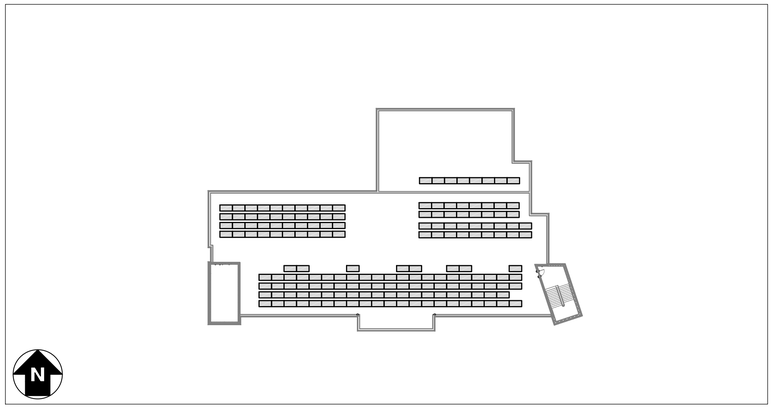
76.12 KW SOLAR ROOFTOP SYSTEM AT

ST. DENIS COMMUNITY SCHOOL

121 MCLEAN AVENUE, YONKERS, NEW YORK 10705

LOCATION MAP
SCALE: 1" = 1000'



SYSTEM PLAN
SCALE: 1" = 40'

TOTAL SYSTEM SUMMARY:

TOTAL DC SYSTEM SIZE:	76.12 kWDC
AC SYSTEM SIZE:	72.00 kWAC
MODULE MANUFACTURER:	CANADIAN SOLAR
MODULE MODEL:	CS3W-440MB-AG
MODULES PER STRING:	12, 13 & 14
MODULE QUANTITY:	173
STRING QUANTITY:	13
MODULE TILT:	10°
MODULE AZIMUTH:	153°
INVERTER MANUFACTURER:	SOLAREDGE
INVERTER MODEL:	SE14.4KUS
INVERTER QUANTITY:	5
OPTIMIZER MODEL:	SOLAREDGE P505
OPTIMIZER QUANTITY:	188

SCOPE OF WORK SUMMARY

ROOFTOP PV ARRAY:

- INSTALL SOLAR MODULES AND ROOFTOP RACKING SYSTEM ON TOP OF EXISTING BUILDING.
- INSTALL INVERTERS AND ELECTRICAL DISTRIBUTION EQUIPMENT.
- INTERCONNECT AT NEW ELECTRICAL DISTRIBUTION EQUIPMENT.

DEVELOPER:

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ENGINEERED BY:

PUREPOWER ENGINEERING

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DRAWING INDEX

		SED SUBMISSION	SED SUBMISSION REV1			
GENERAL						
PG001	TITLE SHEET	●	●			
PG200	ARRAY PLAN	●	●			
PG300	FIRE ACCESS PLAN	●	○			
ELECTRICAL						
PE001	ELECTRICAL NOTES & SYMBOL LIST	●	○			
PE100	AC ELECTRICAL PLAN	●	○			
PE200	DC ELECTRICAL PLAN	●	●			
PE300	ONE LINE DIAGRAM	●	○			
PE310	SCHEDULES & CALCULATIONS	●	●			
PE401	GROUNDING DETAILS	●	○			
PE402	ELECTRICAL DETAILS	●	○			
PE500	LABELS & SIGNAGE	●	○			
PE600	EQUIPMENT DATA SHEETS	●	○			

LEGEND:

UPDATED DRAWING ISSUED	●
UNCHANGED, PREVIOUSLY ISSUED DRAWING STILL CURRENT	○
DRAWING REMOVED FROM SET	×

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
10/08/2021	SED SUBMISSION REV1	AK	AA	RI	
07/14/2021	SED SUBMISSION	AK	AA	RI	

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DEVELOPER

PAGE SIZE: 36" x 24"
PROJECT #: 01541

DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 72.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13
ORIENTATION: 10° TILT, 153° AZIMUTH

PROJECT: 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: TITLE SHEET

DRAWING #: PG001

PLOT DATE: 10/8/2021 4:44 PM

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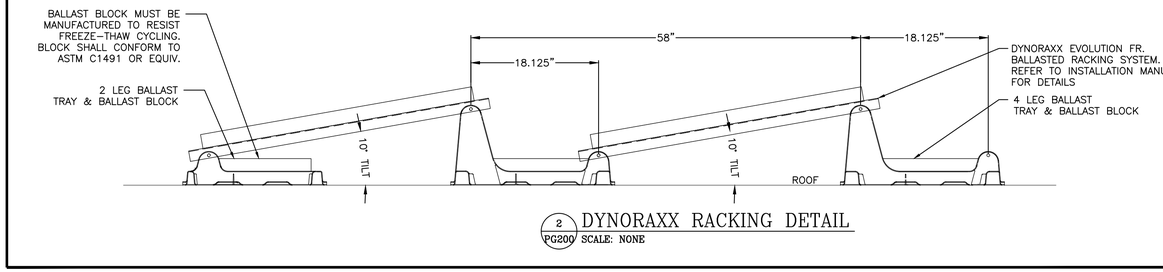
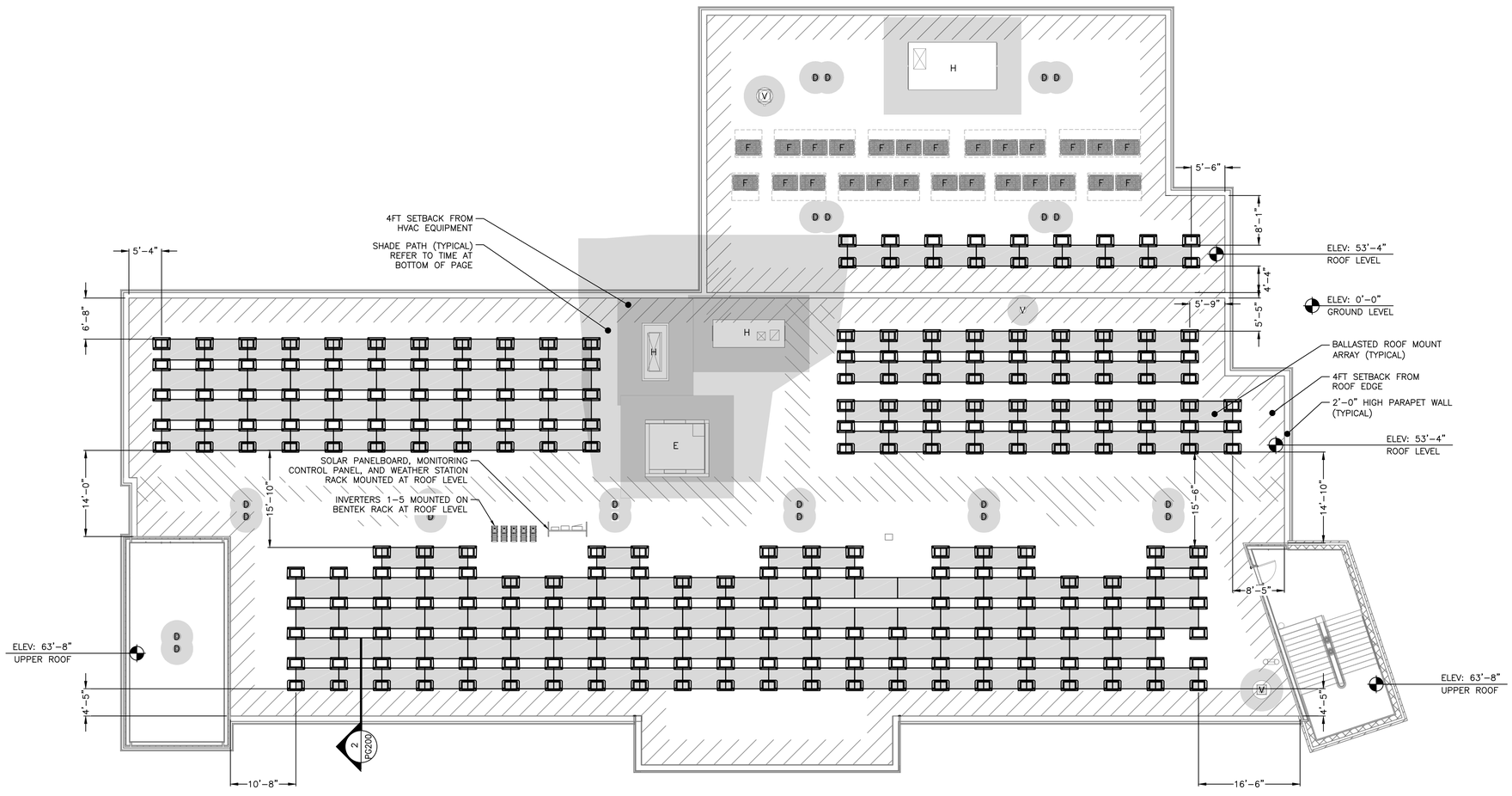


2 DYNORAXX RACKING DETAIL
PG200 SCALE: NONE



IMPORTANT:
DO NOT STEP OR KNEEL ON PV MODULES

1 OVERALL ARRAY PLAN
PG200 SCALE: 1" = 10'–0"

SHADING ZONES:
WINTER: 10:00–2:00
SPRING: 9:00–3:00
SUMMER: 8:00–4:00

LEGEND (EXISTING ITEMS):
A ACCESS
D DRAIN
F FAN
H HVAC
V VENT

NOTE: ELEVATIONS ARE APPROXIMATE AND SHOWN TO LOCAL GRADE. ADJUSTED VALUES MAY BE APPROPRIATE FOR STRUCTURAL ANALYSIS.

NOTE: DIMENSIONS ARE APPROXIMATE AND SHOWN TO RACKING RAILS.

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/08/2021	SED SUBMISSION REV1	AK	AA	RI
07/14/2021	SED SUBMISSION	AK	AA	RI

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DEVELOPER

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DRAWING TITLE: OVERALL ARRAY PLAN

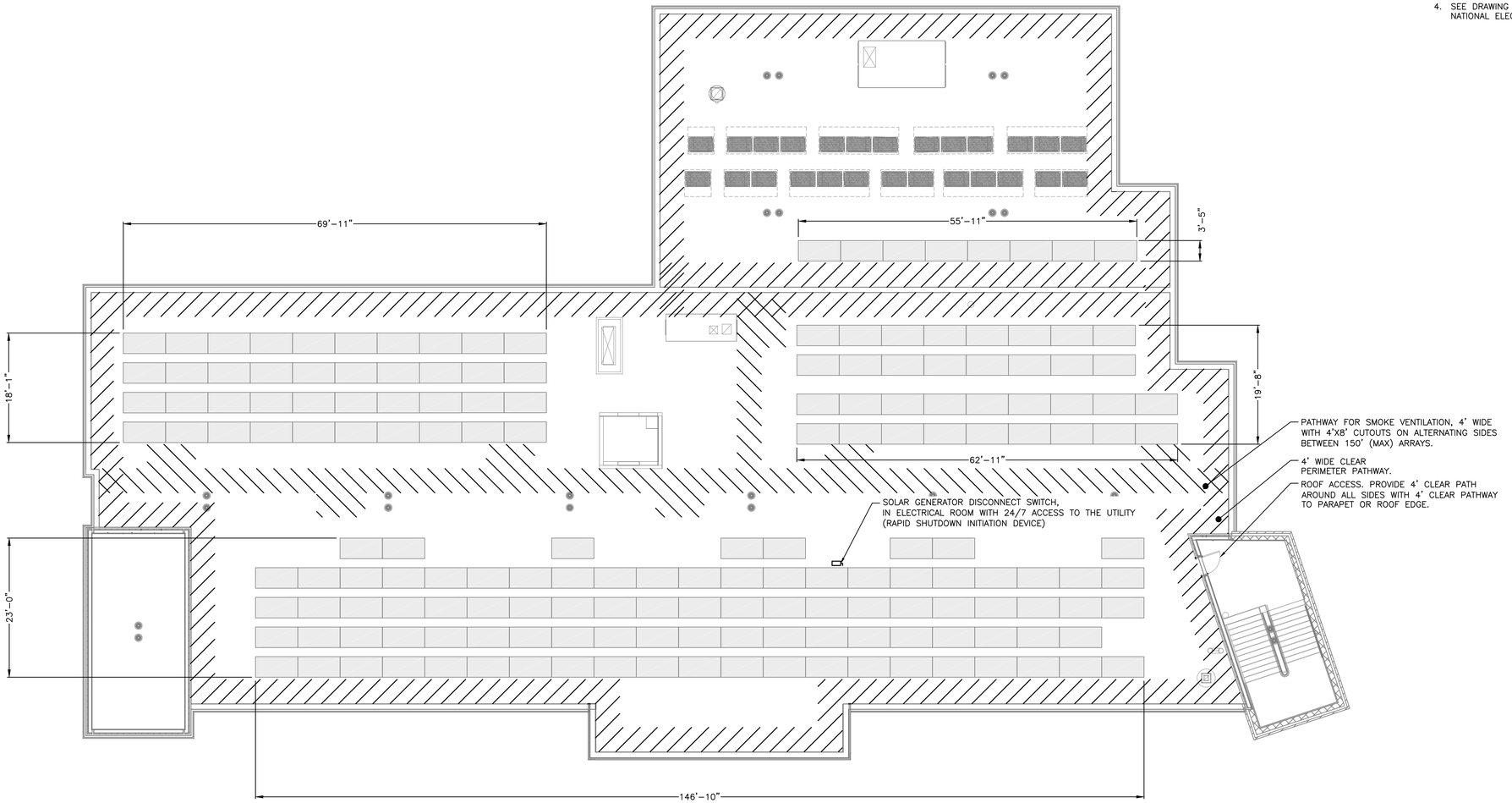
DRAWING #: PG200

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/8/2021 4:45 PM

FLAT ROOF FIRE CODE REFERENCES

REQUIREMENT	IFC 2015	IFC 2018	NFPA1 2012 / 2015	NFPA1 2018
4' CLEAR PERIMETER (≤250')	605.11.3.1 EXCPT	1204.3.1 EXCPT	11.12.2.2.3.1	11.12.2.2.2.3.1
6' CLEAR PERIMETER (>250')	605.11.3.1	1204.3.1	11.12.2.2.3.1	11.12.2.2.2.3.1
ROOF ACCESS HATCH: 4' AROUND ALL SIDES & 4' PATH TO ROOF EDGE	605.11.1.3.2(4)	1204.3.2(3)	11.12.2.2.3.2(5)	11.12.2.2.2.3.2(2)
ARRAYS 150' MAX (BETWEEN PATHS)	605.11.1.3.3(1)	1204.3.2(1)	11.12.2.2.3.3.1	11.12.2.2.2.3.2(3)
8' PATHS	605.11.3.3(2)(2.1)	1204.3.3(2)(2.1)	11.12.2.2.3.3.2(1)	11.12.2.2.2.3.3(1)
4' PATH WITH 4X8 CUTOUTS EVERY 20' ON ALT. SIDES	605.11.3.3(2)(2.4)	1204.3.3(2)(2.3)	11.12.2.2.3.3.2(3)	11.12.2.2.2.3.3(3)
SMOKE VENTS – NON-GRAVITY (MECHANICAL): 4' STRAIGHT PATH TO & 4' AROUND	605.11.1.3.3(2)(2.3)	1204.3.3(1)	11.12.2.2.3.3.2(2)	11.12.2.2.2.3.3
SMOKE VENTS – GRAVITY (DROPOUT) & SKYLIGHTS: 4' STRAIGHT PATH TO ONE SIDE	605.11.1.3.3(2)(2.2)	1204.3.3(2)(2.2)	11.12.2.2.3.3.2(2)	11.12.2.2.2.3.3(2)
ROOF STANDPIPES: 4' STRAIGHT LINE PATH TO ONE SIDE	605.11.1.3.2(3)	1204.3.2(2)	11.12.2.2.3.2(4)	11.12.2.2.2.3.2(1)
"CENTERLINE" ACCESS	605.11.1.3.2(2)	REMOVED	11.12.2.2.3.2(2&3)	REMOVED



1 PG300 FIRE ACCESS PLAN – ROOF
SCALE: 1" = 10'-0"

NFPA 1 REQUIRED LABELS:

1. MAIN SERVICE DISCONNECT – THE LABEL "WARNING: PHOTOVOLTAIC POWER SOURCE" SHALL BE PERMANENTLY AFFIXED TO THE MAIN SERVICE DISCONNECT. LABEL SHALL BE RED WITH WHITE CAPITAL LETTERS AT LEAST 3/4" HIGH IN NONSERIF FONT. MATERIAL SHALL BE REFLECTIVE, WEATHER RESISTANT, AND SUITABLE FOR THE ENVIRONMENT. (NFPA 1: 11.12.2.1.1)
2. INVERTER DISCONNECTS – THE LABEL "PHOTOVOLTAIC DISCONNECT" SHALL BE AFFIXED TO EACH CIRCUIT BREAKER PANEL SERVING THE INVERTERS. LABEL SHALL BE CONTRASTING COLOR WITH CAPITAL LETTERS AT LEAST 3/8" HIGH IN NONSERIF FONT. THE LABEL SHALL BE CONSTRUCTED OF DURABLE ADHESIVE MATERIAL OR OTHER APPROVED MATERIAL. (NFPA 1: 11.12.2.1.2)
3. SOLAR RACEWAYS – THE LABEL "PHOTOVOLTAIC POWER SOURCE" SHALL BE RED WITH WHITE CAPITAL LETTERS AT LEAST 3/8" HIGH IN NONSERIF FONT. LABELS SHALL BE PERMANENTLY AFFIXED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, PULL BOXES, AND JUNCTION BOXES. LABELS SHALL BE SPACED NO GREATER THAN 10 FEET APART. MATERIAL SHALL BE REFLECTIVE, WEATHER RESISTANT, AND SUITABLE FOR THE ENVIRONMENT. (NFPA 1: 11.12.2.1.3)
4. SEE DRAWING E500 FOR ADDITIONAL LABELS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
					RI
					JA
					AK
07/14/2021	SED SUBMISSION				

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DRAWING TITLE: FIRE ACCESS PLAN

DRAWING #: PG300

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/8/2021 4:45 PM

ELECTRICAL NOTES

1. GENERAL
 1.A. ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND ALL EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) TO APPLICABLE UL STANDARDS. THE CONTRACTOR SHALL PROCURE ALL NECESSARY CERTIFICATIONS FOR ALL WORK INSTALLED, PAY ALL FEES AND CHARGES CONNECTED THEREWITH AND DELIVER ALL CERTIFICATES AND INSPECTION APPROVALS TO THE OWNER THROUGH THE ENGINEER, BEFORE WORK WILL BE FINALLY ACCEPTED.
 1.B. ALL INVERTERS SHALL BE IEEE 1547 COMPLIANT AND SHALL BE INSPECTED BY LOCAL UTILITY BEFORE COMMISSIONING, TESTING AND OPERATION OF THE SYSTEM.
 1.C. UNLESS OTHERWISE NOTED, NEW EQUIPMENT SHALL HAVE AN INTERRUPT RATING (kAIC) OR SHORT CIRCUIT CURRENT RATING (SCCR) GREATER THAN OR EQUAL TO THE EXISTING EQUIPMENT.

2. MANNER OF INSTALLATION
 2.A. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. ALL DETAILS OF THE INSTALLATION SHALL BE MECHANICALLY AND ELECTRICALLY CORRECT.
 2.B. TORQUE AND MARK ALL RACKING AND MECHANICAL LUGS.

3. CONDUCTORS AND CONDUCTOR INSTALLATION
 3.A. WHERE POSSIBLE, ALUMINUM CABLE TERMINATIONS SHALL BE MADE WITH COMPRESSION LUGS OR MECHANICAL LUGS WITH COMPRESSION PIN ADAPTORS. REQUEST CLIENT APPROVAL FOR ALTERNATIVES.
 3.B. IF ALUMINUM MC CABLE IS USED, THHN/THWN-2 INSULATION IS ACCEPTABLE. FOR ALUMINUM CONDUCTORS, XHHW-2 SHALL BE USED.
 3.C. ANTI-OXIDANT COMPOUND SHALL BE USED WITH ALL ALUMINUM LUGS. CLEAN OXIDATION FROM WIRE STRANDS WITH STEEL WIRE BRUSH PRIOR TO APPLICATION OF COMPOUND.
 3.D. PV SYSTEM CONDUCTORS SHALL BE MARKED AND IDENTIFIED PER NEC 690.31(B).
 3.E. INSTALL WIRE AND CABLE IN ACCORDANCE WITH THE NEC AND AS HEREINAFTER SPECIFIED. USE THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION'S "STANDARD OF INSTALLATION", THE MANUFACTURER'S WRITTEN INSTRUCTIONS, UNLESS SUPERSEDED BY THESE SPECIFICATIONS. IN ALL CASES THE INSTALLATION SHALL BE IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES.
 3.F. THE USE OF WIRE SPLICES AT ANY POINT IN THE INSTALLATION IS STRICTLY PROHIBITED
 3.G. THE USE OF WIRE LUBE IS REQUIRED FOR ALL WIRE PULLS THROUGH CONDUIT RUNS OF 20' OR LONGER, OR WITH BENDS IN 180° OR MORE. WIRE LUBE IS REQUIRED EVEN WHEN USING SELF LUBRICATING CABLES SUCH AS SOUTHWIRE 'SIMPULL'.
 3.H. STRING WIRING & HOMERUNS SHALL BE SECURED TO UNDERSIDE OF THE RACKING & MODULES USING SUNBUNDLERS OR ZIP TIES OUTDOOR RATED FOR UV (HELLERMAN TYTON PA66UV OR EQUAL). TRANSITION TO EMT OUTSIDE OF ARRAY. NEGATIVE HOMERUN SHALL BE RUN PARALLEL TO POSITIVE HOMERUN.
 3.I. ALL PV SOURCE CIRCUITS WHICH WOULD BE EXPOSED TO PHYSICAL DAMAGE SHALL BE PROTECTED IN CONDUIT OR CABLE TRAY.
 3.J. ALL PV SOURCE CIRCUITS WITH DIRECT EXPOSURE TO SUNLIGHT SHALL BE PROTECTED THROUGH THE USE OF CONDUIT, PROTECTIVE WRAP, SPLIT LOOM, OR EQUIVALENT, WHICH ARE DURABLE FOR THE ENVIRONMENT AND RATED FOR THE APPLICATION.
 3.K. ALL PLUG AND SOCKET CONNECTORS MATED TOGETHER SHALL BE OF THE SAME TYPE AND OF THE SAME MANUFACTURER. "COMPATIBLE" CONNECTORS SHALL NOT BE ACCEPTED (IEC 62446-1).
 3.L. ALL FIELD-MADE PLUG & SOCKET CONNECTORS SHALL BE INSTALLED USING MANUFACTURER APPROVED TOOLS AND METHODS, AND CABLE GLANDS SHALL BE TIGHTENED TO MANUFACTURER'S SPECIFIED TORQUE VALUE.

4. PHASE RELATIONSHIP
 4.A. CONNECT FEEDERS TO MAINTAIN PHASE RELATIONSHIP THROUGH SYSTEM. PHASE LEGS OF FEEDERS SHALL MATCH BUS OR CABLE ARRANGEMENTS IN EQUIPMENT TO WHICH THE FEEDERS ARE CONNECTED. COLOR CODING SHALL BE AS FOLLOWS:

 208/120 VAC
 A PHASE: BLACK, B PHASE: RED, C PHASE: BLUE

 277/480 VAC OR 346/600 VAC
 A PHASE: BROWN, B PHASE; ORANGE, C PHASE: YELLOW

 1500 VDC, 1000 VDC, OR 600 VDC
 UNGROUNDED POSITIVE CONDUCTOR: RED
 UNGROUNDED NEGATIVE CONDUCTOR: BLACK

 AC AND DC SYSTEMS:
 GROUNDED CONDUCTOR: WHITE
 GROUND: GREEN

 4.B. GROUNDED CONDUCTORS (NEUTRAL) AND EQUIPMENT GROUNDING CONDUCTORS SMALLER THAN #4 MUST HAVE COLOR CODED INSULATION. WHERE COLOR CODED CABLE IS NOT USED, TAPE CONDUCTOR WITH OVERLAPPED COLORED TAPE FOR A MINIMUM OF 6" IN ACCESSIBLE LOCATIONS. COLOR CODING MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.

5. CONDUITS AND RACEWAYS
 5.A. PROVIDE RACEWAYS MINIMUM SIZE 3/4".
 5.B. CONDUITS SHALL BE EMT WHERE NOT SUBJECT TO PHYSICAL DAMAGE. CONDUITS SHALL BE IMC OR RMC WHERE SUBJECT TO PHYSICAL DAMAGE. PVC CONDUITS ONLY PERMITTED IN BELOW GRADE DUCT BANKS.
 5.C. DRAWINGS SHOW RACEWAY LOCATIONS DIAGRAMMATICALLY. CONTRACTOR SHALL ADJUST ROUTING TO SUIT FIELD LOCATIONS. ANY CHANGES TO PROPOSED ROUTING SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.
 5.D. FURNISH AND INSTALL ALL FITTINGS AND SPECIAL DEVICES NECESSARY FOR THE PROPER INSTALLATION, CONNECTION AND OPERATION OF THE SYSTEM. CONDUIT ELBOWS SHALL BE OF THE SAME MAKE, QUALITY AND FINISH AS THE CONDUIT USED.
 5.E. A PROTECTIVE COATING OF ASPHALT COMPOUND, PLASTIC SHEATH, OR OTHER EQUIVALENT PROTECTION SHALL BE APPLIED TO ANY GALVANIZED STEEL CONDUITS DIRECTLY BURIED IN EARTH.
 5.F. EMT CONDUIT SHALL USE COMPRESSION RAINTIGHT CONNECTORS, FACTORY STAMPED RAINTIGHT WITH COMPONENTS PROPERLY INSTALLED.
 5.G. PROVIDE EXPANSION FITTINGS WITH BONDING JUMPERS FOR EVERY 100' OF STRAIGHT METAL CONDUIT RUN.
 5.H. CONDUIT EXPANSION AND DEFLECTION FITTINGS WITH BONDING JUMPERS SHALL BE USED WHENEVER CROSSING BUILDING EXPANSION AND SEISMIC SEPARATION JOINTS.
 5.I. LEAVE WIRE SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS. ALL EMPTY CONDUITS OVER 10' IN LENGTH SHALL BE PROVIDED WITH SYNTHETIC FIBER ROPE PULL WIRE.
 5.J. PATCH AND REPAIR ALL SURFACES DAMAGED BY TRENCHING TO MATCH THE PREVIOUSLY EXISTING CONDITIONS.
 5.K. 15" WIDE OR LESS BUCKET TO BE USED FOR TRENCHING.
 5.L. ALL PENETRATIONS SHALL BE SEALED TO MAINTAIN THE EXISTING FIRE RATING.
 5.M. ALL ROOFTOP CONDUITS SHALL BE MARKED PER LOCAL FIRE CODES.
 5.N. ALL CONDUITS ENTERING ENCLOSURES SHALL BE FITTED WITH PROTECTIVE BUSHINGS, INCLUDING CONDUIT WITH CONDUCTOR SIZES SMALLER THAN #4 AWG. METALLIC CONDUIT/BUSHINGS SHALL BE BONDED PER NEC.
 5.O. ALL CONDUIT ENTERING ENCLOSURES SHALL BE SEALED WITH AN APPROVED SEALANT.

6. ELECTRICAL ENCLOSURES
 6.A. ALL OUTDOOR ENCLOSURES (PANELBOARDS, DISCONNECT SWITCHES, JUNCTION BOXES, COMBINER BOXES, ETC.) SHALL BE NEMA 3R, 4, OR 4X. INDOOR ENCLOSURES SHALL BE NEMA 1.
 6.B. PANELBOARD DOORS SHALL BE QUARTER TURN LATCHES OR EXTERNAL HANDLE WITH INTERNAL LATCHES, NO SETS OF EXTERNAL SCREW DOWN CLAMPS.
 6.C. CONDUIT TERMINATING IN OUTDOOR ENCLOSURES SHALL USE MYERS-TYPE HUBS WITH GROUND SCREW. UTILIZE RAINTIGHT FITTINGS FOR ALL CABLE ENTRIES.
 6.D. NO PENETRATIONS OR CABLE ENTRIES IN THE TOP OF OUTDOOR ENCLOSURES. ENTER OUTDOOR ENCLOSURES FROM THE BOTTOM (PREFERRED) OR SIDE.
 6.E. ALL ELECTRICAL EQUIPMENT SHALL BE LISTED OR LABELED BY A RECOGNIZED TESTING AGENCY.
 6.F. ARC FLASH HAZARD WARNING LABELS SHALL BE PROVIDED AND MOUNTED ON EVERY COMBINER BOX, TERMINAL BOX, INVERTER, AC AND DC SWITCH, TRANSFORMER, AND SWITCHGEAR.
 6.G. HAND HOLES, PULL BOXES, OR CONDUIT BODIES SHALL BE INSTALLED (WHETHER OR NOT SHOWN ON DRAWINGS) WHEN THE RACEWAY HAS MORE THAN 360° OF BENDS, OR AS NECESSARY TO NOT EXCEED MANUFACTURER'S MAXIMUM CABLE PULLING TENSION.

7. GROUNDING
 7.A. THE CONTRACTOR SHALL FURNISH AND INSTALL GROUNDING NECESSARY IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

8. TESTS
 8.A. FINAL TESTS AND INSPECTION SHALL BE HELD IN THE PRESENCE OF OWNER'S REPRESENTATIVES AND TO THEIR SATISFACTION.
 8.B. MEGGER TEST ALL DC STRING WIRING, DC COMBINER BOX OUTPUT FEEDERS, AND AC FEEDERS. SUBMIT RESULTS TO OWNER FOR REVIEW.
 8.C. HI-POT TEST ALL MEDIUM VOLTAGE FEEDERS IN ACCORDANCE WITH CABLE MANUFACTURER INSTRUCTIONS.
 8.D. IV CURVE TRACES OF STRINGS SHALL BE GENERATED USING THE SOLMETRIC PV ANALYZER (OR EQUIVALENT DEVICE) AND SUBMITTED TO OWNER FOR APPROVAL.
 8.E. OPEN-CIRCUIT VOLTAGE (Voc) MEASUREMENTS OF ALL DC STRING CONDUCTORS.
 8.F. GROUND FAULT PROTECTION SYSTEMS SHALL BE FUNCTIONAL TESTED IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS (NEC 230.95(C))
 8.G. MEDIUM VOLTAGE EQUIPMENT SHALL BE TESTED IN ACCORDANCE WITH NEC 230.95 AND PER MANUFACTURER INSTRUCTIONS.

GENERAL NOTES

1. THE GENERAL NOTES APPLY TO ALL DRAWINGS UNDER THE CONTRACT. REFER TO INDIVIDUAL DRAWINGS FOR ADDITIONAL NOTES.
2. DRAWINGS ARE DIAGRAMS AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT OF WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM, SPACE CONDITIONS, AND REQUIRED CLEARANCES.
3. PV SYSTEM CONTRACTOR SHALL COORDINATE ALL THE WORK WITH THE ENGINEER, THE CONSTRUCTION MANAGER AND ALL OTHER CONTRACTORS TO INSURE THAT THE PV SYSTEM IS INSTALLED AS SPECIFIED IN THESE DRAWINGS.
4. PERSONAL PROTECTIVE EQUIPMENT (PPE) SHALL BE PROVIDED AS REQUIRED IN ACCORDANCE WITH NEC 70E AND OSHA REQUIREMENTS.
5. UNFORSEEN OBSTRUCTIONS ON THE SITE MAY NECESSITATE A CHANGE IN THE LAYOUT. ANY CHANGES TO THE RACKING LAYOUT SHOULD BE REPORTED TO THE ENGINEER. CHANGES IN UP TO 5% OF THE MODULES SHOULD BE ANTICIPATED. CHANGES TO THE ARRAY LAYOUT SHOULD BE MADE AS TO NOT IMPACT THE NUMBER OF MODULES ON A COMBINER BOX OR INVERTER.
6. LANDSCAPING: RESTORE TO ORIGINAL CONDITIONS.
7. ALL STRUCTURAL AND MISCELLANEOUS EXTERIOR STEEL, INCLUDING STRUT CHANNEL (SUCH AS UNISTUT OR KINDORF) SHALL BE CORROSION RESISTANT, HOT DIP GALVANIZED OR GALVANNEALED WITH A COATED FINISH MINIMUM.

LEGEND – GENERAL

	LIGHT LINE INDICATES EXISTING OR BEYOND THE SCOPE OF PROJECT
	DARK LINE INDICATES NEW OR WITHIN THE SCOPE OF PROJECT
	DASHED LINE INDICATES EQUIPMENT AT A DIFFERENT ELEVATION
EXISTING TEXT	LIGHT TEXT INDICATES EXISTING OR BEYOND THE SCOPE OF PROJECT
NEW TEXT	DARK TEXT INDICATES NEW OR WITHIN THE SCOPE OF PROJECT

LEGEND – PLAN SYMBOLS

	SOLAR MODULE
	RACEWAY TURNING UP OR TOWARDS OBSERVER
	RACEWAY TURNING DOWN OR AWAY FROM OBSERVER
	CABLE TRAY
P OR P	PULLBOX
J OR J	JUNCTION BOX
	PANEL BOARD
	LOCAL DISCONNECT SWITCH
	SIMPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
	DUPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
W	WEATHERPROOF DUPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
GFCI	GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE, RATED: 125-VOLTS AC, 20A
	DOUBLE DUPLEX (QUAD) RECEPTACLE
	CEILING/PENDANT-MOUNT LIGHT, SEE FIXTURE SCHEDULE FOR TYPE
	WALL-MOUNT LIGHT, SEE FIXTURE SCHEDULE FOR TYPE
	GROUND ROD
	GROUND ROD W/ TEST WELL

LEGEND – ONE LINE DIAGRAM AND WIRING DIAGRAM SYMBOLS

	CIRCUIT BREAKER, FRAME SIZE AND TRIP SETTING AS NOTED
	DISCONNECT SWITCH
	INVERTER
	BUS CONNECTION POINT
	CROSSING POINT (NO CONNECTION)
	NORMALLY CLOSED – NORMALLY OPEN CONTACTS
	TRANSFORMER CONTROL/POWER, SIZE AND RATING AS NOTED
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	FUSE, SIZE/RATING AS NOTED
	FUSED DISCONNECT SWITCH
	EARTH GROUND
NC NO	PUSHBUTTON SWITCHES; NUMBER AND TYPE OF CONTACT BLOCKS MAY VARY
NC NO	PUSHBUTTON SWITCHES MUSHROOM HEAD; NUMBER AND TYPE OF CONTACT BLOCKS MAY VARY
K	KEYED INTERLOCK (KIRK KEY OR EQ.)
ST	SHUNT TRIP COIL

ABBREVIATIONS

A	AMPERES
AERMS	ARC ENERGY REDUCING MAINTENANCE SWITCH
AF	AMPERE FRAME
A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AFDI	ARC FAULT DETECTION & INTERRUPTER
AIC	AMPS INTERRUPTING CAPACITY
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BKR	CIRCUIT BREAKER
C	CONDUIT
CB	COMBINER BOX
CKT	CIRCUIT
COU	CONDITIONS OF USE
CP	CONTROL PANEL
CU	COPPER
DISC	DISCONNECT
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELEC	ELECTRIC, ELECTRICAL
EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
EXIST	EXISTING
G, GND	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND-FAULT CIRCUIT INTERRUPTER
GFPE	GROUND-FAULT PROTECTION OF EQUIPMENT
HID	HIGH-INTENSITY DISCHARGE (LIGHTING)
HZ	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
kAIC	1000 AMPS INTERRUPT CAPACITY
kCMIL	1000 CIRCULAR MILLS
kVA	KILO-VOLT AMPERE
kW	KILOWATT
LA	LIGHTNING & SURGE ARRESTOR
LED	LIGHT-EMITTING DIODE
LSIG	LONG, SHORT, INSTANTANEOUS, & GROUND FAULT
LTG	LIGHTING
MAX	MAXIMUM
MFG	MANUFACTURER
MLO	MAIN LUGS ONLY
MLPE	MODULE LEVEL POWER ELECTRONICS
MPPT	MAXIMUM POWER POINT TRACKING
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NTS	NOT TO SCALE
P	POLE
PF	POWER FACTOR
PLC	PROGRAMMABLE LOGIC CONTROLLER
POA	PLANE OF ARRAY
POI	POINT OF INTERCONNECTION
PRI	PRIMARY
PVC	POLYVINYL CHLORIDE
PWR	POWER
RCPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL CONDUIT
RMC	RIGID METAL CONDUIT
SA	SURGE ARRESTOR
SEC	SECONDARY
SPD	SURGE PROTECTION DEVICE
SSBJ	SUPPLY SIDE BONDING JUMPER
ST	SHUNT TRIP
STP	SHIELDED TWISTED PAIR
SW	SWITCH
TBD	TO BE DETERMINED
TP	TWISTED PAIR
TYP	TYPICAL
V	VOLT
VA	VOLT-AMPERE
W	WATT
WP	WEATHERPROOF
XFMR	TRANSFORMER
ø	DIAMETER OR PHASE

NOTES SPECIFIC TO NEW YORK

ADOPTED NEC VERSION: 2017
ADOPTED IBC VERSION: 2018
ADOPTED IFC VERSION: 2018

UTILITY: CONSOLIDATED EDISON (CONED)

UTILITY DISCONNECT SWITCH REQUIREMENTS:
GENERATING EQUIPMENT WITH SYSTEM SIZE LARGER THAN 25 KW SHALL BE CAPABLE OF BEING ISOLATED FROM THE UTILITY SYSTEM BY MEANS OF AN EXTERNAL, MANUAL, VISIBLE, GANG-OPERATED, LOAD BREAK DISCONNECTING SWITCH. THE DISCONNECT SWITCH SHALL BE LOCATED WITHIN 10 FEET OF THE UTILITY'S EXTERNAL ELECTRIC SERVICE METER.

	DATE	REVISION DESCRIPTION	PM	ENG	CHK	
						RL
						AA
	07/14/2021	SED SUBMISSION				AK

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DEVELOPER

PAGE SIZE: 36" x 24"
PROJECT #: 01541

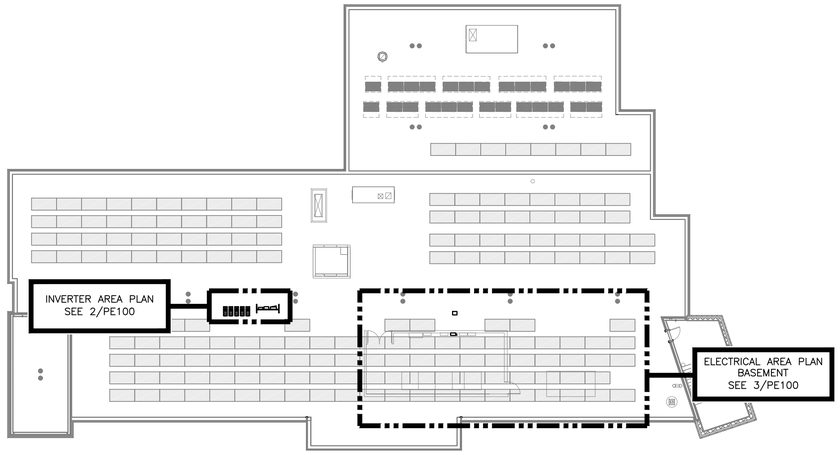
DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 72.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13
ORIENTATION: 10° TILT, 153° AZIMUTH

PROJECT: 76.12 KW SOLAR ROOFTOP SYSTEM AT ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

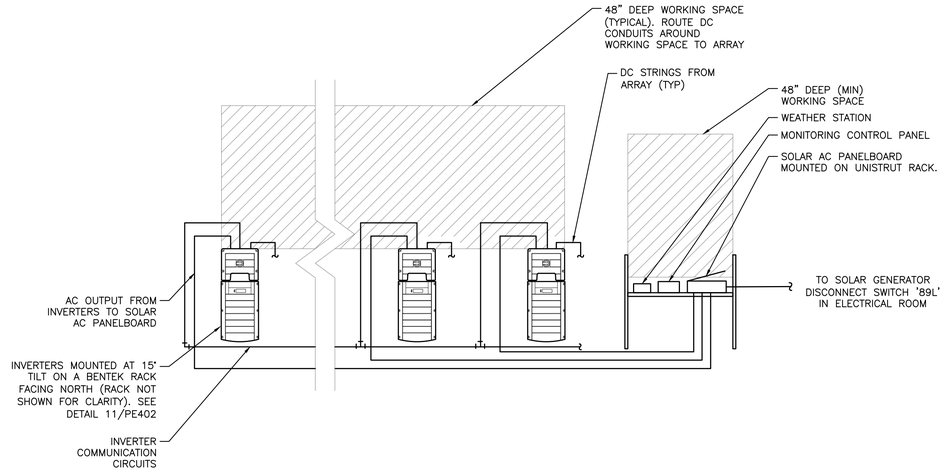
DRAWING TITLE: ELECTRICAL NOTES & SYMBOL LIST

DRAWING #: PE001

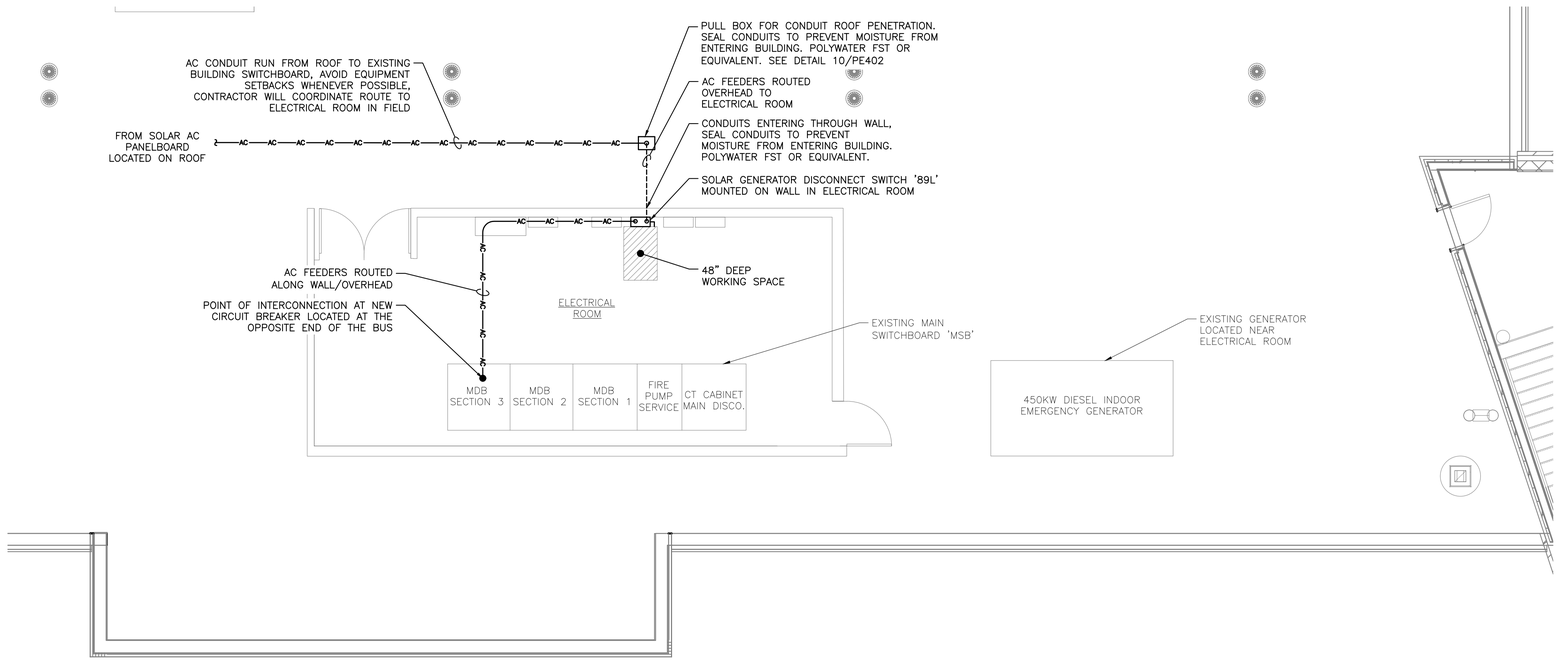
RULER IN INCHES: 0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



1 PE100 OVERALL AC ELECTRICAL PLAN
SCALE: 1" = 20'-0"



2 PE100 INVERTER AREA PLAN
SCALE: 1/2" = 1'-0"



3 PE100 ELECTRICAL AREA PLAN
SCALE: 3/16" = 1'-0"

LINETYPE LEGEND

—DC— DC CIRCUIT IN CONDUIT
—AC— AC CIRCUIT IN CONDUIT
—COM— COMMUNICATIONS

DRAWING TITLE	DRAWING #
AC ELECTRICAL PLAN	PE100

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
07/14/2021	SED SUBMISSION	AK	AA	RI	

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DEVELOPER

PAGE SIZE 36" x 24"
PROJECT # 01541

DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 72.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13
ORIENTATION: 10° TILT, 153° AZIMUTH

PROJECT 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

PLOT DATE: 10/8/2021 4:45 PM

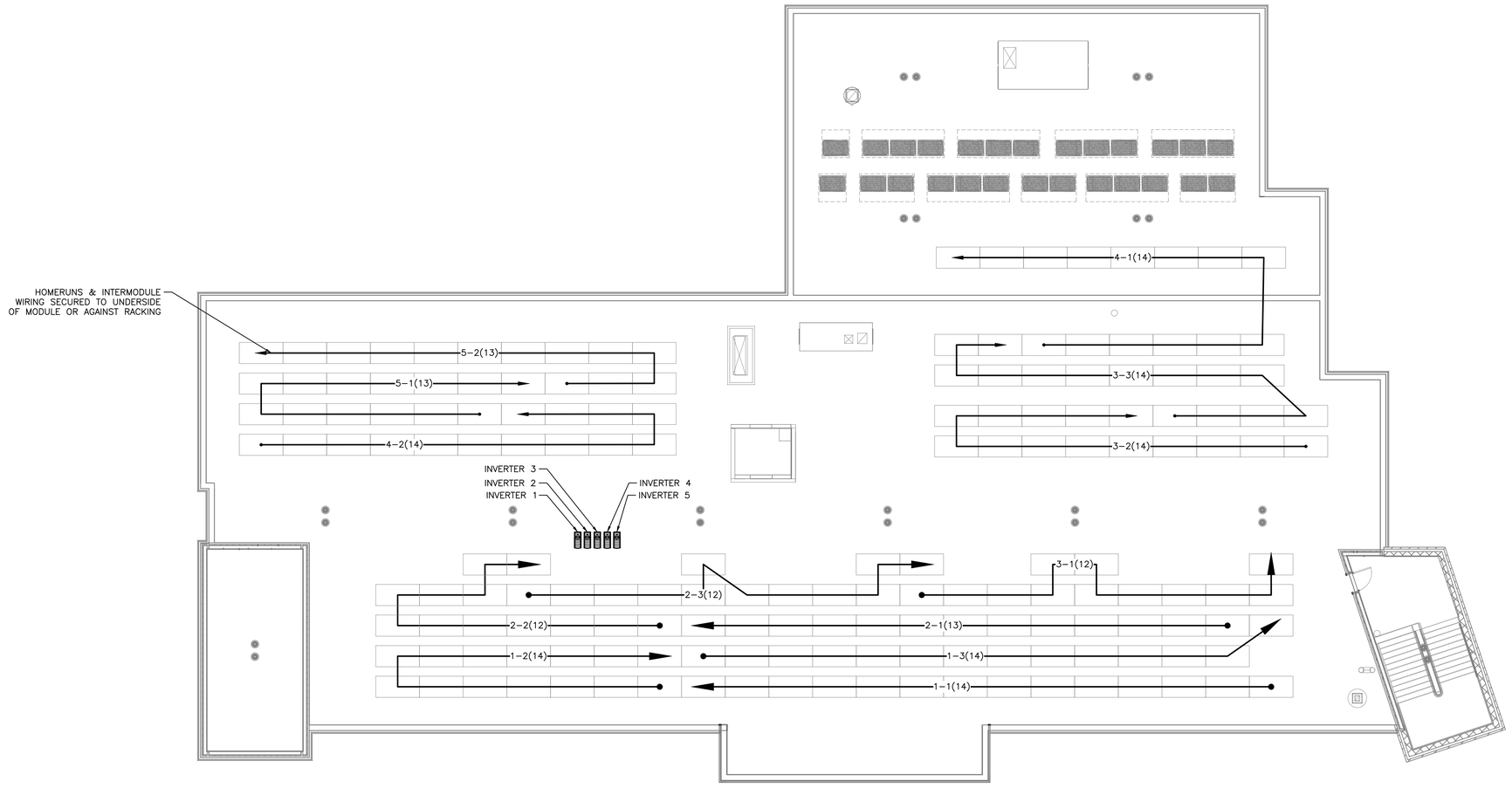
RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/8/2021 4:45 PM

STRING SUMMARY			
INVERTER NAME	MODULES PER STRING	OPTIMIZERS PER STRING	STRING QUANTITY
1	14	14	3
2	12	12	2
	13	13	1
3	12	12	1
	14	14	2
4	14	14	2
5	13	13	2

CONDUIT FILL TABLE		
MAXIMUM NUMBER OF CU #8 PV WIRES. (WITH ALLOWANCE FOR AN ADDITIONAL GROUND WIRE)		
CONDUIT TRADE SIZE	CONDUIT LENGTH 24" OR LESS (60% FILL)	CONDUIT LENTH OVER 24" (40% FILL)
3/4"	3	2
1"	6	4
1.25"	11	7
1.5"	15	9
2"	25	9
2.5"	45	9
3"	68	9
3.5"	89	9
4"	114	9
TABLE ASSUMING: EMT CONDUIT AND CU #8 PV WIRE WITH 0.31in O.D., 0.96 TEMP. DERATE		
DC OPTIMIZER OUTPUT CIRCUIT WITH 15A OUTPUT, 3 IN PARALLEL, AND NO FUSES		

NEC 690.12 RAPID SHUTDOWN NOTE:
THIS SYSTEM INCLUDES MODULE-LEVEL POWER ELECTRONICS WHICH SHUTDOWN DC VOLTAGE AT THE MODULE LEVEL WHEN AC POWER GOES OUT. TIMING AND VOLTAGE LEVELS ARE IN COMPLIANCE WITH NEC 690.12 RAPID SHUTDOWN.



IMPORTANT
CONTRACTOR MUST:
1. REDLINE DRAWINGS TO REFLECT EXACT AS-BUILT STRINGING AND RETURN TO PURE POWER.
2. CREATE MAP OF SOLAREDGE POWER OPTIMIZER ADDRESSING AND RETURN TO SOLAREDGE.

1 PE200 DC ELECTRICAL PLAN
SCALE: 1" = 10'-0"

STRING LABEL KEY
2-3(15)
MODULES/STRING
STRING #
INVERTER #

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/08/2021	SED SUBMISSION REV1	AK	AA	RI
07/14/2021	SED SETS	AK	AA	RI

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DEVELOPER

PAGE SIZE: 36" x 24"
PROJECT #: 01541

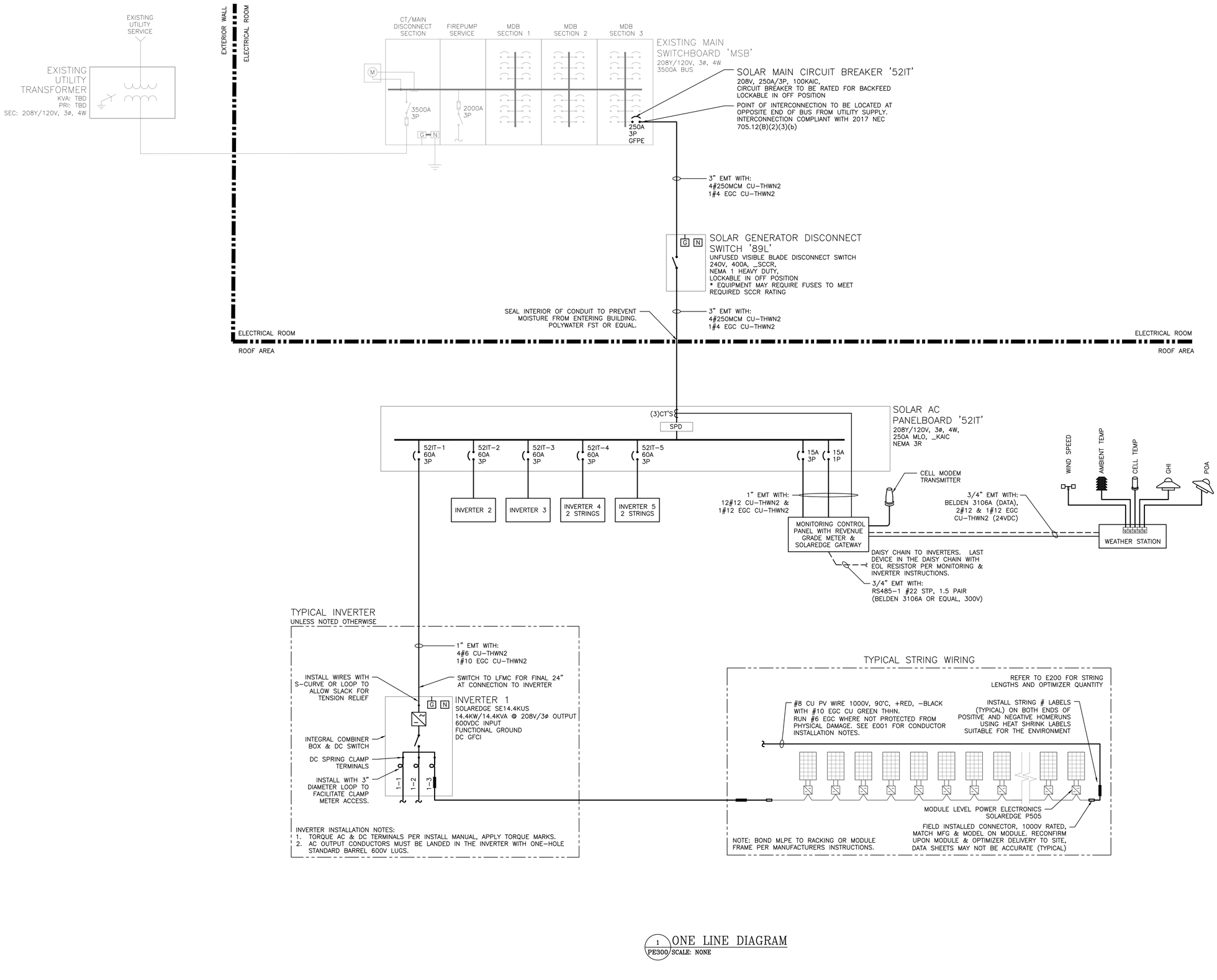
DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 72.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13
ORIENTATION: 10° TILT, 153° AZIMUTH

PROJECT: 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: DC ELECTRICAL PLAN

DRAWING #: PE200

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



1 ONE LINE DIAGRAM
PE300 SCALE: NONE

SHEET NOTES:
1. CONTRACTOR SHALL FIELD-VERIFY INTERCONNECTION MEANS/METHODS PRIOR TO INSTALLATION. COORDINATED SHUTDOWN MAY BE REQUIRED.
2. PROVIDE TORQUE MARKS INSIDE INVERTERS.
3. SET ELECTRONIC-TRIP BREAKERS TO THE SETTINGS BELOW, UNLESS OTHERWISE NOTED IN POWER STUDY. "NOMINAL TRIP" REFERS TO BREAKER TRIP RATING INDICATED ON ONELINE. SETTINGS BELOW ARE NOT FOR COORDINATION PURPOSES.
   - L = 100% OF NOMINAL TRIP (EXACT) MINIMUM TIME DELAY
   - S = 125% OF NOMINAL TRIP (OR NEXT HIGHER) MINIMUM TIME DELAY
   - I = 150% OF NOMINAL TRIP (OR NEXT HIGHER)
   - G = 20% OF NOMINAL TRIP (OR NEXT HIGHER) 0.5 SEC TIME DELAY

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
07/14/2021	SED SUBMISSION	AK	AA		R2

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DEVELOPER

PAGE SIZE: 36" x 24"
PROJECT #: 01541

DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 72.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13
ORIENTATION: 13 @ TILT, 153° AZIMUTH

PROJECT: 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: ONE LINE DIAGRAM

DRAWING #: PE300

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

AC FEEDER CALCULATIONS

EQUIPMENT SUPPLIED	FED FROM	VOLTAGE	FULL LOAD AMPS 'FLA'	FLA x 1.25	OCPD SIZE	GROUND SIZE	CONDUCTORS PER PHASE	PHASE CONDUCTOR SIZE	NEUTRAL CONDUCTOR SIZE	75° AMPACITY	90° AMPACITY	90° AMPACITY WITH C.O.U.	C.O.U DERATE AMBIENT TEMP	C.O.U. DERATE CONDUIT FILL	FEEDER LENGTH (FEET)	SEGMENT VOLTAGE DROP AT FLA	TOTALVOLTAGE DROP AT FLA
SOLAR SYSTEM AC DISCONNECT	POINT OF INTERCONNECTION	208	200.0	250.0	250	CU #4	1	CU 250MCM	CU 250MCM	255	290	278.4	0.96	1.00	30	0.27%	0.27%
SOLAR AC PANELBOARD	SOLAR SYSTEM AC DISCONNECT	208	200.0	250.0	250	CU #4	1	CU 250MCM	CU 250MCM	255	290	278.4	0.96	1.00	70	0.63%	0.90%
INVERTER 1	SOLAR AC PANELBOARD	208	40.0	50.0	60	CU #10	1	CU #6	CU #6	65	75	72	0.96	1.00	10	0.16%	1.06%
INVERTER 2	SOLAR AC PANELBOARD	208	40.0	50.0	60	CU #10	1	CU #6	CU #6	65	75	72	0.96	1.00	15	0.24%	1.14%
INVERTER 3	SOLAR AC PANELBOARD	208	40.0	50.0	60	CU #10	1	CU #6	CU #6	65	75	72	0.96	1.00	20	0.33%	1.23%
INVERTER 4	SOLAR AC PANELBOARD	208	40.0	50.0	60	CU #10	1	CU #6	CU #6	65	75	72	0.96	1.00	25	0.41%	1.31%
INVERTER 5	SOLAR AC PANELBOARD	208	40.0	50.0	60	CU #10	1	CU #6	CU #6	65	75	72	0.96	1.00	30	0.49%	1.39%

AVERAGE AC VOLTAGE DROP FROM POI TO INVERTERS: 1.04%

NOTE: DISTANCES ARE ESTIMATES GENERATED FOR ENGINEER'S CALCULATIONS, CONTRACTOR IS RESPONSIBLE FOR OWN MEASUREMENTS AND TAKEOFFS.

MODULE SPECIFICATIONS	
MAKE/MODEL	CS3W-440MB-AG
POWER [W]	440
ISC [A]	11.48
IMP [A]	10.82
VOC [V]	48.30
VMP [V]	40.10
β VOC [%/degC]	-0.290%
SITE CLIMATE CRITERIA	
ASHRAE HIGH [°C]	33
ASHRAE LOW [°C]	-14
STRING SPECIFICATIONS AT STC	
MODULES/STRING	15
POWER [W]	6600
STRING ISC [A]	11.48
STRING IMP [A]	10.82
STRING VMP [V]	601.50
STRING MAX VOLTAGE CALCULATION	
VOC TEMP ADJUSTMENT @ -14 °C	1.11
VOC @ -14 °C [V]	53.76
MAX STRING VOC [V]	806.4
STRING CALCULATIONS REFER TO THE PV SIDE OF DC OPTIMIZERS, NOT TO THE OPTIMIZER OUTPUT CIRCUIT	

DC STRING WIRING CALCULATION	
OPTIMIZER OUTPUT [AMPS]	15.00
MAX CONTINUOUS FAULT CURRENT FROM PARALLEL SOURCES [AMPS]	30.00
1.25x MAX CONTINUOUS FAULT CURRENT [AMPS]	37.50
MAX # OF WIRES PER CONDUIT	9
CONDUIT FILL DERATE	0.7
MAX AMBIENT TEMPERATURE	33
TEMPERATURE DERATE	0.96
WIRE GAUGE	CU #8
75DEG AMPACITY WITHOUT COU ADJUSTEMENT [AMPS]	50
IS 75 DEG AMPACITY WITHOUT COU ADJUSTEMENT >= 1.25x MAX CIRCUIT CURRENT?	YES. COMPLIES WITH 690.8(B)(1)
90DEG AMPACITY WITH COU ADJUSTMENT [AMPS]	36.96
IS 90DEG AMPACITY WITH COU ADJUSTMENT >= 1.0x MAX CIRCUIT CURRENT?	YES. COMPLIES WITH 690.8(B)(2)
DC OPTIMIZER OUTPUT CIRCUIT FUSE RATING [AMPS]	None
AVAILABLE FAULT CURRENT FROM ALL PARALLEL SOURCES [AMPS]	45
IS 90DEG AMPACITY WITH COU ADJUSTMENT >= AVAILABLE FAULT CURRENT?	YES. COMPLIES WITH 690.9(A) EXCEPTION

SOLAREDGE SE14.4KUS

INVERTER SPECIFICATIONS	
RATED AC OUTPUT POWER	14400 W
NOMINAL AC OUTPUT VOLTAGE	208Y/120 V
MAX. AC OUTPUT CURRENT	40 A
INVERTER PROTECTIVE SETTINGS	
PARAMETERS	SET AT
AC FREQUENCY RANGE	59.3 Hz – 60.5 Hz (DEFAULT)
AC VOLTAGE RANGE	244 V – 305 V (DEFAULT)
POWER FACTOR	1.0 (DEFAULT)
OVERFREQUENCY TRIP TIME	0.16S (DEFAULT)
UNDERFREQUENCY TRIP TIME	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
OVERVOLTAGE TRIP TIME (SLOW)	1.0S (DEFAULT)
UNDERVOLTAGE TRIP TIME (FAST)	0.16S (DEFAULT)
UNDERVOLTAGE TRIP TIME (SLOW)	2.0S (DEFAULT)

INVERTERS 1–5	
STRING WIRE GAUGE	8AWG–CU
DC IMPEDANCE [OHM/KFT]	0.8090
OPERATING VOLTAGE [VDC]	602
OPERATING CURRENT [AMP]	10.8

INVERTERS 1–5		
STRING NUMBER	TOTAL STRING DISTANCE [FT]	STRING VOLTAGE DROP
1–1	85	0.25%
1–2	30	0.09%
1–3	80	0.23%
2–1	70	0.20%
2–2	25	0.07%
2–3	30	0.09%
3–1	80	0.23%
3–2	105	0.30%
3–3	115	0.33%
4–1	135	0.39%
4–2	50	0.15%
5–1	60	0.17%
5–2	55	0.16%
AVERAGE VOLTAGE DROP		0.21%

NOTE: DISTANCES ARE ESTIMATES GENERATED FOR ENGINEER'S CALCULATIONS, CONTRACTOR IS RESPONSIBLE FOR OWN MEASUREMENTS AND TAKEOFFS.

1 PE310 SCHEDULES & CALCULATIONS
SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG	CHK
10/06/2021	SED SUBMISSION REV1	AK	AA	RI
07/14/2021	SED SUBMISSION	AK	AA	RI

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PAGE SIZE 36" x 24"
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DC SYSTEM SIZE: 76.12 kW
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STRING QUANTITY: 13
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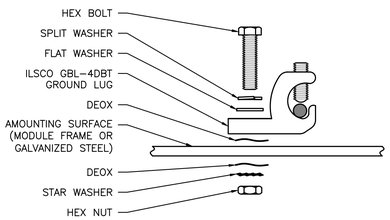
PROJECT 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: SCHEDULES & CALCULATIONS

DRAWING # PE310

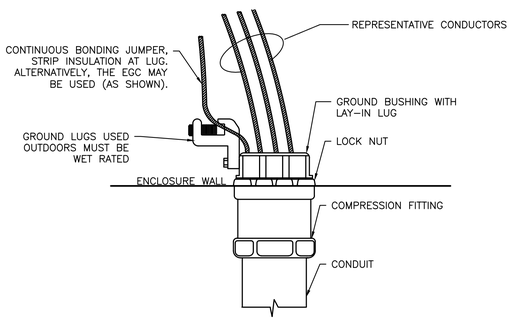
PLOT DATE: 10/8/2021 4:45 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

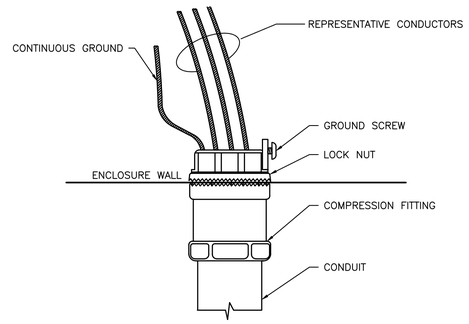


NOTES
1. ALL HARDWARE TO BE STAINLESS STEEL.
2. REFER TO ILSCO MANUAL FOR ADDITIONAL REQUIREMENTS AND TORQUE VALUES

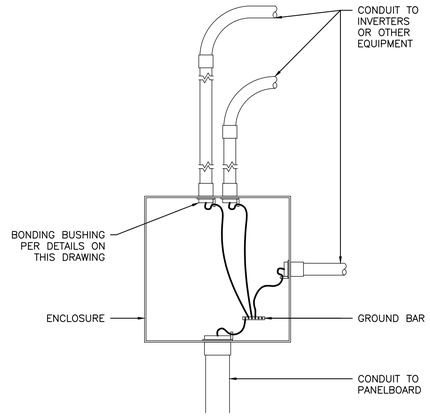
1 GROUND LUG DETAIL – ILSCO
PE401 SCALE: NONE



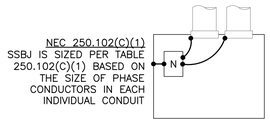
2 BONDING BUSHING GROUNDING DETAIL
PE401 SCALE: NONE



3 MYER'S HUB GROUNDING DETAIL
PE401 SCALE: NONE

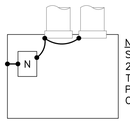


4 PULL BOX/TROUGH GROUNDING DETAIL
PE401 SCALE: NONE



NEC 250.102(C)(1)
SSBJ IS SIZED PER TABLE 250.102(C)(1) BASED ON THE SIZE OF PHASE CONDUCTORS IN EACH INDIVIDUAL CONDUIT

INDIVIDUAL



COMBINED

NEC 250.102(C)(2)
SSBJ IS SIZED PER TABLE 250.102(C)(1) BASED ON THE COMBINED AREA OF PARALLEL PHASE CONDUCTORS

TABLE 250.102(C)(1)			
SIZE OF LARGEST UNGROUNDED CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS (AWG/KCMIL)		SIZE OF GROUNDED CONDUCTOR OR BONDING JUMPER (AWG/KCMIL)	
COPPER	ALUMINUM OR COPPER-CLAD ALUMINUM	COPPER	ALUMINUM OR COPPER-CLAD ALUMINUM
2 OR SMALLER	1/0 OR SMALLER	8	6
1 OR 1/0	2/0 OR 3/0	6	4
2 OR 2/0	4/0 OR 250	4	2
OVER 3/0 THROUGH 350	OVER 250 THROUGH 500	2	1/0
OVER 350 THROUGH 600	OVER 500 THROUGH 900	1/0	3/0
OVER 600 THROUGH 1100	OVER 900 THROUGH 1750	2/0	4/0
OVER 1100	OVER 1750	REFER TO NOTES IN NEC TABLE 250.102(C)(1)	

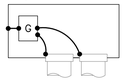
5 SUPPLY SIDE BONDING JUMPERS (SSBJ)
PE401 SCALE: NONE

A) FOR CONCENTRIC KNOCKOUTS, USE BONDING JUMPERS AS FOLLOWS:

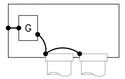
TABLE 250.122		
OVERCURRENT DEVICE CIRCUIT NOT EXCEEDING (AMPERES)	SIZE (AWG OR KCMIL)	
	COPPER	ALUMINUM
15	14	12
20	12	10
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250
1600	4/0	350
2000	250	400
2500	350	600
3000	400	600
4000	500	750

FOR PARALLEL FEEDERS – NEC 250.102(D)
EQUIPMENT BONDING JUMPER IS SIZED PER TABLE 250.122, REGARDLESS IF COMBINED OR INDIVIDUAL BONDING JUMPERS ARE USED

1) INDIVIDUAL



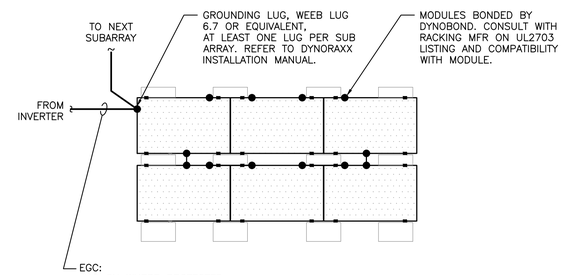
2) COMBINED



B) FOR NON–CONCENTRIC KNOCKOUTS, THE FOLLOWING METHODS SHALL BE PERMITTED (PER NEC 250.97)
1) THREADLESS COUPLINGS AND CONNECTORS FOR CABLES WITH METAL SHEATS
2) TWO LOCKNUTS, ON RIGID METAL CONDUIT OR INTERMEDIATE METAL CONDUIT, ONE INSIDE AND ONE OUTSIDE OF BOXES AND CABINETS
3) FITTINGS WITH SHOULDERS THAT SEAT FIRMLY AGAINST THE BOX OR CABINET, SUCH AS ELECTRICAL METALLIC TUBING CONNECTORS, FLEXIBLE METAL CONDUIT CONNECTORS, AND CABLE CONNECTORS, WITH ON LOCKNUT ON THE INSIDE OF BOXES AND CABINETS
4) LISTED FITTINGS (SUCH AS MEYERS HUB)

6 LOAD SIDE EQUIPMENT BONDING JUMPER
PE401 SCALE: NONE

NOTES:
1. EACH SUBARRAY CONNECTED TO AN INVERTER SHALL HAVE AN EGC RUN TO THAT INVERTER
2. PV MODULES AND RAILS GROUNDED PER NEC 690.43



7 ARRAY GROUNDING – DYNAROXX RACKING
PE401 SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
07/14/2021	SED SUBMISSION	AK			RL

PUREPOWER ENGINEERING
111 RIVER STREET HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
NY LICENSE No. 091197

BARILE GALLAGHER & ASSOCIATES
238 MARBLE AVENUE
PLEASANTVILLE, NY 10570
WWW.BGA-ENG.COM

DEVELOPER

PAGE SIZE 36" x 24"
PROJECT # 01541

DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 72.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13
ORIENTATION: 10° TILT, 153° AZIMUTH

PROJECT 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

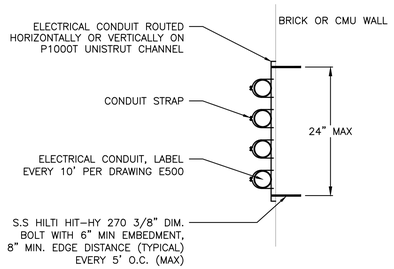
DRAWING TITLE
GROUNDING DETAILS

DRAWING #
PE401

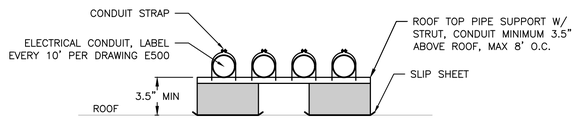
PLOT DATE: 10/8/2021 4:46 PM

RULER IN INCHES: 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 ½ 0

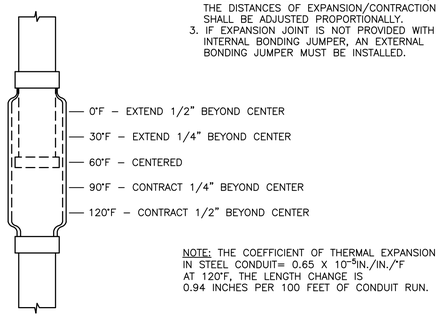
PLOT DATE: 10/8/2021 4:46 PM



1 PE402 CONDUIT WALL ANCHORING
SCALE: NONE



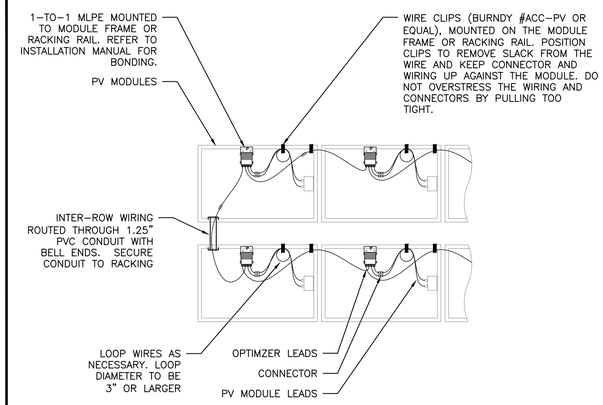
2 PE402 FLAT ROOF CONDUIT SUPPORT
SCALE: NONE



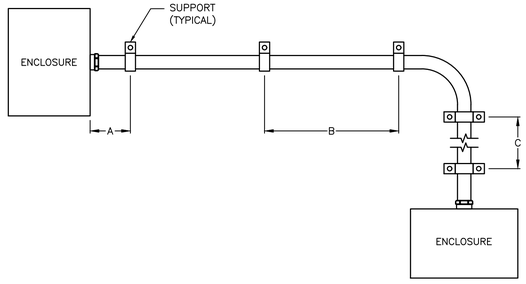
NOTES:
1. INSTALL EXPANSION COUPLING EVERY 100' OF STRAIGHT CONDUIT RUN.
2. IF EXPANSION COUPLINGS ARE INSTALLED AT LENGTHS GREATER OR LESS THAN 100', THE DISTANCES OF EXPANSION/CONTRACTION SHALL BE ADJUSTED PROPORTIONALLY.
3. IF EXPANSION JOINT IS NOT PROVIDED WITH INTERNAL BONDING JUMPER, AN EXTERNAL BONDING JUMPER MUST BE INSTALLED.

NOTE: THE COEFFICIENT OF THERMAL EXPANSION IN STEEL CONDUIT= 0.65 X 10^{-5}IN./IN./°F AT 120°F, THE LENGTH CHANGE IS 0.94 INCHES PER 100 FEET OF CONDUIT RUN.

3 PE402 EMT,IMC,RMC EXPANSION COUPLING DETAIL
SCALE: NONE

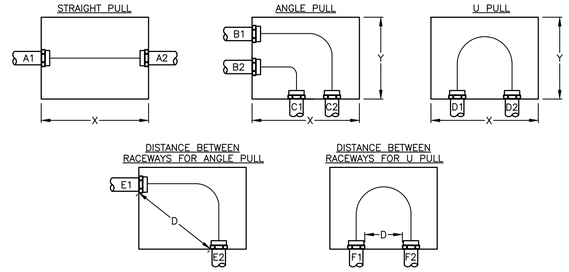


4 PE402 STRING WIRING DETAIL
SCALE: NONE



MAXIMUM CONDUIT HARDWARE SPACING				
CONDUIT TYPE	ENCLOSURE TO SUPPORT (A)	SUPPORT TO SUPPORT (B)	VERTICAL RUNS (C)	NEC ARTICLE
ELECTRICAL METALLIC TUBING (EMT)	3'	10'	10'	358
INTERMEDIATE METAL CONDUIT (IMC)	3'	10'	10'	342
RIGID METAL CONDUIT (RMC)	3'	10'	10'	344
LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)	1'	4.5'	4.5'	350
PVC (SCH40 & 80) [0.5" - 1"]	3'	3'	3'	352
PVC (SCH40 & 80) [1.25" - 2"]	3'	5'	5'	352
PVC (SCH40 & 80) [2.5" - 3"]	3'	6'	6'	352
PVC (SCH40 & 80) [3.5" - 5"]	3'	7'	7'	352
PVC (SCH40 & 80) [6"]	3'	8'	8'	352

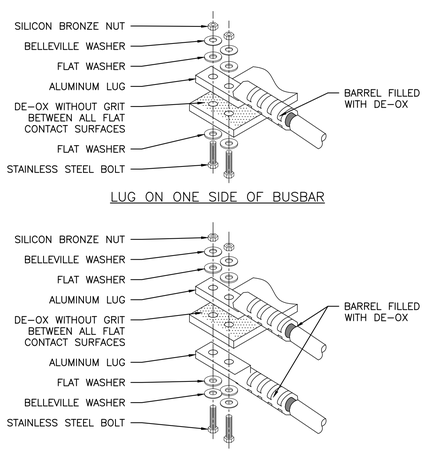
5 PE402 CONDUIT SUPPORT SPACING
SCALE: NONE



NEC 314.28(A)(1)-(3) PULL BOX SIZING (UP TO 1000V)			
BOX TYPE	LENGTH (X)	HEIGHT (Y)	DISTANCE (D)
STRAIGHT PULL	8 X LARGEST OF A1 & A2	AS NEEDED	N/A
ANGLE PULL	6 X (LARGEST OF B1 & B2) + SUM OF OTHER CONDUIT ENTERING THE SAME WALL	6 X (LARGEST OF C1 & C2) + SUM OF OTHER CONDUIT ENTERING THE SAME WALL	6 X LARGEST OF E1 & E2
U PULL	AS NEEDED	6 X (LARGEST OF D1 & D2) + SUM OF OTHER CONDUIT ENTERING THE SAME WALL	6 X LARGEST OF F1 & F2

NOTE:
REFER TO NEC 314.28 FOR ADDITIONAL REQUIREMENTS.

6 PE402 PULL BOX & JUNCTION BOX SIZING
SCALE: NONE

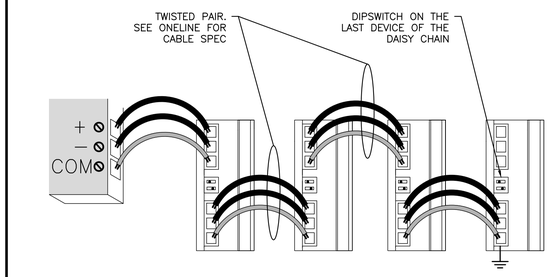


LUG ON ONE SIDE OF BUSBAR

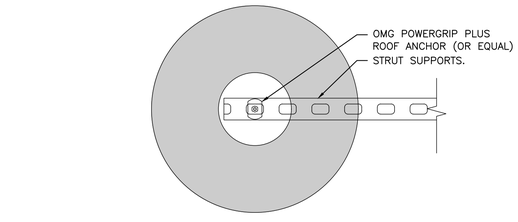
LUGS ON BOTH SIDES OF BUSBAR

7 PE402 COMPRESSION LUG DETAIL
SCALE: NONE
E402 SCALE: NONE

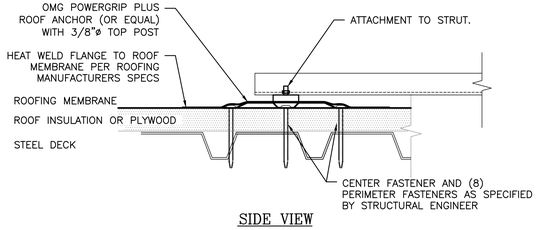
MONITORING NOTES:
1. REFER TO MONITORING SYSTEM INSTALLATION MANUAL FOR DETAILS ON TERMINAL BLOCKS, CABLE TERMINATIONS, AND SYSTEM CONFIGURATION.
2. WIRELESS TRANSCEIVERS MUST HAVE LINE-OF-SIGHT BETWEEN EACH OTHER.
3. PYRANOMETER MUST BE INSTALLED IN UNSHADED LOCATION.



8 PE402 MODBUS DETAIL
SCALE: NONE

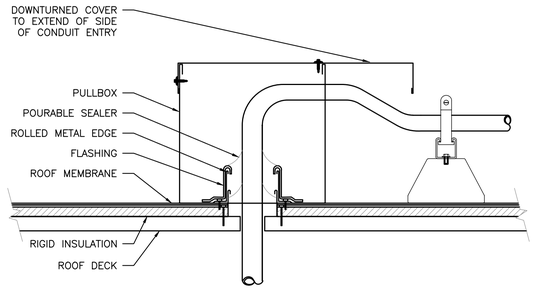


FRONT VIEW

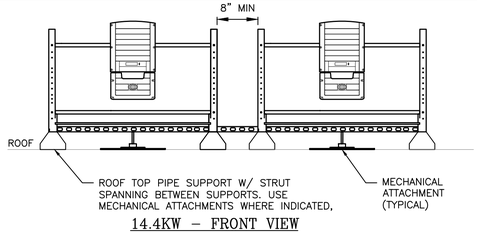


SIDE VIEW

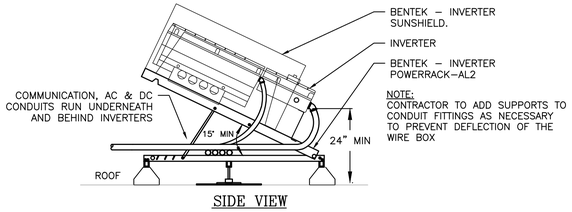
9 PE402 ROOF ANCHOR ATTACHMENT DETAIL
SCALE: NONE



10 PE402 ROOF PENETRATION WITH PITCH POCKET
SCALE: NONE



14.4KW – FRONT VIEW



SIDE VIEW

11 PE402 TYPICAL INVERTER RACK – SOLAREDGE
SCALE: NONE

REVISION	DESCRIPTION	DATE	PM	ENG	CHK
0	SED. SUBMISSION	07/14/2021	AK	4A	RL

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BARILE GALLAGHER & ASSOCIATES
238 MARBLE AVENUE
PLEASANTVILLE, NY 10570
WWW.BGA-ENG.COM

DEVELOPER

PAGE SIZE: 36" x 24"
PROJECT #: 01541

76.12 kW
72.00 kW
CS3W-440MB-AG
173
13
10° TILT, 153° AZIMUTH

DC SYSTEM SIZE:
AC SYSTEM SIZE:
MODULE TYPE:
MODULE QUANTITY:
STRING QUANTITY:
ORIENTATION:

PROJECT: 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: ELECTRICAL DETAILS

DRAWING #: PE402

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 10/8/2021 4:46 PM

GENERAL NOTES FOR LABELS:
1. LABEL SCALE 1:2 UNLESS NOTED
2. LETTERING ON SIGNS SHALL BE CAPITAL LETTERS
3. CLEARLY LABEL ALL CIRCUIT BREAKERS IN THE PANELBOARD(S). THE LABEL SHALL INDICATE THE NAME OF THE DEVICE IT SERVES.

LABEL FORMAT NOTES:
1. FORMAT 1: ENGRAVED MELAMINE, WHITE TEXT ON RED BACKGROUND. TEXT HEIGHT: TITLES 3/8", ALL OTHER TEXT 5/32".
2. FORMAT 2: ENGRAVED MELAMINE, BLACK TEXT ON WHITE BACKGROUND. TEXT HEIGHT: 3/8".
3. FORMAT 3: REFLECTIVE UV RATED LABEL. RED BACKGROUND WITH WHITE CAPITAL LETTERS AT LEAST 3/8" TALL. LABELS SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED.
4. FORMAT 4: ENGRAVED MELAMINE, WHITE TEXT ON RED BACKGROUND. TEXT HEIGHT: TITLES 5/32", ALL OTHER TEXT 3/32".
5. FORMAT 5: VINYL FILM, BLACK TEXT ON WHITE BACKGROUND. TEXT HEIGHT: 3/8"

PER 2017 NEC 690.31(B)(1), PV SYSTEM CIRCUIT CONDUCTORS SHALL BE IDENTIFIED AT ALL ACCESSIBLE POINTS OF TERMINATION, CONNECTION, AND SPLICES.

1. STRING HOMERUNS AT ARRAY
2. DC INPUT TERMINALS OF COMBINER BOX
3. DC OUTPUT TERMINALS OF COMBINER BOX
4. DC INPUT TERMINALS OF INVERTER
5. AC OUTPUT TERMINALS OF INVERTER
6. AC INPUT & OUTPUT TERMINALS OF EACH SUCCESSIVE DEVICE (WHERE APPLICABLE)

4"
PV SYSTEM INSTALLER INFORMATION
INSTALLATION COMPANY: XXXXX SOLAR COMPANY
EMERGENCY PHONE #: (XXX)XXX-XXXX
NFPA1 11.12.2.1.5, INSTALL ON MAIN PV SYSTEM DISCONNECT, FORMAT 4

4"
WARNING
ARC FLASH AND SHOCK HAZARD
Appropriate PPE and Tools Required when working on this equipment.
2"
OUTDOOR RATED STICKER MOUNTED ON ALL EQUIPMENT

6 1/2"
WARNING: PHOTOVOLTAIC POWER SOURCE
NEC 690.31(G)(3)(4), NFPA11.12.2.1.3.2, HELLERMANNTYTON #: 596-00206 OR EQUAL, FORMAT 3. SHALL BE PERMANENTLY AFFIXED ON ALL DC EXPOSED RACEWAYS, CABLE TRAYS, PULL BOXES, AND JUNCTION BOXES. LABELS SHALL BE SPACED NO GREATER THAN 10 FEET APART.

2 — 6 1/2"
RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM
NEC 2017 690.56(C)(3), HELLERMANNTYTON#: 596-00890 OR EQUAL, FORMAT 3. INSTALL ON RAPID SHUTDOWN INITIATION DEVICE.

3 — 6"
PV RAPID SHUTDOWN
PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN
TO START RAPID SHUTDOWN, TURN SWITCH TO OFF POSITION.
WHEN RAPID SHUTDOWN IS INITIATED, EMERGENCY RESPONDERS MAY MOVE AROUND THE ROOF UNDERSTANDING PV SYSTEM CONDUCTORS:
1. LESS THAN 1' FROM AN ARRAY MAY BE ENERGIZED – DO NOT TOUCH!
2. MORE THAN 1' FROM AN ARRAY ARE NOT ENERGIZED AND ARE SAFE TO CONTACT (IF NECESSARY)
6"
NEC 2017 SUPPLEMENT, FORMAT 1

4 — 6"
SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY
4"
NEC 2017 690.56(C)(1)(a), HELLERMANNTYTON #: 596-00885 OR EQUAL, INSTALL ON OR WITHIN 3' OF RAPID SHUTDOWN INITIATION DEVICE AND SERVICE DISCONNECTING MEANS. FOR USE ON PV SYSTEMS THAT SHUTDOWN THE ARRAY AND CONDUCTORS LEAVING ARRAY. TITLE TEXT SHALL BE 3/8" BLACK TEXT ON YELLOW BACKGROUND. ALL OTHER TEXT SHALL BE 3/16" BLACK TEXT ON WHITE BACKGROUND.

5 — 6"
WEATHER STATION
3/4"
FORMAT 2

6 — 6"
SOLAR MONITORING
3/4"
FORMAT 2

7 — 7"
SOLAR GENERATOR DISCONNECT SWITCH '89L'
WARNING: PHOTOVOLTAIC POWER SOURCE. DO NOT RELOCATE THIS OVERCURRENT DEVICE
OPERATING CURRENT: 200A
NOMINAL VOLTAGE: 208V
4"
NEC 2014 705.12(D)(3) & NEC 2017 705.12(B)(3), FORMAT 1

8 — 7"
SOLAR AC PANELBOARD '52IT'
WARNING: SUPPLIED BY UTILITY & PV SOURCES.
OPERATING CURRENT: 200A
NOMINAL VOLTAGE: 208V
DO NOT CONNECT NON-SOLAR LOADS TO THIS PANEL
4"
FORMAT 1

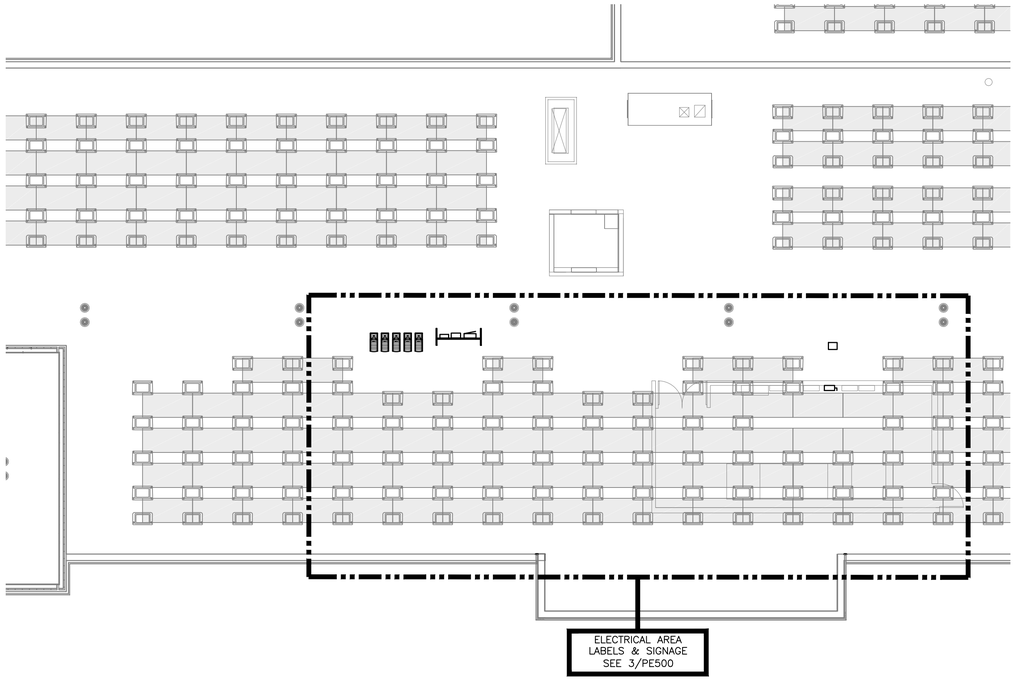
SOLAR MAIN CIRCUIT BREAKER '52IT'
TYPICAL FOR PANELBOARD MAIN CIRCUIT BREAKERS.
FORMAT 5

TYPICAL FOR INVERTER(S) 1–3
6"
INVERTER 1
DC DISCONNECT
MAXIMUM CURRENT: 45A
MAXIMUM VOLTAGE: 600V
2 3/4"
NEC 2017 690.53, NFPA 11.12.2.1.1
FORMAT 1

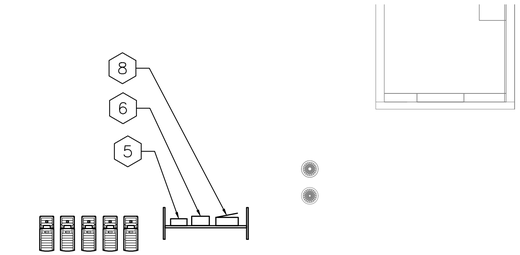
TYPICAL FOR INVERTER(S) 4–5
6"
INVERTER 4
DC DISCONNECT
MAXIMUM CURRENT: 30A
MAXIMUM VOLTAGE: 600V
2 3/4"
NEC 2017 690.53, NFPA 11.12.2.1.1
FORMAT 1

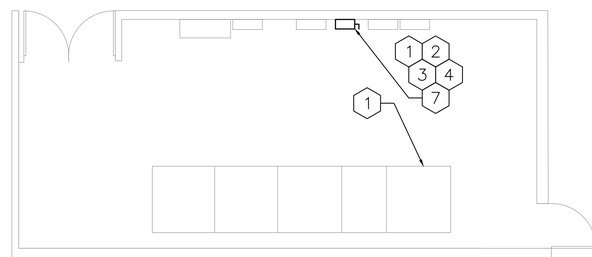
1 — 10"
WARNING:
MULTIPLE POWER SOURCES ARE CONNECTED TO THIS SERVICE WITH DISCONNECTS AS SHOWN:
PV ARRAY ON ROOF
INVERTERS W/DC DISCONNECTS ON ROOF
SOLAR GENERATOR DISCONNECT SWITCH '89L' (MOUNTED IN ELECTRICAL ROOM)
3500A UTILITY DISCONNECT SWITCH LOCATED IN ELECTRICAL ROOM
450KW INDOOR EMERGENCY GENERATOR LOCATED NEAR ELECTRICAL ROOM
6"
NEC 705.10 & 690.56(B)
INSTALL AT MAIN DISCONNECT OF ALL POWER SOURCES. ENGRAVED MELAMINE, WHITE TEXT ON RED BACKGROUND, TITLE MIN. 1/2", DESCRIPTION 5/16", ALL OTHER TEXT 1/8"

2 DIRECTORY LABEL
PE500 SCALE: 1:1



1 LABELS & SIGNAGE
PE500 SCALE: 1" = 10'-0"





3 ELECTRICAL AREA – LABELS & SIGNAGE
PE500 SCALE: 3/16" = 1'-0"

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
07/14/2021	SED SUBMISSION	AK	AA	RC	

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111 WASHINGTON AVENUE, SUITE 2A, MOONACHIE, NJ
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DEVELOPER

PAGE SIZE: 36" x 24"
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DC SYSTEM SIZE: 76.12 kW
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ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: LABELS & SIGNAGE

DRAWING #: PE500

RULER IN INCHES: 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 ½ 0

NEW

CanadianSolar

BiHiKu

SUPER HIGH POWER BIFACIAL MONO PERC MODULE

420 W ~ 445 W

UP TO 30% MORE POWER FROM THE BACK SIDE

CS3W-420|425|430|435|440|445MB-AG

MORE POWER

- EXTRA POWER — Up to 30% more power from the back side
- 24 % higher front side power than conventional modules
- 41°C — Low NMOT: 41 ± 3 °C; Low temperature coefficient (Pmax): -0.35 % / °C
- Better shading tolerance

MORE RELIABLE

- Lower internal current, lower hot spot temperature
- Minimizes micro-crack impacts
- Heavy snow load up to 5400 Pa, wind load up to 3600 Pa *

30 years — **linear power output warranty***

12 years — **enhanced product warranty on materials and workmanship***

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
OHSAS 18001:2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730: VDE / CE / MCS / INMETRO
UL 1703: CSA / IEC 61701 ED2: VDE / IEC 62716: VDE / IEC 60068-2-68: SGS
Take-e-way

* As there are different certification requirements in different markets, please contact your local Canadian Solar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

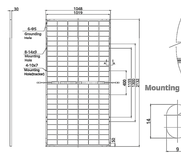
CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 40 GW deployed around the world since 2001.

* For detail information, please refer to Installation Manual.

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

ENGINEERING DRAWING (mm)

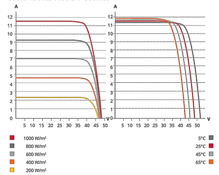
Rear View



Frame Cross Section

Mounting Hole

CS3W-435MB-AG / I-V CURVES



ELECTRICAL DATA | STC*

		Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS3W-420MB-AG		420 W	39.9 V	10.53 A	47.9 V	11.27 A	18.8%
	5%	441 W	39.9 V	11.06 A	47.9 V	11.83 A	19.7%
Bifacial Gain**	10%	462 W	39.9 V	11.58 A	47.9 V	12.40 A	20.7%
	20%	504 W	39.9 V	12.64 A	47.9 V	13.52 A	22.6%
	30%	546 W	39.9 V	13.69 A	47.9 V	14.65 A	24.4%
CS3W-425MB-AG		425 W	40.1 V	10.60 A	48.1 V	11.32 A	19.0%
	5%	446 W	40.1 V	11.13 A	48.1 V	11.89 A	20.0%
Bifacial Gain**	10%	468 W	40.1 V	11.66 A	48.1 V	12.45 A	20.9%
	20%	510 W	40.1 V	12.72 A	48.1 V	13.58 A	22.8%
	30%	553 W	40.1 V	13.78 A	48.1 V	14.72 A	24.8%
CS3W-430MB-AG		430 W	40.3 V	10.68 A	48.3 V	11.37 A	19.2%
	5%	452 W	40.3 V	11.21 A	48.3 V	11.94 A	20.2%
Bifacial Gain**	10%	473 W	40.3 V	11.75 A	48.3 V	12.51 A	21.2%
	20%	516 W	40.3 V	12.82 A	48.3 V	13.64 A	23.1%
	30%	559 W	40.3 V	13.88 A	48.3 V	14.78 A	25.0%
CS3W-435MB-AG		435 W	40.5 V	10.75 A	48.5 V	11.42 A	19.5%
	5%	457 W	40.5 V	11.29 A	48.5 V	11.99 A	20.5%
Bifacial Gain**	10%	479 W	40.5 V	11.83 A	48.5 V	12.56 A	21.4%
	20%	522 W	40.5 V	12.90 A	48.5 V	13.70 A	23.4%
	30%	566 W	40.5 V	13.98 A	48.5 V	14.85 A	25.3%
CS3W-440MB-AG		440 W	40.7 V	10.82 A	48.7 V	11.48 A	19.7%
	5%	462 W	40.7 V	11.36 A	48.7 V	12.05 A	20.7%
Bifacial Gain**	10%	484 W	40.7 V	11.90 A	48.7 V	12.63 A	21.7%
	20%	528 W	40.7 V	12.98 A	48.7 V	13.78 A	23.6%
	30%	572 W	40.7 V	14.07 A	48.7 V	14.92 A	25.6%
CS3W-445MB-AG		445 W	40.9 V	10.89 A	48.9 V	11.54 A	19.9%
	5%	467 W	40.9 V	11.43 A	48.9 V	12.12 A	20.9%
Bifacial Gain**	10%	490 W	40.9 V	11.98 A	48.9 V	12.69 A	21.9%
	20%	534 W	40.9 V	13.07 A	48.9 V	13.85 A	23.9%
	30%	579 W	40.9 V	14.16 A	48.9 V	15.00 A	25.9%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.
** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 3 (UL 1703) or CLASS C (IEC61730)
Max. Series Fuse Rating	25 A
Application Classification	Class A
Power Tolerance	0 ~ +10 W
Power Bifaciality*	70 %

* Power Bifaciality = $P_{max,rear}$ / $P_{max,front}$, both $P_{max,rear}$ and $P_{max,front}$ are tested under STC. Bifaciality tolerance: ± 5 %

ELECTRICAL DATA | NMOT*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS3W-420MB-AG	315 W	37.3 V	8.42 A	45.2 V	9.09 A
CS3W-425MB-AG	318 W	37.5 V	8.48 A	45.4 V	9.13 A
CS3W-430MB-AG	322 W	37.7 V	8.54 A	45.6 V	9.17 A
CS3W-435MB-AG	326 W	37.9 V	8.59 A	45.8 V	9.21 A
CS3W-440MB-AG	329 W	38.1 V	8.65 A	46 V	9.26 A
CS3W-445MB-AG	333 W	38.3 V	8.71 A	46.1 V	9.31 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	144 [2X (12 X 6)]
Dimensions	2132 × 1048 × 30 mm (83.9 × 41.3 × 1.2 in)
Weight	28.4 kg (62.6 lbs)
Front / Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
j-Box	IP68, 3 diodes
Cable	4.0 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-); landscape: 1400 mm (55.1 in) leap-frog connection; 1850 mm (72.8 in)*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	33 pieces
Per Container (40' HQ)	660 pieces or 561 pieces (only for US)

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.35 % / °C
Temperature Coefficient (Voc)	-0.27 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

PARTNER SECTION

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

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Three Phase Inverters for the 120/208V Grid
for North America

SE14.4KUS / SE17.3KUS

INVERTERS

12-20 YEAR WARRANTY

The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for superior efficiency (97.5%) and longer strings
- Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
- Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Integrated Safety Switch
- UL1741 SA certified, for CPUC Rule 21 grid compliance

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/ Three Phase Inverters for the 120/208V Grid(1)
for North America

SE14.4KUS / SE17.3KUS

MODEL NUMBER	SE14.4KUS	SE17.3KUS	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXK-USX2IXXXX		
OUTPUT			
Rated AC Power Output	14400	17300	W
Maximum apparent AC output power	14400	17300	VA
AC Output Line Connections	3W + PE, 4W + PE		
AC Output Voltage Minimum-Nominal-Maximum(2) (L-N)	105-120-132.5		Vac
AC Output Voltage Minimum-Nominal-Maximum(2) (L-L)	183-208-229		Vac
AC Frequency Min-Nom-Max(3)	59.3 - 60 - 60.5		Hz
Continuous Output Current (per Phase)	40	48.25	Aac
GFDI Threshold	1		A
Utility Monitoring, Islanding Protection, Country Configurable Set Points	Yes		
THD	< 3		%
Power Factor Range	+/- 0.85 to 1		
INPUT			
Maximum DC Power (Module STC)	21600	26000	W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage DC+ to DC-	600		Vdc
Nominal Input Voltage DC+ to DC-	400		Vdc
Maximum Input Current	40	48.25	Adc
Maximum Input Short Circuit Current	55		Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	167kΩ Sensitivity(5)		
CEC Weighted Efficiency	97.5		%
Night-time Power Consumption	< 4		W
ADDITIONAL FEATURES			
Supported Communication Interfaces	2 x RS485, Ethernet, Cellular (optional)		
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection		
Rapid Shutdown	NEC2014, NEC2017 and NEC2020 compliant/certified		
RS485 Surge Protection Plug-in	Supplied with the inverter, Built-in		
AC, DC Surge Protection	Type II, field replaceable, Built-in		
DC Fuses (Single Pole)	25A, Built-in		
Smart Energy Management	Export Limitation		
DC SAFETY SWITCH			
DC Disconnect	Integrated		
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 part15 class A		
INSTALLATION SPECIFICATIONS			
AC output conduit size /AWG range	¾" or 1" / 6 - 10 AWG		
DC input conduit size / AWG range	¾" or 1" / 6 - 12 AWG		
Number of DC inputs pairs	4		
Dimensions with Safety Switch (H x W x D)	31.8 x 12.5 x 11.8 / 808 x 317 x 300		in / mm
Weight with Safety Switch	78.2 / 35.5		lb / kg
Cooling	Fans (user replaceable)		
Noise	< 62		dBA
Operating Temperature Range	-40 to +140 / -40 to +60(4)		°F / °C
Protection Rating	NEMA 3R		
Mounting	Bracket provided		

(1) For 277/480V inverters refer to: https://www.solaredge.com/sites/default/files/se-three-phase-us-inverter-277-480V-setapp-datasheet.pdf
(2) For other regional settings please contact SolarEdge support
(3) Where permitted by local regulations
(4) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

CE

Power Optimizer
For North America

P370 / P400 / P401 / P485 / P505

POWER OPTIMIZER

25 YEAR WARRANTY

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

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/ Power Optimizer
For North America

P370 / P400 / P401 / P485 / P505

Optimizer model (typical module compatibility)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high power 60 and 72 cell modules)	P485 (for high-voltage modules)	P505 (for higher current modules)	
INPUT						
Rated Input DC Power(7)	370	400		485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	60	80	60	125(8)	83(8)	Vdc
MPPT Operating Range	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 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		80			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						
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 & 2020			NEC 2014, 2017 & 2020	NEC 2014, 2017 & 2020	
EMC	FCC Part 15 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					Vdc
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 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 / 1.4	750 / 1.7	655 / 1.4	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4(9)			Single or dual MC4(9)(8)	MC4(9)	
Input Wire Length	0.16 / 0.52, 0.9 / 2.95(9)	0.16 / 0.52	0.16 / 0.52, 0.9 / 2.95(9)	0.16 / 0.52	0.16 / 0.52	m / ft
Output Wire Type / Connector	Double Insulated / MC4					
Output Wire Length	1.2 / 3.9					m / ft
Operating Temperature Range(9)	-40 to +85 / -40 to +185					°C / °F
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) 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

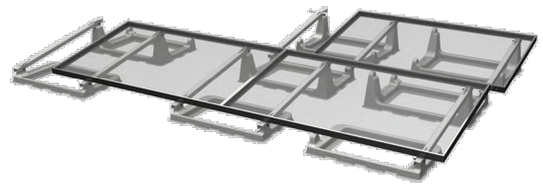
PV System Design Using a SolarEdge Inverter(10)(11)		Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P370, P400, P401	8		10	18	
	P485, P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50	
Maximum Nominal Power per String		5700(8) (6000 with SE7600-US - SE11400-US)	5250(8)	6000(8)	12750(13)	W
Parallel Strings of Different Lengths or Orientations		Yes				

(8) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf
(9) For 208V grid it is allowed to install up to 7,200W per string when the maximum power difference between each string is 1,000W
(10) 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

Intertek RoHS

Evolution FR

DynoRaxx® SUPPORTING YOUR INVESTMENT™



ev•o•lu•tion
noun \ ˌēv ə ˈlo͞o shən
: a process of continuous change from a lower, simpler state, to a higher, more complex, or better state
: growth

DynoRaxx® Evolution delivers a tool-less ballasted racking system for mounting PV solar panels on flat roofs and surfaces. The proprietary design of the DynoRaxx® ballasted-racking system has been created to simplify and speed installation without compromising quality or performance. With DynoRaxx® Evolution FR, buying commercial solar panel racking has never been more cost-effective.

Three Components	**No Tools Needed**
Universal Design	**Rugged Construction**
Space-Saving Reverse Basket Design	**Base protecting / Non-penetrating**

Innovative Design

- Fiberglass
- Proprietary racking enables fast installation in less than half the time of other systems
- No tools needed for assembly — one-step pivot clamp secures panels to racking
- Versatility to accommodate all framed PV solar panels on the market
- Eliminates need to penetrate roof with fasteners on most installations
- Smaller footprint than competitive systems saves roof space and adds flexibility
- 10° tilt available
- Elevated system — does not impede water drainage
- Non-corrosive
- No thermal expansion

www.dynoraxx.com Phone: 1.866.620.2410 sales@dynoraxx.com

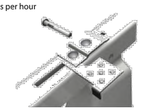
Three Major Components

Rugged Construction

- Baskets –fiberglass
- Rails – fiberglass
- Clamps – 304 stainless steel

Easy Installation

- Initial measurement and chalk line needed for placement of first row
- Precision components require no field measuring
- Assembles without tools
- Save time and labor to install more modules per hour



Tool-less Design

High Performance

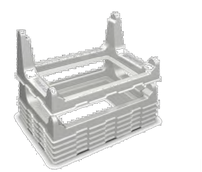
- PE Certified
- ASCE 7-05 compliant
- IBC 2006 compliant
- Wind tunnel tested

Fast Turnaround

- No special orders — ships quickly upon receipt of order
- Racking is palletized — no special shipping requirements
- Tool-less design

Cost-Savings

- Fewer man hours to install
- Baskets stack like cups — Huge Shipping Savings
- A superior, cost-effective solution



Stack for Shipping

DynoRaxx® Evolution Warranty

- DynoRaxx® Evolution carries a 10-year limited material and workmanship warranty.
- Contact us for complete details on the DynoRaxx® warranty.

ARRA and Ontario FIT Compliant

DynoRaxx® SUPPORTING YOUR INVESTMENT™

6500 Sheridan Drive, Suite 120
Buffalo NY 14221
Phone: 1.866.620.2410 Toll Free Fax: 1.866.807.7882

www.dynoraxx.com

DATE	REVISION DESCRIPTION	PM	ENG	CHK	
07/14/2021	SED. SUBMISSION	AK	AA	RI	

PUREPOWER ENGINEERING
111 WEST STREET, ENGLEWOOD, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
NY LICENSE No. 091197

BARILE GALLAGHER & ASSOCIATES
235 MARBLE AVENUE
PLEASANTVILLE, NY 10570
WWW.BGA-ENG.COM

DEVELOPER

PAGE SIZE: 36" x 24"
PROJECT #: 01541

DC SYSTEM SIZE: 76.12 kW
AC SYSTEM SIZE: 70.00 kW
MODULE TYPE: CS3W-440MB-AG
MODULE QUANTITY: 173
STRING QUANTITY: 13 TILT: 15.3° AZIMUTH
ORIENTATION: 10" PORTRAIT

PROJECT: 76.12 KW SOLAR ROOFTOP SYSTEM AT
ST. DENIS COMMUNITY SCHOOL
121 MCCLEAN AVE
YONKERS, NY 10705

DRAWING TITLE: EQUIPMENT DATA SHEETS

DRAWING #: PE600

RULER IN INCHES: