

INSTALLATION OF NEW GROUND MOUNTED
20.8kW PV SYSTEM
102 EAST DELAWARE AVENUE
LANDISVILLE, NJ 08326

GENERAL NOTES

IF ISSUED DRAWING IS MARKED WITH A REVISION CHARACTER OTHER THAN "A", PLEASE BE ADVISED THAT FINAL EQUIPMENT AND/OR SYSTEM CHARACTERISTICS ARE SUBJECT TO CHANGE DUE TO AVAILABILITY OF EQUIPMENT.

GENERAL NOTES

1.

THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL DIRECTIONS AND INSTRUCTIONS CONTAINED IN THE DRAWING PACKAGE AND INFORMATION RECEIVED FROM TRINITY.
2.

THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL DIRECTIONS AND INSTRUCTION CONTAINED IN THE COMPLETE MANUAL.
3.

THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR READING AND UNDERSTANDING ALL DRAWINGS, COMPONENT AND INVERTER MANUALS PRIOR TO INSTALLATION. THE INSTALLATION CONTRACTOR IS ALSO REQUIRED TO HAVE ALL COMPONENT SWITCHES IN THE OFF POSITION AND FUSES REMOVED PRIOR TO THE INSTALLATION OF ALL FUSES BEARING SYSTEM COMPONENTS.
4.

ONCE THE PHOTOVOLTAIC MODULES ARE MOUNTED, THE INSTALLATION CONTRACTOR SHOULD HAVE A MINIMUM OF ONE ELECTRICIAN WHO HAS ATTENDED A SOLAR PHOTOVOLTAIC INSTALLATION COURSE ON SITE.
5.

FOR SAFETY, IT IS RECOMMENDED BY THE MANUFACTURE THAT THE INSTALLATION CREW ALWAYS HAVE A MINIMUM OF TWO PERSONS WORKING TOGETHER AND THAT EACH OF THE INSTALLATION CREW MEMBERS BE TRAINED IN FIRST AID AND CPR.
6.

THIS SOLAR PHOTOVOLTAIC SYSTEM IS TO BE INSTALLED FOLLOWING THE CONVENTIONS OF THE NATIONAL ELECTRIC CODE. ANY LOCAL CODE WHICH MAY SUPERSEDE THE NEC SHALL GOVERN.
7.

ALL SYSTEM COMPONENTS TO BE INSTALLED WITH THIS SYSTEM ARE TO BE "UL" LISTED. ALL EQUIPMENT WILL BE NEMA 3R OUTDOOR RATED UNLESS INDOORS.

GENERAL NOTES CONTINUED

8.

THE DC VOLTAGE FROM THE PANELS IS ALWAYS PRESENT AT THE DC DISCONNECT ENCLOSURE AND THE DC TERMINALS OF THE INVERTER DURING DAYLIGHT HOURS. ALL PERSONS WORKING ON OR INVOLVED WITH THE PHOTOVOLTAIC SYSTEM ARE WARNED THAT THE SOLAR MODULES ARE ENERGIZED WHENEVER THEY ARE EXPOSED TO LIGHT.
9.

ALL PORTIONS OF THIS SOLAR PHOTOVOLTAIC SYSTEM SHALL BE MARKED CLEARLY IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ARTICLE 690.
10.

PRIOR TO THE INSTALLATION OF THIS PHOTOVOLTAIC SYSTEM, THE INSTALLATION CONTRACTOR SHALL ATTEND A PRE-INSTALLTION MEETING FOR THE REVIEW OF THE INSTALLATION PROCEDURES, SCHEDULES, SAFETY AND COORDINATION.
11.

PRIOR TO THE SYSTEM START UP THE INSTALLATION CONTRACTOR SHALL ASSIST IN PERFORMING ALL INITIAL HARDWARE CHECKS AND DC WIRING CONDUCTIVITY CHECKS.
12.

FOR THE PROPER MAINTENANCE AND ISOLATION OF THE INVERTS REFER TO THE ISOLATION PROCEDURES IN THE OPERATION MANUAL.
13.

THE LOCATION OF PROPOSED ELECTRIC AND TELEPHONE UTILITIES ARE SUBJECT TO FINAL APPROVAL OF THE APPROPRIATE UTILITY COMPANIES AND OWNERS.
14.

ALL MATERIALS, WORKMANSHIP AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREIN SHALL BE IN ACCORDANCE WITH:

A) CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS, STANDARDS AND REQUIREMENTS

GENERAL NOTES CONTINUED

14.

B) CURRENT PREVAILING UTILITY COMPANY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS
- 15

THIS SET OF PLANS HAVE BEEN PREPARED FOR THE PURPOSE OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DRAWINGS UNTIL REVISED TO INDICATE "ISSUED FOR CONSTRUCTION".
- 16

ALL INFORMATION SHOWN MUST BE CERTIFIED PRIOR TO USE FOR CONSTRUCTION ACTIVITIES.

ABBREVIATIONS

- AMP

AMPERE
- AC

ALTERNATING CURRENT
- AL

ALUMINUM
- AF

AMP. FRAME
- AFF

ABOVE FINISHED FLOOR
- AFG

ABOVE FINISHED GRADE
- AWG

AMERICAN WIRE GAUGE
- C

CONDUIT (GENERIC TERM OF SPECIFIED)
- CB

COMBINER BOX
- CKT

CIRCUIT
- CT

CURRENT TRANSFORMER
- CU

COPPER
- DC

DIRECT CURRENT
- DISC

DISCONNECT SWITCH
- DWG

DRAWING
- EC

ELECTRICAL SYSTEM INSTALLER
- EMT

ELECTRICAL METALLIC TUBING
- FS

FUSIBLE SWITCH
- FU

FUSE
- GND

GROUND
- GFI

GROUND FAULT INTERRUPTER
- HZ

FREQUENCY (CYCLES PER SECOND)

ABBREVIATIONS CONTINUED

- JB

JUNCTION BOX
- kCmil

THOUSAND CIRCULAR MILS
- kVA

KILO-VOLT AMPERE
- kW

KILO-WATT
- kWH

KILO-WATT HOUR
- L

LINE
- MCB

MAIN CIRCUIT BREAKER
- MDP

MAIN DISTRIBUTION PANEL
- MLO

MAIN LUG ONLY
- MTD

MOUNTED
- MTG

MOUNTING
- N

NEUTRAL
- NEC

NATIONAL ELECTRICAL CODE
- NIC

NOT IN CONTRACT
- NO #

NUMBER
- NTS

NOT TO SCALE
- OCP

OVER CURRENT PROTECTION
- P

POLE
- PB

PULL BOX
- PH ∅

PHASE
- PVC

POLY-VINYL CHLORIDE CONDUIT
- PWR

POWER
- QTY

QUANTITY
- RGS

RIGID GALVANIZED STEEL
- SN

SOLID NEUTRAL
- JSWBD

SWITCHBOARD
- TYP

TYPICAL
- U.O.I.

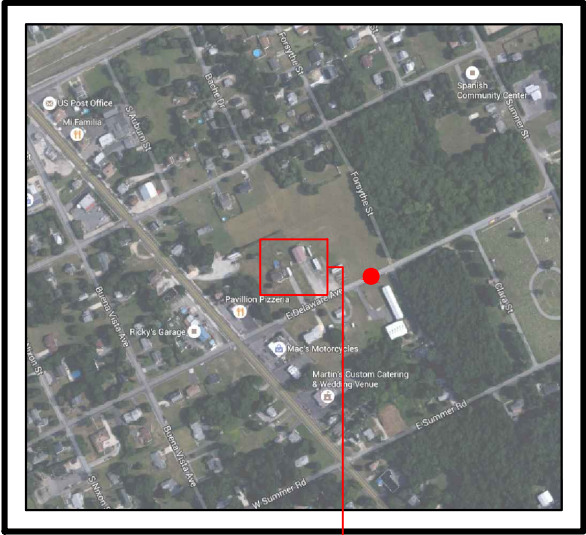
UNLESS OTHERWISE INDICATED
- WP

WEATHERPROOF
- XFMR

TRANSFORMER
- +72

MOUNT 72 INCHES TO BOTTOM OF ABOVE FINISHED FLOOR OR GRADE

EAST DELAWARE AVENUE ●



VICINITY MAP
SCALE: NTS

SITE

APPROVED

By DESIGN DEPARTMENT at 12:11 pm, Feb 11, 2016



SATELLITE VIEW
SCALE: NTS

SHEET INDEX

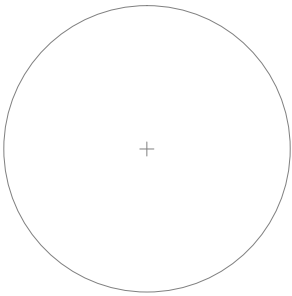
- PV-1

COVER SHEET W/ SITE INFO & NOTES
- PV-2

LAYOUT PLAN W/ MODULE LOCATIONS
- PV-3

ELECTRICAL 3 LINE DIAGRAM

Engineer / License Holder:



Issued / Revisions

R1	CONSTRUCTION DWG	2/11/2016
P1	ISSUED TO TOWNSHIP FOR PERMIT	9/21/2015
NO.	DESCRIPTION	DATE

Project Title:

DROGO,TERI- (SYSTEM #1)
TRINITY ACCT #: 2015-62193

Project Address:

102 EAST DELAWARE AVENUE
LANDISVILLE, NJ 08326

Drawing Title:

PROPOSED 20.8kW
SOLAR SYSTEM

Drawing Information

DRAWING DATE:	9/21/2015
DRAWN BY:	JC
REVISED BY:	JES

System Information:

TOTAL SYSTEM SIZE:	20.8kW
TOTAL MODULE COUNT:	80
MODULES USED:	TRINA 260
MODULE SPEC #:	TSM-260 PD05.08
UTILITY COMPANY:	ACE
UTILITY ACCT #:	55004665489
UTILITY METER #:	99G053668270
DEAL TYPE:	SUNNOVA

Rev. No.

R1

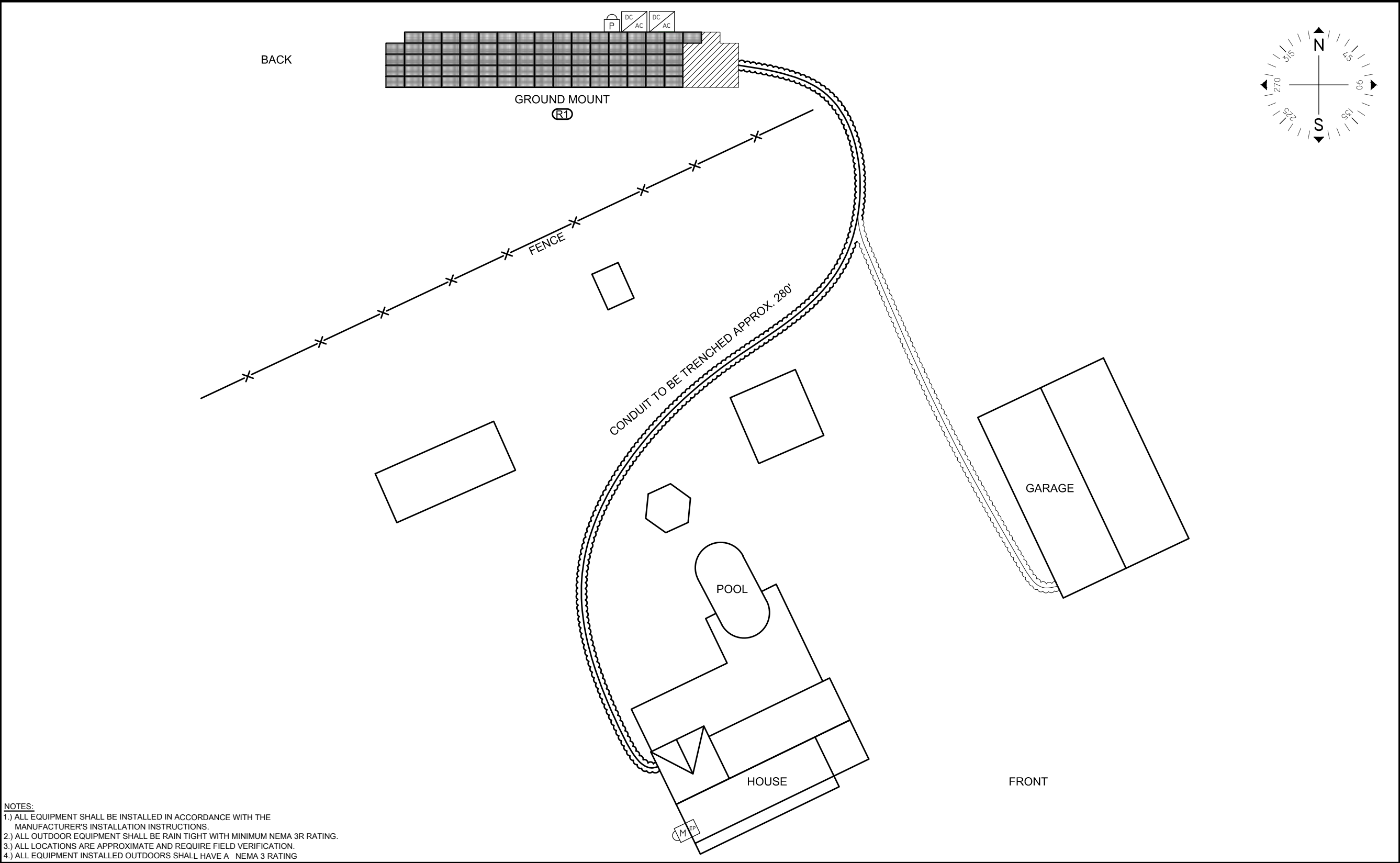
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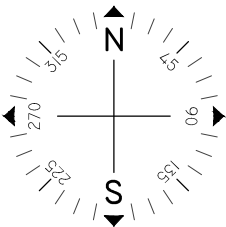
*PLANS COMPLY WITH 2010 RCNYS ASCE 7-05, 2001 WFCM AS PER REFERNCED STANDARDS. WIND SPEED DESIGN IS 110 MPH

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- NOTES:
- 1.) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 - 2.) ALL OUTDOOR EQUIPMENT SHALL BE RAIN TIGHT WITH MINIMUM NEMA 3R RATING.
 - 3.) ALL LOCATIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
 - 4.) ALL EQUIPMENT INSTALLED OUTDOORS SHALL HAVE A NEMA 3 RATING

ARRAY SCHEDULE		SYMBOL LEGEND				EQUIPMENT SCHEDULE	
ARRAY 1 ARRAY ORIENTATION = 180° MODULE PITCH = 30°		INDICATES 24" DEEP TRENCHED.		INDICATES NEW UTILITY DISCONNECT TO BE INSTALLED OUTSIDE		INDICATES SEPARATE PV SOLAR SYSTEM TO BE INSTALLED WITHIN SAME ARRAY	QTY
		INDICATES EXISTING METER LOCATION		INDICATES NEW PV SOLAR MODULE. RED MODULES INDICATE PANELS THAT USE MICRO INVERTERS. REFER TO EQUIPMENT SCHEDULE FOR SPECS.			80
		INDICATES EXISTING ELECTRICAL PANEL LOCATION: INSIDE		INDICATES NEW PRODUCTION METER TO BE INSTALLED OUTSIDE.			1
		INDICATES NEW MAIN DISCONNECT TO BE GROUPED WITH MAIN PANEL		INDICATES NEW INVERTER TO BE INSTALLED OUTSIDE. REFER TO EQUIPMENT SCHEDULE FOR SPECS.			1
							TRINA 260 (TSM-260 PD05.08)
							SE10000A-US
							SE6000A-US



Engineer / License Holder:

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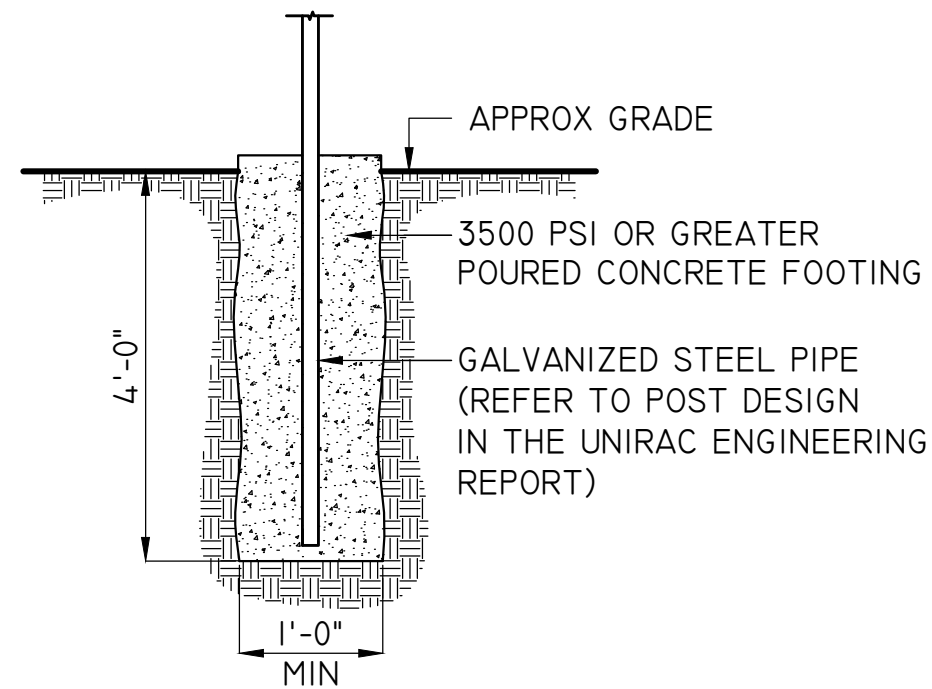
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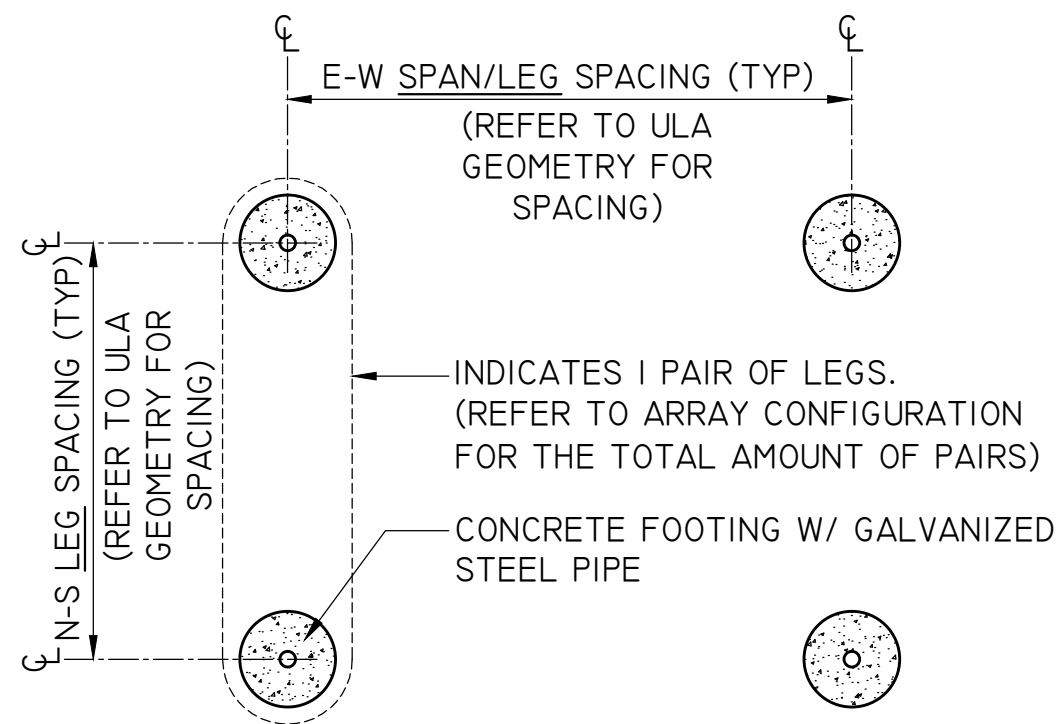
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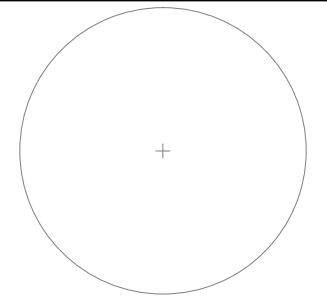


CONCRETE FOOTING DETAIL
 SCALE: NTS REFER TO UNIRAC ENGINEER REPORT FOR SPECIFICATIONS



CONCRETE FOOTING LAYOUT
 SCALE: NTS REFER TO UNIRAC ULA QUOTATIONS FOR SPECIFICATIONS

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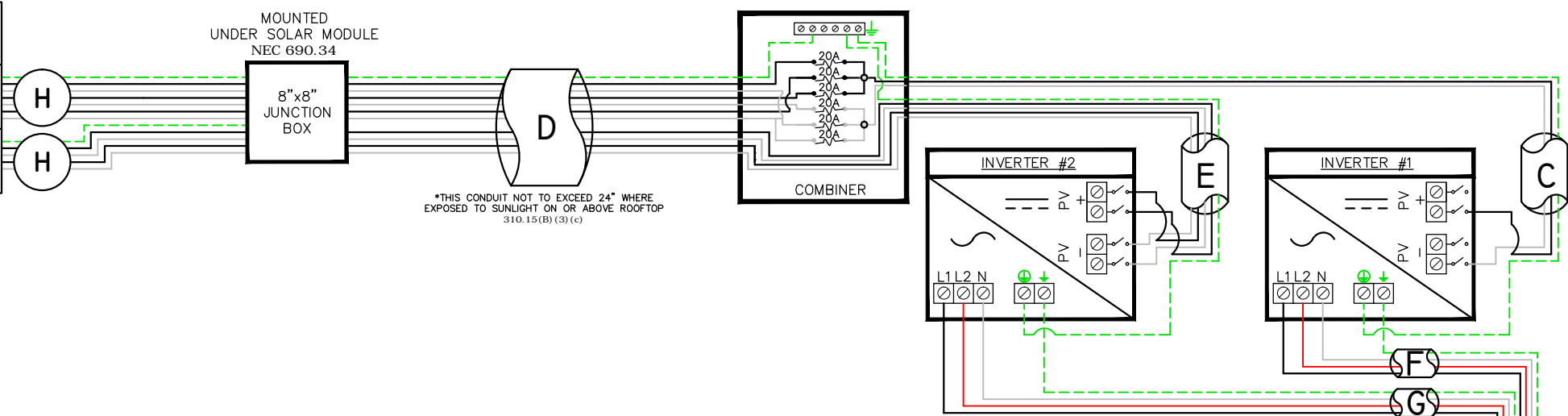
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SOLAR MODULES GROUND MOUNTED ON 1 ARRAY 80 - 260W MODULES W/ 1 SOLAR EDGE P300 PER MODULE 18.75 ADC MAX PER STRING
2 STRINGS OF 17 MODULES IN SERIES - 350 Vmax 1 STRING OF 16 MODULES IN SERIES - 350 Vmax *3 STRINGS TO BE TERMINATED IN PARALLEL INSIDE COMBINER BOX
2 STRINGS OF 15 MODULES IN SERIES - 350 Vmax *2 STRINGS TO BE TERMINATED IN PARALLEL INSIDE INVERTER 2



*THIS CONDUIT NOT TO EXCEED 24" WHERE EXPOSED TO SUNLIGHT ON OR ABOVE ROOFTOP
310.15 (B) (3) (c)

ARRAY CIRCUIT WIRING NOTES

COMPLIES WITH 2011 NEC

- 1.) LOWEST EXPECTED AMBIENT TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. LOWEST EXPECTED AMBIENT TEMP = -16°C
- 2.) HIGHEST CONTINUOUS AMBIENT TEMPERATURE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. HIGHEST CONTINUOUS TEMP = 33°C
- 3.) 2005 ASHRAE FUNDAMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 47°C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1°C). FOR LESS THAN 9 CURRENT-CARRYING CONDUCTORS IN A ROOF-MOUNTED SUNLIT CONDUIT AT LEAST 0.5" ABOVE ROOF AND USING THE OUTDOOR DESIGN TEMPERATURE OF 47°C OR LESS (ALL OF UNITED STATES),
- 4.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED TO OPERATE WITH UNGROUNDED PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT AS PER NEC 690.35
- 5.) ALL EQUIPMENT INSTALLED OUTDOORS SHALL HAVE A NEMA 3R RATING.

CALCULATIONS FOR CURRENT CARRYING CONDUCTORS
REQUIRED CONDUCTOR AMPACITY PER STRING
[NEC 690.8(B) (1)]: (15.00*1.25)3 = 56.25A

AWG #6, DERATED AMPACITY
AMBIENT TEMP: 55°C, TEMP DERATING FACTOR: .76
RACEWAY DERATING = 2 CCC: 1.00
(75*.76)1.00 = 57.00A

57.00A ≥ 56.25A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY
67.00A*1.25 = 83.75A

AWG #4, DERATED AMPACITY
AMBIENT TEMP: 30°C, TEMP DERATING: 1.0
RACEWAY DERATING ≤ 3 CCC: N/A
95A*1.0 = 95A

95A ≥ 83.75A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION
TOTAL INVERTER CURRENT: 67.00A
67.00A*1.25 = 83.75A
--> 90A OVERCURRENT PROTECTION IS VALID

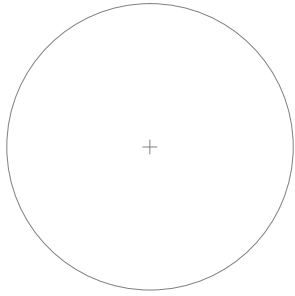
PV MODULE SPECIFICATIONS	
TRINA 260 (TSM-260 PD05.08)	
Imp	8.5
Vmp	30.6
Voc	38.2
Isc	9

INVERTER #1 - SE10000A-US			
DC		AC	
Imp	30.5	Pout	10000
Vmp	350	Iout	42
Voc	500	Imax	52.5
Isc	45	Vnom	240

INVERTER #2 - SE6000A-US			
DC		AC	
Imp	18	Pout	6000
Vmp	350	Iout	25
Voc	500	Imax	31.25
Isc	30	Vnom	240

A	#6 THWN-2 GEC TO EXISTING GROUND ROD	G	3/4" EMT W/ 2-#8 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
B	1" EMT W/ 2-#4 THWN-2, 1-#8 THWN-2, 1-#8THWN-2 GROUND	H	#12 PV WIRE W/ #8 BARE COPPER BOND TO MODULES AND RAILS
C	3/4" EMT W/ 2-#6 THWN-2, 1-#10 THWN-2 GROUND	I	1" FMC W/ 3-#4 THWN-2, 1-#8 THWN-2 GROUND
D	3/4" EMT W/ 6-#10 THWN-2, 1-#10 THWN-2 GROUND	J	1 1/2" PVC W/ 2-2/0 THWN-2, 1-#1 THWN-2, 1-#1 THWN-2 GROUND (CONDUIT TO BE TRENCHED APPROX. 270')
E	3/4" EMT W/ 4-#10 THWN-2, 1-#10 THWN-2 GROUND		
F	3/4" EMT W/ 2-#6 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND		

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