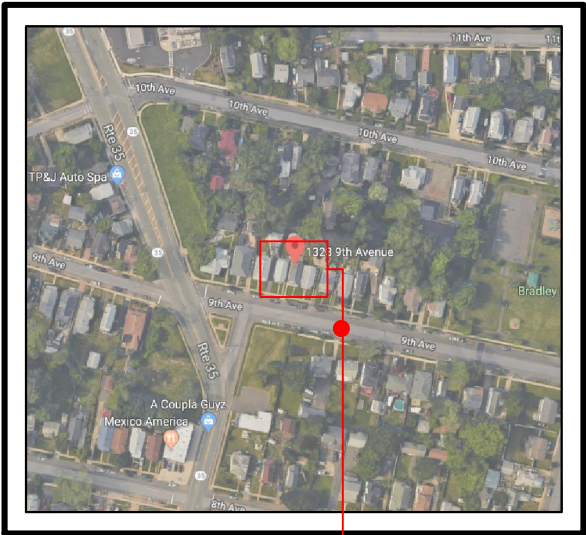


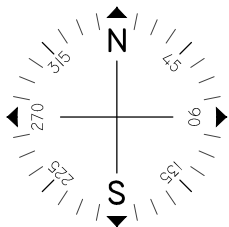
INSTALLATION OF NEW
ROOF MOUNTED PV SOLAR SYSTEM
1323 1 2 9TH AVE
NEPTUNE, NJ 07753

1 2 9TH AVE ●



VICINITY MAP
SCALE: NTS

SITE



Issued / Revisions

A1	AS BUILT	5/17/2019
P1	ISSUED TO TOWNSHIP FOR PERMIT	5/1/2019
NO.	DESCRIPTION	DATE

Project Title:

SCHMIDT, JASON-
TRINITY ACCT #: 2019-04-337322

Project Address:

1323 1 2 9TH AVE
NEPTUNE, NJ 07753
40.207692,-74.025346

Drawing Title:

AS BUILT PV SOLAR SYSTEM

Drawing Information

DRAWING DATE:	5/1/2019
DRAWN BY:	KTD
REVISED BY:	KB

System Information:

DC SYSTEM SIZE:	5.04kW
AC SYSTEM SIZE:	3.8kW
TOTAL MODULE COUNT:	16
MODULES USED:	HANWHA 315
MODULE SPEC #:	Q.PEAK DUO BLK-G5 315
UTILITY COMPANY:	JCP&L
UTILITY ACCT #:	100117588986
UTILITY METER #:	S59150268
DEAL TYPE:	SUNNOVA

Rev. No.

A1

Sheet

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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 FUSE 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 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 ELECTRICAL 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

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 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 ELECTRICAL CODE ARTICLE 690 & 705.
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 INVERTERS 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 RACEWAY, PROVIDE AS 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)

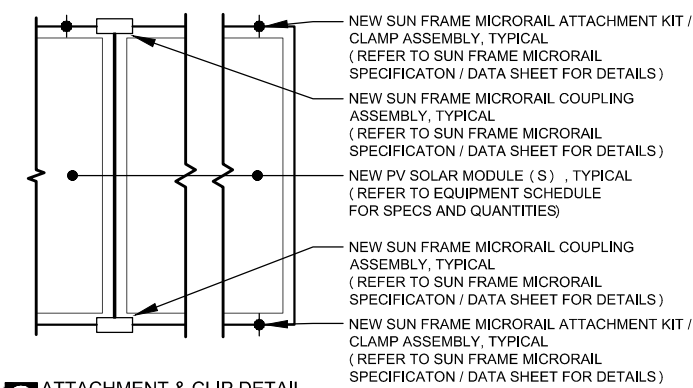
ABBREVIATIONS CONTINUED

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

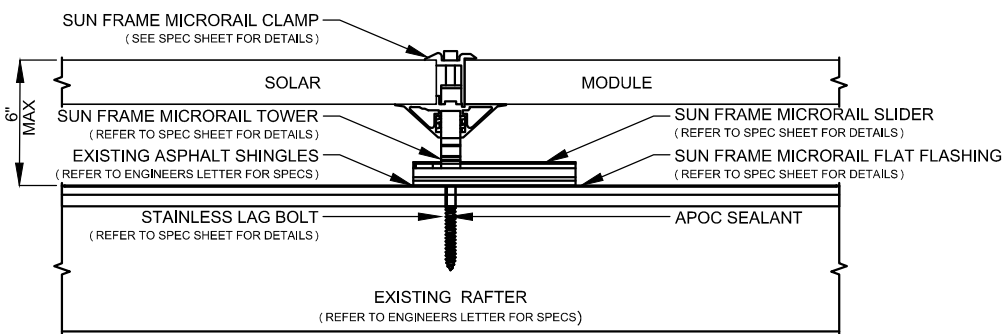
SHEET INDEX

- PV-1 COVER SHEET W/ SITE INFO & NOTES
PV-2 ROOF PLAN W/ MODULE LOCATIONS
PV-3 ELECTRICAL 3 LINE DIAGRAM
AP APPENDIX

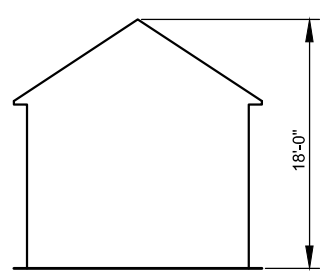
NOTES : *REFER TO MODULE SPECS FOR MODULE DIMENSIONS
*DEPICTED MODULES MAY BE PORTRAIT OR LANDSCAPE



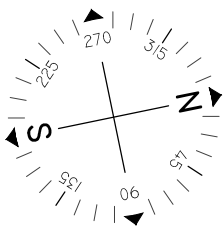
ATTACHMENT & CLIP DETAIL
SCALE: NOT TO SCALE



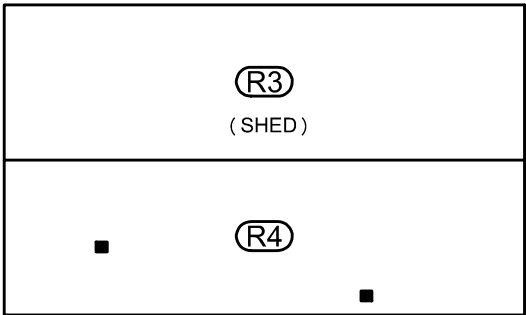
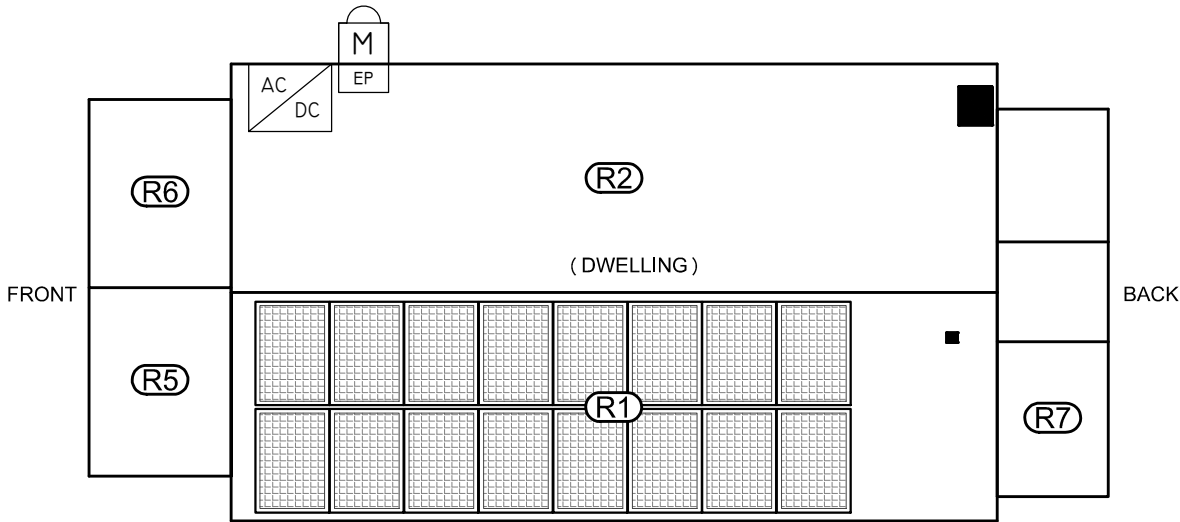
PV MODULE ATTACHMENT ON ASPHALT SHINGLE ROOF
SCALE: NOT TO SCALE



HEIGHT FROM GROUND LEVEL TO PEAK OF ROOF
SCALE: NOT TO SCALE



ARRAY SCHEDULE



ROOF 1
MODULES: 16
PITCH: 32°
ORIENTATION: 102°

ROOF 2
MODULES: 0
PITCH: 30°
ORIENTATION: 282°

ROOF 3
MODULES: 0
PITCH: 27°
ORIENTATION: 282°

ROOF 4
MODULES: 0
PITCH: 30°
ORIENTATION: 102°

ROOF 5
MODULES: 0
PITCH: 30°
ORIENTATION: 102°

ROOF 6
MODULES: 0
PITCH: 30°
ORIENTATION: 282°

ROOF 7
MODULES: 0
PITCH: 14°
ORIENTATION: 102°

NOTES:

- 1.) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 2.) ARRAY BONDING TO COMPLY WITH MANUFACTURER SPECIFICATION.
- 3.) ALL LOCATIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
- 4.) AN AC DISCONNECT SHALL BE GROUPED WITH INVERTER (S) NEC 690.13 (E) .
- 5.) ALL OUTDOOR EQUIPMENT SHALL BE RAIN TIGHT WITH MINIMUM NEMA 3R RATING.
- 6.) ROOFTOP SOLAR INSTALLATION ONLY PV ARRAY SHALL NOT EXTEND BEYOND THE EXISTING ROOF EDGE.

SYMBOL LEGEND

	INDICATES ROOF DESIGNATION . REFER TO ARRAY SCHEDULE FOR MORE INFORMATION		INDICATES NEW UNFUSED PV DISCONNECT TO BE INSTALLED OUTSIDE (UTILITY ACCESSIBLE)		INDICATES NEW PV ONLY SUBPANEL TO BE INSTALLED
	INDICATES EXISTING METER LOCATION		INDICATES NEW PV SOLAR MODULE. RED MODULES INDICATE PANELS THAT USE MICRO INVERTERS. REFER TO EQUIPMENT SCHEDULE FOR SPECS.		
	INDICATES EXISTING ELECTRICAL PANEL LOCATION: IN BASEMENT		INDICATES NEW PRODUCTION METER TO BE INSTALLED OUTSIDE.		
	INDICATES NEW FUSED PV DISCONNECT TO BE INSTALLED IN BASEMENT		INDICATES NEW INVERTER TO BE INSTALLED OUTSIDE. REFER TO EQUIPMENT SCHEDULE FOR SPECS		

PLUMBING SCHEDULE

OTHER OBSTRUCTIONS	

EQUIPMENT SCHEDULE

QTY	SPEC #
16	HANWHA 315 (Q.PEAK DUO BLK-G5 315)
1	SE3800H-US000NNC2

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AS BUILT PV SOLAR SYSTEM

Drawing Information

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DRAWN BY:	KTD
REVISED BY:	KB

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UTILITY ACCT #:	100117588986
UTILITY METER #:	S59150268
DEAL TYPE:	SUNNOVA

Rev. No.

A1

Sheet

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ARRAY CIRCUIT WIRING NOTES
1.) LICENSED ELECTRICIAN ASSUMES ALL RESPONSIBILITY
FOR DETERMINING ONSITE CONDITIONS AND
EXECUTING INSTALLATION IN ACCORDANCE WITH
NEC 2014

2.) 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**

3.) 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

4.) 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)

5.) PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS
SHALL INCLUDE A RAPID SHUTDOWN FUNCTION THAT
CONTROLS SPECIFIC CONDUCTORS IN ACCORDANCE WITH
NEC 690.12(1) THROUGH (5)

6.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED
TO OPERATE WITH UNGROUNDED PHOTOVOLTAIC
SOURCE AND OUTPUT CIRCUIT AS PER **NEC 690.35**

7.) UNGROUNDED DC CIRCUIT CONDUCTORS SHALL BE
IDENTIFIED WITH THE FOLLOWING OUTER FINISH:
POSITIVE CONDUCTORS = RED
NEGATIVE CONDUCTORS = BLACK
NEC 210.5(C)(2)

8.) ARRAY AND SUB ARRAY CONDUCTORS SHALL BE #10 PV
WIRE TYPE RHW-2 OR EQUIVELANT AND SHALL BE
PROTECTED BY CONDUIT WHERE EXPOSED TO DIRECT
SUNLIGHT. SUB ARRAY CONDUIT LONGER THAN 24" SHALL
CONTAIN ≤ 20 CURRENT CARRYING CONDUCTORS AND
WHERE EXPOSED TO DIRECT SUNLIGHT SHALL CONTAIN
≤ 9 CURRENT CARRYING CONDUCTORS.

9.) ALL WIRE LENGTHS SHALL BE LESS THAN 100' UNLESS
OTHERWISE NOTED

10.) FLEXIBLE CONDUIT SHALL NOT BE INSTALLED ON
ROOFTOP AND SHALL BE LIMITED TO 12" IF USED
OUTDOORS

11.) OVERCURRENT PROTECTION FOR CONDUCTORS
CONNECTED TO THE SUPPLY SIDE OF A SERVICE SHALL BE
LOCATED WITHIN 10' OF THE POINT OF CONNECTION NEC
705.31

12.) WHERE TWO SOURCES FEED A BUSSBAR, ONE A
UTILITY AND THE OTHER AN INVERTER, PV BACKFEED
BREAKER(S) SHALL BE LOCATED OPPOSITE FROM UTILITY
NEC 705.12(D)(2)(3)(b)

13.) ALL SOLAR SYSTEM LOAD CENTERS TO CONTAIN ONLY
GENERATION CIRCUITS AND NO UNUSED POSITIONS OR
LOADS

14.) 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)**]: $(15.00 \times 1.25)1 = 18.75A$

AWG #10, DERATED AMPACITY
AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96
RACEWAY DERATING = 2 CCC: 1.00
 $(40 \times .96)1.00 = 38.40A$

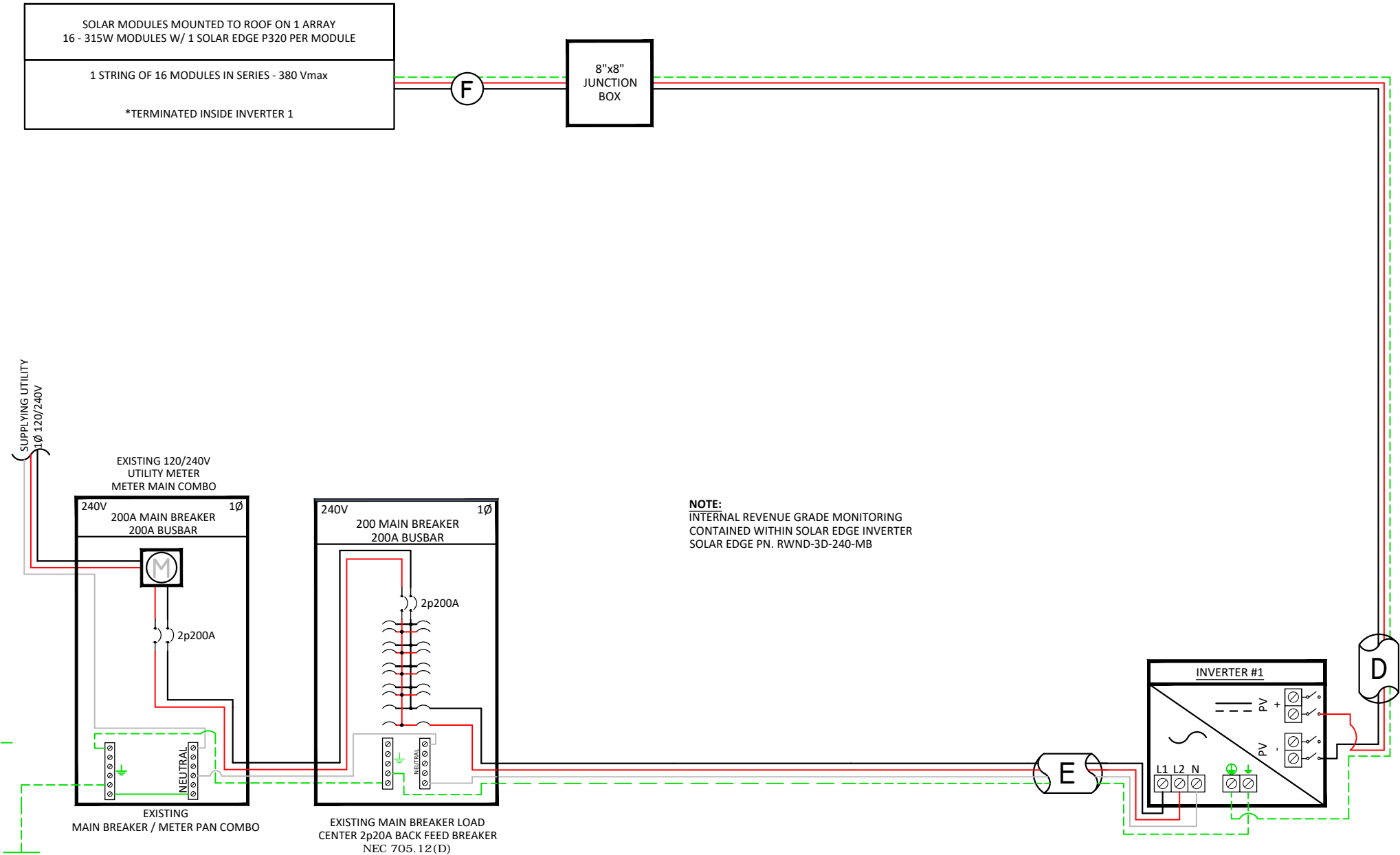
$38.40A \geq 18.75A$, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY
 $16.00A \times 1.25 = 20.00A$

AWG #10, DERATED AMPACITY
AMBIENT TEMP: 30°C, TEMP DERATING: 1.0
RACEWAY DERATING ≤ 3 CCC: N/A
 $40A \times 1.0 = 40A$

$40A \geq 20.00A$, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION
TOTAL INVERTER CURRENT: 16.00A
 $16.00A \times 1.25 = 20.00A$
--> 20A OVERCURRENT PROTECTION IS VALID



NOTE:
INTERNAL REVENUE GRADE MONITORING
CONTAINED WITHIN SOLAR EDGE INVERTER
SOLAR EDGE PN. RWND-3D-240-MB

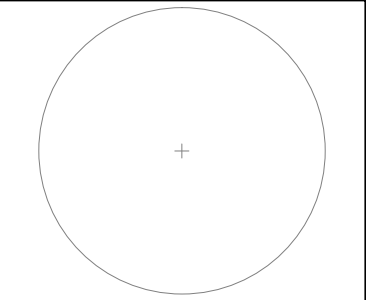
NOTE: CONDUIT TYPE SHALL BE CHOSEN BY THE INSTALLATION CONTRACTOR
TO MEET OR EXCEED NEC AND LOCAL AHJD REQUIREMENTS

A	#6 THWN-2 GEC TO EXISTING GROUND ROD
B	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
C	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2 GROUND
D	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2 GROUND
E	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
F	#10 PV WIRE (FREE AIR) W/ #6 BARE COPPER BOND TO ARRAY

PV MODULE SPECIFICATIONS	
HANWHA 315 (Q.PEAK DUO BLK-G5 315)	
Imp	9.41
Vmp	33.46
Voc	40.29
Isc	9.89

INVERTER #1 - SE3800H-US000NNC2			
DC		AC	
Imp	10.5	Pout	3800
Vmp	380	Imax	16
Voc	480	OCpDmin	20
Isc	15	Vnom	240

Engineer / License Holder:



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A1	PV - 3



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APPLICATIONS CHANGE

(FOR INTERNAL USE ONLY)

☐ UPDATE ☐ REVISION

BUILDING

ZONING REQUIRED?

☐ YES ☐ NO

☐ UPDATE ☐ REVISION

ELECTRICAL

☒ REVISED LAYOUT

☐ REVISED ENGINEER LETTER

☐ ADD ____ PANELS

☐ REMOVE ____ PANELS

☐ RELOCATING PANELS

☐ CHANGE RACKING

BUILDING NOTE:

-

ELECTRICAL NOTE:

-

ZONING NOTE:

-

☐ SYSTEM SIZE INCREASE

☐ SYSTEM SIZE DECREASE

☐ ADD TAP BOX \$100

☐ ADD SUBPANEL \$150

☐ NEW METER PAN \$100

☐ NEW RISER \$100

☐ NEW MAIN PANEL \$800
(includes meter pan and riser)

☐ ADD INVERTER \$150

☐ ADD ____ AMP FUSED DISCONNECT \$50

☐ ADD ____ AMP BREAKER

☐ ADD BREAKER ENCLOSURE \$100

☐ ADD UNFUSED DISCONNECT \$100

☒ REMOVE UNFUSED DISCONNECT

☐ REMOVE FUSED DISCONNECT

☐ CHANGE POINT OF INTERCONNECTION

☐ CHANGE METHOD OF INTERCONNECTION

☐ REMOVE PRODUCTION METER

☐ ADD PRODUCTION METER

☐ DECREASE FUSE SIZE

☐ INCREASE FUSE SIZE

☐ INVERTER SIZE DECREASE

☐ INVERTER SIZE INCREASE