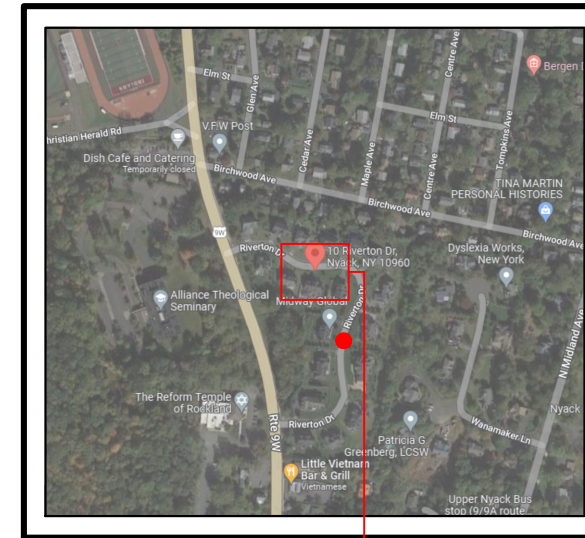


INSTALLATION OF NEW ROOF MOUNTED PV SOLAR SYSTEM

10 RIVERTON DRIVE NYACK, NY 10960

RIVERTON DRIVE ●



VICINITY MAP
SCALE: NTS

SITE



Issued / Revisions

NO.	DESCRIPTION	DATE
R2	CODES / ELEVATIONS	10/15/2022
R1	AERIAL MAP	7/18/2022
P1	ISSUED TO TOWNSHIP FOR PERMIT	7/12/2022

Project Title:

LEWY, ROBERT-
TRINITY ACCT #: 2022-05-709022

Project Address:

10 RIVERTON DRIVE
NYACK, NY 10960
41.104362, -73.925510

Drawing Title:

PROPOSED PV SOLAR SYSTEM

Drawing Information

DRAWING DATE:	7/12/2022
DRAWN BY:	PM
REVISED BY:	DMR

System Information:

DC SYSTEM SIZE:	9.2kW
AC SYSTEM SIZE:	7.6kW
MODULE COUNT:	23
MODULES USED:	HANWHA 400
MODULE SPEC #:	Q.PEAK DUO BLK ML-G10.a+ 400
UTILITY COMPANY:	ORANGE ROCKLAND
UTILITY ACCT #:	39131-36038
UTILITY METER #:	701036896
DEAL TYPE:	SUNNOVA

Rev. No.	Sheet
R2	PV - 1



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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 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. ONCE APPROVED, THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL SYSTEM COMPONENTS AS DESCRIBED IN THE DRAWING PACKAGE.
16. ALL INFORMATION SHOWN MUST BE CERTIFIED PRIOR TO USE FOR CONSTRUCTION ACTIVITIES.

ABBREVIATIONS

AMP	AMPERE
AC	ALTERNATING CURRENT
AL	ALUMINUM
AF	AMP. FRAME
AFG	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

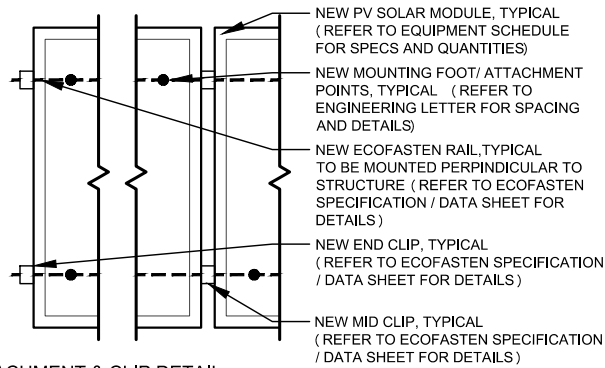
- PV-1 COVER SHEET W/ SITE INFO & NOTES
- PV-2 ROOF PLAN W/ MODULE LOCATIONS
- PV-3 AERIAL MAP
- PV-4 ELEVATION DRAWINGS
- PV-5 ELEVATION DRAWINGS
- PV-6 ELECTRICAL 3 LINE DIAGRAM
- AP APPENDIX

GENERAL NOTES

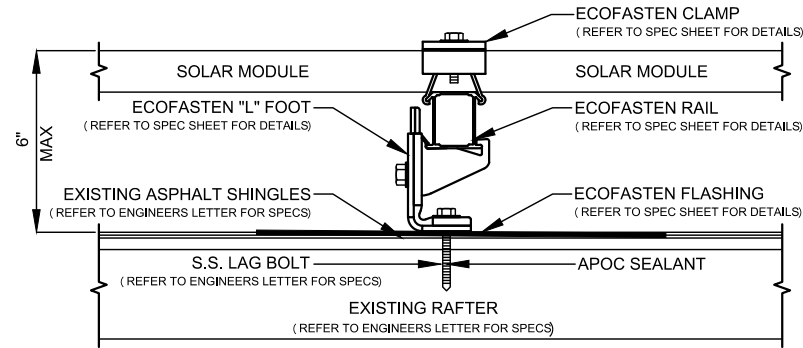
IF ISSUED DRAWING IS MARKED WITH A REVISION CHARACTER OTHER THAN "A", PLEASE BE ADVISED THAT FINAL EQUIPMENT AND/OR SYSTEM CHARACTERISTICS ARE SUBJECT TO CHANGE DUE TO AVAILABILITY OF EQUIPMENT.

*PLANS IN COMPLIANCE WITH THE 2020 NEW YORK STATE RESIDENTIAL CODE, 2020 NYS UNIFORM FIRE PREVENTION AND BUILDING CODE (UNIFORM CODE) & THE 2017 NATIONAL ELECTRICAL CODE.

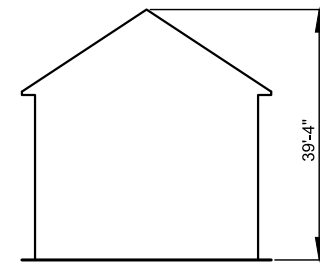
NOTES : *REFER TO MODULE SPECS FOR MODULE DIMENSIONS
 *DEPICTED MODULES MAY BE PORTRAIT OR LANDSCAPE



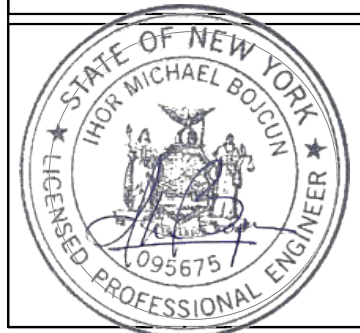
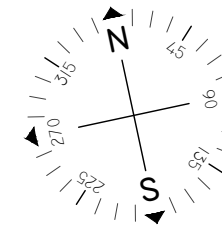
ATTACHMENT & CLIP DETAIL
 SCALE: NOT TO SCALE



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

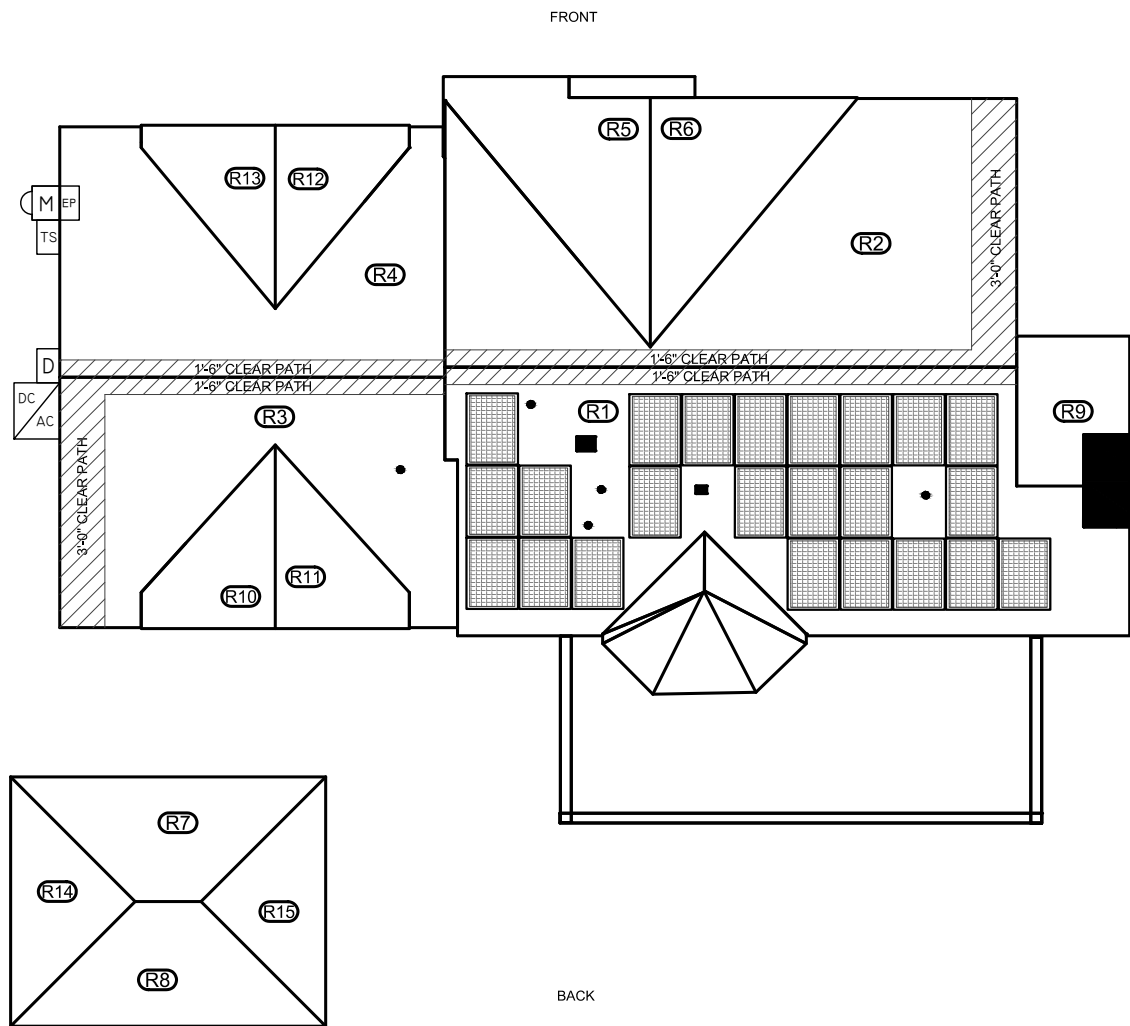


HEIGHT FROM GROUND LEVEL TO PEAK OF ROOF
 SCALE: NOT TO SCALE



ARRAY SCHEDULE

- ROOF 1
 MODULES: 23
 PITCH: 40°
 ORIENTATION: 192°
- ROOF 2
 MODULES: 0
 PITCH: 40°
 ORIENTATION: 12°
- ROOF 3
 MODULES: 0
 PITCH: 40°
 ORIENTATION: 192°
- ROOF 4
 MODULES: 0
 PITCH: 40°
 ORIENTATION: 12°
- ROOF 5
 MODULES: 0
 PITCH: 45°
 ORIENTATION: 282°
- ROOF 6
 MODULES: 0
 PITCH: 45°
 ORIENTATION: 102°
- ROOF 7
 MODULES: 0
 PITCH: 23°
 ORIENTATION: 12°
- ROOF 8
 MODULES: 0
 PITCH: 23°
 ORIENTATION: 192°
- ROOF 9
 MODULES: 0
 PITCH: 40°
 ORIENTATION: 12°
- ROOF 10
 MODULES: 0
 PITCH: 43°
 ORIENTATION: 282°
- ROOF 11
 MODULES: 0
 PITCH: 43°
 ORIENTATION: 102°
- ROOF 12
 MODULES: 0
 PITCH: 45°
 ORIENTATION: 102°
- ROOF 13
 MODULES: 0
 PITCH: 45°
 ORIENTATION: 282°
- ROOF 14
 MODULES: 0
 PITCH: 23°
 ORIENTATION: 282°
- ROOF 15
 MODULES: 0
 PITCH: 23°
 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

(R1)	INDICATES ROOF DESIGNATION . REFER TO ARRAY SCHEDULE FOR MORE INFORMATION	[UD]	INDICATES NEW UNFUSED PV DISCONNECT TO BE INSTALLED OUTSIDE (UTILITY ACCESSIBLE)	[SP]	INDICATES NEW PV ONLY SUBPANEL TO BE INSTALLED
(M)	INDICATES EXISTING METER LOCATION	[Grid]	INDICATES NEW PV SOLAR MODULE. RED MODULES INDICATE PANELS THAT USE MICRO INVERTERS. REFER TO EQUIPMENT SCHEDULE FOR SPECS.	[DC]	INDICATES NEW DC DISCONNECT
(EP)	INDICATES EXISTING ELECTRICAL PANEL LOCATION: INSIDE	(P)	INDICATES NEW PRODUCTION METER TO BE INSTALLED OUTSIDE.	[SD]	INDICATES EXISTING SERVICE DISCONNECT
(D)	INDICATES NEW FUSED PV DISCONNECT TO BE INSTALLED OUTSIDE (UTILITY ACCESSIBLE)	[DC/AC]	INDICATES NEW INVERTER TO BE INSTALLED OUTSIDE. REFER TO EQUIPMENT SCHEDULE FOR SPECS	[TS]	INDICATES EXISTING TRANSFER SWITCH

PLUMBING SCHEDULE

OTHER OBSTRUCTIONS

EQUIPMENT SCHEDULE

QTY	SPEC #
23	HANWHA 400 (Q.PEAK DUO BLK ML-G10.a+ 400)
1	SE7600H-US0SHBNC4

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LEWY, ROBERT-
 TRINITY ACCT #: 2022-05-709022

Project Address:

10 RIVERTON DRIVE
 NYACK, NY 10960
 41.104362,-73.925510

Drawing Title:

PROPOSED PV SOLAR SYSTEM

Drawing Information

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DRAWN BY:	PM
REVISED BY:	DMR

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AC SYSTEM SIZE:	7.6kW
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MODULES USED:	HANWHA 400
MODULE SPEC #:	Q.PEAK DUO BLK ML-G10.a+ 400
UTILITY COMPANY:	ORANGE ROCKLAND
UTILITY ACCT #:	39131-36038
UTILITY METER #:	701036896
DEAL TYPE:	SUNNOVA

Rev. No.	Sheet
R2	PV - 2



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Engineer / License Holder:



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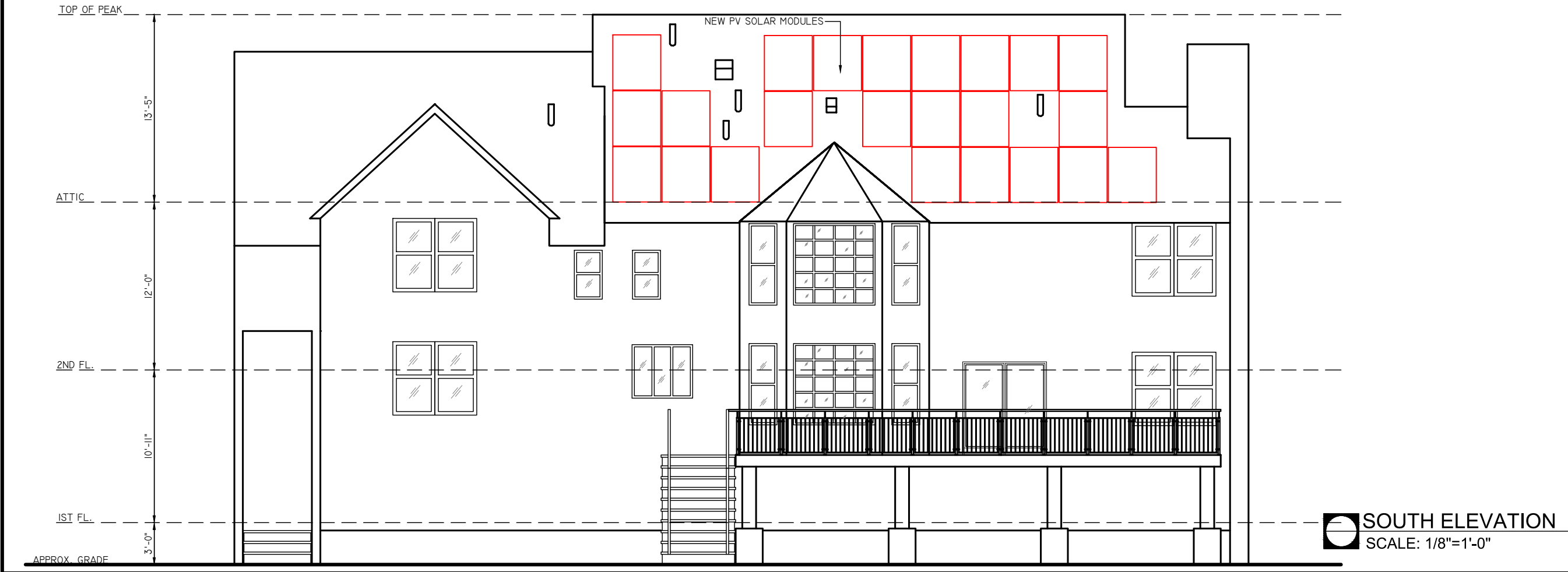
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UTILITY METER #:	701036896
DEAL TYPE:	SUNNOVA

Rev. No.	Sheet
R2	PV - 3





NORTH ELEVATION
SCALE: 1/8"=1'-0"



SOUTH ELEVATION
SCALE: 1/8"=1'-0"

Engineer / License Holder:

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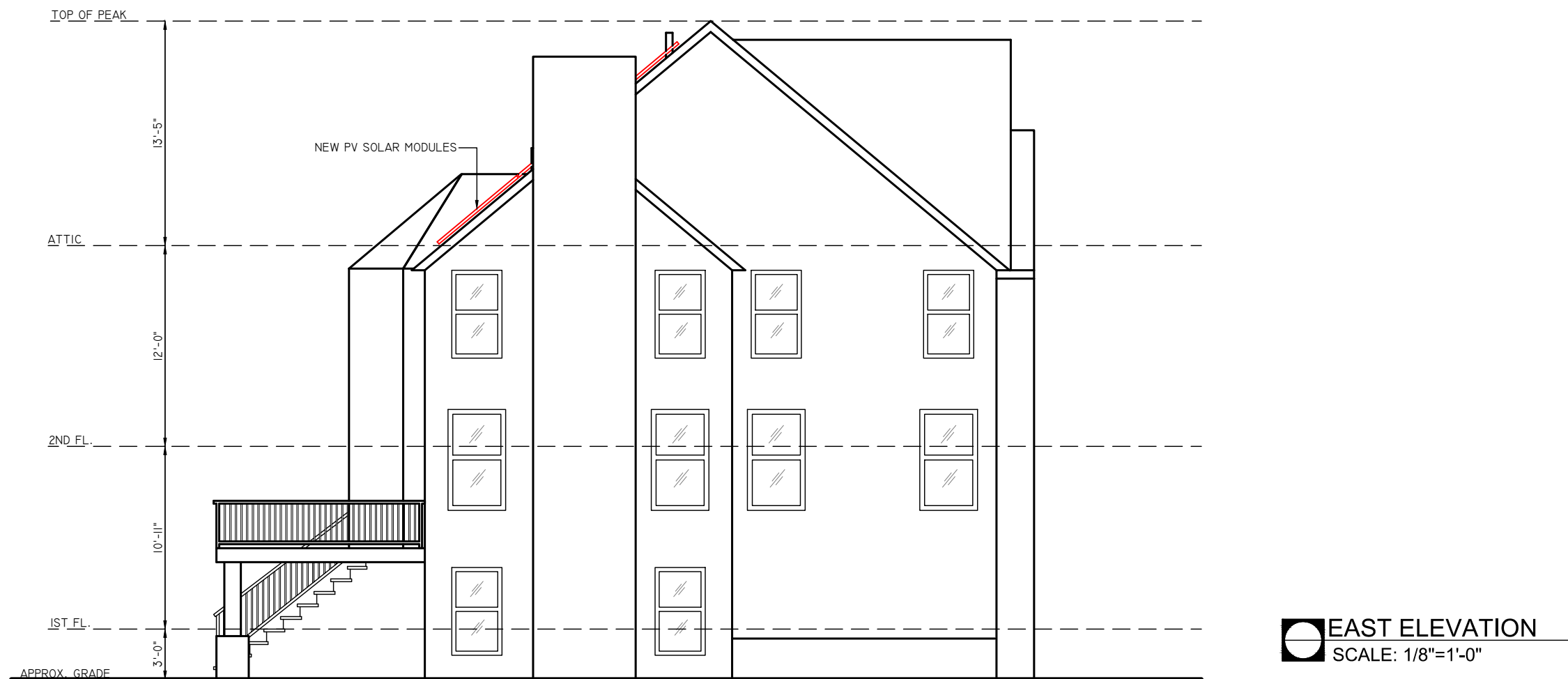
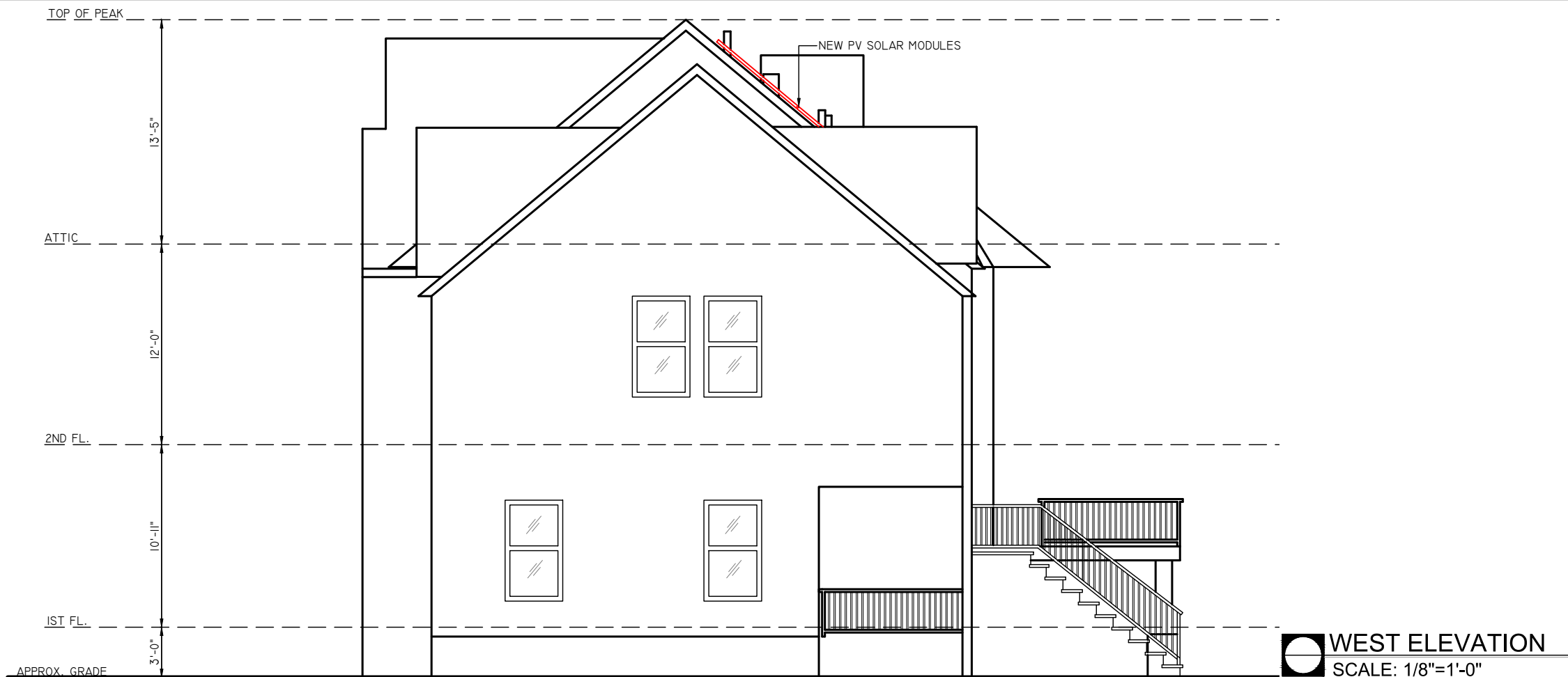
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Rev. No.	Sheet
R2	PV - 4

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DEAL TYPE:	SUNNOVA

Rev. No.	Sheet
R2	PV - 5

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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 2017

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(A) THROUGH (D)

6.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED TO OPERATE WITH UNGROUNDED PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT AS PER **NEC 690.41 (A)(4)**

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 EQUIVALENT 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 BUSBAR, ONE A UTILITY AND THE OTHER AN INVERTER, PV BACKFEED BREAKER(S) SHALL BE LOCATED OPPOSITE FROM UTILITY **NEC 705.12(B)(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*1.25)1 = 18.75A

AWG #10, DERATED AMPACITY
 AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96
 RACEWAY DERATING = 4 CCC: 0.80
 (40*.96)0.80 = 30.72A

30.72A ≥ 18.75A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY
 32.00A*1.25 = 40.00A

AWG #8, DERATED AMPACITY
 AMBIENT TEMP: 30°C, TEMP DERATING: 1.0
 RACEWAY DERATING ≤ 3 CCC: N/A
 55A*1.0 = 55A

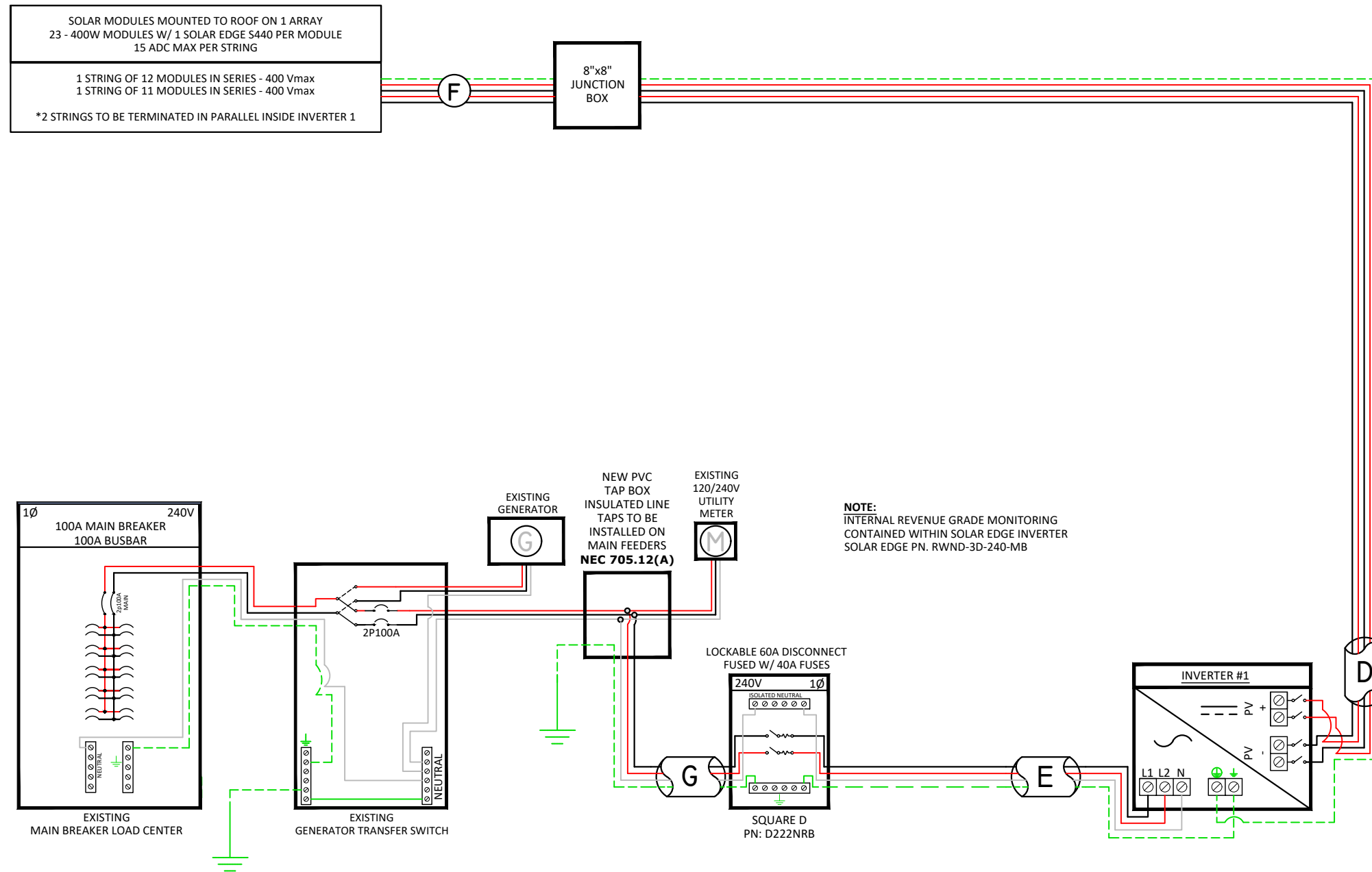
55A ≥ 40.00A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION

TOTAL INVERTER CURRENT: 32.00A

32.00A*1.25 = 40.00A

-> 40A OVERCURRENT PROTECTION IS VALID



PV MODULE SPECIFICATIONS	
HANWHA 400 (Q.PEAK DUO BLK ML-G10.a+ 400)	
I _{mp}	10.77
V _{mp}	37.13
V _{oc}	45.3
I _{sc}	11.14

INVERTER #1 - SE7600H-US0SHBNC4			
DC		AC	
I _{mp}	20	P _{out}	7600
V _{mp}	400	I _{max}	32
V _{oc}	480	OCPD _{min}	40
I _{sc}	30	V _{nom}	240

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-#8 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
C	3/4" CONDUIT W/ 4-#10 THWN-2, 1-#10 THWN-2 GROUND
D	3/4" CONDUIT W/ 4-#10 THWN-2, 1-#10 THWN-2 GROUND
E	3/4" CONDUIT W/ 2-#8 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
F	#10 PV WIRE (FREE AIR) W/ #6 BARE COPPER BOND TO ARRAY
G	3/4" CONDUIT W/ 2-#6 THWN-2, 1-#6 THWN-2, 1-#8 THWN-2 GROUND

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R2	PV - 6

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MATERIAL LIST

(FOR INTERNAL USE ONLY)



2211 Allenwood Road
Wall, New Jersey 07719

877-786-7283
www.Trinity-Solar.com

JOB NAME: LEWY, ROBERT-
ADDRESS: 10 Riverton Drive
Nyack, NY 10960
41.104362,-73.925510

60.88 ESTIMATED PERSONNEL HOURS

2.54 DAYS

1.9 DAYS

1.27 DAYS

- 23 HANWHA 400's (9.2KW)
- 1 ARRAY
- 39' PEAK TO GROUND
- 23 PORTRAIT & 0 LANDSCAPED
- 1 INVERTERS INSTALLED OUTSIDE
- NO TRENCH

(CREW OF 3)

(CREW OF 4)

(CREW OF 6)

	<u>ESTIMATED</u>	<u>SENT TO JOB</u>	<u>USED</u>
<input type="checkbox"/> HANWHA 400 (Q.PEAK DUO BLK ML-G10.a+ 400)	23	—	—
<input type="checkbox"/> S440 SE OPTIMIZERS	23	—	—
<input type="checkbox"/> SE7600H-US0SHBNC4	1	—	—
<input type="checkbox"/> 60A OUTDOOR FUSED DISCONNECT W/ (2) 40A FUSES	1	—	—
<input type="checkbox"/> SOLADECK BOX(ES) & HAYCO CONNECTOR(S)	1	—	—
<input type="checkbox"/> PV LEAD WIRE	100'	—	—
<input type="checkbox"/> INSULATED BUG BITES (LINE TAPS)	2	—	—
<input type="checkbox"/> CASE(S) OF BLACK SPRAY PAINT	1	—	—
<input type="checkbox"/> CASE(S) OF TAR	1	—	—
<input type="checkbox"/> ECOFASTEN 2012025 CF STD RAIL MLL AL 171.5	16	—	—
<input type="checkbox"/> ECOFASTEN 2012013 CF RAIL SPLICE	4	—	—
<input type="checkbox"/> ECOFASTEN 2099017 CF END CLAMP 32MM BLK	32	—	—
<input type="checkbox"/> ECOFASTEN 2099022 CF MID CLAMP SHORT BLK	30	—	—
<input type="checkbox"/> ECOFASTEN 4011011 MODULE JUMPER	7	—	—
<input type="checkbox"/> GROUNDING LUG (NOT PROVIDED BY ECOFASTEN)	1	—	—
<input type="checkbox"/> ECOFASTEN 2012022 CF UNIV L-FOOT MLL 3	60	—	—
<input type="checkbox"/> ECOFASTEN 3012020 GF-1 FLASHING GLV BLK 8 x 10	60	—	—
<input type="checkbox"/> ECOFASTEN 2012019 CF MLPE MOUNT	23	—	—
<input type="checkbox"/> ECOFASTEN 2012020 CF WIRE MGMT CLIP	23	—	—
<input type="checkbox"/> ECOFASTEN 2012024 CF END CAP	32	—	—



2211 Allenwood Road 877-786-7283
Wall, New Jersey 07719 www.Trinity-Solar.com

INSTALLATION OF NEW
ROOF MOUNTED PV SOLAR SYSTEM

LEWY, ROBERT-
10 RIVERTON DRIVE
NYACK, NY 10960
41.104362,-73.925510

APPENDIX

CONTENTS
LABELS, STICKERS, AND PLACARDS
EQUIPMENT DATA SHEETS

NOTES:

- 1.) COMPLIES WITH NEC 2017
- 2.) REFER TO SHEET PV-3 FOR SITE SPECIFIC VALUES REQUIRED BY NEC 690
- 3.) STICKERS, LABELS, AND PLACKARDS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED

To be located on all DC junction boxes and every 10' on DC conduit

WARNING: PHOTOVOLTAIC POWER SOURCE
NEC 690.31(G)



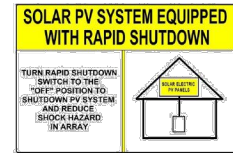
DC Junction Box



Soladeck



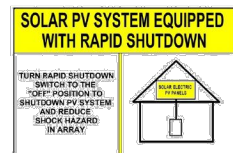
DC Conduit



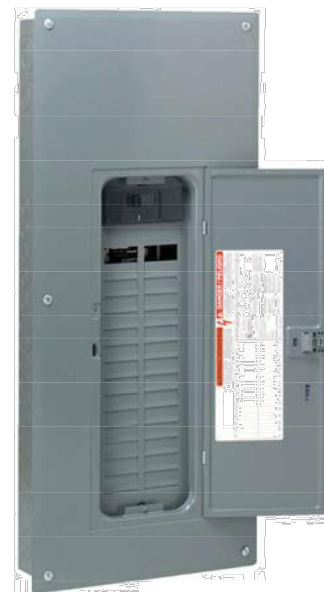
NEC 690.56(C)(1)(A)



Service Disconnect



NEC 690.56(C)(1)(A)



Main Service Panel



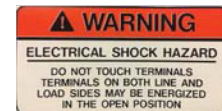
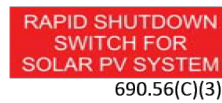
Utility Meter Socket



NEC 690.13(B)



Solar Meter Socket



NEC 690.13(B)



NEC 690.54



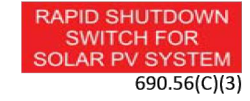
Photovoltaic AC Disconnect



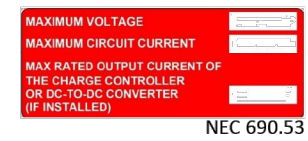
NEC 690.54



Load Center (To Combine Inverters)



NEC 690.13(B)



NEC 690.53



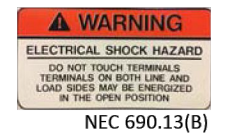
Inverter(s)



NEC 690.53



DC Disconnect



NEC 690.13(B)



Enphase Envoy Box



powered by
Q.ANTUM DUO Z

Q.PEAK DUO BLK ML-G10.a+

385-405

ENDURING HIGH PERFORMANCE



BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry. The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.



INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology¹, Hot-Spot Protect and Traceable Quality Tra.Q™.



EXTREME WEATHER RATING

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).



A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty².

¹ APT test conditions according to IEC/TS 62804-1:2015, method A (-1500V, 96h)
² See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:



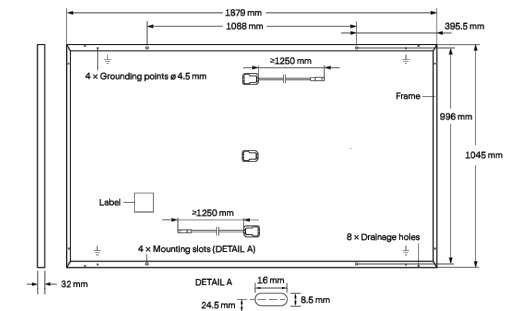
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	1879 mm × 1045 mm × 32 mm (including frame)
Weight	22.0 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) ≥1250 mm, (-) ≥1250 mm
Connector	Stäubli MC4; IP68

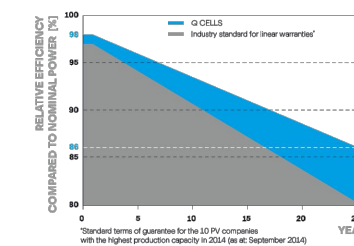


ELECTRICAL CHARACTERISTICS

POWER CLASS			385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5 W / -0 W)							
Minimum	Power at MPP ¹	P _{MPP} [W]	385	390	395	400	405
	Short Circuit Current ¹	I _{SC} [A]	11.04	11.07	11.10	11.14	11.17
	Open Circuit Voltage ¹	V _{OC} [V]	45.19	45.23	45.27	45.30	45.34
	Current at MPP	I _{MPP} [A]	10.59	10.65	10.71	10.77	10.83
	Voltage at MPP	V _{MPP} [V]	36.36	36.62	36.88	37.13	37.39
	Efficiency ¹	η [%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ²							
Minimum	Power at MPP	P _{MPP} [W]	288.8	292.6	296.3	300.1	303.8
	Short Circuit Current	I _{SC} [A]	8.90	8.92	8.95	8.97	9.00
	Open Circuit Voltage	V _{OC} [V]	42.62	42.65	42.69	42.72	42.76
	Current at MPP	I _{MPP} [A]	8.35	8.41	8.46	8.51	8.57
	Voltage at MPP	V _{MPP} [V]	34.59	34.81	35.03	35.25	35.46

¹ Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • 800 W/m², NMOT, spectrum AM 1.5

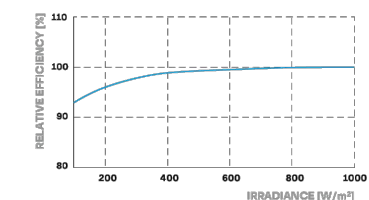
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I _{SC}	α [%/K]	+0.04	Temperature Coefficient of V _{OC}	β [%/K]	-0.27
Temperature Coefficient of P _{MPP}	γ [%/K]	-0.34	Nominal Module Operating Temperature	NMOT [°C]	43 ± 3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V _{SYS} [V]	1000	PV module classification	Class II
Maximum Reverse Current	I _R [A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 2
Max. Design Load, Push / Pull	[Pa]	3600 / 2660	Permitted Module Temperature on Continuous Duty	-40 °C - +85 °C
Max. Test Load, Push / Pull	[Pa]	5400 / 4000		

QUALIFICATIONS AND CERTIFICATES

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016. This data sheet complies with DIN EN 50380.



PACKAGING INFORMATION

	1940 mm	1100 mm	1220 mm	751 kg	28 pallets	24 pallets	32 modules
Horizontal packaging							
Vertical packaging	1970 mm	1150 mm	1215 mm	765 kg	28 pallets	24 pallets	33 modules

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH

Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | TEL +49 (0)3494 66 99-23444 | FAX +49 (0)3494 66 99-23000 | EMAIL sales@q-cells.com | WEB www.q-cells.com

Engineered in Germany

Q CELLS

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US



INVERTERS

Optimized installation with HD-Wave technology

- / Specifically designed to work with power optimizers
 / UL1741 SA certified, for CPUC Rule 21 grid compliance
- / Record-breaking 99% weighted efficiency
 / Small, lightweight, and easy to install both outdoors or indoors
- / Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
 / Built-in module-level monitoring
- / Fixed voltage inverter for longer strings
 / Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)
- / Integrated arc fault protection and rapid shutdown for NEC 2014, NEC 2017 and NEC 2020 per article 690.11 and 690.12

solaredge.com



Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US		
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4								
OUTPUT									
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac	
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac	
AC Frequency (Nominal)	59.3 - 60 - 60.5 ⁽¹⁾								
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A	
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A	
Power Factor	1, Adjustable - 0.85 to 0.85								
GFDI Threshold	1								
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes								
INPUT									
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W	
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W	
Transformer-less, Ungrounded	Yes								
Maximum Input Voltage	480								
Nominal DC Input Voltage	380				400				
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Adc	
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Adc	
Max. Input Short Circuit Current	45								
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600k Ω Sensitivity								
Maximum Inverter Efficiency	99	99.2							%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%	
Nighttime Power Consumption	< 2.5								
ADDITIONAL FEATURES									
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)								
Revenue Grade Metering, ANSI C12.20 Consumption metering	Optional ⁽³⁾								
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection								
Rapid Shutdown - NEC 2014, NEC 2017 and NEC 2020, 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect								
STANDARD COMPLIANCE									
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07								
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)								
Emissions	FCC Part 15 Class B								
INSTALLATION SPECIFICATIONS									
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG				1" Maximum / 14-4 AWG				
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG				1" Maximum / 1-3 strings / 14-6 AWG				
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.3 x 14.6 x 7.3 / 540 x 370 x 185				
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6					
Noise	< 25				< 50				
Cooling	Natural Convection								
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽⁴⁾								
Protection Rating	NEMA 4X (Inverter with Safety Switch)								

(1) For other regional settings please contact SolarEdge support
 (2) A higher current source may be used; the inverter will limit its input current to the values stated
 (3) Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BN4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box
 (4) Full power up to at least 50°C / 122°F; for power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>
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Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505



POWER OPTIMIZER

PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- 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
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

solaredge.com



Power Optimizer For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high-power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P505 (for higher current modules)		
INPUT										
Rated Input DC Power ⁽¹⁾	320	350	370	400		405	485	505	W	
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	60	125 ⁽²⁾		83 ⁽²⁾	Vdc	
MPPT Operating Range	8 - 48		8 - 60	8 - 80	8-60	12.5 - 105		12.5 - 83	Vdc	
Maximum Short Circuit Current (Isc)	11			10.1	11.75	11		14	Adc	
Maximum DC Input Current	13.75			12.5	14.65	12.5		17.5	Adc	
Maximum Efficiency	99.5									
Weighted Efficiency	98.8								98.6	%
Overtoltage Category	II									
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)										
Maximum Output Current	15									
Maximum Output Voltage	60						85		Vdc	
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)										
Safety Output Voltage per Power Optimizer	1 ± 0.1									
STANDARD COMPLIANCE										
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3									
Safety	IEC62109-1 (class II safety), UL1741									
Material	UL94 V-0, UV Resistant									
RoHS	Yes									
INSTALLATION SPECIFICATIONS										
Maximum Allowed System Voltage	1000									
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters									
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1		129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9		129 x 162 x 59 / 5.1 x 6.4 x 2.3		mm / in	
Weight (including cables)	630 / 1.4		750 / 1.7	655 / 1.5	845 / 1.9		1064 / 2.3		gr / lb	
Input Connector	MC4 ⁽³⁾							Single or dual MC4 ⁽³⁾⁽⁴⁾	MC4 ⁽³⁾	
Input Wire Length	0.16 / 0.52				0.16 or 0.9 / 0.52 or 2.95 ⁽⁵⁾	0.16 / 0.52			m / ft	
Output Wire Type / Connector	Double Insulated / MC4									
Output Wire Length	0.9 / 2.95			1.2 / 3.9						m / ft
Operating Temperature Range ⁽⁶⁾	-40 - +85 / -40 - +185									
Protection Rating	IP68 / NEMA6P									
Relative Humidity	0 - 100									

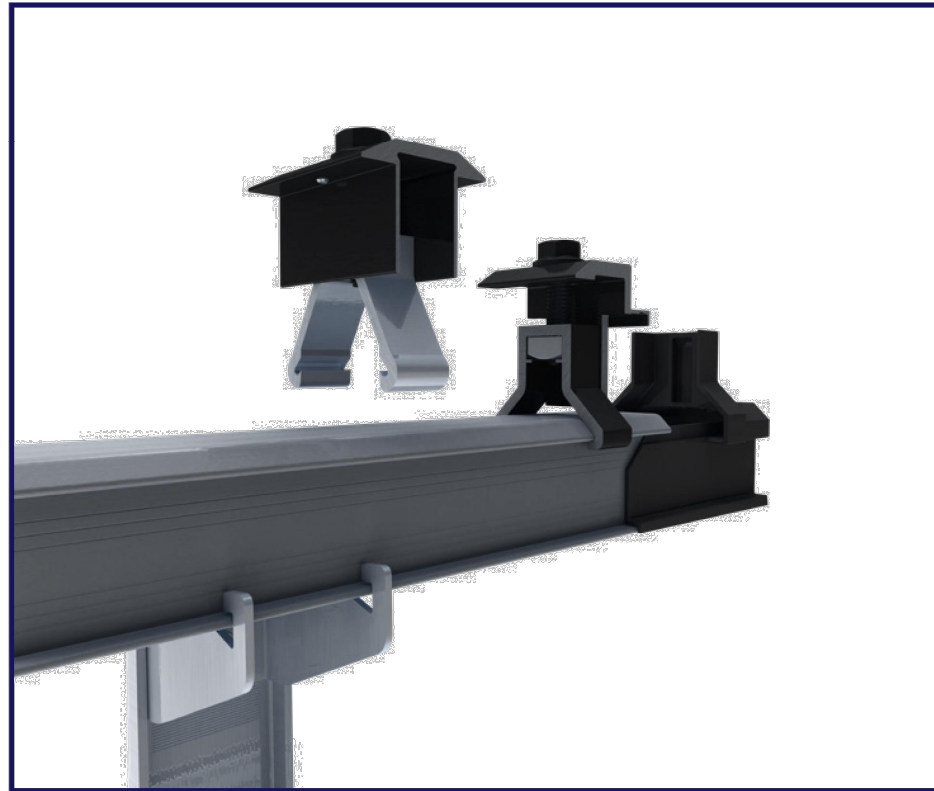
(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed
 (2) NEC 2017 requires max input voltage be not more than 80V
 (3) For other connector types please contact SolarEdge
 (4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals.
 (5) Longer inputs wire length are available for use. For 0.9m input wire length order P401-xxxLxxx.
 (6) For ambient temperature above +85°C / +185°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter ⁽⁷⁾⁽⁸⁾	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401 P405, P485, P505	8	10	18	
Maximum String Length (Power Optimizers)		6	8	14	
Maximum Power per String		25	25	50 ⁽⁹⁾	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 ⁽¹⁰⁾	12750 ⁽¹¹⁾	W
Parallel Strings of Different Lengths or Orientations	Yes				

(7) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf
 (8) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string
 (9) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
 (10) For 208V grid: it is allowed to install up to 6,500W per string when the maximum power difference between each string is 1,000W
 (11) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

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CLICKFIT

The UL 2703 listed ClickFit is one of the fastest installing rail-based systems in the industry. Thanks to its Click-In Rail assembly, the rails can be connected to any of EcoFasten's composition shingle, tile and metal roof mounts in seconds without the need for fasteners or tools. The ClickFit system is made of robust materials, such as aluminum and coated steel, to ensure resistance to corrosion and longevity. ClickFit is tested in extreme weather, wind, fire, and snow conditions.

FEATURES

- Tool and fastener free rail attachment
- Fully integrated bonding
- Click-on Mid & End Clamps
- Compatible with a variety of EcoFasten roof attachments

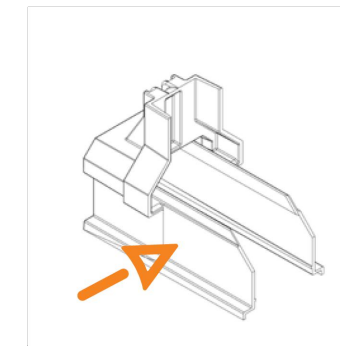
FEATURES + BENEFITS

RATINGS

Fire Rating**	Class A System Fire Rating
Max System Voltage	1500 VDC
Max Fuse Rating	30A
Certification	Conforms to UL STD 2703
Warranty	20 Year Material and Workmanship
UL 2703 Markings	Product listing label is located on the rail end-caps
Roof Pitch	2:12 - 12:12
UL 2703 Allowable Design Load Rating	10 psf downward, 5 psf upward, and 5 psf lateral
Max Module Size	25.6 sqft
Module Orientation	Portrait or Landscape
Multiple use Rated Components (Position Independent)	Mid Clamp, MLPE Clip, and MLPE Bracket

**Class A System fire rating with Type 1 & 2 PV modules. Any module-to-roof gap is permitted, with no skirt required. This rating is applicable with any roof attachment.

UL 2703 MARKING EXAMPLE:



TORQUE SPECIFICATIONS

Component	Torque (in-lb)	Notes
Lag Screw	N/A	Fully Seat. Use visual indicator of the black EPDM ring around the bonded washer for torquing.
Mid-Clamp	144	
End-Clamp	96	
Rail Clicker Leveling Bolt	142	Pre-torqued upon delivery. Applies to Tile Hook and L-Foot/Clicker
Hook Height Bolt	N/A	Lightly clamp hook to flush with top of next tile row
Ground Lug	N/A	Refer to specific ground lug manufacturer's installation manual
MLPE Clip	144	
MLPE Mount	144	

RATINGS