – revenue grade data, ANSI C12.1

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## Single Phase Inverters for North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US / SE7600A-US / SE10000A-US / SE11400A-US

	SE3000A-US	SE3800A-US	SE5000A-US	SE6000A-US	SE7600A-US	SE10000A-US	SE11400A-US		
<b>OUTPUT</b>									
Nominal AC Power Output	3000	3800	5000	6000	7600	9980 @ 208V 10000 @ 240V	11400	VA	
Max. AC Power Output	3300	4150	5400 @ 208V 5450 @ 240V	6000	8350	10800 @ 208V 10950 @ 240V	12000	VA	
AC Output Voltage Min.-Nom.-Max. <sup>(1)</sup> 183 - 208 - 229 Vac	-	-	✓	-	-	✓	-		
AC Output Voltage Min.-Nom.-Max. <sup>(1)</sup> 211 - 240 - 264 Vac	✓	✓	✓	✓	✓	✓	✓		
AC Frequency Min.-Nom.-Max. <sup>(1)</sup>	59.3 - 60 - 60.5							Hz	
Max. Continuous Output Current	12.5	16	24 @ 208V 21 @ 240V	25	32	48 @ 208V 42 @ 240V	47.5	A	
GFDI Threshold	1							A	
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							Yes	
<b>INPUT</b>									
Maximum DC Power (STC)	4050	5100	6750	8100	10250	13500	15350	W	
Transformer-less, Ungrounded	Yes								
Max. Input Voltage	500							Vdc	
Nom. DC Input Voltage	325 @ 208V / 350 @ 240V							Vdc	
Max. Input Current <sup>(2)</sup>	9.5	13	16.5 @ 208V 15.5 @ 240V	18	23	33 @ 208V 30.5 @ 240V	34.5	Adc	
Max. Input Short Circuit Current	45							Adc	
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600ka Sensitivity								
Maximum Inverter Efficiency	97.7	98.2	98.3	98.3	98	98	98	%	
CEC Weighted Efficiency	97.5	98	97 @ 208V 98 @ 240V	97.5	97.5	97 @ 208V 97.5 @ 240V	97.5	%	
Nighttime Power Consumption	< 2.5			< 4				W	
<b>ADDITIONAL FEATURES</b>									
Supported Communication Interfaces	RS485, RS232, Ethernet, ZigBee (optional)								
Revenue Grade Data, ANSI C12.1	Optional <sup>(3)</sup>								
Rapid Shutdown – NEC 2014 690.12	Yes								
<b>STANDARD COMPLIANCE</b>									
Safety	UL1741, UL1741 SA, UL1699B, UL1998, CSA 22.2								
Grid Connection Standards	IEEE1547								
Emissions	FCC part15 class B								
<b>INSTALLATION SPECIFICATIONS</b>									
AC output conduit size / AWG range	3/4" minimum / 16-6 AWG				3/4" minimum / 8-3 AWG				
DC input conduit size / # of strings / AWG range	3/4" minimum / 1-2 strings / 16-6 AWG				3/4" minimum / 1-3 strings / 14-6 AWG				
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 7.2 / 775 x 315 x 184				30.5 x 12.5 x 10.5 / 775 x 315 x 260				in / mm
Weight with Safety Switch	51.2 / 23.2		54.7 / 24.7		88.4 / 40.1			lb / kg	
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)		Fans (user replaceable)		
Noise	< 25				< 50				dBa
Min.-Max. Operating Temperature Range	-13 to +140 / -25 to +60 (-40 to +60 version available <sup>(4)</sup> )							°F / °C	
Protection Rating	NEMA 3R								

<sup>(1)</sup> For other regional settings please contact SolarEdge support.  
<sup>(2)</sup> A higher current source may be used; the inverter will limit its input current to the values stated.  
<sup>(3)</sup> Revenue grade inverter P/N: SExxxxA-US000NNR2 (for 7600W inverter:SE7600A-US002NNR2).  
<sup>(4)</sup> -40 version P/N: SExxxxA-US000NNU4 (for 7600W inverter:SE7600A-US002NNU4).



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SYSTEM SIZE: 14.88kW

SYSTEM MODEL TYPE: CSUN 310-72P

TOTAL No. PANEL 48

PROJECT NO. 5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
  
1210 E. UNIVERSITY AVE.  
URBANA, IL

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 DRAWN BY: M. PARAYNO 03/10/17  
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DRAWING TITLE:

VENDOR INFORMATION

DRAWING NUMBER:

Z-100



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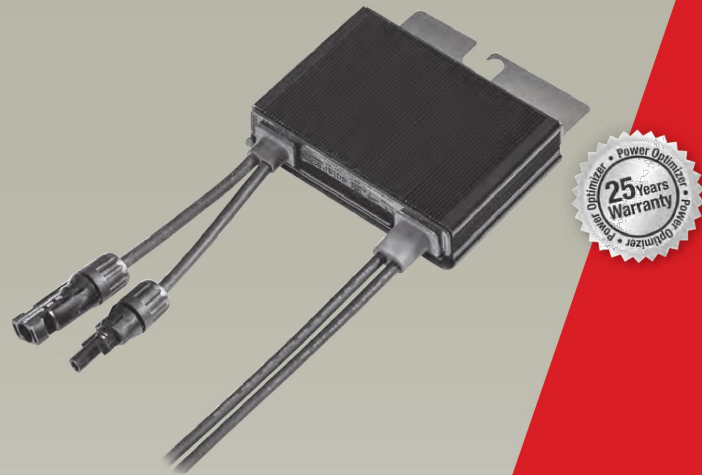




# SolarEdge Power Optimizer

## Module Add-On For North America

P300 / **P320** / P400 / P405



POWER OPTIMIZER

### PV power optimization at the module-level

- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety

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# SolarEdge Power Optimizer

## Module Add-On for North America

### P300 / P320 / P400 / P405

	P300 (for 60-cell modules)	P320 (for high-power 60-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)		
<b>INPUT</b>						
Rated Input DC Power <sup>(1)</sup>	300	320	400	405	W	
Absolute Maximum Input Voltage (Voc at lowest temperature)	48			80	125	Vdc
MPPT Operating Range	8 - 48		8 - 80	12.5 - 105		Vdc
Maximum Short Circuit Current (Isc)	10	11	10.1		Adc	
Maximum DC Input Current	12.5	13.75	12.63		Adc	
Maximum Efficiency	99.5				%	
Weighted Efficiency	98.8				%	
Overvoltage Category	II					
<b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)</b>						
Maximum Output Current	15				Adc	
Maximum Output Voltage	60			85	Vdc	
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)</b>						
Safety Output Voltage per Power Optimizer	1				Vdc	
<b>STANDARD COMPLIANCE</b>						
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety), UL1741					
RoHS	Yes					
<b>INSTALLATION SPECIFICATIONS</b>						
Maximum Allowed System Voltage	1000				Vdc	
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters					
Dimensions (W x L x H)	128 x 152 x 27.5 / 5 x 5.97 x 1.08	128 x 152 x 35 / 5 x 5.97 x 1.37	128 x 152 x 50 / 5 x 5.97 x 1.96		mm / in	
Weight (including cables)	630 / 1.4		750 / 1.7	845 / 1.9	gr / lb	
Input Connector	MC4 Compatible					
Output Wire Type / Connector	Double Insulated; MC4 Compatible					
Output Wire Length	0.95 / 3.0		1.2 / 3.9		m / ft	
Operating Temperature Range	-40 - +85 / -40 - +185				°C / °F	
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100				%	

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

PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER <sup>(1)</sup>	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	8	10	18	
Maximum String Length (Power Optimizers)	25	25	50	
Maximum Power per String	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations	Yes			

<sup>(1)</sup> It is not allowed to mix P405 with P300/P400/P600/P700 in one string.



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TOTAL No. PANEL	48
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DRAWN BY:	Ken Vojtk	03/10/17
REVIEWED BY:	Asad Bajwa	03/10/17
SCALE:	NOT TO SCALE	

DRAWING TITLE:

VENDOR  
INFORMATION

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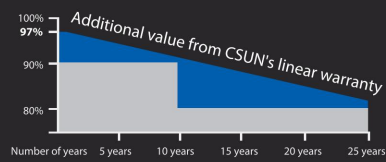
Poly

**Powerguard insurance global coverage**

Within the first year, the output power shall not be less than 97% of the minimum output power in CSUN's product datasheet, thereafter the loss of output power shall not exceed 0.7% per year, ending with 80.2% in the 25<sup>th</sup> year.

■ CSUN ■ Standard warranty

CSUN's NEW linear performance warranty



**CSUN310-72P**  
High-efficiency poly module

**WARATAH™**  
CSUN310-72P CSUN295-72P  
CSUN305-72P CSUN290-72P  
CSUN300-72P

**16.01%**  
Module efficiency

**310 W**  
Highest power output

**10 years**  
Material & workmanship warranty

**25 years**  
Linear power output warranty

- Innovative cell and module technology for highest efficiency
- Positive tolerance offer
- Unique 5 busbar design improves reliability of module performance
- Certified to withstand wind (2400 Pa) and snow load (5400 Pa)
- Resistance to salt mist & ammonia corrosion, blowing sand and hail
- Excellent performance under low light conditions
- Good temperature coefficient for better output in high temperature regions

- CSUN, established in 2004, is a high-tech corporation with its core business in R&D, manufacturing and sale of high-efficiency silicon based solar cells and modules.
- As one of the leading PV enterprises in the world, CSUN has delivered more than 1GW solar products to residential, commercial, utility and off-grid projects all around the world.
- Through strict selection of raw materials, stringent quality control and rigorous test in state of the art facilities in Istanbul, Nanjing and Shanghai, CSUN has always committed to higher efficiency, more stable and better cost performance products.

**WARATAH™** is the trade mark owned by CSUN. It's the brand name of polycrystalline solar modules produced by CSUN.

All information and data are subject to change without notice.



www.csun-solar.com



**Electrical characteristics at Standard Test Conditions (STC)**

Module	CSUN 310-72P	CSUN 305-72P	CSUN 300-72P	CSUN 295-72P	CSUN 290-72P
Maximum Power - P <sub>mp</sub> (W)	310	305	300	295	290
Positive power tolerance	0~3%	0~3%	0~3%	0~3%	0~3%
Open Circuit Voltage - Voc (V)	44.8	44.7	44.5	44.4	44.3
Short Circuit Current - Isc (A)	9.04	8.97	8.91	8.83	8.75
Maximum Power Voltage - V <sub>mp</sub> (V)	36.1	35.9	35.8	35.7	35.6
Maximum Power Current - I <sub>mp</sub> (A)	8.58	8.50	8.37	8.26	8.15
Module efficiency	16.01%	15.75%	15.49%	15.23%	14.98%

Electrical data relates to standard test conditions (STC): irradiance 1000W /m<sup>2</sup>; AM 1.5; cell temperature 25°C measuring uncertainty of power is within ±3%. Certified in accordance with IEC61215, IEC61730-1/2 and UL 1703

**Electrical Characteristics at Normal Operating Cell Temperature (NOCT)**

Module	CSUN 310-72P	CSUN 305-72P	CSUN 300-72P	CSUN 295-72P	CSUN 290-72P
Maximum Power - P <sub>mp</sub> (W)	228	225	220	217	213
Maximum Power Voltage - V <sub>mp</sub> (V)	33.4	33.2	32.9	32.5	32.3
Maximum Power Current - I <sub>mp</sub> (A)	6.83	6.77	6.71	6.67	6.59
Open Circuit Voltage - Voc (V)	41.4	41.3	41.1	41.0	40.8
Short Circuit Current - Isc (A)	7.29	7.24	7.19	7.01	6.95

Electrical data relates to normal operating cell temperature (NOCT): irradiance 800W /m<sup>2</sup>; wind speed 1 m/s; cell temperature 45°C; ambient temperature 20°C measuring uncertainty of power is within ±3%.

**Temperature Characteristics**

Voltage Temperature Coefficient	-0.292%/K
Current Temperature Coefficient	+0.045%/K
Power Temperature Coefficient	-0.408%/K

**Maximum Ratings**

Maximum system voltage (V)	1000
Series fuse rating (A)	20
Reverse current overload (A)	27

**Mechanical Characteristics**

Dimensions	1956 × 990 × 50 mm
Weight	23.8 kg
Frame	Anodized aluminum profile
Front glass	White toughened safety glass, 3.2 mm
Cell Encapsulation	EVA (Ethylene-Vinyl-Acetate)
Back Sheet	Composite film
Cells	6 × 12 pieces polycrystalline solar cells series strings (156 mm × 156 mm)
Junction Box	Rated current ≥ 12A, IP ≥ 65, TUV & UL
Cable	Length 900 mm, 1 × 4 mm <sup>2</sup>
Connector	MC 4/ compatible with MC 4

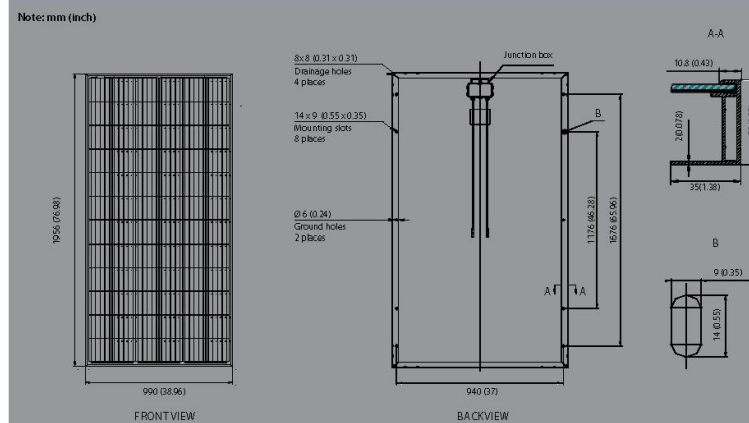
**Packaging**

Container 20'	200 pcs.
Container 40'	480 pcs.
Container 40'HC	516 pcs.

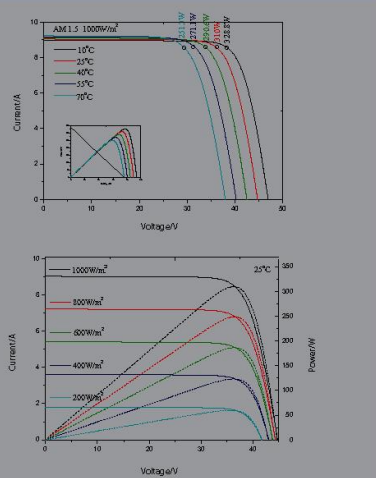
**System Design**

Temp. range	-40°C to + 85°C
Hail	max. diameter of 25mm with 23m/s impact speed
Max. capacity	Snow 5400 Pa, wind 2400 Pa
Application class	A
Safety class	II

**Dimensions**



**IV-Curves**



1057 SHORE ROAD  
NAPERVILLE, IL 60563

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DO NOT SCALE DRAWINGS.

SYSTEM SIZE:	14.88kW
SYSTEM MODEL TYPE:	CSUN 310-72P
TOTAL No. PANEL	48
PROJECT NO.	5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
**1210 E. UNIVERSITY AVE.**  
URBANA, IL

PROFESSIONAL CERTIFICATION HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS LICENSED STATE No.

REV	DESCRIPTION	DATE
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01	AS-BUILT	10/05/17

DESIGNED BY: DEW 03/10/17  
DRAWN BY: M. PARAYNO 03/10/17  
REVIEWED BY: ASAD BAJWA 03/10/17  
SCALE: NOT TO SCALE

DRAWING TITLE:

**VENDOR INFORMATION**

DRAWING NUMBER:  
**Z-120**



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SYSTEM SIZE:	14.88kW
SYSTEM MODEL TYPE:	CSUN 310-72P
TOTAL No. PANEL	48
PROJECT NO.	5001UC

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URBANA  
SOLAR GROUND MOUNT  
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DESIGN CRITERIA:  
FOR STRUCTURAL DESIGN INFORMATION AND APPLICABLE BUILDING CODES, REFERENCE ACCOMPANYING LETTER OF ACCEPTANCE AND CALCULATIONS.

LOADS:  
MODULE DEAD LOAD = MAX 3.0 PSF, MIN 1.75 PSF  
SNOW LOAD = SEE TABLE FOR SPECIFIC SNOW LOAD (Ss = 1.00, Cs = 1.20, Ce = 0.90, Cs = SEE TABLE)

WIND DESIGN:  
DESIGN BASED UPON WIND TUNNEL TEST REPORT # RC 11270611\_1e  
BASIC WIND SPEED = SEE TABLE FOR SPECIFIC WIND SPEED  
EXPOSURE C SEISMIC LOADS:  
RISK CATEGORY = II (ASCE 7-10) SEISMIC DESIGN CATEGORY: E  
W = 1.0 (ASCE 7-05) SOIL SITE CLASS = D  
Sds = 1.57 S01 = 1.0  
Ie = 1.0 Ss = 2.5  
S1 = 1.0 R = 1.25

INSTALLATION TOLERANCES:  
ARRAY TILT ANGULAR TOLERANCE ±1.0°  
LATERAL SUPPORT PLACEMENT IS ±2.5"  
SUPPORT HEIGHT VARIATION TOLERANCE IS ±0.5"  
TOTAL LATERAL DEVIATION OF SUPPORTS WITHIN AN ARRAY IS ±2.5"

GENERAL:  
1 THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OR SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACKING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERE TO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTION OF THESE ITEMS). THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF ALL SCAFFOLDING, BRACKING AND SHORING.  
2 WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA.

ALUMINUM:  
1 ALL ALUMINUM SHALL CONFORM WITH THE LATEST ALUMINUM DESIGN HANDBOOK.  
2 ALL ALUMINUM SECTIONS SHALL BE:  
a SEMI-HOLLOW AND HOLLOW SHALL BE 6105 15, 6005A-16, OR 6005-T5  
b SOLIDS SHALL BE 6063-T6

STEEL:  
1 ALL BOLTS AND WASHERS SHALL BE 304 STAINLESS STEEL CLASS 2 (A2-70).  
2 ALL NUTS SHALL BE 316 STAINLESS STEEL CLASS 2 (A4-70).

TORQUE:  
TORX BOLT FOR RAPID 2 - MODULE CLAMPS IS 14 N·M (10.5 FT-LBS)  
M6 AND 1/4" BOLT TORQUE IS 6 N·M (4.5 FT-LBS)  
M8 AND 3/8" BOLT TORQUE IS 14 N·M (10.5 FT-LBS)  
M10 AND 3/8" BOLT TORQUE IS 30 N·M (23 FT-LBS)  
M12 AND 1/2" BOLT TORQUE IS 50 N·M (37 FT-LBS)  
M16 AND 5/8" BOLT TORQUE IS 121 N·M (89 FT-LBS)  
M20 AND 3/4" BOLT TORQUE IS 244 N·M (180 FT-LBS)

MODULE SIZE:  
RACKING SYSTEM DESIGNED FOR MODULE SIZE: MINIMUM = 1900 X 970  
VERTICAL MODULE GAP: 23 mm MAXIMUM = 2000 X 1050  
HORIZONTAL MODULE GAP: 5 mm

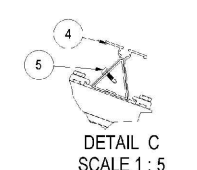
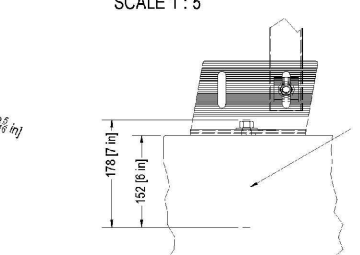
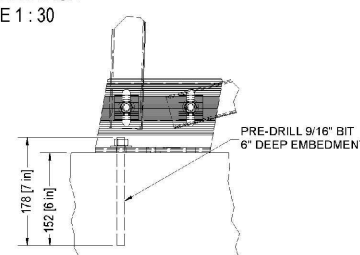
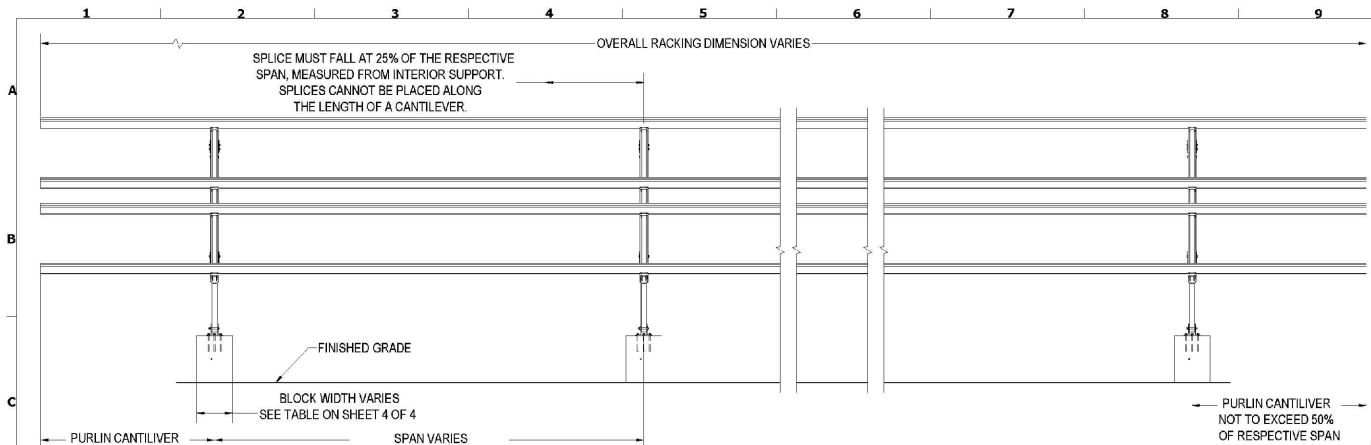
NOTE:  
1 MODULES MUST BE CENTERED ON ARRAY  
2 ARRAY LENGTH NOT TO EXCEED 150 FT  
3 RECOMMENDED SPEED FOR INSTALLATION OF SELF-DRILLING 1/4" DIAMETER SCREWS IS 1200-1800 RPMs.

FOUNDATIONS:  
1 NO SOILS REPORT PROVIDED. FOUNDATION DESIGN IS BASED ON MINIMUM IBC SOIL BEARING VALUE = 1500 PSF PER IBC TABLE 1804.2 (2003, 2006), & 1805.2 (2009, 2012, 2015). BALLAST BLOCKS SHALL BE BUILT ON UNDISTURBED SOIL OR COMPACTED FILL MATERIAL NOT LESS THAN 12" IN DEPTH.  
2 THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR ANY GEOTECHNICAL ASPECTS OF THIS PROJECT. IT IS RECOMMENDED THAT THE OWNER RETAIN A REGISTERED GEOTECHNICAL ENGINEER TO CONDUCT A GEOTECHNICAL INVESTIGATION AND PREPARE A REPORT WITH RECOMMENDATIONS FOR FOUNDATION AND EARTHWORK PROCEDURES.

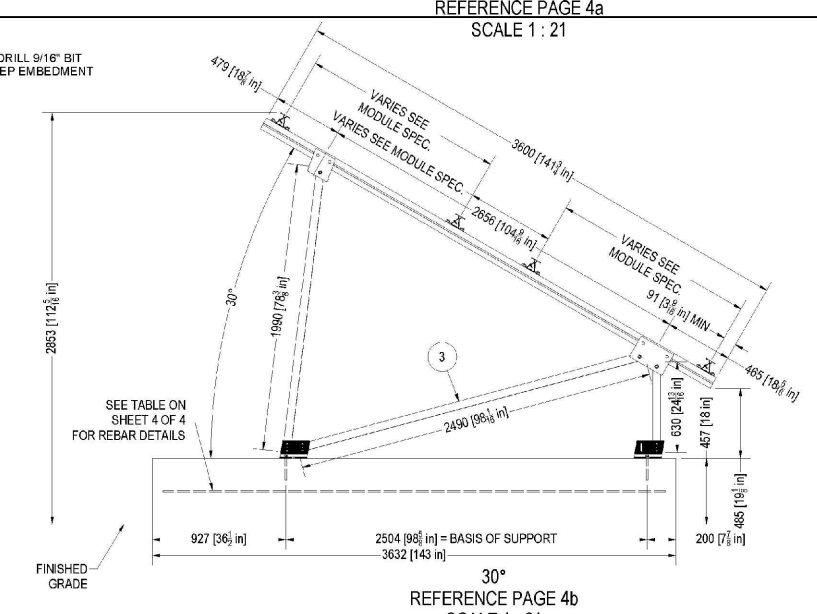
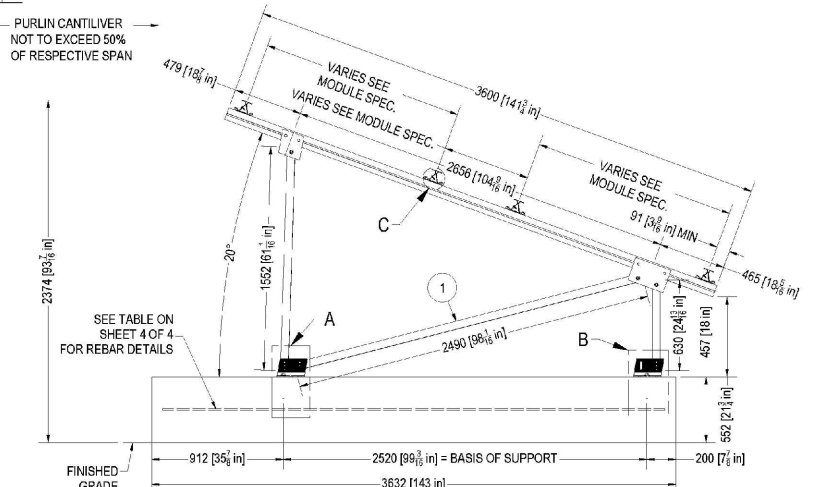
CONCRETE:  
1 ALL CONCRETE WORK SHALL CONFORM WITH THE REQUIREMENTS OF ACI 301 AND ACI 318 CEMENT PER ASTM C150, TYPE II. AGGREGATE PER ASTM C33. CONCRETE SHALL BE READY MIXED IN ACCORDANCE WITH ASTM C94 AND SHALL BE DESIGNED FOR A MINIMUM 28 DAY COMPRESSIVE STRENGTH AS FOLLOWS:  
FOUNDATIONS ..... 3,000 PSI\*  
\*DESIGNED FOR 2,500 PSI  
2 FIBER REINFORCEMENT USED IN CONCRETE SHALL BE BASF MASTERFIBER MAC 100 OR EQUIVALENT. THE AMOUNT TO BE MIXED IN CONCRETE IS 3L/BCU.YD

REINFORCING:  
1 REINFORCING STEEL SHALL CONFORM TO ASTM A615 (Fy=60ksi) DEFORMED BARS. NO TACK WELDING OF REINFORCING BARS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE WITH THE STRUCTURAL ENGINEER. LATEST ACI CODE AND DETAILING MANUAL APPLY.  
2 ACCURATELY PLACE OR SUPPORT ALL REINFORCING TO HAVE A CLEAR CONCRETE COVERAGE OF 3"

POST-INSTALLED ANCHORS:  
1 ADHESIVE BOLTS OR DOWELS SHALL BE A THREADED ROD OR REINFORCING STEEL INSTALLED WITH THE FOLLOWING APPROVED PRODUCT SATISFYING CRACKED CONCRETE REQUIREMENTS IN ACCORDANCE WITH ACI 318, APPENDIX D, SIMPSON 147 XP RAPID USES ER-253  
2 THE CONTRACTOR MAY NOT USE SUBSTITUTES FOR ADHESIVE ANCHORS WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.  
3 FOR MINIMUM EMBEDMENT LENGTH SEE DETAILS. INSTALL ALL BOLTS AS OUTLINED IN MANUFACTURER'S SPECIFICATIONS, UTILIZING PROPER SIZE AND TYPE OF DRILL, CLEANING HOLE, PLACING OF ADHESIVE, INSERTING AND TIGHTENING BOLT.  
4 PERIODIC INSPECTION OF POST-INSTALLED ANCHORS IS REQUIRED.



ITEM	PART NUMBER	DESCRIPTION
1	146002-320	Standard PvMax3, 72 Cell, 20°, Triangle
2	146002-325	Standard PvMax3, 72 Cell, 25°, Triangle
3	146002-330	Standard PvMax3, 72 Cell, 30°, Triangle
4	124303-001	Rail, S1.5, Custom
5	129303-000	Splice, S1.5, Kit



NO.	DRAWN:	CHECKED:	REVIEWED:	APPROVED:	REVISIONS:
0	BushBr 9/27/2014				New Drawing
1	BushBr 3/12/2015				Notes, embedments New Tables, and Sheets
2	BushBr 11/5/2015				Change Ballast Size, Max Dead Load, Add 2015
3	BushBr 11/18/2015				Change Ballast Size
4	VasqHu 09/01/2016				Updated Load Tables
5					
6					
7					
8					

Client:  
Schletter Inc  
2201 North Forbes Boulevard  
Tucson, AZ 85745

**SCHLETTER**  
1001 COMMERCE CENTER DR. | SHELBY, NC 28150  
TEL: (704) 595 - 4200 | Fax: (704) 595 - 4210  
EMAIL: MAIL@SCHLETTER.US  
WWW.SCHLETTER.US

Standard PvMax, 72 Cell, 20° - 30°  
Racking Structure  
Dimensions and Specifications

Project Site:  
Schletter Inc  
1001 Commerce Center Dr  
Shelby, NC 28150

ISSUED BY: SCHLETTER INC.  
PROPRIETARY AND CONFIDENTIAL

Drawing Number:  
**v.01**

JOB NUMBER: V  
SHEET: 1 of 4  
SCALE:  
SEE DRAWING VIEWS

REV	DESCRIPTION	DATE
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--	----	--
01	AS-BUILT	10/05/17

DESIGNED BY: DEW 03/10/17  
DRAWN BY: M. PARAYNO 03/10/17  
REVIEWED BY: ASAD BAJWA 03/10/17  
SCALE: NOT TO SCALE

DRAWING TITLE:  
**VENDOR INFORMATION**

DRAWING NUMBER:  
**Z-200**



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DO NOT SCALE DRAWINGS.

SYSTEM SIZE: 14.88kW

SYSTEM MODEL TYPE: CSUN 310-72P

TOTAL No. PANEL

48

PROJECT NO.

5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
1210 E. UNIVERSITY AVE.  
URBANA, IL

PROFESSIONAL CERTIFICATION HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS LICENSED STATE No

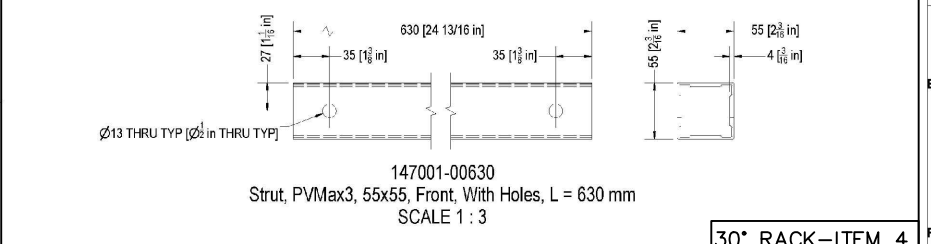
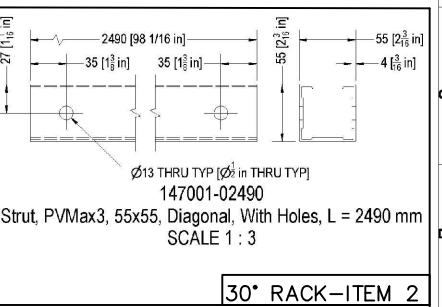
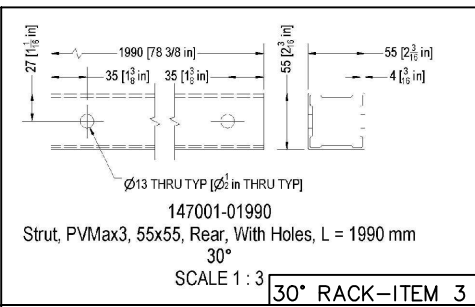
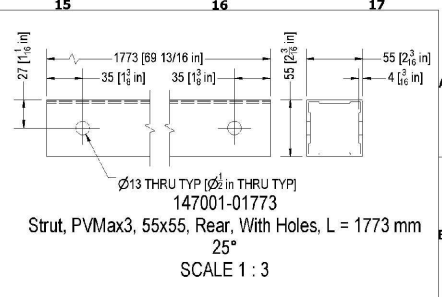
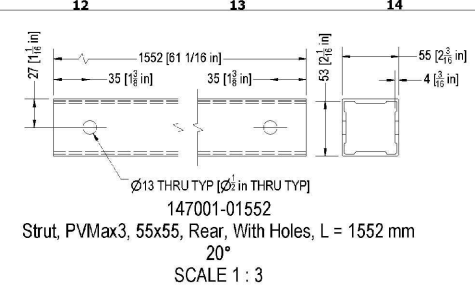
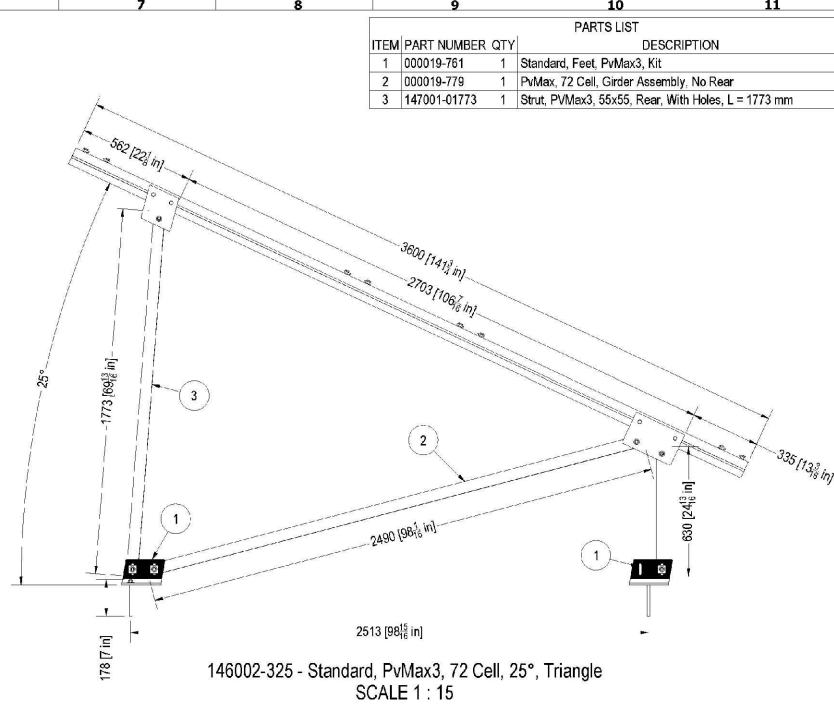
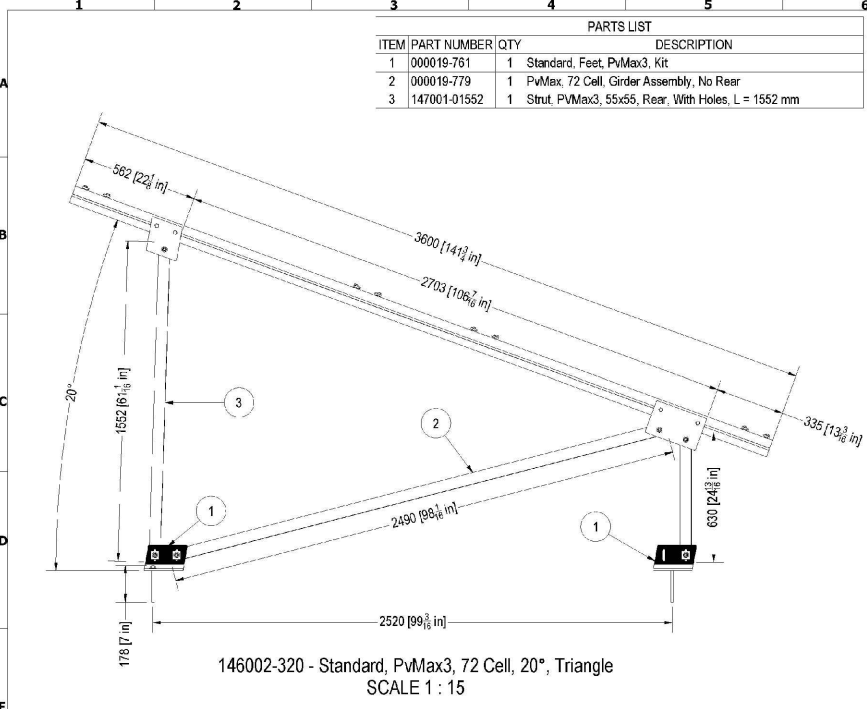
REV	DESCRIPTION	DATE
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01	AS-BUILT	10/05/17
DESIGNED BY: DEW		03/10/17
DRAWN BY: M. PARAYNO		03/10/17
REVIEWED BY: ASAD BAJWA		03/10/17
SCALE: NOT TO SCALE		

DRAWING TITLE:

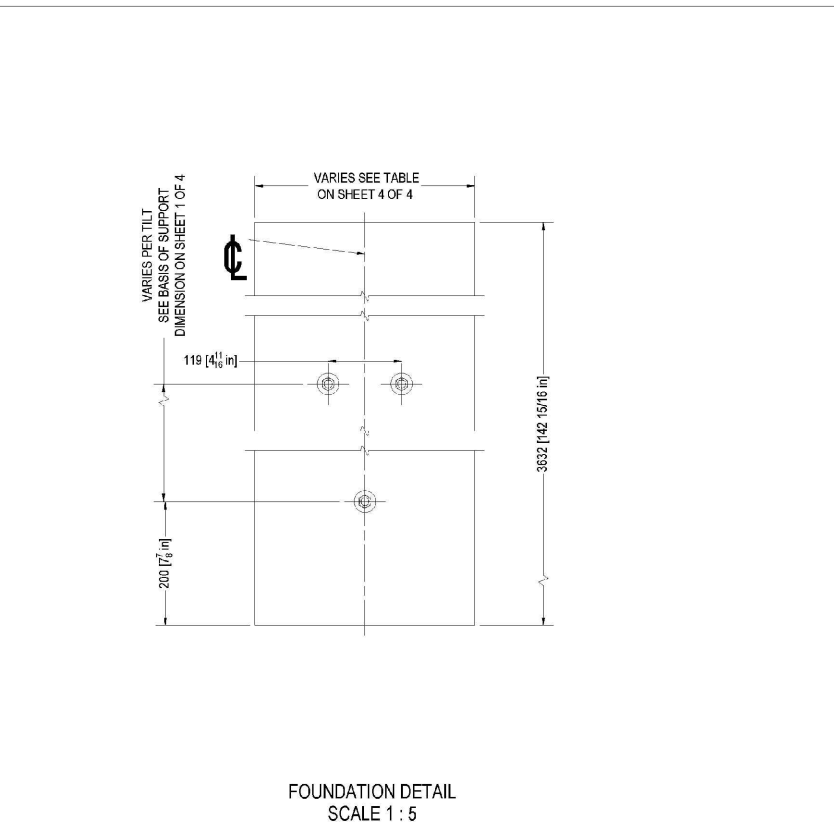
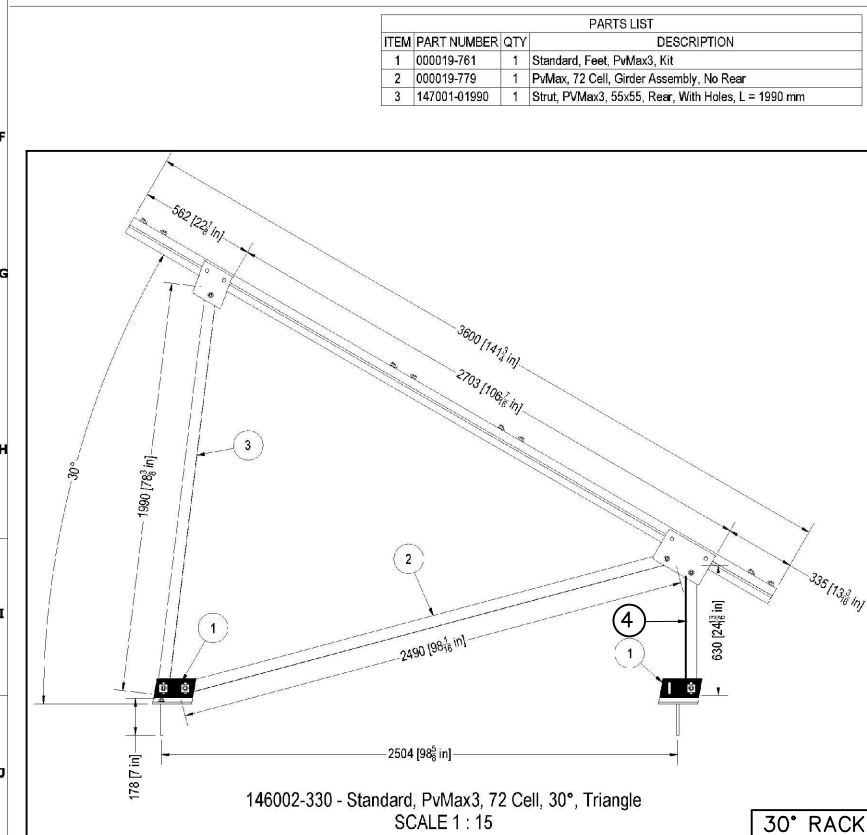
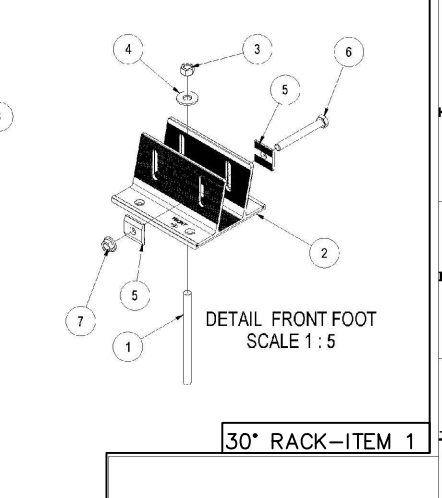
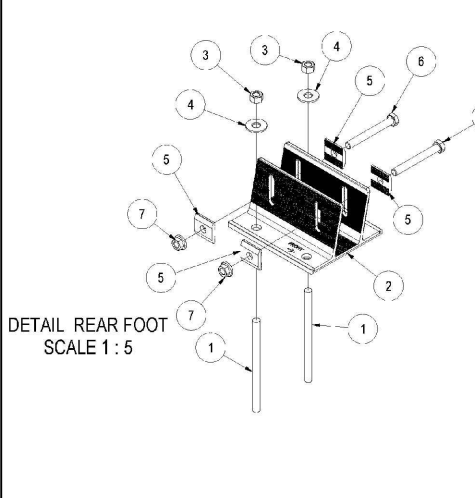
VENDOR  
INFORMATION

DRAWING NUMBER:

Z-201



ITEM	PART NUMBER	QTY	DESCRIPTION
1	119024-03178	3	Threaded Rod, 1/2in-13 UNC, 304 SS, Grade B8, L=178mm
2	147003-020	2	Base, PvMax3, Univ, 5 Holes, 2 Slots, Pre-Assembly
3	943919-122	3	Nut, 1/2" - 13 UNC, ASME-B18.2.2, 316 SS
4	943929-030	3	Washer, Flat, 1/2", ASME-B18.2.1 A-W, 304 SS
5	147005-000	6	Claw, Base, PvMax3
6	943612-100	3	Screw, Hex Head, M12x100mm, DIN 931, 304 SS
7	943912-012	3	Nut, Flange, Serrated, M12, DIN 6923, 316 SS



NO.	DRAWN:	CHECKED:	REVIEWED:	APPROVED:	REVISIONS:
0	BushDr	9/27/2014			New Drawing
1	BushDr	3/12/2015			Notes, embeddings New Tables, and Sheets
2	BushDr	11/5/2015			Change Ballast Size, Max Dead Load, Add 2015
3	BushDr	11/18/2015			Change Ballast Size
4	VasqHu	08/01/2016			Updated Load Tables
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Client:  
**Schletter Inc**  
2201 North Forbes Boulevard  
Tucson, AZ 85745

1001 COMMERCE CENTER DR. | SHELBY, NC 28150  
TEL: (704) 595 - 4200 | Fax: (704) 595 - 4210  
EMAIL: MAIL@SCHLETTER.US  
WWW.SCHLETTER.US

Standard PvMax, 72 Cell, 20° - 30°  
Racking Structure  
Details and Parts List

ISSUED BY: SCHLETTER INC.  
PROPRIETARY AND CONFIDENTIAL

Project Site:  
**Schletter Inc**  
1001 Commerce Center Dr  
Shelby, NC 28150

Drawing Number:  
**v.01**

JOB NUMBER: V  
SHEET: 2 of 4

SCALE:  
SEE DRAWING VIEWS

NO.	DRAWN:	CHECKED:	REVIEWED:	APPROVED:	REVISIONS:
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NAPERVILLE, IL 60563

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SYSTEM SIZE: 14.88kW

SYSTEM MODEL TYPE: CSUN 310-72P

TOTAL No. PANEL: 48

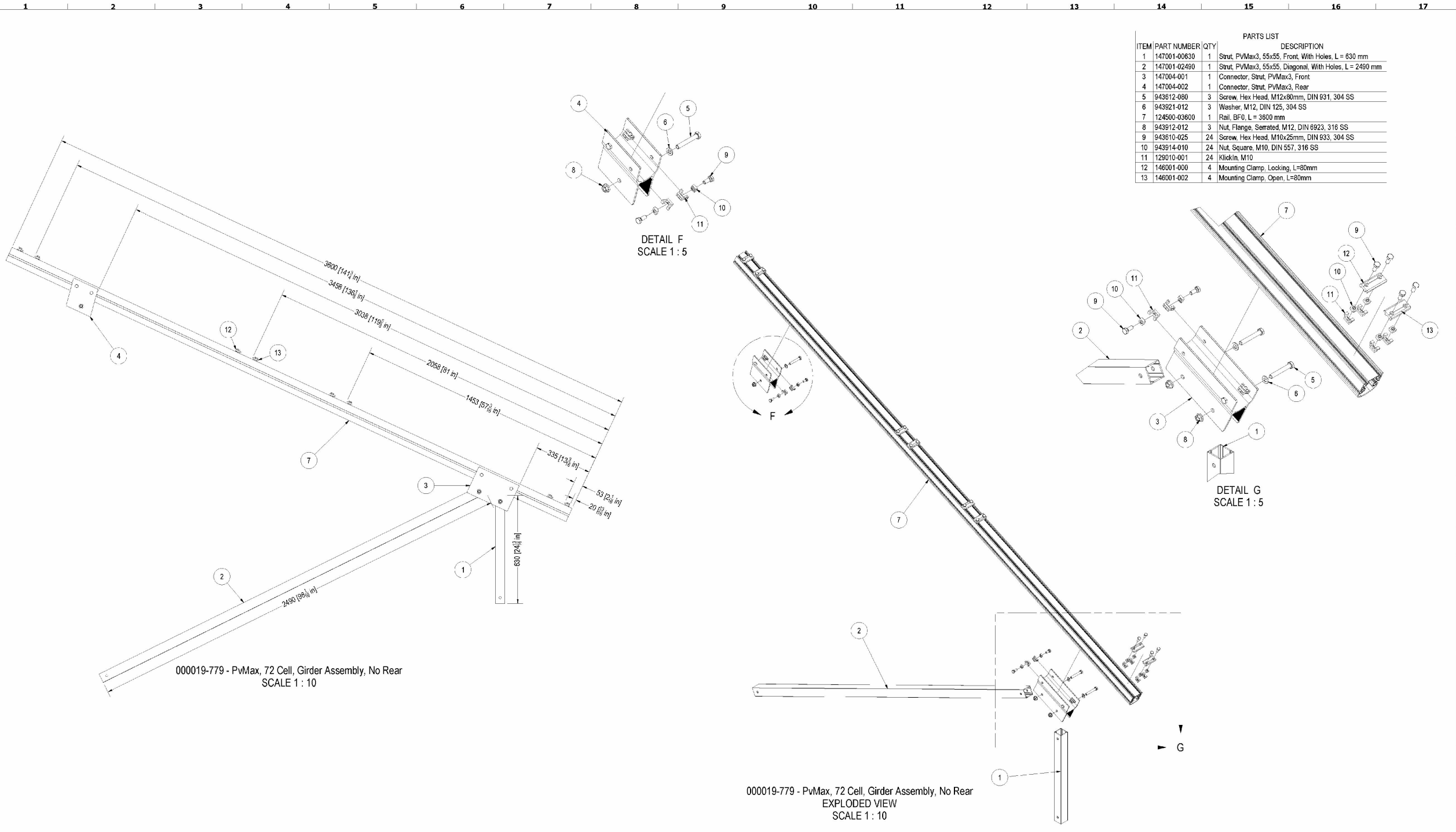
PROJECT NO. 5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
**1210 E. UNIVERSITY AVE.**  
URBANA, IL

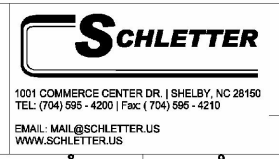
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ITEM	PART NUMBER	QTY	DESCRIPTION
1	147001-00630	1	Strut, PvMax3, 55x55, Front, With Holes, L = 630 mm
2	147001-02490	1	Strut, PvMax3, 55x55, Diagonal, With Holes, L = 2490 mm
3	147004-001	1	Connector, Strut, PvMax3, Front
4	147004-002	1	Connector, Strut, PvMax3, Rear
5	943912-080	3	Screw, Hex Head, M12x80mm, DIN 931, 304 SS
6	943921-012	3	Washer, M12, DIN 125, 304 SS
7	124500-03600	1	Rail, BF0, L = 3600 mm
8	943912-012	3	Nut, Flange, Serrated, M12, DIN 6923, 316 SS
9	943910-025	24	Screw, Hex Head, M10x25mm, DIN 933, 304 SS
10	943914-010	24	Nut, Square, M10, DIN 557, 316 SS
11	129010-001	24	Klickin, M10
12	146001-000	4	Mounting Clamp, Locking, L=80mm
13	146001-002	4	Mounting Clamp, Open, L=80mm



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Client:  
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2201 North Forbes Boulevard  
Tucson, AZ 85745



Standard PvMax, 72 Cell, 20° - 30°  
Racking Structure  
Details and Parts List

Project Site:  
**Schletter Inc**  
1001 Commerce Center Dr  
Shelby, NC 28150

Drawing Number:  
**v.01**

JOB NUMBER: V  
SHEET: 3 of 4

SCALE:  
SEE DRAWING VIEWS

REV	DESCRIPTION	DATE
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DESIGNED BY: DEW 03/10/17  
DRAWN BY: M. PARAYNO 03/10/17  
REVIEWED BY: ASAD BAJWA 03/10/17  
SCALE: NOT TO SCALE

DRAWING TITLE:  
**VENDOR INFORMATION**

DRAWING NUMBER:  
**Z-202**



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NAPERVILLE, IL 60563

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DO NOT SCALE DRAWINGS.

SYSTEM SIZE: 14.88kW

SYSTEM MODEL TYPE: CSUN 310-72P

TOTAL No. PANEL 48

PROJECT NO. 5001UC

PROJECT NAME AND ADDRESS:

URBANA  
SOLAR GROUND MOUNT  
1210 E. UNIVERSITY AVE.  
URBANA, IL

PROFESSIONAL CERTIFICATION HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS  
LICENSED STATE No

REV	DESCRIPTION	DATE
--	----	--
01	AS-BUILT	10/05/17

DESIGNED BY: DEW 03/10/17  
DRAWN BY: M. PARAYNO 03/10/17  
REVIEWED BY: ASAD BAJWA 03/10/17  
SCALE: NOT TO SCALE

DRAWING TITLE:

VENDOR  
INFORMATION

DRAWING NUMBER:

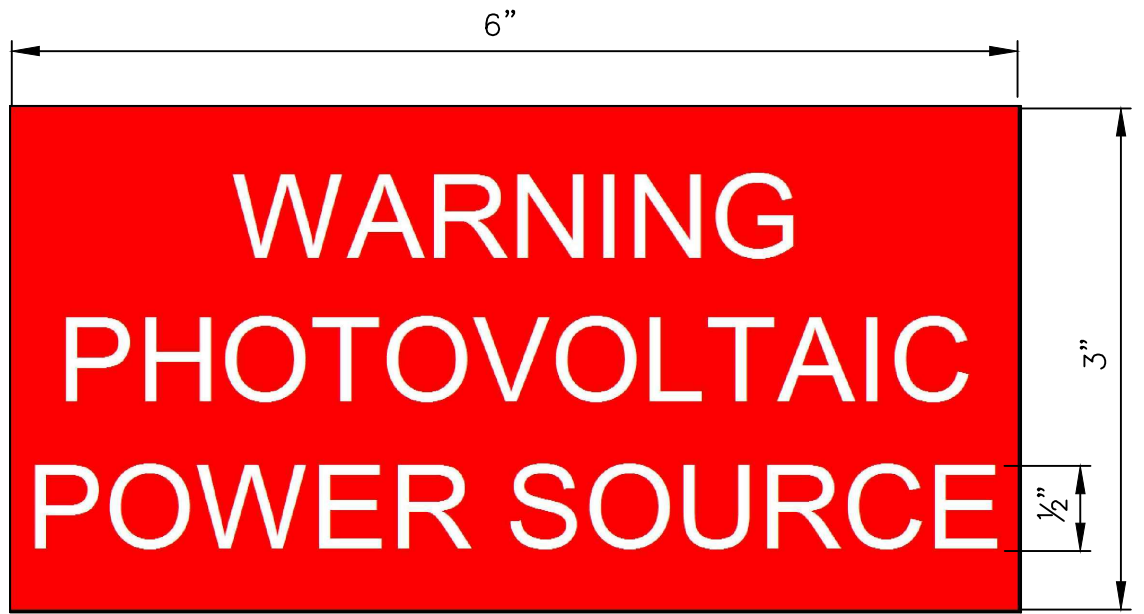
Z-203

Tilt	Cs
15°	1.00
20°	0.91
25°	0.82
30°	0.73
35°	0.64

TILT	MAX WIND	ASCE 7-05									
		GROUND SNOW	ROOF SNOW	MAX SPAN	FRONT CONNECTION			REAR CONNECTION			BALLAST WIDTH
85 MPH	0 PSF	0.00 PSF	12.00 FT	0.09 KIP	2.64 KIP	0.01 KIP	6.17 KIP	4.42 KIP	3.87 KIP	3.1 IN	(2) #5
	10 PSF	5.50 PSF	12.00 FT	0.09 KIP	2.92 KIP	0.02 KIP	6.17 KIP	4.71 KIP	3.87 KIP	3.1 IN	(2) #5
	20 PSF	11.00 PSF	11.50 FT	0.09 KIP	3.28 KIP	0.02 KIP	5.91 KIP	4.79 KIP	3.70 KIP	3.0 IN	(2) #5
	30 PSF	16.49 PSF	10.00 FT	0.07 KIP	3.62 KIP	0.02 KIP	5.11 KIP	4.39 KIP	3.20 KIP	2.6 IN	(2) #5
	40 PSF	21.98 PSF	9.25 FT	0.07 KIP	4.06 KIP	0.03 KIP	4.71 KIP	4.73 KIP	2.95 KIP	2.4 IN	(2) #5
	50 PSF	27.48 PSF	8.50 FT	0.06 KIP	4.38 KIP	0.03 KIP	4.31 KIP	4.97 KIP	2.70 KIP	2.2 IN	(1) #5
90 MPH	0 PSF	0.00 PSF	11.25 FT	0.13 KIP	2.71 KIP	0.01 KIP	6.50 KIP	4.58 KIP	4.06 KIP	3.3 IN	(2) #5
	10 PSF	5.50 PSF	11.25 FT	0.13 KIP	2.98 KIP	0.01 KIP	6.50 KIP	4.85 KIP	4.06 KIP	3.3 IN	(2) #5
	20 PSF	11.00 PSF	10.75 FT	0.12 KIP	3.18 KIP	0.02 KIP	6.20 KIP	4.89 KIP	3.88 KIP	3.1 IN	(2) #5
	30 PSF	16.49 PSF	10.00 FT	0.11 KIP	3.73 KIP	0.02 KIP	5.75 KIP	4.78 KIP	3.60 KIP	2.9 IN	(2) #5
	40 PSF	21.98 PSF	9.00 FT	0.10 KIP	4.04 KIP	0.02 KIP	5.15 KIP	4.76 KIP	3.22 KIP	2.6 IN	(2) #5
	50 PSF	27.48 PSF	8.25 FT	0.09 KIP	4.34 KIP	0.03 KIP	4.70 KIP	4.97 KIP	2.93 KIP	2.4 IN	(2) #5
100 MPH	0 PSF	0.00 PSF	9.75 FT	0.18 KIP	2.79 KIP	0.00 KIP	6.97 KIP	4.77 KIP	4.33 KIP	3.5 IN	(2) #5
	10 PSF	5.50 PSF	9.50 FT	0.18 KIP	2.95 KIP	0.01 KIP	6.78 KIP	4.87 KIP	4.21 KIP	3.4 IN	(2) #5
	20 PSF	11.00 PSF	9.25 FT	0.17 KIP	3.09 KIP	0.01 KIP	6.59 KIP	4.96 KIP	4.10 KIP	3.3 IN	(2) #5
	30 PSF	16.49 PSF	8.75 FT	0.16 KIP	3.46 KIP	0.01 KIP	6.22 KIP	4.89 KIP	3.86 KIP	3.2 IN	(2) #5
	40 PSF	21.98 PSF	8.50 FT	0.16 KIP	4.01 KIP	0.02 KIP	6.03 KIP	4.94 KIP	3.74 KIP	3.1 IN	(2) #5
	50 PSF	27.48 PSF	7.75 FT	0.14 KIP	4.25 KIP	0.02 KIP	5.47 KIP	4.97 KIP	3.39 KIP	2.8 IN	(2) #5
110 MPH	0 PSF	0.00 PSF	8.00 FT	0.21 KIP	2.69 KIP	0.00 KIP	6.88 KIP	4.61 KIP	4.25 KIP	3.5 IN	(2) #5
	10 PSF	5.50 PSF	8.00 FT	0.21 KIP	2.88 KIP	0.01 KIP	6.88 KIP	4.80 KIP	4.25 KIP	3.5 IN	(2) #5
	20 PSF	11.00 PSF	8.00 FT	0.21 KIP	3.07 KIP	0.01 KIP	6.88 KIP	4.99 KIP	4.25 KIP	3.5 IN	(2) #5
	30 PSF	16.49 PSF	7.75 FT	0.21 KIP	3.26 KIP	0.01 KIP	6.65 KIP	5.00 KIP	4.11 KIP	3.4 IN	(2) #5
	40 PSF	21.98 PSF	7.50 FT	0.20 KIP	3.73 KIP	0.02 KIP	6.42 KIP	5.01 KIP	3.96 KIP	3.3 IN	(2) #5
	50 PSF	27.48 PSF	7.50 FT	0.20 KIP	4.30 KIP	0.02 KIP	6.42 KIP	5.18 KIP	3.96 KIP	3.3 IN	(2) #5
120 MPH	0 PSF	0.00 PSF	6.75 FT	0.24 KIP	2.63 KIP	0.00 KIP	6.84 KIP	4.51 KIP	4.20 KIP	3.6 IN	(3) #5
	10 PSF	5.50 PSF	6.75 FT	0.24 KIP	2.79 KIP	0.00 KIP	6.84 KIP	4.60 KIP	4.20 KIP	3.6 IN	(3) #5
	20 PSF	11.00 PSF	6.75 FT	0.24 KIP	2.95 KIP	0.01 KIP	6.84 KIP	4.82 KIP	4.20 KIP	3.6 IN	(3) #5
	30 PSF	16.49 PSF	6.75 FT	0.24 KIP	3.11 KIP	0.01 KIP	6.84 KIP	4.98 KIP	4.20 KIP	3.6 IN	(3) #5
	40 PSF	21.98 PSF	6.75 FT	0.24 KIP	3.53 KIP	0.01 KIP	6.84 KIP	5.13 KIP	4.20 KIP	3.6 IN	(3) #5
	50 PSF	27.48 PSF	6.50 FT	0.23 KIP	3.90 KIP	0.01 KIP	6.56 KIP	5.07 KIP	4.03 KIP	3.5 IN	(2) #5
130 MPH	0 PSF	0.00 PSF	6.00 FT	0.28 KIP	2.68 KIP	0.00 KIP	7.06 KIP	4.59 KIP	4.32 KIP	3.8 IN	(3) #5
	10 PSF	5.50 PSF	6.00 FT	0.28 KIP	2.82 KIP	0.00 KIP	7.06 KIP	4.73 KIP	4.32 KIP	3.8 IN	(3) #5
	20 PSF	11.00 PSF	6.00 FT	0.28 KIP	2.97 KIP	0.01 KIP	7.06 KIP	4.86 KIP	4.32 KIP	3.8 IN	(3) #5
	30 PSF	16.49 PSF	6.00 FT	0.28 KIP	3.11 KIP	0.01 KIP	7.06 KIP	5.00 KIP	4.32 KIP	3.8 IN	(3) #5
	40 PSF	21.98 PSF	6.00 FT	0.28 KIP	3.31 KIP	0.01 KIP	7.06 KIP	5.14 KIP	4.32 KIP	3.8 IN	(3) #5
	50 PSF	27.48 PSF	6.00 FT	0.28 KIP	3.77 KIP	0.01 KIP	7.06 KIP	5.28 KIP	4.32 KIP	3.8 IN	(3) #5

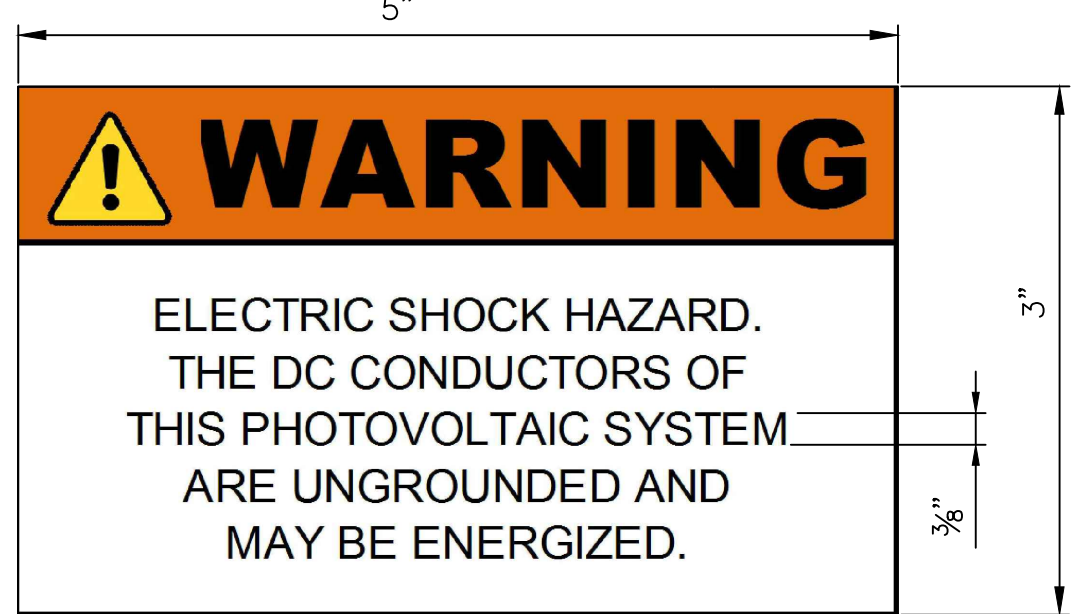
TILT	MAX WIND	ASCE 7-05 W SEISMIC DESIGN										
		GROUND SNOW	ROOF SNOW	MAX SPAN	FRONT CONNECTION			REAR CONNECTION			BALLAST WIDTH	# OF REBAR
85 MPH	0 PSF	0.00 PSF	11.50 FT	0.09 KIP	2.53 KIP	0.49 KIP	5.91 KIP	4.23 KIP	3.70 KIP	3.0 IN	(2) #5	
	10 PSF	5.50 PSF	11.50 FT	0.09 KIP	2.80 KIP	0.49 KIP	5.91 KIP	4.51 KIP	3.70 KIP	3.0 IN	(2) #5	
	20 PSF	11.00 PSF	11.50 FT	0.09 KIP	3.28 KIP	0.49 KIP	5.91 KIP	4.79 KIP	3.70 KIP	3.0 IN	(2) #5	
	30 PSF	16.49 PSF	10.00 FT	0.07 KIP	3.62 KIP	0.44 KIP	5.11 KIP	4.39 KIP	3.20 KIP	2.6 IN	(2) #5	
	40 PSF	21.98 PSF	9.25 FT	0.07 KIP	4.06 KIP	0.47 KIP	4.71 KIP	4.73 KIP	2.95 KIP	2.4 IN	(2) #5	
	50 PSF	27.48 PSF	8.50 FT	0.06 KIP	4.38 KIP	0.47 KIP	4.31 KIP	4.97 KIP	2.70 KIP	2.2 IN	(1) #5	
90 MPH	0 PSF	0.00 PSF	11.25 FT	0.13 KIP	2.71 KIP	0.48 KIP	6.50 KIP	4.58 KIP	4.06 KIP	3.3 IN	(2) #5	
	10 PSF	5.50 PSF	11.25 FT	0.13 KIP	2.98 KIP	0.48 KIP	6.50 KIP	4.85 KIP	4.06 KIP	3.3 IN	(2) #5	
	20 PSF	11.00 PSF	10.75 FT	0.12 KIP	3.18 KIP	0.46 KIP	6.20 KIP	4.89 KIP	3.88 KIP	3.1 IN	(2) #5	
	30 PSF	16.49 PSF	10.00 FT	0.11 KIP	3.73 KIP	0.44 KIP	5.75 KIP	4.78 KIP	3.60 KIP	2.9 IN	(2) #5	
	40 PSF	21.98 PSF	9.00 FT	0.10 KIP	4.04 KIP	0.47 KIP	5.15 KIP	4.76 KIP	3.22 KIP	2.6 IN	(2) #5	
	50 PSF	27.48 PSF	8.25 FT	0.09 KIP	4.34 KIP	0.47 KIP	4.70 KIP	4.97 KIP	2.93 KIP	2.4 IN	(2) #5	
100 MPH	0 PSF	0.00 PSF	9.75 FT	0.18 KIP	2.79 KIP	0.42 KIP	6.97 KIP	4.77 KIP	4.33 KIP	3.5 IN	(2) #5	
	10 PSF	5.50 PSF	9.50 FT	0.18 KIP	2.95 KIP	0.41 KIP	6.78 KIP	4.87 KIP	4.21 KIP	3.4 IN	(2) #5	
	20 PSF	11.00 PSF	9.25 FT	0.17 KIP	3.09 KIP	0.41 KIP	6.59 KIP	4.96 KIP	4.10 KIP	3.3 IN	(2) #5	
	30 PSF	16.49 PSF	8.75 FT	0.16 KIP	3.46 KIP	0.39 KIP	6.22 KIP	4.89 KIP	3.86 KIP	3.2 IN	(2) #5	
	40 PSF	21.98 PSF	8.50 FT	0.16 KIP	4.01 KIP	0.42 KIP	6.03 KIP	4.94 KIP	3.74 KIP	3.1 IN	(2) #5	
	50 PSF	27.48 PSF	7.75 FT	0.14 KIP	4.25 KIP	0.42 KIP	5.47 KIP	4.97 KIP	3.39 KIP	2.8 IN	(2) #5	
110 MPH	0 PSF	0.00 PSF	8.00 FT	0.21 KIP	2.69 KIP	0.36 KIP	6.88 KIP	4.61 KIP	4.25 KIP	3.5 IN	(2) #5	
	10 PSF	5.50 PSF	8.00 FT	0.21 KIP	2.88 KIP	0.36 KIP	6.88 KIP	4.80 KIP	4.25 KIP	3.5 IN	(2) #5	
	20 PSF	11.00 PSF	8.00 FT	0.21 KIP	3.07 KIP	0.36 KIP	6.88 KIP	4.99 KIP	4.25 KIP	3.5 IN	(2) #5	
	30 PSF	16.49 PSF	7.75 FT	0.21 KIP	3.26 KIP	0.35 KIP	6.65 KIP	5.00 KIP	4.11 KIP	3.4 IN	(2) #5	
	40 PSF	21.98 PSF	7.50 FT	0.20 KIP	3.73 KIP	0.37 KIP	6.42 KIP	5.01 KIP	3.73 KIP	2.94 KIP	2.6 IN	(2) #5
	50 PSF	27.48 PSF	7.50 FT	0.20 KIP	4.30 KIP	0.37 KIP	6.42 KIP	5.18 KIP	3.96 KIP	3.3 IN	(2) #5	
120 MPH	0 PSF	0.00 PSF	6.75 FT	0.24 KIP	2.63 KIP	0.31 KIP	6.84 KIP	4.51 KIP	4.20 KIP	3.6 IN	(3) #5	
	10 PSF	5.50 PSF	6.75 FT	0.24 KIP	2.79 KIP	0.31 KIP	6.84 KIP	4.60 KIP	4.20 KIP	3.6 IN	(3) #5	
	20 PSF	11.00 PSF	6.75 FT	0.24 KIP	2.95 KIP	0.31 KIP	6.84 KIP	4.82 KIP	4.20 KIP	3.6 IN	(3) #5	
	30 PSF	16.49 PSF	6.75 FT	0.24 KIP	3.11 KIP	0.31 KIP	6.84 KIP	4.98 KIP	4.20 KIP	3.6 IN	(3) #5	
	40 PSF	21.98 PSF	6.75 FT	0.24 KIP	3.53 KIP	0.31 KIP	6.84 KIP	5.13 KIP	4.20 KIP	3.6 IN	(3) #5	
	50 PSF	27.48 PSF	6.50 FT	0.23 KIP	3.90 KIP	0.31 KIP	6.56 KIP	5.07 KIP	4.03 KIP	3.5 IN	(2) #5	
130 MPH	0 PSF	0.00 PSF	6.00 FT	0.28 KIP	2.68 KIP	0.28 KIP	7.06 KIP	4.59 KIP	4.32 KIP	3.8 IN	(3) #5	
	10 PSF	5.50 PSF	6.00 FT	0.28 KIP	2.82 KIP	0.28 KIP	7.06 KIP	4.73 KIP	4.32 KIP	3.8 IN	(3) #5	
	20 PSF	11.00 PSF	6.00 FT	0.28 KIP	2.97 KIP	0.28 KIP	7.06 KIP	4.86 KIP	4.32 KIP	3.8 IN	(3) #5	
	30 PSF	16.49 PSF	6.00 FT	0.28 KIP	3.11 KIP	0.28 KIP	7.06 KIP	5.00 KIP	4.32 KIP	3.8 IN	(3) #5	
	40 PSF	21.98 PSF	6.00 FT	0.28 KIP	3.31 KIP	0.28 KIP	7.06 KIP	5.14 KIP	4.32 KIP	3.8 IN	(3) #5	
	50 PSF	27.48 PSF	6.00 FT	0.28 KIP	3.77 KIP	0.28 KIP	7.06 KIP	5.28 KIP	4.32 KIP	3.8 IN	(3) #5	

TILT	MAX WIND	ASCE 7-10									
		GROUND SNOW	ROOF SNOW	MAX SPAN	FRONT CONNECTION			REAR CONNECTION			BALLAST WIDTH
110 MPH	0 PSF	0.00 PSF	11.75 FT	0.11 KIP	2.68 KIP	0.01 KIP	6.33 KIP	4.51 KIP	3.97 KIP	3.1 IN	(2) #5
	10 PSF	5.50 PSF	11.75 FT	0.11 KIP	2.96 KIP	0.01 KIP	6.33 KIP	4.79 KIP	3.97 KIP	3.1 IN	(2) #5
	20 PSF	11.00 PSF	11.25 FT	0.10 KIP	3.26 KIP	0.02 KIP	6.06 KIP	4.85 KIP	3.79 KIP	2.9 IN	(2) #5
	30 PSF	16.49 PSF	10.00 FT	0.09 KIP	3.66 KIP	0.02 KIP	5.36 KIP	4.54 KIP	3.35 KIP	2.6 IN	(2) #5
	40 PSF	21.98 PSF	9.00 FT	0.08 KIP	3.99 KIP	0.02 KIP	4.80 KIP	4.66 KIP	3.00 KIP	2.3 IN	(1) #5
	50 PSF	27.48 PSF	8.50 FT	0.07 KIP	4.41 KIP	0.03 KIP	4.52 KIP	5.03 KIP	2.83 KIP	2.2 IN	(1) #5
115 MPH	0 PSF	0.00 PSF									



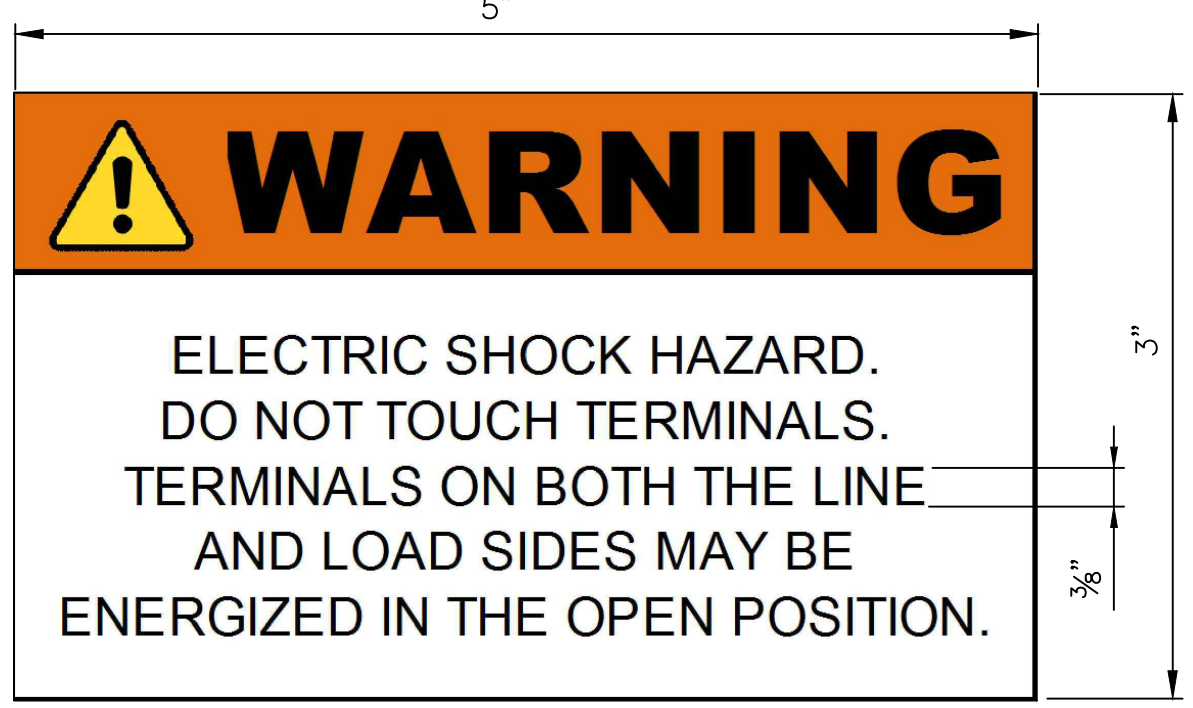
LOCATION:  
 LABEL SHALL BE PLACED ON (A) ENCLOSURES, PULLBOXES, JUNCTION BOXES, (B) EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS, AND (C) ON CONDUIT BODIES IN WHICH ANY AVAILABLE CONDUIT OPENINGS ARE UNUSED, THAT CONTAIN DC PV SOURCE CONDUCTORS. SPACING SHALL NOT EXCEED 10 FT.

APPEARANCE:  
 WHITE TEXT ON RED BACKGROUND



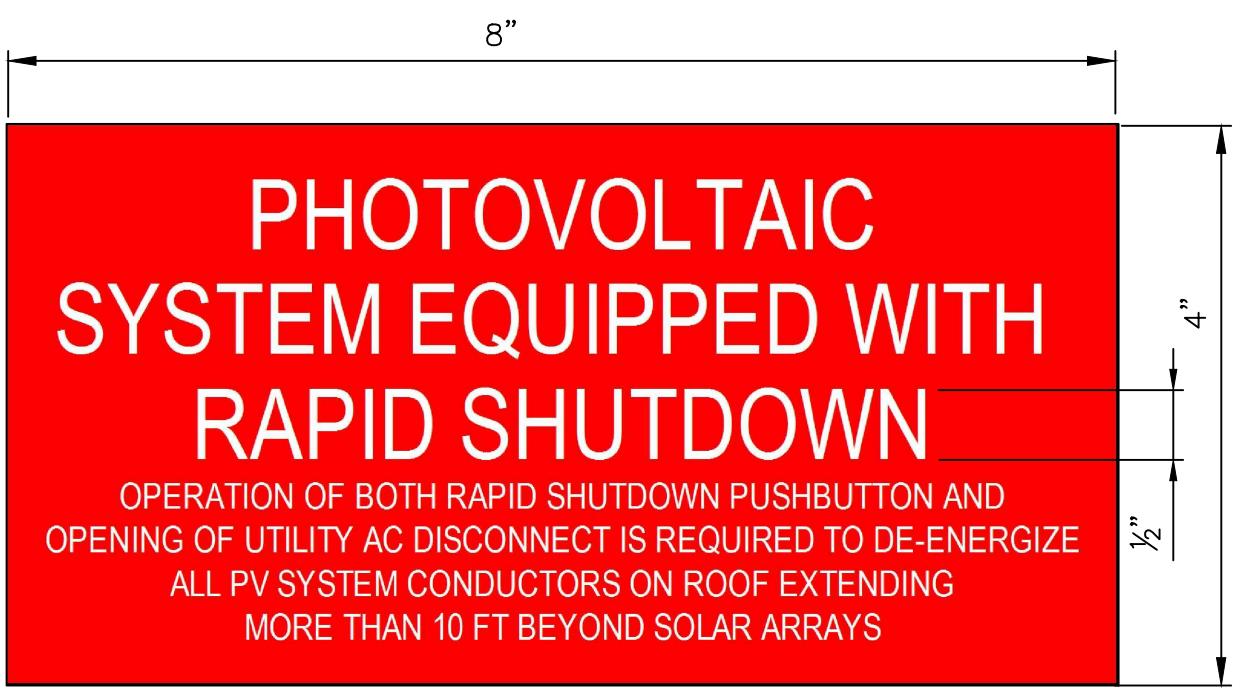
LOCATION:  
 APPLY LABELS TO EACH COMPONENT CONTAINING PV POWER SOURCE CONDUCTORS, INCLUDING RACEWAY JUNCTION BOXES & DC DISCONNECTS, UNLESS SUCH WORDING IS ON ANOTHER LABEL ON SAME PIECE OF EQUIPMENT.  
 BLACK TEXT ON WHITE BACKGROUND, ORANGE BACKGROUND ON "WARNING" LABEL

APPEARANCE:  
 BLACK TEXT ON WHITE BACKGROUND, ORANGE BACKGROUND ON "WARNING" LABEL



LOCATION:  
 APPLY LABELS TO ALL AC & DC ELECTRICAL EQUIPMENT, SUCH AS PANELBOARDS, METERS, INVERTERS, ETC. UNLESS SUCH WORDING IS ON ANOTHER LABEL ON SAME PIECE OF EQUIPMENT.

APPEARANCE:  
 BLACK TEXT ON WHITE BACKGROUND, ORANGE BACKGROUND ON "WARNING" LABEL



LOCATION:  
 PLACARD SHALL BE PLACED IN VICINITY OF CUSTOMER PRIMARY METER

APPEARANCE:  
 WHITE TEXT ON RED BACKGROUND



1057 SHORE ROAD  
 NAPERVILLE, IL 60563

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THESE DRAWINGS ARE HAVE BEEN REPRODUCED AT A SIZED DIFFERENT THAN ORIGINALLY DRAWN. OWNER AND ARCHITECT ASSUME NO RESPONSIBILITY FOR USE OF INCORRECT SCALE.

DO NOT SCALE DRAWINGS.

SYSTEM SIZE:	14.88kW
SYSTEM MODEL TYPE:	CSUN 310-72P
TOTAL No. PANEL	48
PROJECT NO.	5001UC

PROJECT NAME AND ADDRESS:  
 URBANA  
 SOLAR GROUND MOUNT  
 1210 E UNIVERSITY AVE.  
 URBANA, IL

PROFESSIONAL CERTIFICATION HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS LICENSED STATE No

REV	DESCRIPTION	DATE
-	---	-
-	---	-
-	---	-
01	AS-BUILT	10/05/17

DESIGNED BY: KEN VOJTIK 03/03/17  
 DRAWN BY: M. PARAYNO 03/03/17  
 REVIEWED BY: ASAD BAJWA 03/03/17  
 SCALE: NOT TO SCALE

DRAWING TITLE:  
**LABELS**

DRAWING NUMBER:  
**Z-300**