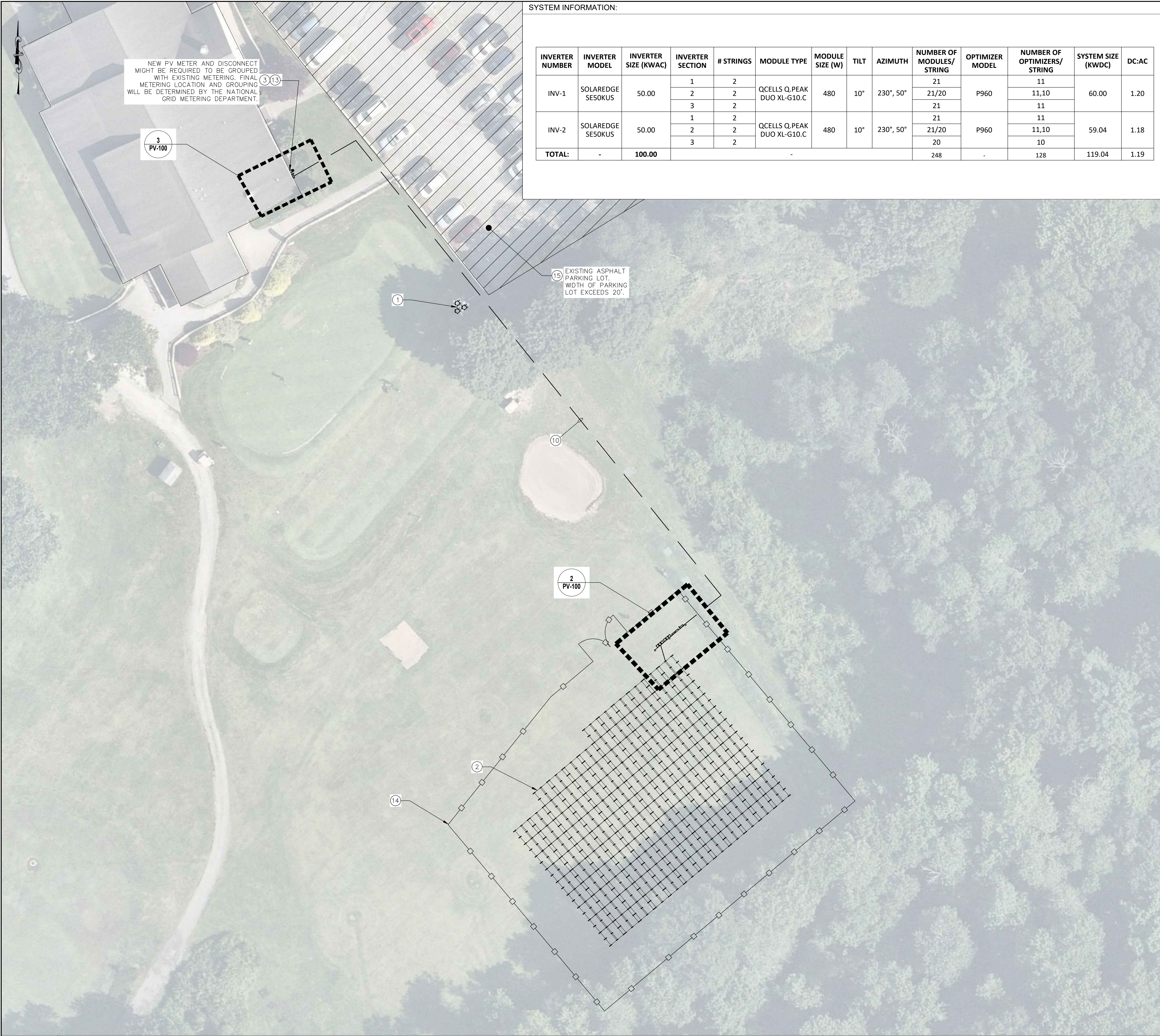


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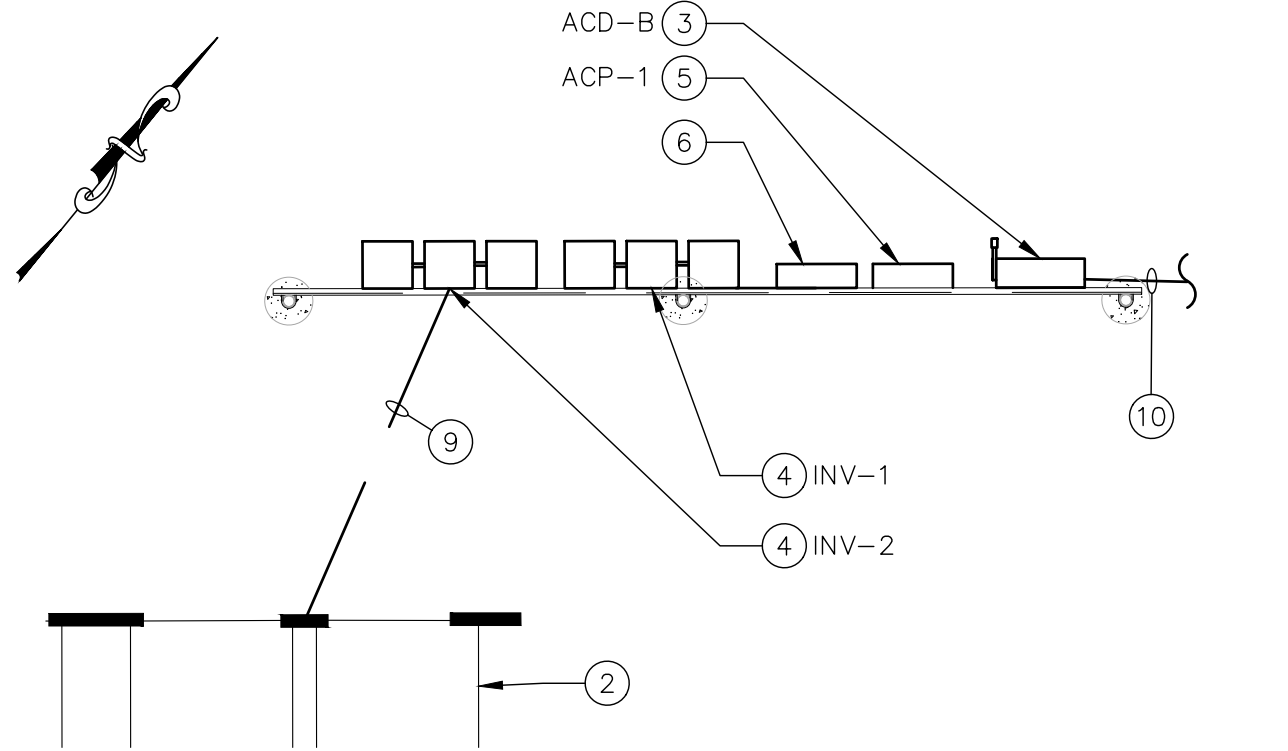


SYSTEM INFORMATION:													
INVERTER NUMBER	INVERTER MODEL	INVERTER SIZE (KWAC)	INVERTER SECTION	# STRINGS	MODULE TYPE	MODULE SIZE (W)	TILT	AZIMUTH	NUMBER OF MODULES/ STRING	OPTIMIZER MODEL	NUMBER OF OPTIMIZERS/ STRING	SYSTEM SIZE (KWDC)	DC:AC
INV-1	SOLAREDGE SE50KUS	50.00	1	2	QCELLS Q.PEAK DUO XL-G10.C	480	10°	230°, 50°	21	P960	11	60.00	1.20
			2	2					21/20		11,10		
			3	2					21		11		
INV-2	SOLAREDGE SE50KUS	50.00	1	2	QCELLS Q.PEAK DUO XL-G10.C	480	10°	230°, 50°	21	P960	11	59.04	1.18
			2	2					21/20		11,10		
			3	2					20		10		
TOTAL:	-	100.00			-				248	-	128	119.04	1.19

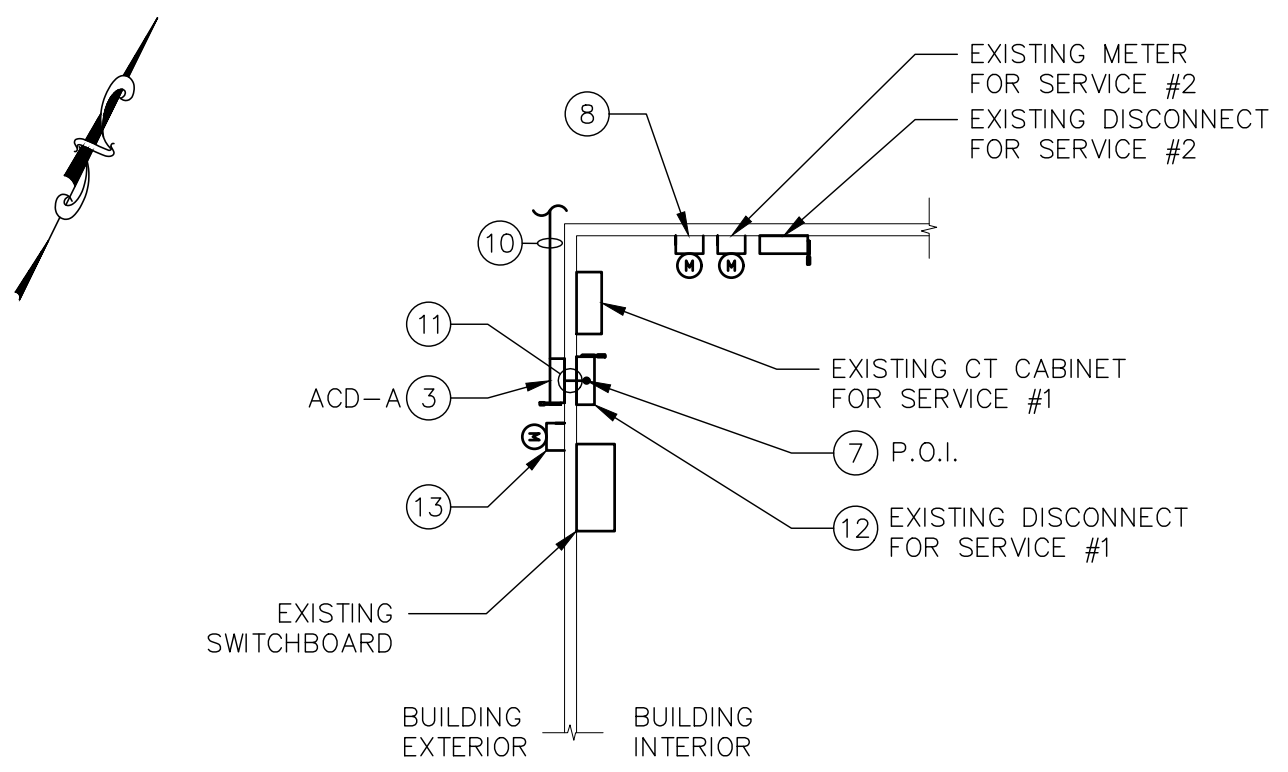
SYSTEM PLAN GENERAL NOTES:

1. PHOTOVOLTAIC INSTALLATION SHALL BE INSTALLED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE 2020 EDITION & 9TH EDITION OF THE MA STATE BUILDING CODE 780 CMR.
2. THE CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS AND MAKE ANY ADJUSTMENTS NECESSARY TO AVOID INTERFERENCE.
3. CONTRACTOR SHALL MAINTAIN ALL SITE SAFETY REGULATIONS AS OUTLINED BY ONSITE MANAGEMENT. CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS OF SAFETY AND RIGGING. THESE PLANS SHOULD NOT BE UTILIZED AS VERIFICATION FOR POINTS OF ATTACHMENT OF SAFETY EQUIPMENT AND/OR PLACEMENT OF VERTICAL EQUIPMENT LIFTS.
4. CONTRACTOR SHALL MINIMIZE DISRUPTION OF OWNER'S ONSITE ACTIVITIES. VERIFY SCHEDULE AND ALL STAGING AND STORAGE AREAS WITH THE OWNER PRIOR TO BEGINNING WORK.
5. THE DESIGN OF THE RACKING SYSTEM, BALLASTING AND/OR ATTACHMENT DESIGN, AND ALL ASSOCIATED CALCULATIONS ARE NOT INCLUDED IN THE SCOPE OF WORK PERFORMED BY KMB DESIGN GROUP, LLC(KMB), ARE NOT PART OF THESE DRAWINGS AND KMB MAKES NO REPRESENTATION WHATSOEVER WITH REGARD TO SAID RACKING, BALLASTING AND/OR ATTACHMENT DESIGN.

- (1) EXISTING POLE MOUNTED UTILITY TRANSFORMERS WITH 120/208V 3PH SECONDARIES.
- (2) NEW PV ARRAY ON AEROCOMPACT COMPACT GROUND G20 GROUND MOUNTING SYSTEM. QCCELLS Q.PEAK DUO XL-G10.C 480W MODULES. SEE SINGLE LINE DIAGRAM ON PV-200 FOR ADDITIONAL INFORMATION.
- (3) NEW PV MAIN SERVICE AC FUSIBLE DISCONNECT SWITCH ACD-A, FUSED AT 350A, 400A, 120/208V, 3ø, 4W, NEMA 3R AND DISCONNECT SWITCH, ACD-B, UNFUSED, 400A, 120/208V, 3ø, 4W, NEMA 3R. SWITCH SHALL BE LOAD BREAK RATED, VISIBLE BREAK, LOCKABLE IN THE OPEN POSITION AND ACCESSIBLE 24/7. NEW PV METER AND DISCONNECT MUST BE REQUIRED TO BE GROUPED WITH EXISTING METERING. FINAL METERING LOCATION AND GROUPING WILL BE DETERMINED BY THE NGRID METERING DEPARTMENT.
- (4) NEW SOLAREEDGE SE50KUS STRING INVERTER, 208V, 3PH, 4W INVERTER. SEE PV-200 FOR DETAILS.
- (5) NEW 400A, 120/208V, 3PH, 4W, NEMA 3R PV COMBINER AC PANELBOARD, ACP-1. MOUNTED ON UNISTRUT FRAME. SEE PV-200 FOR DETAILS.
- (6) NEW REVENUE GRADE SREC METER AND DAS IN NEMA 3R ENCLOSURE. COORDINATE EXACT REQUIREMENTS WITH DAS MANUFACTURER.
- (7) NEW PV INTERCONNECTION TO BE MADE IN EXISTING MAIN SERVICE DISCONNECT #1. SEE PV-200 FOR DETAILS.
- (8) EXISTING NATIONAL GRID UTILITY METER #: 05085036.
- (9) APPROXIMATE ROUTE OF NEW UNDERGROUND DC CONDUCTORS RUN FROM GROUND MOUNT ARRAY TO THE INVERTERS MOUNTED ON A UNISTRUT FRAME.
- (10) APPROXIMATE ROUTE OF NEW UNDERGROUND AC CONDUCTORS FROM ACP-1 TO THE AC DISCONNECT, ACD-A, LOCATED AT THE BUILDING EXTERIOR. REFER TO TRENCHING DETAIL ON PV-401 DETAIL 3.
- (11) APPROXIMATE ROUTE OF NEW AC CONDUCTORS FROM ACD-A, LOCATED AT THE BUILDING EXTERIOR TO THE INTERCONNECTION IN EXISTING MAIN SERVICE DISCONNECT #1. CONDUIT SHALL PENETRATE BUILDING WALL AND RUN TO EXISTING MAIN SERVICE DISCONNECT #1.
- (12) EXISTING MAIN SERVICE DISCONNECT SWITCH FOR SERVICE #1, 800A, 120/208V, 3PH, 4W.
- (13) PROVIDE NEW UTILITY APPROVED GENERATION METER SOCKET. CONTRACTOR SHALL VERIFY COMPLIANCE WITH CURRENT UTILITY SERVICE REQUIREMENTS AT TIME OF INSTALL. CONTRACTOR SHALL SUPPLY TIE TO THE METER, WIRELESS SERVICE FOR COMMUNICATION. METER TO SERVICE AS UTILITY REVENUE METER FOR SMART PROGRAM COMPLIANCE. METER SHALL BE OUTSIDE ACCESSIBLE AND BE WITHIN CLOSE PROXIMITY TO THE EXISTING UTILITY METER. NEW PV METER AND DISCONNECT MUST BE REQUIRED TO BE GROUPED WITH EXISTING METERING. FINAL METERING LOCATION AND GROUPING WILL BE DETERMINED BY THE NGRID METERING DEPARTMENT.
- (14) NEW 6' CHAIN LINK FENCE INSTALLED AROUND NEW ARRAY.
- (15) EXISTING ASPHALT PARKING LOT. WIDTH OF PARKING LOT EXCEEDS 20'.



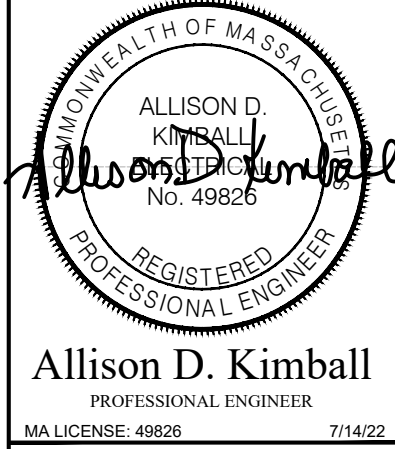
2	ENLARGED ELECTRICAL EQUIPMENT PLAN
SCALE: 1/4" = 1'-0"	



3 ENLARGED ELECTRICAL ROOM PLAN

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

				
				
				
				
				
				
	07.14.22	REVISED FOR PERMIT	JL	ADK
	12.01.21	REVISED FOR PERMIT	JL	MAUR
	10.22.21	ISSUED FOR PERMIT	JL	MAUR
	10.08.21	ISSUED FOR INTERCONNECTION	JL	ADK
REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD BY



STERLING GOLF MANAGEMENT
GROUND MOUNTED PHOTOVOLTAIC SYSTEM
100.0 KW AC / 119.04 KW DC
276 PLAIN ST
ROCKLAND, MA 02370

KMB PROJECT No: **732.0900**

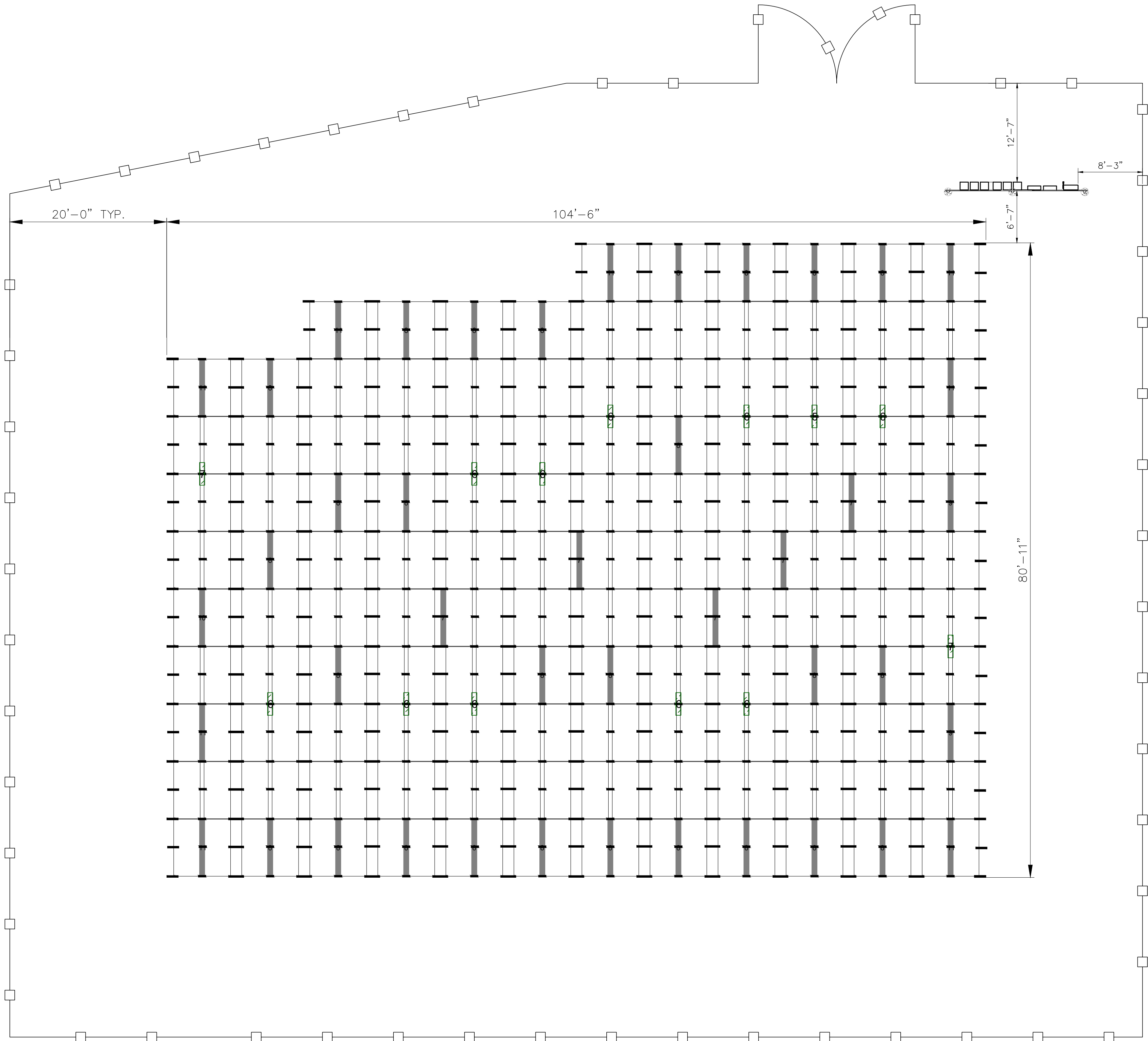
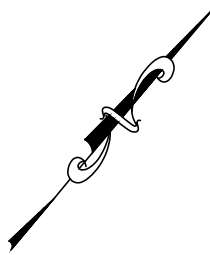
DRAWING TITLE

PHOTOVOLTAIC
SYSTEM LAYOUT

DRAWING SCALE:		
AS NOTED		
DRAWN BY:	CHECKED BY:	DATE:
JL	ADK	10.08.21

PV-100

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SYSTEM PLAN GENERAL NOTES:

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△	07.14.20	REVISED FOR PERMIT	JL	ADK
△	12.01.21	REVISED FOR PERMIT	JL	MAK/PA
△	10.22.21	REVISED FOR PERMIT	JL	MAK/PA
△	10.08.21	REVISED FOR INTERCONNECTION	JL	ADK
REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHECKED BY



Allison D. Kimball
PROFESSIONAL ENGINEER
MA LICENSE 49826 7/14/22



STERLING GOLF MANAGEMENT
GROUND MOUNTED PHOTOVOLTAIC SYSTEM
100.0 KW AC / 119.04 KW DC
276 PLAIN ST
ROCKLAND, MA 02370

KMB PROJECT NO:
732.0900

DRAWING TITLE:
PHOTOVOLTAIC
DIMENSION
PLAN

DRAWING SCALE:
AS NOTED

DRAWN BY:	CHECKED BY:	DATE:
JL	ADK	10.08.21

DWG NO.:

PV-101



INVERTER DC WIRING SCHEDULE:

DC WIRING CHART							
INVERTER #	STRING HOME RUN WIRE SIZE AND TYPE		EQUIPMENT GROUND SIZE	MODULES PER STRING	NUMBER OF STRINGS	LONGEST STRING LENGTH (FT)	STRING VOLTAGE DROP (%)
INV-1	#8	AWG 1KV PV WIRE	#6 AWG	21,20	5,1	150	0.33%
INV-2	#8	AWG 1KV PV WIRE	#6 AWG	21,20	3,3	200	0.43%

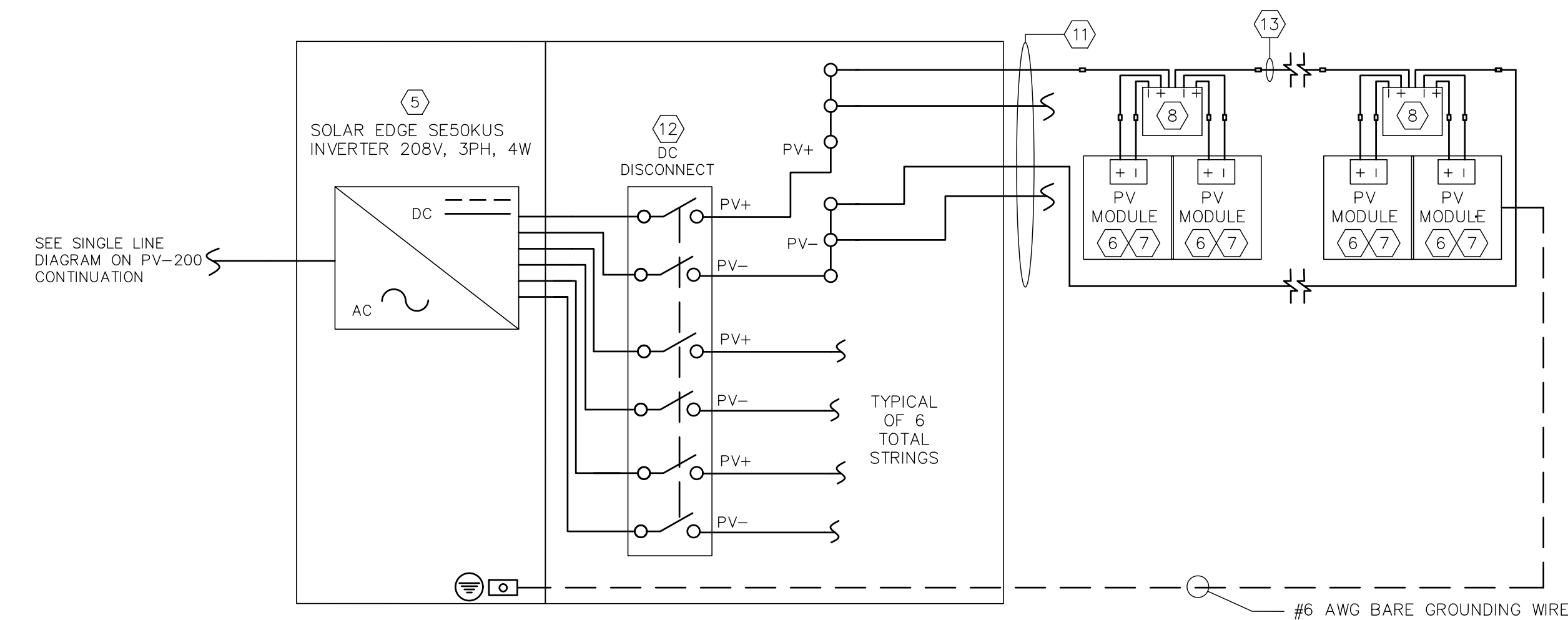
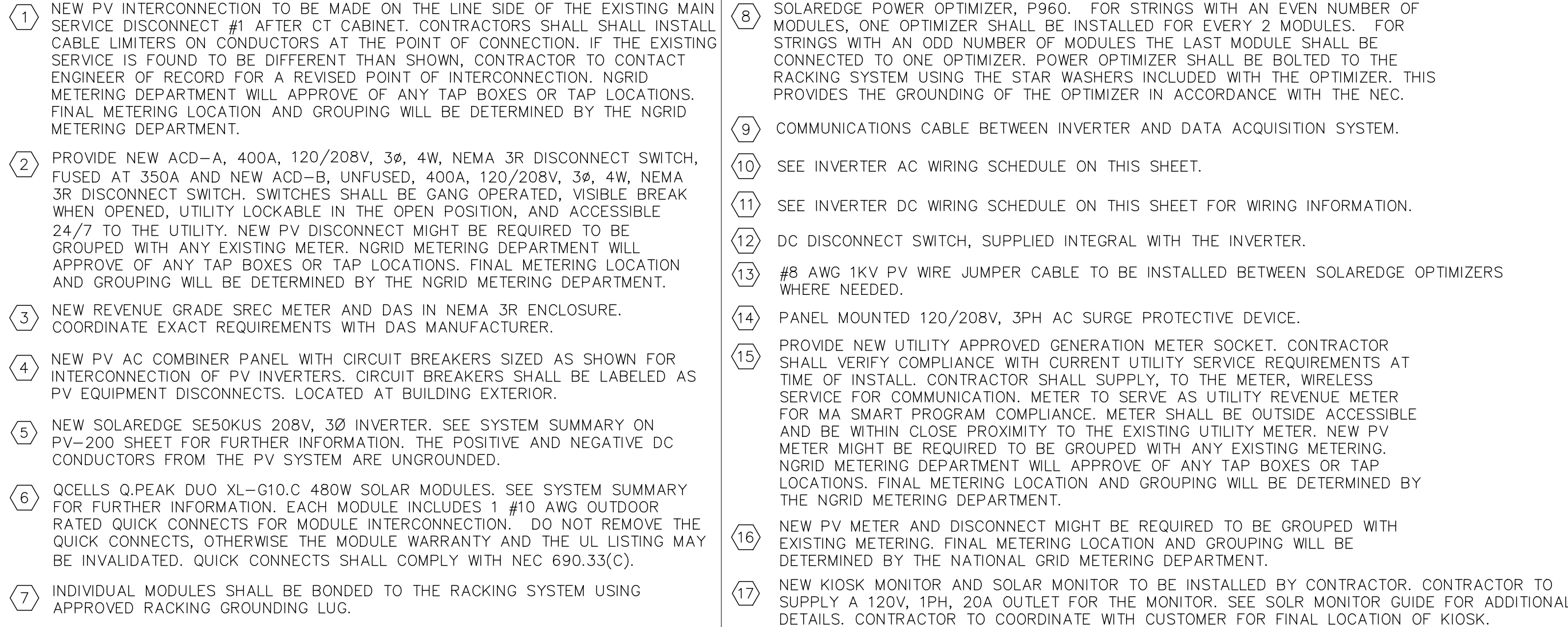
INVERTER AC WIRE SCHEDULE						
INVERTER #	MINIMUM VOLTAGE	MAX OCPD FOR AC PROTECTION (A)	CONDUCTOR SIZE & TYPE	MINIMUM CONDUIT	CONDUCTOR LENGTH (FT)	VOLTAGE DROP
INV-1	208V 3PH	175	(3) #2/0 AWG CU THWN-2 +#6 AWG N + #6 AWG GND	(1) 2"	10	0.05%
INV-2	208V 3PH	175	(3) #2/0 AWG CU THWN-2 +#6 AWG N + #6 AWG GND	(1) 2"	10	0.05%

AC WIRE AND CONDUIT SCHEDULE:

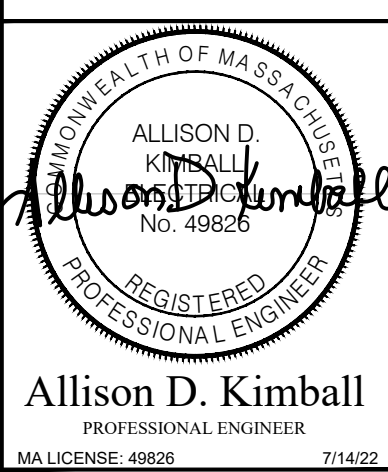
PROPOSED INVERTER GRID PROTECTION SETTINGS						
DEVICE SETTING	PICKUP	VALUE		CLEARING TIME (SEC)	CLEARING TIME (CYCLES)	DESCRIPTION
27-1	50%	60.05	V	1.10	66.00	UNDERVOLTAGE
27-2	88%	105.68	V	2.00	120.00	
59-1	110%	132	V	2.00	120.00	OVERVOLTAGE
59-2	120%	144	V	0.16	9.60	
81U-2		56.5Hz		0.16	9.60	UNDERFREQUENCY
81U-1		58.5Hz		300.00	18000.00	
81O-1		61.2Hz		300.00	18000.00	OVERFREQUENCY
81O-2		62.0Hz		0.16	9.60	

AC WIRE AND CONDUIT SCHEDULE					
	MINIMUM VOLTAGE	WIRE SIZE & TYPE	MINIMUM CONDUIT	CONDUCTOR LENGTH (FT)	VOLTAGE DROP
A	208V 3PH	(3) 500 KCMIL CU THWN-2 +#3 AWG N + #3 AWG GND	(1) 4"	20	0.06%
B	208V 3PH	(3) 500 KCMIL CU THWN-2 +#3 AWG N + #3 AWG GND	(1) 4"	325	0.95%
C	-	18 AWG SHIELDED TWISTED PAIR - CT EXTENSION CABLE	-	-	-
D	208V 3PH	(3) #12 THWN-2 + #12AWG CU GROUND	3/4"	-	-
E	-	RS485 MODBUS COMMUNICATIONS CABLE	-	-	-
F	-	RS485 MODBUS COMMUNICATIONS CABLE OR CAT-5 EQUIVALENT	-	-	-
G	120V 1PH	(2) #12 THWN-2 + #12AWG CU GROUND	3/4"	-	-

TYPICAL INVERTER SCHEMATIC



KMB
DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623



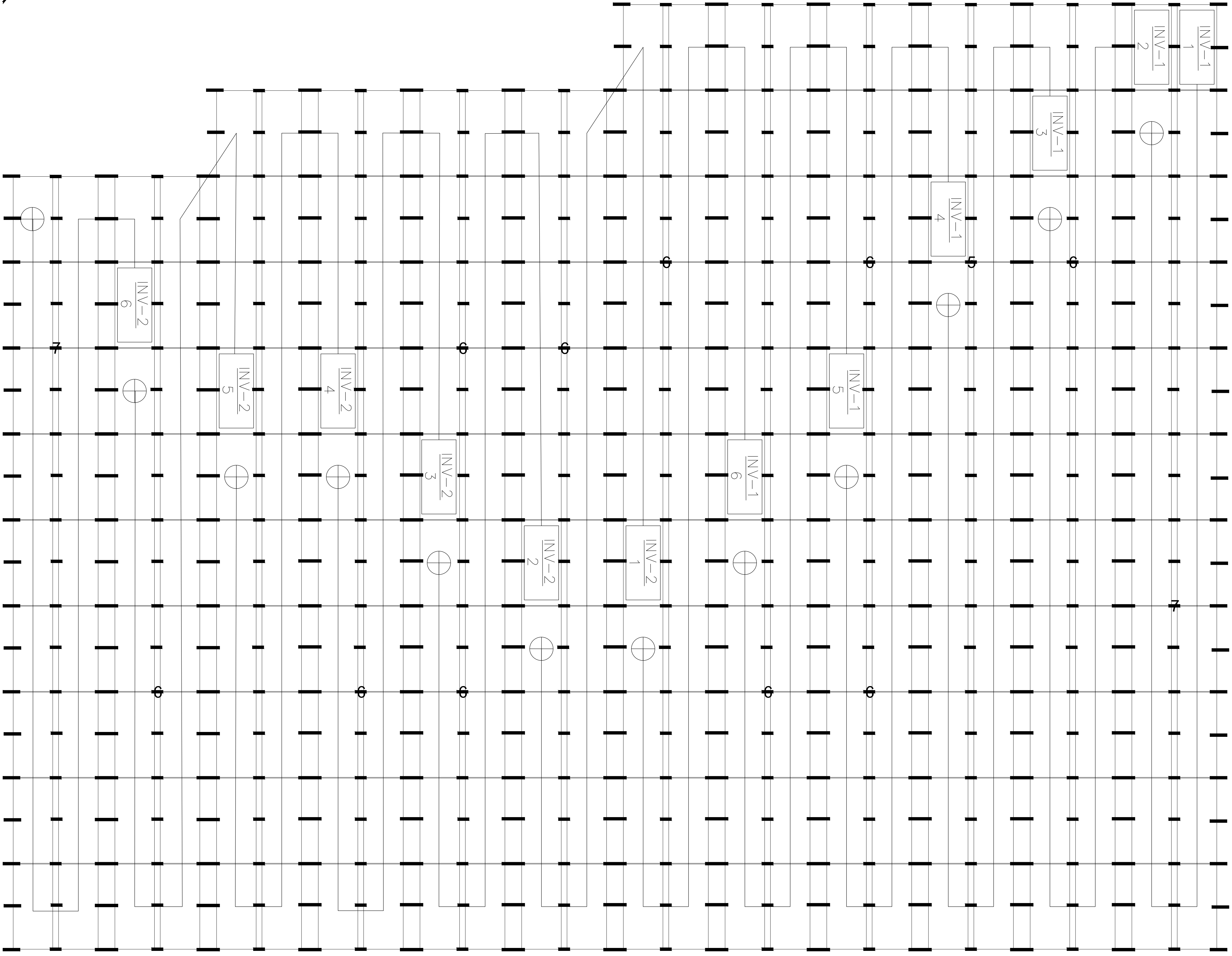
STERLING GOLF MANAGEMENT
GROUND MOUNTED PHOTOVOLTAIC SYSTEM
100.0 KW AC / 119.04 KW DC
276 PLAIN ST
ROCKLAND, MA 02370

KMB PROJECT No. **732.0900**

DRAWING TITLE
**PHOTOVOLTAIC
ONE-LINE
DIAGRAM**

DRAWING SCALE:		
NONE		
DRAWN BY:	CHECKED BY:	DATE:
JL	ADK	10.08.21

PV-200



1

PHOTOVOLTAIC SYSTEM CIRCUITING LAYOUT

SCALE: 1/4" = 1'-0"

SERVICE PLAN GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE WIRING IDENTIFICATION AS FOLLOWS

DC WIRING
POSITIVE: RED
NEGATIVE: BLACK
GROUND: GREEN

AC WIRING 120V/208V/240V

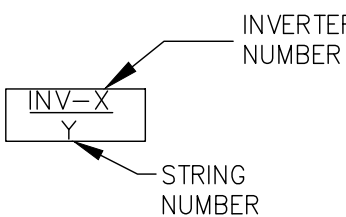
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUND	GREEN

AC WIRING 277V/480V

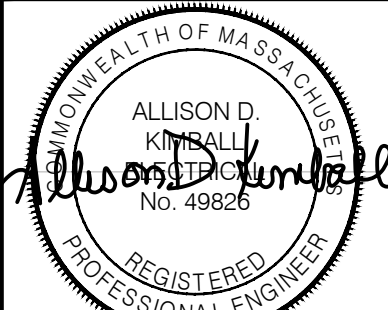
PHASE A	BROWN
PHASE B	ORANGE
PHASE C	YELLOW
NEUTRAL	GRAY
GROUND	GREEN

2. INSTALLATION CONTRACTOR SHALL INSTALL HOME RUN DC WIRING TO INVERTERS. THIS SHALL CONSIST OF #8 AWG 1KV PV SUNLIGHT RESISTANT CABLE WITH LOCKING MC CONNECTOR. JUMPER CABLES OF PAIR OPTIMIZERS SHALL CONSIST OF #8 AWG 1KV PV SUNLIGHT RESISTANT CABLE.
3. ANY STRING WIRING THAT IS NOT UNDER THE ARRAY SHALL BE RUN IN CONDUIT FOR PROTECTION.
4. THE DESIGN OF THE RACKING SYSTEM AND/OR ATTACHMENT DESIGN, AND ALL ASSOCIATED CALCULATIONS ARE NOT INCLUDED IN THE SCOPE OF WORK PERFORMED BY KMB DESIGN GROUP. DRAWINGS ARE THE PROPERTY OF KMB DESIGN GROUP AND KMB MAKES NO REPRESENTATION WHATSOEVER WITH REGARD TO SAID RACKING, AND/OR ATTACHMENT DESIGN.

LEGEND:



				
				
				
				
				
				
	07.14.22	REVISED FOR PERMIT	JL	ADK
	12.01.21	REVISED FOR PERMIT	JL	MMJR
	10.22.21	ISSUED FOR PERMIT	JL	MMJR
	10.08.21	ISSUED FOR INTERCONNECTION	JL	ADK
REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY



Allison D. Kimball
PROFESSIONAL ENGINEER
MA LICENSE: 49826 7/14/22



STERLING GOLF MANAGEMENT
GROUND MOUNTED PHOTOVOLTAIC SYSTEM
100.0 KW AC / 119.04 KW DC
276 PLAIN ST
ROCKLAND, MA 02370

KMB PROJECT №: **732.0900**

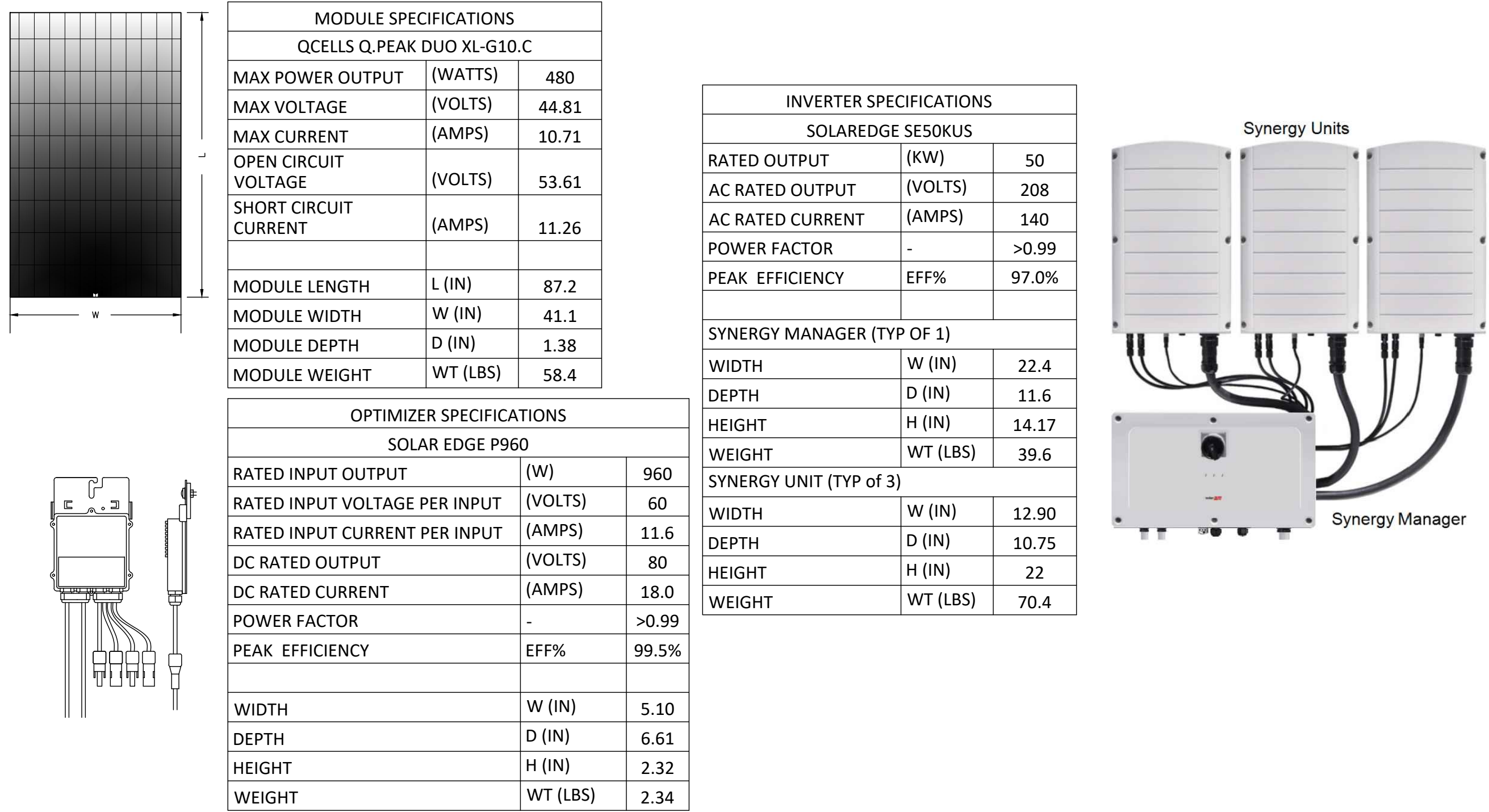
DRAWING TITLE

PV SYSTEM
CIRCUITING
PLAN

DRAWING SCALE:		
NONE		
DRAWN BY:	CHECKED BY:	DATE:
JL	ADK	10.08.21

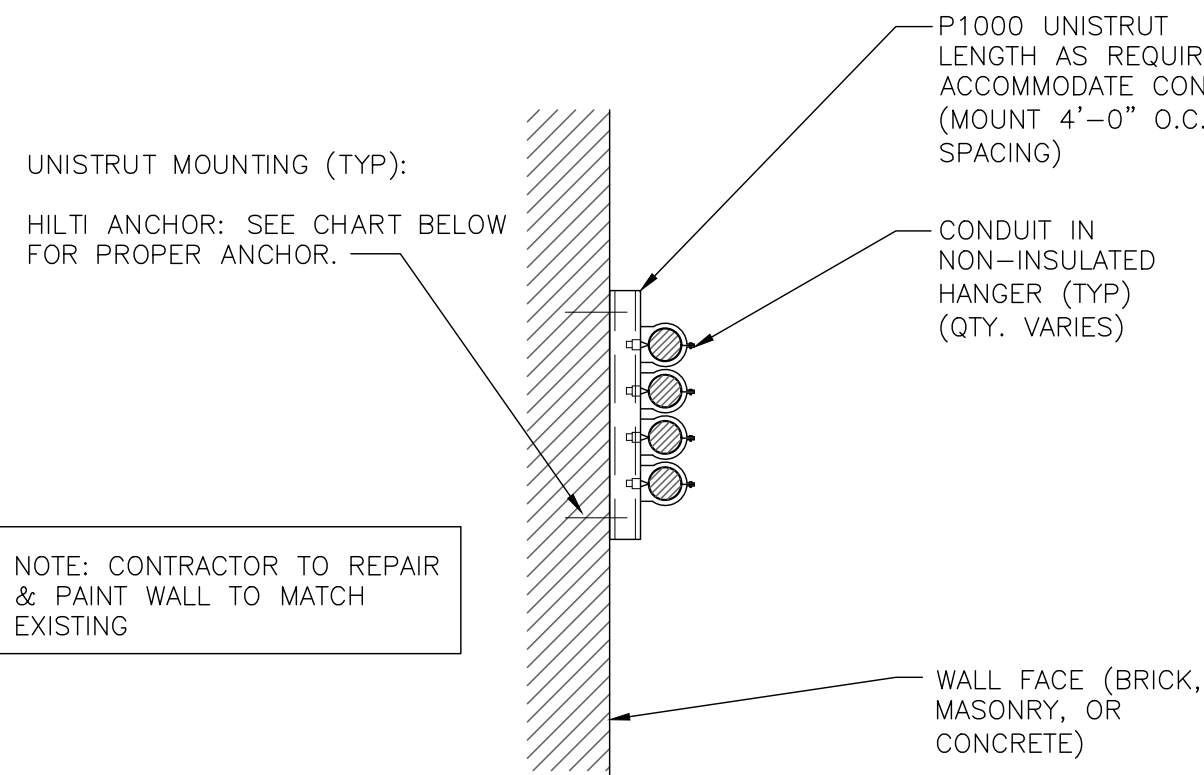
DWG No.:

PV-300



1	INVERTERS & SOLAR PANEL SPECS
---	--

SCALE: NTS



MOUNTING METHODS CHART	
WALL TYPE	METHOD OF ATTACHMENT
CONCRETE BLOCK (HOLLOW)	3/8"Ø HILTI HIT HY70 WITH SCREEN. MINIMUM EMBEDMENT 6" SPACED 24" O. C. OR 1/4"Ø HILTI KWIK-CON II+ 3 1/2" MINIMUM EMBEDMENT SPACED 16" O. C.
CONCRETE /BRICK	3/8"Ø HILTI HIT HY150. MINIMUM EMBEDMENT 3 1/2" SPACED 24" O. C. OR 1/4"Ø HILTI KWIK-CON II+ 3 1/2" MINIMUM EMBEDMENT SPACED 16" O. C.

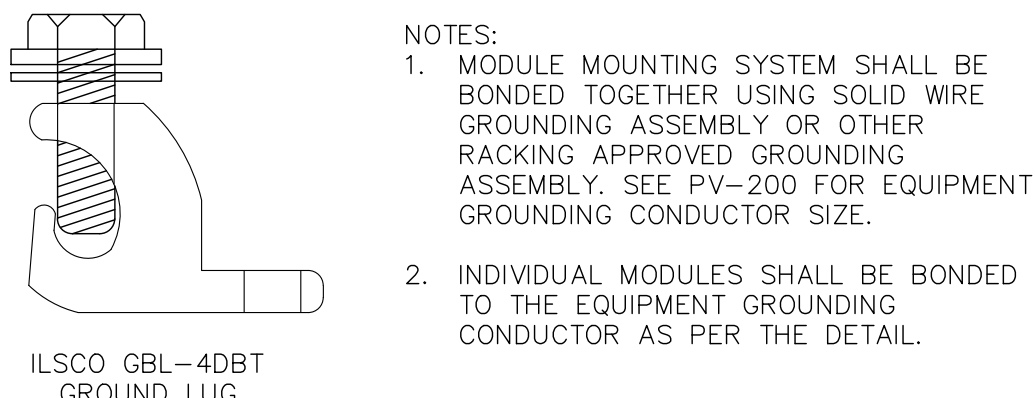
3	CONDUIT VERTICAL SUPPORT DETAIL
---	---------------------------------

SCALE: NTS

1. ALL GROUNDING/BONDING CONNECTIONS NOT TERMINATED INSIDE EQUIPMENT SHALL BE MADE USING IRREVERSIBLE COMPRESSION OR EXOTHERMIC CONNECTIONS.
2. ALL AC & DC MADE GROUNDING ELECTRODES SHALL CONSIST OF COPPER OR COPPER/CLAD DRIVEN GROUND RODS NO SMALLER THAN 5/8"x10" AND HAVE RESISTANCE TO EARTH OF 25 OHMS OR LESS. IF RESISTANCE OF 25 OHMS OR LESS TO EARTH CANNOT BE ACHIEVED THAN A SUPPLEMENTAL ELECTRODE SHALL BE DRIVEN AS PER NEC 50.5.3. IF MULTIPLE GROUND RODS ARE DRIVEN THEY SHALL BE SPACED NOT LESS THAN 6FT APART.
3. ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, ETC SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
4. ALL EXTERIOR METALLIC CONDUIT WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF HANDHOLES, NON-METALLIC JUNCTION BOXES, DIRECT BURIAL TRANSITIONS, CABLE TRAY TRANSITIONS, ETC SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE RUN. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE WHERE THERE IS NOT CONTINUITY BETWEEN THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT.
5. PROPERLY SIZED EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSTALLED WITH ALL RACEWAYS AND CABLE CONVEYANCES. METALLIC RACEWAY AND CONDUIT CONNECTORS SHALL NOT BE CONSIDERED ADEQUATE GROUNDING.

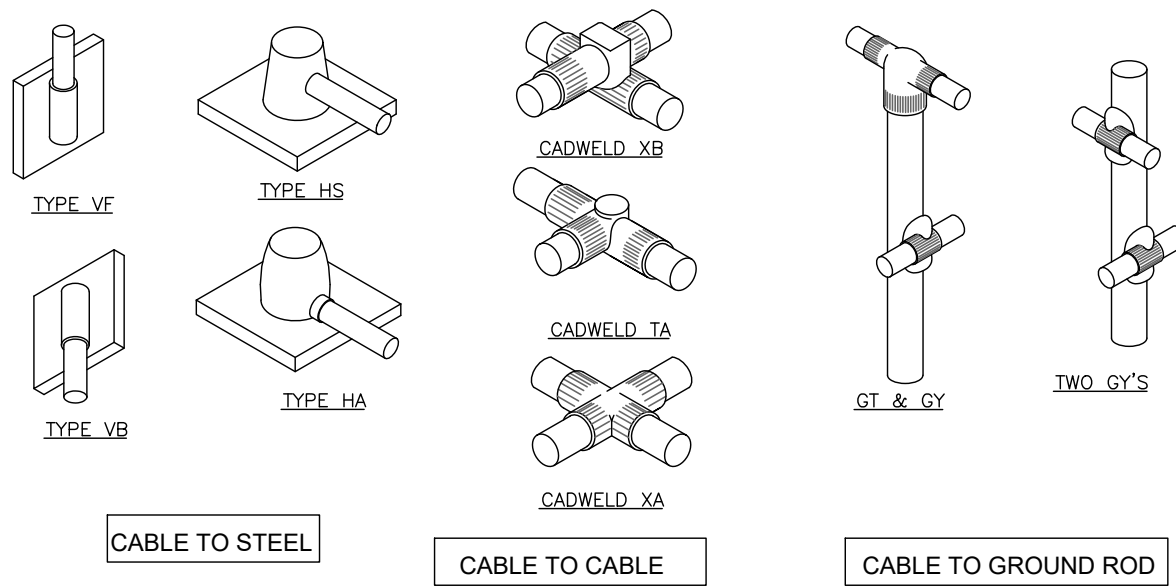
GROUNDING NOTES

SCALE: NTS



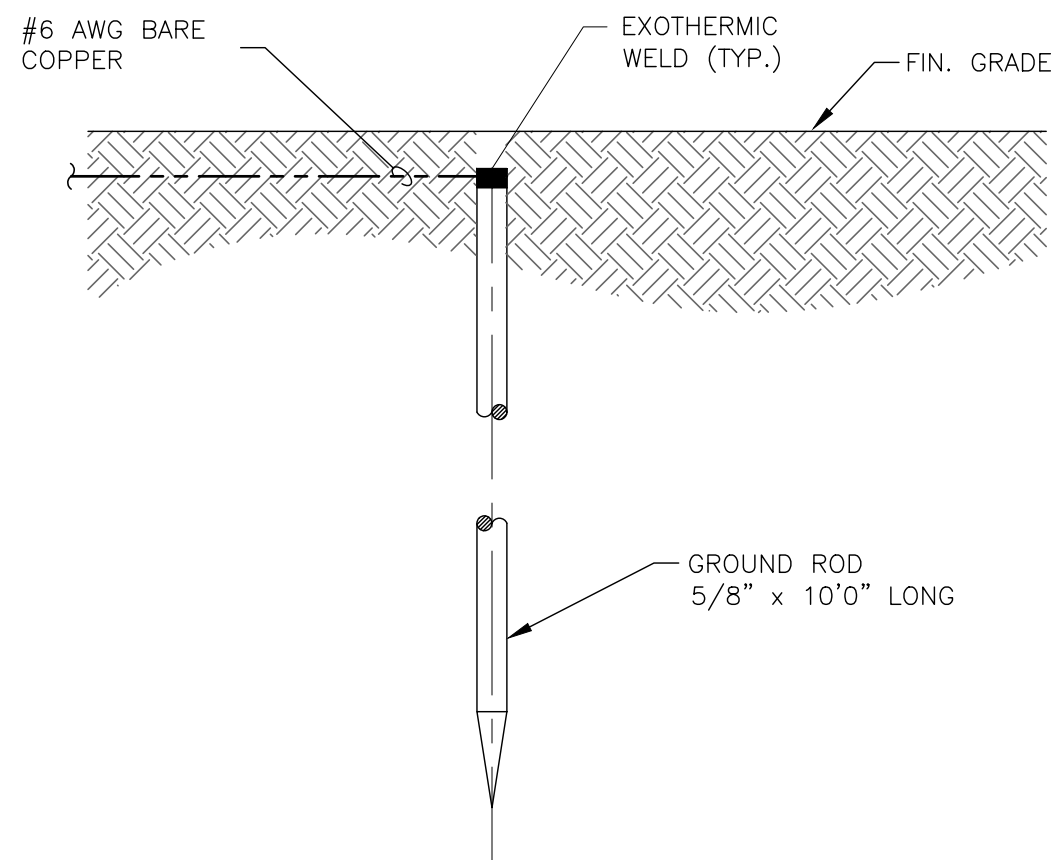
4	TYPICAL LAY-IN GROUNDING LUG
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SCALE: NTS



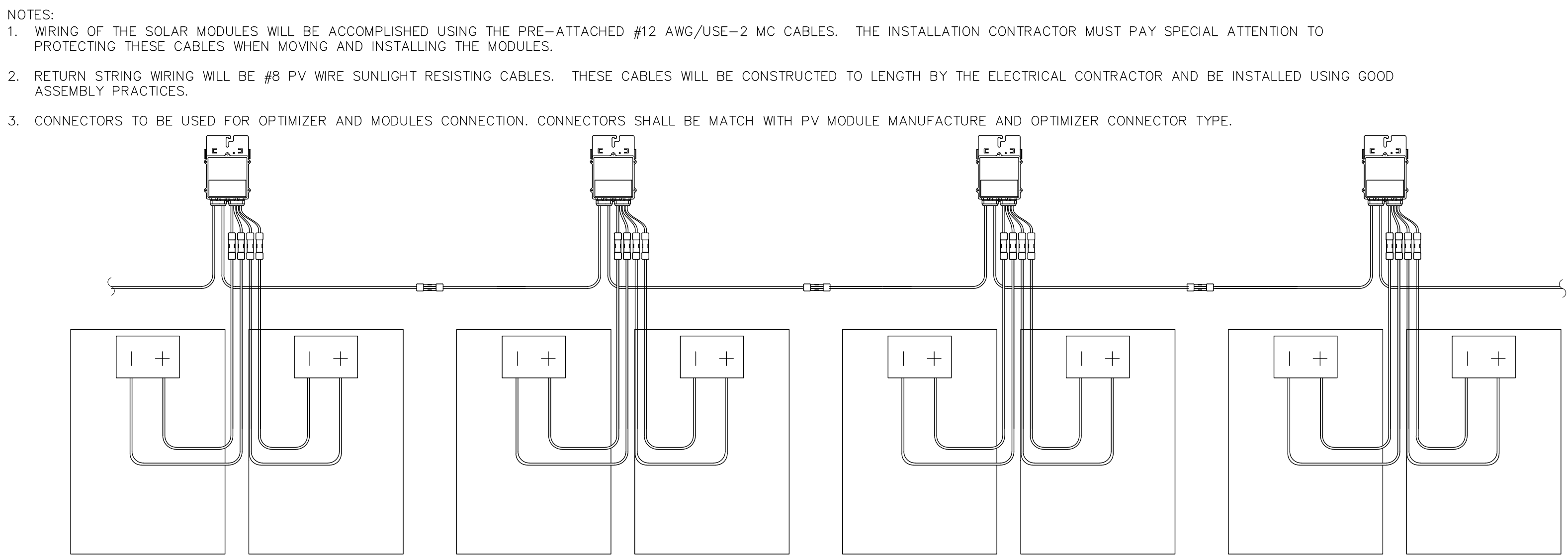
EXOTHERMIC WELD CONNECTIONS

SCALE: NTS



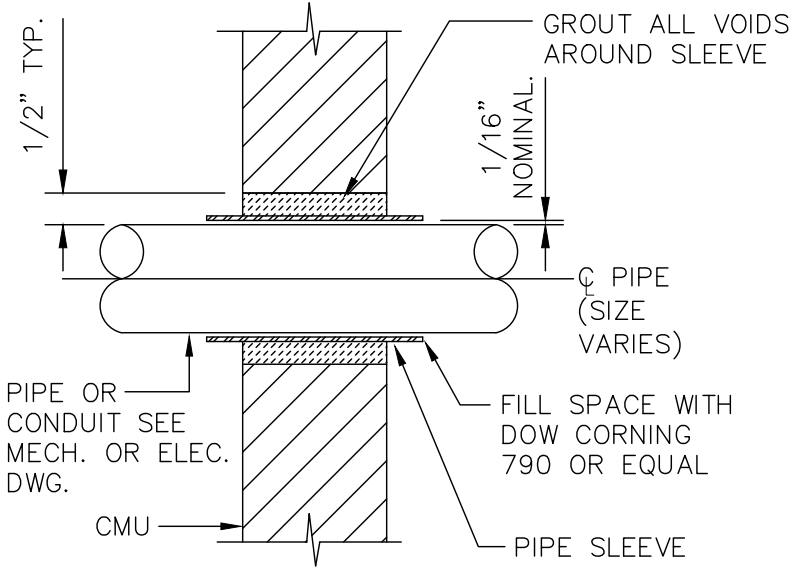
AC GROUNDING ELECTRODE DETAIL

SCALE: NTS



2	2-MODULE OPTIMIZER STRINGING DETAIL
---	-------------------------------------

SCALE: NTS

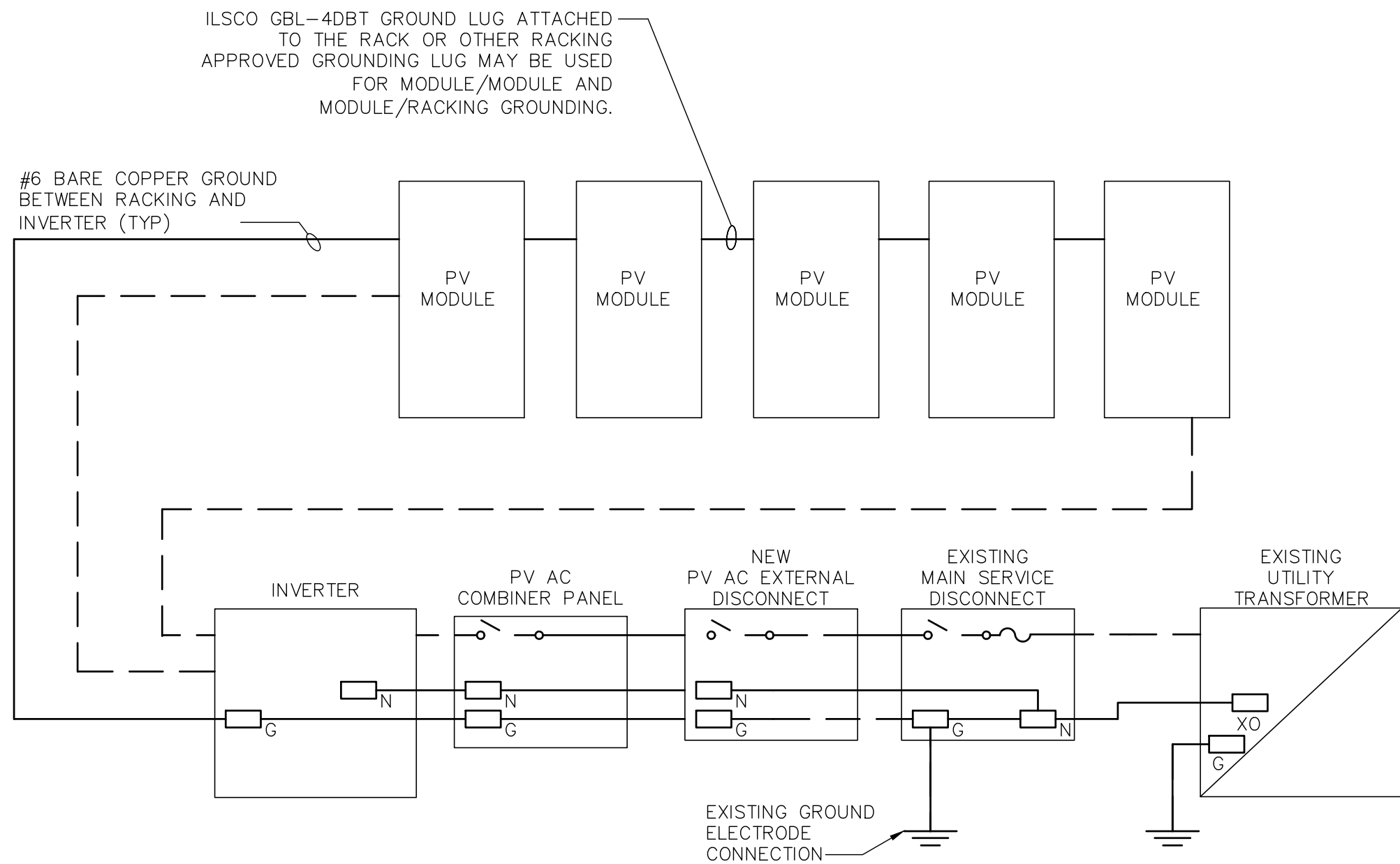


NOTES: (FOR FIRE-RATED WALL ONLY)

1. PIPE ANCHORAGE IS REQUIRED NEARBY TO PREVENT PIPE MOVEMENT THROUGH PENETRATION.
2. CABLES WITHIN CONDUIT PENETRATION SHALL BE FIRE SEALED AFTER INSTALLATION

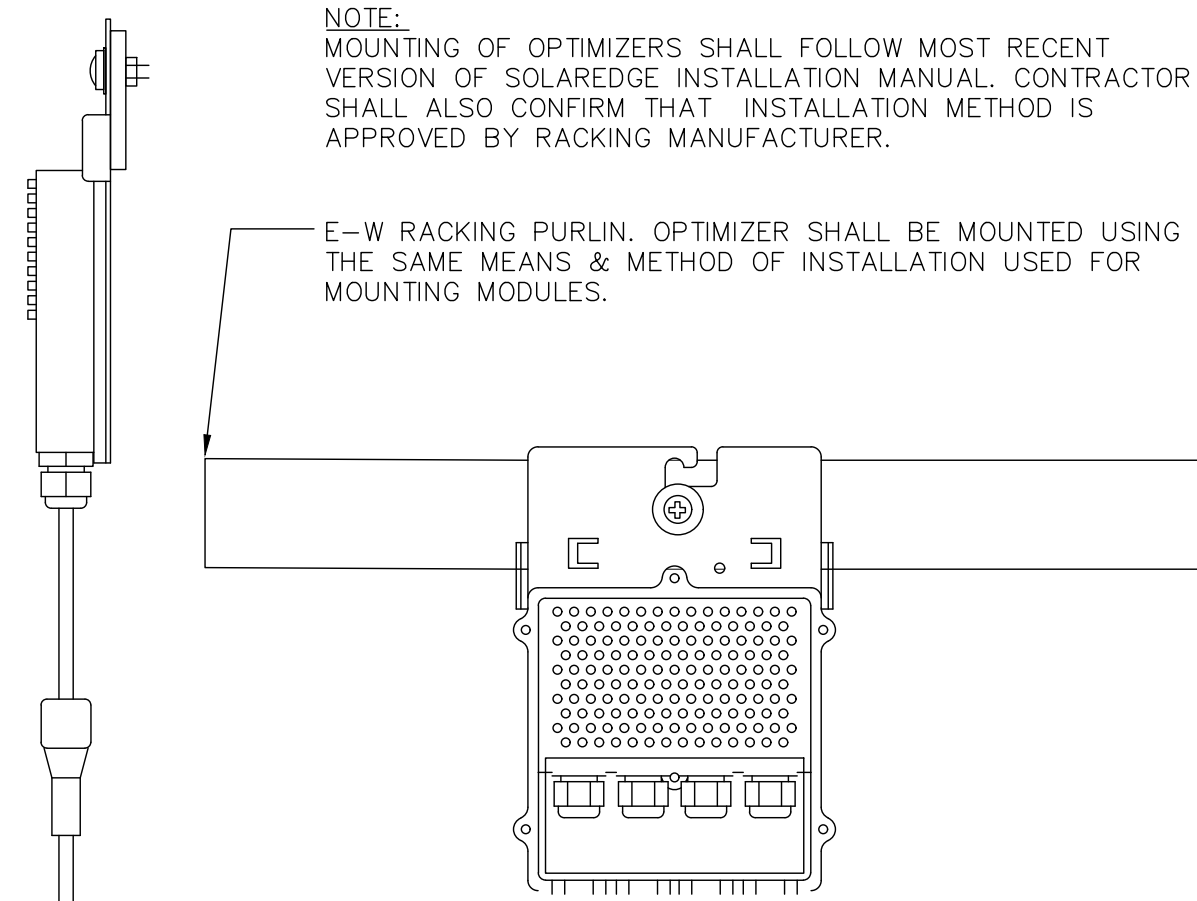
CONDUIT WALL PENETRATION DETAIL

SCALE: NTS



TYPICAL GROUNDING DETAIL

SCALE: NTS



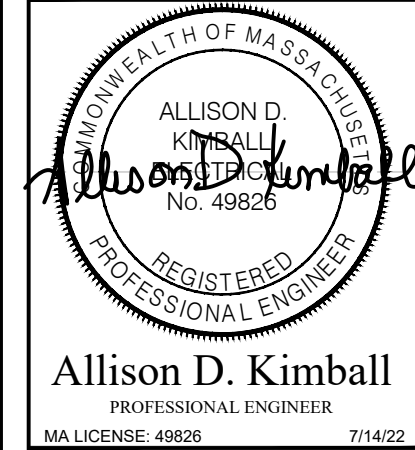
SOLAR EDGE P960 OPTIMIZER DETAIL

SCALE: NTS

- ## NOTES

1. PER NEC 690.47(A), PV ARRAY EQUIPMENT GROUNDING CONDUCTORS SHALL BE CONNECTED TO THE GROUNDING ELECTRODE SYSTEM OF THE BUILDING OR STRUCTURE SUPPORTING THE PV ARRAY.
2. DC EQUIPMENT GROUNDING CONDUCTORS FOR PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUITS SHALL BE SIZED PER NEC 250.122.
3. GROUNDING ELECTRODE CONDUCTOR SHALL BE SIZED TO MEET BOTH 250.66 FOR THE AC SYSTEM AND 250.166 FOR THE DC SYSTEM.



K&B PROJECT No:		
732.0900		
DRAWING TITLE:		
PHOTOVOLTAIC SYSTEM LABEL SHEET 1		
DRAWING SCALE:		
NONE		
DRAWN BY:	CHECKED BY:	DATE:
JL	ADK	10.08.21
DWG No.:		
PV-402		

[illegible]

powered by

Q.ANTUM DUO Z

PRELIMINARY

Q.PEAK DUO XL-G10.2

475-495

ENDURING HIGH
PERFORMANCE

BREAKING THE 21% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.6%.

LOW ELECTRICITY GENERATION COSTS

Higher yield per surface area, lower BOS costs and up to 80 watts more module power than standard 144 half-cell modules.

ENDURING HIGH PERFORMANCE

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

EXTREME WEATHER RATING

High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT

Inclusive 12-year product warranty and 25-year linear performance warranty².

STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

¹ APT test conditions according to IEC/TS 62804-3:2015, method B (-3500V, 168h)

² See data sheet on form for further information.

THE IDEAL SOLUTION FOR:

 Ground-mounted solar power plants

Engineered in Germany



PRELIMINARY

MECHANICAL SPECIFICATION

Format	2216mm x 1045mm x 35mm (including frame)
Weight	26.5kg
Front Cover	3.2mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 x 26 monocrystalline Q-ANTUM solar half cells
Junction box	63-101mm x 32-60mm x 15-18mm Protection class IP67, with bypass diodes
Cable	4mm ² Solar cable; (+) >700mm, (-) >350mm*
Connector	Stäubli MCA-Evo2, Hanwha Q-CELLS HQCA-IP68

*Long cables (+) ≥ 1450mm, (-) ≥ 1450mm for landscape installation are available upon request.

ELECTRICAL CHARACTERISTICS

POWER CLASS		475	480	485	490	495
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE ±5W)						
Power at MPP	P_{MPP} [W]	470	475	480	485	490
Short Circuit Current ¹	I_{SC} [A]	11.24	11.26	11.29	11.31	11.34
Open Circuit Voltage ¹	V_{OC} [V]	53.58	53.61	53.64	53.68	53.71
Current at MPP	I_{MPP} [A]	10.66	10.71	10.76	10.81	10.86
Voltage at MPP	V_{MPP} [V]	44.54	44.81	45.07	45.33	45.59
Efficiency ¹	η [%]	220.5	220.7	220.9	221.2	221.4
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ²						
Power at MPP	P_{MPP} [W]	356.4	360.1	363.9	367.6	371.4
Short Circuit Current	I_{SC} [A]	9.05	9.07	9.09	9.12	9.14
Open Circuit Voltage	V_{OC} [V]	50.53	50.56	50.59	50.62	50.65
Current at MPP	I_{MPP} [A]	8.39	8.43	8.47	8.52	8.56
Voltage at MPP	V_{MPP} [V]	42.49	42.72	42.94	43.17	43.39

Measurement tolerances P_{MPP} ±3%, I_{SC} , V_{OC} ±5% at STC, 1000W/m², 25±2°C, AM 1.5 according to IEC 60904-3, 1800W/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 10.5% of nominal power up to 10 years. At least 98% of nominal power up to 25 years.

All data within measurement tolerances. Full warranty is 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, 1000W/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_{MPP} [V]	1500	PV module classification	Class II
Maximum Reverse Current	I_R [A]	20	Fire Rating based on ANSI/UL 6730	C/TYPE I
Max. Design Load, Push/Pull	[Pa]	3600/1600	Permitted Module Temperature on Continuous Duty	-40°C ~ +85°C
Max. Test Load, Push/Pull	[Pa]	5400/2400		

QUALIFICATIONS AND CERTIFICATES

IEC 62103-2018
IEC 62103-2018
This data sheet complies
with ON EN 62103-2018
Certification in process.

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, 06776 Bitterfeld-Wolfen, Germany | TEL +49 (0)349 66 99-23444 | FAX +49 (0)349 66 99-23000 | EMAIL sales@q-cells.com | WEB www.q-cells.com

Specifications subject to technical change. Q-CELLS Gbmlb, 048, 049, 050, 051, 052, 053, 054, 055, 056, 057, 058, 059, 060, 061, 062, 063, 064, 065, 066, 067, 068, 069, 070, 071, 072, 073, 074, 075, 076, 077, 078, 079, 080, 081, 082, 083, 084, 085, 086, 087, 088, 089, 090, 091, 092, 093, 094, 095, 096, 097, 098, 099, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175,

INVERTERS

Three Phase Inverter with Synergy Technology

For the 208V Grid for North America

SE50KUS

Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 3 Synergy units and one Synergy Manager)
- Independent operation of each Synergy unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring ensuring enhanced protection and safety
- Built in arc fault protection and rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

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Applicable to inverter with Part Numbers		SExxK-USx21xxx	
OUTPUT		SE50KUS	
Rated AC Active Output Power	50000		W
Maximum AC Apparent Output Power	50000		VA
AC Output Line Connections	3W + PE, 4W + PE		
Supported Grids	WYE-TN-C, TN-S, TN-C-S, TT, IT; Delta IT		
AC Output Voltage Minimum-Nominal-Maximum ⁽¹⁾ (L-N)	105-120-132.5		Vac
AC Output Voltage Minimum-Nominal-Maximum ⁽¹⁾ (L-L)	183-208-229		Vac
AC Frequency Min-Nom-Max ⁽²⁾	59.5 - 60 - 60.5		Hz
Maximum Continuous Output Current (per Phase, PF=1)	199.5		Aac
GFD Threshold	1		A
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes		
Total Harmonic Distortion	≤ 3		%
Power Factor Range	+/- 0.2 to 1		
INPUT			
Maximum DC Power (Module STC) Inverter / Synergy Unit	75000 / 25000		W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage DC+ to DC-	600		Vdc
Operating Voltage Range	370 - 600		Vdc
Maximum Input Current	3 x 46.5		Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	167uG sensitivity per Synergy Unit ⁽³⁾		
CEC Weighted Efficiency	97		%
Nighttime Power Consumption	< 12		W
ADDITIONAL FEATURES			
Supported Communication Interfaces ⁽⁴⁾	2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional)		
Smart Energy Management	Export Limitation		
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection		
Arc Fault Protection	Built-in, User Configurable (According to UL1699B)		
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 and 2020, Built-in		
PID Rectifier	Nighttime, built-in		
RS485 Surge Protection (ports 1+2)	Type II, field replaceable, integrated		
AC, DC Surge Protection	Type II, field replaceable, integrated		
DC Ties (Single Pole)	25A, integrated		
DC SAFETY SWITCH			
DC Disconnect	Built-in		
STANDARD COMPLIANCE			
Safety	UL1699B, CSA C22.2#107.1, Canadian AFCI according to T.I.L. M-07		
Grid Connection Standards	IEEE 1547, Rule 21, Rule 14 (H-I)		
Emissions	FCC part 15 class A		
(1) For other regional settings please contact SolarEdge support (2) Where permitted by local regulations (3) For specifications of the optional communication options, visit https://www.solaredge.com/product/communication or the Resource Library webpage: https://www.solaredge.com/downloads#, to download the relevant product datasheet			

Power Optimizer

For North America

P860 / P960 / P1101

POWER OPTIMIZER

PV power optimization at the module-level

The most cost-effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses and combiner boxes, over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

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 Power Optimizer For North America						
P860 / P960 / P1101						
Power Optimizer Model (Typical Module Compatibility)	P860 (for 2 x 72 cell modules)	P960 (for 2 x 96 cell modules)	P1101 (for up to 2 x high power or bi-facial modules)			
INPUT						
Rated Input DC Power ¹⁾	860	960	1100			
Connection Method	Dual input for independently connected modules ²⁾		Single input for series connected modules			
Absolute Maximum Input Voltage (Voc at lowest temperature)	60	60	125			
MPPPT Operating Range	12.5 - 40		12.5 - 105			
Maximum Short Circuit Current (IsC)	22	23.2	14.1			
Maximum Short Circuit Current per input (IsC)	11	11.6	-			
Maximum Efficiency	99.5		-			
Weighted Efficiency	98.6		%			
Overvoltage Category	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)						
Maximum Output Current	18		Adc			
Maximum Output Voltage	80		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						
Photovoltaic Rapid Shutdown System	Compliant with NEC 2014, 2017, 2020					
EMC	FCC Part 15 Class A, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62709-1 (class II safety), UL1741					
Material	UL94 V-0, UV resistant					
	Yes					
INSTALLATION SPECIFICATIONS						
Compatible SolarEdge Inverters	Three phase inverters		SE30K & larger			
Maximum Allowed System Voltage	1000		Vdc			
Dimensions (W x L x H)	129 x 168 x 59 / 5.1 x 6.61 x 2.32		129 x 162 x 59 / 5.1 x 6.4 x 2.32			
Weight	1064 / 2.34		mm / in			
Input Wire Connector	MC4 ³⁾					
Input Wire Length Options	Input #1 (-) 0.16 / 0.52, (+) 0.16 / 0.52	Input #2 (-) 0.16 / 0.52, (+) 0.16 / 0.52	Input #1 (-) 1.6 / 5.2, (+) 1.6 / 5.2	Input #2 (-) 1.6 / 5.2, (+) 1.6 / 5.2		
1			1.6 / 5.2			
2			1.6 / 5.2			
3			1.6 / 5.2			
Output Wire Type / Connector	Double insulated; MC4					
Output Wire Length	2.3 / 7.5		2.4 / 7.8			
Operating Temperature Range ⁴⁾	-40 to +85 / -40 to +185					
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					
¹⁾ Rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power" Modules with up to +5% power tolerance are allowed. ²⁾ In the event of an odd number of PV modules in one string, installation of one P860 / P960 Power Optimizer connected to one PV module is allowed. When connecting a single module to the P860/ P960, use the unused input connectors with the supplied pair of wails. ³⁾ In order to connect correct type please refer to https://www.solaredge.com/sites/default/files/PowerOptimizer-input-connector-compatibility.pdf ⁴⁾ For ambient temperature above +70°C / +158°F, power de-rating is applied. Refer to the Power Optimizers Temperature De-Rating Application Note for more details.						
PV System Design Using a SolarEdge Inverter ⁵⁾	208V Grid SE14.4K	208V Grid SE17.3K	277/480V Grid SE30K, 30K	277/480V Grid SE33.3K, SE40K		
Compatible Power Optimizers	P860, P960, P1101	P860, P960, P1101	P860, P960, P1101	P860, P960, P1101		
Minimum String	Power Optimizers 8	9	14	14		
Length	Power Optimizers 15	17	27	27		
Maximum String	Power Optimizers 30	30	30	30		
Length	PV Modules 60	60	60	60		
Maximum Continuous Power per String	7200	8730	15300	15300		
Maximum Allowed Connected Power per String ⁶⁾	1 string - 8400	1 string - 9930	1 string - 17550	2 strings or less - 17550		
Permitted only when the difference in connected power between strings is up to 2,000W for the 277/480V grids or 1,000W for the 208V grid	2 strings or more - 9000	2 strings or more - 10530	2 strings or more - 20300	3 strings or more - 20300		
Parallel Strings of Different Lengths or Orientations	Yes					
⁵⁾ The same rules apply for String Lengths of equivalent power ratings, that are part of the modular Synergy Technology (inverter) ⁶⁾ P860 can be tied in one string only with P860/P960 ⁷⁾ P860/P960 design with three phase 208V inverters is limited. Use the SolarEdge Designer for verification ⁸⁾ To connect more STC power per string, derating your project using SolarEdge Designer.						
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[illegible]



COMPACT**GROUND G+**

SMART. STABLE. INTELLIGENT.

Compact and tested substructure for the two-sided stand-mounting of PV modules on open ground

THE COMPACTGROUND G+ is an east-west aligned open ground system with an incline of 10° and a floor spacing of up to 40 cm. When compared with conventional systems, up to 30% more modules can be installed on the same space with the COMPACTGROUND G+.

AEROCOMPACT®



The aerodynamic design boasts excellent structural properties and requires considerably less ballast than other systems on the market. Installation is performed without piling instruments or big machine deployment. THE COMPACTGROUND G+ is ballasted with weights, but can also alternatively be fixed with the grounding pins option.

As one of the quickest open ground systems in the industry to install and with the capability of loading up to 1 MWp in one truck, the COMPACTGROUND G⁺ not only offers the best installation times and transport costs, but also a considerable price advantage. Thanks to these distinctive product characteristics, the system is also especially well-suited to temporary project installations or small systems from 2 kWp and upwards.

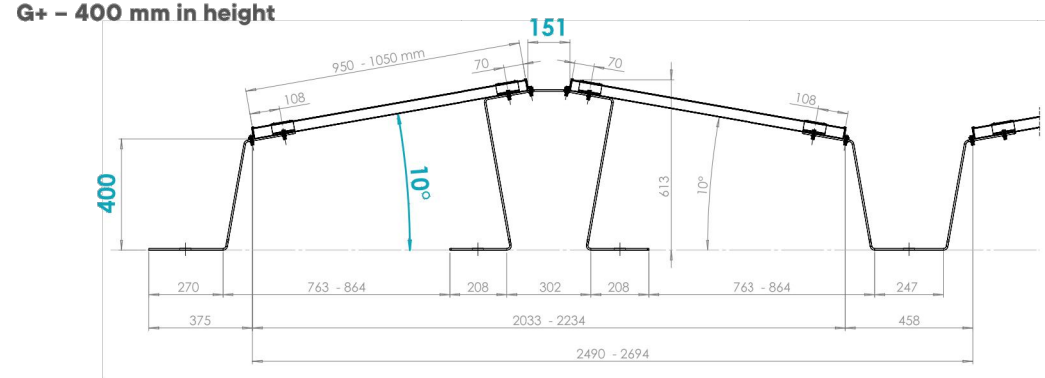
Due to the special "spring effect" of the legs, the substructure adjusts optimally to the conditions of the surface structure.

The system was tested and approved by TÜV Rheinland in accordance with UL 2703. The wire management solution for the string-wiring of module rows is UL-certified and available as an accessory with the substructure.

The COMPACTGROUND G+ is stored in our 3D engineering software AEROTOOL.
The AEROCOMPACT® customer center is able to issue clear and competent project reports based on empirical data (wind load, snow load, structural analysis).

With only three main components, the **COMPACTGROUND G+** achieves an exceptional price-performance ratio. In addition to the attractive system price, the simple installation of the innovative system saves time and resources.

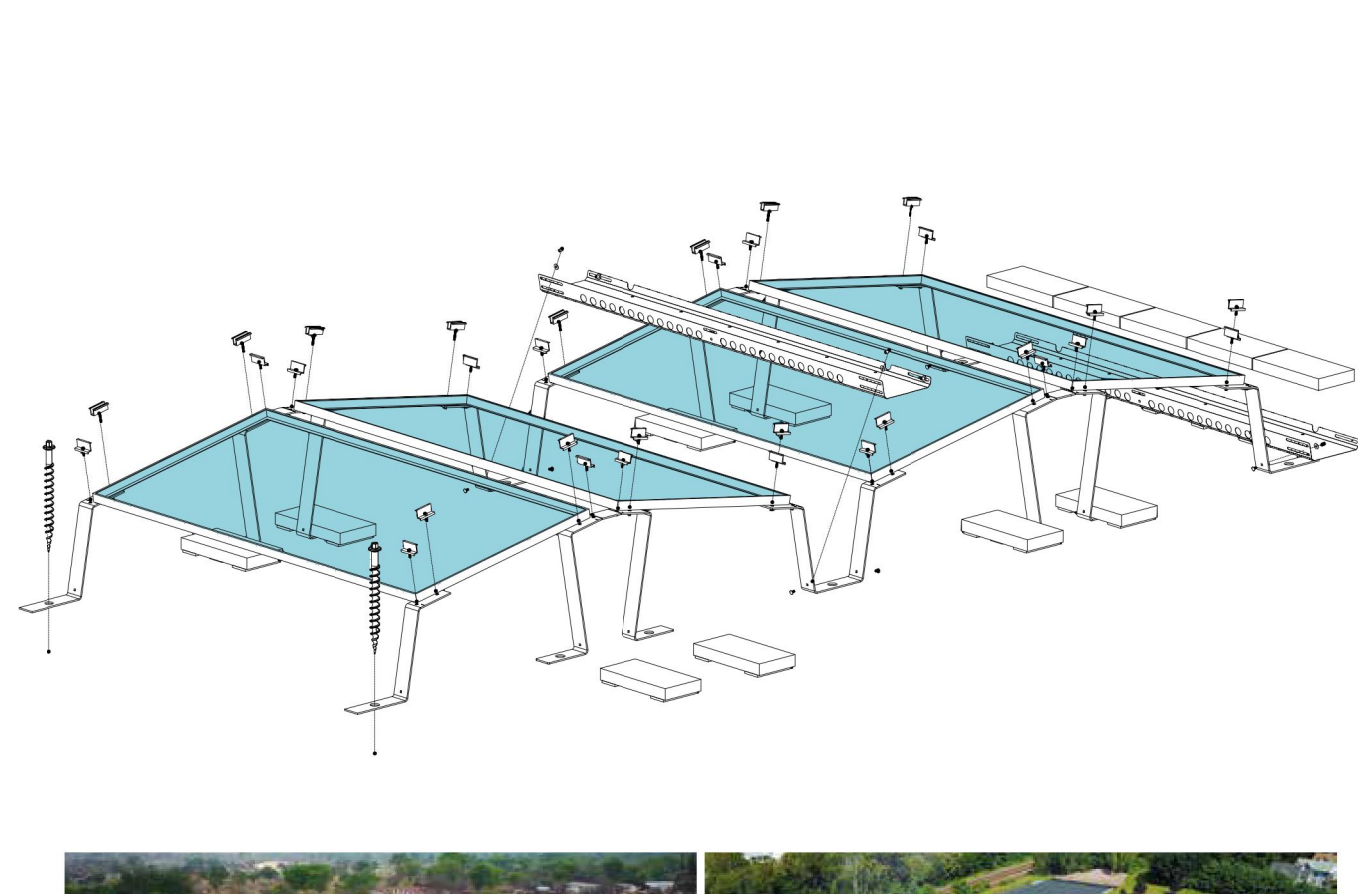
PB-G+-EN-EU-V02-2019



TECHNICAL DATA

Description	Aerodynamic installation system for the stand-mounting of framed PV modules on open ground.
Scope of use	On grassland and farmland, as well as on sand, gravel, grit, concrete or asphalt
Module dimensions	950-1,050 mm x 1,475-2,080 mm (width x length)
Installation angle	10°, bilateral
Row spacing	COMPACTGROUND G+ (8° internal shading angle): 609 mm
Distance from the roof surface / floor surface	Approx. 400 mm
Distance from roof edge	-
Max. building height	-
Max. roof pitch	Up to 10° possible without ground anchors; over 10° only with ground anchors
Max. field size	12 x 16 double rows; 384 modules
Min. field size	2 double rows for every 2 modules
Wind load	Suction load up to 2.4 kN/m ²
Snow load	Pressure load up to 2.4 kN/m ²
Design/stability verification	Software-supported based on wind tunnel analyses
On-site requirements	Sufficient load-bearing capacity and compressive strength of the ground must be ensured on site. The general terms and conditions, terms of warranty, and the user agreement apply.
Module approval	The list of approved modules is provided by AEROCOMPACT®; individual approvals through the module manufacturer
Components	Module clamps with grounding pins, open ground brackets, ballast stones; optional ballast trays, ground anchors
Materials	Bearing connecting parts made from aluminum EN AW 6060 T64; module clamps made from aluminum EN AW 6063 T66; screws made from stainless steel A2-70; ballast trays made from steel with aluminum-zinc coating; ground anchors made from cast aluminum

When installing on green spaces, we recommend using a robotic lawn mower or inserting some natural growth-inhibiting fleece underneath.



- ▶ Module clamps with grounding pins
- ▶ Grounding screw fixing option
- ▶ Very low transport costs
- ▶ Installation without piling implements or big machine deployment
- ▶ Suitable for temporary project installations
- ▶ Structurally optimized system
- ▶ Minimum order quantity only 2 kWp
- ▶ Quickest open ground installation
- ▶ UL-certified wiring management
- ▶ TÜV-certified as per UL 2703
- ▶ Wind tunnel-tested
- ▶ Engineered in Europe
- ▶ General building inspectorate approval applied for
- ▶ 25 years product warranty



< Scan QR code to watch installation video

AEROCOMPACT®

Headquarter Europe

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www.aerocompact.com

				
				
				
				
				
				
	07.14.22	REVISED FOR PERMIT	JL	ADK
	12.01.21	REVISED FOR PERMIT	JL	MWJR
	10.22.21	ISSUED FOR PERMIT	JL	MWJR
	10.06.21	ISSUED FOR INTERCONNECTION	JL	ADK
REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY



Allison D. Kimball
PROFESSIONAL ENGINEER
MA LICENSE: 49826 7/14/



STERLING GOLF MANAGEMENT
GROUND MOUNTED PHOTOVOLTAIC SYSTEM
100.0 KW AC / 119.04 KW DC
276 PLAIN ST
ROCKLAND, MA 02370

MB PROJECT No: **732.0900**

DRAWING TITLE
PHOTOVOLTAIC
SYSTEM
DATA SHEET 2

DRAWING SCALE:		
NONE		
DRAWN BY:	CHECKED BY:	DATE:
JL	ADK	10.08.21

PV-501