GENERAL NOTES

1. THIS SYSTEM COMPLIES WITH THE 2019 CRC, 2019 CBC, 2019 CFC, AND THE 2019 CEC.

2. THE SYSTEM WILL NOT BE TURNED-ON UNTIL THE SERVING UTILITY COMPANY HAS BEEN NOTIFIED.

3. THE INSTALLED SOLAR SYSTEM HAS A DISTRIBUTED WEIGHT LESS THAN 4 PSF.

4. THE CONCENTRATED LOAD FOR EACH VERTICAL SUPPORT IS LESS THAN 40 LBS.

5. ALL PV EQUIPMENT IS LISTED BY A RECOGNIZED TESTING LAB. INVERTERS ARE UL 1741 COMPLIANT.

6. THE BACKFED BREAKER WILL BE LOCATED AT THE OPPOSITE END OF THE BUS FROM THE MAN BREAKER.

7. CONDUCTORS ARE COPPER WIRE.

8. ANY CONDUCTORS EXPOSED TO SUNLIGHT ARE LISTED AS SUNLIGHT RESISTANT.

9. IF DC CONDUCTORS ARE RUN INSIDE THE BUILDING, THEY WILL BE CONTAINED IN A METAL RACEWAY.

10. ANY CONDUCTORS BETWEEN SEPARATE ARRAYS ON THE ROOF WILL BE PROTECTED IN CONDUIT.

11. THE EQUIPMENT CROUNDING CONDUCTOR ON THE ROOF WILL BE PROTECTED FROM PHYSICAL DAMAGE. ITWILL BE TUCKED NEATLY UNDER THE MODULES AND RAILS AND SECURED IN PLACE.

12. THE MODULES WILL BE ATTACHED TO THE EQUIPMENT GROUNDING CONDUCTOR IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

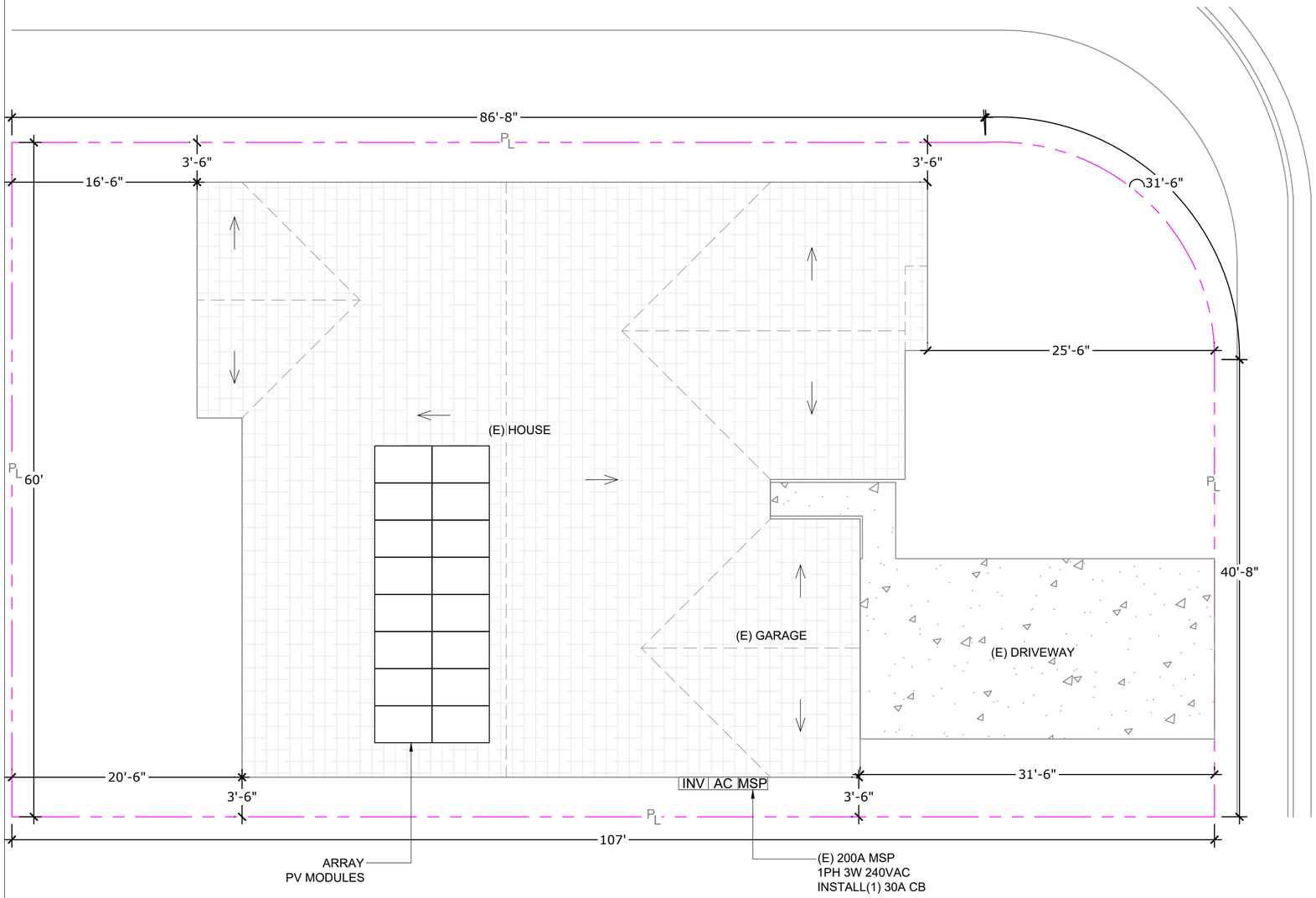
13. ALL EXTERIOR CONDUIT, FITTINGS AND BOXES ARE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS.

14. CLEARANCES AROUND ALL ELECTRICAL EQUIPMENT WILL BE NED IN ACCORDANCE WITH CEC 110,26.

15. SOLAR MODULES WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL OR BUILDING ROOF VENTS.

16. IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE A VERIFIABLE CROUNDING ELECTRODE SYSTEM, A GROUNDING ELECTRODE SYSTEM WILL BE INSTALLED PER CEC 250.50. THE ELECTRICAL SERVICE WILL BE BONDED TO THE WATER ANDGAS PIPING PER SECTION 250.104 OF THE CEC.

NUMBER OF ARRAYS PROPOSED: 1				
ARRAY # 1 DETAILS	# OF MODULES: 16	TILT: 22	AZIMUTH: 180°	MAX HEIGHT: 9"



1 SITE PLAN

Scale: 1/8" = 1'-0"

N

GENERAL NOTE:

TITLE 24, PART 6 BY CEC (MINIMUN REQUIREMENT SOLAR PV SYSTEMS):
KWPV = (CFA X A)/1000 + (NDWELL X B)
KWPV = (2.738 S.F. X 0.613)/1000 + (1 X 1.40)
KWPV = 3.08 KW (MINIMUM REQUIRED SYSTEM)
SYSTEM SIZE (STC DC) = 5.28 KW > 3.08 KW, THEREFOR OK

SYSTEM SPECIFICATION

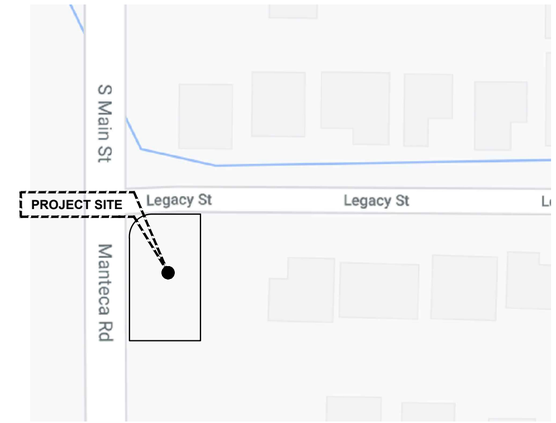
PHOTOVOLTAIC SOLAR SYSTEM

SYSTEM SIZE (STC DC)	5.28 kW
SYSTEM SIZE (PTC DC)	4.90 kW
SYSTEM SIZE (CEC AC)	4.85 kW
SYSTEM SIZE (AC)	5.00 kW
PV MODULE SPECIFICATION	(16)HANWHA Q CELLS Q.PEAK DUO-G7 330
STC	330 W
PTC	306.5W
PV OPTIMIZER	(16) SOLAREDGE SE P370
PV INVERTER SPECIFICATION	(1) SOLAREDGE SE5000H-US (240V)
RATED OUTPUT POWER	5.00 kW
CEC EFFICIENCY	99%

SITE DETAILS

SPANISH TILE ROOF, 2X4 TRUSSES @ 24" O.C., DF #2, ROOF SLOPE(S): 22°
AREA OF ROOF(PLAN VIEW)= 3103SF
AREA OF NEW ARRAY = 269SF = 9% OF ROOF AREA
(ARRAY < 33% OF ROOF AREA)
CLIMATE DATA SOURCE: STOCKTON METROPOLITAN ARPT, 37.89NN, 121.24W
ASHRAE EXTREME LOW: -3°C
ASHRAE 2% HIGH: 40°C
ASHRAE EXTREME HIGH: 45.4°C
WIND SPEED: 120 MPH (ASCE7-10)
RISK CATEGORY:II
WIND EXPOSURE CATEGORY: B
GROUND SNOW LOAD: 0 PSF

LOCATION MAP



© GOOGLE MAPS

CODE ANALYSIS

ALL MATERIALS, EQUIPMENT, INSTALLATION AND WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES:

2019 CFC, 2019 CBC. 2019 CRC, 2019 CPC, 2019 CALIFORNIA RESIDENTIAL CODE: BASED ON THE 2018 INTERNATIONAL RESIDENTIAL CODE (IRC)
2019 CALIFORNIA ELECTRICAL CODE: BASED ON THE 2017 NATIONAL ELECTRICAL CODE (NEC)
2019 CALIFORNIA MECHANICAL CODE: BASED ON THE 2018 UNIFORM MECHANICAL CODE (UMC)2019 CALIFORNIA PLUMBING CODE: BASED ON THE 2018 UNIFORM PLUMBING CODE (UPC)
2019 CALIFORNIA GREEN CODE: CALIFORNIA BUILDING STANDARDS COMMISSION
2019 CALIFORNIA ENERGY CODE: CALIFORNIA ENERGY COMMISSION

SHEET INDEX

LEGEND

MSP	MAIN SERVICE PANEL
PV	PV DEDICATED SUBPANEL
AC	AC DISCONNECT
INV	INVERTER
CB	COMBINER BOX
E	EXISTING
N	NEW
PL	PROPERTY LINE

CONTRACTOR

SEAL / SIGNATURE

PROJECT OWNER
MANJIT SANDHU

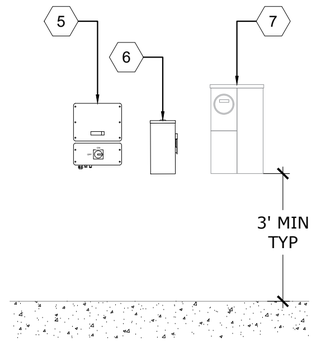
PROJECT ADDRESS
120 LEGACY ST.
MANTECA, CA

DRAWN BY
AM

REVISIONS
⚠ 9/13/2020

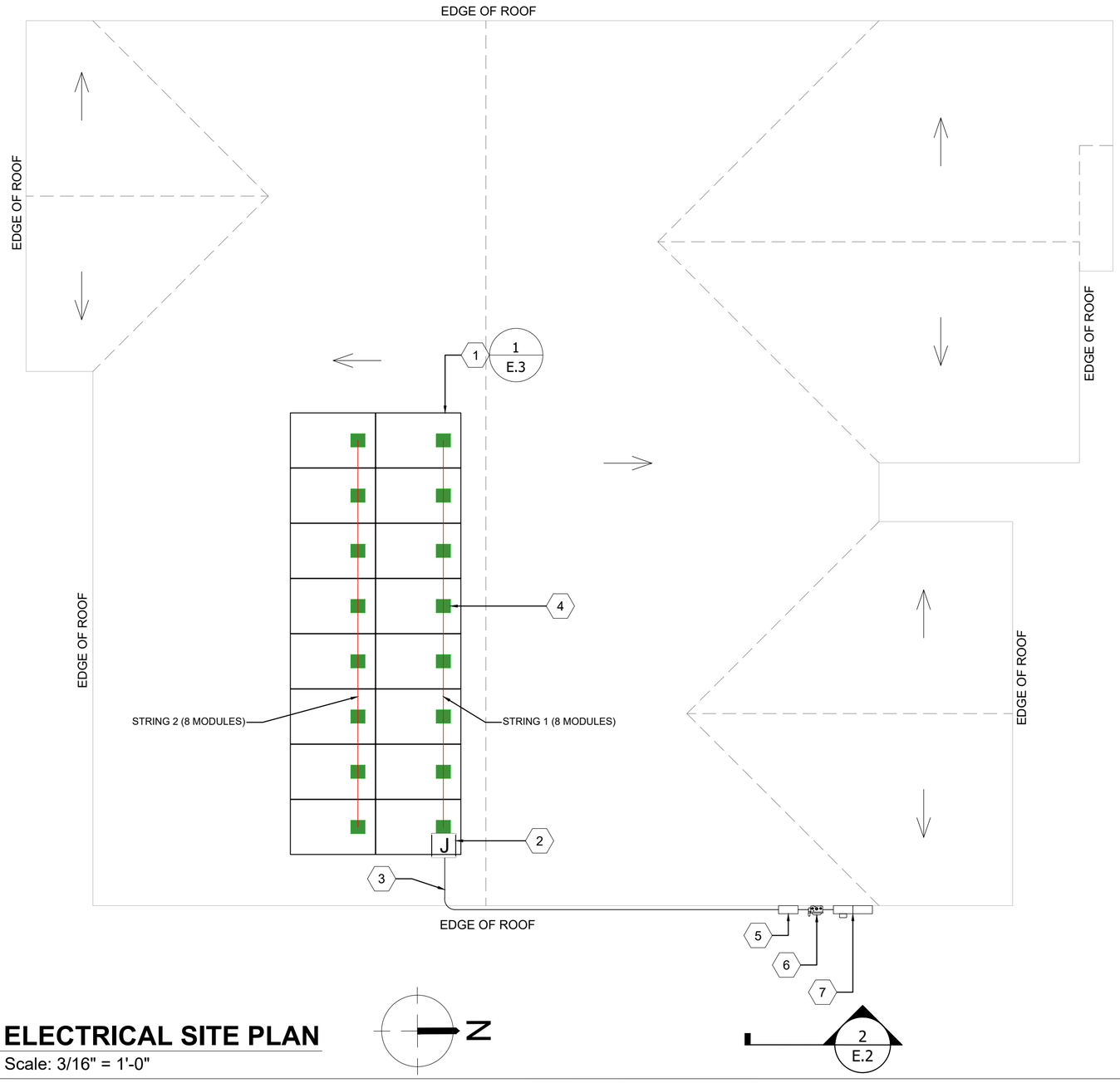
SHEET DESCRIPTION
COVER SHEET

E.1



2 EQUIPMENT ELEVATION

Scale: 3/8" = 1'-0"



1 ELECTRICAL SITE PLAN

Scale: 3/16" = 1'-0"

CONSTRUCTION NOTES

1. INSTALL (16) Q.PEAK DUO-G7 330(HANWHA Q CELLS) SOLAR MODULES SHALL BE GROUNDED PER UL2703.
2. INSTALL NEMA 3R, JUNCTION BOX.
3. CONDUIT RUN.
4. INSTALL (16) SOLAREDGE SE P370 POWER OPTIMIZER (INSTALLED UNDER MODULE)
5. INSTALL (1) INVERTER SOLAREDGE SE5000H-US (240V)
6. INSTALL 30A AC DISCONNECT, NEMA 3R.
7. EXISTING 200A MAIN SERVICE PANEL, 1PH 3W, 120 / 240V WITH 200A BUS BAR RATING/ METER

NOTES

1. IF NECESSARY PLUMBING VENTS SHALL BE REROUTED AROUND SOLAR ARRAYS THROUGH ATTIC SPACE AND TERMINATED MIN 6" ABOVE ROOFLINE. PERMIT AS NEEDED.
2. ALL CONDUIT SHALL MATCH STUCCO, SIDING, PAINT AND TRIM.

WARNING LABELS

TEXT SIZE: 3 / 8" MIN. NON BOLD MTRL: REFLECTIVE, PERMANENT, TEXT SHALL BE WHITE, BACKGROUND SHALL BE RED.

1. WARNING
INVERTER OUTPUT CONNECTED.
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LOCATION: ON BACK FED (PV LINE) BREAKER IN MAIN SERVICE PANEL.
CEC 705.12 (D) (7)

2. WARNING
DUAL POWER SOURCES
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
RATED AC OUTPUT CURRENT: 30A AC
NORMAL OPERATING VOLTAGE: 240V

LOCATION: ON IN MAIN SERVICE PANEL.
CEC 690.54 and CEC 705.12 (D) (4)

3. PV SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT: 30A AC
NORMAL OPERATING VOLTAGE: 240V

LOCATION: ON AC DISCONNECT.
CEC 690.54

4. WARNING: PHOTOVOLTAIC POWER SOURCE

LOCATION: ON EXPOSED AC/DC CONDUIT EVERY 10' AT BENDS, RACEWAYS, J-BOX AND COMBINER BOXES, ENCLOSURE ADN CABLE ASSEMBLIES
CRC R331.2 and CFC 605.11.1

5. PHOTOVOLTAIC SYSTEM IS EQUIPPED WITH RAPID SHUT DOWN

LOCATION: ON IN MAIN SERVICE PANEL.

NOTES:

SIGNAL REQUIREMENT 96

1. RESIDENTIAL BUILDING - THE MARKING MAY BE PLACED WITHIN THE MAIN SERVICE DISCONNECT. THE MARKING SHALL BE PLACED ON THE OUT SIDE COVER IF MAIN SERVICE DISCONNECT OPERABLE WITH THE SERVICE PANEL CLOSED.

2. MARKINGS:
A.VERBIAGE: CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED.
B. FORMAT: 1. WHITE LETTERING ON A RED BACKGROUND. 2. MIN. 318 " LETTER HEIGHT. 3. ALL LETTERS SHALL BE CAPITALIZED. 4. ARIAL OR SIMILAR FONT, NON BOLD.
C. MATERIAL: 1. REFLECTIV, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (USE UL-969 AS STANDARD FOR WEATHER RATING), DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT.

C. MARKING REQUIREMENTS ON DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, D COMBINERS AND JUNCTION BOXES: 1. MARKINGS: PLACEMENT, VERBIAGE, FORMAT AND TYPE OF MATERIAL.
A. PLACEMENT: MARKINGS SHALL BE PLACED EVERY 10' ON ALL INTERIOR DC CONDUITS, RACEWAYS,
ENCLOSURES AND CABLE ASSEMBLIES, AT TURNS, ABOVE ANDIOR BELOW PENETRATIONS, ALL DC COMBINERS AND JUNCTION BOXES.
B. VERBIAGE: CAUTION: SOLAR CIRCUIT. NOTE: THE FORMAT AND TYPE OF MATERIAL SHALL BE
ADHERE OT "B-3b, C" OF THIS REQUIREMENT.
D. INVERTERS - ARE NOT REQUIRED TO HAVE CAUTION MARKINGS.

LEGEND

- PV MODULE
- J — JUNCTION BOX
- CONDUIT
- BRANCH CIRCUIT NUMBER
- RIDGELINE

CONTRACTOR

SEAL / SIGNATURE

PROJECT OWNER
MANJIT SANDHU

PROJECT ADDRESS
120 LEGACY ST.
MANTECA, CA

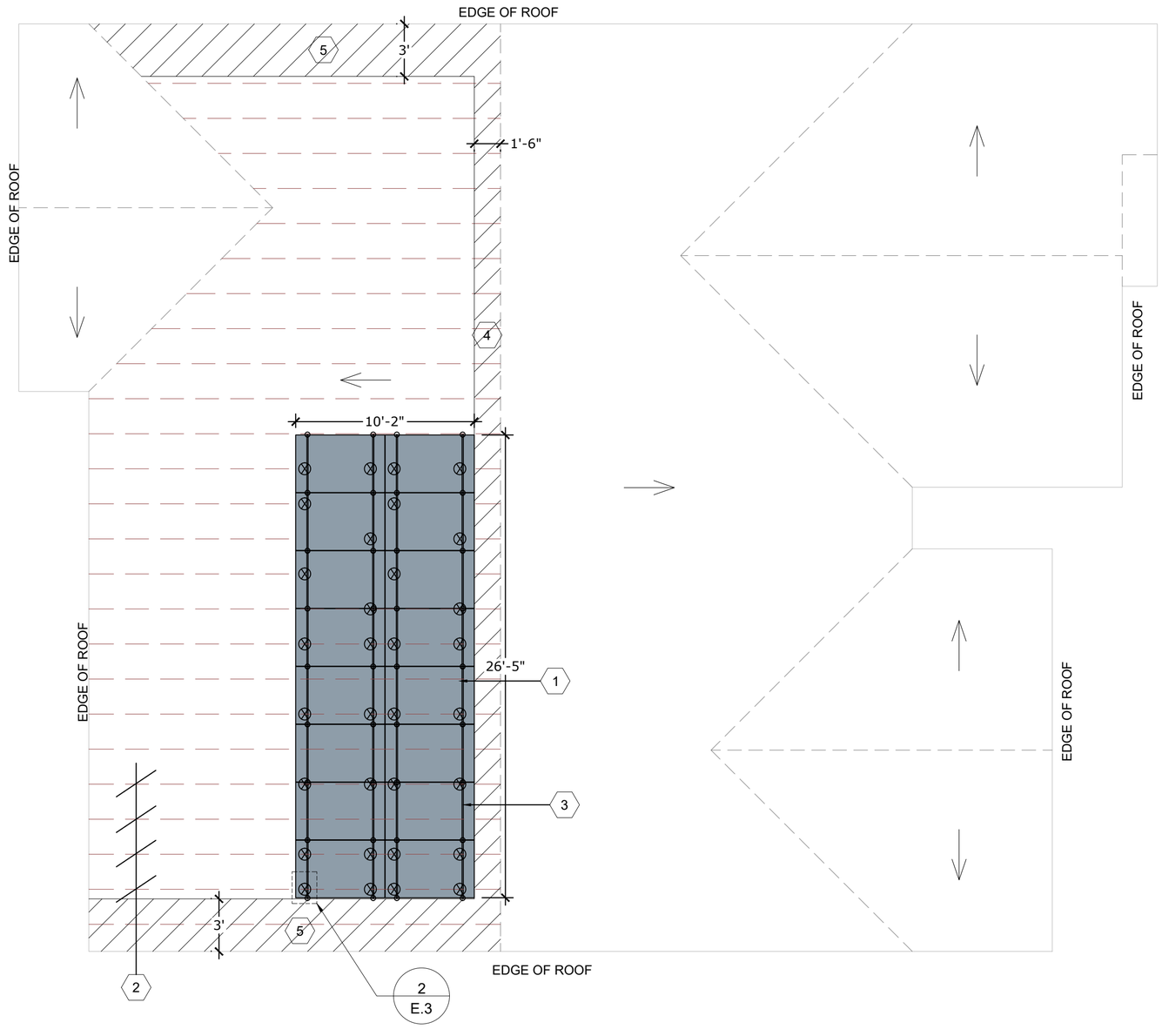
DRAWN BY
AM

REVISIONS
⚠ 9/13/2020

SHEET DESCRIPTION
ELECTRICAL SITE PLAN

E.2

NUMBER OF ARRAYS PROPOSED: 1				
ARRAY # 1 DETAILS	# OF MODULES: 16	TILT: 22	AZIMUTH: 180°	MAX HEIGHT: 9"



1 STRUCTURE

Scale: 3/16" = 1'-0"

N

CALCULATIONS

MODULE SPECS

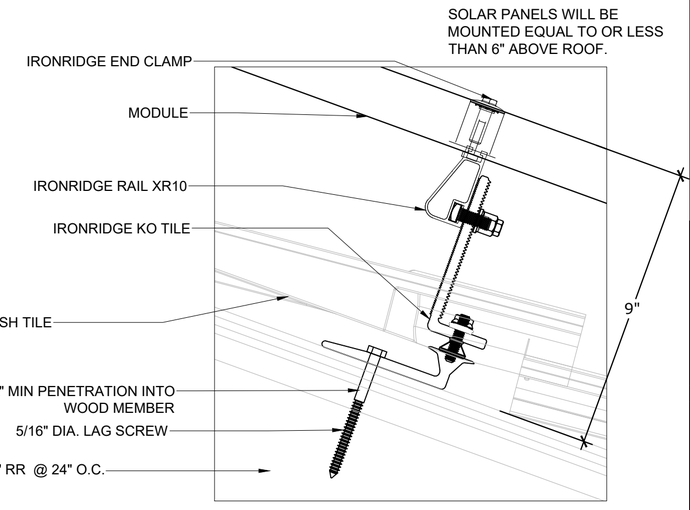
MANUFACTURER:	HANWHA Q CELLS
MODEL:	Q.PEAK DUO-G7 330
MODULE WEIGHT (LBS):	41.2
MODULE LENGTH (INCH):	66.3
MODULE WIDTH (INCH):	39.4

ARRAY SPECS

NUMBER OF MODULES:	16
MODULE WEIGHT (LBS):	659.2
ARRAY AREA (SQFT):	269
ARRAY DEAD LOAD (LBS/SQFT):	2.45
NUMBER OF MOUNTS:	32
LOAD PER MOUNT (LBS):	20.6

KEYED NOTES

1. IRONRIDGE/ KO TILE, TYP OF 32
2. 2X4 TRUSSES @ 24" O.C.
3. IRONRIDGE XR10 BLK RAIL
4. RIDGE (18 SETBACK)
5. TWO 36" PATHWAY FROM EAVE TO RIDGE MIN. ONE ACCESS FOR ARRAY ROOF PLANE PER 2019 CFC 1204.2.1.1.



2 ATTACHMENT DETAIL

Scale: NTS

LEGACY ST

CONTRACTOR

SEAL / SIGNATURE

PROJECT OWNER

MANJIT SANDHU

PROJECT ADDRESS

120 LEGACY ST.
MANTECA, CA

DRAWN BY

AM

REVISIONS

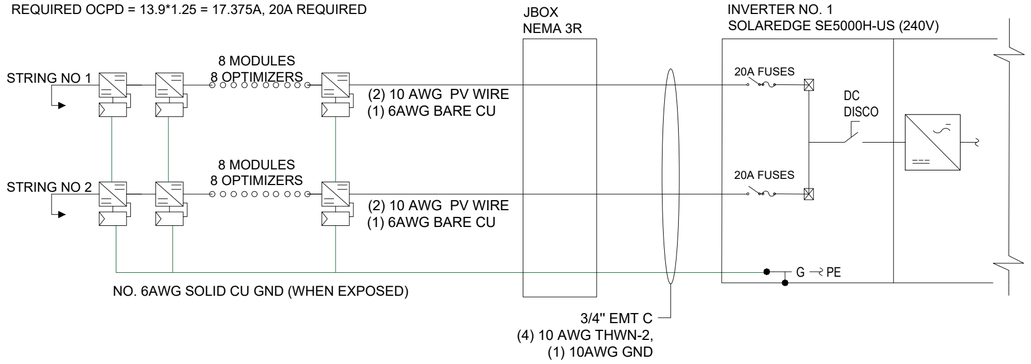
⚠ 9/13/2020

SHEET DESCRIPTION

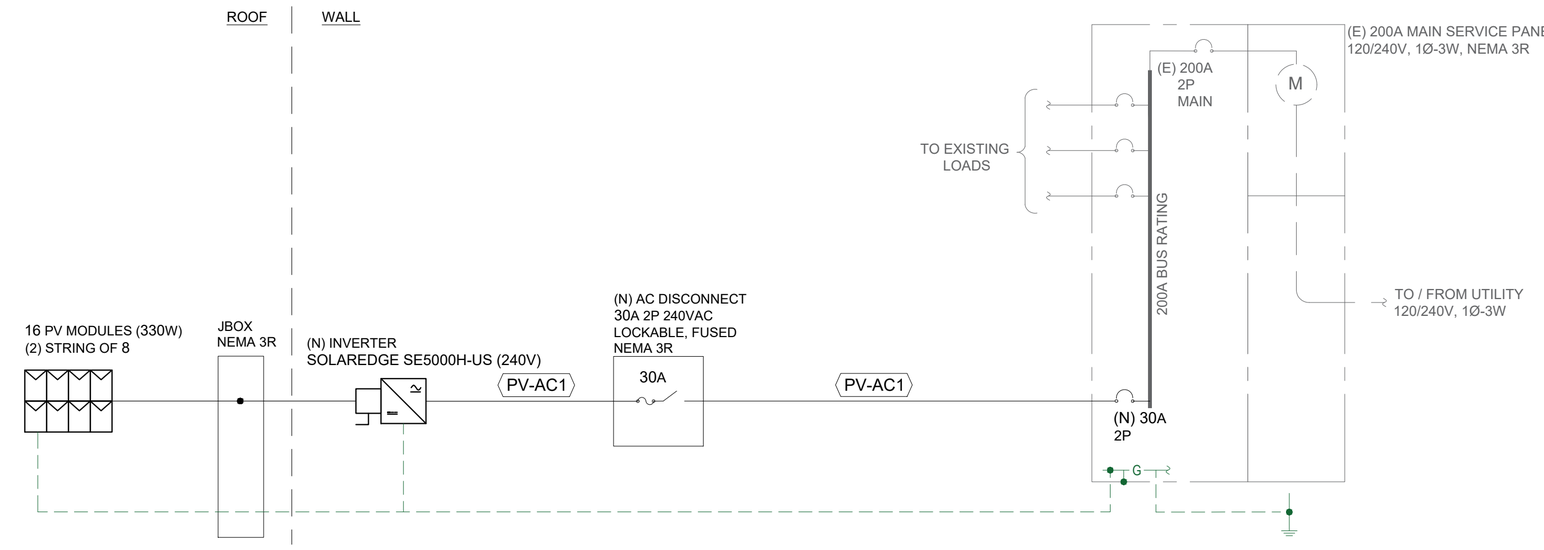
STRUCTURE

E.3

16 TOTAL PV MODULES
(1) STRING OF (8) SE P370 PV OPTIMIZERS (8 MODULES)
(1) MODULE PER OPTIMIZER
CONSTANT VOLTAGE: 380VDC
MAX OPERATING CURRENT:
8*330W = 2640W, 2640W/380V = 13.9A
REQUIRED OCPD = 13.9*1.25 = 17.375A, 20A REQUIRED



1 PV INVERTER SINGLE LINE DETAIL



2 SINGLE LINE DIAGRAM - GRID INTERACTIVE PV SYSTEM

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS

CIRCUIT/NAME	TYPICAL	CONDUCTOR	CONDUIT	CURRENT-CARRYING CONDUCTORS IN CONDUIT	OCPD	EGC	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	LENGTH	VOLTAGE DROP
PV STRING TO J-BOX/ PV-DC1	1	10 AWG PV WIRE, CU	FREE AIR	2	N/A	6 AWG BARE, COPPER	0.87 (45.4°C)	1	13.9A*	17.4A	35A	30.45A	75°C	30FT	0.28%
J-BOX TO INVERTER/ PV-DC2	1	10 AWG PV WIRE, CU	0.75" DIA. EMT	4	N/A	10 AWG THWN-2, CU	0.87 (45.4°C)	0.8	13.9A*	17.4A	35A	24.36A	75°C	45FT	0.42%
INVERTER TO INTERCONNECTION/ PV-AC1	1	10 AWG THWN-2, CU	0.75" DIA. EMT	3	30A	10 AWG THWN-2, CU	0.91 (40°C)	1	21.0A	26.3A	35A	31.85A	75°C	15FT	0.34%
													TOTAL VD %		1.05%

3 FEEDER SCHEDULE / VOLTAGE DROP TABLE

SYSTEM SPECIFICATION

PHOTOVOLTAIC SOLAR SYSTEM

SYSTEM SIZE (STC DC)	5.28 kW
SYSTEM SIZE (PTC DC)	4.90 kW
SYSTEM SIZE (CEC AC)	4.85 kW
SYSTEM SIZE (AC)	5.00 kW
PV MODULE SPECIFICATION	(16)HANWHA Q CELLS Q.PEAK DUO-G7 330
STC	330 W
PTC	306.5W
PV OPTIMIZER	(16) SOLAREDGE SE P370
PV INVERTER SPECIFICATION	(1) SOLAREDGE SE5000H-US (240V)
RATED OUTPUT POWER	5.00 kW
CEC EFFICIENCY	99%

CALCULATIONS

TOTAL OUTPUT POWER:
INVERTER SOLAREDGE SE5000H-US (240V) OUTPUT CIRCUIT
21A (INVERTER OUTPUT CURRENT) * 1.25 =26.25A, ROUNDED TO 30A 2P CB

PROPOSED OUTPUT CIRCUIT:
MAX OCPD = 200A (BUS)*1.2 = 240A
200A MAIN BREAKER + 21A PV LINE = 221A

PV LINE = 120% RULE, THEREFOR OK

NOTES

1. ALL EXPOSED CABLE SHALL BE UV RATED PV-WIRE.
2. ALL CONNECTORS SHALL BE LOCKING OR LATCHING TYPE RATED FOR EXPOSED AND WET LOCATIONS.
3. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO PROCUREMENT AND CONSTRUCTION.
4. ALL EQUIPMENT SHALL BE INSTALLED PER MFG RECOMMENDATIONS AND LISTING INSTRUCTIONS.
5. ALL WORK SHALL CONFORM TO THE 2018 NEC AND 2019 CEC AS WELL AS 2019 CALIFORNIA BUILDING CODE
6. PANELS SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR ROOF VENTS WHEN INSTALLED.

PV MODULE SPECIFICATIONS

MANUFACTURER:	HANWHA Q CELLS
MODEL:	Q.PEAK DUO-G7 330
MAXIMUM POWER:	330 Wp
OPEN CIRCUIT VOLTAGE:	40.62 V
MAXIMUM POWER POINT VOLTAGE:	34.14 V
SHORT CIRCUIT CURRENT:	10.15 A
MAXIMUM POWER POINT CURRENT:	9.67 A
TEMPERATURE COEFFICIENT:	-0.282 %/C
CELLS PER MODULE:	120
FRAME:	BLACK ANODIZED ALUMINUM
WEIGHT:	41.3 LBS
JUNCTION BOX:	IP68

PV INVERTER SPECIFICATIONS

MANUFACTURER AND MODEL:	SOLAREDGE SE5000H-US (240V)

OUTPUT

AC NOMINAL POWER:	5000W
NOMINAL AC VOLTAGE:	240V
MAX. OUTPUT CURRENT:	21A
CEC EFFICIENCY	0.98%

INPUT

MAX. RECOMMENDED PV POWER (@MODULE STC):	7750W
MAX. DC VOLTAGE:	480V
NOMINAL DC VOLTAGE:	380V
NUMBER OF MPPT:	1
NUMBER OF STRINGS:	2
MAX SHORT CIRCUIT CURRENT	45

INSTALLATION SPECIFICATIONS

DIMENSIONS (WXHXD):	17.7 X 14.6 X 6.8 IN
WEIGHT:	25.1 LB
WEIGHU:	

CONTRACTOR

SEAL / SIGNATURE

PROJECT OWNER
MANJIT SANDHU

PROJECT ADDRESS
120 LEGACY ST.
MANTECA, CA

DRAWN BY
AM

REVISIONS
⚠ 9/13/2020

SHEET DESCRIPTION
SINGLE LINE DIAGRAM

E.4

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

12-25 YEAR WARRANTY

Optimized installation with HD-Wave technology

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

solaredge.com

solaredge

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]							Hz
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							A
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							Vdc
Nominal DC Input Voltage	380				400			Vdc
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							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

[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

CONTRACTOR

SEAL / SIGNATURE

PROJECT OWNER
MANJIT SANDHU

PROJECT ADDRESS
120 LEGACY ST.
MANTECA, CA

DRAWN BY
AM

REVISIONS
⚠ 9/13/2020

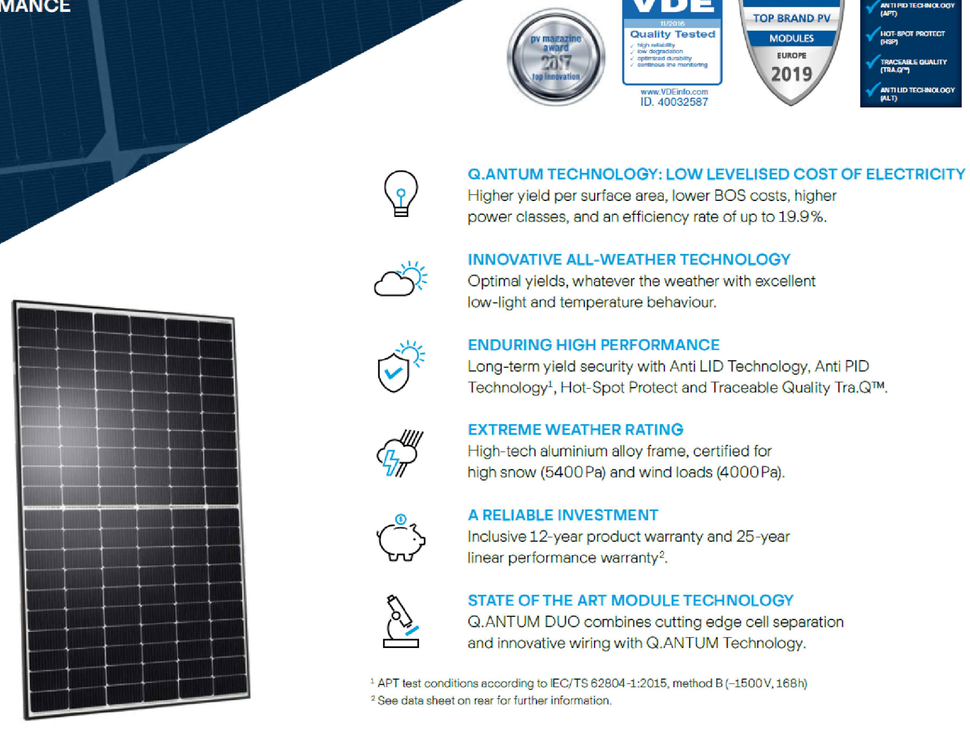
SHEET DESCRIPTION
CUT SHEETS

E.CS1

Q.PEAK DUO-G7

315-330

ENDURING HIGH PERFORMANCE



Q.ANTUM TECHNOLOGY: LOW LEVELISED COST OF ELECTRICITY

Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.9%.

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 Technology[1], 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 12-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (−1500 V, 168 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

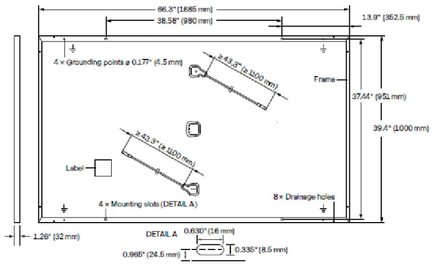
Rooftop arrays on residential buildings

Rooftop arrays on commercial and industrial buildings

Engineered in Germany

MECHANICAL SPECIFICATION

Format	66.3 in × 39.4 in × 1.26 in (including frame) (1685 mm × 1000 mm × 32 mm)
Weight	41.2 lbs (18.7 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 43.3 in (1100 mm), (−) ≥ 43.3 in (1100 mm)
Connector	Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67

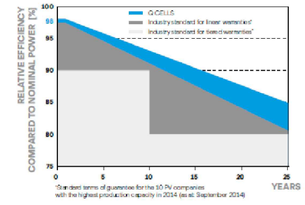


ELECTRICAL CHARACTERISTICS

POWER CLASS				315	320	325	330
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)							
Minimum	Power at MPP[1]	P_{MPP}	[W]	315	320	325	330
	Short Circuit Current[1]	I_{SC}	[A]	9.99	10.04	10.10	10.15
	Open Circuit Voltage[1]	V_{OC}	[V]	39.84	40.10	40.36	40.62
	Current at MPP	I_{MPP}	[A]	9.51	9.56	9.61	9.67
	Voltage at MPP	V_{MPP}	[V]	33.14	33.47	33.81	34.14
	Efficiency[1]	η	[%]	≥18.7	≥19.0	≥19.3	≥19.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP}	[W]	235.9	239.6	243.4	247.1
	Short Circuit Current	I_{SC}	[A]	8.05	8.09	8.14	8.18
	Open Circuit Voltage	V_{OC}	[V]	37.56	37.81	38.06	38.31
	Current at MPP	I_{MPP}	[A]	7.48	7.52	7.57	7.61
	Voltage at MPP	V_{MPP}	[V]	31.53	31.85	32.17	32.48

[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 • [2] 800 W/m², NMOT, spectrum AM 1.5

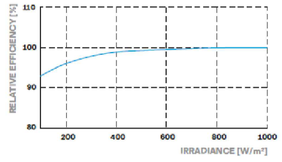
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% 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]	−0.35	Normal Module Operating Temperature	NMOT	[°F]	109 ± 5.4 (43 ± 3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	Safety Class	II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 1703	C (IEC) / TYPE 2 (UL)
Max. Design Load, Push / Pull[3]	[lbs / ft²]	75 (3600 Pa) / 55 (2667 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs / ft²]	113 (5400 Pa) / 84 (4000 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 1703, VDE Quality Tested, CE-compliant, IEC 61215:2016, IEC 61730:2016, Application Class II, U.S. Patent No. 9,893,215 (solar cells)

PACKAGING INFORMATION

Number of Modules per Pallet	32
Number of Pallets per 53' Trailer	30
Number of Pallets per 40' HC-Container	26
Pallet Dimensions (L × W × H)	69.3 × 45.3 × 46.9 in (1760 × 1150 × 1190 mm)
Pallet Weight	1415 lbs (642 kg)

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.

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REVISIONS
⚠ 9/13/2020

SHEET DESCRIPTION
CUT SHEETS

E.CS2

Power Optimizer

P370 / P401 / P404 / P405 / P485 / P500 / P505

POWER OPTIMIZER

PV power optimization at the module level

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

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Power Optimizer

P370 / P401 / P404 / P405 / P485 / P500 / P505

OPTIMIZER MODEL (typical module compatibilty)	P370 (60/72 Cell modules)	P401 (For high power 60/72-cell modules)	P404 (for 60/72-cell short strings)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P500 (for 96-cell modules)	P505 (for higher current modules)	UNIT
INPUT								
Rated Input DC Power(1)	370	400	405	405	485	500	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	60		80	125		80	83	Vdc
MPPT Operating Range	8 - 60		12.5 - 80	12.5 - 105		8 - 80	12.5-83	Vdc
Maximum Short Circuit Current (Isc)	11	11.75	11			10.1	14	Adc
Maximum Efficiency	99.5							%
Weighted Efficiency	98.8							%
Overvoltage Category	II							
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)								
Maximum Output Current	15							Adc
Maximum Output Voltage	60		85			60	85	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)								
Safety Output Voltage per Power Optimizer	1 ± 0.1							Vdc
STANDARD COMPLIANCE								
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3							
Safety	IEC62109-1 (class II safety), UL1741							
RoHS	Yes							
Fire Safety	VDE-AR-E 2100-712:2013-05							
INSTALLATION SPECIFICATIONS								
Maximum Allowed System Voltage	1000							Vdc
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1	129 x 153 x29.5 / 5.08 x6.02 x 1.16	129 x 89 x 42.5 / 5.1 x 3.5 x 1.7	129 x 90 x 49.5 / 5.1 x 3.5 x 1.9		129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	655 / 1.5		775 / 1.7	845 / 1.9		750 / 1.7	1064 / 2.3	gr / lb
Input Connector	MC4(2)				Single or Dual MC4(2)(3)	MC4(2)		
Input Wire Length	0.16 / 0.52							m / ft
Output Connector	MC4							
Output Wire Length	1.2 / 3.9							m / ft
Operating Temperature Range	-40 - +85 / -40 - +185							°C / °F
Protection Rating	IP68							
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) For other connector types please contact SolarEdge.
(3) For dual version for parallel connection of two modules use the P485. 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 is supported. When connecting a single module, seal the unused input connectors using the supplied pair of seals.

PV SYSTEM DESIGN USING A SOLAREDGE INVERTER(4)(5)		SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE	THREE PHASE FOR 277/480V GRID	
Minimum String Length (Power Optimizers)	P370, P401, P500(6)	8		16	18	
	P404, P405, P485, P505	6		14 (13 with SE3K(7))	14	
Maximum String Length (Power Optimizers)		25		50	50	
Maximum Power per String		5700	5250	11250(8)	12750(9)	W
Parallel Strings of Different Lengths or Orientations		Yes				

(4) It is not allowed to mix P404/P405/P485/P505 with P370/P401/P500/P600/P650/P730/P801/P800p/P850/P950 in one string.
(5) For SE15k and above, the minimum DC power should be 11KW.
(6) The P370/P401/P500 cannot be used with the SE3K three phase inverter (available in some countries; refer to the three phase inverter SE3K-SE10K datasheet).
(7) Exactly 10 when using SE3K-RW010BNN4
(8) For the 230/400V grid: it is allowed to install up to 13,500W per string when the maximum power diference between each string is 2,000W.
(9) For the 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power diference between each string is 2,000W

CE

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REVISIONS

⚠ 9/13/2020

SHEET DESCRIPTION

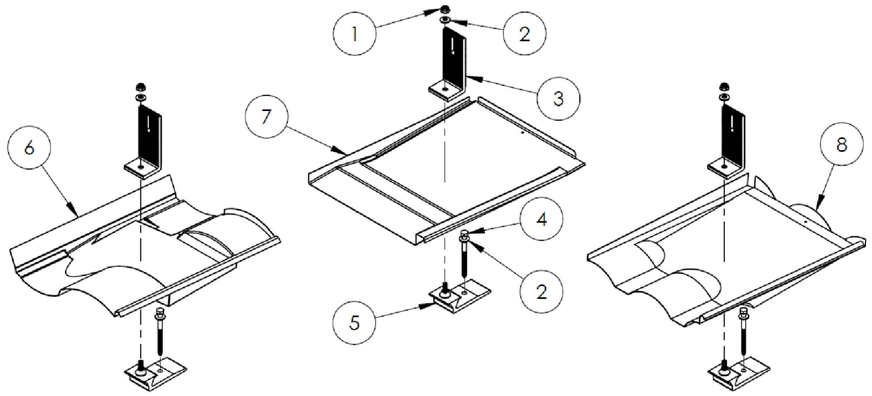
CUT SHEETS

E.CS3

Cut Sheet

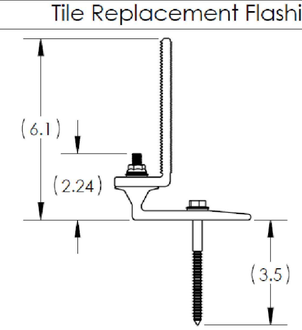
IRONRIDGE

Knockout Tile



ITEM NO.	DESCRIPTION	QTY IN KIT
1	NUT, FLANGE 5/16-18 SST	1
2	WASHER, BONDED	2
3	L-1X5, BLACK	1
4	LAG SCREW, 5/16X4	1
5	ASSY, PEDESTAL 1	1
6	FLASHING, TILE REPLACEMENT, S TAN	1
7	FLASHING, TILE REPLACEMENT, FLAT TAN	1
8	FLASHING, TILE REPLACEMENT, W TAN	1

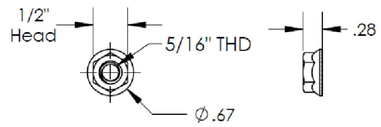
Part Number	Description
KOB-1L01-B1	Tile Replacement Base and Hardware
KOF-S01-T1	Tile Replacement Flashing, S Tan
KOF-F01-T1	Tile Replacement Flashing, Flat Tan
KOF-W01-T1	Tile Replacement Flashing, W Tan



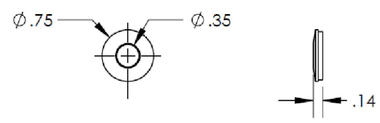
v1.10

Cut Sheet

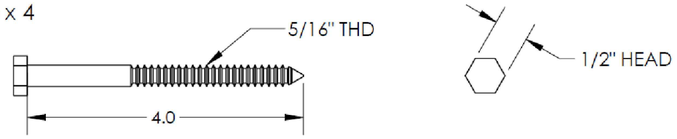
1) Nut, Flange 5/16-18 SST



2) Washer, Bonded

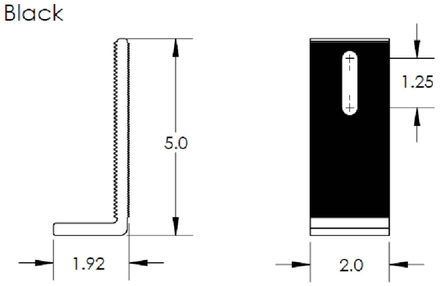


3) Lag Screw, 5/16 x 4



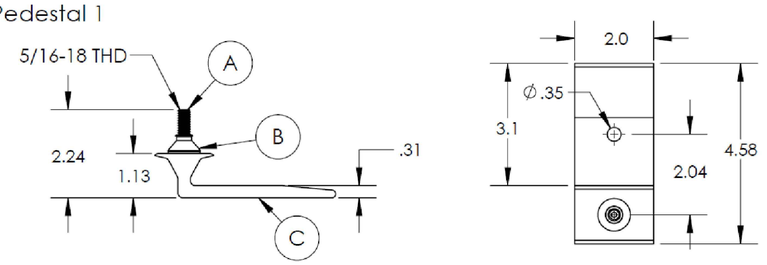
Items 1,2, & 3	Property	Value
	Material	300 Series Stainless Steel
	Finish	Clear

4) L-1x5, Black



Property	Value
Material	Aluminum
Finish	Black

5) Assy, Pedestal 1



Item	Description	Material	Finish
A	Screw, Set 5/16-18 x 1.5 SS	300 Series Stainless Steel	Clear
B	Simple Seal	EPDM	Black
C	Pedestal 1	Aluminum	Mill

v1.10

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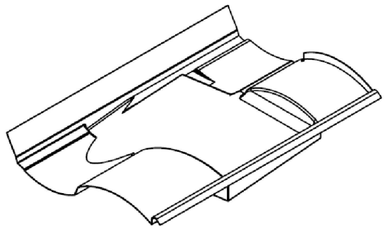
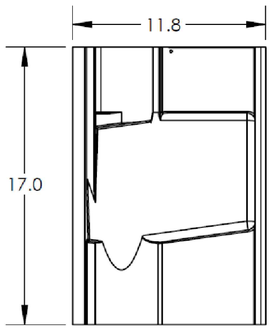
SHEET DESCRIPTION
CUT SHEETS

E.CS4

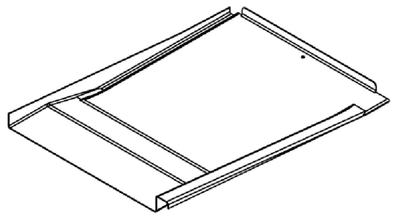
Cut Sheet

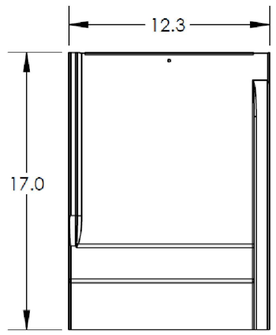
6) Flashing, Tile Replacement, S Tan



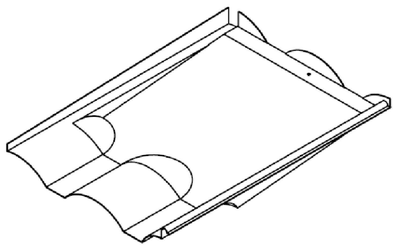


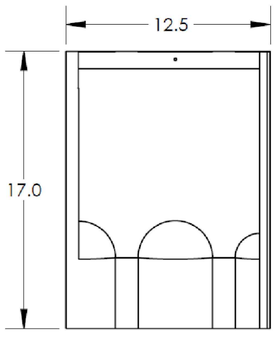
7) Flashing, Tile Replacement, Flat Tan





8) Flashing, Tile Replacement, W Tan





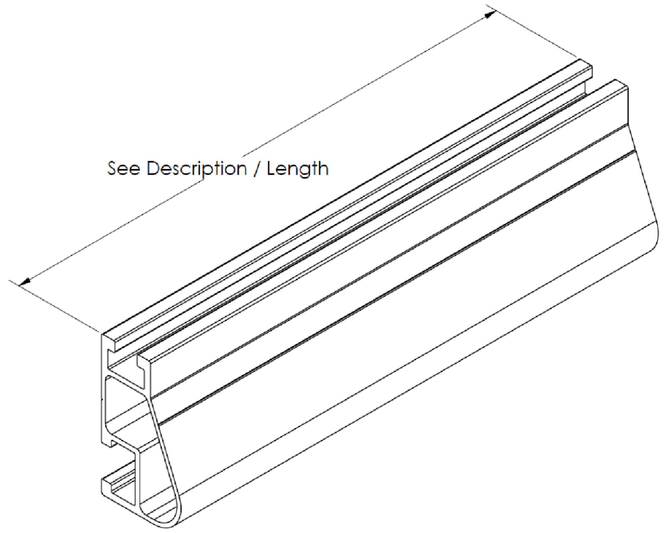
Items 7,8, & 9	Property	Value
	Material	Aluminum
	Finish	Tan

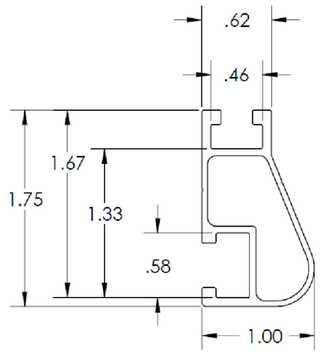
v1.10

Cut Sheet

IRONRIDGE

XR10 Rail





Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.363 in^2
Section Modulus (X-axis)	0.136 in^3
Moment of Inertia (X-axis)	0.124 in^4
Moment of Inertia (Y-axis)	0.032 in^4
Torsional Constant	0.076 in^3
Polar Moment of Inertia	0.033 in^4

Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-10-132A	XR-10-132B	XR10, Rail 132" (11 Feet)	6000-Series Aluminum	4.67 lbs.
XR-10-168A	XR-10-168B	XR10, Rail 168" (14 Feet)		5.95 lbs.
XR-10-204A	XR-10-204B	XR10, Rail 204" (17 Feet)		7.22 lbs.

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SHEET DESCRIPTION

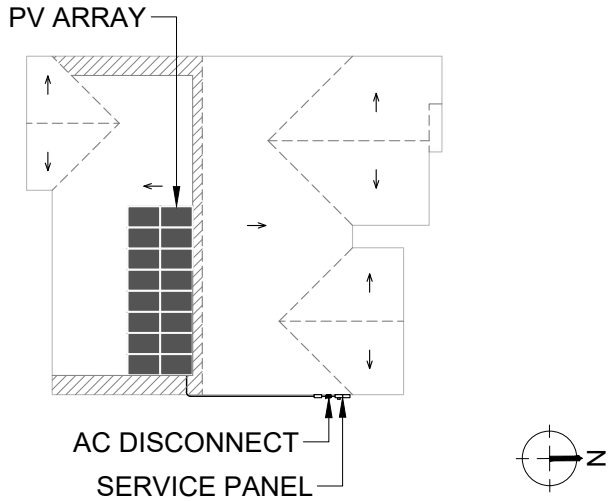
CUT SHEETS

E.CS5

LOCATION: MAIN SERVICE PANEL DOOR - QUANTITY: ONE

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECT(S) LOCATED AS SHOWN. DANGEROUS VOLTAGE MAY BE PRESENT AT ALL TIMES



"WARNING"
PHOTOVOLTAIC ARRAY
DISCONNECTION OF NEUTRAL OR GROUNDED CONDUCTORS MAY RESULT IN OVERVOLTAGE ON ARRAY OR INVERTER.