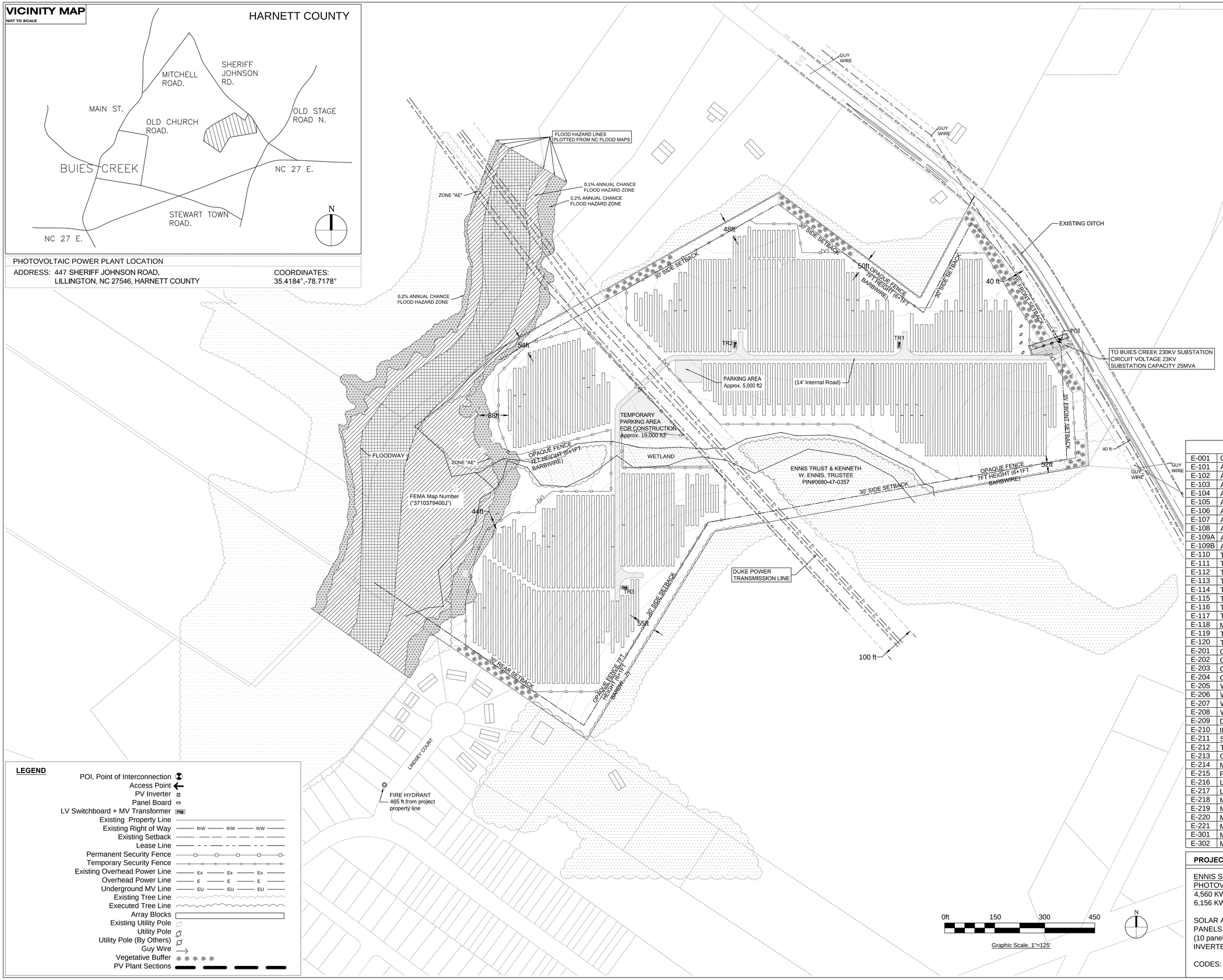
VICINITY MAP

NOT TO SCALE

PHOTOVOLTAIC POWER PLANT LOCATION

ADDRESS: 447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546, HARNETT COUNTY

COORDINATES: 35.4184°,-78.7178°



LEGEND

- POI, Point of Interconnection
- Access Point
- PV Inverter
- Panel Board
- LV Switchboard + MV Transformer
- Existing Property Line
- Existing Right of Way
- Existing Setback
- Lease Line
- Permanent Security Fence
- Temporary Security Fence
- Existing Overhead Power Line
- Overhead Power Line
- Underground MV Line
- Existing Tree Line
- Executed Tree Line
- Array Blocks
- Existing Utility Pole
- Utility Pole
- Utility Pole (By Others)
- Guy Wire
- Vegetative Buffer
- PV Plant Sections

DRAWING LIST	
E-001	COVER PAGE
E-101	ARRAY OVERVIEW
E-102	ARRAY DETAIL - SECTION "A" (1)
E-103	ARRAY DETAIL - SECTION "A" (2)
E-104	ARRAY DETAIL - SECTION "B" (1)
E-105	ARRAY DETAIL - SECTION "B" (2) & "A"(3)
E-106	ARRAY DETAIL - SECTION "B" (3)
E-107	ARRAY DETAIL - SECTION "C" (1)
E-108	ARRAY DETAIL - SECTION "C" (2)
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E-109B	ARRAY BLOCKS, LAYOUT DETAILS
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E-111	TRENCHES LAYOUT - SECTION "A" (1)
E-112	TRENCHES LAYOUT - SECTION "A" (2)
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E-116	TRENCHES LAYOUT - SECTION "C" (1)
E-117	TRENCHES LAYOUT - SECTION "C" (2)
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E-119	TRENCHES
E-120	TRENCHES DETAILS
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E-202	ONE LINE - PANEL BOARDS
E-203	ONE LINE - PANEL BOARDS
E-204	ONE LINE - PANEL BOARDS
E-205	WIRE CHART (AC)
E-206	WIRE CHART (DC-1)
E-207	WIRE CHART (DC-2)
E-208	WIRE CHART (DC-3)
E-209	DC HARNESS
E-210	INVERTER WIRING
E-211	SYSTEM LABELS
E-212	TRANSFORMER & SWITCHBOARD PAD
E-213	GROUNDING DETAILS
E-214	MODULE / INVERTER DATA
E-215	PANEL BOARDS DATA
E-216	LV SWITCHBOARD 1&3 DATA
E-217	LV SWITCHBOARD 2 DATA
E-218	MINI LOAD CENTER DATA
E-219	MV TRANSFORMER DATA
E-220	MV POLES
E-221	MANHOLE / PULLBOX
E-301	MONITORING DIAGRAM
E-302	MONITORING LAYOUT & DETAIL

PROJECT DATA

ENNIS SOLAR, LLC
PHOTOVOLTAIC POWER PLANT
4,560 KW-AC
6,156 KW-DC

SOLAR ARRAY:
PANELS: (51,300) First Solar FS-4120-A3
(10 panels per string)
INVERTERS: (190) Fronius Symo 24.0-3 480

CODES: IBC-2009 NEC-2017

greengo

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
CHARLOTTE, NC 28203
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ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

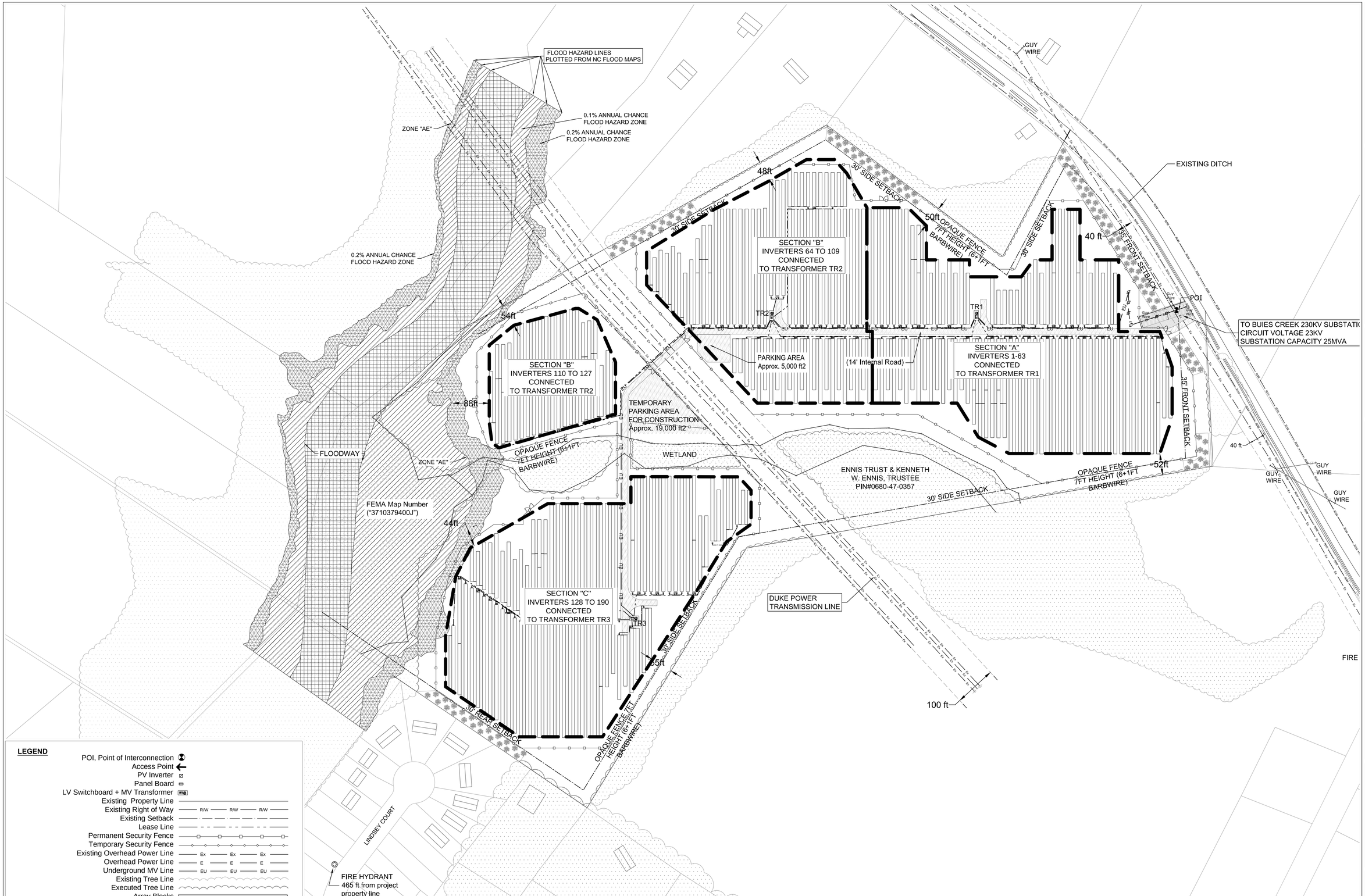
REVISIONS

DATE	COMMENT
10-31-2018	Inv, 77, 78, 79 adjusted
11-08-2018	Fence height & type
11-21-2018	Fence updated by civil
11-21-2018	MV poles to POI
12-20-2018	NEC code updated
01-18-2019	3rd Customer Pole Added

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=125'
DATE	12-21-2018

COVER PAGE

E-001



LEGEND

- POI, Point of Interconnection
- Access Point
- PV Inverter
- Panel Board
- LV Switchboard + MV Transformer
- Existing Property Line
- Existing Right of Way
- Existing Setback
- Lease Line
- Permanent Security Fence
- Temporary Security Fence
- Existing Overhead Power Line
- Overhead Power Line
- Underground MV Line
- Existing Tree Line
- Executed Tree Line
- Array Blocks
- Existing Utility Pole
- Utility Pole
- Utility Pole (By Others)
- Guy Wire
- Vegetative Buffer
- PV Plant Sections

ARRAY BLOCKS DESCRIPTION

Panel tilt: -50° to +50°
GCR: 55
Row Pitch: 14.76ft

- Block Type 01 (1 inv, mppts 1+2). 4x67.5=270 modules, 27 strings
- Block Type 02 (mppt 1). 4x37.5=150 modules, 15 strings
- Block Type 03 (mppt 2). 4x30=120 modules, 12 strings
- Block Type 04 (mppt 1). 4x27.5=110 modules, 11 strings
- Block Type 05 (mppt 1+2). 4x20=80 modules, 8 strings
- Block Type 06 (mppt 2). 4x20=80 modules, 8 strings
- Block Type 07 (mppt 1). 4x20=80 modules, 8 strings
- Block Type 08 (mppt 1). 4x22.5=90 modules, 9 strings

0ft 150 300 450

Graphic Scale. 1"=100'

N

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32166 ENGINEER JAMES A. CLONTZ

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

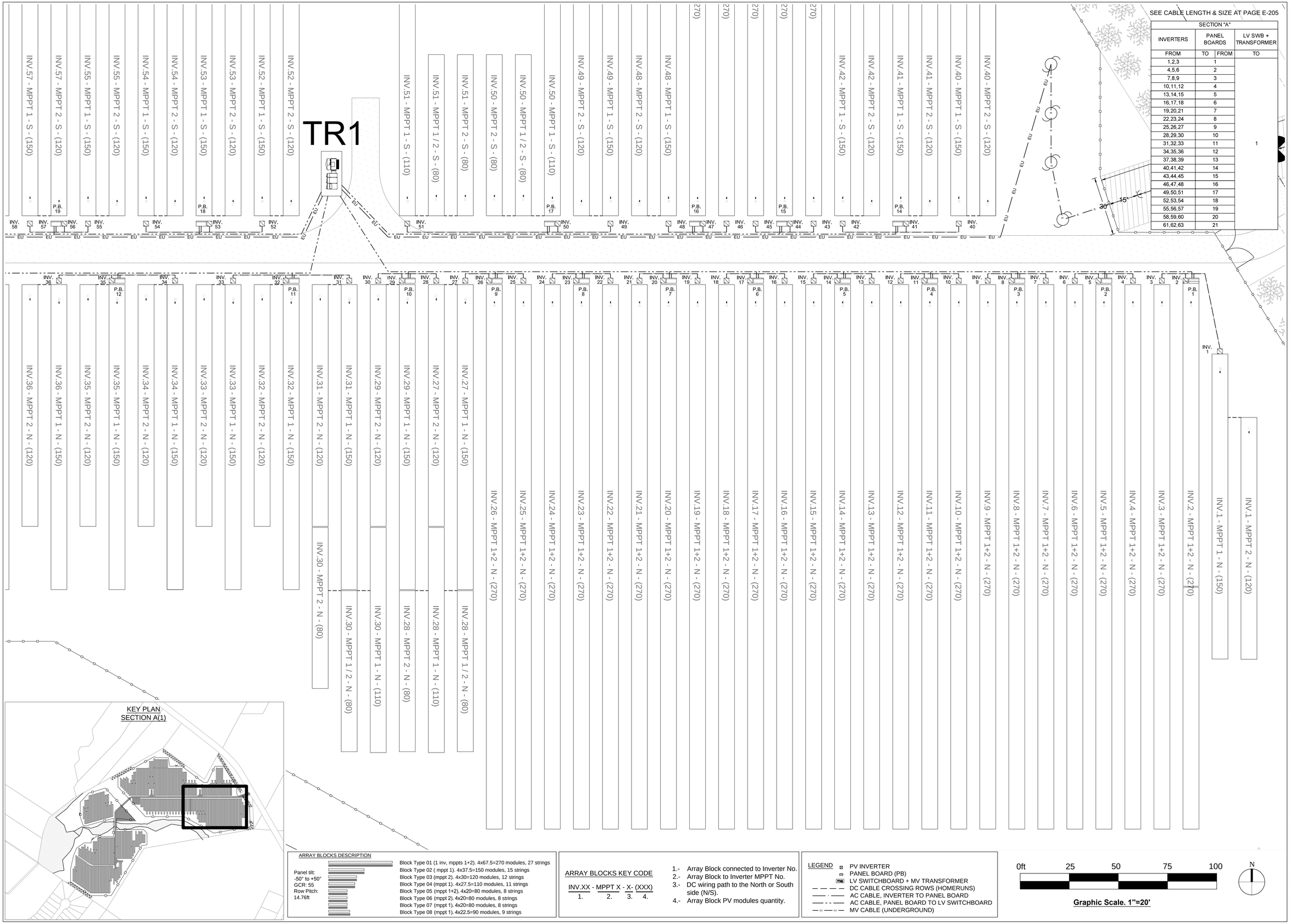
REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Array blocks desc. adjusted
11-08-2018	Fence height & type
11-21-2018	Fence updated by civil
11-21-2018	MV poles to POI
01-18-2019	3rd Customer Pole Added

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=100'
DATE	12-21-2018

ARRAY OVERVIEW

E-101



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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

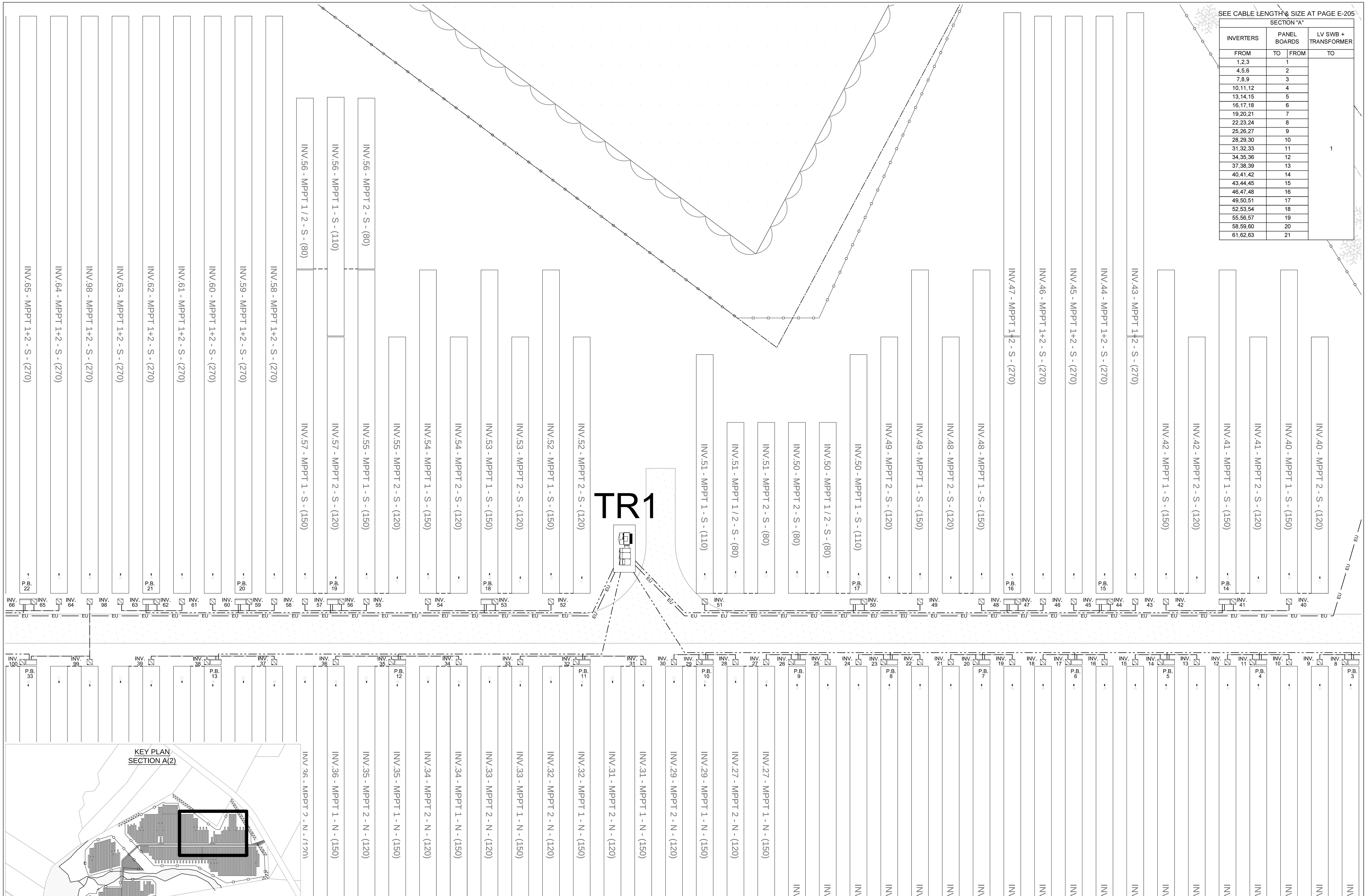
REVISIONS

DATE	COMMENT
09-07-2018	Panel board 01
08-28-2018	Panel tilt changed to +-50°
10/31/2018	Array blocks desc. adjusted
11-21-2018	Fence updated by civil
11-21-2018	MV poles to POI

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

ARRAY SECTION A(1)

E-102



SEE CABLE LENGTH & SIZE AT PAGE E-205

SECTION "A"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
1,2,3	1		1
4,5,6	2		
7,8,9	3		
10,11,12	4		
13,14,15	5		
16,17,18	6		
19,20,21	7		
22,23,24	8		
25,26,27	9		
28,29,30	10		
31,32,33	11		
34,35,36	12		
37,38,39	13		
40,41,42	14		
43,44,45	15		
46,47,48	16		
49,50,51	17		
52,53,54	18		
55,56,57	19		
58,59,60	20		
61,62,63	21		

ARRAY BLOCKS DESCRIPTION

Panel tilt: -50° to +50°
GCR: 55
Row Pitch: 14.76ft

- Block Type 01 (1 inv, mppts 1+2). 4x67.5=270 modules, 27 strings
- Block Type 02 (mppt 1). 4x37.5=150 modules, 15 strings
- Block Type 03 (mppt 2). 4x30=120 modules, 12 strings
- Block Type 04 (mppt 1). 4x27.5=110 modules, 11 strings
- Block Type 05 (mppt 1+2). 4x20=80 modules, 8 strings
- Block Type 06 (mppt 2). 4x20=80 modules, 8 strings
- Block Type 07 (mppt 1). 4x20=80 modules, 8 strings
- Block Type 08 (mppt 1). 4x22.5=90 modules, 9 strings

ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

1.- Array Block connected to Inverter No.
2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

LEGEND

- PV INVERTER
- PANEL BOARD (PB)
- LV SWITCHBOARD + MV TRANSFORMER
- DC CABLE CROSSING ROWS (HOMERUNS)
- AC CABLE, INVERTER TO PANEL BOARD
- AC CABLE, PANEL BOARD TO LV SWITCHBOARD
- MV CABLE (UNDERGROUND)

0ft 25 50 75 100

Graphic Scale. 1"=20'

N

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Array blocks desc. adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

ARRAY SECTION A(2)

E-103

SEE CABLE LENGTH & SIZE AT PAGE E-205

SECTION "B"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
64, 65, 66	22		
67, 68, 69	23		
70, 71, 72	24		
73, 74, 75, 76	25		
77, 78, 79	26		
80, 81, 82	27		
83, 84, 85	28		
86, 87, 88	29		
89, 90, 91	30		
92,93,94	31		
95,96,97	32		2
98,99,100	33		
101,102,103	34		
104,105,106	35		
107,108,109	36		
110,111,112	37		
113,114,115	38		
116,117,118	39		
119,120,121	40		
122,123,124	41		
125,126,127	42		

INV.97 - MPPT 2 - S - (80)

INV.97 - MPPT 1 / 2 - S - (80)

INV.97 - MPPT 1 - S - (110)

INV.96 - MPPT 2 - S - (120)

INV.96 - MPPT 1 - S - (150)

INV.95 - MPPT 1 - S - (150)

INV.95 - MPPT 2 - S - (120)

INV.94 - MPPT 1 - S - (150)

INV.94 - MPPT 2 - S - (120)

INV.93 - MPPT 2 - S - (80)

INV.93 - MPPT 1 / 2 - S - (80)

INV.93 - MPPT 1 - S - (110)

INV.92 - MPPT 1 - S - (150)

INV.92 - MPPT 2 - S - (120)

INV.91 - MPPT 1+2 - S - (270)

INV.90 - MPPT 1+2 - S - (270)

INV.89 - MPPT 1+2 - S - (270)

INV.88 - MPPT 1+2 - S - (270)

INV.87 - MPPT 1+2 - S - (270)

INV.86 - MPPT 1+2 - S - (270)

INV.85 - MPPT 1+2 - S - (270)

INV.84 - MPPT 1+2 - S - (270)

INV.83 - MPPT 1+2 - S - (270)

INV.82 - MPPT 1+2 - S - (270)

INV.81 - MPPT 1+2 - S - (270)

INV.80 - MPPT 1+2 - S - (270)

INV.76 - MPPT 1+2 - S - (270)

INV.75 - MPPT 1+2 - S - (270)

INV.74 - MPPT 1+2 - S - (270)

INV.73 - MPPT 1+2 - S - (270)

INV.72 - MPPT 1+2 - S - (270)

INV.71 - MPPT 1+2 - S - (270)

INV.70 - MPPT 1+2 - S - (270)

INV.69 - MPPT 1+2 - S - (270)

INV.68 - MPPT 1+2 - S - (270)

INV.67 - MPPT 1+2 - S - (270)

INV.66 - MPPT 1+2 - S - (270)

INV.65 - MPPT 1+2 - S - (270)

INV.64 - MPPT 1+2 - S - (270)

INV.98 - MPPT 1+2 - S - (270)

INV.63 - MPPT 1+2 - S - (270)

INV.77 / 78 & 79 - MPPT 1 - S - (90)

INV.79 - MPPT 1 - S - (80)

INV.79 - MPPT 1 / 2 - S - (80)

INV.79 - MPPT 2 - S - (80)

INV.78 - MPPT 1 - S - (80)

INV.78 - MPPT 1 / 2 - S - (80)

INV.78 - MPPT 2 - S - (80)

INV.77 - MPPT 1 - S - (80)

INV.77 - MPPT 1 / 2 - S - (80)

INV.77 - MPPT 2 - S - (80)

P.B. 32 · INV. 96 · INV. 95 · P.B. 31 · INV. 94 · INV. 93 · INV. 92 · P.B. 30 · INV. 91 · INV. 90 · INV. 89 · INV. 88 · P.B. 29 · INV. 87 · INV. 86 · INV. 85 · P.B. 28 · INV. 84 · INV. 83 · P.B. 27 · INV. 82 · INV. 81 · INV. 80 · P.B. 25 · INV. 76 · INV. 75 · P.B. 24 · INV. 74 · INV. 73 · INV. 72 · P.B. 23 · INV. 71 · INV. 70 · INV. 69 · P.B. 22 · INV. 68 · INV. 67 · INV. 66 · INV. 65 · INV. 64 · INV. 98 · INV. 63 · P.B. 26 · INV. 79 · INV. 78 · INV. 77

EU

TR2

KEY PLAN
SECTION B(1)

ARRAY BLOCKS DESCRIPTION

Panel tilt: -50° to +50°
GCR: 55
Row Pitch: 14.76ft

Block Type 01 (1 inv, mppts 1+2). 4x67.5=270 modules, 27 strings
Block Type 02 (mppt 1). 4x37.5=150 modules, 15 strings
Block Type 03 (mppt 2). 4x30=120 modules, 12 strings
Block Type 04 (mppt 1). 4x27.5=110 modules, 11 strings
Block Type 05 (mppt 1+2). 4x20=80 modules, 8 strings
Block Type 06 (mppt 2). 4x20=80 modules, 8 strings
Block Type 07 (mppt 1). 4x20=80 modules, 8 strings
Block Type 08 (mppt 1). 4x22.5=90 modules, 9 strings

ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

1.- Array Block connected to Inverter No.
2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

LEGEND
- PV INVERTER
- PANEL BOARD (PB)
- LV SWITCHBOARD + MV TRANSFORMER
- DC CABLE CROSSING ROWS (HOMERUNS)
- AC CABLE, INVERTER TO PANEL BOARD
- AC CABLE, PANEL BOARD TO LV SWITCHBOARD
- MV CABLE (UNDERGROUND)

0ft 25 50 75 100

Graphic Scale. 1"=20'

N

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
CHARLOTTE, NC 28203
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ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32426 JAMES A. CRAWFORD

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

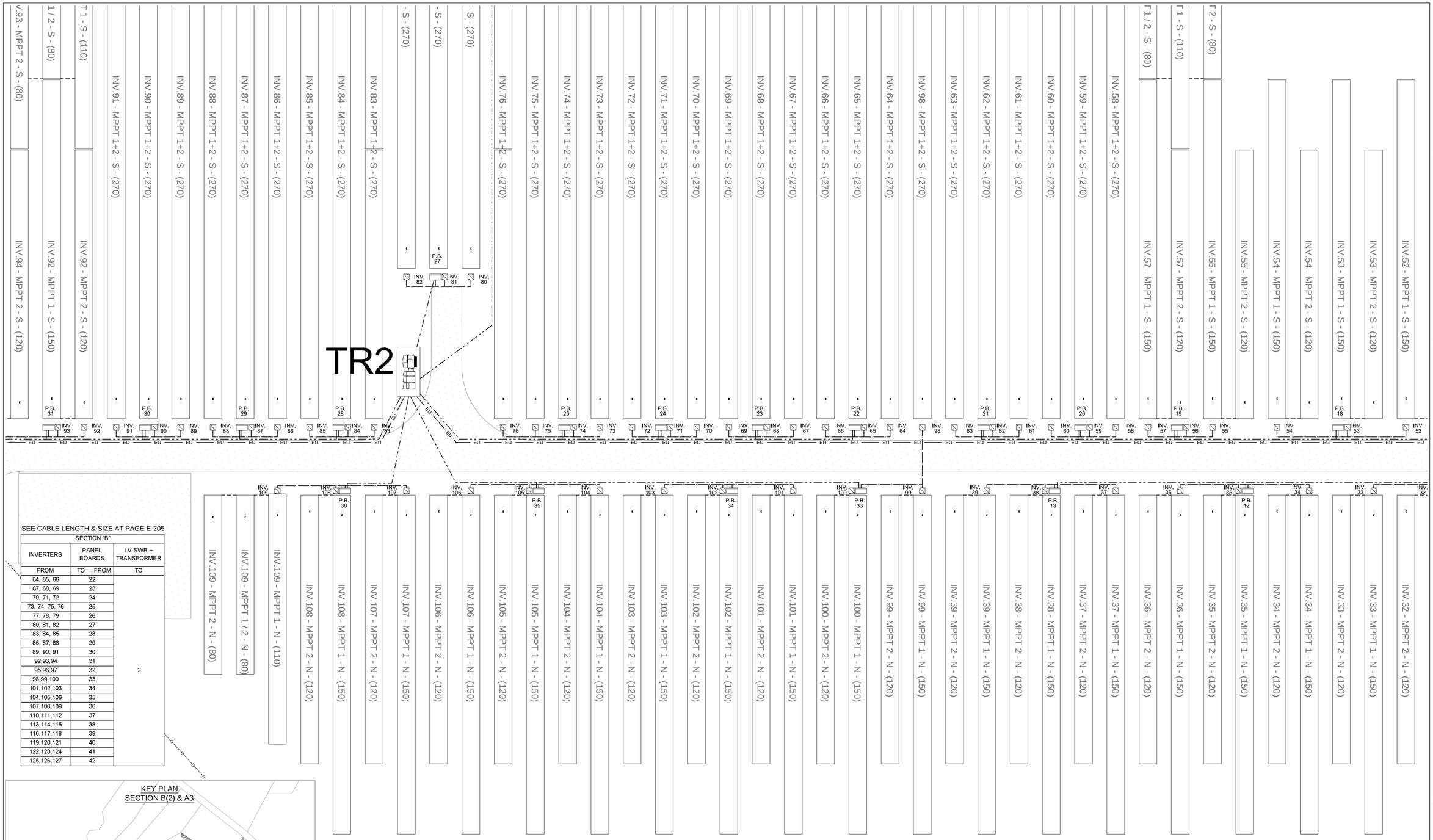
REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Inv. 77, 78, 79 adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

ARRAY SECTION B(1)

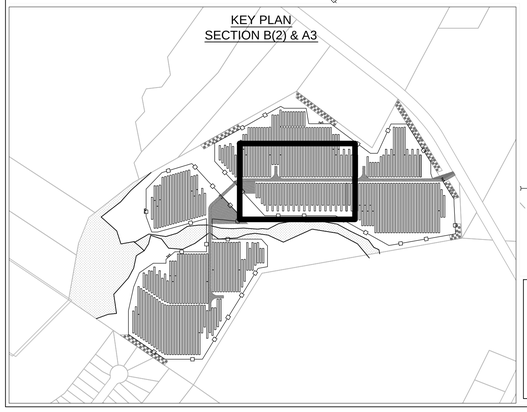
E-104



SEE CABLE LENGTH & SIZE AT PAGE E-205

SECTION "B"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
64, 65, 66	22		
67, 68, 69	23		
70, 71, 72	24		
73, 74, 75, 76	25		
77, 78, 79	26		
80, 81, 82	27		
83, 84, 85	28		
86, 87, 88	29		
89, 90, 91	30		
92,93,94	31		
95,96,97	32		2
98,99,100	33		
101,102,103	34		
104,105,106	35		
107,108,109	36		
110,111,112	37		
113,114,115	38		
116,117,118	39		
119,120,121	40		
122,123,124	41		
125,126,127	42		

KEY PLAN
SECTION B(2) & A3



ARRAY BLOCKS DESCRIPTION

Panel tilt:
-50° to +50°
GCR: 55
Row Pitch:
14.76ft

Block Type 01 (1 inv, mppts 1+2). 4x67.5=270 modules, 27 strings
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Block Type 07 (mppt 1). 4x20=80 modules, 8 strings
Block Type 08 (mppt 1). 4x22.5=90 modules, 9 strings

ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

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2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

LEGEND
- PV INVERTER
- PANEL BOARD (PB)
- LV SWITCHBOARD + MV TRANSFORMER
- DC CABLE CROSSING ROWS (HOMERUNS)
- AC CABLE, INVERTER TO PANEL BOARD
- AC CABLE, PANEL BOARD TO LV SWITCHBOARD
- MV CABLE (UNDERGROUND)

0ft 25 50 75 100

Graphic Scale. 1"=20'

N

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CRAWFORD

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

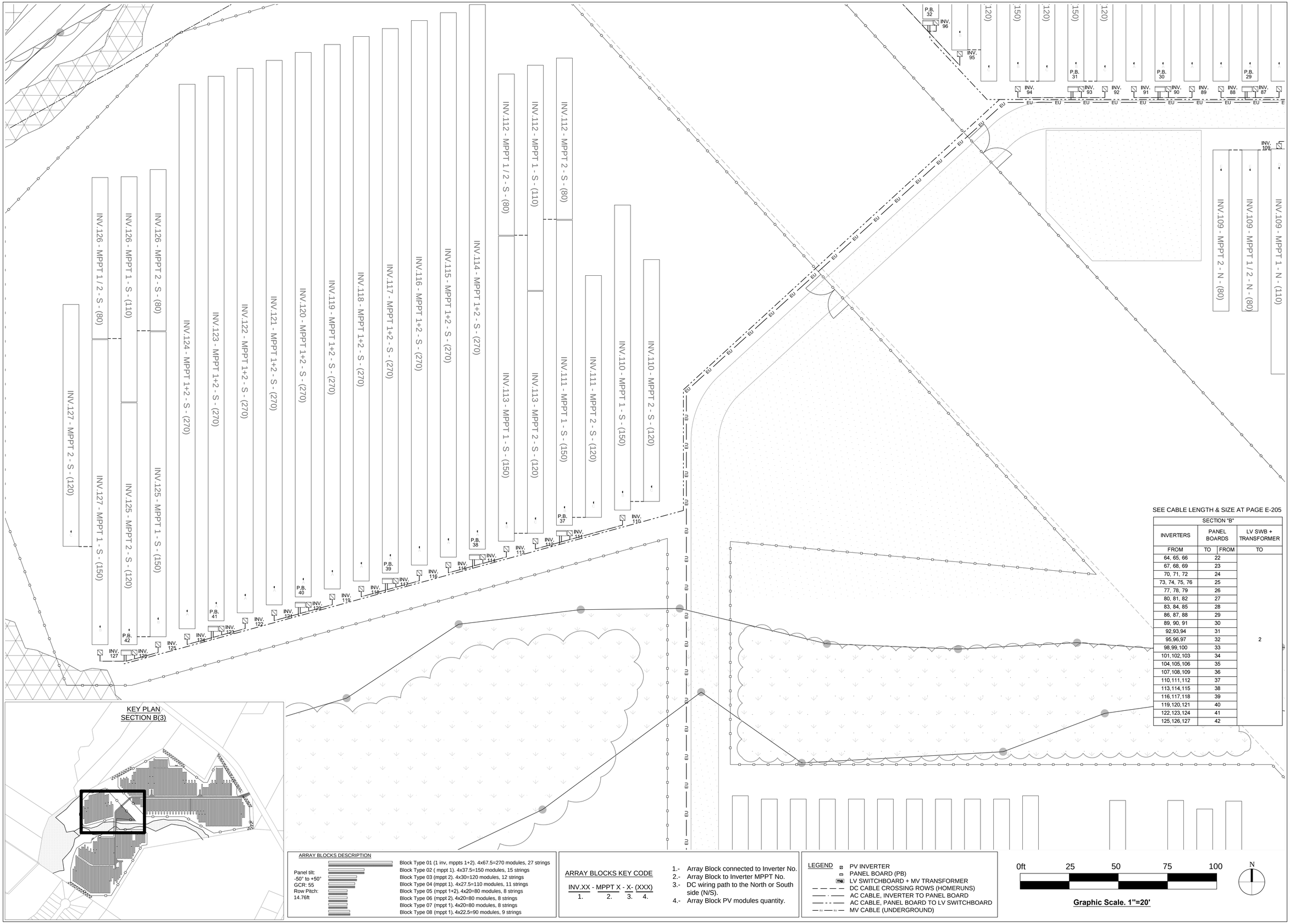
REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Array blocks desc. adjusted

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

ARRAY SECTION B(2) & A(3)

E-105



SEE CABLE LENGTH & SIZE AT PAGE E-205

SECTION "B"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
64, 65, 66	22		2
67, 68, 69	23		
70, 71, 72	24		
73, 74, 75, 76	25		
77, 78, 79	26		
80, 81, 82	27		
83, 84, 85	28		
86, 87, 88	29		
89, 90, 91	30		
92,93,94	31		
95,96,97	32		
98,99,100	33		
101,102,103	34		
104,105,106	35		
107,108,109	36		
110,111,112	37		
113,114,115	38		
116,117,118	39		
119,120,121	40		
122,123,124	41		
125,126,127	42		

ARRAY BLOCKS DESCRIPTION

Panel tilt:
-50° to +50°
GCR: 55
Row Pitch:
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Block Type 01 (1 inv, mppts 1+2). 4x67.5=270 modules, 27 strings
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Block Type 08 (mppt 1). 4x22.5=90 modules, 9 strings

ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

1.- Array Block connected to Inverter No.
2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

LEGEND

▨	PV INVERTER
▭	PANEL BOARD (PB)
▨	LV SWITCHBOARD + MV TRANSFORMER
— — — —	DC CABLE CROSSING ROWS (HOMERUNS)
—— · ——	AC CABLE, INVERTER TO PANEL BOARD
—— - - ——	AC CABLE, PANEL BOARD TO LV SWITCHBOARD
— EU — EU —	MV CABLE (UNDERGROUND)

greengo

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ARC DESIGN
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(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

SEAL 32152
JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

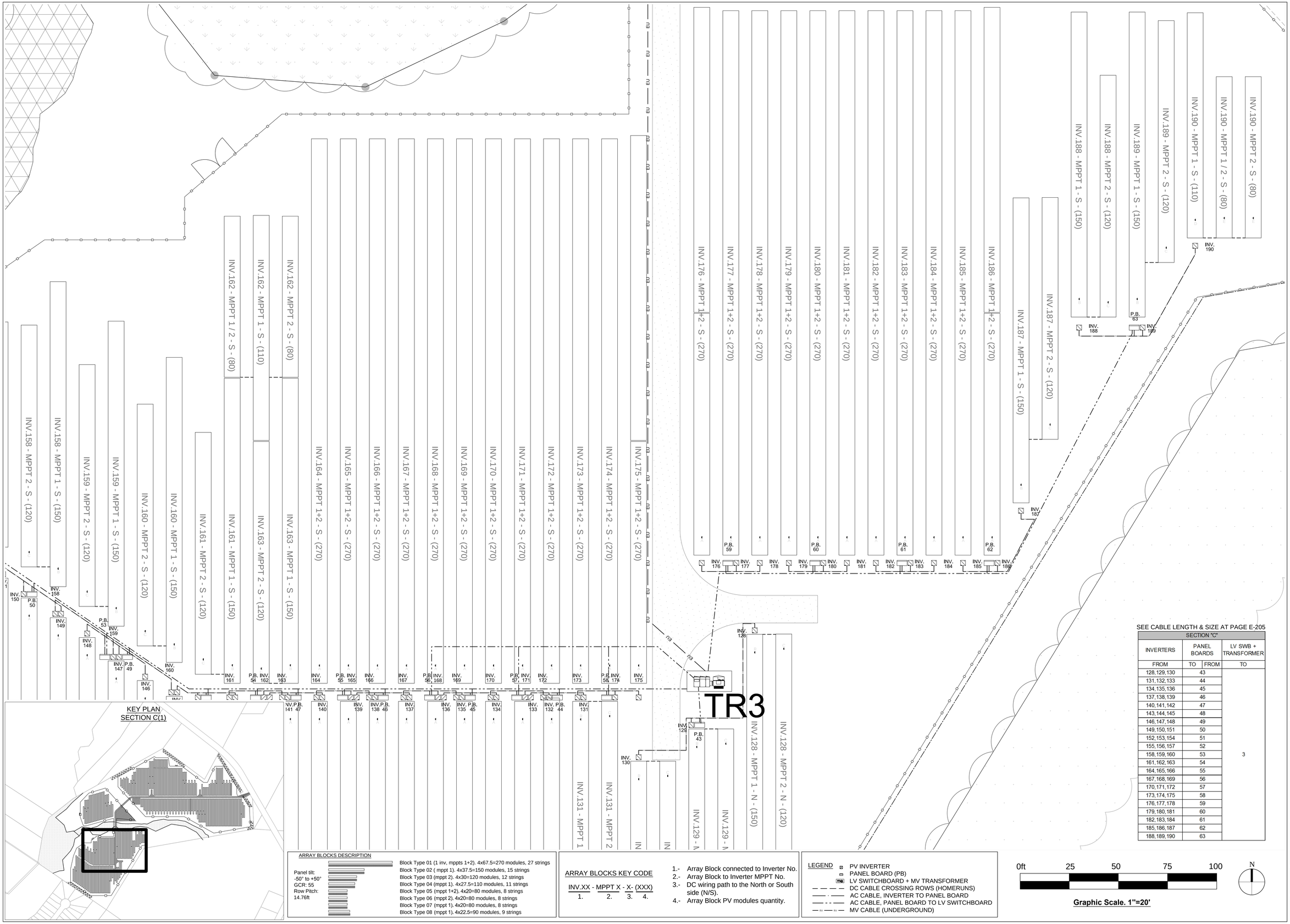
REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Array blocks desc. adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1''=20'
DATE	12-21-2018

ARRAY SECTION B(3)

E-106



SEE CABLE LENGTH & SIZE AT PAGE E-205

SECTION "C"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
128,129,130	43		3
131,132,133	44		
134,135,136	45		
137,138,139	46		
140,141,142	47		
143,144,145	48		
146,147,148	49		
149,150,151	50		
152,153,154	51		
155,156,157	52		
158,159,160	53		
161,162,163	54		
164,165,166	55		
167,168,169	56		
170,171,172	57		
173,174,175	58		
176,177,178	59		
179,180,181	60		
182,183,184	61		
185,186,187	62		
188,189,190	63		

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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

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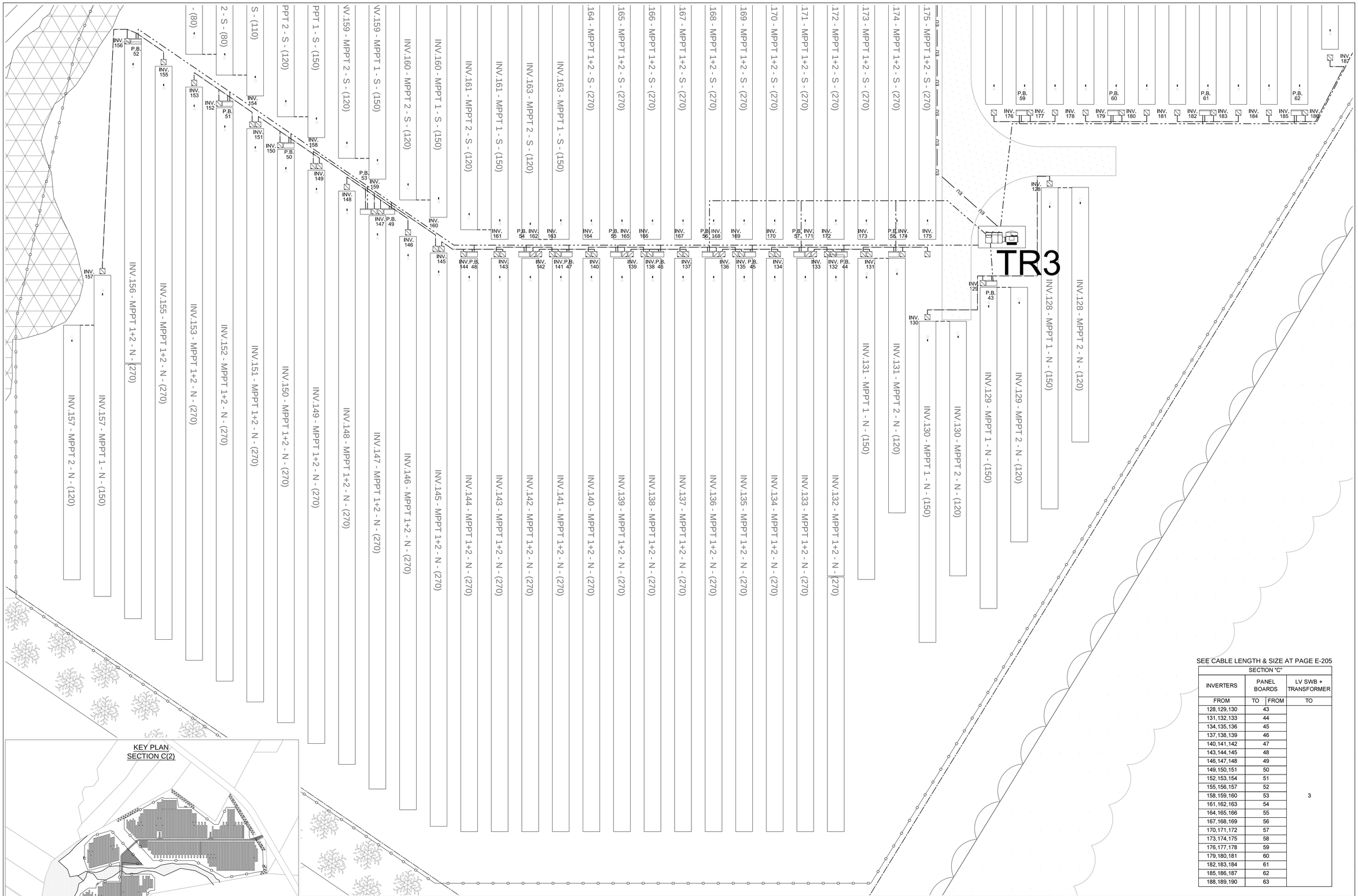
REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Array blocks desc. adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1''=20'
DATE	12-21-2018

ARRAY SECTION C(1)

E-107



SEE CABLE LENGTH & SIZE AT PAGE E-205

SECTION "C"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
128,129,130	43		3
131,132,133	44		
134,135,136	45		
137,138,139	46		
140,141,142	47		
143,144,145	48		
146,147,148	49		
149,150,151	50		
152,153,154	51		
155,156,157	52		
158,159,160	53		
161,162,163	54		
164,165,166	55		
167,168,169	56		
170,171,172	57		
173,174,175	58		
176,177,178	59		
179,180,181	60		
182,183,184	61		
185,186,187	62		
188,189,190	63		

ARRAY BLOCKS DESCRIPTION

Panel tilt:
-50° to +50°
GCR: 55
Row Pitch:
14.76ft

- Block Type 01 (1 inv, mppts 1+2). 4x67.5=270 modules, 27 strings
- Block Type 02 (mppt 1). 4x37.5=150 modules, 15 strings
- Block Type 03 (mppt 2). 4x30=120 modules, 12 strings
- Block Type 04 (mppt 1). 4x27.5=110 modules, 11 strings
- Block Type 05 (mppt 1+2). 4x20=80 modules, 8 strings
- Block Type 06 (mppt 2). 4x20=80 modules, 8 strings
- Block Type 07 (mppt 1). 4x20=80 modules, 8 strings
- Block Type 08 (mppt 1). 4x22.5=90 modules, 9 strings

ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

1.- Array Block connected to Inverter No.
2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

LEGEND

▨	PV INVERTER
▭	PANEL BOARD (PB)
▤	LV SWITCHBOARD + MV TRANSFORMER
— — —	DC CABLE CROSSING ROWS (HOMERUNS)
—— · ——	AC CABLE, INVERTER TO PANEL BOARD
—— - - ——	AC CABLE, PANEL BOARD TO LV SWITCHBOARD
— EU — EU —	MV CABLE (UNDERGROUND)

0ft 25 50 75 100

Graphic Scale. 1"=20'

N

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PROFESSIONAL SEAL
SEAL 32152
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REVISIONS

DATE	COMMENT
08-28-2018	Panel tilt changed to +-50°
10-31-2018	Array blocks desc. adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

ARRAY SECTION C(2)

E-108

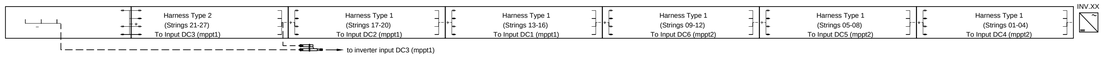
INV.XX - MPPT 1+2 - S- (270)

Block Type 01 (1 inverter, 2 mppts)
4x67+2=270 modules, 27 strings

PV BLOCK - MODULE BREAKDOWN:

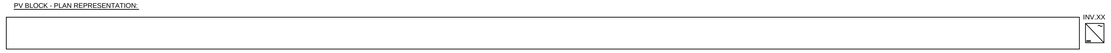
PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:



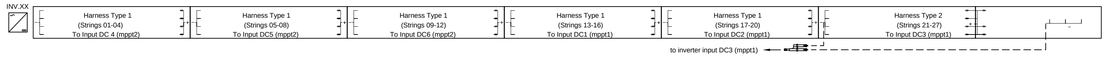
INV.XX - MPPT 1+2 - N- (270)

Block Type 01 (1 inverter, 2 mppts)
4x67+2=270 modules, 27 strings

PV BLOCK - MODULE BREAKDOWN:

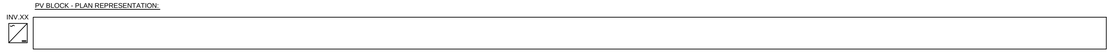
PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

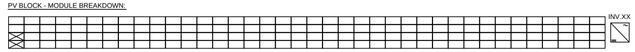
PV BLOCK - PLAN REPRESENTATION:



INV.XX - MPPT 1 - S - (150)

Block Type 02 (mppt 1)
4x37.5=150 modules, 15 strings

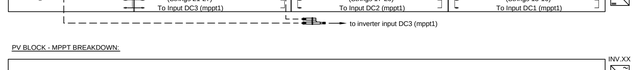
PV BLOCK - MODULE BREAKDOWN:



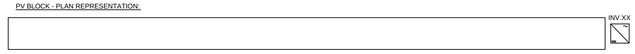
PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:

PV BLOCK - MPPT BREAKDOWN:

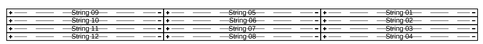


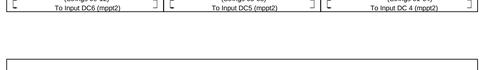
PV BLOCK - PLAN REPRESENTATION:



INV.XX - MPPT 2 - S- (120)

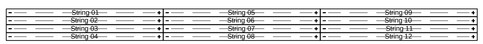
Block Type 03 (mppt 2)
4x30=120 modules, 12 strings

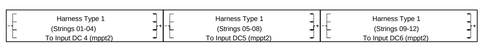


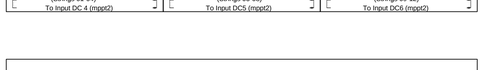


INV.XX - MPPT 2 - N- (120)

Block Type 03 (mppt 2)
4x30=120 modules, 12 strings



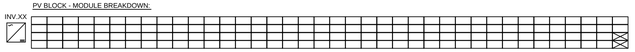




INV.XX - MPPT 1 - N - (150)

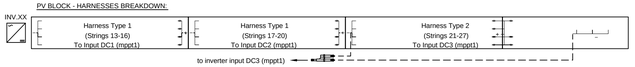
Block Type 02 (mppt 1)
4x37.5=150 modules, 15 strings

PV BLOCK - MODULE BREAKDOWN:



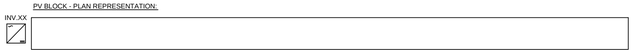
PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

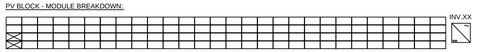
PV BLOCK - PLAN REPRESENTATION:



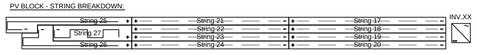
INV.XX - MPPT 1 - S- (110)

Block Type 04 (mppt 1)
4x27.5=110 modules, 11 strings

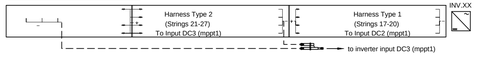
PV BLOCK - MODULE BREAKDOWN:



PV BLOCK - STRING BREAKDOWN:



PV BLOCK - HARNESSES BREAKDOWN:



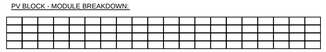
PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:

INV.XX - MPPT 1 & 2 - S- (80)

Block Type 05 (mppt 1 & 2)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:



PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:

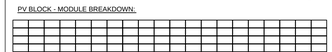
PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:

INV.XX - MPPT 2 - S- (80)

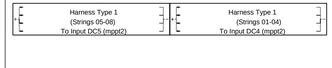
Block Type 06 (mppt 2)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:

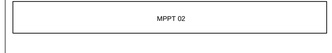


PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

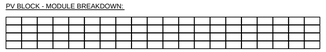


PV BLOCK - PLAN REPRESENTATION:

INV.XX - MPPT 2 - N- (80)

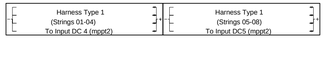
Block Type 06 (mppt 2)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:



PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



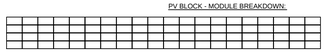
PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:

INV.XX - MPPT 2 & 1 - N- (80)

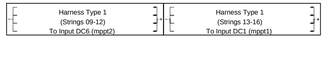
Block Type 05 (mppt 2 & 1)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:



PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



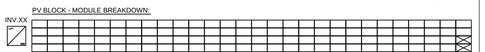
PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:

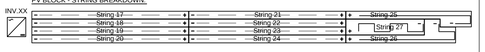
INV.XX - MPPT 1 - N- (110)

Block Type 04 (mppt 1)
4x27.5=110 modules, 11 strings

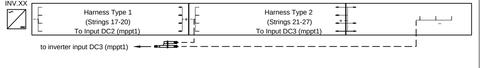
PV BLOCK - MODULE BREAKDOWN:



PV BLOCK - STRING BREAKDOWN:



PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:

SEE PLAN E-210 (INVERTER WIRING)

ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

1.- Array Block connected to Inverter No.
2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

greengo

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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
09-07-2018	Mppt title correction
10-31-2018	Renamed page

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

ARRAY BLOCKS LAYOUT DETAIL

E-109 A

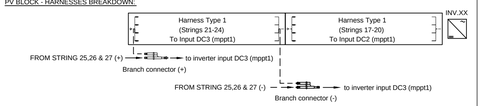
INV.77/78/79 - MPPT 1 - S- (80)

Block Type 07 (mppt 1)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:

PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



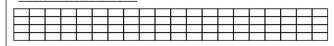
PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:

INV.77/78/79 - MPPT 1 & 2 - S- (80)

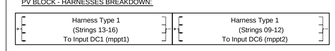
Block Type 05 (mppt 1 & 2)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:



PV BLOCK - STRING BREAKDOWN:

PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

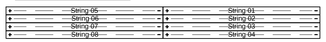
PV BLOCK - PLAN REPRESENTATION:

INV.77/78/79 - MPPT 2 - S- (80)

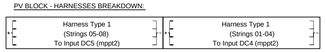
Block Type 06 (mppt 2)
4x20=80 modules, 8 strings

PV BLOCK - MODULE BREAKDOWN:

PV BLOCK - STRING BREAKDOWN:



PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

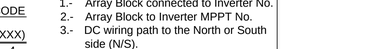
PV BLOCK - PLAN REPRESENTATION:

INV.77/78/79 - MPPT 1 - S- (90)

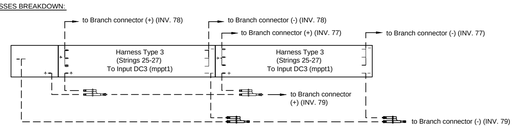
Block Type 08 (mppt 1)
4x22.5=90 modules, 9 strings

PV BLOCK - MODULE BREAKDOWN:

PV BLOCK - STRING BREAKDOWN:

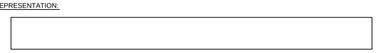


PV BLOCK - HARNESSES BREAKDOWN:



PV BLOCK - MPPT BREAKDOWN:

PV BLOCK - PLAN REPRESENTATION:



ARRAY BLOCKS KEY CODE

INV.XX - MPPT X - X- (XXX)
1. 2. 3. 4.

1.- Array Block connected to Inverter No.
2.- Array Block to Inverter MPPT No.
3.- DC wiring path to the North or South side (N/S).
4.- Array Block PV modules quantity.

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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

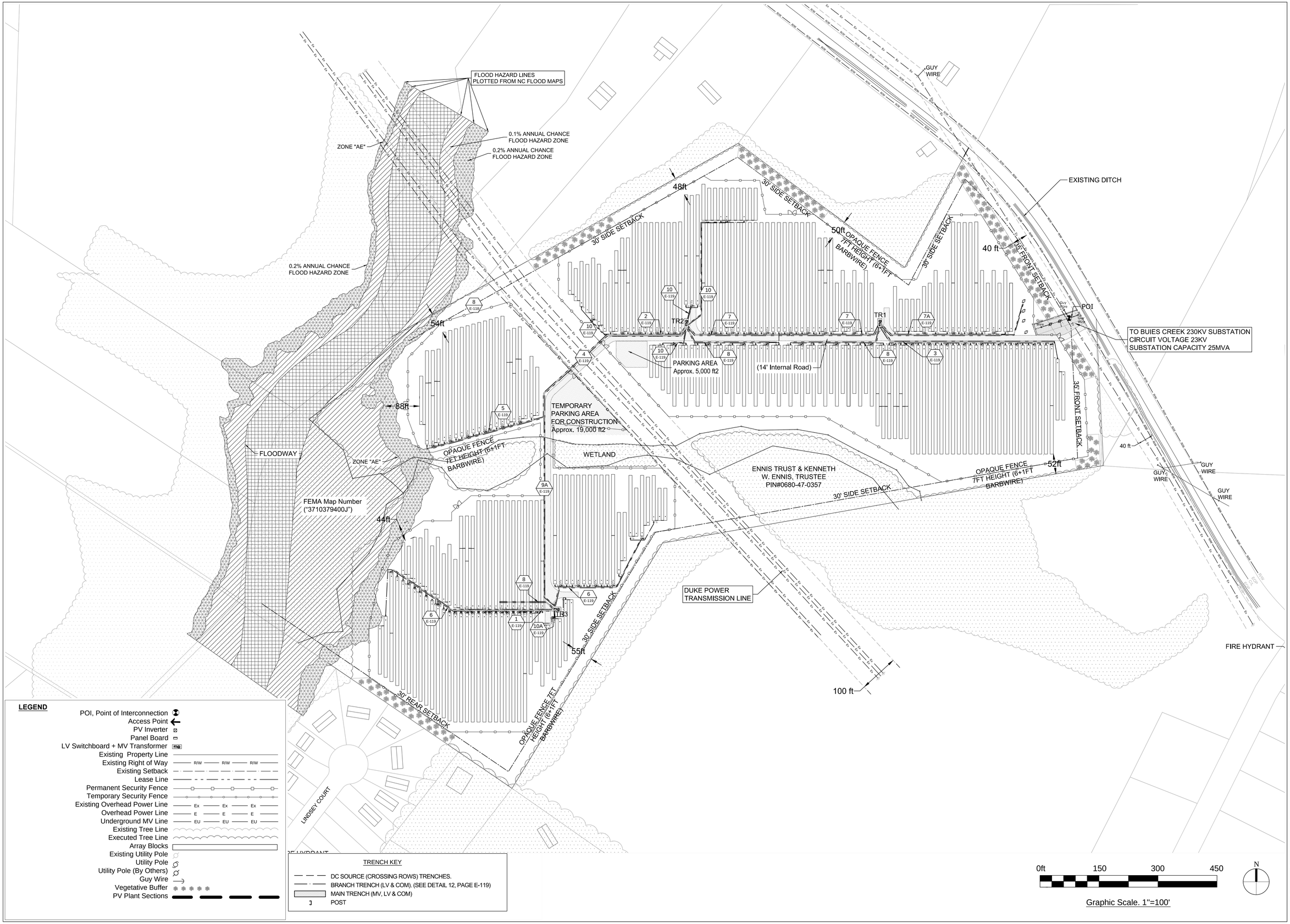
REVISIONS

DATE	COMMENT
09-07-2018	Mppt title correction

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

ARRAY BLOCKS LAYOUT DETAIL

E-109 B



LEGEND

- POI, Point of Interconnection
- Access Point
- PV Inverter
- Panel Board
- LV Switchboard + MV Transformer
- Existing Property Line
- Existing Right of Way
- Existing Setback
- Lease Line
- Permanent Security Fence
- Temporary Security Fence
- Existing Overhead Power Line
- Overhead Power Line
- Underground MV Line
- Existing Tree Line
- Executed Tree Line
- Array Blocks
- Existing Utility Pole
- Utility Pole
- Utility Pole (By Others)
- Guy Wire
- Vegetative Buffer
- PV Plant Sections

TRENCH KEY

- DC SOURCE (CROSSING ROWS) TRENCHES.
- BRANCH TRENCH (LV & COM). (SEE DETAIL 12, PAGE E-119)
- MAIN TRENCH (MV, LV & COM)
- POST

0ft 150 300 450

Graphic Scale. 1"=100'

N

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32182 JAMES A. CRAIG

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

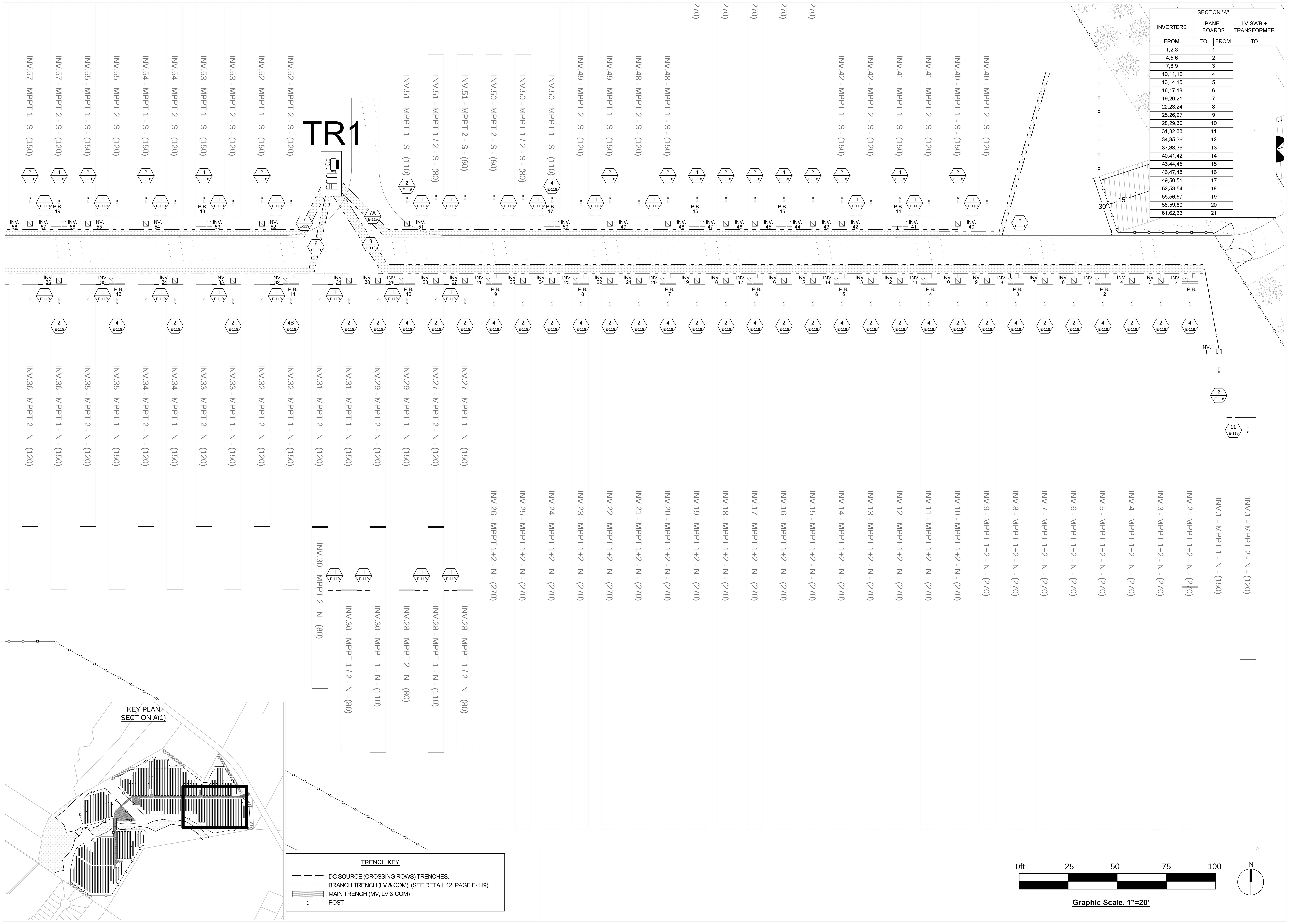
REVISIONS

DATE	COMMENT
10-31-2018	Inv. 77, 78, 79 adjusted
11-08-2018	Fence height & type
11-21-2018	Fence updated by civil
11-21-2018	MV poles to POI
01-18-2019	3rd Customer Pole Added
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=100'
DATE	12-21-2018

TRENCHES LAYOUT

E-110



SECTION "A"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
1,2,3	1		1
4,5,6	2		
7,8,9	3		
10,11,12	4		
13,14,15	5		
16,17,18	6		
19,20,21	7		
22,23,24	8		
25,26,27	9		
28,29,30	10		
31,32,33	11		
34,35,36	12		
37,38,39	13		
40,41,42	14		
43,44,45	15		
46,47,48	16		
49,50,51	17		
52,53,54	18		
55,56,57	19		
58,59,60	20		
61,62,63	21		

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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
09-07-2018	Panel board 01
09-07-2018	Some Ref 11 were added
11-21-2018	Fence updated by civil
11-21-2018	MV poles to POI
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

TRENCHES LAYOUT SECTION A(1)

E-111

SECTION "A"			
INVERTERS		PANEL BOARDS	LV SWB + TRANSFORMER
FROM	TO	FROM	TO
1,2,3		1	
4,5,6		2	
7,8,9		3	
10,11,12		4	
13,14,15		5	
16,17,18		6	
19,20,21		7	
22,23,24		8	
25,26,27		9	
28,29,30		10	
31,32,33		11	1
34,35,36		12	
37,38,39		13	
40,41,42		14	
43,44,45		15	
46,47,48		16	
49,50,51		17	
52,53,54		18	
55,56,57		19	
58,59,60		20	
61,62,63		21	

INV.43 - MPPT 1+2 - S - (270)
INV.44 - MPPT 1+2 - S - (270)
INV.45 - MPPT 1+2 - S - (270)
INV.46 - MPPT 1+2 - S - (270)
INV.47 - MPPT 1+2 - S - (270)
INV.48 - MPPT 1 - S - (150)
INV.48 - MPPT 2 - S - (120)
INV.49 - MPPT 1 - S - (150)
INV.49 - MPPT 2 - S - (120)
INV.50 - MPPT 1 - S - (110)
INV.50 - MPPT 1 / 2 - S - (80)
INV.50 - MPPT 2 - S - (80)
INV.51 - MPPT 1 - S - (110)
INV.51 - MPPT 1 / 2 - S - (80)
INV.51 - MPPT 2 - S - (80)
INV.52 - MPPT 1 - S - (150)
INV.52 - MPPT 2 - S - (120)
INV.53 - MPPT 1 - S - (150)
INV.53 - MPPT 2 - S - (120)
INV.54 - MPPT 1 - S - (150)
INV.54 - MPPT 2 - S - (120)
INV.55 - MPPT 1 - S - (150)
INV.55 - MPPT 2 - S - (120)
INV.56 - MPPT 1 - S - (110)
INV.56 - MPPT 2 - S - (80)
INV.57 - MPPT 1 / 2 - S - (80)
INV.57 - MPPT 2 - S - (120)
INV.56 - MPPT 1 - S - (150)
INV.58 - MPPT 1+2 - S - (270)
INV.59 - MPPT 1+2 - S - (270)
INV.60 - MPPT 1+2 - S - (270)
INV.61 - MPPT 1+2 - S - (270)
INV.62 - MPPT 1+2 - S - (270)
INV.63 - MPPT 1+2 - S - (270)
INV.98 - MPPT 1+2 - S - (270)
INV.64 - MPPT 1+2 - S - (270)
INV.65 - MPPT 1+2 - S - (270)

TR1

INV.41 - MPPT 1 - S - (150)
INV.41 - MPPT 2 - S - (120)
INV.40 - MPPT 1 - S - (150)
INV.40 - MPPT 2 - S - (120)

INV.36 - MPPT 2 - N - (120)
INV.36 - MPPT 1 - N - (150)
INV.35 - MPPT 2 - N - (120)
INV.35 - MPPT 1 - N - (150)
INV.34 - MPPT 2 - N - (120)
INV.34 - MPPT 1 - N - (150)
INV.33 - MPPT 2 - N - (120)
INV.33 - MPPT 1 - N - (150)
INV.32 - MPPT 2 - N - (120)
INV.32 - MPPT 1 - N - (150)
INV.31 - MPPT 2 - N - (120)
INV.31 - MPPT 1 - N - (150)
INV.29 - MPPT 2 - N - (120)
INV.29 - MPPT 1 - N - (150)
INV.27 - MPPT 2 - N - (120)
INV.27 - MPPT 1 - N - (150)

KEY PLAN
SECTION A(2)

TRENCH KEY

- DC SOURCE (CROSSING ROWS) TRENCHES.
- BRANCH TRENCH (LV & COM). (SEE DETAIL 12, PAGE E-119)
- MAIN TRENCH (MV, LV & COM)
- POST

0ft 25 50 75 100

Graphic Scale. 1"=20'

N

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PROFESSIONAL SEAL

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 32182 JAMES A. CONNOLLY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

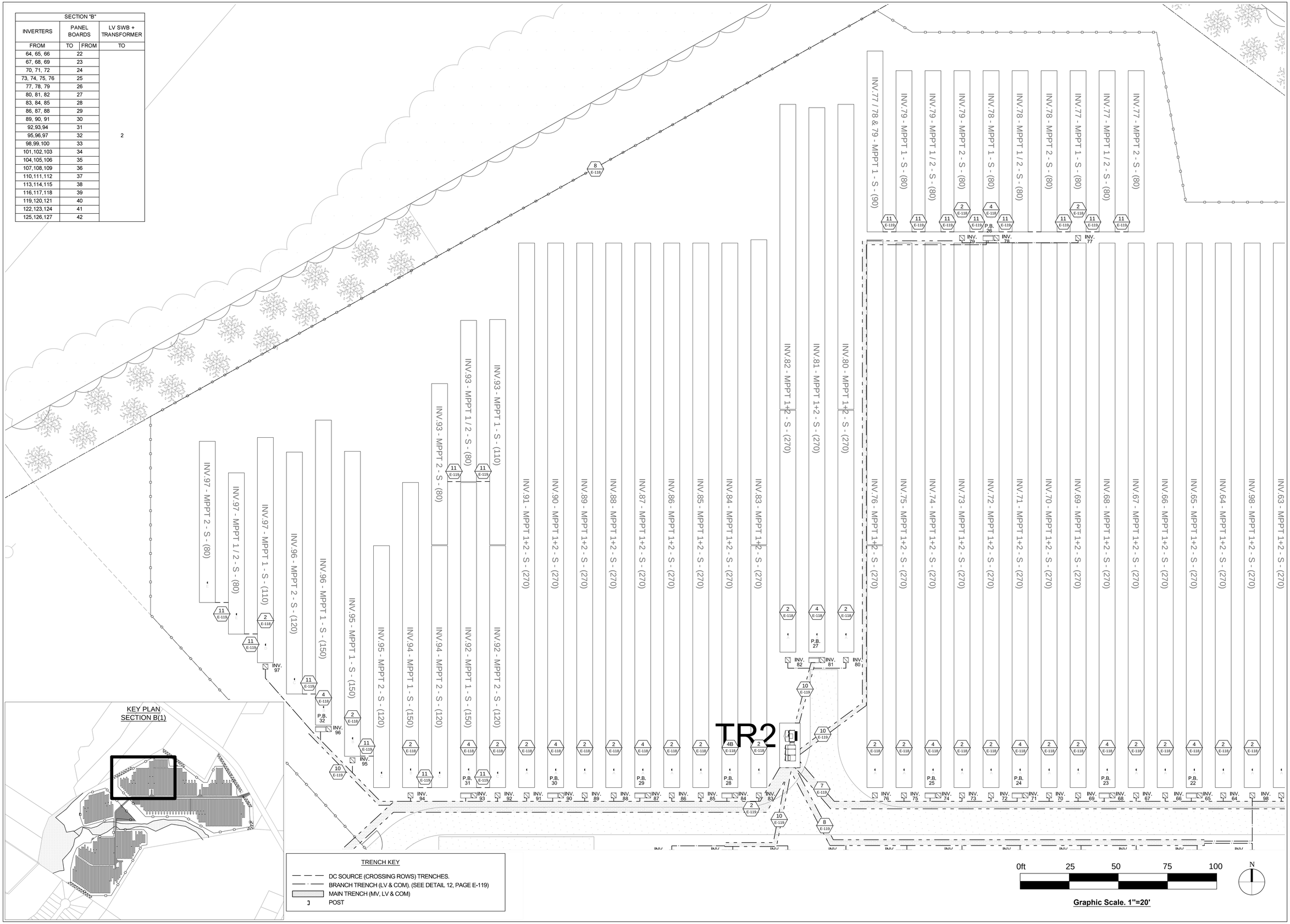
REVISIONS	
DATE	COMMENT
09-07-2018	Some Ref 11 were added
10-31-2018	Array texts adjusted
11-21-2018	Fence updated by civil
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

TRENCHES LAYOUT SECTION A(2)

E-112

SECTION "B"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
64, 65, 66	22		2
67, 68, 69	23		
70, 71, 72	24		
73, 74, 75, 76	25		
77, 78, 79	26		
80, 81, 82	27		
83, 84, 85	28		
86, 87, 88	29		
89, 90, 91	30		
92,93,94	31		
95,96,97	32		
98,99,100	33		
101,102,103	34		
104,105,106	35		
107,108,109	36		
110,111,112	37		
113,114,115	38		
116,117,118	39		
119,120,121	40		
122,123,124	41		
125,126,127	42		



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(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032196 JAMES A. WARD

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
09-07-2018	Some Ref 11 were added
10-31-2018	Trenches symbol adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

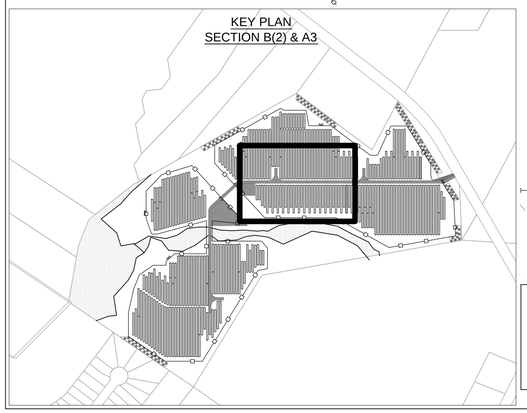
TRENCHES LAYOUT SECTION B(1)

E-113

TR2

SECTION "B"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
64, 65, 66	22		
67, 68, 69	23		
70, 71, 72	24		
73, 74, 75, 76	25		
77, 78, 79	26		
80, 81, 82	27		
83, 84, 85	28		
86, 87, 88	29		
89, 90, 91	30		
92,93,94	31		
95,96,97	32		2
98,99,100	33		
101,102,103	34		
104,105,106	35		
107,108,109	36		
110,111,112	37		
113,114,115	38		
116,117,118	39		
119,120,121	40		
122,123,124	41		
125,126,127	42		

KEY PLAN
SECTION B(2) & A3



TRENCH KEY

- DC SOURCE (CROSSING ROWS) TRENCHES.
- BRANCH TRENCH (LV & COM). (SEE DETAIL 12, PAGE E-119)
- MAIN TRENCH (MV, LV & COM)
- POST

0ft 25 50 75 100

Graphic Scale. 1"=20'

N

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ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CAY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

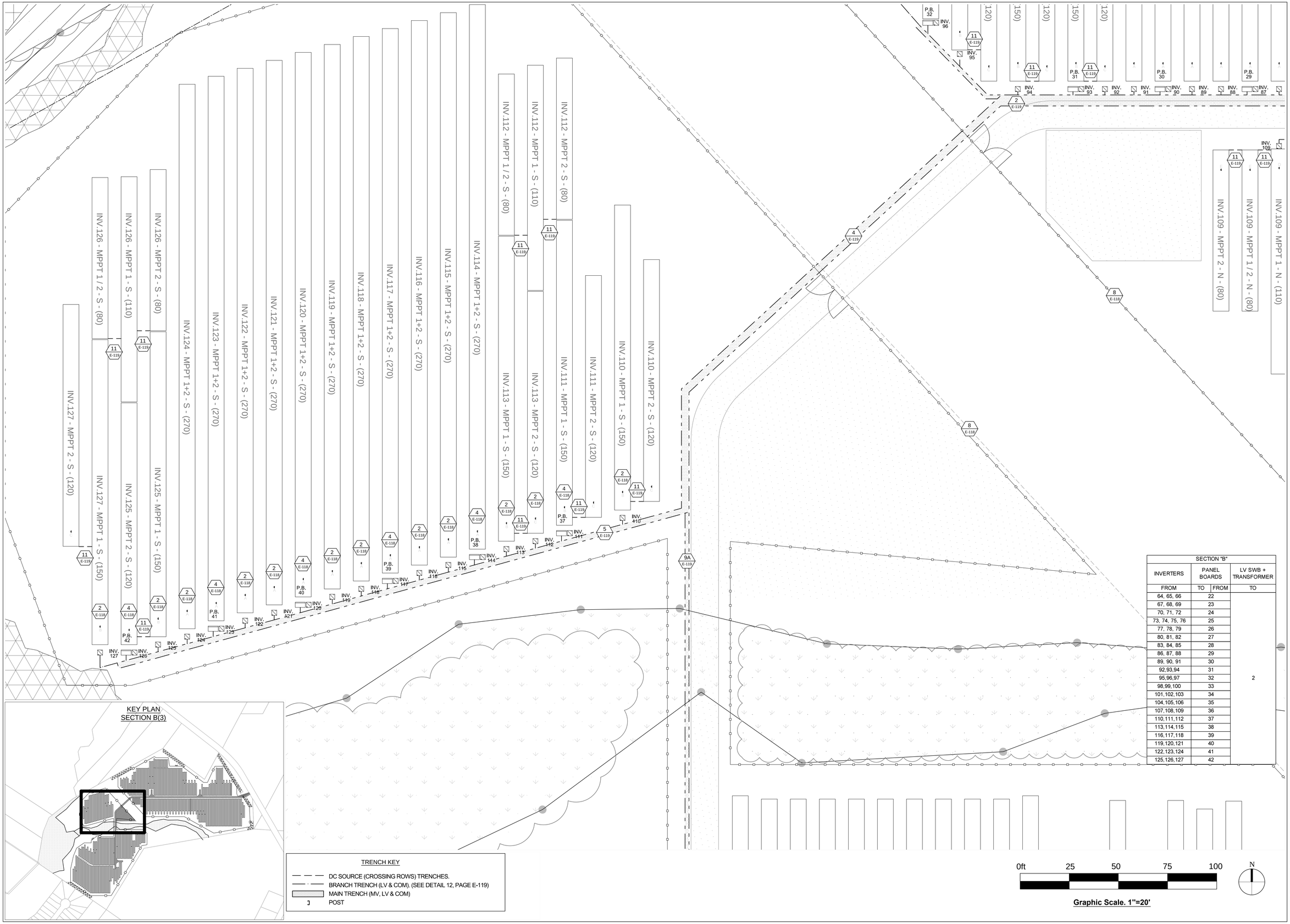
REVISIONS

DATE	COMMENT
09-07-2018	Some Ref 11 were added
10-31-2018	Array texts adjusted
11-21-2018	Fence updated by civil

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

TRENCHES LAYOUT SECTION B (2) & A(3)

E-114



SECTION "B"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
64, 65, 66	22		2
67, 68, 69	23		
70, 71, 72	24		
73, 74, 75, 76	25		
77, 78, 79	26		
80, 81, 82	27		
83, 84, 85	28		
86, 87, 88	29		
89, 90, 91	30		
92,93,94	31		
95,96,97	32		
98,99,100	33		
101,102,103	34		
104,105,106	35		
107,108,109	36		
110,111,112	37		
113,114,115	38		
116,117,118	39		
119,120,121	40		
122,123,124	41		
125,126,127	42		

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PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAC SAWYER

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
09-07-2018	Some Ref 11 were added
11-21-2018	Fence updated by civil
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

TRENCHES LAYOUT SECTION B(3)

E-115

SECTION "C"			
INVERTERS		PANEL BOARDS	LV SWB + TRANSFORMER
FROM	TO	FROM	TO
128,129,130		43	
131,132,133		44	
134,135,136		45	
137,138,139		46	
140,141,142		47	
143,144,145		48	
146,147,148		49	
149,150,151		50	
152,153,154		51	
155,156,157		52	
158,159,160		53	3
161,162,163		54	
164,165,166		55	
167,168,169		56	
170,171,172		57	
173,174,175		58	
176,177,178		59	
179,180,181		60	
182,183,184		61	
185,186,187		62	
188,189,190		63	

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. BRANNEN

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

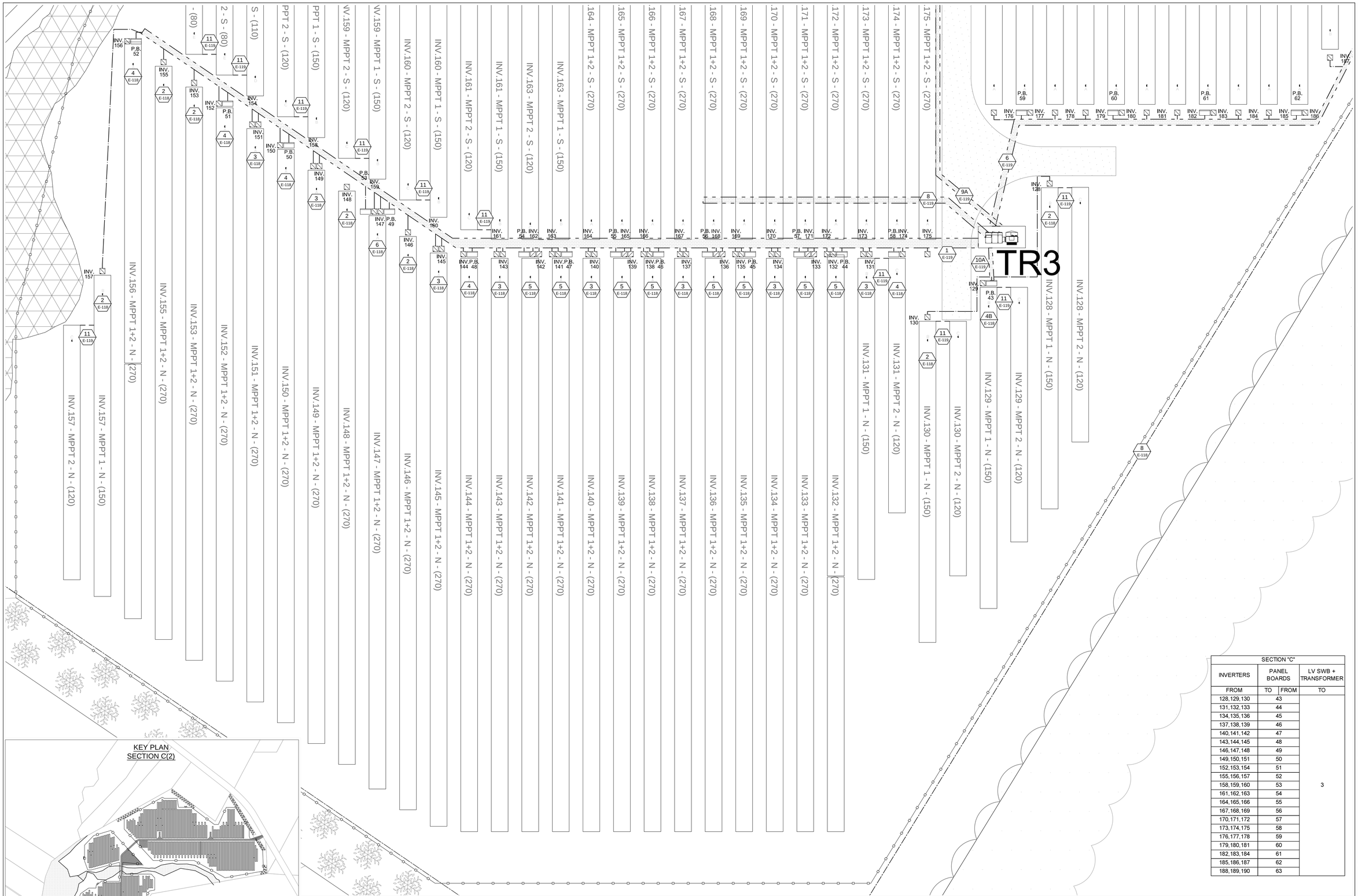
REVISIONS

DATE	COMMENT
09-07-2018	Some Ref 11 were added
11-21-2018	Fence updated by civil
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=20'
DATE	12-21-2018

TRENCHES LAYOUT SECTION C(1)

E-116



TRENCH KEY

- DC SOURCE (CROSSING ROWS) TRENCHES.
- BRANCH TRENCH (LV & COM). (SEE DETAIL 12, PAGE E-119)
- MAIN TRENCH (MV, LV & COM)
- POST

SECTION "C"			
INVERTERS	PANEL BOARDS		LV SWB + TRANSFORMER
FROM	TO	FROM	TO
128,129,130	43		3
131,132,133	44		
134,135,136	45		
137,138,139	46		
140,141,142	47		
143,144,145	48		
146,147,148	49		
149,150,151	50		
152,153,154	51		
155,156,157	52		
158,159,160	53		
161,162,163	54		
164,165,166	55		
167,168,169	56		
170,171,172	57		
173,174,175	58		
176,177,178	59		
179,180,181	60		
182,183,184	61		
185,186,187	62		
188,189,190	63		

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ELMER, NEW JERSEY 08318
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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 32152
JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

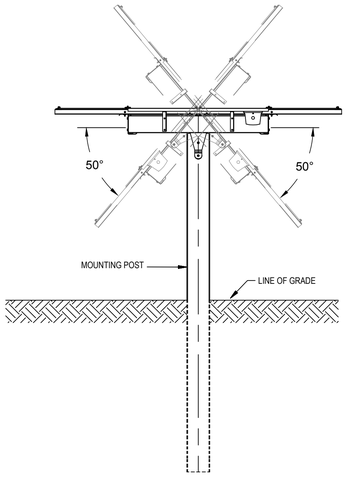
REVISIONS

DATE	COMMENT
09-07-2018	Some Ref 11 were added
11-21-2018	Fence updated by civil
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1''=20'
DATE	12-21-2018

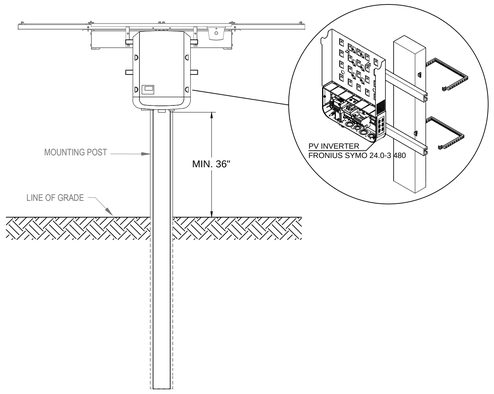
**TRENCHES LAYOUT
SECTION C(2)**

E-117



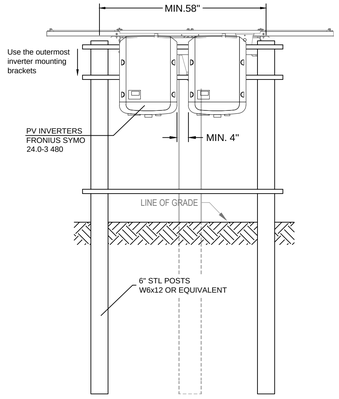
* TYP. SINGLE AXIS TRACKER
ARRAY STRUCTURE

1 E-118 SECTION DETAIL SCALE:1"=20'



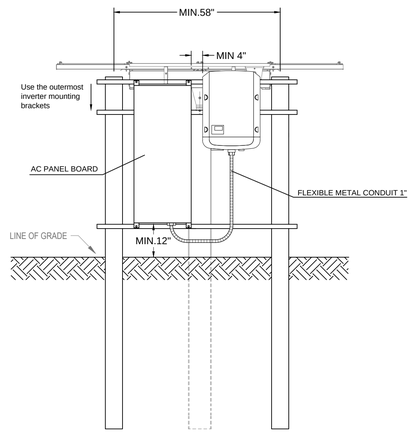
* TYP. INVERTER MOUNT
1 INVERTER

2 E-118 INVERTERS MOUNT (1) SCALE:1"=20'



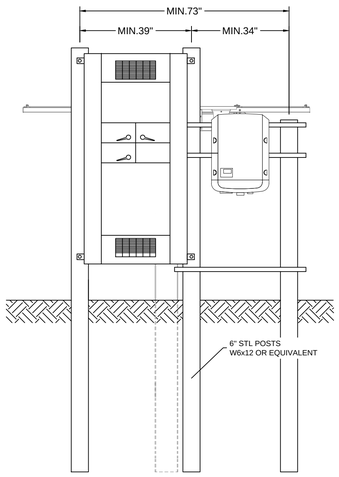
* TYP. INVERTER MOUNT
2 INVERTERS

3 E-118 INVERTERS MOUNT (2) SCALE:1"=20'



* TYP. AC PANEL / INVERTER MOUNT
1 PANEL + 1 INVERTER

4 E-118 INVERTERS + PANEL MOUNT (1+1) SCALE:1"=20'



* TYP. AC FUSED PANEL / INVERTER MOUNT
1 FUSED PANEL + 1 INVERTER

4B E-118 INVERTERS + PANEL MOUNT (1+1) SCALE:1"=20'

* TYP. AC PANEL / INVERTER MOUNT
1 PANEL + 2 INVERTER

5 E-118 INVERTERS + PANEL MOUNT (2+1) SCALE:1"=20'

* TYP. AC PANEL / INVERTER MOUNT
2 PANEL + 2 INVERTERS

6 E-118 INVERTERS + PANEL MOUNT (2+2) SCALE:1"=20'

7 E-118 **RACKING & PANEL BOARD MOUNTING** SCALE: N/S

7B E-118 **RACKING & PANEL BOARD MOUNTING** SCALE: N/S

* TYP. FENCE GROUNDING

8 E-118 FENCE GROUNDING

* TYP. T - JOINT

9 E-118 T JOINT SCALE: N/S

* TYP. GROUND ROD

10 E-118 GROUND ROD SCALE: N/S

* TYP. GROUND ROD - TEST WELL

11 E-118 GROUND ROD - TEST WELL SCALE: N/S

* TYP. INTERSYSTEM BONDING - TERMINATION WELL

12 E-118 INTERSYSTEM BONDING - TERMINATION WELL SCALE: N/S

greengo

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PROFESSIONAL SEAL

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 32182 JAMES A. CRAWFORD

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

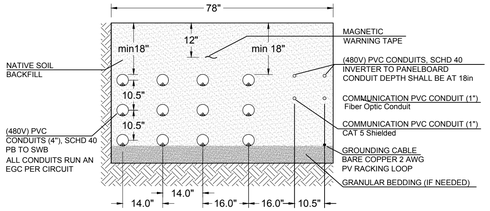
REVISIONS

DATE	COMMENT
12-18-2018	Inverter conduit sized
01-18-2019	Mounting racks adjusted

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=25"
DATE	12-21-2018

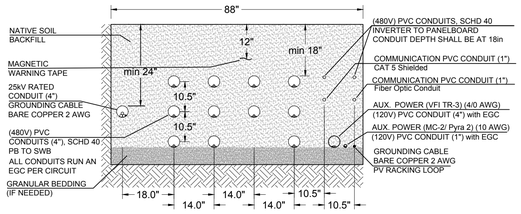
MOUNTING DETAILS

E-118



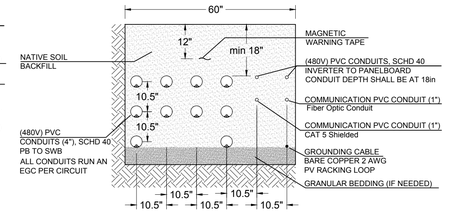
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 12 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANELBOARD)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

1 E-119 TRENCH SECTION A SCALE:1"=20"



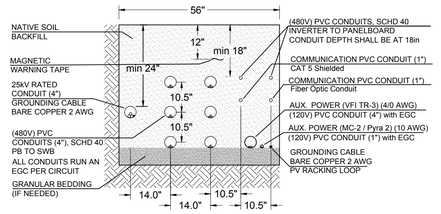
* TYP. MV 25kV W/ 480V & DATA
UP TO 11 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

2 E-119 TRENCH SECTION A SCALE:1"=20"



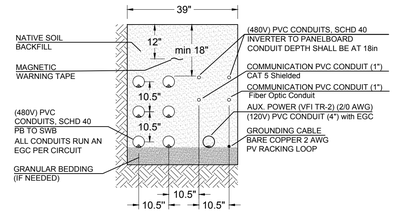
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 10 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANELBOARD)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

3 E-119 TRENCH SECTION A SCALE:1"=20"



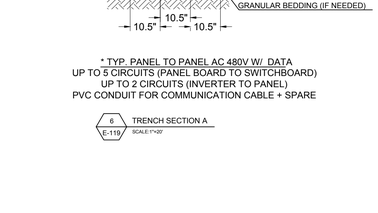
* TYP. MV 25kV W/ 480V & DATA
UP TO 6 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

4 E-119 TRENCH SECTION A SCALE:1"=20"



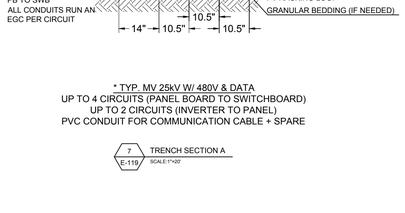
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 6 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

5 E-119 TRENCH SECTION A SCALE:1"=20"



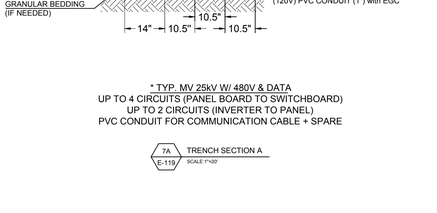
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 5 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

6 E-119 TRENCH SECTION A SCALE:1"=20"



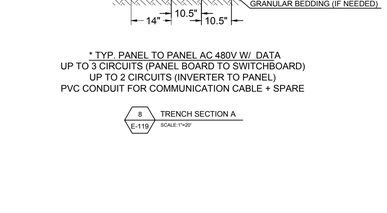
* TYP. MV 25kV W/ 480V & DATA
UP TO 4 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

7 E-119 TRENCH SECTION A SCALE:1"=20"



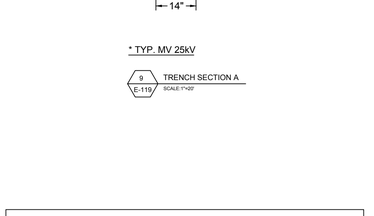
* TYP. MV 25kV W/ 480V & DATA
UP TO 4 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

7A E-119 TRENCH SECTION A SCALE:1"=20"



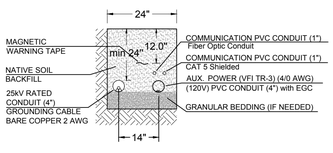
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 3 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

8 E-119 TRENCH SECTION A SCALE:1"=20"



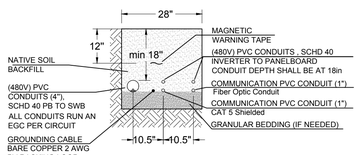
* TYP. MV 25kV

9 E-119 TRENCH SECTION A SCALE:1"=20"



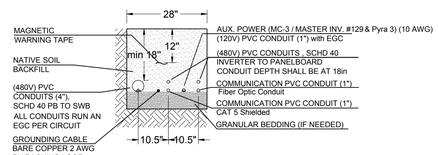
* TYP. MV 25kV

9A E-119 TRENCH SECTION A SCALE:1"=20"



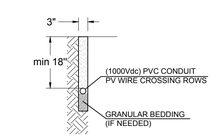
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 1 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

10 E-119 TRENCH SECTION A SCALE:1"=20"



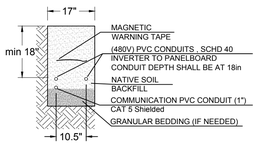
* TYP. PANEL TO PANEL AC 480V W/ DATA
UP TO 1 CIRCUITS (PANEL BOARD TO SWITCHBOARD)
UP TO 2 CIRCUITS (INVERTER TO PANEL)
PVC CONDUIT FOR COMMUNICATION CABLE + SPARE

10A E-119 TRENCH SECTION A SCALE:1"=20"



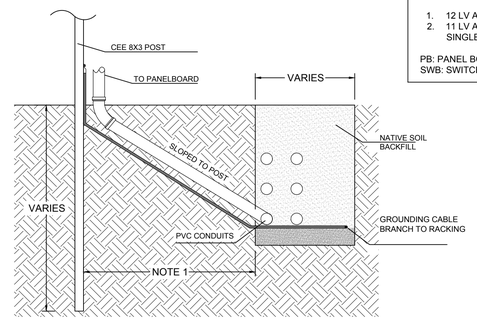
* TYP. ROW TO ROW DC CIRCUITS

11 E-119 TRENCH SECTION A SCALE:1"=20"



* TYP. INVERTER TO PANELBOARD

12 E-119 TRENCH SECTION A SCALE:1"=20"



TRENCH TO POST DETAIL

13 E-119 TRENCH SECTION A SCALE:1"=20"

MAXIMUM NUMBER OF CIRCUITS IN A SINGLE TRENCH ACCORDING TO CABLE AMPACITY STUDY REPORT:

1. 12 LV AC FEEDERS FROM PB TO SWB + 2 LV AC FEEDERS INV. TO PB.
2. 11 LV AC FEEDERS FROM PB TO SWB + 2 LV AC FEEDERS INV. TO PB. + SINGLE MV CIRCUIT

PB: PANEL BOARD
SWB: SWITCHBOARD

INSTALLER TO PROVIDE BONDING JUMPER BETWEEN RACKING SECTIONS.

FIRST SOLAR IS A FRAMELESS MODULE AND DOES NOT REQUIRE GROUND EQUIPMENT AS LONG AS A CLIP LENGTH OF 100mm FOR A STANDARD 4 CLIP MOUNTING IS NOT EXCEEDED.

6-INCH GRANULAR BEDDING SHALL BE PLACED BENEATH BURIED UTILITIES TO PROVIDE UNIFORM SUPPORT WHEN THEY ARE SUPPORTED ON FINE-GRAINED SOIL OR IF GROUNDWATER IS ENCOUNTERED.

NOTE 1:
MINIMUM RECOMMENDED DISTANCE FROM THE EDGE OF THE TRENCH TO THE EDGE OF THE FOUNDATION (SEE GENERAL NOTES IN STRUCTURAL PACKAGE):

- FOR "NORMAL GOOD SOIL" CONDITIONS, 3'-0"
- FOR "POOR SOIL" CONDITIONS, EQUAL OR GREATER THAN THE DEPTH OF FOUNDATION.

IF IN DOUBT OF SOIL CONDITIONS RBI SOLAR RECOMMENDS CONSULTING A QUALIFIED GEOTECHNICAL ENGINEER TO ASSESS SOIL CONDITIONS AT THE SITE.

CABLES SHALL BE PLACED FROM DEEPER TO SHALLOWER DUCT LEVEL BASED ON THE CABLE-CROSS SECTIONS, I.E., BIGGER CROSS-SECTIONS IN DEEPER DUCTS AND SMALLER CROSS-SECTIONS IN SHALLOWER DUCTS.

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PROFESSIONAL SEAL

PROFESSIONAL ENGINEER NORTH CAROLINA SEAL 32162 JAMES A. CAY IV

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

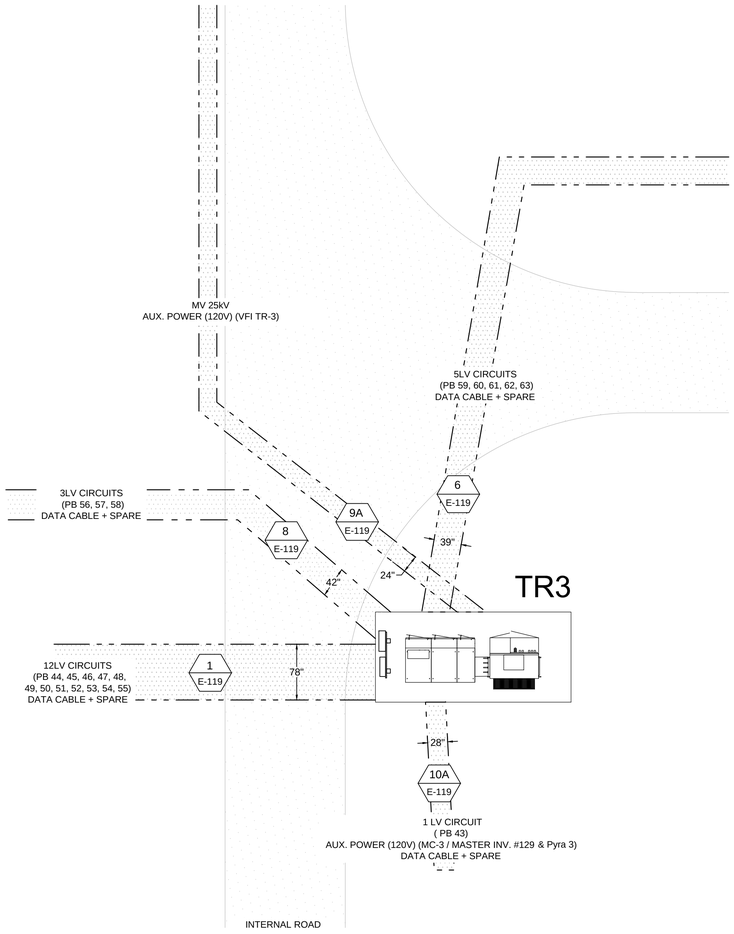
REVISIONS

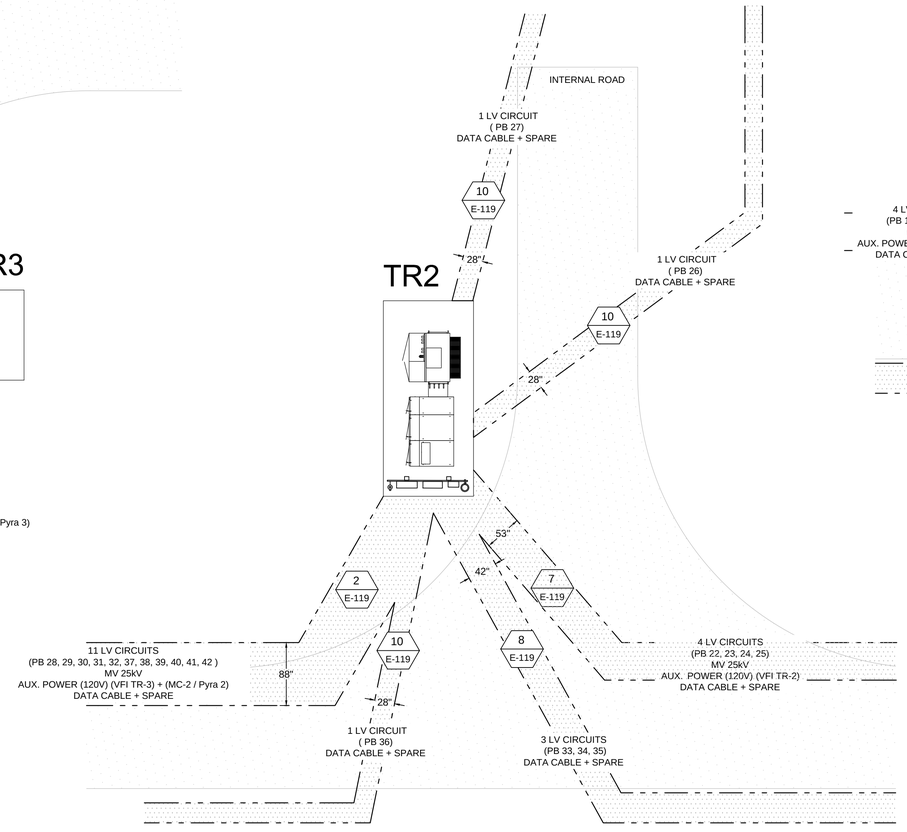
DATE	COMMENT
09-07-18	Trench #13
08-28-18	Text box added
01-25-19	Aux. Power Conduit

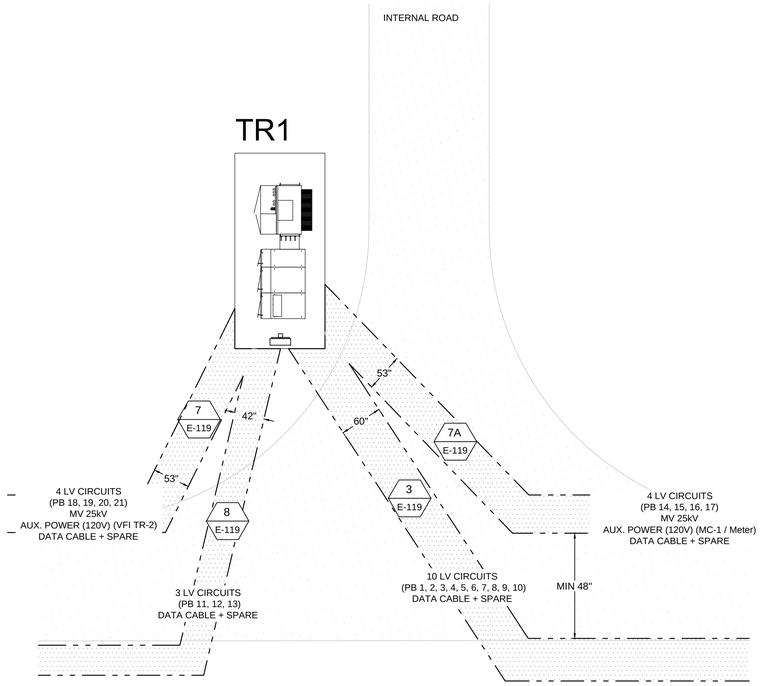
PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=25"
DATE	12-21-2018

TRENCHES

E-119







0ft 150 300 450

Graphic Scale. 1"=100"

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CRAIG

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
09-07-2018	TR2-Switch P.B. 25 & 26
12-13-2018	MLC & Meteo rack added
01-25-2019	Aux. Power Circuit

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=100"
DATE	12-21-2018

TRENCHES DETAILS (PAD ARRANGEMENT)

E-120

CONNECTION TO POI ACCORDING TO DUKE'S REQUIREMENTS FOR ELECTRIC SERVICE AND METER INSTALLATIONS FIGURE (71B)

(POINT OF COMMON COUPLING-PCC)

UTILITY OWNED AND OPERATED | CUSTOMER OWNED

MV WIRE SIZE RISER POLE TO POI :
CABLE #14
(3 + Neutral) #1/0 ACSR
AERIAL FEED

UTILITY LOADBREAK DISCONNECT SWITCH

UTILITY RISER POLE

UTILITY 3 Ø RECLOSER, POLE MOUNTING (BY UTILITY)

POLE MTD. PRIMARY UTILITY METERING CABINET (OWNED AND OPERATED BY UTILITY)

UTILITY LOCKABLE 600A, 25KV AERIAL GANG OPERATED LOAD BREAK DISCONNECT SWITCH

CUSTOMER POLE 3

CUSTOMER CUT-OUT (SOLID BLADE)

CUSTOMER POLE 2

CUSTOMER FUSED CUT-OUT (200A)

CUSTOMER POLE 1 (RISER POLE)

POI

22.86kV

(E) POLE

NEW POLE

R

PT

CT

25KV S.A. 15.3KV MCOV (3)

CONTROL POWER TO RECLOSER (BY UTILITY)

EXISTING UTILITY DISTRIBUTION CIRCUIT

CUSTOMER POLE 3 GOAB SWITCH & S.A.

Power Supply 120Vac

POLE MTD. CUSTOMER METERING UNIT (150:5 A)

25KV S.A. 15.3KV MCOV (3)

CUSTOMER POLE 2 ENERGEY METER (CT,PT)

25KV S.A. 15.3KV MCOV (3)

O.H.

U.G.

CABLE #: 14

CABLE #14
(3) #2/0 w/ 1/3 CONC. N
#2 GND
4" CONDUIT

TR-1
NEW 1700KVA TRANSFORMER
IMPEDANCE=5.75% (ABSOLUTE)
LOW FLUX DENSITY TRANSFORMER WITH
OPERATING FLUX DENSITY NOT TO EXCEED 1.1 TESLA
ALL VALUES IN ACCORDANCE TO IEEE ANSI C57.12

22.86kV

480V

22860GY/13200 V (HV)

480Y/277 Y (LV)

THROAT CONNECTION
40 KAIC MIN.

CABLE #: TT2.1

(3) #2/0 w/ 1/3 CONC. N
#2 GND
4" CONDUIT

AIC CALCULATION
1700000 / 480 * √3 / 0.0575 = 35,561 A

TR-2
NEW 1700KVA TRANSFORMER
IMPEDANCE=5.75%(ABSOLUTE)
LOW FLUX DENSITY TRANSFORMER WITH
OPERATING FLUX DENSITY NOT TO EXCEED 1.1 TESLA
ALL VALUES IN ACCORDANCE TO IEEE ANSI C57.12

22.86kV

Timer (Td 105EC)

480V

POWERED BY LV AC MINI LOAD CENTER 1

22860GY/13200 V (HV)

480Y/277 Y (LV)

THROAT CONNECTION
40 KAIC MIN.

CABLE #: TT3.2

(3) #2/0 w/ 1/3 CONC. N
#2 GND
4" CONDUIT

TR-3
NEW 1700KVA
VFI TRANSFORMER
IMPEDANCE=5.75%(ABSOLUTE)
LOW FLUX DENSITY TRANSFORMER WITH
OPERATING FLUX DENSITY NOT TO EXCEED 1.1 TESLA
ALL VALUES IN ACCORDANCE TO IEEE ANSI C57.12

22.86kV

Timer (Td 105Sec)

480V

POWERED BY LV AC MINI LOAD CENTER 2

22860GY/13200 V (HV)

480Y/277 Y (LV)

THROAT CONNECTION
40 KAIC MIN.

ELBOW SURGE ARRESTOR (INSIDE XFMR)
25KV S.A.
15.3KV MCOV
(3)

PV AC SWITCHBOARD 1
2500 A BUSS
2500 A MAIN
480/277Y-3P-4W
40 KAIC MIN.

3P/2500A MAIN

PV AC SUB PANEL 1
3 INVERTERS

PV AC SUB PANEL 2
3 INVERTERS

PV AC SUB PANEL 19
3 INVERTERS

PV AC SUB PANEL 20
3 INVERTERS

PV AC SUB PANEL 21
3 INVERTERS

SPARE

21 SUB PANELS @ 125A OCPD
1 MINI POWER ZONE @ 20A
BUSS BAR RATING 2500A

CABLE #: PS1.1

PV 1
PV AC SUB PANEL 1
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: IP1.1

28.9 A

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

INV-1
FRONIUS SYMO 24.0-3-480 PV INVERTER

INV-2 270 MODULES

INV-3 270 MODULES

INVERTER MAX CONTINUOUS OUTPUT CURRENT = 28.9A EACH
28.9A*1.25=36.125A MIN OCPD

27 STRINGS OF 10 MODULES
MPPT1: 15 STRINGS
MPPT2: 12 STRINGS
270 MODULES = 32,400 W-DC

4-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS
7-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS

DATA
CONVENIENCE RECEPTACLE
LIGHTS
VFI CONTROLLER FEEDER (TR-2)

MINI LOAD CENTER 1-120/208V
15KVA TRANS 480V DELTA
PRIMARY/208Y/120 SECONDARY
60A RATED MAINS
6 OF 20A 1 POLE BRANCH BREAKERS
NEMA 3R

SEE PAGE E-202 TO E-204 FOR PV AC SUB PANEL DETAILS

PV AC SWITCHBOARD 2
2500 A BUSS
2500 A MAIN
480/277Y-3P-4W
40 KAIC MIN.

3P/2500A MAIN

PV AC SUB PANEL 22
3 INVERTERS

PV AC SUB PANEL 23
3 INVERTERS

PV AC SUB PANEL 25
4 INVERTERS

PV AC SUB PANEL 41
3 INVERTERS

PV AC SUB PANEL 42
3 INVERTERS

SPARE

20 SUB PANELS @ 125A OCPD
1 SUB PANELS @ 150A OCPD
1 MINI POWER ZONE @ 20A
BUSS BAR RATING 2500A

CABLE #: PS25.2

PV 25
PV AC SUB PANEL 25
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: IP73.25

28.9 A

4 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

INV-73
FRONIUS SYMO 24.0-3-480 PV INVERTER

INV-74 270 MODULES

INV-75 270 MODULES

INV-76 270 MODULES

INVERTER MAX CONTINUOUS OUTPUT CURRENT = 28.9A EACH
28.9A*1.25=36.125A MIN OCPD

27 STRINGS OF 10 MODULES
MPPT1: 15 STRINGS
MPPT2: 12 STRINGS
270 MODULES = 32,400 W-DC

4-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS
7-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS

PV AC SWITCHBOARD 3
2500 A BUSS
2500 A MAIN
480/277Y-3P-4W
40 KAIC MIN.

3P/2500A MAIN

PV AC SUB PANEL 43
3 INVERTERS

PV AC SUB PANEL 44
3 INVERTERS

PV AC SUB PANEL 61
3 INVERTERS

PV AC SUB PANEL 62
3 INVERTERS

PV AC SUB PANEL 63
3 INVERTERS

SPARE

21 SUB PANELS @ 125A OCPD
1 MINI POWER ZONE @ 20A
BUSS BAR RATING 2500A

DATA
CONVENIENCE RECEPTACLE
LIGHTS
VFI CONTROLLER FEEDER (TR-3)

MINI LOAD CENTER 2-120/208V
15KVA TRANS 480V DELTA
PRIMARY/208Y/120 SECONDARY
60A RATED MAINS
6 OF 20A 1 POLE BRANCH BREAKERS
NEMA 3R

MINI LOAD CENTER 3-120/208V
15KVA TRANS 480V DELTA
PRIMARY/208Y/120 SECONDARY
60A RATED MAINS
6 OF 20A 1 POLE BRANCH BREAKERS
NEMA 3R

SYSTEM SIZE = 6,156,000 W DC
4,560,000 W AC

51,300 FIRST SOLAR FS-4120A-3 120W MODULES
190 FRONIUS SYMO 24.0-3 480

INVERTER 1-190
PV MODULES = 120Watts STC
270 Modules per Inverter = 32,400 Watts STC
27 strings of 10 PV Modules

TRANSFORMER 1 WILL ENERGIZE WITH CLOSING OF RECLOSER BY DUKE ENERGY.

TRANSFORMER 2 WILL ENERGIZE 10 SECONDS AFTER TRANSFORMER 1.

TRANSFORMER 3 WILL ENERGIZE 10 SECONDS AFTER TRANSFORMER 2

AS PER SHORT-CIRCUIT STUDY AND IN ORDER TO PROTECT THE INVERTER POWER SUPPLY WIRING, ALL PANELBOARDS FEEDING SWITCHBOARDS WITH CONDUCTORS LENGTHS <76 FT SHALL BE PROVIDED WITH CURRENT LIMITING FUSES.

THIS APPLIES TO PANEL BOARDS:
- 11 (SWITCHBOARD 1)
- 27, 28 (SWITCHBOARD 2)
- 43 (SWITCHBOARD 3)

CABLE # NOMENCLATURE

CABLE FROM INVERTER TO PV AC SUB PANEL = IP
EXAMPLE:
CABLE FROM INVERTER 190 TO PV AC SUB PANEL 64 = IP190.64

CABLE FROM PV AC SUB PANEL TO PV AC SWITCHBOARD = PS
EXAMPLE:
CABLE FROM PV AC SUB PANEL 64 TO PV AC SWITCHBOARD 3 = PS64.3

CABLE FROM TRANSFORMER TO TRANSFORMER = TT
EXAMPLE:
CABLE FROM TRANSFORMER 3 TO TRANSFORMER 2 = TT3.2

CABLE FROM TRANSFORMER 1 TO POI = CABLE #14

greengo

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PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32152 JAMES A. CRAIG

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
07-13-2018	Alignament update
07-24-2018	Fused PB numbers
07-30-2018	Surge arrester rating
07-30-2018	Trafo rating nomenclature
11-12-2018	VFI Power supply
01-18-2019	3rd Customer Pole Added

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

ONE LINE MV-LV

E-201

INVERTER MAX CONTINUOUS
OUTPUT CURRENT = 28.9A EACH
28.9A*1.25=36.125A MIN OCPD

27 STRINGS OF 10 MODULES
MPPT1: 15 STRINGS
MPPT2: 12 STRINGS
270 MODULES = 32,400 W-DC

INV-1
FRONIUS
SYMO 24.0-3-480
PV INVERTER

28.9 A

4-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS
7-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS

PV 1
PV AC SUB PANEL 1
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS1.1
PV-1 FEEDER TO SWB-1
MLO
CABLE #: IP1.1
3P/40A
INV-2 270 MODULES CABLE #: IP2.1
INV-3 270 MODULES CABLE #: IP3.1
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 2
PV AC SUB PANEL 2
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS2.1
PV-2 FEEDER TO SWB-1
MLO
3P/40A
INV-4 270 MODULES CABLE #: IP4.2
INV-5 270 MODULES CABLE #: IP5.2
INV-6 270 MODULES CABLE #: IP6.2
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 3
PV AC SUB PANEL 3
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS3.1
PV-3 FEEDER TO SWB-1
MLO
3P/40A
INV-7 270 MODULES CABLE #: IP7.3
INV-8 270 MODULES CABLE #: IP8.3
INV-9 270 MODULES CABLE #: IP9.3
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 4
PV AC SUB PANEL 4
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS4.1
PV-4 FEEDER TO SWB-1
MLO
3P/40A
INV-10 270 MODULES CABLE #: IP10.4
INV-11 270 MODULES CABLE #: IP11.4
INV-12 270 MODULES CABLE #: IP12.4
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 5
PV AC SUB PANEL 5
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS5.1
PV-5 FEEDER TO SWB-1
MLO
3P/40A
INV-13 270 MODULES CABLE #: IP13.5
INV-14 270 MODULES CABLE #: IP14.5
INV-15 270 MODULES CABLE #: IP15.5
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 6
PV AC SUB PANEL 6
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS6.1
PV-6 FEEDER TO SWB-1
MLO
3P/40A
INV-16 270 MODULES CABLE #: IP16.6
INV-17 270 MODULES CABLE #: IP17.6
INV-18 270 MODULES CABLE #: IP18.6
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 7
PV AC SUB PANEL 7
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS7.1
PV-7 FEEDER TO SWB-1
MLO
3P/40A
INV-19 270 MODULES CABLE #: IP19.7
INV-20 270 MODULES CABLE #: IP20.7
INV-21 270 MODULES CABLE #: IP21.7
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 8
PV AC SUB PANEL 8
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS8.1
PV-8 FEEDER TO SWB-1
MLO
3P/40A
INV-22 270 MODULES CABLE #: IP22.8
INV-23 270 MODULES CABLE #: IP23.8
INV-24 270 MODULES CABLE #: IP24.8
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 9
PV AC SUB PANEL 9
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS9.1
PV-9 FEEDER TO SWB-1
MLO
3P/40A
INV-25 270 MODULES CABLE #: IP25.9
INV-26 270 MODULES CABLE #: IP26.9
INV-27 270 MODULES CABLE #: IP27.9
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 10
PV AC SUB PANEL 10
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS10.1
PV-10 FEEDER TO SWB-1
MLO
3P/40A
INV-28 270 MODULES CABLE #: IP28.10
INV-29 270 MODULES CABLE #: IP29.10
INV-30 270 MODULES CABLE #: IP30.10
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 11
PV AC SUB PANEL 11
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS11.1
PV-11 FEEDER TO SWB-1
MLO
3P/40A
INV-31 270 MODULES CABLE #: IP31.11
INV-32 270 MODULES CABLE #: IP32.11
INV-33 270 MODULES CABLE #: IP33.11
SPARE
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A
CLASS J FUSE OR EQUIVALENT <16kA

PV 12
PV AC SUB PANEL 12
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS12.1
PV-12 FEEDER TO SWB-1
MLO
3P/40A
INV-34 270 MODULES CABLE #: IP34.12
INV-35 270 MODULES CABLE #: IP35.12
INV-36 270 MODULES CABLE #: IP36.12
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 13
PV AC SUB PANEL 13
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS13.1
PV-13 FEEDER TO SWB-1
MLO
3P/40A
INV-37 270 MODULES CABLE #: IP37.13
INV-38 270 MODULES CABLE #: IP38.13
INV-39 270 MODULES CABLE #: IP39.13
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 14
PV AC SUB PANEL 14
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS14.1
PV-14 FEEDER TO SWB-1
MLO
3P/40A
INV-40 270 MODULES CABLE #: IP40.14
INV-41 270 MODULES CABLE #: IP41.14
INV-42 270 MODULES CABLE #: IP42.14
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 15
PV AC SUB PANEL 15
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS15.1
PV-15 FEEDER TO SWB-1
MLO
3P/40A
INV-43 270 MODULES CABLE #: IP43.15
INV-44 270 MODULES CABLE #: IP44.15
INV-45 270 MODULES CABLE #: IP45.15
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 16
PV AC SUB PANEL 16
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS16.1
PV-16 FEEDER TO SWB-1
MLO
3P/40A
INV-46 270 MODULES CABLE #: IP46.16
INV-47 270 MODULES CABLE #: IP47.16
INV-48 270 MODULES CABLE #: IP48.16
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 17
PV AC SUB PANEL 17
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS17.1
PV-17 FEEDER TO SWB-1
MLO
3P/40A
INV-49 270 MODULES CABLE #: IP49.17
INV-50 270 MODULES CABLE #: IP50.17
INV-51 270 MODULES CABLE #: IP51.17
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 18
PV AC SUB PANEL 18
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS18.1
PV-18 FEEDER TO SWB-1
MLO
3P/40A
INV-52 270 MODULES CABLE #: IP52.18
INV-53 270 MODULES CABLE #: IP53.18
INV-54 270 MODULES CABLE #: IP54.18
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 19
PV AC SUB PANEL 19
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS19.1
PV-19 FEEDER TO SWB-1
MLO
3P/40A
INV-55 270 MODULES CABLE #: IP55.19
INV-56 270 MODULES CABLE #: IP56.19
INV-57 270 MODULES CABLE #: IP57.19
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 20
PV AC SUB PANEL 20
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS20.1
PV-20 FEEDER TO SWB-1
MLO
3P/40A
INV-58 270 MODULES CABLE #: IP58.20
INV-59 270 MODULES CABLE #: IP59.20
INV-60 270 MODULES CABLE #: IP60.20
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 21
PV AC SUB PANEL 21
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS21.1
PV-21 FEEDER TO SWB-1
MLO
3P/40A
INV-61 270 MODULES CABLE #: IP61.21
INV-62 270 MODULES CABLE #: IP62.21
INV-63 270 MODULES CABLE #: IP63.21
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

SEE PAGE E-201 FOR SWB DETAILS

INVERTER 2-190 DC CONFIGURATION
TYPICAL OF INV-1

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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS	
DATE	COMMENT
07-13-2018	Alignament update
07-24-2018	PV 10,11,18 changed

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

ONE LINE
PANEL BOARDS

E-202

INVERTER MAX CONTINUOUS
OUTPUT CURRENT = 28.9A EACH
28.9A*1.25=36.125A MIN OCPD

27 STRINGS OF 10 MODULES
MPPT1: 15 STRINGS
MPPT2: 12 STRINGS
270 MODULES = 32,400 W-DC

INV-64 FRONIUS SYMO 24.0-3 480 PV INVERTER

28.9 A

4-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS
7-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS

PV 22
PV AC SUB PANEL 22
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS22.2
PV-22 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
CABLE #: IP64.22
INV-65 270 MODULES
CABLE #: IP65.22
INV-66 270 MODULES
CABLE #: IP66.22

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 23
PV AC SUB PANEL 23
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS23.2
PV-23 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-67 270 MODULES
CABLE #: IP67.23
INV-68 270 MODULES
CABLE #: IP68.23
INV-69 270 MODULES
CABLE #: IP69.23

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 24
PV AC SUB PANEL 24
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS24.2
PV-24 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-70 270 MODULES
CABLE #: IP70.24
INV-71 270 MODULES
CABLE #: IP71.24
INV-72 270 MODULES
CABLE #: IP72.24

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 25
PV AC SUB PANEL 25
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS25.2
PV-25 FEEDER TO SG-2
MLO
3P/40A
3P/40A
3P/40A
3P/40A
INV-73 270 MODULES
CABLE #: IP73.25
INV-74 270 MODULES
CABLE #: IP74.25
INV-75 270 MODULES
CABLE #: IP75.25
INV-76 270 MODULES
CABLE #: IP76.25

4 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 26
PV AC SUB PANEL 26
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS26.2
PV-26 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-77 270 MODULES
CABLE #: IP77.26
INV-78 270 MODULES
CABLE #: IP78.26
INV-79 270 MODULES
CABLE #: IP79.26

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 27
PV AC SUB PANEL 27
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS27.2
PV-27 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
3P/40A
INV-80 270 MODULES
CABLE #: IP80.27
INV-81 270 MODULES
CABLE #: IP81.27
INV-82 270 MODULES
CABLE #: IP82.27
SPARE

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A
CLASS J FUSE OR EQUIVALENT <16kA

PV 28
PV AC SUB PANEL 28
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS28.2
PV-28 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
3P/40A
INV-83 270 MODULES
CABLE #: IP83.28
INV-84 270 MODULES
CABLE #: IP84.28
INV-85 270 MODULES
CABLE #: IP85.28
SPARE

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A
CLASS J FUSE OR EQUIVALENT <16kA

PV 29
PV AC SUB PANEL 29
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS29.2
PV-29 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-86 270 MODULES
CABLE #: IP86.29
INV-87 270 MODULES
CABLE #: IP87.29
INV-88 270 MODULES
CABLE #: IP88.29

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 30
PV AC SUB PANEL 30
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS30.2
PV-30 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-89 270 MODULES
CABLE #: IP89.30
INV-90 270 MODULES
CABLE #: IP90.30
INV-91 270 MODULES
CABLE #: IP91.30

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 31
PV AC SUB PANEL 31
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS31.2
PV-31 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-92 270 MODULES
CABLE #: IP92.31
INV-93 270 MODULES
CABLE #: IP93.31
INV-94 270 MODULES
CABLE #: IP94.31

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 32
PV AC SUB PANEL 32
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS32.2
PV-32 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-95 270 MODULES
CABLE #: IP95.32
INV-96 270 MODULES
CABLE #: IP96.32
INV-97 270 MODULES
CABLE #: IP97.32

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 33
PV AC SUB PANEL 33
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS33.2
PV-33 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-98 270 MODULES
CABLE #: IP98.33
INV-99 270 MODULES
CABLE #: IP99.33
INV-100 270 MODULES
CABLE #: IP100.33

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 34
PV AC SUB PANEL 34
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS34.2
PV-34 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-101 270 MODULES
CABLE #: IP101.34
INV-102 270 MODULES
CABLE #: IP102.34
INV-103 270 MODULES
CABLE #: IP103.34

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 35
PV AC SUB PANEL 35
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS35.2
PV-35 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-104 270 MODULES
CABLE #: IP104.35
INV-105 270 MODULES
CABLE #: IP105.35
INV-106 270 MODULES
CABLE #: IP106.35

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 36
PV AC SUB PANEL 36
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS36.2
PV-36 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-107 270 MODULES
CABLE #: IP107.36
INV-108 270 MODULES
CABLE #: IP108.36
INV-109 270 MODULES
CABLE #: IP109.36

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 37
PV AC SUB PANEL 37
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS37.2
PV-37 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-110 270 MODULES
CABLE #: IP110.37
INV-111 270 MODULES
CABLE #: IP111.37
INV-112 270 MODULES
CABLE #: IP112.37

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 38
PV AC SUB PANEL 38
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS38.2
PV-38 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-113 270 MODULES
CABLE #: IP113.38
INV-114 270 MODULES
CABLE #: IP114.38
INV-115 270 MODULES
CABLE #: IP115.38

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 39
PV AC SUB PANEL 39
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS39.2
PV-39 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-116 270 MODULES
CABLE #: IP116.39
INV-117 270 MODULES
CABLE #: IP117.39
INV-118 270 MODULES
CABLE #: IP118.39

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 40
PV AC SUB PANEL 40
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS40.2
PV-40 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-119 270 MODULES
CABLE #: IP119.40
INV-120 270 MODULES
CABLE #: IP120.40
INV-121 270 MODULES
CABLE #: IP121.40

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 41
PV AC SUB PANEL 41
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS41.2
PV-41 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-122 270 MODULES
CABLE #: IP122.41
INV-123 270 MODULES
CABLE #: IP123.41
INV-124 270 MODULES
CABLE #: IP124.41

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 42
PV AC SUB PANEL 42
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS42.2
PV-42 FEEDER TO SWB-2
MLO
3P/40A
3P/40A
3P/40A
INV-125 270 MODULES
CABLE #: IP125.42
INV-126 270 MODULES
CABLE #: IP126.42
INV-127 270 MODULES
CABLE #: IP127.42

3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

SEE PAGE E-201 FOR SWB DETAILS

INVERTER 2-190 DC CONFIGURATION
TYPICAL OF INV-1

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
07-13-2018	Alignament update
07-24-2018	PV 25,27,35,36 changed
07/24/2018	PV 28 adjustment
08/15/2018	PV 25 adjusted to 4 Inv.

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

ONE LINE PANEL BOARDS

E-203

INVERTER MAX CONTINUOUS
OUTPUT CURRENT = 28.9A EACH
28.9A*1.25=36.125A MIN OCPD

27 STRINGS OF 10 MODULES
MPPT1: 15 STRINGS
MPPT2: 12 STRINGS
270 MODULES = 32,400 W-DC

INV-128
FRONIUS
SYMO 24.0-3 480
PV INVERTER

4-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS
7-STRINGS HARNESS
4-STRINGS HARNESS
4-STRINGS HARNESS

CABLE #: IP128.43
28.9 A

PV 43
PV AC SUB PANEL 43
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS43.3
PV-43 FEEDER TO SWB-3
MLO
3P/40A
INV-129 270 MODULES
CABLE #: IP129.43
INV-130 270 MODULES
CABLE #: IP130.43
SPARE
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A
CLASS J FUSE OR EQUIVALENT <16kA

PV 44
PV AC SUB PANEL 44
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS44.3
PV-44 FEEDER TO SWB-3
MLO
INV-131 270 MODULES
CABLE #: IP128.44
INV-132 270 MODULES
CABLE #: IP129.44
INV-133 270 MODULES
CABLE #: IP130.44
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 45
PV AC SUB PANEL 45
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS45.3
PV-45 FEEDER TO SWB-3
MLO
INV-134 270 MODULES
CABLE #: IP134.45
INV-135 270 MODULES
CABLE #: IP135.45
INV-136 270 MODULES
CABLE #: IP136.45
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 46
PV AC SUB PANEL 46
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS46.3
PV-46 FEEDER TO SWB-3
MLO
INV-137 270 MODULES
CABLE #: IP137.46
INV-138 270 MODULES
CABLE #: IP138.46
INV-139 270 MODULES
CABLE #: IP139.46
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 47
PV AC SUB PANEL 47
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS47.3
PV-47 FEEDER TO SWB-3
MLO
INV-140 270 MODULES
CABLE #: IP140.47
INV-141 270 MODULES
CABLE #: IP141.47
INV-142 270 MODULES
CABLE #: IP142.47
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 48
PV AC SUB PANEL 48
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS48.3
PV-48 FEEDER TO SWB-3
MLO
INV-143 270 MODULES
CABLE #: IP143.48
INV-144 270 MODULES
CABLE #: IP144.48
INV-145 270 MODULES
CABLE #: IP145.48
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 49
PV AC SUB PANEL 49
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS49.3
PV-49 FEEDER TO SWB-3
MLO
INV-146 270 MODULES
CABLE #: IP146.49
INV-147 270 MODULES
CABLE #: IP147.49
INV-148 270 MODULES
CABLE #: IP148.49
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 50
PV AC SUB PANEL 50
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS50.3
PV-50 FEEDER TO SWB-3
MLO
INV-149 270 MODULES
CABLE #: IP149.50
INV-150 270 MODULES
CABLE #: IP150.50
INV-151 270 MODULES
CABLE #: IP151.50
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 51
PV AC SUB PANEL 51
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS51.3
PV-51 FEEDER TO SWB-3
MLO
INV-152 270 MODULES
CABLE #: IP152.51
INV-153 270 MODULES
CABLE #: IP153.51
INV-154 270 MODULES
CABLE #: IP154.51
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 52
PV AC SUB PANEL 52
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS52.3
PV-52 FEEDER TO SWB-3
MLO
INV-155 270 MODULES
CABLE #: IP155.52
INV-156 270 MODULES
CABLE #: IP156.52
INV-157 270 MODULES
CABLE #: IP157.52
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 53
PV AC SUB PANEL 53
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS53.3
PV-53 FEEDER TO SWB-3
MLO
INV-158 270 MODULES
CABLE #: IP158.53
INV-159 270 MODULES
CABLE #: IP159.53
INV-160 270 MODULES
CABLE #: IP160.53
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 54
PV AC SUB PANEL 54
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS54.3
PV-54 FEEDER TO SWB-3
MLO
INV-161 270 MODULES
CABLE #: IP161.54
INV-162 270 MODULES
CABLE #: IP162.54
INV-163 270 MODULES
CABLE #: IP163.54
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 55
PV AC SUB PANEL 55
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS55.3
PV-55 FEEDER TO SWB-3
MLO
INV-164 270 MODULES
CABLE #: IP164.55
INV-165 270 MODULES
CABLE #: IP165.55
INV-166 270 MODULES
CABLE #: IP166.55
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 56
PV AC SUB PANEL 56
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS56.3
PV-56 FEEDER TO SWB-3
MLO
INV-167 270 MODULES
CABLE #: IP167.56
INV-168 270 MODULES
CABLE #: IP168.56
INV-169 270 MODULES
CABLE #: IP169.56
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 57
PV AC SUB PANEL 57
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS57.3
PV-57 FEEDER TO SWB-3
MLO
INV-170 270 MODULES
CABLE #: IP170.57
INV-171 270 MODULES
CABLE #: IP171.57
INV-172 270 MODULES
CABLE #: IP172.57
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 58
PV AC SUB PANEL 58
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS58.3
PV-58 FEEDER TO SWB-3
MLO
INV-173 270 MODULES
CABLE #: IP173.58
INV-174 270 MODULES
CABLE #: IP174.58
INV-175 270 MODULES
CABLE #: IP175.58
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 59
PV AC SUB PANEL 59
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS59.3
PV-59 FEEDER TO SWB-3
MLO
INV-176 270 MODULES
CABLE #: IP176.59
INV-177 270 MODULES
CABLE #: IP177.59
INV-178 270 MODULES
CABLE #: IP178.59
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 60
PV AC SUB PANEL 60
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS60.3
PV-60 FEEDER TO SWB-3
MLO
INV-179 270 MODULES
CABLE #: IP179.60
INV-180 270 MODULES
CABLE #: IP180.60
INV-181 270 MODULES
CABLE #: IP181.60
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 61
PV AC SUB PANEL 61
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS61.3
PV-61 FEEDER TO SWB-3
MLO
INV-182 270 MODULES
CABLE #: IP182.61
INV-183 270 MODULES
CABLE #: IP183.61
INV-184 270 MODULES
CABLE #: IP184.61
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 62
PV AC SUB PANEL 62
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS62.3
PV-62 FEEDER TO SWB-3
MLO
INV-185 270 MODULES
CABLE #: IP185.62
INV-186 270 MODULES
CABLE #: IP186.62
INV-187 270 MODULES
CABLE #: IP187.62
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

PV 63
PV AC SUB PANEL 63
200A MLO AC SUB PANEL
480/277Y-3P-4W
35 KAIC MIN.

CABLE #: PS63.3
PV-63 FEEDER TO SWB-3
MLO
INV-188 270 MODULES
CABLE #: IP188.63
INV-189 270 MODULES
CABLE #: IP189.63
INV-190 270 MODULES
CABLE #: IP190.63
3 INVERTERS @ 40A OCPD
BUSS BAR RATING 200-A

SEE PAGE E-201 FOR SWB DETAILS

INVERTER 2-190 DC CONFIGURATION
TYPICAL OF INV-1

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
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ARC DESIGN
SALEM COUNTY OFFICE
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(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL
NOTARIAL SEAL
JAMES A. CICCONE
ENGINEER
SEAL
32192
PROFESSIONAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
07-13-2018	Alignament update
07-24-2018	PV 44,58,59 changed
07-24-2018	PV 43 adjustment

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

ONE LINE PANEL BOARDS

E-204

ACCORDING TO NEC 310.15 (C) Engineering Supervision, ALL AC CABLE SIZE CALCULATIONS ARE JUSTIFIED WITH THE AMPACITY STUDY NAMED "ENNIS SOLAR, LLC 4.56MWac PV PLANT CABLE AMAPACITY STUDY REPORT".

From Inverter #	To Sub Panel #	Cable #	COOPER L1, L2, L3	COOPER N	GND	CONDUIT	LENGTH (FT)	Voltage drop (%)
1	1	IP1.1	#6	#10	#10	1"	53.7	0.25%
2		IP2.1	#6	#10	#10	1"	9.6	0.04%
3		IP3.1	#6	#10	#10	1"	39.1	0.18%
4	2	IP4.2	#6	#10	#10	1"	33.9	0.16%
5		IP5.2	#6	#10	#10	1"	9.6	0.04%
6		IP6.2	#6	#10	#10	1"	39.1	0.18%
7	3	IP7.3	#6	#10	#10	1"	33.9	0.16%
8		IP8.3	#6	#10	#10	1"	9.6	0.04%
9		IP9.3	#6	#10	#10	1"	39.1	0.18%
10	4	IP10.4	#6	#10	#10	1"	33.9	0.16%
11		IP11.4	#6	#10	#10	1"	9.6	0.04%
12		IP12.4	#6	#10	#10	1"	39.1	0.18%
13	5	IP13.5	#6	#10	#10	1"	33.9	0.16%
14		IP14.5	#6	#10	#10	1"	9.6	0.04%
15		IP15.5	#6	#10	#10	1"	39.1	0.18%
16	6	IP16.6	#6	#10	#10	1"	33.9	0.16%
17		IP17.6	#6	#10	#10	1"	9.6	0.04%
18		IP18.6	#6	#10	#10	1"	39.1	0.18%
19	7	IP19.7	#6	#10	#10	1"	33.9	0.16%
20		IP20.7	#6	#10	#10	1"	9.6	0.04%
21		IP21.7	#6	#10	#10	1"	39.1	0.18%
22	8	IP22.8	#6	#10	#10	1"	33.9	0.16%
23		IP23.8	#6	#10	#10	1"	9.6	0.04%
24		IP24.8	#6	#10	#10	1"	39.1	0.18%
25	9	IP25.9	#6	#10	#10	1"	33.9	0.16%
26		IP26.9	#6	#10	#10	1"	9.6	0.04%
27		IP27.9	#6	#10	#10	1"	39.1	0.18%
28	10	IP28.10	#6	#10	#10	1"	33.9	0.16%
29		IP29.10	#6	#10	#10	1"	9.6	0.04%
30		IP30.10	#6	#10	#10	1"	39.1	0.18%
31	11	IP31.11	#6	#10	#10	1"	47.5	0.22%
32		IP32.11	#6	#10	#10	1"	9.6	0.04%
33		IP33.11	#6	#10	#10	1"	52.7	0.24%
34	12	IP34.12	#6	#10	#10	1"	47.5	0.22%
35		IP35.12	#6	#10	#10	1"	9.6	0.04%
36		IP36.12	#6	#10	#10	1"	52.7	0.24%
37	13	IP37.13	#6	#10	#10	1"	47.5	0.22%
38		IP38.13	#6	#10	#10	1"	9.6	0.04%
39		IP39.13	#6	#10	#10	1"	52.7	0.24%
40	14	IP40.14	#6	#10	#10	1"	51.5	0.24%
41		IP41.14	#6	#10	#10	1"	9.6	0.04%
42		IP42.14	#6	#10	#10	1"	46.3	0.21%
43	15	IP43.15	#6	#10	#10	1"	35.6	0.16%
44		IP44.15	#6	#10	#10	1"	9.6	0.04%
45		IP45.15	#6	#10	#10	1"	31.3	0.14%
46	16	IP46.16	#6	#10	#10	1"	35.6	0.16%
47		IP47.16	#6	#10	#10	1"	9.6	0.04%
48		IP48.16	#6	#10	#10	1"	31.3	0.14%
49	17	IP49.17	#6	#10	#10	1"	51.5	0.24%
50		IP50.17	#6	#10	#10	1"	9.6	0.04%
51		IP51.17	#6	#10	#10	1"	91.2	0.42%
52	18	IP52.18	#6	#10	#10	1"	51.6	0.24%
53		IP53.18	#6	#10	#10	1"	9.6	0.04%
54		IP54.18	#6	#10	#10	1"	46.2	0.21%
55	19	IP55.19	#6	#10	#10	1"	36.5	0.17%
56		IP56.19	#6	#10	#10	1"	9.6	0.04%
57		IP57.19	#6	#10	#10	1"	31.3	0.14%
58	20	IP58.20	#6	#10	#10	1"	36.5	0.17%
59		IP59.20	#6	#10	#10	1"	9.6	0.04%
60		IP60.20	#6	#10	#10	1"	31.3	0.14%
61	21	IP61.21	#6	#10	#10	1"	36.5	0.17%
62		IP62.21	#6	#10	#10	1"	9.6	0.04%
63		IP63.21	#6	#10	#10	1"	31.3	0.14%
64	22	IP64.22	#6	#10	#10	1"	36.5	0.17%
65		IP65.22	#6	#10	#10	1"	17.6	0.08%
66		IP66.22	#6	#10	#10	1"	23.0	0.11%
67	23	IP67.23	#6	#10	#10	1"	36.5	0.17%
68		IP68.23	#6	#10	#10	1"	17.6	0.08%
69		IP69.23	#6	#10	#10	1"	23.0	0.11%
70	24	IP70.24	#6	#10	#10	1"	36.5	0.17%
71		IP71.24	#6	#10	#10	1"	17.6	0.08%
72		IP72.24	#6	#10	#10	1"	23.0	0.11%
73	25	IP73.25	#6	#10	#10	1"	36.5	0.17%
74		IP74.25	#6	#10	#10	1"	17.6	0.08%
75		IP75.25	#6	#10	#10	1"	23.0	0.11%
76		IP76.25	#6	#10	#10	1"	46.3	0.21%
77	26	IP77.26	#6	#10	#10	1"	62.6	0.29%
78		IP78.26	#6	#10	#10	1"	9.6	0.04%
79		IP79.26	#6	#10	#10	1"	27.4	0.13%
80	27	IP80.27	#6	#10	#10	1"	36.6	0.17%
81		IP81.27	#6	#10	#10	1"	9.6	0.04%
82		IP82.27	#6	#10	#10	1"	31.5	0.14%
83	28	IP83.28	#6	#10	#10	1"	36.5	0.17%
84		IP84.28	#6	#10	#10	1"	9.6	0.04%
85		IP85.28	#6	#10	#10	1"	31.3	0.14%
86	29	IP86.29	#6	#10	#10	1"	36.5	0.17%
87		IP87.29	#6	#10	#10	1"	9.6	0.04%
88		IP88.29	#6	#10	#10	1"	31.3	0.14%
89	30	IP89.30	#6	#10	#10	1"	36.5	0.17%
90		IP90.30	#6	#10	#10	1"	9.6	0.04%
91		IP91.30	#6	#10	#10	1"	31.3	0.14%
92	31	IP92.31	#6	#10	#10	1"	36.5	0.17%
93		IP93.31	#6	#10	#10	1"	9.6	0.04%
94		IP94.31	#6	#10	#10	1"	46.3	0.21%
95	32	IP95.32	#6	#10	#10	1"	45.5	0.21%
96		IP96.32	#6	#10	#10	1"	9.6	0.04%
97		IP97.32	#6	#10	#10	1"	59.9	0.28%
98	33	IP98.33	#6	#10	#10	1"	67.7	0.31%
99		IP99.33	#6	#10	#10	1"	39.0	0.18%
100		IP100.33	#6	#10	#10	1"	17.6	0.08%
101	34	IP101.34	#6	#10	#10	1"	47.5	0.22%
102		IP102.34	#6	#10	#10	1"	9.6	0.04%
103		IP103.34	#6	#10	#10	1"	52.7	0.24%
104	35	IP104.35	#6	#10	#10	1"	47.5	0.22%
105		IP105.35	#6	#10	#10	1"	9.6	0.04%
106		IP106.35	#6	#10	#10	1"	52.7	0.24%
107	36	IP107.36	#6	#10	#10	1"	45.5	0.21%
108		IP108.36	#6	#10	#10	1"	9.6	0.04%
109		IP109.36	#6	#10	#10	1"	50.7	0.23%
110	37	IP110.37	#6	#10	#10	1"	54.2	0.25%
111		IP111.37	#6	#10	#10	1"	9.6	0.04%
112		IP112.37	#6	#10	#10	1"	33.7	0.15%
113	38	IP113.38	#6	#10	#10	1"	39.1	0.18%
114		IP114.38	#6	#10	#10	1"	9.6	0.04%
115		IP115.38	#6	#10	#10	1"	33.7	0.15%
116	39	IP116.39	#6	#10	#10	1"	39.1	0.18%
117		IP117.39	#6	#10	#10	1"	9.6	0.04%
118		IP118.39	#6	#10	#10	1"	33.7	0.15%
119	40	IP119.40	#6	#10	#10	1"	39.1	0.18%
120		IP120.40	#6	#10	#10	1"	9.6	0.04%
121		IP121.40	#6	#10	#10	1"	33.7	0.15%
122	41	IP122.41	#6	#10	#10	1"	39.1	0.18%
123		IP123.41	#6	#10	#10	1"	9.6	0.04%
124		IP124.41	#6	#10	#10	1"	33.7	0.15%
125	42	IP125.42	#6	#10	#10	1"	38.2	0.18%
126		IP126.42	#6	#10	#10	1"	9.6	0.04%
127		IP127.42	#6	#10	#10	1"	32.5	0.15%
128	43	IP128.43	#6	#10	#10	1"	99.0	0.45%
129		IP129.43	#6	#10	#10	1"	9.6	0.04%
130		IP130.43	#6	#10	#10	1"	69.4	0.32%
131	44	IP131.44	#6	#10	#10	1"	33.9	0.16%
132		IP132.44	#6	#10	#10	1"	9.6	0.04%
133		IP133.44	#6	#10	#10	1"	37.1	0.17%
134	45	IP134.45	#6	#10	#10	1"	33.9	0.16%
135		IP135.45	#6	#10	#10	1"	9.6	0.04%
136		IP136.45	#6	#10	#10	1"	37.1	0.17%
137	46	IP137.46	#6	#10	#10	1"	33.9	0.16%
138		IP138.46	#6	#10	#10	1"	9.6	0.04%
139		IP139.46	#6	#10	#10	1"	37.1	0.17%
140	47	IP140.47	#6	#10	#10	1"	33.9	0.16%
141		IP141.47	#6	#10	#10	1"	9.6	0.04%
142		IP142.47	#6	#10	#10	1"	37.1	0.17%
143	48	IP143.48	#6	#10	#10	1"	33.9	0.16%
144		IP144.48	#6	#10	#10	1"	9.6	0.04%
145		IP145.48	#6	#10	#10	1"	43.3	0.20%
146	49	IP146.49	#6	#10	#10	1"	44.1	0.20%
147		IP147.49	#6	#10	#10	1"	9.6	0.04%
148		IP148.49	#6	#10	#10	1"	48.6	0.22%
149	50	IP149.50	#6	#10	#10	1"	40.2	0.18%
150		IP150.50	#6	#10	#10	1"	9.6	0.04%
151		IP151.50	#6	#10	#10	1"	46.7	0.21%
152	51	IP152.51	#6	#10	#10	1"	9.6	0.04%
153		IP153.51	#6	#10	#10	1"	46.7	0.21%
154		IP154.51	#6	#10	#10	1"	39.1	0.18%
155	52	IP155.52	#6	#10	#10	1"	38.3	0.18%
156		IP156.52	#6	#10	#10	1"	9.6	0.04%
157		IP157.52	#6	#10	#10	1"	148.0	0.68%
158	53	IP158.53	#6	#10	#10	1"	67.2	0.31%
159		IP159.53	#6	#10	#10	1"	9.6	0.04%
160		IP160.53	#6	#10	#10	1"	73.3	0.34%
161	54	IP161.54	#6	#10	#10	1"	36.0	0.17%
162		IP162.54	#6	#10	#10	1"	9.6	0.04%
163		IP163.54	#6	#10	#10	1"	37.1	0.17%
164	55	IP164.55	#6	#10	#10	1"	36.0	0.17%
165		IP165.55	#6	#10	#10	1"	9.6	0.04%
166		IP166.55	#6	#10	#10	1"	37.1	0.17%
167	56	IP167.56	#6	#10	#10	1"	36.0	0.17%
168		IP168.56	#6	#10	#10	1"	9.6	0.04%
169		IP169.56	#6	#10	#10	1"	37.1	0.17%
170	57	IP170.57	#6	#10	#10	1"	36.0	0.17%
171		IP171.57	#6	#10	#10	1"	9.6	0.04%
172		IP172.57	#6	#10	#10	1"	37.1	0.17%
173	58	IP173.58	#6	#10	#10	1"	36.0	0.17%
174		IP174.58	#6	#10	#10	1"	9.6	0.04%
175		IP175.58	#6	#10	#10	1"	39.2	0.18%
176	59	IP176.59	#6	#10	#10	1"	31.8	0.15%
177		IP177.59	#6	#10	#10	1"	9.6	0.04%
178		IP178.59	#6	#10	#10	1"	37.1	0.17%
179	60	IP179.60	#6	#10	#10	1"	31.8	0.15%
180		IP180.60	#6	#10	#10	1"	9.6	0.04%
181		IP181.60	#6	#10	#10	1"	37.1	0.17%
182	61	IP182.61	#6	#10	#10	1"	31.8	0.15%
183		IP183.61	#6	#10	#10	1"	9.6	0.04%
184		IP184.61	#6	#10	#10	1"	37.1	0.17%
185	62	IP185.62	#6	#10	#10	1"	31.8	0.15%
186		IP186.62	#6	#10	#10	1"	9.6	0.04%
187		IP187.62	#6	#10	#10	1"	59.4	0.27%
188	63	IP188.63	#6	#10	#10	1"	47.1	0.22%
189		IP189.63	#6	#10	#10	1"	9.6	0.04%
190		IP190.63	#6	#10	#10	1"	75.8	0.35%

From Sub Panel #	To Switchgear #	Cable #	ALUMINIUM L1, L2, L3	ALUMINIUM N	GND	CONDUIT	LENGTH (FT)	Voltage drop (%)
1		PS1.1	4/0	#4	#4	4"	487.0	1.36%
2		PS2.1	3/0	#4	#4	4"	442.0	1.55%
3		PS3.1	3/0	#4	#4	4"	397.1	1.39%
4		PS4.1	3/0	#4	#4	4"	352.1	1.23%
5		PS5.1	3/0	#4	#4	4"	307.1	1.08%
6		PS6.1	3/0	#4	#4	4"	262.2	0.92%
7		PS7.1	2/0	#4	#4	4"	217.3	0.96%
8		PS8.1	2/0	#4	#4	4"	172.4	0.76%
9		PS9.1	1/0	#4	#4	4"	127.4	0.71%
10		PS10.1	1/0	#4	#4	4"	82.4	0.46%
11	1	PS11.1	1/0	#4	#4	4"	69.9	0.39%
12		PS12.1	1/0	#4	#4	4"	159.9	0.89%
13		PS13.1	2/0	#4	#4	4"	249.7	1.10%
14		PS14.1	3/0	#4	#4	4"	317.7	1.11%
15		PS15.1	2/0	#4	#4	4"	257.7	1.14%
16		PS16.1	2/0	#4	#4	4"	212.8	0.94%
17		PS17.1	1/0	#4	#4	4"	137.8	0.77%
18		PS18.1	1/0	#4	#4	4"	98.8	0.55%
19		PS19.1	1/0	#4	#4	4"	173.6	0.97%
20		PS20.1	2/0	#4	#4	4"	218.5	0.96%
21		PS21.1	2/0	#4	#4	4"	263.5	1.16%
22		PS22.2	2/0	#4	#4	4"	234.1	1.03%
23		PS23.2	2/0	#4	#4	4"	189.1	0.83%
24		PS24.2	1/0	#4	#4	4"	144.1	0.80%
25		PS25.2	2/0	#4	#4	4"	99.3	0.58%
26		PS26.2	3/0	#4	#4	4"	361.1	1.27%
27		PS27.2	1/0	#4	#4	4"	68.0	0.38%
28		PS28.2	1/0	#4	#4	4"	65.7	0.37%
29		PS29.2	1/0	#4	#4	4"	110.5	0.62%
30		PS30.2	1/0	#4	#4	4"	155.5	0.87%
31		PS31.2	2/0	#4	#4	4"	200.5	0.89%
32	2	PS32.2	2/0	#4	#4	4"	288.6	1.27%
33		PS33.2	2/0	#4	#4	4"	256.0	1.13%
34		PS34.2	2/0	#4	#4	4"	196.1	0.87%
35		PS35.2	1/0	#4	#4	4"	106.2	0.59%
36		PS36.2	1/0	#4	#4	4"	82.3	0.46%
37		PS37.2	4/0	#4	#4	4"	589.3	1.64%
38		PS38.2	4/0	#4	#4	4"	636.0	1.77%
39		PS39.2	4/0	#4	#4	4"	682.6	1.90%
40		PS40.2	4/0	#4	#4	4"	729.2	2.03%
41		PS41.2	4/0	#4	#4	4"	775.8	2.16%
42		PS42.2	4/0	#4	#4	4"	822.4	2.29%
43		PS43.3	1/0	#4	#4	4"	35.0	0.20%
44		PS44.3	1/0	#4	#4	4"	91.2	0.51%
45		PS45.3	1/0	#4	#4	4"	138.4	0.77%
46		PS46.3	1/0	#4	#4	4"	184.3	1.03%
47		PS47.3	2/0	#4	#4	4"	230.1	1.02%
48		PS48.3	2/0	#4	#4	4"	276.0	1.22%
49		PS49.3	3/0	#4	#4	4"	332.4	1.17%
50		PS50.3	3/0	#4	#4	4"	385.9	1.35%
51		PS51.3	3/0	#4	#4	4"	422.9	1.48%
52		PS52.3	3/0	#4	#4	4"	475.7	1.67%
53	3	PS53.3	3/0	#4	#4	4"	346.5	1.21%
54		PS54.3	2/0	#4	#4	4"	250.7	1.11%
55		PS55.3	2/0	#4	#4	4"	204.9	0.90%
56		PS56.3	1/0	#4	#4	4"	186.1	1.04%
57		PS57.3	1/0	#4	#4	4"	140.2	0.78%
58		PS58.3	1/0	#4	#4	4"	94.4	0.53%
59		PS59.3	1/0	#4	#4	4"	75.8	0.42%
60		PS60.3	1/0	#4	#4	4"	122.3	0.68%
61		PS61.3	1/0	#4	#4	4"	168.1	0.94%
62		PS62.3	2/0	#4	#4	4"	214.0	0.94%
63		PS63.3	3/0	#4	#4	4"	366.2	1.28%

From	To	Cable #	WIRE SIZE (MINIMUM) L1, L2, L3	N	GND	CONDUIT	LENGTH (FT)
Switchboard #	Transformer #						
Switchboard 1	Transformer 1	bus	bus	bus	bus	N/A	(+/-) 10
Switchboard 2	Transformer 2	bus	bus	bus	bus	N/A	(+/-) 10
Switchboard 3	Transformer 3	bus	bus	bus	bus	N/A	(+/-) 10

From	To	Cable #	MEDIUM VOLTAGE 25 KV Rated Wire (Aluminum) H1,H2, H3	N	GND (CU)	CONDUIT	LENGTH (FT)	Voltage drop (%)
Transformer 3	Transformer 2	TT3.2	#2/0	1/3 CN	#2	4"	1063.4	0.04%
Transformer 2	Transformer 1	TT2.1	#2/0	1/3 CN	#2	4"	556.2	0.05%
Transformer 1	Riser Pole 1	#14	#2/0	1/3 CN	#2	4"	499.4	0.06%
Riser Pole 1	POI		#1/0 (ASCR)	#1/0 (ASCR)	N/A	N/A	194.2	0.02%

From	To	Cable #	LOW VOLTAGE 120 V Auxiliary Power L, N	GND	CONDUIT	LENGTH (FT)	Voltage drop (%)
MLC1	VFI TR-2	MV1.2	2/0 (AL)	10 (Cu)	4"	620	2.59%
MLC2	VFI TR-3	MV2.3	4/0 (AL)	10 (Cu)	4"	1050	2.75%
MLC 1	MC 1 (RP)	MM1.1	10 (Cu)	10 (Cu)	1"	393.75	0.88%
MLC2	Full Base Station	MF.2	10 (Cu)	10 (Cu)	1"	10	0.02%
MLC2	MC 2	MM2.2	10 (Cu)	10 (Cu)	1"	677.25	1.51%
MLC3	MC 3	MM3.3	10 (Cu)	10 (Cu)	1"	44	0.10%

From	To	Cable #	480 V MINI-LOAD CENTER FEEDER L1, L2, L3	GND	CONDUIT	LENGTH (FT)	Voltage drop (%)
SWB-1	MLC-1	SM1.1	10 (Cu)	10 (Cu)	1"	20	0.07%
SWB-2	MLC-2	SM2.2	10 (Cu)	10 (Cu)	1"	20	0.07%

MLC : Mini Load Center/ MC: Media Converter/ VFI: Vacum Fault Interrupter/ RP: Riser Pole / SWB: Switchboard

(4) Indicates 4 sets, (3) Indicates 3 sets, and (2) Indicates 2 sets of wire to be ran. All Conduits may be Sched 40 PVC or Rigid Galvanized at contractors option & in compliance with local codes. Provide 1" conduit to meter location for Utility Telemetering communications line. Supports and expansions shall be placed as per NEC-2017 requirements.

greengo
GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CRAIG

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
12-12-2018	Auxiliary Power Table
12-20-2018	NEC code updated
01-15-2019	OH Neutral ASCR section

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

WIRE CHART (AC)

E-205

INVERTER DC HOMERUNS

NEC-2017 690.8(A):
MAX CIRCUIT CURRET: = Isc x 1.25

DC1 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC2 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC3 (+/- POLES): 7 STRINGS x 1.84A x 1.25 = 16.1A
DC4 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC5 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC6 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A

AMPACITY DE-RATING FACTORS:

ASHRAE 2% TEMPERATURE FACTOR

FORT BRAGG/SIMMONS, NC, USA

AMBIENT HIGH TEMP = 36°C BASE
TEMPERATURE CORRECTION FACTOR FOR 36°C
TABLE 690.31(E)= 0.91

STRING WIRE (HARNESSES AND HOMERUNS):
MIN. #10 PV WIRE 90° C = 40 A /NEC 310-16
x 0.91 TCF
36.4A ALLOWABLE

MAX. NUMBER OF CURRENT-CARRYING CONDUCTORS
IN A SINGLE RUN:
12 (6 positive + 6 Negative)
TABLE 310.15 (B)(3)(a)= 0.50
18.2A ALLOWABLE

VOLTAGE DROP CALCULATION:

$$\Delta V = \frac{2\cdot L\cdot I\cdot \cos\varphi}{K\cdot S}$$

ΔV= Voltage drop in Volts
L= Length of conductor in meters
I= Carried current in amperes
cosφ= 1 (for DC or single phase)
K= Electric conductivity coefficient
K copper (70°C): 48.47
K copper (40°C): 52
K copper (20°C): 58
K aluminum (70°C): 30
K aluminum (40°C): 32
K aluminum (20°C):36
S= Conductor Section in sq.mm.

ΔV(%) = (ΔV/Vmpp)·100

Vmpp= String Voltage at max. power point in Volts

From	To	Labeling	COPPER PV WIRE					
Harness #	inverter #	Cable #	Strings qty	PV Wire +/-	CONDUIT	Isc (A)	LENGTH (FT)	Voltage drop (%)
1	1	PV1 .1	4	#10		7.36	40.00	0.07%
2		PV1 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV1 .3	7	#10		12.88	150.00	0.26%
4		PV1 .4	4	#10		7.36	92.00	0.16%
5		PV1 .5	4	#10	1 1/4"	7.36	132.00	0.23%
6		PV1 .6	4	#10		7.36	172.00	0.30%
1	2	PV2 .1	4	#10		7.36	40.00	0.07%
2		PV2 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV2 .3	4	#10		7.36	120.00	0.21%
4		PV2 .4	4	#10		7.36	160.00	0.28%
5		PV2 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV2 .6	7	#10		12.88	270.00	0.47%
1	3	PV3 .1	4	#10		7.36	40.00	0.07%
2		PV3 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV3 .3	4	#10		7.36	120.00	0.21%
4		PV3 .4	4	#10		7.36	160.00	0.28%
5		PV3 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV3 .6	7	#10		12.88	270.00	0.47%
1	4	PV4 .1	4	#10		7.36	40.00	0.07%
2		PV4 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV4 .3	4	#10		7.36	120.00	0.21%
4		PV4 .4	4	#10		7.36	160.00	0.28%
5		PV4 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV4 .6	7	#10		12.88	270.00	0.47%
1	5	PV5 .1	4	#10		7.36	40.00	0.07%
2		PV5 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV5 .3	4	#10		7.36	120.00	0.21%
4		PV5 .4	4	#10		7.36	160.00	0.28%
5		PV5 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV5 .6	7	#10		12.88	270.00	0.47%
1	6	PV6 .1	4	#10		7.36	40.00	0.07%
2		PV6 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV6 .3	4	#10		7.36	120.00	0.21%
4		PV6 .4	4	#10		7.36	160.00	0.28%
5		PV6 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV6 .6	7	#10		12.88	270.00	0.47%
1	7	PV7 .1	4	#10		7.36	40.00	0.07%
2		PV7 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV7 .3	4	#10		7.36	120.00	0.21%
4		PV7 .4	4	#10		7.36	160.00	0.28%
5		PV7 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV7 .6	7	#10		12.88	270.00	0.47%
1	8	PV8 .1	4	#10		7.36	40.00	0.07%
2		PV8 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV8 .3	4	#10		7.36	120.00	0.21%
4		PV8 .4	4	#10		7.36	160.00	0.28%
5		PV8 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV8 .6	7	#10		12.88	270.00	0.47%
1	9	PV9 .1	4	#10		7.36	40.00	0.07%
2		PV9 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV9 .3	4	#10		7.36	120.00	0.21%
4		PV9 .4	4	#10		7.36	160.00	0.28%
5		PV9 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV9 .6	7	#10		12.88	270.00	0.47%
1	10	PV10 .1	4	#10		7.36	40.00	0.07%
2		PV10 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV10 .3	4	#10		7.36	120.00	0.21%
4		PV10 .4	4	#10		7.36	160.00	0.28%
5		PV10 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV10 .6	7	#10		12.88	270.00	0.47%
1	11	PV11 .1	4	#10		7.36	40.00	0.07%
2		PV11 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV11 .3	4	#10		7.36	120.00	0.21%
4		PV11 .4	4	#10		7.36	160.00	0.28%
5		PV11 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV11 .6	7	#10		12.88	270.00	0.47%
1	12	PV12 .1	4	#10		7.36	40.00	0.07%
2		PV12 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV12 .3	4	#10		7.36	120.00	0.21%
4		PV12 .4	4	#10		7.36	160.00	0.28%
5		PV12 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV12 .6	7	#10		12.88	270.00	0.47%
1	13	PV13 .1	4	#10		7.36	40.00	0.07%
2		PV13 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV13 .3	4	#10		7.36	120.00	0.21%
4		PV13 .4	4	#10		7.36	160.00	0.28%
5		PV13 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV13 .6	7	#10		12.88	270.00	0.47%
1	14	PV14 .1	4	#10		7.36	40.00	0.07%
2		PV14 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV14 .3	4	#10		7.36	120.00	0.21%
4		PV14 .4	4	#10		7.36	160.00	0.28%
5		PV14 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV14 .6	7	#10		12.88	270.00	0.47%
1	15	PV15 .1	4	#10		7.36	40.00	0.07%
2		PV15 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV15 .3	4	#10		7.36	120.00	0.21%
4		PV15 .4	4	#10		7.36	160.00	0.28%
5		PV15 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV15 .6	7	#10		12.88	270.00	0.47%
1	16	PV16 .1	4	#10		7.36	40.00	0.07%
2		PV16 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV16 .3	4	#10		7.36	120.00	0.21%
4		PV16 .4	4	#10		7.36	160.00	0.28%
5		PV16 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV16 .6	7	#10		12.88	270.00	0.47%
1	17	PV17 .1	4	#10		7.36	40.00	0.07%
2		PV17 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV17 .3	4	#10		7.36	120.00	0.21%
4		PV17 .4	4	#10		7.36	160.00	0.28%
5		PV17 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV17 .6	7	#10		12.88	270.00	0.47%
1	18	PV18 .1	4	#10		7.36	40.00	0.07%
2		PV18 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV18 .3	4	#10		7.36	120.00	0.21%
4		PV18 .4	4	#10		7.36	160.00	0.28%
5		PV18 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV18 .6	7	#10		12.88	270.00	0.47%
1	19	PV19 .1	4	#10		7.36	40.00	0.07%
2		PV19 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV19 .3	4	#10		7.36	120.00	0.21%
4		PV19 .4	4	#10		7.36	160.00	0.28%
5		PV19 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV19 .6	7	#10		12.88	270.00	0.47%
1	20	PV20 .1	4	#10		7.36	40.00	0.07%
2		PV20 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV20 .3	4	#10		7.36	120.00	0.21%
4		PV20 .4	4	#10		7.36	160.00	0.28%
5		PV20 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV20 .6	7	#10		12.88	270.00	0.47%
1	21	PV21 .1	4	#10		7.36	40.00	0.07%
2		PV21 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV21 .3	4	#10		7.36	120.00	0.21%
4		PV21 .4	4	#10		7.36	160.00	0.28%
5		PV21 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV21 .6	7	#10		12.88	270.00	0.47%

From	To	Labeling	COPPER PV WIRE					
Harness #	inverter #	Cable #	Strings qty	PV Wire +/-	CONDUIT	Isc (A)	LENGTH (FT)	Voltage drop (%)
1	22	PV22 .1	4	#10		7.4	40.00	0.07%
2		PV22 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV22 .3	4	#10		7.36	120.00	0.21%
4		PV22 .4	4	#10		7.36	160.00	0.28%
5		PV22 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV22 .6	7	#10		12.88	270.00	0.47%
1	23	PV23 .1	4	#10		7.4	40.00	0.07%
2		PV23 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV23 .3	4	#10		7.36	120.00	0.21%
4		PV23 .4	4	#10		7.36	160.00	0.28%
5		PV23 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV23 .6	7	#10		12.88	270.00	0.47%
1	24	PV24 .1	4	#10		7.4	40.00	0.07%
2		PV24 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV24 .3	4	#10		7.36	120.00	0.21%
4		PV24 .4	4	#10		7.36	160.00	0.28%
5		PV24 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV24 .6	7	#10		12.88	270.00	0.47%
1	25	PV25 .1	4	#10		7.4	40.00	0.07%
2		PV25 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV25 .3	4	#10		7.36	120.00	0.21%
4		PV25 .4	4	#10		7.36	160.00	0.28%
5		PV25 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV25 .6	7	#10		12.88	270.00	0.47%
1	26	PV26 .1	4	#10		7.4	40.00	0.07%
2		PV26 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV26 .3	4	#10		7.36	120.00	0.21%
4		PV26 .4	4	#10		7.36	160.00	0.28%
5		PV26 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV26 .6	7	#10		12.88	270.00	0.47%
1	27	PV27 .1	4	#10		7.4	40.00	0.07%
2		PV27 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV27 .3	7	#10		12.88	150.00	0.26%
4		PV27 .4	4	#10		7.36	60.00	0.10%
5		PV27 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV27 .6	4	#10		7.36	140.00	0.24%
1	28	PV28 .1	4	#10		7.4	160.00	0.28%
2		PV28 .2	7	#10	1 1/4"	12.88	230.00	0.40%
3		PV28 .3	4	#10		7.36	215.00	0.37%
4		PV28 .4	4	#10		7.36	255.00	0.44%
5		PV28 .5	4	#10	1 1/4"	7.36	215.00	0.37%
6		PV28 .6	4	#10		7.36	255.00	0.44%
1	29	PV29 .1	4	#10		7.4	40.00	0.07%
2		PV29 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV29 .3	7	#10		12.88	150.00	0.26%
4		PV29 .4	4	#10		7.36	60.00	0.10%
5		PV29 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV29 .6	4	#10		7.36	140.00	0.24%
1	30	PV30 .1	4	#10		7.4	160.00	0.28%
2		PV30 .2	7	#10	1 1/4"	12.88	230.00	0.40%
3		PV30 .3	4	#10		7.36	215.00	0.37%
4		PV30 .4	4	#10		7.36	255.00	0.44%
5		PV30 .5	4	#10	1 1/4"	7.36	215.00	0.37%
6		PV30 .6	4	#10		7.36	255.00	0.44%
1	31	PV31 .1	4	#10		7.4	40.00	0.07%
2		PV31 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV31 .3	7	#10		12.88	150.00	0.26%
4		PV31 .4	4	#10		7.36	60.00	0.10%
5		PV31 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV31 .6	4	#10		7.36	140.00	0.24%
1	32	PV32 .1	4	#10		7.4	40.00	0.07%
2		PV32 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV32 .3	7	#10		12.88	150.00	0.26%
4		PV32 .4	4	#10		7.36	60.00	0.10%
5		PV32 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV32 .6	4	#10		7.36	140.00	0.24%
1	33	PV33 .1	4	#10		7.4	40.00	0.07%
2		PV33 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV33 .3	7	#10		12.88	150.00	0.26%
4		PV33 .4	4	#10		7.36	60.00	0.10%
5		PV33 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV33 .6	4	#10		7.36	140.00	0.24%
1	34	PV34 .1	4	#10		7.4	40.00	0.07%
2		PV34 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV34 .3	7	#10		12.88	150.00	0.26%
4		PV34 .4	4	#10		7.36	60.00	0.10%
5		PV34 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV34 .6	4	#10		7.36	140.00	0.24%
1	35	PV35 .1	4	#10		7.4	40.00	0.07%
2		PV35 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV35 .3	7	#10		12.88	150.00	0.26%
4		PV35 .4	4	#10		7.36	60.00	0.10%
5		PV35 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV35 .6	4	#10		7.36	140.00	0.24%
1	36	PV36 .1	4	#10		7.4	40.00	0.07%
2		PV36 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV36 .3	7	#10		12.88	150.00	0.26%
4		PV36 .4	4	#10		7.36	60.00	0.10%
5		PV36 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV36 .6	4	#10		7.36	140.00	0.24%
1	37	PV37 .1	4	#10		7.4	40.00	0.07%
2		PV37 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV37 .3	7	#10		12.88	150.00	0.26%
4		PV37 .4	4	#10		7.36	60.00	0.10%
5		PV37 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV37 .6	4	#10		7.36	140.00	0.24%
1	38	PV38 .1	4	#10		7.4	40.00	0.07%
2		PV38 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV38 .3	7	#10		12.88	150.00	0.26%
4		PV38 .4	4	#10		7.36	60.00	0.10%
5		PV38 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV38 .6	4	#10		7.36	140.00	0.24%
1	39	PV39 .1	4	#10		7.4	40.00	0.07%
2		PV39 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV39 .3	7	#10		12.88	150.00	0.26%
4		PV39 .4	4	#10		7.36	60.00	0.10%
5		PV39 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV39 .6	4	#10		7.36	140.00	0.24%
1	40	PV40 .1	4	#10		7.4	40.00	0.07%
2		PV40 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV40 .3	7	#10		12.88	150.00	0.26%
4		PV40 .4	4	#10		7.36	60.00	0.10%
5		PV40 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV40 .6	4	#10		7.36	140.00	0.24%
1	41	PV41 .1	4	#10		7.4	40.00	0.07%
2		PV41 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV41 .3	7	#10		12.88	150.00	0.26%
4		PV41 .4	4	#10		7.36	60.00	0.10%
5		PV41 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV41 .6	4	#10		7.36	140.00	0.24%
1	42	PV42 .1	4	#10		7.4	40.00	0.07%
2		PV42 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV42 .3	7	#10		12.88	150.00	0.26%
4		PV42 .4	4	#10		7.36	60.00	0.10%
5		PV42 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV42 .6	4	#10		7.36	140.00	0.24%

From	To	Labeling	COPPER PV WIRE					
Harness #	inverter #	Cable #	Strings qty	PV Wire +/-	CONDUIT	Isc (A)	LENGTH (FT)	Voltage drop (%)
1	43	PV43 .1	4	#10		7.4	40.00	0.07%
2		PV43 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV43 .3	4	#10		7.36	120.00	0.21%
4		PV43 .4	4	#10		7.36	160.00	0.28%
5		PV43 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV43 .6	7	#10		12.88	270.00	0.47%
1	44	PV44 .1	4	#10		7.4	40.00	0.07%
2		PV44 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV44 .3	4	#10		7.36	120.00	0.21%
4		PV44 .4	4	#10		7.36	160.00	0.28%
5		PV44 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV44 .6	7	#10		12.88	270.00	0.47%
1	45	PV45 .1	4	#10		7.4	40.00	0.07%
2		PV45 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV45 .3	4	#10		7.36	120.00	0.21%
4		PV45 .4	4	#10		7.36	160.00	0.28%
5		PV45 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV45 .6	7	#10		12.88	270.00	0.47%
1	46	PV46 .1	4	#10		7.4	40.00	0.07%
2		PV46 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV46 .3	4	#10		7.36	120.00	0.21%
4		PV46 .4	4	#10		7.36	160.00	0.28%
5		PV46 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV46 .6	7	#10		12.88	270.00	0.47%
1	47	PV47 .1	4	#10		7.4	40.00	0.07%
2		PV47 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV47 .3	4	#10		7.36	120.00	0.21%
4		PV47 .4	4	#10		7.36	160.00	0.28%
5		PV47 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV47 .6	7	#10		12.88	270.00	0.47%
1	48	PV48 .1	4	#10		7.4	40.00	0.07%
2		PV48 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV48 .3	7	#10		12.88	150.00	0.26%
4		PV48 .4	4	#10		7.36	60.00	0.10%
5		PV48 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV48 .6	4	#10		7.36	140.00	0.24%
1	49	PV49 .1	4	#10		7.4	40.00	0.07%
2		PV49 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV49 .3	7	#10		12.88	150.00	0.26%
4		PV49 .4	4	#10		7.36	60.00	0.10%
5		PV49 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV49 .6	4	#10		7.36	140.00	0.24%
1	50	PV50 .1	4	#10		7.4	40.00	0.07%
2		PV50 .2	7	#10	1 1/4"	12.88	110.00	0.19%
3		PV50 .3	4	#10		7.36	60.00	0.10%
4		PV50 .4	4	#10		7.36	100.00	0.17%
5		PV50 .5	4	#10	1 1/4"	7.36	60.00	0.10%
6		PV50 .6	4	#10		7.36	100.00	0.17%
1	51	PV51 .1	4	#10		7.4	40.00	0.07%
2		PV51 .2	7	#10	1 1/4"	12.88	110.00	0.19%
3		PV51 .3	4	#10		7.36	60.00	0.10%
4		PV51 .4	4	#10		7.36	100.00	0.17%
5		PV51 .5	4	#10	1 1/4"	7.36	60.00	0.10%
6		PV51 .6	4	#10		7.36	100.00	0.17%
1	52	PV52 .1	4	#10		7.4	40.00	0.07%
2		PV52 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV52 .3	7	#10		12.88	150.00	0.26%
4		PV52 .4	4	#10		7.36	60.00	0.10%
5		PV52 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV52 .6	4	#10		7.36	140.00	0.24%
1	53	PV53 .1	4	#10		7.4	40.00	0.07%
2		PV53 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV53 .3	7	#10		12.88	150.00	0.26%
4		PV53 .4	4	#10		7.36	60.00	0.10%
5		PV53 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV53 .6	4	#10		7.36	140.00	0.24%
1	54	PV54 .1	4	#10		7.4	40.00	0.07%
2		PV54 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV54 .3	7	#10		12.88	150.00	0.26%
4		PV54 .4	4	#10		7.36	60.00	0.10%
5		PV54 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV54 .6	4	#10		7.36	140.00	0.24%
1	55	PV55 .1	4	#10		7.4	40.00	0.07%
2		PV55 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV55 .3	7	#10		12.88	150.00	0.26%
4		PV55 .4	4	#10		7.36	60.00	0.10%
5		PV55 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV55 .6	4	#10		7.36	140.00	0.24%
1	56	PV56 .1	4	#10		7.4	160.00	0.28%
2		PV56 .2	7	#10	1 1/4"	12.88	230.00	0.40%
3		PV56 .3	4	#10		7.36	215.00	0.37%
4		PV56 .4	4	#10		7.36	255.00	0.44%
5		PV56 .5	4	#10	1 1/4"	7.36	215.00	0.37%
6		PV56 .6	4	#10		7.36	255.00	0.44%
1	57	PV57 .1	4	#10		7.4	40.00	0.07%
2		PV57 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV57 .3	7	#10		12.88	150.00	0.26%
4		PV57 .4	4	#10		7.36	60.00	0.10%
5		PV57 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV57 .6	4	#10		7.36	140.00	0.24%
1	58	PV58 .1	4	#10		7.4	40.00	0.07%
2		PV58 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV58 .3	4	#10		7.36	120.00	0.21%
4		PV58 .4	4	#10		7.36	160.00	0.28%
5		PV58 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV58 .6	7	#10		12.88	270.00	0.47%
1	59	PV59 .1	4	#10		7.4	40.00	0.07%
2		PV59 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV59 .3	4	#10		7.36	120.00	0.21%
4		PV59 .4	4	#10		7.36	160.00	0.28%
5		PV59 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV59 .6	7	#10		12.88	270.00	0.47%
1	60	PV60 .1	4	#10		7.4	40.00	0.07%
2		PV60 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV60 .3	4	#10		7.36	120.00	0.21%
4		PV60 .4	4	#10		7.36	160.00	0.28%
5		PV60 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV60 .6	7	#10		12.88	270.00	0.47%
1	61	PV61 .1	4	#10		7.4	40.00	0.07%
2		PV61 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV61 .3	4	#10		7.36	120.00	0.21%
4		PV61 .4	4	#10		7.36	160.00	0.28%
5		PV61 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV61 .6	7	#10		12.88	270.00	0.47%
1	62	PV62 .1	4	#10		7.4	40.00	0.07%
2		PV62 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV62 .3	4	#10		7.36	120.00	0.21%
4		PV62 .4	4	#10		7.36	160.00	0.28%
5		PV62 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV62 .6	7	#10		12.88	270.00	0.47%
1	63	PV63 .1	4	#10		7.4	40.00	0.07%
2		PV63 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV63 .3	4	#10		7.36	120.00	0.21%
4		PV63 .4	4	#10		7.36	160.00	0.28%
5		PV63 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV63 .6	7	#10		12.88	270.00	0.47%

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL
32152
JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
12-18-2018	Conduit size modified
12-20-2018	NEC code updated

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

WIRE CHART (DC-1)

E-206

INVERTER DC HOMERUNS

NEC-2017 690.8(A):
MAX CIRCUIT CURRET: = Isc x 1.25

DC1 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC2 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC3 (+/- POLES): 7 STRINGS x 1.84A x 1.25 = 16.1A
DC4 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC5 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC6 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A

AMPACITY DE-RATING FACTORS:

ASHRAE 2% TEMPERATURE FACTOR

FORT BRAGG/SIMMONS, NC, USA

AMBIENT HIGH TEMP = 36°C BASE
TEMPERATURE CORRECTION FACTOR FOR 36°C
TABLE 690.31(E)= 0.91

STRING WIRE (HARNESSES AND HOMERUNS):
MIN. #10 PV WIRE 90° C = 40 A /NEC 310-16
x 0.91 TCF
36.4A ALLOWABLE

MAX. NUMBER OF CURRENT-CARRYING CONDUCTORS
IN A SINGLE RUN:
12 (6 positive + 6 Negative)
TABLE 310.15 (B)(3)(a)= 0.50
18.2A ALLOWABLE

VOLTAGE DROP CALCULATION:

$$\Delta V = \frac{2 \cdot L \cdot I \cdot \cos\varphi}{K \cdot S}$$

ΔV= Voltage drop in Volts
L= Length of conductor in meters
I= Carried current in amperes
cosφ= 1 (for DC or single phase)
K= Electric conductivity coefficient
K copper (70°C): 48.47
K copper (40°C): 52
K copper (20°C): 58
K aluminum (70°C): 30
K aluminum (40°C): 32
K aluminum (20°C):36
S= Conductor Section in sq.mm.

ΔV(%) = (ΔV/Vmpp)·100

Vmpp= String Voltage at max. power point in Volts

From	To	Labeling	COPPER PV WIRE					
Harness #	inverter #	Cable #	Strings qty	PV Wire +/-	CONDUIT	Isc (A)	LENGTH (FT)	Voltage drop (%)
1	64	PV64 .1	4	#10		7.4	40.00	0.07%
2		PV64 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV64 .3	4	#10		7.36	120.00	0.21%
4		PV64 .4	4	#10		7.36	160.00	0.28%
5		PV64 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV64 .6	7	#10		12.88	270.00	0.47%
1	65	PV65 .1	4	#10		7.4	40.00	0.07%
2		PV65 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV65 .3	4	#10		7.36	120.00	0.21%
4		PV65 .4	4	#10		7.36	160.00	0.28%
5		PV65 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV65 .6	7	#10		12.88	270.00	0.47%
1	66	PV66 .1	4	#10		7.4	40.00	0.07%
2		PV66 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV66 .3	4	#10		7.36	120.00	0.21%
4		PV66 .4	4	#10		7.36	160.00	0.28%
5		PV66 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV66 .6	7	#10		12.88	270.00	0.47%
1	67	PV67 .1	4	#10		7.4	40.00	0.07%
2		PV67 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV67 .3	4	#10		7.36	120.00	0.21%
4		PV67 .4	4	#10		7.36	160.00	0.28%
5		PV67 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV67 .6	7	#10		12.88	270.00	0.47%
1	68	PV68 .1	4	#10		7.4	40.00	0.07%
2		PV68 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV68 .3	4	#10		7.36	120.00	0.21%
4		PV68 .4	4	#10		7.36	160.00	0.28%
5		PV68 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV68 .6	7	#10		12.88	270.00	0.47%
1	69	PV69 .1	4	#10		7.4	40.00	0.07%
2		PV69 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV69 .3	4	#10		7.36	120.00	0.21%
4		PV69 .4	4	#10		7.36	160.00	0.28%
5		PV69 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV69 .6	7	#10		12.88	270.00	0.47%
1	70	PV70 .1	4	#10		7.4	40.00	0.07%
2		PV70 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV70 .3	4	#10		7.36	120.00	0.21%
4		PV70 .4	4	#10		7.36	160.00	0.28%
5		PV70 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV70 .6	7	#10		12.88	270.00	0.47%
1	71	PV71 .1	4	#10		7.4	40.00	0.07%
2		PV71 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV71 .3	4	#10		7.36	120.00	0.21%
4		PV71 .4	4	#10		7.36	160.00	0.28%
5		PV71 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV71 .6	7	#10		12.88	270.00	0.47%
1	72	PV72 .1	4	#10		7.4	40.00	0.07%
2		PV72 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV72 .3	4	#10		7.36	120.00	0.21%
4		PV72 .4	4	#10		7.36	160.00	0.28%
5		PV72 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV72 .6	7	#10		12.88	270.00	0.47%
1	73	PV73 .1	4	#10		7.4	40.00	0.07%
2		PV73 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV73 .3	4	#10		7.36	120.00	0.21%
4		PV73 .4	4	#10		7.36	160.00	0.28%
5		PV73 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV73 .6	7	#10		12.88	270.00	0.47%
1	74	PV74 .1	4	#10		7.4	40.00	0.07%
2		PV74 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV74 .3	4	#10		7.36	120.00	0.21%
4		PV74 .4	4	#10		7.36	160.00	0.28%
5		PV74 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV74 .6	7	#10		12.88	270.00	0.47%
1	75	PV75 .1	4	#10		7.4	40.00	0.07%
2		PV75 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV75 .3	4	#10		7.36	120.00	0.21%
4		PV75 .4	4	#10		7.36	160.00	0.28%
5		PV75 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV75 .6	7	#10		12.88	270.00	0.47%
1	76	PV76 .1	4	#10		7.4	40.00	0.07%
2		PV76 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV76 .3	4	#10		7.36	120.00	0.21%
4		PV76 .4	4	#10		7.36	160.00	0.28%
5		PV76 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV76 .6	7	#10		12.88	270.00	0.47%
1	77	PV77 .1	4	#10		7.4	40.00	0.07%
2		PV77 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV77 .3	3	#10		5.52	170.00	0.29%
4		PV77 .4	4	#10		7.36	90.00	0.16%
5		PV77 .5	4	#10	1 1/4"	7.36	130.00	0.22%
6		PV77 .6	4	#10		7.36	100.00	0.17%
7		PV77 .7	4	#10		7.36	140.00	0.24%
1	78	PV78 .1	4	#10	1 1/4"	7.4	40.00	0.07%
2		PV78 .2	4	#10		7.36	80.00	0.14%
3		PV78 .3	3	#10		5.52	130.00	0.22%
4		PV78 .4	4	#10	1 1/4"	7.36	90.00	0.16%
5		PV78 .5	4	#10		7.36	130.00	0.22%
6		PV78 .6	4	#10		7.36	100.00	0.17%
7		PV78 .7	4	#10	1 1/4"	7.36	140.00	0.24%
1	79	PV79 .1	4	#10		7.4	40.00	0.07%
2		PV79 .2	4	#10		7.36	80.00	0.14%
3		PV79 .3	3	#10	1 1/4"	5.52	110.00	0.19%
4		PV79 .4	4	#10		7.36	90.00	0.16%
5		PV79 .5	4	#10		7.36	130.00	0.22%
6		PV79 .6	4	#10	1 1/4"	7.36	100.00	0.17%
7		PV79 .7	4	#10		7.36	140.00	0.24%
1	80	PV80 .1	4	#10		7.4	40.00	0.07%
2		PV80 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV80 .3	4	#10		7.36	120.00	0.21%
4		PV80 .4	4	#10		7.36	160.00	0.28%
5		PV80 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV80 .6	7	#10		12.88	270.00	0.47%
1	81	PV81 .1	4	#10		7.4	40.00	0.07%
2		PV81 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV81 .3	4	#10		7.36	120.00	0.21%
4		PV81 .4	4	#10		7.36	160.00	0.28%
5		PV81 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV81 .6	7	#10		12.88	270.00	0.47%
1	82	PV82 .1	4	#10		7.4	40.00	0.07%
2		PV82 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV82 .3	4	#10		7.36	120.00	0.21%
4		PV82 .4	4	#10		7.36	160.00	0.28%
5		PV82 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV82 .6	7	#10		12.88	270.00	0.47%
1	83	PV83 .1	4	#10		7.4	40.00	0.07%
2		PV83 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV83 .3	4	#10		7.36	120.00	0.21%
4		PV83 .4	4	#10		7.36	160.00	0.28%
5		PV83 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV83 .6	7	#10		12.88	270.00	0.47%
1	84	PV84 .1	4	#10		7.4	40.00	0.07%
2		PV84 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV84 .3	4	#10		7.36	120.00	0.21%
4		PV84 .4	4	#10		7.36	160.00	0.28%
5		PV84 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV84 .6	7	#10		12.88	270.00	0.47%
1	85	PV85 .1	4	#10		7.4	40.00	0.07%
2		PV85 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV85 .3	4	#10		7.36	120.00	0.21%
4		PV85 .4	4	#10		7.36	160.00	0.28%
5		PV85 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV85 .6	7	#10		12.88	270.00	0.47%
1	86	PV86 .1	4	#10		7.4	40.00	0.07%
2		PV86 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV86 .3	4	#10		7.36	120.00	0.21%
4		PV86 .4	4	#10		7.36	160.00	0.28%
5		PV86 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV86 .6	7	#10		12.88	270.00	0.47%
1	87	PV87 .1	4	#10		7.4	40.00	0.07%
2		PV87 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV87 .3	4	#10		7.36	120.00	0.21%
4		PV87 .4	4	#10		7.36	160.00	0.28%
5		PV87 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV87 .6	7	#10		12.88	270.00	0.47%
1	88	PV88 .1	4	#10		7.4	40.00	0.07%
2		PV88 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV88 .3	4	#10		7.36	120.00	0.21%
4		PV88 .4	4	#10		7.36	160.00	0.28%
5		PV88 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV88 .6	7	#10		12.88	270.00	0.47%
1	89	PV89 .1	4	#10		7.4	40.00	0.07%
2		PV89 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV89 .3	4	#10		7.36	120.00	0.21%
4		PV89 .4	4	#10		7.36	160.00	0.28%
5		PV89 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV89 .6	7	#10		12.88	270.00	0.47%
1	90	PV90 .1	4	#10		7.4	40.00	0.07%
2		PV90 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV90 .3	4	#10		7.36	120.00	0.21%
4		PV90 .4	4	#10		7.36	160.00	0.28%
5		PV90 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV90 .6	7	#10		12.88	270.00	0.47%
1	91	PV91 .1	4	#10		7.4	40.00	0.07%
2		PV91 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV91 .3	4	#10		7.36	120.00	0.21%
4		PV91 .4	4	#10		7.36	160.00	0.28%
5		PV91 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV91 .6	7	#10		12.88	270.00	0.47%
1	92	PV92 .1	4	#10		7.4	160.00	0.28%
2		PV92 .2	7	#10	1 1/4"	12.88	230.00	0.40%
3		PV92 .3	4	#10		7.36	215.00	0.37%
4		PV92 .4	4	#10		7.36	255.00	0.44%
5		PV92 .5	4	#10	1 1/4"	7.36	215.00	0.37%
6		PV92 .6	4	#10		7.36	255.00	0.44%
1	93	PV93 .1	4	#10		7.4	40.00	0.07%
2		PV93 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV93 .3	7	#10		12.88	150.00	0.26%
4		PV93 .4	4	#10		7.36	60.00	0.10%
5		PV93 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV93 .6	4	#10		7.36	140.00	0.24%
1	94	PV94 .1	4	#10		7.4	40.00	0.07%
2		PV94 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV94 .3	7	#10		12.88	150.00	0.26%
4		PV94 .4	4	#10		7.36	60.00	0.10%
5		PV94 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV94 .6	4	#10		7.36	140.00	0.24%
1	95	PV95 .1	4	#10		7.4	40.00	0.07%
2		PV95 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV95 .3	7	#10		12.88	150.00	0.26%
4		PV95 .4	4	#10		7.36	76.00	0.13%
5		PV95 .5	4	#10	1 1/4"	7.36	116.00	0.20%
6		PV95 .6	4	#10		7.36	156.00	0.27%
1	96	PV96 .1	4	#10		7.4	40.00	0.07%
2		PV96 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV96 .3	7	#10		12.88	150.00	0.26%
4		PV96 .4	4	#10		7.36	76.00	0.13%
5		PV96 .5	4	#10	1 1/4"	7.36	116.00	0.20%
6		PV96 .6	4	#10		7.36	156.00	0.27%
1	97	PV97 .1	4	#10		7.4	40.00	0.07%
2		PV97 .2	7	#10	1 1/4"	12.88	110.00	0.19%
3		PV97 .3	4	#10		7.36	75.00	0.13%
4		PV97 .4	4	#10		7.36	115.00	0.20%
5		PV97 .5	4	#10	1 1/4"	7.36	90.00	0.16%
6		PV97 .6	4	#10		7.36	130.00	0.22%
1	98	PV98 .1	4	#10		7.4	40.00	0.07%
2		PV98 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV98 .3	7	#10		12.88	120.00	0.21%
4		PV98 .4	4	#10		7.36	160.00	0.28%
5		PV98 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV98 .6	4	#10		7.36	270.00	0.47%
1	99	PV99 .1	4	#10		7.4	40.00	0.07%
2		PV99 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV99 .3	7	#10		12.88	150.00	0.26%
4		PV99 .4	4	#10		7.36	60.00	0.10%
5		PV99 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV99 .6	4	#10		7.36	140.00	0.24%
1	100	PV100 .1	4	#10		7.4	40.00	0.07%
2		PV100 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV100 .3	7	#10		12.88	150.00	0.26%
4		PV100 .4	4	#10		7.36	60.00	0.10%
5		PV100 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV100 .6	4	#10		7.36	140.00	0.24%
1	101	PV101 .1	4	#10		7.4	40.00	0.07%
2		PV101 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV101 .3	7	#10		12.88	150.00	0.26%
4		PV101 .4	4	#10		7.36	60.00	0.10%
5		PV101 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV101 .6	4	#10		7.36	140.00	0.24%
1	102	PV102 .1	4	#10		7.4	40.00	0.07%
2		PV102 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV102 .3	7	#10		12.88	150.00	0.26%
4		PV102 .4	4	#10		7.36	60.00	0.10%
5		PV102 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV102 .6	4	#10		7.36	140.00	0.24%
1	103	PV103 .1	4	#10		7.4	40.00	0.07%
2		PV103 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV103 .3	7	#10		12.88	150.00	0.26%
4		PV103 .4	4	#10		7.36	60.00	0.10%
5		PV103 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV103 .6	4	#10		7.36	140.00	0.24%
1	104	PV104 .1	4	#10		7.4	40.00	0.07%
2		PV104 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV104 .3	7	#10		12.88	150.00	0.26%
4		PV104 .4	4	#10		7.36	60.00	0.10%
5		PV104 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV104 .6	4	#10		7.36	140.00	0.24%
1	105	PV105 .1	4	#10		7.4	40.00	0.07%
2		PV105 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV105 .3	7	#10		12.88	150.00	0.26%
4		PV105 .4	4	#10		7.36	60.00	0.10%
5		PV105 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV105 .6	4	#10		7.36	140.00	0.24%
1	106	PV106 .1	4	#10		7.4	40.00	0.07%
2		PV106 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV106 .3	7	#10		12.88	150.00	0.26%
4		PV106 .4	4	#10		7.36	60.00	0.10%
5		PV106 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV106 .6	4	#10		7.36	140.00	0.24%
1	107	PV107 .1	4	#10		7.4	40.00	0.07%
2		PV107 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV107 .3	7	#10		12.88	150.00	0.26%
4		PV107 .4	4	#10		7.36	60.00	0.10%
5		PV107 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV107 .6	4	#10		7.36	140.00	0.24%
1	108	PV108 .1	4	#10		7.4	40.00	0.07%
2		PV108 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV108 .3	7	#10		12.88	150.00	0.26%
4		PV108 .4	4	#10		7.36	60.00	0.10%
5		PV108 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV108 .6	4	#10		7.36	140.00	0.24%
1	109	PV109 .1	4	#10		7.4	40.00	0.07%
2		PV109 .2	7	#10	1 1/4"	12.88	110.00	0.19%
3		PV109 .3	4	#10		7.36	60.00	0.10%
4		PV109 .4	4	#10		7.36	100.00	0.17%
5		PV109 .5	4	#10	1 1/4"	7.36	75.00	0.13%
6		PV109 .6	4	#10		7.36	115.00	0.20%
1	110	PV110 .1	4	#10		7.4	40.00	0.07%
2		PV110 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV110 .3	7	#10		12.88	150.00	0.26%
4		PV110 .4	4	#10		7.36	60.00	0.10%
5		PV110 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV110 .6	4	#10		7.36	140.00	0.24%
1	111	PV111 .1	4	#10		7.4	40.00	0.07%
2		PV111 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV111 .3	7	#10		12.88	150.00	0.26%
4		PV111 .4	4	#10		7.36	60.00	0.10%
5		PV111 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV111 .6	4	#10		7.36	140.00	0.24%
1	112	PV112 .1	4	#10		7.4	160.00	0.28%
2		PV112 .2	7	#10	1 1/4"	12.88	230.00	0.40%
3		PV112 .3	4	#10		7.36	215.00	0.37%
4		PV112 .4	4	#10		7.36	255.00	0.44%
5		PV112 .5	4	#10	1 1/4"	7.36	215.00	0.37%
6		PV112 .6	4	#10		7.36	255.00	0.44%
1	113	PV113 .1	4	#10		7.4	40.00	0.07%
2		PV113 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV113 .3	7	#10		12.88	150.00	0.26%
4		PV113 .4	4	#10		7.36	60.00	0.10%
5		PV113 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV113 .6	4	#10		7.36	140.00	0.24%
1	114	PV114 .1	4	#10		7.4	40.00	0.07%
2		PV114 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV114 .3	4	#10		7.36	120.00	0.21%
4		PV114 .4	4	#10		7.36	160.00	0.28%
5		PV114 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV114 .6	7	#10		12.88	270.00	0.47%
1	115	PV115 .1	4	#10		7.4	40.00	0.07%
2		PV115 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV115 .3	4	#10		7.36	120.00	0.21%
4		PV115 .4	4	#10		7.36	160.00	0.28%
5		PV115 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV115 .6	7	#10		12.88	270.00	0.47%
1	116	PV116 .1	4	#10		7.4	40.00	0.07%
2		PV116 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV116 .3	4	#10		7.36	120.00	0.21%
4		PV116 .4	4	#10		7.36	160.00	0.28%
5		PV116 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV116 .6	7	#10		12.88	270.00	0.47%
1	117	PV117 .1	4	#10		7.4	40.00	0.07%
2		PV117 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV117 .3	4	#10		7.36	120.00	0.21%
4		PV117 .4	4	#10		7.36	160.00	0.28%
5		PV117 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV117 .6	7	#10		12.88	270.00	0.47%
1	118	PV118 .1	4	#10		7.4	40.00	0.07%
2		PV118 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV118 .3	4	#10		7.36	120.00	0.21%
4		PV118 .4	4	#10		7.36	160.00	0.28%
5		PV118 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV118 .6	7	#10		12.88	270.00	0.47%
1	119	PV119 .1	4	#10		7.4	40.00	0.07%
2		PV119 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV119 .3	4	#10		7.36	120.00	0.21%
4		PV119 .4	4	#10		7.36	160.00	0.28%
5		PV119 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV119 .6	7	#10		12.88	270.00	0.47%
1	120	PV120 .1	4	#10		7.4	40.00	0.07%
2		PV120 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV120 .3	4	#10		7.36	120.00	0.21%
4		PV120 .4	4	#10		7.36	160.00	0.28%
5		PV120 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV120 .6	7	#10		12.88	270.00	0.47%
1	121	PV121 .1	4	#10		7.4	40.00	0.07%
2		PV121 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV121 .3	4	#10		7.36	120.00	0.21%
4		PV121 .4	4	#10		7.36	160.00	0.28%
5		PV121 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV121 .6	7	#10		12.88	270.00	0.47%
1	122	PV122 .1	4	#10		7.4	40.00	0.07%
2		PV122 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV122 .3	4	#10		7.36	120.00	0.21%
4		PV122 .4	4	#10		7.36	160.00	0.28%
5		PV122 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV122 .6	7	#10		12.88	270.00	0.47%
1	123	PV123 .1	4	#10		7.4	40.00	0.07%
2		PV123 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV123 .3	4	#10		7.36	120.00	0.21%
4		PV123 .4	4	#10		7.36	160.00	0.28%
5		PV123 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV123 .6	7	#10		12.88	270.00	0.47%
1	124	PV124 .1	4	#10		7.4	40.00	0.07%
2		PV124 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV124 .3	4	#10		7.36	120.00	0.21%
4		PV124 .4	4	#10		7.36	160.00	0.28%
5		PV124 .5	4	#10	1 1/4"	7.36	200.00	0.34%
6		PV124 .6	7	#10		12.88	270.00	0.47%
1	125	PV125 .1	4	#10		7.4	40.00	0.07%
2		PV125 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV125 .3	7	#10		12.88	150.00	0.26%
4		PV125 .4	4	#10		7.36	60.00	0.10%
5		PV125 .5	4	#10	1 1/4"	7.36	100.00	0.17%
6		PV125 .6	4	#10		7.36	140.00	0.24%
1	126	PV126 .1	4	#10		7.4	160.00	0.28%
2		PV126 .2	7	#10	1 1/4"	12.88	230.00	0.40%
3		PV126 .3	4	#10		7.36	215.00	0.37%
4		PV126 .4	4	#10		7.36	255.00	0.44%
5		PV126 .5	4	#10	1 1/4"	7.36	215.00	0.37%
6		PV126 .6	4	#10		7.36	255.00	0.44%
1	127	PV127 .1	4	#10		7.4	40.00	0.07%
2		PV127 .2	4	#10	1 1/4"	7.36	80.00	0.14%
3		PV127 .3	7	#10		12.88	150.00	0.26%
4		PV127 .4	4	#10		7.36	110.00	0.19%
5		PV127 .5	4	#10	1 1/4"	7.36	150.00	0.26%
6		PV127 .6	4	#10		7.36	190.00	0.33%

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

SEAL 32152
JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
10-31-2018	Inv. 77, 78, 79 adjusted
12-18-2018	Conduit size modified
12-20-2018	NEC code updated

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

WIRE CHART (DC-2)

E-207

INVERTER DC HOMERUNS

NEC-2017 690.8(A):
MAX CIRCUIT CURRET: = Isc x 1.25

DC1 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC2 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC3 (+/- POLES): 7 STRINGS x 1.84A x 1.25 = 16.1A
DC4 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC5 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A
DC6 (+/- POLES): 4 STRINGS x 1.84A x 1.25 = 9.2A

AMPACITY DE-RATING FACTORS:

ASHRAE 2% TEMPERATURE FACTOR

FORT BRAGG/SIMMONS, NC, USA

AMBIENT HIGH TEMP = 36°C BASE
TEMPERATURE CORRECTION FACTOR FOR 36°C
TABLE 690.31(E)= 0.91

STRING WIRE (HARNESSES AND HOMERUNS):
MIN. #10 PV WIRE 90° C = 40 A /NEC 310-16
x 0.91 TCF
36.4A ALLOWABLE

MAX. NUMBER OF CURRENT-CARRYING CONDUCTORS
IN A SINGLE RUN:
12 (6 positive + 6 Negative)
TABLE 310.15 (B)(3)(a)= 0.50
18.2A ALLOWABLE

VOLTAGE DROP CALCULATION:

$$\Delta V = \frac{2 \cdot L \cdot I \cdot \cos\varphi}{K \cdot S}$$

ΔV= Voltage drop in Volts
L= Length of conductor in meters
I= Carried current in amperes
cosφ= 1 (for DC or single phase)
K= Electric conductivity coefficient
K copper (70°C): 48.47
K copper (40°C): 52
K copper (20°C): 58
K aluminum (70°C): 30
K aluminum (40°C): 32
K aluminum (20°C):36
S= Conductor Section in sq.mm.

ΔV(%) = (ΔV/Vmpp)·100

Vmpp= String Voltage at max. power point in Volts

From	To	Labeling	COPPER PV WIRE					
Harness #	inverter #	Cable #	Strings qty	PV Wire +/-	CONDUIT	Isc (A)	LENGTH (FT)	Voltage drop (%)
1	128	PV128 .1	4	#10		7.4	40.00	0.07%
2		PV128 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV128 .3	7	#10		12.88	150.00	0.26%
4		PV128 .4	4	#10		7.36	60.00	0.10%
5		PV128 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV128 .6	4	#10		7.36	140.00	0.24%
1	129	PV129 .1	4	#10		7.4	40.00	0.07%
2		PV129 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV129 .3	7	#10		12.88	150.00	0.26%
4		PV129 .4	4	#10		7.36	60.00	0.10%
5		PV129 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV129 .6	4	#10		7.36	140.00	0.24%
1	130	PV130 .1	4	#10		7.4	40.00	0.07%
2		PV130 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV130 .3	7	#10		12.88	150.00	0.26%
4		PV130 .4	4	#10		7.36	60.00	0.10%
5		PV130 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV130 .6	4	#10		7.36	140.00	0.24%
1	131	PV131 .1	4	#10		7.4	40.00	0.07%
2		PV131 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV131 .3	7	#10		12.88	150.00	0.26%
4		PV131 .4	4	#10		7.36	60.00	0.10%
5		PV131 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV131 .6	4	#10		7.36	140.00	0.24%
1	132	PV132 .1	4	#10		7.4	40.00	0.07%
2		PV132 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV132 .3	4	#10		7.36	120.00	0.21%
4		PV132 .4	4	#10		7.36	160.00	0.28%
5		PV132 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV132 .6	7	#10		12.88	270.00	0.47%
1	133	PV133 .1	4	#10		7.4	40.00	0.07%
2		PV133 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV133 .3	4	#10		7.36	120.00	0.21%
4		PV133 .4	4	#10		7.36	160.00	0.28%
5		PV133 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV133 .6	7	#10		12.88	270.00	0.47%
1	134	PV134 .1	4	#10		7.4	40.00	0.07%
2		PV134 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV134 .3	4	#10		7.36	120.00	0.21%
4		PV134 .4	4	#10		7.36	160.00	0.28%
5		PV134 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV134 .6	7	#10		12.88	270.00	0.47%
1	135	PV135 .1	4	#10		7.4	40.00	0.07%
2		PV135 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV135 .3	4	#10		7.36	120.00	0.21%
4		PV135 .4	4	#10		7.36	160.00	0.28%
5		PV135 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV135 .6	7	#10		12.88	270.00	0.47%
1	136	PV136 .1	4	#10		7.4	40.00	0.07%
2		PV136 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV136 .3	4	#10		7.36	120.00	0.21%
4		PV136 .4	4	#10		7.36	160.00	0.28%
5		PV136 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV136 .6	7	#10		12.88	270.00	0.47%
1	137	PV137 .1	4	#10		7.4	40.00	0.07%
2		PV137 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV137 .3	4	#10		7.36	120.00	0.21%
4		PV137 .4	4	#10		7.36	160.00	0.28%
5		PV137 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV137 .6	7	#10		12.88	270.00	0.47%
1	138	PV138 .1	4	#10		7.4	40.00	0.07%
2		PV138 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV138 .3	4	#10		7.36	120.00	0.21%
4		PV138 .4	4	#10		7.36	160.00	0.28%
5		PV138 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV138 .6	7	#10		12.88	270.00	0.47%
1	139	PV139 .1	4	#10		7.4	40.00	0.07%
2		PV139 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV139 .3	4	#10		7.36	120.00	0.21%
4		PV139 .4	4	#10		7.36	160.00	0.28%
5		PV139 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV139 .6	7	#10		12.88	270.00	0.47%
1	140	PV140 .1	4	#10		7.4	40.00	0.07%
2		PV140 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV140 .3	4	#10		7.36	120.00	0.21%
4		PV140 .4	4	#10		7.36	160.00	0.28%
5		PV140 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV140 .6	7	#10		12.88	270.00	0.47%
1	141	PV141 .1	4	#10		7.4	40.00	0.07%
2		PV141 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV141 .3	4	#10		7.36	120.00	0.21%
4		PV141 .4	4	#10		7.36	160.00	0.28%
5		PV141 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV141 .6	7	#10		12.88	270.00	0.47%
1	142	PV142 .1	4	#10		7.4	40.00	0.07%
2		PV142 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV142 .3	4	#10		7.36	120.00	0.21%
4		PV142 .4	4	#10		7.36	160.00	0.28%
5		PV142 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV142 .6	7	#10		12.88	270.00	0.47%
1	143	PV143 .1	4	#10		7.4	40.00	0.07%
2		PV143 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV143 .3	4	#10		7.36	120.00	0.21%
4		PV143 .4	4	#10		7.36	160.00	0.28%
5		PV143 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV143 .6	7	#10		12.88	270.00	0.47%
1	144	PV144 .1	4	#10		7.4	40.00	0.07%
2		PV144 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV144 .3	4	#10		7.36	120.00	0.21%
4		PV144 .4	4	#10		7.36	160.00	0.28%
5		PV144 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV144 .6	7	#10		12.88	270.00	0.47%
1	145	PV145 .1	4	#10		7.4	40.00	0.07%
2		PV145 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV145 .3	4	#10		7.36	120.00	0.21%
4		PV145 .4	4	#10		7.36	160.00	0.28%
5		PV145 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV145 .6	7	#10		12.88	270.00	0.47%
1	146	PV146 .1	4	#10		7.4	40.00	0.07%
2		PV146 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV146 .3	4	#10		7.36	120.00	0.21%
4		PV146 .4	4	#10		7.36	160.00	0.28%
5		PV146 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV146 .6	7	#10		12.88	270.00	0.47%
1	147	PV147 .1	4	#10		7.4	40.00	0.07%
2		PV147 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV147 .3	4	#10		7.36	120.00	0.21%
4		PV147 .4	4	#10		7.36	160.00	0.28%
5		PV147 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV147 .6	7	#10		12.88	270.00	0.47%
1	148	PV148 .1	4	#10		7.4	40.00	0.07%
2		PV148 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV148 .3	4	#10		7.36	120.00	0.21%
4		PV148 .4	4	#10		7.36	160.00	0.28%
5		PV148 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV148 .6	7	#10		12.88	270.00	0.47%
1	149	PV149 .1	4	#10		7.4	40.00	0.07%
2		PV149 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV149 .3	4	#10		7.36	120.00	0.21%
4		PV149 .4	4	#10		7.36	160.00	0.28%
5		PV149 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV149 .6	7	#10		12.88	270.00	0.47%
1	150	PV150 .1	4	#10		7.4	40.00	0.07%
2		PV150 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV150 .3	4	#10		7.36	120.00	0.21%
4		PV150 .4	4	#10		7.36	160.00	0.28%
5		PV150 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV150 .6	7	#10		12.88	270.00	0.47%
1	151	PV151 .1	4	#10		7.4	40.00	0.07%
2		PV151 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV151 .3	4	#10		7.36	120.00	0.21%
4		PV151 .4	4	#10		7.36	160.00	0.28%
5		PV151 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV151 .6	7	#10		12.88	270.00	0.47%
1	152	PV152 .1	4	#10		7.4	40.00	0.07%
2		PV152 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV152 .3	4	#10		7.36	120.00	0.21%
4		PV152 .4	4	#10		7.36	160.00	0.28%
5		PV152 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV152 .6	7	#10		12.88	270.00	0.47%
1	153	PV153 .1	4	#10		7.4	40.00	0.07%
2		PV153 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV153 .3	4	#10		7.36	120.00	0.21%
4		PV153 .4	4	#10		7.36	160.00	0.28%
5		PV153 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV153 .6	7	#10		12.88	270.00	0.47%
1	154	PV154 .1	4	#10		7.4	40.00	0.07%
2		PV154 .2	4	#10	1 1/4'	7.36	110.00	0.19%
3		PV154 .3	4	#10		7.36	70.00	0.12%
4		PV154 .4	4	#10		7.36	110.00	0.19%
5		PV154 .5	4	#10	1 1/4'	7.36	75.00	0.13%
6		PV154 .6	7	#10		12.88	115.00	0.20%
1	155	PV155 .1	4	#10		7.4	40.00	0.07%
2		PV155 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV155 .3	4	#10		7.36	120.00	0.21%
4		PV155 .4	4	#10		7.36	160.00	0.28%
5		PV155 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV155 .6	7	#10		12.88	270.00	0.47%
1	156	PV156 .1	4	#10		7.4	40.00	0.07%
2		PV156 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV156 .3	4	#10		7.36	120.00	0.21%
4		PV156 .4	4	#10		7.36	160.00	0.28%
5		PV156 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV156 .6	7	#10		12.88	270.00	0.47%
1	157	PV157 .1	4	#10		7.4	40.00	0.07%
2		PV157 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV157 .3	7	#10		12.88	120.00	0.21%
4		PV157 .4	4	#10		7.36	160.00	0.28%
5		PV157 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV157 .6	4	#10		7.36	270.00	0.47%
1	158	PV158 .1	4	#10		7.4	40.00	0.07%
2		PV158 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV158 .3	7	#10		12.88	150.00	0.26%
4		PV158 .4	4	#10		7.36	60.00	0.10%
5		PV158 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV158 .6	4	#10		7.36	140.00	0.24%
1	159	PV159 .1	4	#10		7.4	40.00	0.07%
2		PV159 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV159 .3	7	#10		12.88	150.00	0.26%
4		PV159 .4	4	#10		7.36	60.00	0.10%
5		PV159 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV159 .6	4	#10		7.36	140.00	0.24%
1	160	PV160 .1	4	#10		7.4	40.00	0.07%
2		PV160 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV160 .3	7	#10		12.88	150.00	0.26%
4		PV160 .4	4	#10		7.36	60.00	0.10%
5		PV160 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV160 .6	4	#10		7.36	140.00	0.24%
1	161	PV161 .1	4	#10		7.4	40.00	0.07%
2		PV161 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV161 .3	7	#10		12.88	150.00	0.26%
4		PV161 .4	4	#10		7.36	60.00	0.10%
5		PV161 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV161 .6	4	#10		7.36	140.00	0.24%
1	162	PV162 .1	4	#10		7.4	160.00	0.28%
2		PV162 .2	7	#10	1 1/4'	12.88	230.00	0.40%
3		PV162 .3	4	#10		7.36	215.00	0.37%
4		PV162 .4	4	#10		7.36	255.00	0.44%
5		PV162 .5	4	#10	1 1/4'	7.36	215.00	0.37%
6		PV162 .6	4	#10		7.36	255.00	0.44%
1	163	PV163 .1	4	#10		7.4	40.00	0.07%
2		PV163 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV163 .3	7	#10		12.88	150.00	0.26%
4		PV163 .4	4	#10		7.36	60.00	0.10%
5		PV163 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV163 .6	4	#10		7.36	140.00	0.24%
1	164	PV164 .1	4	#10		7.4	40.00	0.07%
2		PV164 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV164 .3	4	#10		7.36	120.00	0.21%
4		PV164 .4	4	#10		7.36	160.00	0.28%
5		PV164 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV164 .6	7	#10		12.88	270.00	0.47%
1	165	PV165 .1	4	#10		7.4	40.00	0.07%
2		PV165 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV165 .3	4	#10		7.36	120.00	0.21%
4		PV165 .4	4	#10		7.36	160.00	0.28%
5		PV165 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV165 .6	7	#10		12.88	270.00	0.47%
1	166	PV166 .1	4	#10		7.4	40.00	0.07%
2		PV166 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV166 .3	4	#10		7.36	120.00	0.21%
4		PV166 .4	4	#10		7.36	160.00	0.28%
5		PV166 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV166 .6	7	#10		12.88	270.00	0.47%
1	167	PV167 .1	4	#10		7.4	40.00	0.07%
2		PV167 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV167 .3	4	#10		7.36	120.00	0.21%
4		PV167 .4	4	#10		7.36	160.00	0.28%
5		PV167 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV167 .6	7	#10		12.88	270.00	0.47%
1	168	PV168 .1	4	#10		7.4	40.00	0.07%
2		PV168 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV168 .3	4	#10		7.36	120.00	0.21%
4		PV168 .4	4	#10		7.36	160.00	0.28%
5		PV168 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV168 .6	7	#10		12.88	270.00	0.47%
1	169	PV169 .1	4	#10		7.4	40.00	0.07%
2		PV169 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV169 .3	4	#10		7.36	120.00	0.21%
4		PV169 .4	4	#10		7.36	160.00	0.28%
5		PV169 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV169 .6	7	#10		12.88	270.00	0.47%
1	170	PV170 .1	4	#10		7.4	40.00	0.07%
2		PV170 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV170 .3	4	#10		7.36	120.00	0.21%
4		PV170 .4	4	#10		7.36	160.00	0.28%
5		PV170 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV170 .6	7	#10		12.88	270.00	0.47%
1	171	PV171 .1	4	#10		7.4	40.00	0.07%
2		PV171 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV171 .3	4	#10		7.36	120.00	0.21%
4		PV171 .4	4	#10		7.36	160.00	0.28%
5		PV171 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV171 .6	7	#10		12.88	270.00	0.47%
1	172	PV172 .1	4	#10		7.4	40.00	0.07%
2		PV172 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV172 .3	4	#10		7.36	120.00	0.21%
4		PV172 .4	4	#10		7.36	160.00	0.28%
5		PV172 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV172 .6	7	#10		12.88	270.00	0.47%
1	173	PV173 .1	4	#10		7.4	40.00	0.07%
2		PV173 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV173 .3	4	#10		7.36	120.00	0.21%
4		PV173 .4	4	#10		7.36	160.00	0.28%
5		PV173 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV173 .6	7	#10		12.88	270.00	0.47%
1	174	PV174 .1	4	#10		7.4	40.00	0.07%
2		PV174 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV174 .3	4	#10		7.36	120.00	0.21%
4		PV174 .4	4	#10		7.36	160.00	0.28%
5		PV174 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV174 .6	7	#10		12.88	270.00	0.47%
1	175	PV175 .1	4	#10		7.4	40.00	0.07%
2		PV175 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV175 .3	4	#10		7.36	120.00	0.21%
4		PV175 .4	4	#10		7.36	160.00	0.28%
5		PV175 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV175 .6	7	#10		12.88	270.00	0.47%
1	176	PV176 .1	4	#10		7.4	40.00	0.07%
2		PV176 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV176 .3	4	#10		7.36	120.00	0.21%
4		PV176 .4	4	#10		7.36	160.00	0.28%
5		PV176 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV176 .6	7	#10		12.88	270.00	0.47%
1	177	PV177 .1	4	#10		7.4	40.00	0.07%
2		PV177 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV177 .3	4	#10		7.36	120.00	0.21%
4		PV177 .4	4	#10		7.36	160.00	0.28%
5		PV177 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV177 .6	7	#10		12.88	270.00	0.47%
1	178	PV178 .1	4	#10		7.4	40.00	0.07%
2		PV178 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV178 .3	4	#10		7.36	120.00	0.21%
4		PV178 .4	4	#10		7.36	160.00	0.28%
5		PV178 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV178 .6	7	#10		12.88	270.00	0.47%
1	179	PV179 .1	4	#10		7.4	40.00	0.07%
2		PV179 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV179 .3	4	#10		7.36	120.00	0.21%
4		PV179 .4	4	#10		7.36	160.00	0.28%
5		PV179 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV179 .6	7	#10		12.88	270.00	0.47%
1	180	PV180 .1	4	#10		7.4	40.00	0.07%
2		PV180 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV180 .3	4	#10		7.36	120.00	0.21%
4		PV180 .4	4	#10		7.36	160.00	0.28%
5		PV180 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV180 .6	7	#10		12.88	270.00	0.47%
1	181	PV181 .1	4	#10		7.4	40.00	0.07%
2		PV181 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV181 .3	4	#10		7.36	120.00	0.21%
4		PV181 .4	4	#10		7.36	160.00	0.28%
5		PV181 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV181 .6	7	#10		12.88	270.00	0.47%
1	182	PV182 .1	4	#10		7.4	40.00	0.07%
2		PV182 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV182 .3	4	#10		7.36	120.00	0.21%
4		PV182 .4	4	#10		7.36	160.00	0.28%
5		PV182 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV182 .6	7	#10		12.88	270.00	0.47%
1	183	PV183 .1	4	#10		7.4	40.00	0.07%
2		PV183 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV183 .3	4	#10		7.36	120.00	0.21%
4		PV183 .4	4	#10		7.36	160.00	0.28%
5		PV183 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV183 .6	7	#10		12.88	270.00	0.47%
1	184	PV184 .1	4	#10		7.4	40.00	0.07%
2		PV184 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV184 .3	4	#10		7.36	120.00	0.21%
4		PV184 .4	4	#10		7.36	160.00	0.28%
5		PV184 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV184 .6	7	#10		12.88	270.00	0.47%
1	185	PV185 .1	4	#10		7.4	40.00	0.07%
2		PV185 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV185 .3	4	#10		7.36	120.00	0.21%
4		PV185 .4	4	#10		7.36	160.00	0.28%
5		PV185 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV185 .6	7	#10		12.88	270.00	0.47%
1	186	PV186 .1	4	#10		7.4	40.00	0.07%
2		PV186 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV186 .3	4	#10		7.36	120.00	0.21%
4		PV186 .4	4	#10		7.36	160.00	0.28%
5		PV186 .5	4	#10	1 1/4'	7.36	200.00	0.34%
6		PV186 .6	7	#10		12.88	270.00	0.47%
1	187	PV187 .1	4	#10		7.4	40.00	0.07%
2		PV187 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV187 .3	7	#10		12.88	150.00	0.26%
4		PV187 .4	4	#10		7.36	92.00	0.16%
5		PV187 .5	4	#10	1 1/4'	7.36	132.00	0.23%
6		PV187 .6	4	#10		7.36	172.00	0.30%
1	188	PV188 .1	4	#10		7.4	40.00	0.07%
2		PV188 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV188 .3	7	#10		12.88	150.00	0.26%
4		PV188 .4	4	#10		7.36	60.00	0.10%
5		PV188 .5	4	#10	1 1/4'	7.36	100.00	0.17%
6		PV188 .6	4	#10		7.36	140.00	0.24%
1	189	PV189 .1	4	#10		7.4	40.00	0.07%
2		PV189 .2	4	#10	1 1/4'	7.36	80.00	0.14%
3		PV189 .3	7	#10		12.88	150.00	0.26%
4		PV189 .4	4	#10		7.36	90.00	0.16%
5		PV189 .5	4	#10	1 1/4'	7.36	130.00	0.22%
6		PV189 .6	4	#10		7.36	170.00	0.29%
1	190	PV190 .1	4	#10		7.4	40.00	0.07%
2		PV190 .2	7	#10	1 1/4'	12.88	110.00	0.19%
3		PV190 .3	4	#10		7.36	60.00	0.10%
4		PV190 .4	4	#10		7.36	100.00	0.17%
5		PV190 .5	4	#10	1 1/4'	7.36	60.00	0.10%
6		PV190 .6	4	#10		7.36	100.00	0.17%

greengo

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
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CHARLOTTE, NC 28203
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ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL
32152
JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS	
DATE	COMMENT
12-18-2018	Conduit size modified
12-20-2018	NEC code updated

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

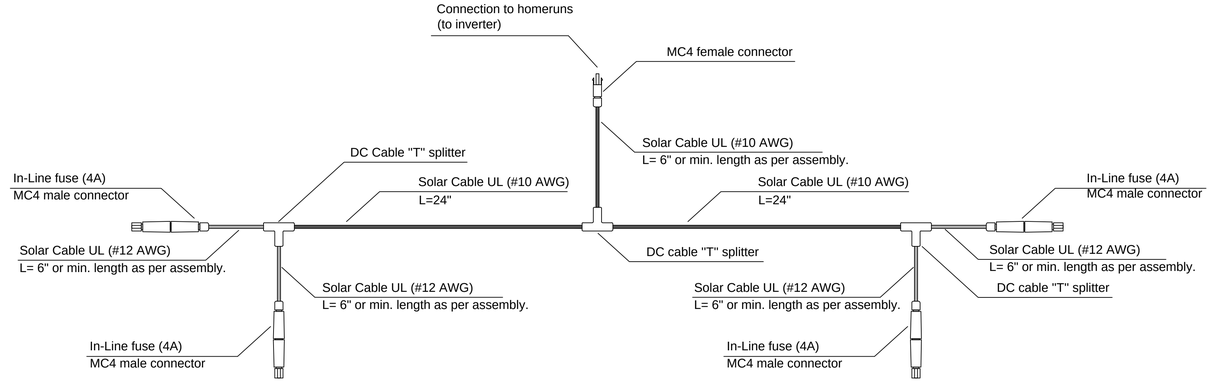
WIRE CHART (DC-3)

E-208

PV WIRING HARNESS : TYPE 1 POS (+)
4 FUSED POSITIVE INPUTS (+)
QUANTITY: 950

Components breakdown:

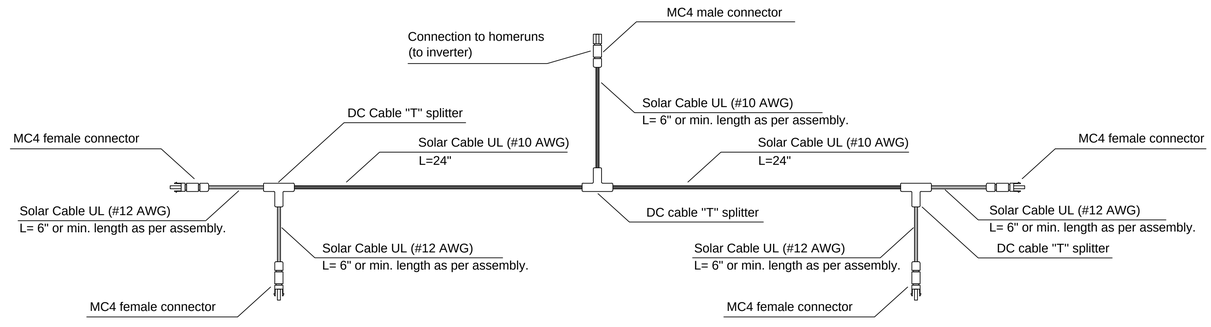
- In-Line fuse (4A) MC4 male conn. : 4
- MC4 female connector: 1
- DC Cable "T" splitter: 3
- Solar Cable #10 AWG (5.26mm²): 54in
- Solar Cable #12 AWG (3.31mm²): 24in



PV WIRING HARNESS : TYPE 1 NEG (-)
4 NEGATIVE INPUTS (-)
QUANTITY: 1140

Components breakdown:

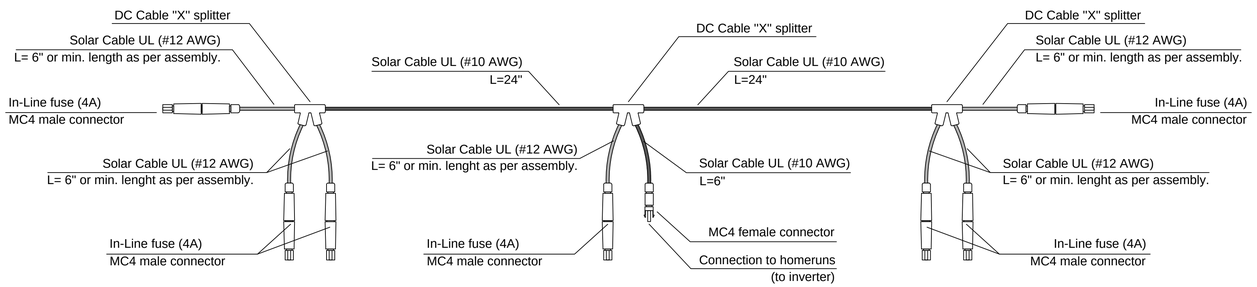
- MC4 female conn. : 4
- MC4 male connector: 1
- DC Cable "T" splitter: 3
- DC Cable "X" splitter: 0
- Solar Cable #10 AWG (5.26mm²): 54in
- Solar Cable #12 AWG (3.31mm²): 24in



PV WIRING HARNESS : TYPE 1 POS (+)
7 FUSED POSITIVE INPUTS (+)
QUANTITY: 190

Components breakdown:

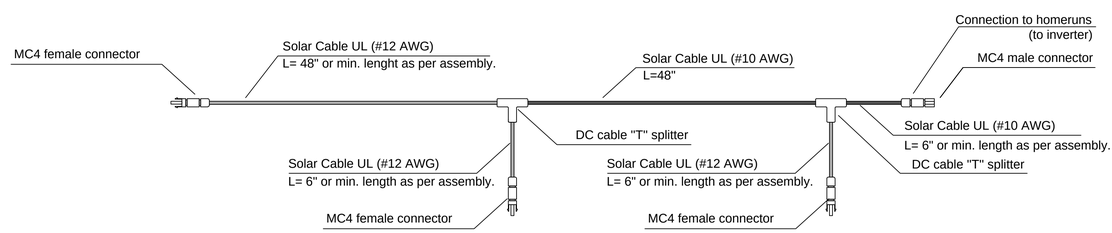
- In-Line fuse (4A) MC4 male conn. : 7
- MC4 female connector: 1
- DC Cable "X" splitter: 3
- Solar Cable #10 AWG (5.26mm²): 54in
- Solar Cable #12 AWG (3.31mm²): 42in



PV WIRING HARNESS : TYPE 1 NEG (-)
3 NEGATIVE INPUTS (-)
QUANTITY: 190

Components breakdown:

- MC4 female conn. : 3
- MC4 male connector: 1
- DC Cable "T" splitter: 2
- Solar Cable #10 AWG (5.26mm²): 54in
- Solar Cable #12 AWG (3.31mm²): 60in



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(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32182 JAMES A. CONDO

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

DC HARNESSES

E-209

INVERTERS 1 TO 190

TO AC PANEL BOARD

3PH+N+GND CABLE
#6 AWG THHN/THWN COPPER

INVERTER
FRONIUS SYMO 24.0-3 480

-	MAX. OUTPUT POWER:	23995VA
-	MAX. Isc (MPPT1/MPPT2):	49.5A/37.5A
-	MAX. CONTINUOUS OUTPUT CURRENT:	28.9A
-	MAX. EFFICIENCY:	98%
-	MAX. CEC EFFICIENCY:	97.5%
-	THD:	<1%
-	AFCI , NEC-2017:	COMPLIANT
-	DC DISCONNECT:	YES
-	DC REVERSE POLARITY PROTECTION:	YES
-	GROUND FAULT PROTECTION W/ INSULATION MONITOR INTERRUPTER:	YES

MPPT 1 | MPPT 2

DC1 | DC2 | DC3 | DC4 | DC5 | DC6

PV WIRE (HOMERUNS)
RHW-2/USE-2 (90°C) COPPER
#10 AWG IF LENGTH < 360ft
#8 AWG IF LENGTH > 360ft

40 MODULES 4800Wdc	4 STRINGS HARNESS Isc= 4x 1.84A = 7.36A	TO DC1
40 MODULES 4800Wdc	4 STRINGS HARNESS Isc= 4x 1.84A = 7.36A	TO DC2
70 MODULES 8400Wdc	7 STRINGS HARNESS Isc= 7x 1.84A = 12.88A	TO DC3
40 MODULES 4800Wdc	4 STRINGS HARNESS Isc= 4x 1.84A = 7.36A	TO DC4
40 MODULES 4800Wdc	4 STRINGS HARNESS Isc= 4x 1.84A = 7.36A	TO DC5
40 MODULES 4800Wdc	4 STRINGS HARNESS Isc= 4x 1.84A = 7.36A	TO DC6

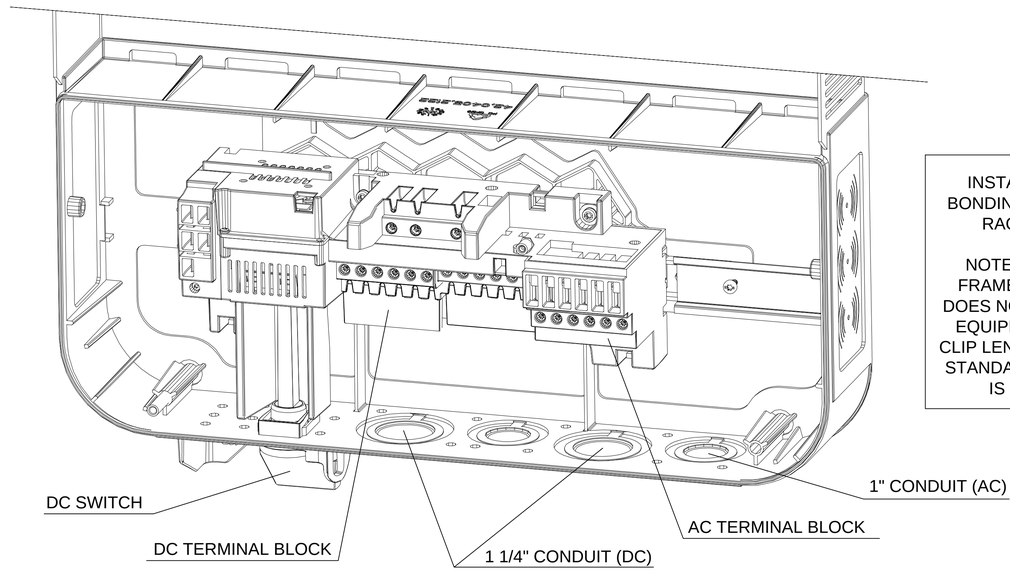
INVERTER DC INPUTS FUSE SIZING:

DC1 (+/- POLES): 4 STRINGS x 1.84A = 7.36A x 1.8 ≈ 15A FUSE
DC2 (+/- POLES): 4 STRINGS x 1.84A = 7.36A x 1.8 ≈ 15A FUSE
DC3 (+/- POLES): 7 STRINGS x 1.84A = 12.88A x 1.8 ≈ 25A FUSE
DC4 (+/- POLES): 4 STRINGS x 1.84A = 7.36A x 1.8 ≈ 15A FUSE
DC5 (+/- POLES): 4 STRINGS x 1.84A = 7.36A x 1.8 ≈ 15A FUSE
DC6 (+/- POLES): 4 STRINGS x 1.84A = 7.36A x 1.8 ≈ 15A FUSE

FUSE SIZING IN ACCORDANCE WITH MANUFACTURER OPERATIONS MANUAL AND IN COMPLIANCE WITH NEC-2017 (690.9(B))

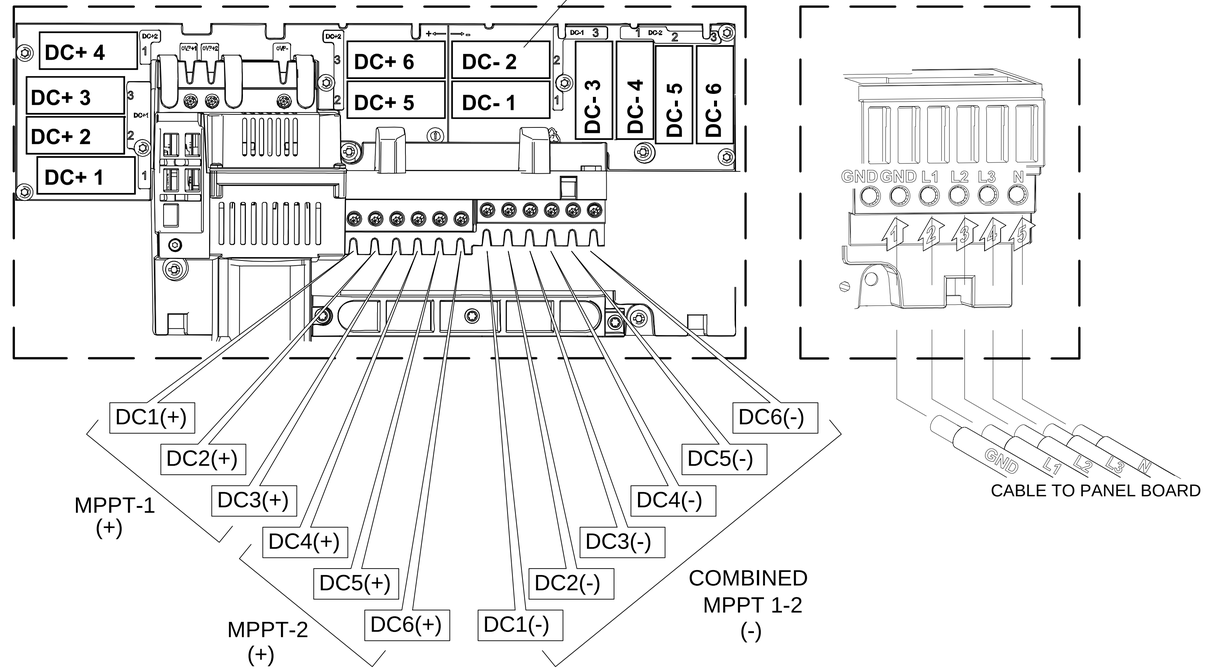
FRONIUS INSTALLATION MANUAL:
FUSE NOMINAL CURRENT: (1.8xIsc) < IN < (2.4xIsc)

NEC-2017 690.9(B):
OVERCURRENT DEVICE RATING: ≥ Isc x 1.56



INSTALLER TO PROVIDE BONDING JUMPER BETWEEN RACKING SECTIONS.

NOTE: FIRST SOLAR IS A FRAMELESS MODULE AND DOES NOT REQUIRE GROUND EQUIPMENT AS LONG AS A CLIP LENGTH OF 100mm FOR A STANDARD 4 CLIP MOUNTING IS NOT EXCEEDED.



SEE PLAN E-109 (ARRAY BLOCK- CONNECTION DETAIL)
SEE PLAN E-201 (SINGLE LINE DIAGRAM)
SEE PLAN E-205 (AC WIRE CHART)
SEE PLAN E-206, E-207, E-208 (DC WIRE CHARTS)

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PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc
ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
12-18-2018	Conduit size indicated
12-20-2018	NEC code updated

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

INVERTER WIRING

E-210

WARNING
ELECTRIC SHOCK HAZARD

IF A GROUND FAULT IS INDICATED
NORMALLY GROUNDED CONDUCTORS
MAY BE UNGROUNDED AND ENERGIZED

LABEL LOCATION:
DC DISCONNECT, INVERTER
(PER CODE: NEC 690.35(F))
[To be used when inverter is ungrounded]

WARNING
ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE UNGROUNDED
AND MAY BE ENERGIZED

LABEL LOCATION:
DC DISCONNECT, INVERTER
(PER CODE: NEC 690.35(F))
[To be used when inverter is ungrounded]

WARNING
ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
PER CODE: NEC 690.17(E), CB

WARNING
ARC FLASH AND SHOCK HAZARD

WILL CAUSE SEVER INJURY OR DEATH

WEAR PROPER PROTECTIVE EQUIPMENT BEFORE
OPENING OR PERFORMING DIAGNOSTIC
MEASUREMENTS WHILE ENERGIZED (SEE NFPA 70E)

LABEL LOCATION:
SWITCHBOARD, TRANSFORMER, PV PANELS, DISCONNECTS
(PER CODE: NEC 690.35(F))

WARNING
ARC FLASH AND SHOCK HAZARD

DISCONNECT MAIN POWER SUPPLY
BEFORE SERVICING EQUIPMENT

LABEL LOCATION:
SWITCHBOARD, TRANSFORMER, PV PANELS, DISCONNECTS
(PER CODE: NEC 690.35(F))

WARNING
INVERTER OUTPUT CONNECTION DO NOT
RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(D)(7))
[Not required if panelboard is rated not less than sum of ampere ratings
of all overcurrent devices supplying it]

CAUTION: SOLAR CIRCUIT

LABEL LOCATION:
MARKINGS PLACED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES,
AND CABLE ASSEMBLIES AT LEAST EVERY 1O FT, AT TURNS AND ABOVE/BELOW PENETRATIONS
AND ALL COMBINER/JUCTION BOXES. (PER CODE: IFC605.11.1.4)

SOLAR DISCONNECT

LABEL LOCATION:
DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC690.13(B))

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
POINT OF INTERCONNECTION AND TRANSFORMER LABEL
(PER CODE: CEC 705.12(D)(4))

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: CEC690.15, 690.13(B))

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
CONDUIT, COMBINER BOX
(PER CODE: NEC690.31(G)(3)(4) & NEC 690.13(G)(4)

DANGER
ARC FLASH AND SHOCK HAZARD

FOLLOW ALL REQUIREMENTS IN NFPA 70E
FOR SAFE WORK PRACTICES AND FOR
PERSONAL PROTECTION EQUIPMENT

LABEL LOCATION:
SWITCHBOARD, TRANSFORMER, PV PANELS, DISCONNECTS
(PER CODE: NEC 690.35(F))

TYP INVERTER LABEL

INV-1

LABEL LOCATION:
INVERTERS

TYP SUB PANEL LABEL

PB-1

LABEL LOCATION:
AC PANEL BOARDS

TYP LV SWITCHBOARD LABEL

SWB-1

LABEL LOCATION:
SWITCHBOARDS

TYP TRANSFORMER LABEL

TR-1

LABEL LOCATION:
MV TRANSFORMERS

PHOTOVOLTAIC
INVERTER INPUT
DC DISCONNECT

WARNING
ELECTRIC
SHOCK HAZARD !

DO NOT TOUCH TERMINALS. TERMINALS ON
BOTH THE LINE AND LOAD SIDES MAY BE
ENERGIZED IN THE OPEN POSITION

INTERACTIVE SOLAR PV SYSTEM RATING

RATED DC CURRENT	45.90	AMP
RATED DC VOLTAGE	708	VDC
MAXIMUM SYSTEM VOLTAGE	887	VDC
SHORT CIRCUIT CURRENT	49.68	AMP

SYSTEM INSTALLER: _____
FOR SERVICE CALL: _____

INVERTERS 1 - 190

PHOTOVOLTAIC SYSTEM
DISCONNECT FOR
UTILITY OPERATION

WARNING
ELECTRIC
SHOCK HAZARD !

DO NOT TOUCH TERMINALS. TERMINALS ON
BOTH THE LINE AND LOAD SIDES MAY BE
ENERGIZED IN THE OPEN POSITION

INTERACTIVE SOLAR PV SYSTEM RATING

RATED OPERATING CURRENT	116	AMP
NORMAL OPERATING VOLTAGE	22,860	VAC

SYSTEM INSTALLER: _____
FOR SERVICE CALL: _____

UTILITY DISCONNECT WARNING LABEL

WARNING - Electric Shock Hazard
No user serviceable parts inside
Contact authorized service provider for assistance

LABEL LOCATION:
INVERTER, JUNCTION BOXES (ROOF), AC DISCONNECT
(PER CODE: NEC690.13.G.3 & NEC 690.13.G.4)

ADHESIVE FASTENED SIGNS:
- THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
- WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].
- ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED.

DC Arc Flash Label

WARNING
ARC FLASH AND SHOCK RISK
APPROPRIATE PPE REQUIRED

13 inches	Arc Flash Boundary
0.60	cal/cm^2 Incident Energy at 18 inches
PPE	No Arc rated PPE Required
1000 VDC	Shock Risk when cover is removed
0	Glove Class
42 inches	Limited Approach
12 inches	Restricted Approach

Location: **dcBUS-0002**

SKM Systems Analysis, Inc.
1 Pearl St. Redondo Beach, CA 90277
(310) 698-4700

Job#: 232874	Prepared on: 06/22/18	By: Engineer

Warning: Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements.

AF Label - #01

WARNING
ARC FLASH AND SHOCK RISK
APPROPRIATE PPE REQUIRED

16 inches	Arc Flash Boundary
0.96	cal/cm^2 Incident Energy at 18 inches
PPE	Shirt & pants or coverall, Nonmelting (ASTM F1506) or Untreated Fiber
480 VAC	Shock Risk when cover is removed
00	Glove Class
42 inches	Limited Approach
12 inches	Restricted Approach

Location: **BUS-INV-0**

SKM Systems Analysis, Inc.
1 Pearl St. Redondo Beach, CA 90277
(310) 698-4700

Job#: 232874	Prepared on: 06/21/18	By: Engineer

Warning: Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements.

AF Label - #02

WARNING
ARC FLASH AND SHOCK RISK
APPROPRIATE PPE REQUIRED

19 inches	Arc Flash Boundary
1.26	cal/cm^2 Incident Energy at 18 inches
PPE	Arc rated shirt & pants + arc-rated coverall + arc-rated arc flash suit
480 VAC	Shock Risk when cover is removed
00	Glove Class
42 inches	Limited Approach
12 inches	Restricted Approach

Location: **PNLBRD**

SKM Systems Analysis, Inc.
1 Pearl St. Redondo Beach, CA 90277
(310) 698-4700

Job#: 232874	Prepared on: 06/21/18	By: Engineer

Warning: Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements.

AF Label - #03

DANGER
NO SAFE PPE EXISTS
ENERGIZED WORK PROHIBITED

381 inches	Arc Flash Boundary
70.2	cal/cm^2 Incident Energy at 24 inches
PPE	Dangerous! DO NOT WORK ON LIVE!
480 VAC	Shock Risk when cover is removed
0	Glove Class
42 inches	Limited Approach
12 inches	Restricted Approach

Location: **SWB**

SKM Systems Analysis, Inc.
1 Pearl St. Redondo Beach, CA 90277
(310) 698-4700

Job#: 232874	Prepared on: 06/21/18	By: Engineer

Warning: Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements.

AF Label - #04

DANGER
NO SAFE PPE EXISTS
ENERGIZED WORK PROHIBITED

283 inches	Arc Flash Boundary
73.8	cal/cm^2 Incident Energy at 36 inches
PPE	Dangerous! DO NOT WORK ON LIVE!
23000 VAC	Shock Risk when cover is removed
3	Glove Class
72 inches	Limited Approach
33 inches	Restricted Approach

Location: **XM-H**

SKM Systems Analysis, Inc.
1 Pearl St. Redondo Beach, CA 90277
(310) 698-4700

Job#: 232874	Prepared on: 06/21/18	By: Engineer

Warning: Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements.

AF Label - #05

DANGER
NO SAFE PPE EXISTS
ENERGIZED WORK PROHIBITED

297 inches	Arc Flash Boundary
118.8	cal/cm^2 Incident Energy at 18 inches
PPE	Dangerous! DO NOT WORK ON LIVE!
480 VAC	Shock Risk when cover is removed
00	Glove Class
42 inches	Limited Approach
12 inches	Restricted Approach

Location: **XM-L**

SKM Systems Analysis, Inc.
1 Pearl St. Redondo Beach, CA 90277
(310) 698-4700

Job#: 232874	Prepared on: 06/21/18	By: Engineer

Warning: Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements.

greengo

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ARC DESIGN
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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CAMPBELL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

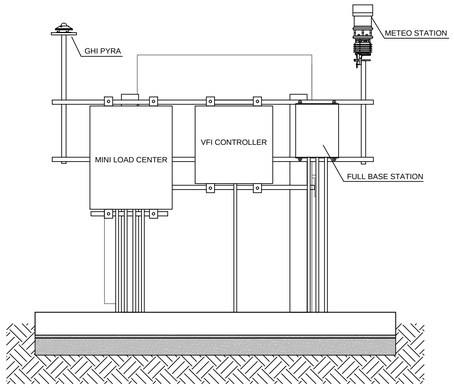
REVISIONS

DATE	COMMENT
09-07-2018	AF Label - #05 moved

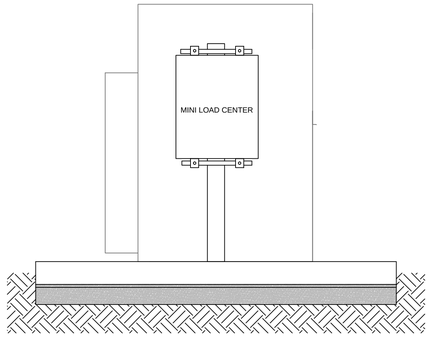
PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

SYSTEM LABELS

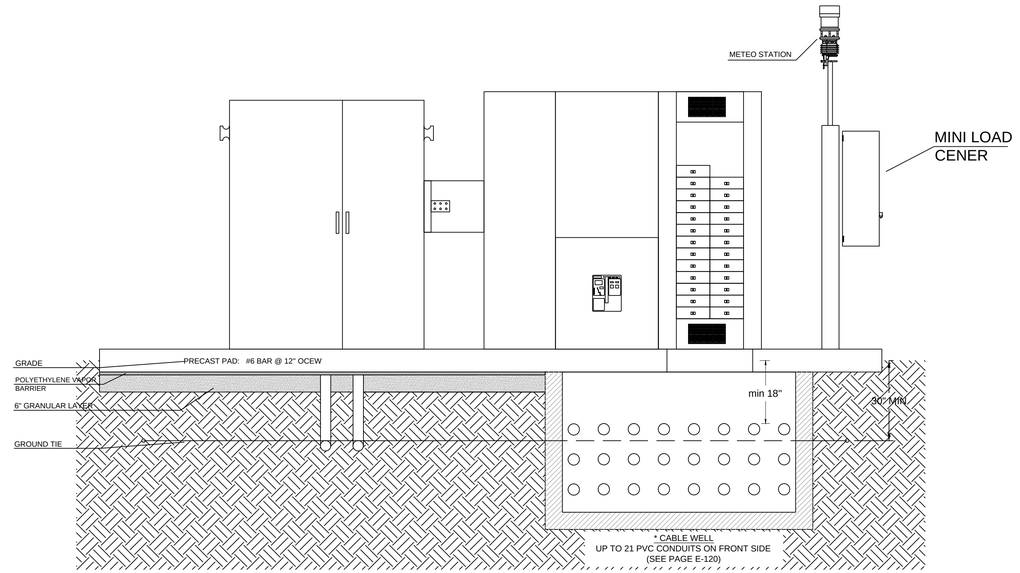
E-211

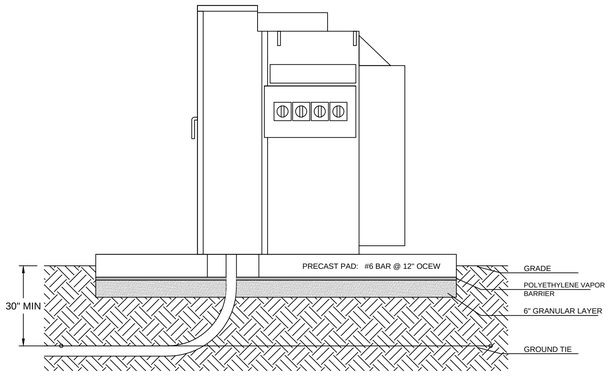


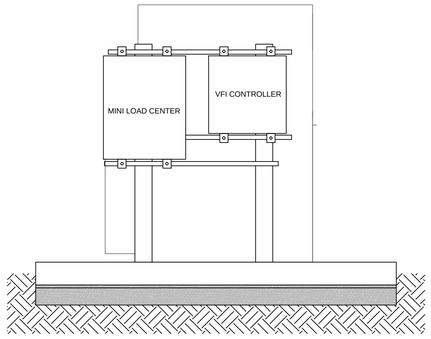
MINI LOAD CENTER, VFI CONTROLLER & FULL BASE STATION AT TR-2
FRONT VIEW



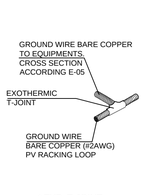
MINI LOAD CENTER AT TR-1
FRONT VIEW





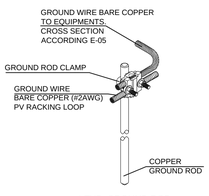


MINI LOAD CENTER & VFI CONTROLLER AT TR-3
FRONT VIEW



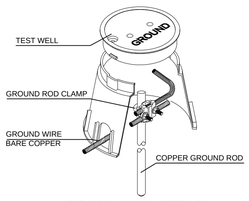
* TYP. T-JOINT

9 E-118 T-JOINT SCALE: N/S



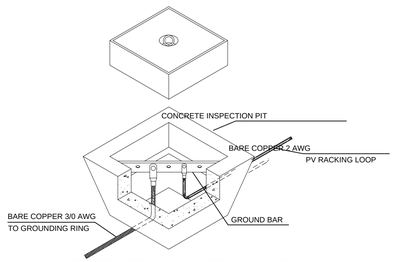
* TYP. GROUND ROD

10 E-118 GROUND ROD SCALE: N/S



* TYP. GROUND ROD - TEST WELL

11 E-118 GROUND ROD - TEST WELL SCALE: N/S

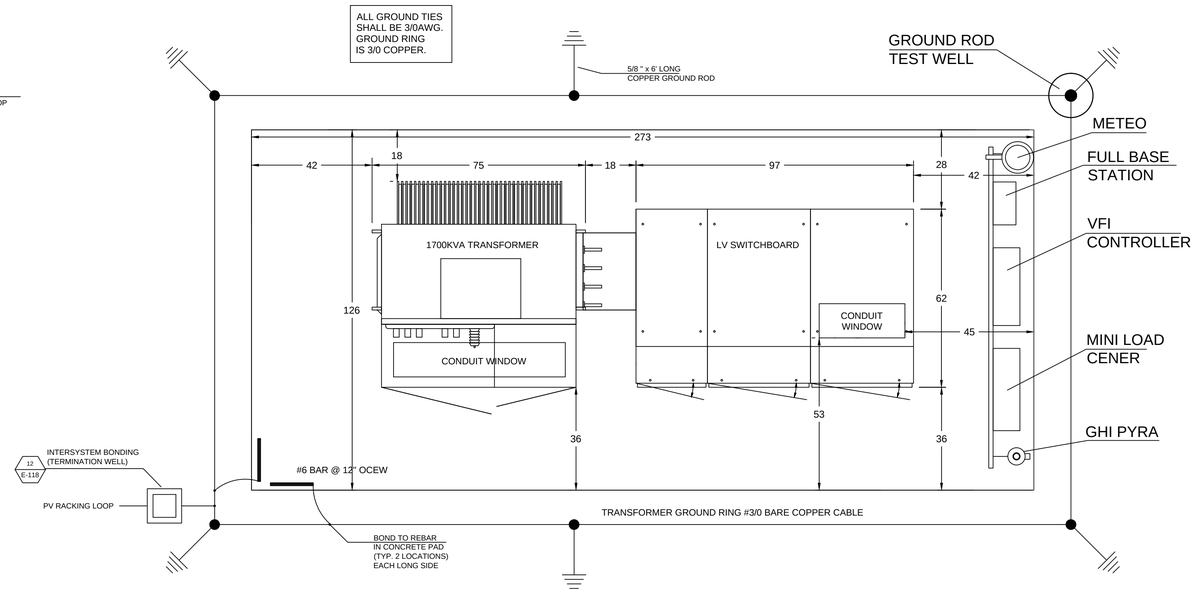


* TYP. INTERSYSTEM BONDING - TERMINATION WELL

12 E-118 INTERSYSTEM BONDING - TERMINATION WELL SCALE: N/S

GROUNDING NOTES

*GROUNDING SYSTEM IS SHOWN DIAGRAMMATICALLY.
*ALL TAPS, SPLICES AND CONNECTIONS BETWEEN GROUND CABLES, GROUND RODS OR ANY OTHER UNDERGROUND OR EMBEDDED CONNECTION SHALL BE MADE USING EXOTHERMIC CONNECTIONS UNLESS OTHERWISE NOTED.
*ALL BOLTED JOINTS SHALL BE MADE UP FIRMLY, BOLTS, NUTS AND WASHERS SHALL BE SILICON-BRONZE ALLOY FOR COPPER TO COPPER CONNECTIONS. USE STAINLESS STEEL HARDWARE WHEN CONNECTING DISSIMILAR METALS.
*CABLE PIGTAILS BROUGHT OUT FOR CONNECTION TO EQUIPMENT AND OTHER CONNECTIONS ABOVE GRADE, SHALL EXTEND TO THE PROPOSED CONNECTION POINT OR BE TERMINATED WITH A GROUNDING INSERT.
*ABOVE-GRADE CONNECTIONS TO EQUIPMENT OR TESTING POINTS SHALL BE FULL COMPRESSION COPPER LUGS UNLESS OTHERWISE NOTED.
*CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. DO NOT DRIVE GROUND UNTIL ALL UNDERGROUND UTILITY LINES ARE LOCATED.
*THE BASIC GROUNDING GRID WILL CONSIST OF A PERIMETER RING OF #3/0 AWG BURIED BARE COPPER CONDUCTOR. CABLE SHALL BE SOFT DRAWN, CLASS B STRANDED. TAPS FROM THE GROUND RING TO TRANSFORMER AND SWITCHBOARD WILL BE #3/0 AWG BARE COPPER CABLE
*PV RACKING GROUNDING GRID WILL CONSIST OF A PERIMETER LOOP OF #2 AWG DIRECT BURIED BARE COPPER CONDUCTOR RUNNING THROUGH ALL MAIN TRENCHES AND SHALL BE BONDED TO THE TRANSFORMER RINGS. TAPS FROM THE GROUNDING LOOP TO INDUVIDUAL RACKING WILL BE #2/0 AWG BARE COPPER CABLE.
*THE GROUNDING SYSTEM SHALL BE INSTALLED AND TESTED TO MEET A RESISTIVITY OF LESS THAN 5 OHMS. CONTRACTOR SHALL PROVIDE AND INSTALL ADDITIONAL CABLE/GROUND RODS TO MEET THE REQUIREMENTS.



GREENGO ENERGY US, INC.
1447 S. TRYON STREET
SUITE 201
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+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL 32192 JAMES A. COX

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

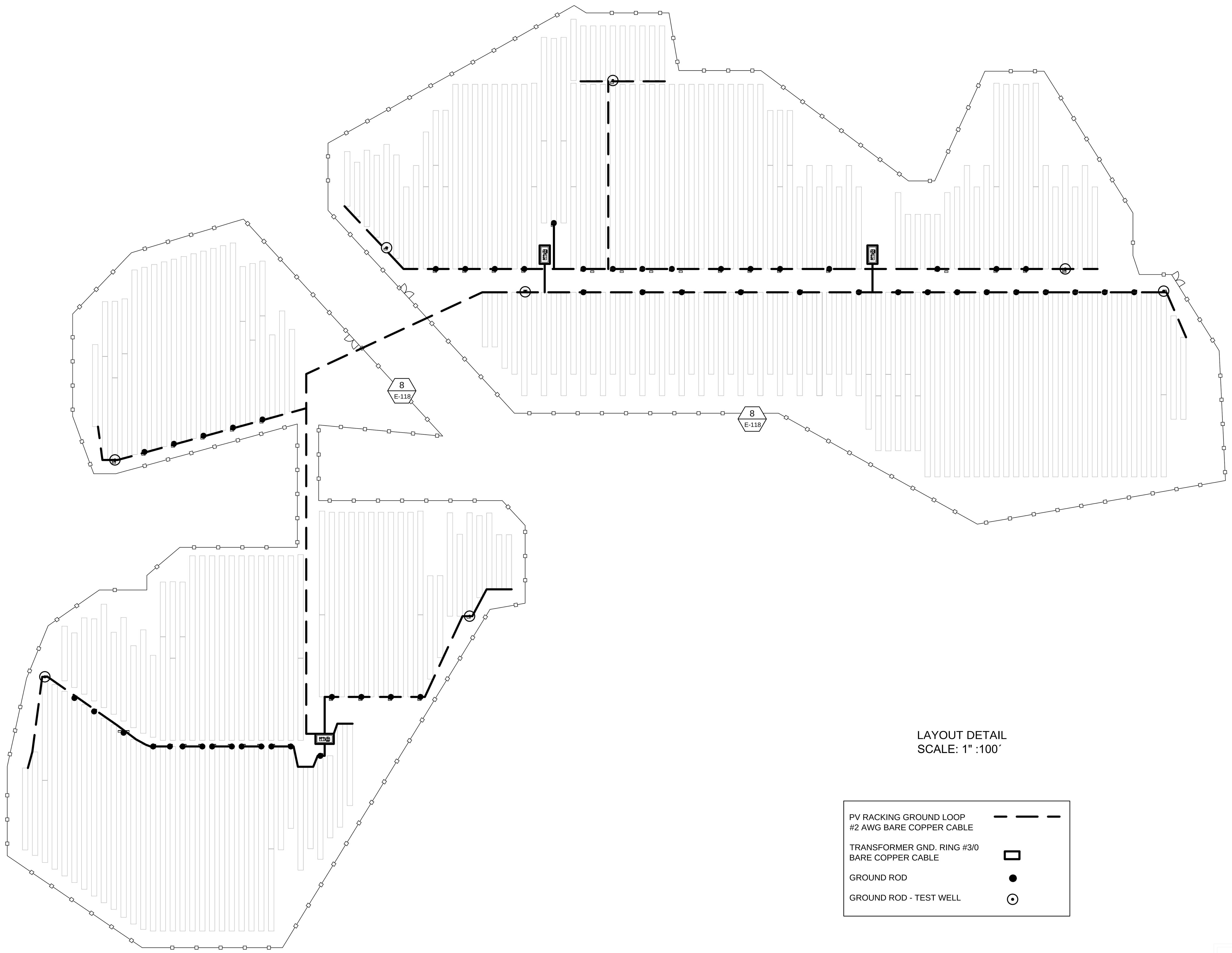
REVISIONS

DATE	COMMENT
10-07-2018	Ground details adjustment
12-13-2018	MLC & Meteo rack added
01-18-2019	Ring-Test Well added

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	1"=25´
DATE	12-21-2018

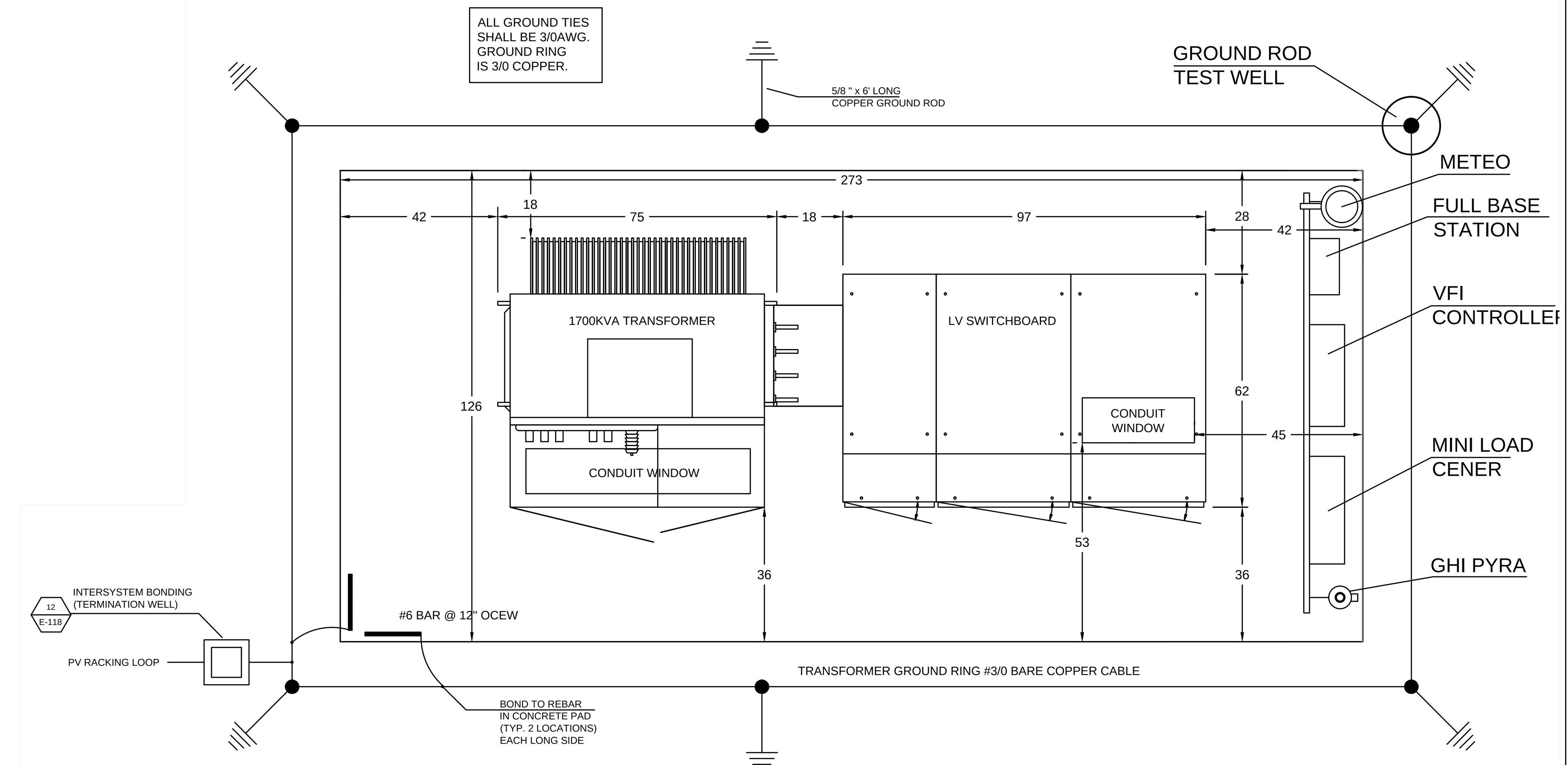
TRANSFORMER & LV SWITCHBOARD PAD

E-212

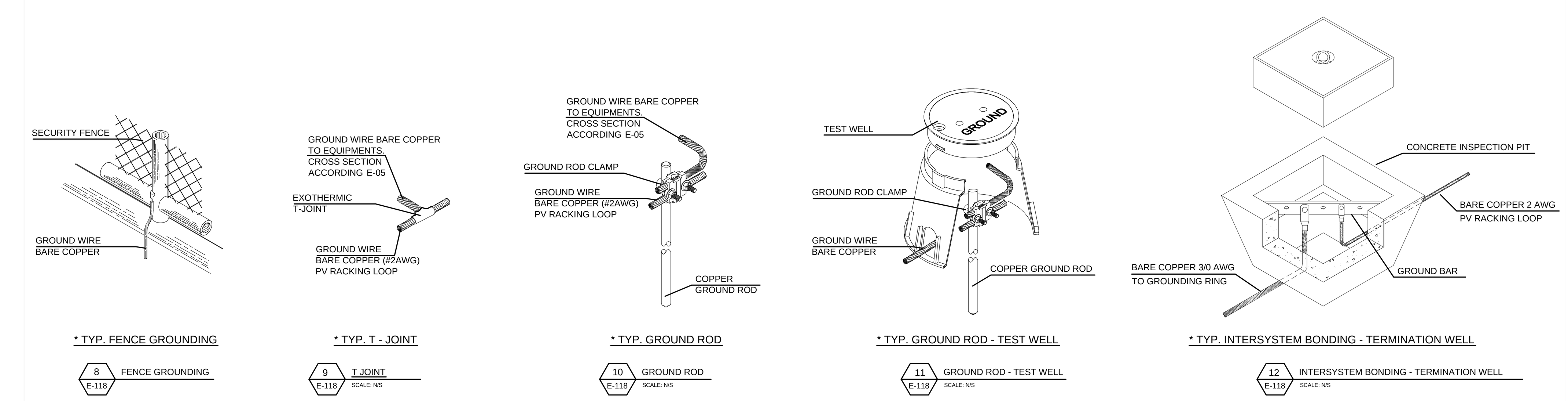


LAYOUT DETAIL
SCALE: 1" :100´

PV RACKING GROUND LOOP #2 AWG BARE COPPER CABLE	— — —
TRANSFORMER GND. RING #3/0 BARE COPPER CABLE	▭
GROUND ROD	●
GROUND ROD - TEST WELL	⊙



TRANSFORMER & LV SWITCHBOARD PAD



* TYP. FENCE GROUNDING — 8 / E-118 FENCE GROUNDING

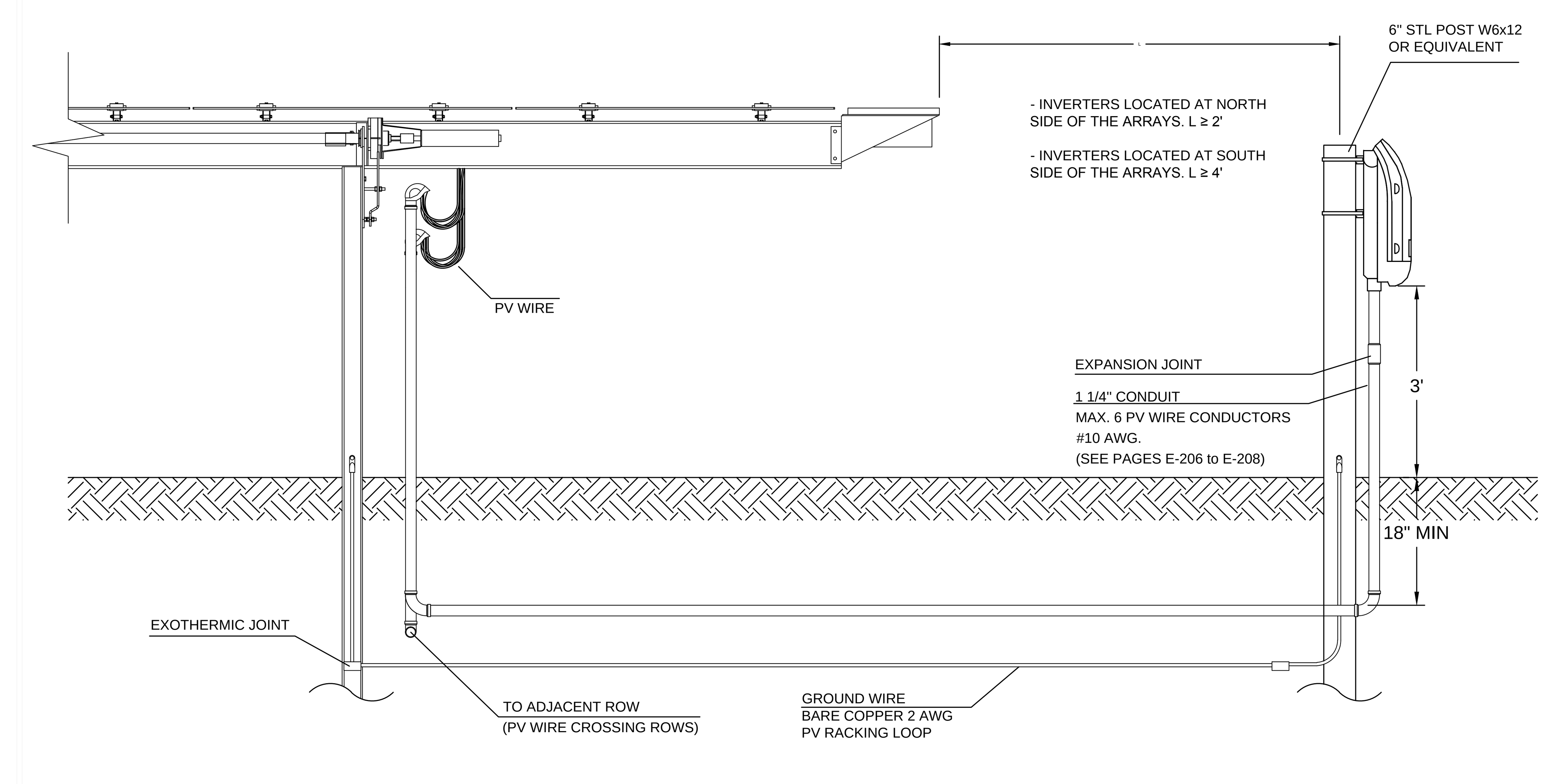
* TYP. T - JOINT — 9 / E-118 T JOINT, SCALE: N/S

* TYP. GROUND ROD — 10 / E-118 GROUND ROD, SCALE: N/S

* TYP. GROUND ROD - TEST WELL — 11 / E-118 GROUND ROD - TEST WELL, SCALE: N/S

* TYP. INTERSYSTEM BONDING - TERMINATION WELL — 12 / E-118 INTERSYSTEM BONDING - TERMINATION WELL, SCALE: N/S

GROUND CONNECTIONS



RACKING & INVERTER MOUNTING

greengo
GREENGO ENERGY US, INC.
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ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32162 ENGINEER JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
10-07-2018	Test well added
10-31-2018	Inv. 77, 78, 79 adjusted
11-21-2018	Fence updated by civil
12-18-2018	Inverter conduit sized
01-18-2019	Ring-Test Well added

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/S
DATE	12-21-2018

GROUNDING DETAIL

E-213

First Solar Series 4™ PV Module

ADVANCED THIN FILM SOLAR TECHNOLOGY

122.5 WATT MODULE
EFFICIENCY OF 17.0%

INDUSTRY BENCHMARK SOLAR MODULES

As a global leader in PV energy, First Solar's advanced thin film solar modules have set the industry benchmark with over 10 gigawatts (GW) installed worldwide and a proven performance advantage over conventional crystalline silicon solar modules. Generating more energy than competing modules with the same power rating, First Solar's Series 4™ and Series 4A™ PV Modules deliver superior performance and reliability to our customers.

PROVEN ENERGY YIELD ADVANTAGE

- Generates more energy than conventional crystalline silicon solar modules with the same power due to superior temperature coefficient and superior spectral response
- Anti-reflective coated glass (Series 4A™) enhances energy production

ADVANCED PERFORMANCE & RELIABILITY

- Compatible with advanced 1500V plant architectures
- Highly predictable energy in all climates and applications
- Independently certified for reliable performance in high temperature, high humidity, extreme desert and coastal environments

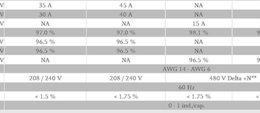
CERTIFICATIONS & TESTS

- PID-Free, Thresher Test[1], Long-Term Sequential Test[1], and ATLAS 25+[1]
- IEC 61646 1500V, IEC 61730 1500V, CE
- IEC 61701 Salt Mist Corrosion, IEC 60068-2-68 Dust and Sand Resistance
- ISO 9001:2008 and ISO 14001:2004
- UL 1703 Listed Fire Performance PV Module Type 10[2]
- CSI Eligible, FSEC, MCS, CEC Listed (Australia), SII[3], InMetro

END-OF-LIFE RECYCLING

- Recycling services available through First Solar's industry-leading recycling program or customer-selected third party.

MODULE WARRANTY[9]



- 25-Year Linear Performance Warranty[4]
- 10-Year Limited Product Warranty

First Solar, Inc. | firstsolar.com | info@firstsolar.com

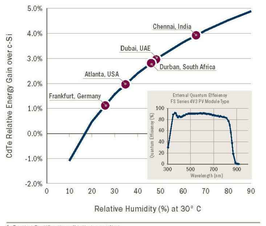
PD-5-401-04-3 | November 2016

FIRST SOLAR SERIES 4™ PV MODULE

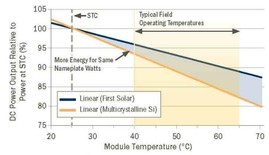
MECHANICAL DESCRIPTION	
Length	1200mm
Width	600mm
Weight	12kg
Thickness	6.8mm
Area	0.72m²
Leadwire	2.6mm², 610mm
Connectors	MC4[8]
Bypass Diode	None
Cell Type	Thin-film CdTe semiconductor, up to 216 cells
Frame Material	None
Front Glass	3.2mm heat strengthened Series 4A™ includes anti-reflective coating
Back Glass	3.2mm tempered
Encapsulation	Laminate material with edge seal
Load Rating	2400Pa[10]

MODULE NUMBERS AND RATINGS AT STANDARD TEST CONDITIONS (1000W/m², AM 1.5, 25°C)[5]							
NOMINAL VALUES		FS-4110-3 FS-4110A-3	FS-4112-3 FS-4112A-3	FS-4115-3 FS-4115A-3	FS-4117-3 FS-4117A-3	FS-4120-3 FS-4120A-3	FS-4122-3 FS-4122A-3
Nominal Power[6] (-0/+5W)	P_{NOM} (W)	110.0	112.5	115.0	117.5	120.0	122.5
Voltage at P_{MAX}	V_{NOM} (V)	67.8	68.5	69.3	70.1	70.8	71.5
Current at P_{MAX}	I_{NOM} (A)	1.62	1.64	1.66	1.68	1.70	1.71
Open Circuit Voltage	V_{OC} (V)	86.4	87.0	87.6	88.1	88.7	88.7
Short Circuit Current	I_{SC} (A)	1.82	1.83	1.83	1.83	1.84	1.85
Module Efficiency	%	15.3	15.6	16.0	16.3	16.7	17.0
Maximum System Voltage	V_{SYS} (V)	1500 [7,8]					
Limiting Reverse Current	I_R (A)	4.0					
Maximum Series Fuse	I_{CF} (A)	4.0					
RATINGS AT NOMINAL OPERATING CELL TEMPERATURE OF 45°C (800W/m², 20°C air temperature, AM 1.5, 1m/s wind speed)[5]							
Nominal Power	P_{NOM} (W)	82.2	85.1	87.0	89.0	90.8	92.7
Voltage at P_{MAX}	V_{NOM} (V)	63.5	64.5	64.9	65.9	66.3	67.2
Current at P_{MAX}	I_{NOM} (A)	1.31	1.32	1.34	1.35	1.37	1.38
Open Circuit Voltage	V_{OC} (V)	81.6	82.1	82.7	83.2	83.7	83.7
Short Circuit Current	I_{SC} (A)	1.47	1.47	1.48	1.48	1.48	1.49
TEMPERATURE CHARACTERISTICS							
Module Operating Temperature Range	(°C)	-40 to +85					
Temperature Coefficient of P_{MAX}	T_K (P_{MAX})	-0.28%/°C (Temperature Range: 25°C to 75°C)					
Temperature Coefficient of V_{OC}	T_K (V_{OC})	-0.28%/°C					
Temperature Coefficient of I_{SC}	T_K (I_{SC})	+0.04%/°C					

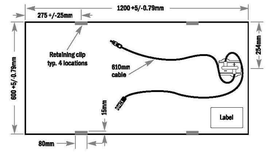
SUPERIOR SPECTRAL RESPONSE



SUPERIOR TEMPERATURE COEFFICIENT



MECHANICAL DRAWING



1 Testing Certifications/Listings pending
2 Class A Spread of Flame / Class B Burning Brand. Roof mounted fire rating is established by assessing rack and solar module as a unit
3 Limited power output and product warranties subject to warranty terms and conditions
4 Ensures 98% rated power in first year, -0.5%/year through year 25
5 All ratings ± 10%, unless specified otherwise. Specifications are subject to change
6 Measurement uncertainty applies
7 UL 1703 1500V Listed / ULC 1703 1000V Listed
8 Application Class A for 1000V (class II), Application Class B for 1500V (class 0)
9 Multi-Contact MC4 (PV-KST4/PV-KBT4)
10 Higher load ratings can be met with additional clips or wider clips, subject to testing

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/ Perfect Welding / Solar Energy / Perfect Charging

FRONIUS
SHIFTING THE LIMITS

FRONIUS SYMO

/ Powering commercial projects that last. The Fronius Symo.

/ Featuring ten models ranging from 10 kW to 24 kW, the transformerless Fronius Symo is the ideal compact three-phase inverter for all commercial applications. The high system voltage and wide input range ensure maximum flexibility in system design. With low roof loading, NEMA 4X and 1000 V DC rating, the Fronius Symo can be mounted in many different ways, including flat on a roof or on a pole. The modern design is equipped with the SnapINverter mounting system, allowing for lightweight, secure and convenient installation. Several industry-leading features are available with the Fronius Symo including Wi-Fi® and SunSpec Modbus interfaces for seamless monitoring and data-logging, field proven Arc Fault Circuit Interruption (AFCI), NEC 2014 compliant, and Fronius' superb online and mobile monitoring platform Fronius Solar.web.

TECHNICAL DATA FRONIUS SYMO (10.0-3 208-240, 12.0-3 208-240, 10.0-3 480, 12.5-3 480, 15.0-3 208)

INPUT DATA		SYMO 10.0-3 208-240	SYMO 12.0-3 208-240	SYMO 10.0-3 480	SYMO 12.5-3 480	SYMO 15.0-3 208
Recommended PV power (kWp)		8.0 - 13.0	9.5 - 15.5	8.0 - 13.0	10.0 - 16.0	12.0 - 19.5
Max. usable input current (MPPT1/MPPT 2)		24.0 A / 16.5 A				30.0 A
Max. usable input current total (MPPT 1 + MPPT 2)		41.5 A				50.0 A
Max. array short circuit current (1.5 * Imax) MPPT 1/MPPT 2)		37.5 A / 24.8 A				75.0 A
Integrated DC string fuse holders		NA				6- and 6+
MPP voltage range		300 - 500 V		300 - 800 V	350 - 800 V	325 - 850 V
Operating voltage range		200 - 600 V		200 - 1000 V		325 - 1000 V
Max. input voltage		600 V		1000 V		
Nominal input voltage	208 V	350 V	350 V	NA	NA	325 V
	240 V	400 V	470 V	NA	NA	NA
	480 V	NA	NA	675 V	685 V	NA
Admissable conductor size DC		AWG 14 - AWG 6 copper direct, AWG 6 aluminium direct, AWG 4 - AWG 2 copper or aluminium with input combiner				
Number of MPPT		2				1

OUTPUT DATA		SYMO 10.0-3 208-240	SYMO 12.0-3 208-240	SYMO 10.0-3 480	SYMO 12.5-3 480	SYMO 15.0-3 208
Max. output power	208 V	9995 VA	11995 VA	NA	NA	15000 VA
	240 V	9995 VA	11995 VA	NA	NA	NA
	480 V	NA	NA	9995 VA	12495 VA	NA
Max. continuous output current	208 V	27.7 A	33.3 A	NA	NA	41.6 A
	240 V	24.0 A	28.9 A	NA	NA	NA
	480 V	NA	NA	12.0 A	15.0 A	NA
Recommended OCPD/AC breaker size	208 V	35 A	45 A	NA	NA	60 A
	240 V	30 A	40 A	NA	NA	NA
	480 V	NA	NA	15 A	20 A	NA
Max. Efficiency		97.0 %	97.0 %	98.1 %	98.1 %	97.3%
CEC Efficiency	208 V	96.5 %	96.5 %	NA	NA	96.5%
	240 V	96.5 %	96.5 %	NA	NA	NA
	480 V	NA	NA	96.5 %	97.0 %	NA
Admissable conductor size AC		AWG 14 - AWG 6				
Grid connection		208 / 240 V	208 / 240 V	480 V Delta +N**		208 V
Frequency		60 Hz				
Total harmonic distortion		< 1.5 %	< 1.75 %	< 1.75 %	< 1.5 %	< 3.5%
Power factor		0 - 1 ind./cap.				

**+N for sensing purposes - no current carrying conductor.

TECHNICAL DATA (10.0-3 208/240, 12.0-3 208/240, 10.0-3 480, 12.5-3 480, 15.0-3 208)

GENERAL DATA	STANDARD WITH ALL FRONIUS SYMO MODELS
Dimensions (width x height x depth)	20.1 x 28.5 x 8.9 inches
Degree of protection	NEMA 4X
Night time consumption	< 1 W
Inverter topology	Transformerless
Cooling	Variable speed fan
Installation	Indoor and outdoor installation
Ambient operating temperature range	-40°F - + 140 °F (-40 - +60 °C)
Permitted humidity	0 - 100 % (noncondensing)
DC connection terminals	6x DC+ and 6x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminium (solid / stranded)
AC connection terminals	Screw terminals 14-6 AWG
Certificates and compliance with standards (Symo 15.0-208 V)	UL 1741-2010, UL1998 (for functions: AFCI and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2005, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690, C22. 2 No. 107.1-01 (September 2001), UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013
Certificates and compliance with standards (Symo 15.0-208 V)	UL 1741-2010, UL1998 (for functions: AFCI, RCMU and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2005, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC 2014 Article 690, C22. 2 No. 107.1-01 (September 2001) , UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013

GENERAL DATA	SYMO 10.0-3 208-240	SYMO 12.0-3 208-240	SYMO 10.0-3 480	SYMO 12.5-3 480	SYMO 15.0-3 208
Weight	91.9 lbs.		76.7 lbs.		78.3 lbs.

PROTECTIVE DEVICES	STANDARD WITH ALL FRONIUS SYMO MODELS
AFCI & 2014 NEC Compliant	Yes
DC disconnect	Yes
DC reverse polarity protection	Yes
Ground Fault Protection with Isolation Monitor Interrupter	Yes

INTERFACES	AVAILABLE WITH ALL FRONIUS SYMO MODELS
USB (A socket)	Datalogging and inverter update possible via USB
2x RS422 (RJ45 socket)	Fronius Solar Net, interface protocol
AVAILABLE WITH THE FRONIUS DATAMANAGER 2.0 CARD (ONLY ONE CARD REQUIRED FOR UP TO 100 INVERTERS)	
Wi-Fi/Ethernet/Serial/ Datalogger and webserver	Wireless standard 802.11 b/g/n / Fronius Solar.web, SunSpec Modbus TCP, JSON / SunSpec Modbus RTU
6 inputs and 4 digital I/Os	Load management; signaling, multipurpose I/O

**+N for sensing purposes - no current carrying conductor.

TECHNICAL DATA (15.0-3 480, 17.5-3 480, 20.0-3 480, 22.7-3 480, 24.0-3 480)

INPUT DATA		SYMO 15.0-3 480	SYMO 17.5-3 480	SYMO 20.0-3 480	SYMO 22.7-3 480	SYMO 24.0-3 480
Recommended PV power (kWp)		12.0 – 19.5	14.0 - 23.0	16.0 - 26.0	18.0 - 29.5	19.0 - 31.0
Max. usable input current (MPPT1/MPPT 2)		33.0 A / 25.0 A				
Max. usable input current total (MPPT 1 + MPPT 2)		51 A				
Max. array short circuit current (1.5 * Imax) MPPT 1/MPPT 2)		49.5 A / 37.5 A				
Integrated DC string fuse holders		NA	NA	6- and 6+		
MPP voltage range		350 - 800 V	400 - 800 V	450 - 800 V	500 - 800 V	500 - 800 V
Operating voltage range		200 - 1000 V				
Max. input voltage		1000 V				
Nominal input voltage	208 V	NA	NA	NA	NA	NA
	240 V	NA	NA	NA	NA	NA
	480 V	685 V	695 V	710 V	720 V	720 V
Admissable conductor size DC		AWG 14 - AWG 6 copper direct, AWG 6 aluminium direct, AWG 4 - AWG 2 copper or aluminium with input combiner				
Number of MPPT		2				

OUTPUT DATA		SYMO 15.0-3 480	SYMO 17.5-3 480	SYMO 20.0-3 480	SYMO 22.7-3 480	SYMO 24.0-3 480
Max. output power	208 V	NA	NA	NA	NA	NA
	240 V	NA	NA	NA	NA	NA
	480 V	14995 VA	17495 VA	19995 VA	22727 VA	23995 VA
Max. continuous output current	208 V	NA	NA	NA	NA	NA
	240 V	NA	NA	NA	NA	NA
	480 V	18.0 A	21.0 A	24.0 A	27.3 A	28.9 A
Recommended OCPD/AC breaker size	208 V	NA	NA	NA	NA	NA
	240 V	NA	NA	NA	NA	NA
	480 V	25 A	30 A	30 A	35 A	40 A
Max. Efficiency		98.0 %		98.0 %		
CEC Efficiency	208 V	NA	NA	NA	NA	NA
	240 V	NA	NA	NA	NA	NA
	480 V	97.0 %	97.5 %	97.5 %	97.5 %	97.5 %
Admissable conductor size AC		AWG 14 - AWG 6				
Grid connection		480 V Delta +N**				
Frequency		60 Hz				
Total harmonic distortion		< 1.5 %	< 1.25 %	< 1.0 %	<1.25 %	< 1.0 %
Power factor		0 - 1 ind./cap.				

**+N for sensing purposes - no current carrying conductor.

TECHNICAL DATA (15.0-3 480, 17.5-3 480, 20.0-3 480, 22.7-3 480, 24.0-3 480)

GENERAL DATA	STANDARD WITH ALL FRONIUS SYMO MODELS
Dimensions (width x height x depth)	20.1 x 28.5 x 8.9 inches
Degree of protection	NEMA 4X
Night time consumption	< 1 W
Inverter topology	Transformerless
Cooling	Variable speed fan
Installation	Indoor and outdoor installation
Ambient operating temperature range	-40°F - + 140 °F (-40 - +60 °C)
Permitted humidity	0 - 100 % (noncondensing)
DC connection terminals	6x DC+ and 6x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminium (solid / stranded)
AC connection terminals	Screw terminals 14-6 AWG
Certificates and compliance with standards	UL 1741-2010, UL1998 (for functions: AFCI and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2005, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690, C22. 2 No. 107.1-01 (September 2001), UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013

GENERAL DATA	SYMO 15.0-3 480	SYMO 17.5-3 480	SYMO 20.0-3 480	SYMO 22.7-3 480	SYMO 24.0-3 480
Weight	99.7 lbs.				

PROTECTIVE DEVICES	STANDARD WITH ALL FRONIUS SYMO MODELS
AFCI & 2014 NEC Compliant	Yes
DC disconnect	Yes
DC reverse polarity protection	Yes
Ground Fault Protection with Isolation Monitor Interrupter	Yes

INTERFACES	AVAILABLE WITH ALL FRONIUS SYMO MODELS
USB (A socket)	Datalogging and inverter update possible via USB
2x RS422 (RJ45 socket)	Fronius Solar Net, interface protocol
AVAILABLE WITH THE FRONIUS DATAMANAGER 2.0 CARD (ONLY ONE CARD REQUIRED FOR UP TO 100 INVERTERS)	
Wi-Fi/Ethernet/Serial/ Datalogger and webserver	Wireless standard 802.11 b/g/n / Fronius Solar.web, SunSpec Modbus TCP, JSON / SunSpec Modbus RTU
6 inputs and 4 digital I/Os	Load management; signaling, multipurpose I/O

greengo

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
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+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4.560 kWac / 6.156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

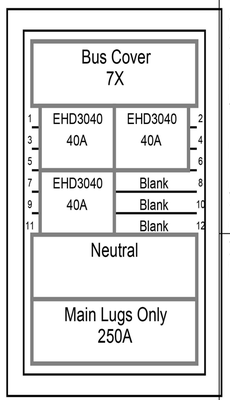
REVISIONS

DATE	COMMENT

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

MODULES / INVERTER DATA

E-214



General Information **(Section 1 of 1)**

Service Voltage:	480Y/277V 3Ph 4W	**Enclosure:**	Type 3R
Bus Rating & Type:	250A Aluminum	**Neutral Rating:**	250A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	65k A.I.C. Series Rated		

Main Device Type: MLO-Upstream HJD - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-350 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-350 kcmil (Cu/Al)
Box Catalog No.: LWPQ2048
Trim: Complete Enclosure (Includes Trim)

Surface Mounted

Box Dimensions: 48.00" [1219.2mm]H x 20.00" [508.0mm]W x 6.5" [165.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 4" [101.6mm] Right = 4" [101.6mm]

Panel ID Nameplate: **(1) AC Combiner Level 1 - 250A 65K**
Type: Plastic, adhesive-backed **(2) 480Y/277V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: T-Handle Lock Assembly
Circuit Directory: Plastic Sleeve with Card
Painted Box: ANSI 61
Heat Loss - Watts (Est.) = 109

Device Modifications:

Ref #	Description

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
3	3	40	EHD	100	65

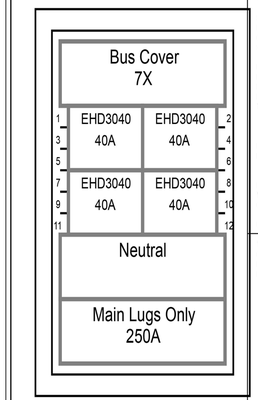
Main Devices

Qty	Poles	Trip	Frame	Amps	kAIC
1	0	N/A			65

Notes:

The information on this document is created by Eaton Corporation. It is disclosed in confidence and it is only to be used for the purpose in which it is supplied.	PREPARED BY: William Furse	DATE: 7/9/2018	**Eaton**		
	APPROVED BY:	DATE:	JOB NAME: Novo Nordisk GreenGO-CH190313X8K1		
			DESIGNATION: AC Combiner Level 1 - 250A 65K		
	VERSION: 1.0.0.22		TYPE: PRL3a	DRAWING TYPE: Customer Approval	
NEG-ALT Number: CH190313X8K1-0017	REVISION: 0	DWG SIZE: A	G.O.	ITEM	SHEET: 1 of 1

3 INVERTERS PANEL BOARD



General Information **(Section 1 of 1)**

Service Voltage:	480Y/277V 3Ph 4W	**Enclosure:**	Type 3R
Bus Rating & Type:	250A Aluminum	**Neutral Rating:**	250A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	65k A.I.C. Series Rated		

Main Device Type: MLO-Upstream HJD - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-350 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-350 kcmil (Cu/Al)
Box Catalog No.: LWPQ2048
Trim: Complete Enclosure (Includes Trim)

Surface Mounted

Box Dimensions: 48.00" [1219.2mm]H x 20.00" [508.0mm]W x 6.5" [165.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 4" [101.6mm] Right = 4" [101.6mm]

Panel ID Nameplate: **(1) AC Combiner Level 1 - 250A 65K**
Type: Plastic, adhesive-backed **(2) 480Y/277V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: T-Handle Lock Assembly
Circuit Directory: Plastic Sleeve with Card
Painted Box: ANSI 61
Heat Loss - Watts (Est.) = 109

Device Modifications:

Ref #	Description

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
4	3	40	EHD	100	65

Main Devices

Qty	Poles	Trip	Frame	Amps	kAIC
1	0	N/A			65

Notes:

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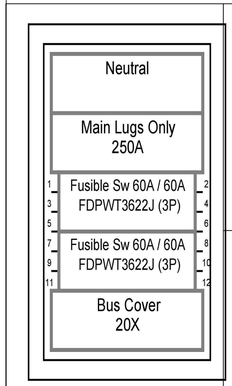
	APPROVED BY:	DATE:	JOB NAME: Novo Nordisk GreenGO-CH190313X8K1		
			DESIGNATION: AC Combiner Level 1 - 250A 65K		
	VERSION: 1.0.0.22		TYPE: PRL3a	DRAWING TYPE: Customer Approval	
NEG-ALT Number: CH190313X8K1-0018	REVISION: 0	DWG SIZE: A	G.O.	ITEM	SHEET: 1 of 1

4 INVERTERS PANEL BOARD



General Information **(Section 1 of 1)**

Service Voltage:	480Y/277V 3Ph 4W	**Enclosure:**	Type 3R
Bus Rating & Type:	250A Aluminum	**Neutral Rating:**	250A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	100k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Top Cable Entry
Main Terminals: Mechanical - (1) #4-500 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #4-500 kcmil (Cu/Al)
Box Catalog No.: RPCB3673
Trim: Complete Enclosure (Includes Trim)

Surface Mounted

Box Dimensions: 73.50" [1866.9mm]H x 36.00" [914.4mm]W x 12.85" [326.4mm]D
Min. Gutter Size: Top = 10.625" [269.9mm] Bottom = 10.625" [269.9mm]
Left = 6" [152.4mm] Right = 6" [203.2mm]

Panel ID Nameplate: **(1)**
Type: Plastic, adhesive-backed **(2) 480Y/277V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: T-Handle Lock Assembly
Circuit Directory: Plastic Sleeve with Card
Painted Box: ANSI 61
Heat Loss - Watts (Est.) =

Device Modifications:

Ref #	Description

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
2	3	N/A	FDPWT	60	100

Notes:

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	APPROVED BY:	DATE:	JOB NAME:		
			DESIGNATION:		
	VERSION: 1.0.0.18		TYPE: PRL4	DRAWING TYPE: Customer Approval	
NEG-ALT Number: CH190215X8K2-0000	REVISION: 0	DWG SIZE: A	G.O.	ITEM	SHEET: 1 of 2

3 INVERTERS PANEL BOARD

TYPE: PRL4

FUSED SWITCHES

GREENGO ENERGY US, INC.
1447 S. TRYON STREET
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CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

PANEL BOARDS DATA

E-215

Switchboard General Information

Pow-R-Line C - Specifications
Quantity: 1
Alignment: Front Access/ Front and Rear Align
Service: 480Y/277V 3-Phase 4-Wire — Minimum Interrupt Rating: 65 kA

Bus Specifications
Bus Amps: 2500 — Bus Bracing Rating: 65kA
Neutral Amps: 2500
Bus Material: Aluminum — Heat Test
Ground Bus Material: Aluminum .25 X 3.0 Ground Bus Bolted To Frame, (1) #6-350 kcmil Ground Lug

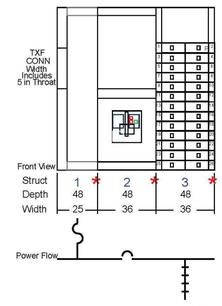
Incoming Information
Incoming Entry: Transformer Connection — Incoming Location: Left
Incoming Qty & Size: None

Structure Specifications
Service Entrance
Enclosure Type: Type 3R (nonwalk-in) Flat Roof
Seismic Label (IBC/CBC Seismic Qualified) - Freestanding
Refer to seismic installation data sheet TD01508002E and drawing 1A32497 for details.
Heater package - (CPT, heater, thermostat, fused disconnect)

Enclosure properties

Struct #	Description/Modifications
1	Bussed transformer connection structure (Incoming Auxiliary Pull Section) Vertical isolating barrier Xfo Fan Control Power
2	Main device (Main Structure) Vertical isolating barrier
3	50x chassis mounted feeders (Feeder Structure)

PREPARED BY: — DATE:
APPROVED BY: — DATE:
VERSION: 8.0.20.0
Eaton — SumterSC
JOB NAME:
DESIGNATION: PV AC SWBD 2
TYPE: Switchboards
DRAWING TYPE: CustAppr
NEG-ALT Number: OH190821X7H2-0000
REVISION: 0
DWG SIZE: DwgA
G.O.:
ITEM:
SHEET: 1 of 6



Structure	1	2	3			
Ship-Inches	25.00	36.00	36.00			
Ship-MM	635	914	914			
Width-Inches	25.00	36.00	36.00			
Width-MM	635	914	914			
Depth(Inner)-In.	48.00	48.00	48.00			
Depth(Inner)-MM	1219	1219	1219			
Depth(Outer)-In.	61.00	61.00	61.00			
Depth(Outer)-MM	1549	1549	1549			
Height-Inches	90.00	90.00	90.00			
Height-MM	2286	2286	2286			
Weight-Lbs (Est.)	480	620	700			
Weight-Kg (Est.)	217	281	317			

Switchboard Units Information

Str#	Unit	Description/Modifications	Nameplate
1			
2		Main Breaker - Ind Mtd-2500A 3P Magnum SB Brkr SBS-625 [Fixed-Manual], Trip 2500A., RMS520MC LSIG, 100 % rated Auxiliary Switch: 4A/4B	
3			
	1	Feeder Breaker - Chassis Mtd-20A 3P [HFD 225A Frame], Trip 20A., Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	
	2	Feeder Breaker - Chassis Mtd-3P [HFD 225A Frame] Provision Neutral Terminal, (1) #14-1/0	
	3	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	4	Feeder Breaker - Chassis Mtd-20A 3P [HFD 225A Frame], Trip 20A., Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	
	5	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	6	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	7	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	8	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	9	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	10	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag	

PREPARED BY: — DATE:
APPROVED BY: — DATE:
VERSION: 8.0.20.0
Eaton — SumterSC
JOB NAME:
DESIGNATION: PV AC SWBD 2
TYPE: Switchboards
DRAWING TYPE: CustAppr
NEG-ALT Number: OH190821X7H2-0000
REVISION: 0
DWG SIZE: DwgA
G.O.:
ITEM:
SHEET: 3 of 6

Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

11 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

12 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

13 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

14 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

15 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

16 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

17 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

18 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

19 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

20 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

21 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

PREPARED BY: — DATE:
APPROVED BY: — DATE:
VERSION: 8.0.20.0
Eaton — SumterSC
JOB NAME:
DESIGNATION: PV AC SWBD 2
TYPE: Switchboards
DRAWING TYPE: CustAppr
NEG-ALT Number: OH190821X7H2-0000
REVISION: 0
DWG SIZE: DwgA
G.O.:
ITEM:
SHEET: 4 of 6

22 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

23 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

24 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

25 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

26 Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag
Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

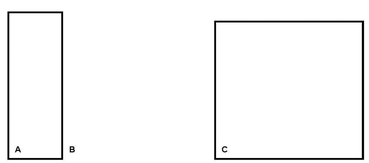
PREPARED BY: — DATE:
APPROVED BY: — DATE:
VERSION: 8.0.20.0
Eaton — SumterSC
JOB NAME:
DESIGNATION: PV AC SWBD 2
TYPE: Switchboards
DRAWING TYPE: CustAppr
NEG-ALT Number: OH190821X7H2-0000
REVISION: 0
DWG SIZE: DwgA
G.O.:
ITEM:
SHEET: 5 of 6

SUBSTATION-FRONT VIEW

Unit A: Lightning Arrestor: None
Lightning Arrestor: None
Heaters Power by LV: No — Outdoor: No

Unit B: Type Transformer, KVA, TBD/Match Swbd Volts
Relay 63 Coordination: None
Relay 49 Coordination: None
Lightning Arrestor: None
Forced Air Cooling (FAC): No — Heaters Power by LV: No — Outdoor: No

Unit C: Switchboard Assembly (See previous pages)



Unit	A	B	C			
Width-In	Later	Later	97.00			
Width-MM			2463			
Depth-In	Later	Later	48.00			
Depth-MM			1219			
Height-In	Later	Later	90.00			
Height-MM			2286			
Weight-Lbs	Later	Later	1800.00			
Weight-Kg			816			

PREPARED BY: — DATE:
APPROVED BY: — DATE:
VERSION: 8.0.20.0
Eaton — SumterSC
JOB NAME:
DESIGNATION: PV AC SWBD 2
TYPE: Switchboards
DRAWING TYPE: CustAppr
NEG-ALT Number: OH190821X7H2-0000
REVISION: 0
DWG SIZE: DwgA
G.O.:
ITEM:
SHEET: 6 of 6

greengo
GREENGO ENERGY US, INC.
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CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 52162 JAMES A. CLEVELAND

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

LV SWITCHBOARD 1&3 DATA

E-216

Switchboard General Information

Pow-R-Line C - Specifications
Quantity: 1
Alignment: Front Access/ Front and Rear Align
Service: 480Y/277V 3-Phase 4-Wire — Minimum Interrupt Rating: 65 kA

Bus Specifications
Bus Amps: 3000 — Bus Bracing Rating: 65kA
Neutral Amps: 3000
Bus Material: Aluminum — Heat Test
Ground Bus Material: Aluminum .25 X 3.0 Ground Bus Bolted To Frame, (1) #6-350 kcmil Ground Lug

Incoming Information
Incoming Entry: Transformer Connection — Incoming Location: Left
Incoming Qty & Size: None

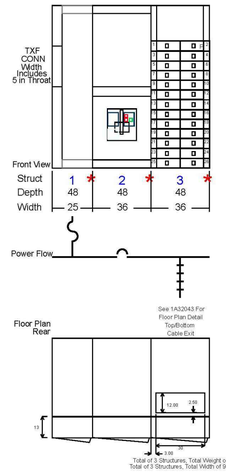
Structure Specifications
Service Entrance
Enclosure Type: Type 3R (nonwalk-in) Flat Roof
Seismic Label (IBC/CBC Seismic Qualified) - Freestanding
Refer to seismic installation data sheet TD01508002E and drawing 1A32497 for details.
Heater package - (CPT, heater, thermostat, fused disconnect)

Enclosure properties

Struct #	Description/Modifications
1	Bussed transformer connection structure (Incoming Auxiliary Pull Section) Vertical isolating barrier Xfo Fan Control Power
2	Main device (Main Structure) Vertical isolating barrier
3	50x chassis mounted feeders (Feeder Structure)

PREPARED BY	DATE	Eaton	SumterSC
APPROVED BY	DATE	JOB NAME / DESIGNATION	PV AC SWBD 1
VERSION		TYPE	DRAWING TYPE
8.0.20.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
OH190821X7H2-0000	0	DwgA			1 of 6



Structure	1	2	3			
Ship-Inches	25.00	36.00	36.00			
Ship-MM	635	914	914			
Width-Inches	25.00	36.00	36.00			
Width-MM	635	914	914			
Depth(Inner)-In.	48.00	48.00	48.00			
Depth(Inner)-MM	1219	1219	1219			
Depth(Outer)-In.	61.00	61.00	61.00			
Depth(Outer)-MM	1549	1549	1549			
Height-Inches	90.00	90.00	90.00			
Height-MM	2286	2286	2286			
Weight-Lbs (Est.)	520	800	720			
Weight-Kg (Est.)	235	362	326			

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PREPARED BY	DATE	Eaton	SumterSC
APPROVED BY	DATE	JOB NAME / DESIGNATION	PV AC SWBD 1
VERSION		TYPE	DRAWING TYPE
8.0.20.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
OH190821X7H2-0000	0	DwgA			2 of 6

Switchboard Units Information

Str#	Unit	Description/Modifications	Nameplate
1			
2		Main Breaker - Ind Mtd-3000A 3P Magnum SB Brkr SBS-630 [Fixed-Manual], Trip 3000A., RMS520MC LSIG, 100 % rated Auxiliary Switch: 4A/4B	
3			
	1	Feeder Breaker - Chassis Mtd-20A 3P [HFD 225A Frame], Trip 20A., Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	
	2	Feeder Breaker - Chassis Mtd-3P [HFD 225A Frame] Provision Neutral Terminal, (1) #14-1/0	
	3	Feeder Breaker - Chassis Mtd-150A 3P [HFD 225A Frame], Trip 150A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	4	Feeder Breaker - Chassis Mtd-20A 3P [HFD 225A Frame], Trip 20A., Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	
	5	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	6	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	7	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	8	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	9	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
	10	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag	

The information on this document is created by Eaton Corporation. It is disclosed in confidence and it is only to be used for the purpose in which it is supplied.

PREPARED BY	DATE	Eaton	SumterSC
APPROVED BY	DATE	JOB NAME / DESIGNATION	PV AC SWBD 1
VERSION		TYPE	DRAWING TYPE
8.0.20.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
OH190821X7H2-0000	0	DwgA			3 of 6

Terminals, Mechanical, (1) #4-4/0
Neutral Terminal, (1) #6-350 kcmil

11	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
12	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
13	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
14	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
15	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
16	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
17	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
18	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
19	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
20	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
21	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	

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PREPARED BY	DATE	Eaton	SumterSC
APPROVED BY	DATE	JOB NAME / DESIGNATION	PV AC SWBD 1
VERSION		TYPE	DRAWING TYPE
8.0.20.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
OH190821X7H2-0000	0	DwgA			4 of 6

22	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
23	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
24	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
25	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	
26	Feeder Breaker - Chassis Mtd-125A 3P [HFD 225A Frame], Trip 125A., Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	

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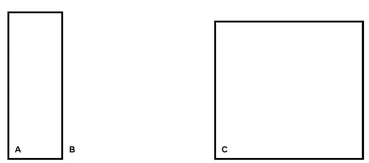
PREPARED BY	DATE	Eaton	SumterSC
APPROVED BY	DATE	JOB NAME / DESIGNATION	PV AC SWBD 1
VERSION		TYPE	DRAWING TYPE
8.0.20.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
OH190821X7H2-0000	0	DwgA			5 of 6

SUBSTATION-FRONT VIEW

Unit A:	Lightning Arrestor: None Lightning Arrestor: None Heaters Power by LV: No Outdoor: No
Unit B:	Type Transformer, KVA, TBD/Match Swbd Volts Relay 63 Coordination: None Relay 49 Coordination: None Lightning Arrestor: None Forced Air Cooling (FAC): No Heaters Power by LV: No Outdoor: No
Unit C:	Switchboard Assembly (See previous pages)



Unit	A	B	C			
Width-In	Later	Later	97.00			
Width-MM			2463			
Depth-In	Later	Later	48.00			
Depth-MM			1219			
Height-In	Later	Later	90.00			
Height-MM			2286			
Weight-Lbs	Later	Later	2040.00			
Weight-Kg			925			

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PREPARED BY	DATE	Eaton	SumterSC
APPROVED BY	DATE	JOB NAME / DESIGNATION	PV AC SWBD 1
VERSION		TYPE	DRAWING TYPE
8.0.20.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
OH190821X7H2-0000	0	DwgA			6 of 6

greengo
GREENGO ENERGY US, INC.
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ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32182 JAMES A CLEVELAND

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

LV SWITCHBOARD 2 DATA

E-217

Dry-Type Transformers General Information

- Standard Transformer Catalog Number: P48G28T15P
- Transformer Type: Mini Power Centers
- Phase: 3
- kVA: 15
- Primary Volts: 480
- Secondary Volts: 208Y/120
- Temperature Rise: 115C
- Winding Material: Aluminum
- Enclosure Type: NEMA 3R Encapsulated
- Frequency (Hz): 60
- Easy Install: N
- Frame: 289A
- Wiring Diagram: 105A15K
- Weight (lbs.): 399
- Impedance (%): 2.48
- UL Listed: Y

Standard Values

- K-Factor: 1
- TAPS: 2@-5%
- Sound Reduction (dB): 0
- NEMA ST20 Sound Level (dB): 50
- Infrared Viewing Window: None

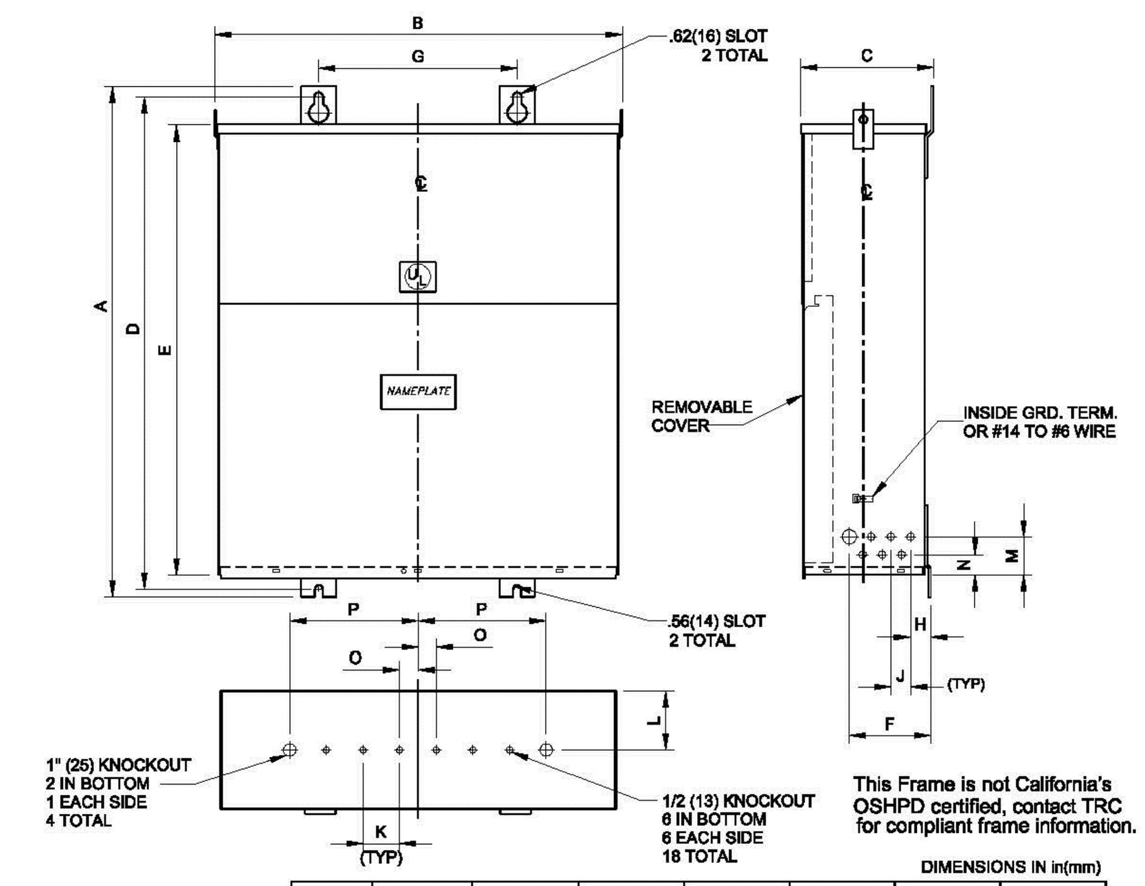
Field-Installed Accessories Included

- Lug Kit: LKS1

The information on this document is created by Eaton. It is disclosed in confidence and it is only to be used for the purpose in which it is supplied.	PREPARED BY William Furse	DATE 8/21/2017	Eaton		
	APPROVED BY	DATE	JOB NAME Suncaster LLC 2250-001 Project	DESIGNATION Mini Loadcenter	
	VERSION 1.0.0.1		TYPE Dry-Type Transformer	DRAWING TYPE Customer Appr.	
NEG-ALT Number CH190821X7K2-0000	REVISION 0	DWG SIZE A	G.O.	ITEM	SHEET 1 of 1

REFERENCE
DWG NO FR289

NOTES:
1. THREE PHASE MINI POWER CENTER.
2. INDOOR/OUTDOOR RATED NEMA - 3R.
3. PRIMARY MAIN CIRCUIT BREAKER INCLUDED.
4. SECONDARY MAIN CIRCUIT BREAKER INCLUDED.
5. GROUND BAR INCLUDED.
6. FEEDER CIRCUIT BREAKERS NOT INCLUDED.
7. 180°C CLASS INSULATION WITH 115°C RISE.
8. COPPER OR ALUMINUM WINDINGS.
9. ALUMINUM INTERIOR STABS OR COPPER INTERIOR BOLT-ON.
10. PAINT COLOR ANSI #61.
11. ALL UNITS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE NEMA, UL, ANSI, IEEE AND CSA STANDARDS.
12. KO'S SHOWN ON THIS DRAWING ONLY AVAILABLE ON CARBON STEEL ENCLOSURES.



This Frame is not California's OSHPD certified, contact TRC for compliant frame information.

DIMENSIONS IN in(mm)

FRAME	A	B	C	D	E	F	G
FR289A	36.12(917)	28.75(730)	9.38(238)	34.75(883)	31.75(806)	5.75(146)	14.00(356)
	H	J	K	L	M	N	O
	1.44(37)	1.38(35)	2.50(63)	4.28(109)	2.70(69)	1.44(37)	1.25(32)
							P
							9.00(229)

THIS DIMENSION DRAWING IS FOR REFERENCE ONLY. IT IS NOT TO BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.

PRODUCT CODE: TRANSFORMER | FEDERAL ID NO.

REV	DESCRIPTION	DFTR	APPD	DATE
06	ECN090114	J.C.S.	C.B.	08/MAY/15
05	Agregar Leyenda OSHPD MOL074216	ANAVA	C.B.	7/23/13

REVISIONS

DFTR SCT DATE 10/03/02
APPD CEE DATE 10/03/02
S.O.
REVISION 06

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EATON

TITLE DRY TYPE TRANSFORMER OUTLINE
TYPE DRY TYPE TRANSFORMER — OUTLINE
G.O. | DWG FR289A | SHEET 1 OF 01

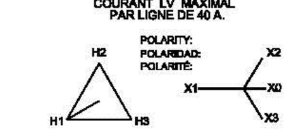
GO/NEG-Alt-Date:		Job Name:
CH190821X7K2-0000-8/21/2017		Suncaster LLC 2250-001 Project
Item Number:	Catalog Number: P48G28T15P	Designation: Mini Loadcenter

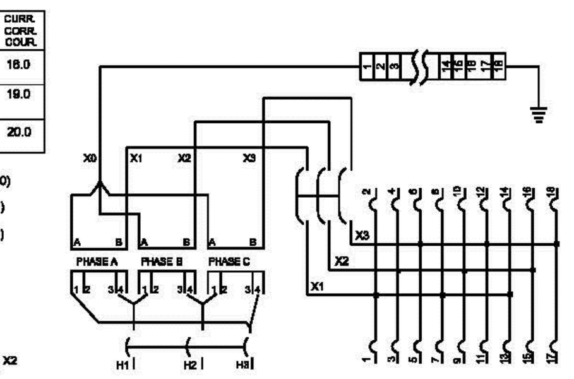
VOLTS	CONN. CONEC. CONN.	LINE LINEA LIGNE	CURR. CORR. COUR.
480	1 - 4	H1 [H2 [H3	16.0
456	2 - 4		19.0
432	2 - 3		20.0

208 VOLTS 3 Ø LINE TO LINE
120 VOLTS LINE TO NEUTRAL (X0)
208 VOLTS 3 Ø LINEA A LINEA
120 VOLTS LINEA A NEUTRO (X0)
208 VOLTS 3 Ø LIGNE À LIGNE
120 VOLTS LIGNE À NEUTRE (X0)

MAXIMUM LV CURRENT PER LINE 40 AMPS
MAXIMA CORRIENTE EN EL LV POR LINEA 40 AMPS
COURANT LV MAXIMAL PAR LIGNE DE 40 A.

POLARITY:
POLARIDAD:
POLARITÉ:





PRODUCT CODE: TRANSFORMERS | FEDERAL ID NO.

REV	DESCRIPTION	DFTR	APPD	DATE
03	UPDATE FORMAT EATON & CHANGE DESC. TO HV/LV	M.RDZ	C.BADILLO	10/JUN14

REVISIONS

DFTR A.CISNEROS DATE 01/04/02
APPD E.ROBLES DATE 12/10/03
S.O.
REVISION 03

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EATON

TITLE DRY TYPE TRANSFORMER WIRING DIAGRAM WIRING SCHEMATIC
TYPE DRY TYPE TRANSFORMER — WIRING
G.O. | DWG 105A15K | SHEET 1 OF 01

GO/NEG-Alt-Date:		Job Name:
CH190821X7K2-0000-8/21/2017		Suncaster LLC 2250-001 Project
Item Number:	Catalog Number: P48G28T15P	Designation: Mini Loadcenter

greengo
GREENGO ENERGY US, INC.
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+1 (866) 877 0778

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SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CLAY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

MINI LOAD CENTER DATA

E-218

Eaton's Power Systems Division
Proposal Number: BED3687945
Revision 08

Item Details

1700 kVA Pad-Mounted Transformer
22860V/480V
LOW FLUX / NO VFI MOTOR

Description:

kVA	1700 kVA 3 Phase Pad-Mounted Transformer
Temperature Rise	65 degree average winding rise
Cooling Class	KNAN
Frequency	60 Hz.
Duty Cycle	Designed for step-up operation
Insulating fluid	Envirotemp FR3
Elevation	Designed for operation at 1000 m (3300 ft) above sea level
Sound Level	NEMA TR1 Standard
Efficiency Standard	None
High Voltage	22860GY/13200 Volts, 125 kV BIL
kV Class	25 kV
High Voltage Configuration	Dead Front, Loop Feed
Taps	2 - 2.5% taps above and 2 - 2.5% taps below nominal
Tap Changer	100 Amp 5-position tap changer
High Voltage Bushings	200 amp Cooper bushing wells (Qty: 6)
Inserts	25 kV, 125 kV BIL Cooper load-break inserts (Qty: 6)
Neutral Bushing	250 amp porcelain 2-hole spade bushing(s)
Load-break Switching	15-38 kV, 300A 2-Position
High Voltage Arresters	Varistar elbow arresters, 25 kV class, 18 kV (Qty: 3)
Overcurrent Protection	Bayonet Fuses in series with Partial-Range Current-Limiting Fuses (Qty: 3)
Expulsion fuses	Bayonet fuses (Qty: 3)
Bayonet Holder	Copper Bayonet Fuse Holder (Qty: 3)
Low Voltage	480Y/277 Volts, 30 kV BIL
Low Voltage kV Class	1.2 kV
LV Bushing Arrangement	In-line
Low Voltage Bushings	Integral aluminum 12-hole spade bushing(s) (Qty: 4)
Bushing Supports	Standard LV Bushing Support Assembly
Cabinet	30 inch deep cabinet
Cabinet hardware	Penta-head cabinet door bolts
IEEE K-Dimension	Loop feed per IEEE C57.12.34-2015 Figure 11 minimum dimensions (without bails)
Coatings	Special paint color RAL 9016 White
Notifications	Mr. Ouch Decal Assembly--English/Spanish
Notifications	Stainless Steel Nameplate
Certifications	UL Listed
Gauges & Fittings	Liquid level gauge
Gauges & Fittings	Thermometer, dial-type
Gauges & Fittings	Pressure/vacuum gauge
Gauges & Fittings	Schrader valve
Gauges & Fittings	Pressure relief device, 50 SCFM
Gauges & Fittings	Drain valve (1") with sampler in LV compartment
Tank accessories	IEEE standard two-hole ground pads (Qty: 3)
Tank accessories	Nitrogen Blanket
Tank accessories	Seismic anchoring provisions welded to tank
Packaging	None (Pallet Not Included)
Cover	Welded cover with handhole
LV bushings	Segment 4 at 40" from ground with throat

PERFORMANCE DATA:	**Losses are For Reference Only**
Maximum Impedance	5.75%, Absolute
No Load Losses @20 C	1886 Watts
Load Losses @85 C	17282 Watts
Efficiency @ 25% Load	99.33 %
Efficiency @ 50% Load	99.32 %
Efficiency @ 75% Load	99.10 %
Efficiency @ 100% Load	98.89 %
Efficiency @ 125% Load	98.66 %
Exciting Current @ 100% Voltage	0.21 %
Percent IR (Resistance)	0.99 %
Percent IX (Reactance)	5.17 %
Total Weight	13535 lbs
Primary Conductor Material	Aluminum
Secondary Conductor Material	Aluminum
Estimated Overall Height	81.39 inches
Estimated Overall Width	79.49 inches
Estimated Overall Depth	108.73 inches

Eaton's Power Systems Division
Proposal Number: BED3687945
Revision 08

Item Details

1700kVA Pad-Mounted Transformer
22860V/480V
LOW FLUX / WITH VFI MOTOR

Description:

kVA	1700 kVA 3 Phase Pad-Mounted Transformer
Temperature Rise	65 degree average winding rise
Cooling Class	KNAN
Frequency	60 Hz.
Duty Cycle	Designed for step-up operation
Insulating fluid	Envirotemp FR3
Elevation	Designed for operation at 1000 m (3300 ft) above sea level
Sound Level	NEMA TR1 Standard
Efficiency Standard	None
High Voltage	22860GY/13200 Volts, 125 kV BIL
kV Class	25 kV
High Voltage Configuration	Dead Front, Loop Feed
Taps	2 - 2.5% taps above and 2 - 2.5% taps below nominal
Tap Changer	100 Amp 5-position tap changer
High Voltage Bushings	200 amp Cooper bushing wells (Qty: 6)
Inserts	25 kV, 125 kV BIL Cooper load-break inserts (Qty: 6)
Neutral Bushing	250 amp porcelain 2-hole spade bushing(s)
Load-break Switching	15-38 kV, 300A 2-Position
High Voltage Arresters	Varistar elbow arresters, 25 kV class, 18 kV (Qty: 3)
Overcurrent Protection	Vacuum Fault Interrupter in Series with Partial-Range Current-Limiting Fuses (Qty: 3)
VFI Mechanism	35 kV class, 12 kA interrupting rating, with motor operator provision
VFI Control	Tri-Phase Control with DC motor operator for VFI
Low Voltage	480Y/277 Volts, 30 kV BIL
Low Voltage kV Class	1.2 kV
LV Bushing Arrangement	In-line
Low Voltage Bushings	Integral aluminum 12-hole spade bushing(s) (Qty: 4)
Bushing Supports	Standard LV Bushing Support Assembly
Cabinet	30 inch deep cabinet
Cabinet hardware	Penta-head cabinet door bolts
IEEE K-Dimension	Loop feed per IEEE C57.12.34-2015 Figure 11 minimum dimensions (without bails)
Coatings	Special paint color RAL 9016 White
Notifications	Mr. Ouch Decal Assembly--English/Spanish
Notifications	Stainless Steel Nameplate
Certifications	UL Listed
Gauges & Fittings	Liquid level gauge
Gauges & Fittings	Thermometer, dial-type
Gauges & Fittings	Pressure/vacuum gauge
Gauges & Fittings	Schrader valve
Gauges & Fittings	Pressure relief device, 50 SCFM
Gauges & Fittings	Drain valve (1") with sampler in LV compartment
Tank accessories	IEEE standard two-hole ground pads (Qty: 3)
Tank accessories	Nitrogen Blanket
Tank accessories	Seismic anchoring provisions welded to tank
Packaging	None (Pallet Not Included)
Cover	Welded cover with handhole
LV bushings	Segment 4 at 40" from ground with throat
Relay	SEL 751 w/ voltage sensing card & ethernet (751002B0X0X0X850200)
Battery	Battery backup system for relay
Control Box	NEMA 4 box to house relay, motor control, and battery back-up
PTs	Qty 3 - 13200:120V PTs for voltage sensing
CTs	Qty 3 - 100:5 25 kV under oil for current sensing
Relay Scheme	Auto reclosing scheme with timer

PERFORMANCE DATA:	**Losses are For Reference Only**
Maximum Impedance	5.75%, Absolute
No Load Losses @20 C	1886 Watts
Load Losses @85 C	17993 Watts
Efficiency @ 25% Load	99.32 %
Efficiency @ 50% Load	99.31 %
Efficiency @ 75% Load	99.07 %
Efficiency @ 100% Load	98.85 %
Efficiency @ 125% Load	98.61 %
Exciting Current @ 100% Voltage	0.21 %
Percent IR (Resistance)	1.03 %
Percent IX (Reactance)	5.10 %
Total Weight	15203 lbs
Primary Conductor Material	Aluminum
Secondary Conductor Material	Aluminum
Estimated Overall Height	87.40 inches
Estimated Overall Width	90.86 inches
Estimated Overall Depth	109.30 inches

greengo

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32162 ENGINEER JAMES A CUTLER

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

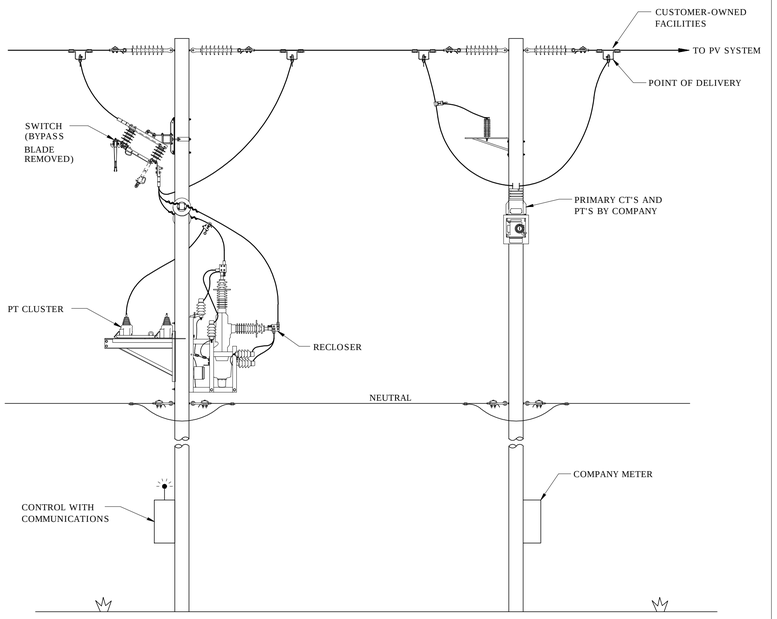
REVISIONS

DATE	COMMENT
12-14-2018	Xfrmr Data sheet updated

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

MV TRANSFORMER DATA

E-219



1. THIS SERVICE ARRANGEMENT IS USED TO CONNECT TO A LARGE IPP STANDALONE SYSTEM WHERE COMPANY PROVIDES A RECLOSER FOR PROTECTION. CUSTOMER RECEIVES PRIMARY VOLTAGE AND PROVIDES THEIR OWN TRANSFORMATION AND OH FACILITIES. RECLOSER SHALL BE LOCATED ON THE PROPERTY OF THE IPP OR AT A PRE-APPROVED LOCATION THAT MINIMIZES POTENTIAL IMPACTS TO OTHER CUSTOMERS.
2. WARNING LABEL TO BE PLACED AT METER ON POLE ADVISING OF CUSTOMER GENERATION ON SITE.
3. CUSTOMER PROVIDES ALL WIRING, DISCONNECTS AND TRANSFORMATION BEYOND POINT OF DELIVERY.
4. SINGLE LINE DIAGRAM SHOWN FOR CLARITY. THIS DRAWING IS A GENERIC REPRESENTATION OF THE DUKE ENERGY PROTECTIVE AND METERING PACKAGE FOR GENERATION SITES. ACTUAL METERING/RECLOSER LOCATIONS AND USE OF SPECIFIC SUBCOMPONENTS MAY VARY BY REGION (EX. DEC HAS PRIMARY METERING ON UTILITY SIDE OF RECLOSER, DEP HAS PRIMARY METERING ON IPP SIDE OF RECLOSER).
5. COMPANY PROVIDES ALL FACILITIES TO P.O.D.
6. ALL BYPASS BLADES WILL BE REMOVED FOLLOWING THE COMMISSIONING OF THE RECLOSER AT THESE IPP SITES.

DUKE ENERGY.

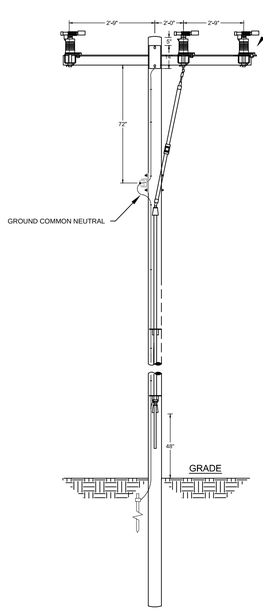
3					SELL ALL GENERATION (GENERAL REPRESENTATION)
2					THREE-PHASE PRIMARY METERING
1	8/2/16	EANES	EANES	ADCOCK	IPP RECLOSER INSTALLATION - CUSTOMER OH CONNECTION
0	10/28/15	SIMPSON	SIMPSON	ADCOCK	
REVISED		BY	CK'D	APPR.	

DEC	DEM	DEP	DEF
X		X	

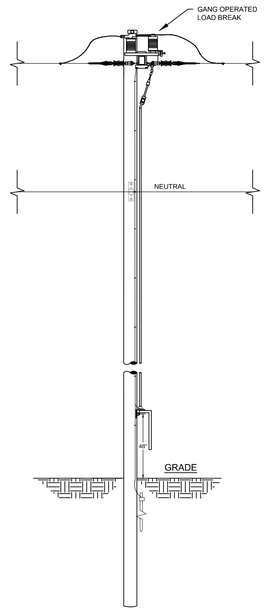
FIG 71B

UTILITY POLES

GOAB SWITCH POLE
(POLE 3)

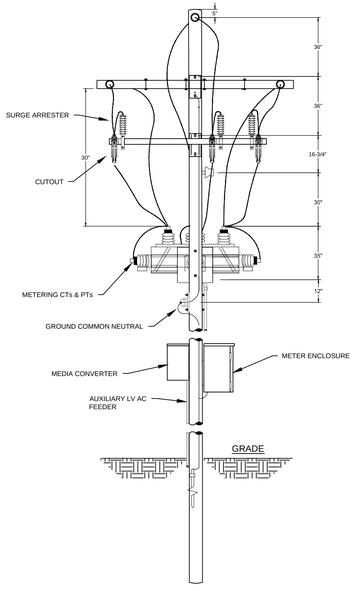


ELEVATION



SIDE VIEW

METER POLE
(POLE 2)



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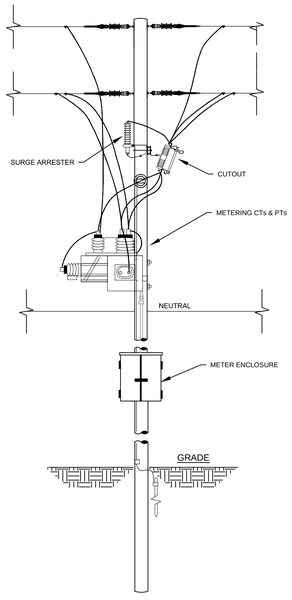
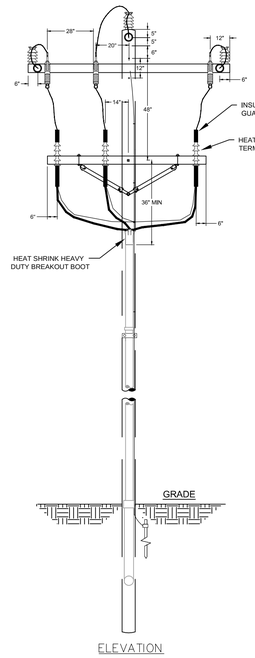


SIDE VIEW

CUSTOMER POLES

RISER POLE
(POLE 1)



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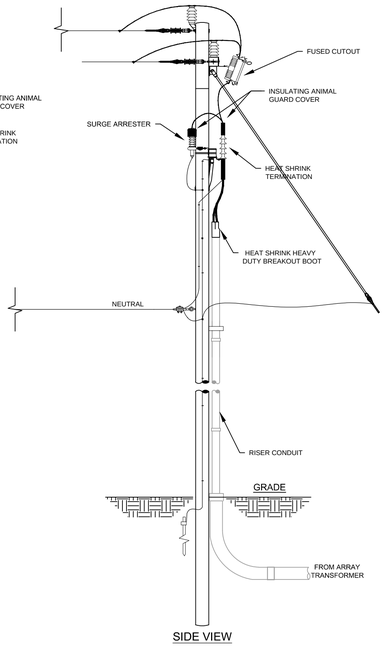

SIDE VIEW

GREENGO ENERGY US, INC.
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ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

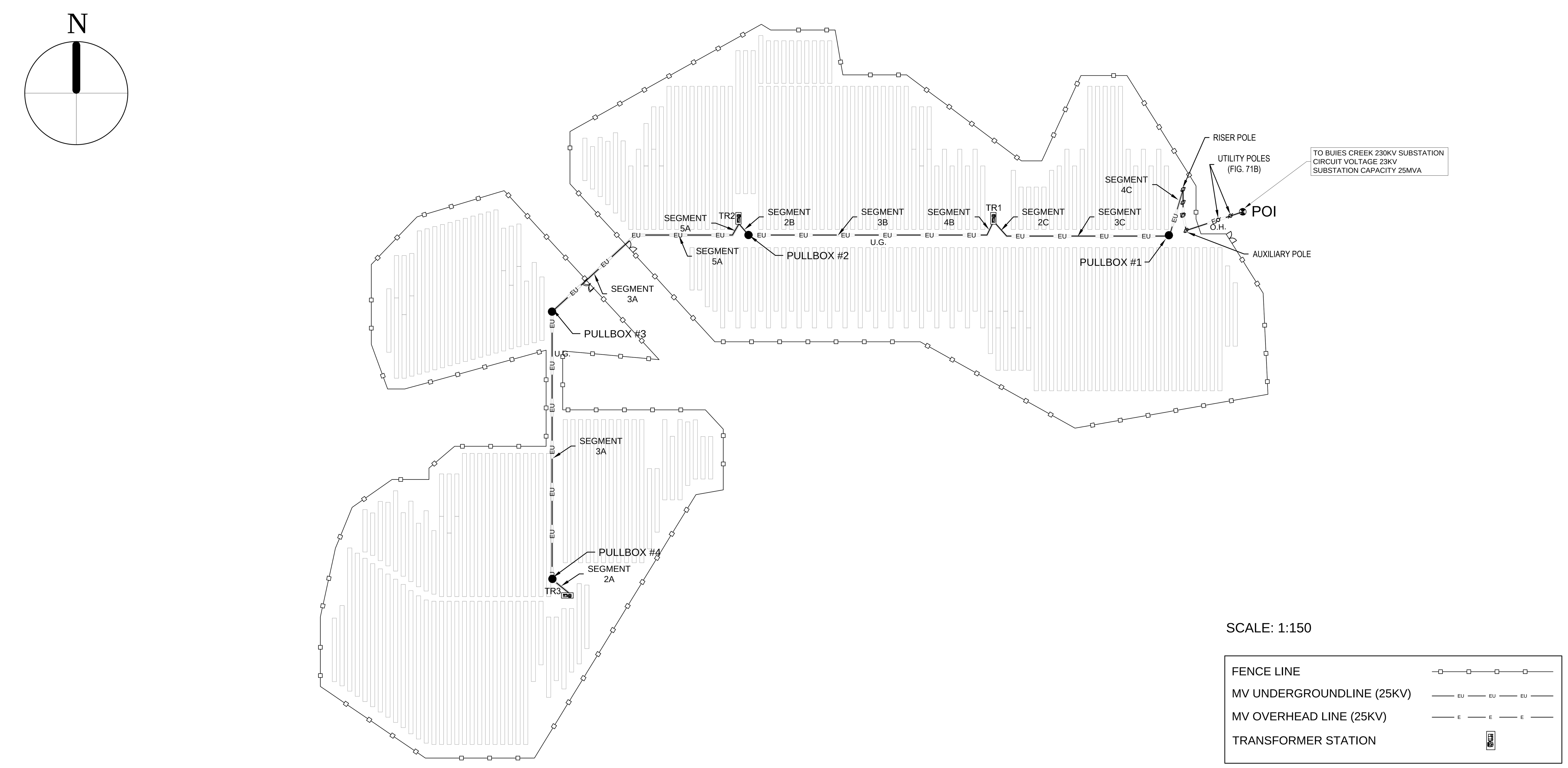
REVISIONS

DATE	COMMENT
01-18-2019	3rd Customer Pole Added

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

MV POLES

E-220



Cable Input Data :

No. Of Cables	ID	Connection	Application	Conductor per Cable	kV	Conductor Size AWG/kcmil	Conductor Size kcmil	Cable OD inch	Weight lb/1000ft	Max. Tension. lb/kcmil	"Max. Sidewall Pressure lb/ft"
3	TT3.2	3-Phase	Power	3/C	25.0	2/0	133.1	1.280	822.1	6.00	800.0
3	TT2.1	3-Phase	Power	3/C	25.0	2/0	133.1	1.280	822.1	6.00	800.0
3	TT1.1 (Cable #14)	3-Phase	Power	3/C	25.0	2/0	133.1	1.280	822.1	6.00	800.0

Conduit Input Data:

Trade Size	Type	OD inch	Thickness inch	% Friction Factor Segments	% Friction Factor Bends	% Fill
4.00	PVC_40	4.500	0.237	13.0	13.0	30.6
4.00	PVC_40	4.500	0.237	13.0	13.0	30.6
4.00	PVC_40	4.500	0.237	13.0	13.0	30.6

Input Parameters:

"Total maximum allowable tension:	2396.2lb (TT3.2), 2396.2 lb (TT2.1), 2396.2 lb (TT1.1)
Equivalent length of cable for pulling from the reel:	10.0 ft
Total length of run (pull):	1018.5 ft (TT3.1) 540.1ft (TT2.1) 497.5 ft (TT1.1)
Tolerance for cable diameter (OD):	0.0%
Tolerance for cable weight:	0.0%
Conduit fill:	30.3 (TT3.2), 30.3 (TT2.1), 30.3 (TT1.1)
Three cable configuration:	Cradled
Reduction factor for the maximum allowable tensions of cables	
Up to 3 cables (1/C, 3/C, etc.):	0.0%
More than 3 single-conductor (1/C) cables:	20%
More than 3 multi-conductor cables:	40%

TR-1 TO RISER POLE — TT1.1

Segment ID	Length ft	Slope deg.	Horizontal Bend ID	Radius ft	Angle deg.	Sidewall Pressure Maximum Tension lb	Total Tension Forward Pull lb	Total Tension Reverse Pull lb
							4.1	303.6
1C	7.0	-90.0						
			c1	3.0	0.0	3637.3	9.0	286.3
2C	39.0	0.0						
			c2	3.0	42.0	3637.3	18.4	199.0
3C	311.0	0.0						
			c3	3.0	74.0	3637.3	182.6	47.4
4C	925.0	0.0						
			c4	3.0	0.0	3637.3	293.5	4.6
5C	33.0	90.0						
							374.9	4.1

TR-2 TO TR1 — TT2.1

Segment ID	Length ft	Slope deg.	Horizontal Bend ID	Radius ft	Angle deg.	Sidewall Pressure Maximum Tension lb	Total Tension Forward Pull lb	Total Tension Reverse Pull lb
							4.1	338.4
1B	7.0	-90.0						
			b1	3.0	0.0	3637.3	8.2	321.1
2B	28.0	0.0						
			b2	3.0	-45.0	3637.3	13.5	230.3
3B	460.0	0.0						
			b3	3.0	-45.0	3637.3	232.4	11.6
4B	24.0	0.0						
			b4	3.0	0.0	3637.3	321.7	8.2
5B	7.0	90.0						
							339.0	4.1

TR-3 TO TR2 — TT3.2

Segment ID	Length ft	Slope deg.	Horizontal Bend ID	Radius ft	Angle deg.	Sidewall Pressure Maximum Tension lb	Total Tension Forward Pull lb	Total Tension Reverse Pull lb
							4.1	686.9
1A	7.0	-90.0						
			a1	3.0	0.0	3637.3	10.0	669.6
2A	40.8	0.0						
			a2	3.0	-45.0	3637.3	19.5	492.8
3A	515.8	0.0						
			a3	3.0	-45.0	3637.3	265.6	218.7
4A	218.0	0.0						
			a4	3.0	-45.0	3637.3	405.8	101.6
5A	187.0	0.0						
			a5	3.0	-45.0	3637.3	551.1	11.6
6A	24.0	0.0						
			a6	3.0	0.0	3637.3	736.4	10.0
7A	7.0	90.0						
							753.7	4.1

Medium Voltage Cable

PRYSMIAN — A brand of the Prysmian Group

5-46kV TRXLPE DOUBLESEAL™
Medium Voltage Utility Cables

Applications

Single conductor cable with solid or filled strand aluminum or copper conductors, triple extruded insulation system consisting of a thermosetting semiconducting conductor shield, high dielectric strength VOLTALENE™ TRXLPE insulation, thermosetting semiconducting insulation shield, copper concentric neutral wires, water swellable agents, black encapsulating linear low-density polyethylene (LLDPE) jacket.

Specifications and ratings

AEIC- AEIC CS8
ICEA- ICEA S-94-649
ICEA- ICEA T-31-610
ICEA- ICEA T-34-664

For 90°C continuous, 130°C emergency, 250°C short-circuit operation

Options

- Black LLDPE jacket with no stripes
- Multiplex cables
- Super smooth conductor shield
- Tinned round and flat strap neutrals
- Compact stranded conductors
- UL MV-90 Rating if required
- 46kV
- RUS Bulletin 1728F-U1 where applicable

Installation

Conduit in Air — Direct Buried
Underground Duct — Isolated in Air
Wet Locations — Dry Locations
With Messenger — Utility Primary

Design Parameters

CONDUCTORS: Solid or Class B Compressed concentric strand aluminum alloy 1350 or soft drawn annealed copper per ASTM. Stranded conductors are water-blocked with STRANDSEAL® conductor filling compound.

CONDUCTOR SHIELD: Extruded thermosetting semiconducting shield which is free stripping from the conductor and bonded to the insulation.

INSULATION: Natural high dielectric VOLTALENE™ TRXLPE insulation, exhibiting an optimum balance of mechanical and electrical properties, assuring resistance to treeing.

INSULATION SHIELD: Extruded thermosetting semiconducting shield with controlled adhesion to the insulation providing the required balance between electrical integrity and ease of stripping.

METALLIC SHIELD: Solid bare copper wires, helically applied and uniformly spaced. Water-blocking agents applied over the insulation shield and around the neutral wires to resist longitudinal water penetration.

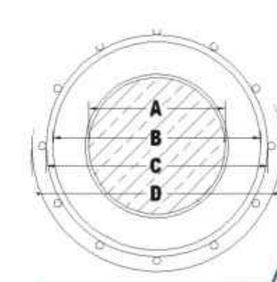
JACKET: Black insulating sunlight resistant linear low-density polyethylene encapsulating the neutral wires with three extruded red stripes and NESC lightning bolt symbol.

Prysmian Group
700 Industrial Drive | Lexington, SC 29072 | +1-800-845-8507 | www.prysmianusa.com
137 Commerce Drive | Johnstown, Ontario K0E 1T1 | www.prysmiancanada.com

2008 MV 5-46KV TRXLPE DOUBLESEAL US 2013-07-08

PRYSMIAN — A brand of the Prysmian Group

25kV TRXLPE SUPERDRI® CSA
100% Medium Voltage Utility Cables



Product Number	Conductor	Insulation Thickness (mils)	Concentric Neutral	Conductor Diameter (mm) (A)	Insulation Diameter (mm) (B)	Insulation Shield Diameter (mm) (C)	Jacket Diameter (mm) (D)	Cable Weight (kg/km)	Minimum Bending Radius (mm)	90°C In Duct †Ampacity (Amps)	90°C In Duct +/- Sequence Impedance Resistance (Ω/km)	90°C In Duct +/- Sequence Impedance Reactance (Ω/km)	90°C In Duct Zero Sequence Impedance Resistance (Ω/km)††	90°C In Duct Zero Sequence Impedance Reactance (Ω/km)††	90°C Direct Buried †Ampacity (Amps)	90°C Direct Buried +/- Sequence Impedance Resistance (Ω/km)	90°C Direct Buried +/- Sequence Impedance Reactance (Ω/km)	90°C Direct Buried Zero Sequence Impedance Resistance (Ω/km)††	90°C Direct Buried Zero Sequence Impedance Reactance (Ω/km)††
25kV 100% Aluminum Single Phase – Full Neutral																			
Q9N05ZC	1 SOLID AL	260	13-#14	7.34	21.97	23.85	31.37	1042	254	149	1.70	0.11	1.70	0.11	197	1.70	0.11	1.70	0.11
Q9O05ZC	1 AWG AL	260	13-#14	7.65	22.17	24.05	31.58	1055	254	150	1.72	0.10	1.72	0.11	198	1.72	0.10	1.72	0.11
Q9P05ZC	1/0 SOLID AL	260	16-#14	8.26	22.89	24.77	32.29	1158	279	169	1.36	0.10	1.36	0.10	223	1.36	0.10	1.36	0.10
Q9Q05ZC	1/0 AWG AL	260	16-#14	8.59	23.11	24.99	32.52	1172	279	170	1.38	0.10	1.38	0.10	225	1.38	0.10	1.38	0.10
Q9R05ZC	2/0 AWG AL	260	13-#12	9.60	24.13	26.01	34.38	1368	279	196	1.08	0.09	1.08	0.10	258	1.08	0.09	1.08	0.10
Q9S05ZC	3/0 AWG AL	260	16-#12	10.82	25.35	27.23	35.60	1550	305	226	0.86	0.09	0.86	0.09	292	0.86	0.09	0.86	0.09
Q9T05ZC	4/0 AWG AL	260	20-#12	12.14	26.67	29.01	37.38	1752	305	253	0.69	0.09	0.69	0.09	332	0.69	0.09	0.69	0.09
Q9U05ZC	250 MCM AL	260	23-#12	13.28	28.07	30.40	38.78	2021	330	284	0.56	0.08	0.56	0.08	370	0.56	0.08	0.56	0.08
Q9V05ZC	350 MCM AL	260	33-#12	15.72	30.51	32.84	41.21	2545	330	336	0.42	0.08	0.42	0.08	433	0.42	0.08	0.42	0.08
25kV 100% Aluminum Three Phase – One-Third Neutral																			
Q9N04ZC	1 SOLID AL	260	7-#16	7.34	21.97	23.85	30.70	876	254	148	0.86	0.18	2.60	0.11	198	0.88	0.33	2.55	0.11
Q9O04ZC	1 AWG AL	260	7-#16	7.65	22.17	24.05	30.90	888	254	147	0.87	0.18	2.62	0.11	197	0.90	0.33	2.57	0.11
Q9P04ZC	1/0 SOLID AL	260	9-#16	8.26	22.89	24.77	31.61	935	254	168	0.68	0.17	2.43	0.10	224	0.71	0.32	2.38	0.10
Q9Q04ZC	1/0 AWG AL	260	9-#16	8.59	23.11	24.99	31.84	935	279	167	0.70	0.17	2.44	0.10	223	0.72	0.32	2.39	0.10
Q9R04ZC	2/0 AWG AL	260	11-#16	9.60	24.13	26.01	32.86	1033	279	189	0.55	0.16	2.14	0.10	252	0.58	0.31	2.10	0.10
Q9S04ZC	3/0 AWG AL	260	14-#16	10.82	25.35	27.23	34.08	1155	279	216	0.44	0.16	1.69	0.09	284	0.47	0.30	1.66	0.09
Q9T04ZC	4/0 AWG AL	260	17-#16	12.14	26.67	29.01	35.85	1278	305	245	0.35	0.15	1.38	0.09	318	0.39	0.29	1.36	0.09
Q9U04ZC	250 MCM AL	260	21-#16	13.28	28.07	30.40	37.25	1491	305	269	0.30	0.15	1.13	0.08	344	0.34	0.28	1.11	0.08
Q9V04ZC	350 MCM AL	260	27-#16	15.72	30.51	32.84	39.69	1788	330	322	0.22	0.14	0.86	0.08	399	0.27	0.26	0.85	0.08
Q9W04ZC	500 MCM AL	260	25-#14	18.80	33.58	35.92	45.01	2400	381	389	0.16	0.13	0.58	0.07	453	0.22	0.23	0.58	0.07
Q9X04ZC	750 MCM AL	260	24-#12	23.11	38.15	40.49	50.43	3261	406	473	0.11	0.13	0.39	0.06	515	0.18	0.19	0.39	0.06
Q9Y04ZC	1000 MCM AL	260	31-#12	26.92	41.96	45.16	55.11	4057	457	536	0.09	0.12	0.30	0.06	560	0.16	0.17	0.30	0.06

PRODUCT NOTES:

5 Items are Prysmian authorized stock.

The above dimensions are approximate and subject to normal manufacturing tolerances.

Single Phase Impedance Values Assume Full Return in the Metallic Shield.

All metric (SI) dimensions are derived from a soft conversion.

† Ampacities are based on the following:

Single Phase Operation (Full Neutral Design)

In Duct: One single cable in plastic duct, direct-buried, 90°C conductor temperature, 20°C ambient temperature, earth RHO of 90°C-cm/Watt, 100% load factor, 36 inch depth of burial, and shields short-circuited.

Direct Buried: One single cable, direct-buried, 90°C conductor temperature, 20°C ambient temperature, earth RHO of 90°C-cm/Watt, 100% load factor, 36 inch depth of burial, and shields short-circuited.

††Zero Sequence Impedance considers all return in the neutral only.

Three Phase Operation (1/3 Neutral Design)

In Duct: Three single cables in plastic duct, direct-buried in a triangular configuration, 90°C conductor temperature, 20°C ambient temperature, earth RHO of 90°C-cm/Watt, 100% load factor, 36 inch depth of burial, and shields short-circuited.

Direct Buried: Three single cables, direct-buried, spaced 7.5 inches horizontally, 90°C conductor temperature, 20°C ambient temperature, earth RHO of 90°C-cm/Watt, 100% load factor, 36 inch depth of burial, and shields short-circuited.

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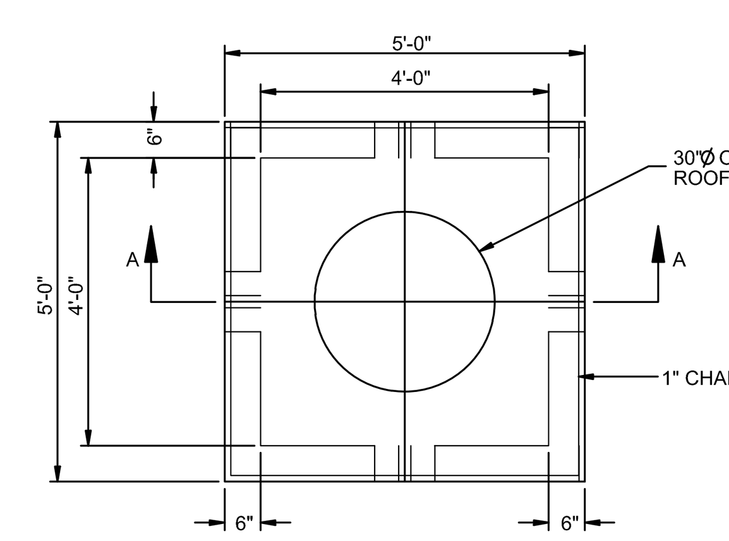
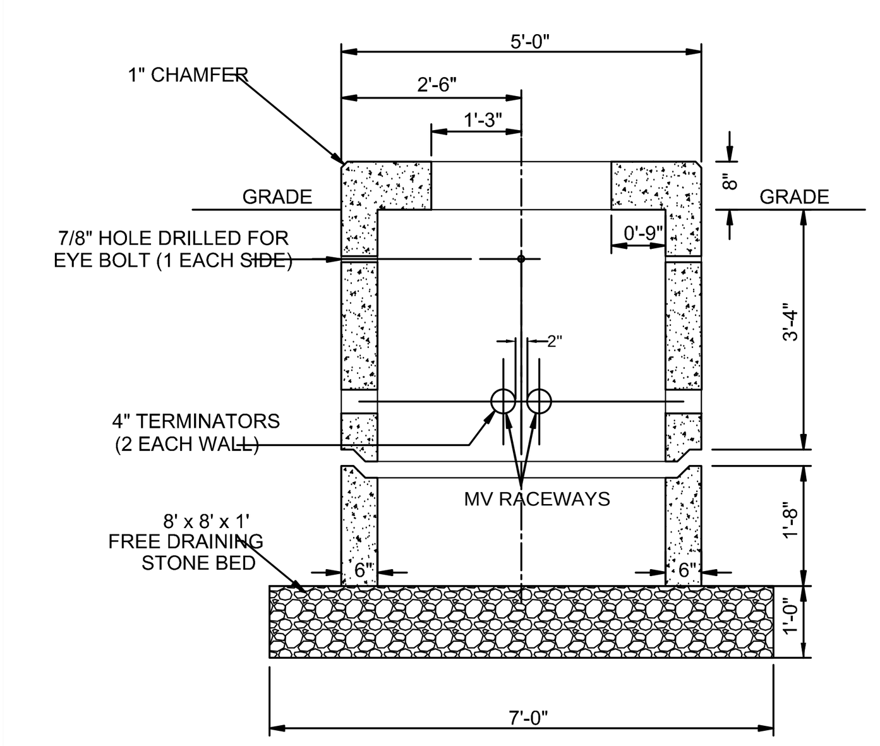
137 Commerce Drive | Johnstown, Ontario K0E 1T1 | www.prysmiancanada.com



1A / E-221 MANHOLE / PULLBOX TOP
TYP. MV 25KV



1B / E-221 MANHOLE / PULLBOX TOPCROSS
TYP. MV 25KV
SCALE: 1:40

greengo
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PROFESSIONAL SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32162 JAMES A. CLANCY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS

DATE	COMMENT
10-31-2018	Inv. 77, 78, 79 adjusted
11-21-2018	Fence updated by civil
12-05-2018	Pullbox tables updated
01-18-2019	3rd Customer Pole Added
01-28-2019	Pullbox analisys updated

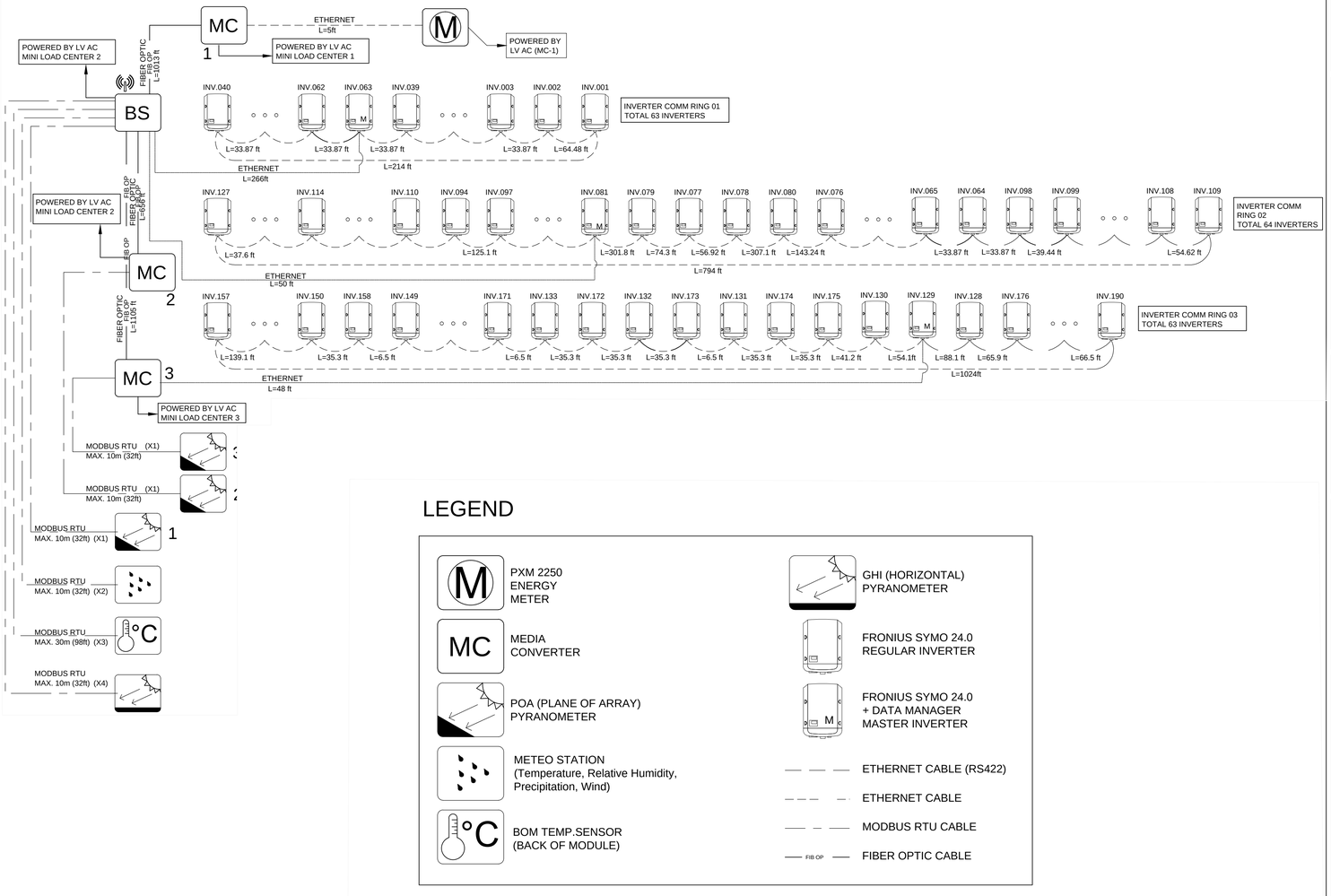
PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

MANHOLE / PULLBOX

E-221

Ring 1 - 63 inverters to Data Manager 1					Ring 2 - 64 inverters to Data Manager 2					Ring 3 - 63 inverters to Data Manager 3				
Data Manager installed on:			Inverter 63		Data Manager installed on:			Inverter 81		Data Manager installed on:			Inverter 129	
from	to	Length (ft)	Length (m)	Protocol	from	to	Length (ft)	Length (m)	Protocol	from	to	Length (ft)	Length (m)	Protocol
1	2	67.71	20.6	RS422	109	108	57.35	17.48	RS422	190	189	69.8	21.28	RS422
2	3	35.57	10.8	RS422	108	107	57.35	17.48	RS422	189	188	53.5	16.30	RS422
3	4	35.57	10.8	RS422	107	106	57.35	17.48	RS422	188	187	169.2	51.57	RS422
4	5	35.57	10.8	RS422	106	105	57.35	17.48	RS422	187	186	59.5	18.12	RS422
5	6	35.57	10.8	RS422	105	104	57.35	17.48	RS422	186	185	37.1	11.30	RS422
6	7	35.57	10.8	RS422	104	103	57.35	17.48	RS422	185	184	37.1	11.30	RS422
7	8	35.57	10.8	RS422	103	102	57.35	17.48	RS422	184	183	37.1	11.30	RS422
8	9	35.57	10.8	RS422	102	101	57.35	17.48	RS422	183	182	37.1	11.30	RS422
9	10	35.57	10.8	RS422	101	100	57.35	17.48	RS422	182	181	37.1	11.30	RS422
10	11	35.57	10.8	RS422	100	99	57.35	17.48	RS422	181	180	37.1	11.30	RS422
11	12	35.57	10.8	RS422	99	98	41.41	12.62	RS422	180	179	37.1	11.30	RS422
12	13	35.57	10.8	RS422	98	64	35.57	10.84	RS422	179	178	37.1	11.30	RS422
13	14	35.57	10.8	RS422	64	65	35.57	10.84	RS422	178	177	37.1	11.30	RS422
14	15	35.57	10.8	RS422	65	66	35.57	10.84	RS422	177	176	37.1	11.30	RS422
15	16	35.57	10.8	RS422	66	67	35.57	10.84	RS422	176	128	69.2	21.09	RS422
16	17	35.57	10.8	RS422	67	68	35.57	10.84	RS422	128	129	92.5	28.20	RS422
17	18	35.57	10.8	RS422	68	69	35.57	10.84	RS422	129	130	56.8	17.32	RS422
18	19	35.57	10.8	RS422	69	70	35.57	10.84	RS422	130	175	43.2	13.16	RS422
19	20	35.57	10.8	RS422	70	71	35.57	10.84	RS422	175	174	37.1	11.30	RS422
20	21	35.57	10.8	RS422	71	72	35.57	10.84	RS422	174	131	37.1	11.30	RS422
21	22	35.57	10.8	RS422	72	73	35.57	10.84	RS422	131	173	6.8	2.08	RS422
22	23	35.57	10.8	RS422	73	74	35.57	10.84	RS422	173	132	37.1	11.30	RS422
23	24	35.57	10.8	RS422	74	75	35.57	10.84	RS422	132	172	6.8	2.08	RS422
24	25	35.57	10.8	RS422	75	76	35.57	10.84	RS422	172	133	37.1	11.30	RS422
25	26	35.57	10.8	RS422	76	80	150.40	45.84	RS422	133	171	6.8	2.08	RS422
26	27	35.57	10.8	RS422	80	78	322.48	98.29	RS422	171	134	37.1	11.30	RS422
27	28	35.57	10.8	RS422	78	77	59.77	18.22	RS422	134	170	6.8	2.08	RS422
28	29	35.57	10.8	RS422	77	79	78.04	23.78	RS422	170	135	37.1	11.30	RS422
29	30	35.57	10.8	RS422	79	81	316.91	96.59	RS422	135	169	6.8	2.08	RS422
30	31	35.57	10.8	RS422	81	82	35.57	10.84	RS422	169	136	37.1	11.30	RS422
31	32	57.35	17.5	RS422	82	83	119.83	36.52	RS422	136	168	6.8	2.08	RS422
32	33	57.35	17.5	RS422	83	84	35.57	10.84	RS422	168	137	37.1	11.30	RS422
33	34	57.35	17.5	RS422	84	85	35.57	10.84	RS422	137	167	6.8	2.08	RS422
34	35	57.35	17.5	RS422	85	86	35.57	10.84	RS422	167	138	37.1	11.30	RS422
35	36	57.35	17.5	RS422	86	87	35.57	10.84	RS422	138	166	6.8	2.08	RS422
36	37	57.35	17.5	RS422	87	88	35.57	10.84	RS422	166	139	37.1	11.30	RS422
37	38	57.35	17.5	RS422	88	89	35.57	10.84	RS422	139	165	6.8	2.08	RS422
38	39	57.35	17.5	RS422	89	90	35.57	10.84	RS422	165	140	37.1	11.30	RS422
39	63	57.35	17.5	RS422	90	91	35.57	10.84	RS422	140	164	6.8	2.08	RS422
63	62	35.57	10.8	RS422	91	92	35.57	10.84	RS422	164	141	37.1	11.30	RS422
62	61	35.57	10.8	RS422	92	93	35.57	10.84	RS422	141	163	6.8	2.08	RS422
61	60	35.57	10.8	RS422	93	95	94.96	28.94	RS422	163	142	37.1	11.30	RS422
60	59	35.57	10.8	RS422	95	96	48.85	14.89	RS422	142	162	6.8	2.08	RS422
59	58	35.57	10.8	RS422	96	97	82.75	25.22	RS422	162	143	37.1	11.30	RS422
58	57	35.57	10.8	RS422	97	94	131.38	40.04	RS422	143	161	6.8	2.08	RS422
57	56	35.57	10.8	RS422	94	110	356.08	108.53	RS422	161	144	37.1	11.30	RS422
56	55	35.57	10.8	RS422	110	111	48.64	14.82	RS422	144	145	34.8	10.60	RS422
55	54	57.35	17.5	RS422	111	112	39.50	12.04	RS422	145	160	6.8	2.08	RS422
54	53	57.35	17.5	RS422	112	113	39.50	12.04	RS422	160	146	37.1	11.30	RS422
53	52	57.35	17.5	RS422	113	114	39.50	12.04	RS422	146	147	37.1	11.30	RS422
52	51	124.07	37.8	RS422	114	115	39.50	12.04	RS422	147	159	6.8	2.08	RS422
51	50	103.63	31.6	RS422	115	116	39.50	12.04	RS422	159	148	37.1	11.30	RS422
50	49	57.35	17.5	RS422	116	117	39.50	12.04	RS422	148	149	37.1	11.30	RS422
49	48	57.35	17.5	RS422	117	118	39.50	12.04	RS422	149	158	6.8	2.08	RS422
48	47	35.57	10.8	RS422	118	119	39.50	12.04	RS422	158	150	37.1	11.30	RS422
47	46	35.57	10.8	RS422	119	120	39.50	12.04	RS422	150	151	37.1	11.30	RS422
46	45	35.57	10.8	RS422	120	121	39.50	12.04	RS422	151	152	6.8	2.08	RS422
45	44	35.57	10.8	RS422	121	122	39.50	12.04	RS422	152	153	37.1	11.30	RS422
44	43	35.57	10.8	RS422	122	123	39.50	12.04	RS422	153	154	37.1	11.30	RS422
43	42	35.57	10.8	RS422	123	124	39.50	12.04	RS422	154	155	37.1	11.30	RS422
42	41	57.35	17.5	RS422	124	125	39.50	12.04	RS422	155	156	37.1	11.30	RS422
41	40	57.35	17.5	RS422	125	126	39.50	12.04	RS422	156	157	146.1	44.52	RS422
40	1	856.36	261.0	RS422	126	127	39.50	12.04	RS422	157	190	1023.8	312.03	RS422
					127	109	808.50	246.43	RS422					
Data manager 1	Full Base Station	279.43	85.2	LAN	Data manager 2	Full Base Station	53.68	16.36	LAN	Data manager 3	Full Base Station	1160.3	353.64	F.O.

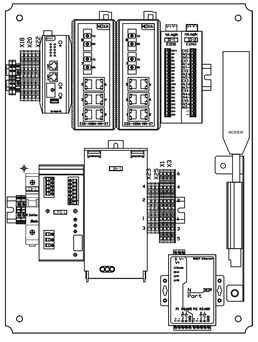
	From	To	Protocol	Cable Type	Max. L (m)	Max. L (ft)	Notes:
Daisy /chain with plug pins	Inverter	Inverter	RS422	Ethernet 4X2 AWG22 Indoor/Outdoor Shielded	100	328.09	N/A
Closed Ring	Inverter	Inverter	RS422	Ethernet 4X2 AWG22 Indoor/Outdoor Shielded	1000	3280.9	
Comm. To PC / Cloud	D.Manager	Full Base Station	LAN	Ethernet 4X2 AWG22 Indoor/Outdoor Shielded	100	328.09	
Comm. To PC / Cloud	D.Manager	Full Base Station	LAN	Fiber Optic	2000	6561.8	



LEGEND

- PXM 2250 ENERGY METER
- MEDIA CONVERTER
- POA (PLANE OF ARRAY) PYRANOMETER
- METEO STATION (Temperature, Relative Humidity, Precipitation, Wind)
- °C BOM TEMP.SENSOR (BACK OF MODULE)
- GHI (HORIZONTAL) PYRANOMETER
- FRONIUS SYMO 24.0 REGULAR INVERTER
- FRONIUS SYMO 24.0 + DATA MANAGER MASTER INVERTER
- ETHERNET CABLE (RS422)
- ETHERNET CABLE
- MODBUS RTU CABLE
- FIB OP FIBER OPTIC CABLE

FULL BASE STATION WITH MET STATION, PYR and BOM



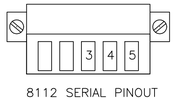
ENCLOSURE IS 19X15X8 INCHES
DOOR HINGED AT RIGHT

INTERNAL WIRING TABLE (SIGNAL)

COMPONENT	PIN	DEVICE	PIN	SIGNAL NAME
X1	2	8112 P1	3	ORANGE
	4		4	WHT/ORG
	6		5	GREEN
X2	2	8112 P2	3	BROWN
	4		4	WHT/BROWN
	6		5	WHT/GRN
X3	2	IO-2	EXO	BLUE
	4		INO+	WHITE
	6		INO-	RED
X4	2	N-Port P1	R+/D+	BLUE
	4		R-/D-	WHITE
	6		GND	RED
BA-1	ALARM	IO-1	BROWN	DI15
	BAT MODE		LILAC	DI14

INTERNAL WIRING TABLE (POWER)

COMPONENT	PIN	DEVICE	PIN	
X18	1	PS 1	24 V-	BLACK
	3		24 V+	RED
	2	IO-1	-	BLACK
	4		+	RED
X19	2	8112 P2	-	BLACK
	4		+	RED
X20	2	IO-2	-	BLACK
	4		+	RED
X21	2	SWITCH 1/2	-	BLACK
	4		+	RED
X22	2	N-Port	-	BLACK
	4		+	RED
	1	X23	2	BLACK
	3		4	RED



8112 SERIAL PINOUT

ETHERNET INTERNAL

COMPONENT	PIN	DEVICE	PIN
ID-1	LAN1	SWITCH 1	1 (RJ45)
N-Port 1	LAN1		2 (RJ45)
MODEM	LAN1		3 (RJ45)
8112	LAN1		4 (RJ45)
D.MANGER 1	LAN1		5 (RJ45)
SWITCH 2	LAN1		6 (RJ45)
D.M2/N-Port2	LAN1		7 (F.O.-ST)
PXM 2250	LAN1		8 (F.O.-ST)

ETHERNET INTERNAL

COMPONENT	PIN	DEVICE	PIN
ID-2	LAN2	SWITCH 2	1 (RJ45)
8112	LAN2		2 (RJ45)
	LAN2		3 (RJ45)
	LAN2		4 (RJ45)
	LAN2		5 (RJ45)
	LAN2		6 (RJ45)
D.M3/N-Port3	LAN2		7 (F.O.-ST)
	LAN2		8 (F.O.-ST)

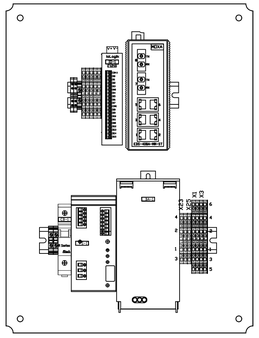
EXTERNAL WIRING TABLE (SIGNAL)

COMPONENT	PIN	DEVICE	PIN	SIGNAL NAME
X1	1	SR-05	WHITE	PYRANOMETER
	3		GREY	
	5			
X2	1	WS 500	GREEN (+)	LUFFT WS 601
	3		YELLOW (-)	
	5			
X3	1	PT1000 RTD	ANY	BOM TEMP
	3		ANY	
	5			
X4	1	SR-05	WHITE	PYRANOMETER
	3		GREY	
	5			

EXTERNAL WIRING TABLE (POWER)

COMPONENT	PIN	DEVICE	PIN	SIGNAL NAME
X23	1	LUFFT WS	BROWN/24V +	DC POWER
	3		WHT / 24V -	
X24	1	SR-05 PYR	BROWN/24V +	DC POWER
	3		BLK/24V -	
X25	1	SR-05 PYR	BROWN/24V +	DC POWER
	3		BLK/24V -	

MEDIA CONVERTER STATION 1



ENCLOSURE IS 19X15X8 INCHES
DOOR HINGED AT RIGHT

MEDIA CONVERTER STATION 1 (ENERGY METER)

INTERNAL WIRING TABLE (SIGNAL)

COMPONENT	PIN	DEVICE	PIN	PIN	SIGNAL NAME
BA-1	ALARM	IO-1	BROWN	DI15	BATTERY STATUS
	BAT MODE		LILAC	DI14	

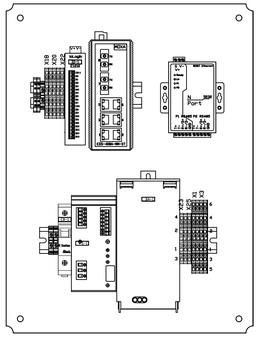
INTERNAL WIRING TABLE (POWER)

COMPONENT	PIN	DEVICE	PIN	PIN
X18	2	IO-1	-	BLACK
	4		+	RED
X21	2	SWTCH	-	BLACK
	4		+	RED

ETHERNET INTERNAL

COMPONENT	PIN	DEVICE	PIN
ID-1	LAN1	SWITCH	1 (RJ45)
PXM 2250	LAN1		7 (F.O.-ST)

MEDIA CONVERTER STATION 2 & 3



ENCLOSURE IS 19X15X8 INCHES
DOOR HINGED AT RIGHT

MEDIA CONVERTER STATION 2 & 3 (DATA MANAGER & PYRA)

INTERNAL WIRING TABLE (SIGNAL)

COMPONENT	PIN	DEVICE	PIN	PIN	SIGNAL NAME
BA-1	ALARM	IO-1	BROWN	DI15	BATTERY STATUS
	BAT MODE		LILAC	DI14	
X1	2	N-Port P1	R+/D+	BLUE	PYRANOMETER
	4		R-/D-	WHITE	
	6		GND	RED	

INTERNAL WIRING TABLE (POWER)

COMPONENT	PIN	DEVICE	PIN	PIN
X18	2	IO-1	-	BLACK
	4		+	RED
X21	2	SWTCH	-	BLACK
	4		+	RED
X22	2	N-Port2/3	-	BLACK
	4		+	RED
	1	X23	2	BLACK
	3		4	RED

ETHERNET INTERNAL

COMPONENT	PIN	DEVICE	PIN
ID-1	LAN1	SWITCH	1 (RJ45)
N-Port2/3	LAN1		2 (RJ45)
D.MANGER2/3	LAN1		7 (F.O.-ST)

GREENGO ENERGY US, INC.
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SUITE 201
CHARLOTTE, NC 28203
+1 (866) 877 0778

ARC DESIGN
SALEM COUNTY OFFICE
409 NORTH MAIN STREET
ELMER, NEW JERSEY 08318
(856) 712-2166 FAX: (856) 358-1511

PROFESSIONAL SEAL

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

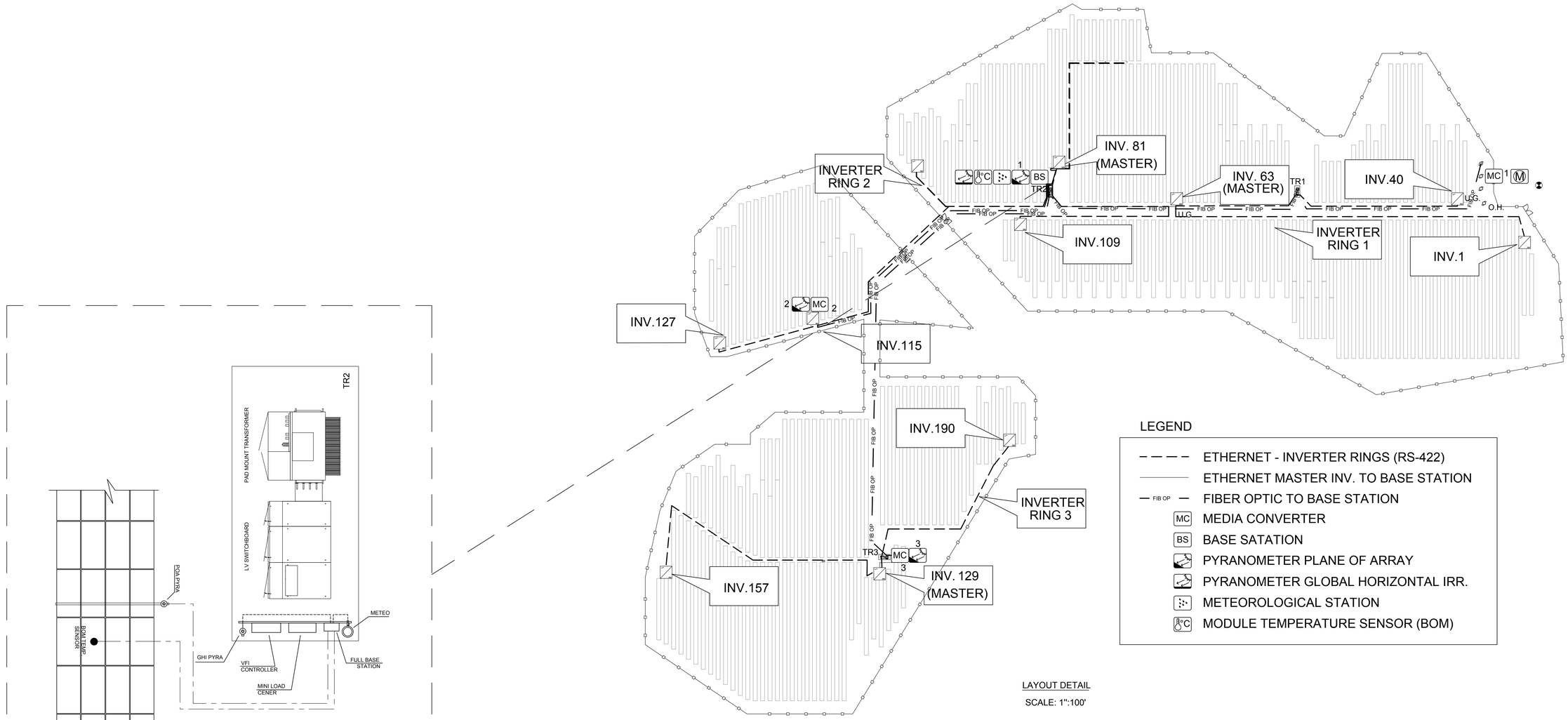
ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS	
DATE	COMMENT
12-12-2018	Auxiliary Power MC & BS
01-23-2019	Meter Power Supply
01-24-2019	MC-1 Fiber Optic length

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/A
DATE	12-21-2018

MONITORING DIAGRAM

E-301

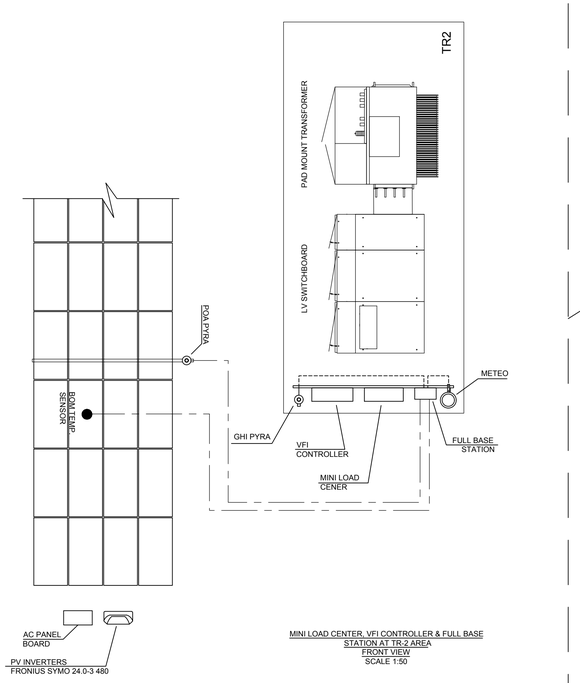


LEGEND

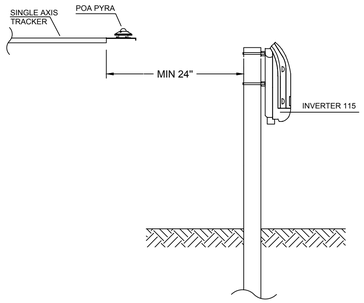
- ETHERNET - INVERTER RINGS (RS-422)
- ETHERNET MASTER INV. TO BASE STATION
- FIB OP — FIBER OPTIC TO BASE STATION
- MC — MEDIA CONVERTER
- BS — BASE SATATION
- PYRANOMETER PLANE OF ARRAY
- PYRANOMETER GLOBAL HORIZONTAL IRR.
- METEOROLOGICAL STATION
- °C — MODULE TEMPERATURE SENSOR (BOM)

LAYOUT DETAIL

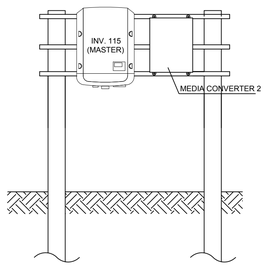
SCALE: 1":100'



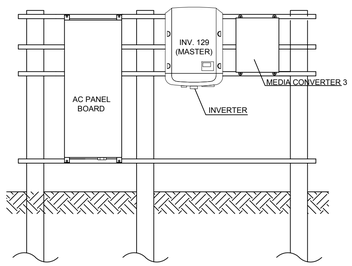
MINI LOAD CENTER, VFI CONTROLLER & FULL BASE STATION AT TR-2 AREA
FRONT VIEW
SCALE 1:50



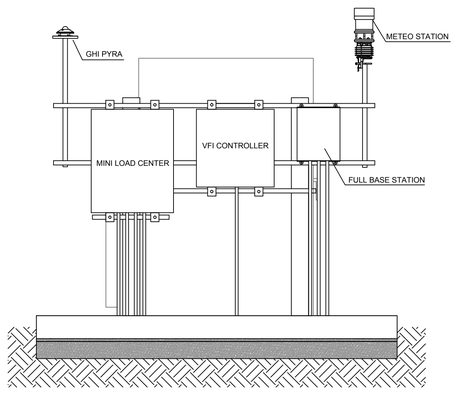
PYRANOMETER PLANE OF ARRAY & MEDIA CONVERTER
SIDE VIEW
SCALE: 1:25



MASTER INVERTER & MEDIA CONVERTER AT TR-2 AREA
FRONT VIEW
SCALE 1:25



MASTER INVERTER & MEDIA CONVERTER AT TR-3 AREA
FRONT VIEW
SCALE 1:25



MINI LOAD CENTER, VFI CONTROLLER & FULL BASE STATION AT TR-2
FRONT VIEW
SCALE 1:25

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PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32102 JAMES A. CASEY

PHOTOVOLTAIC POWER PLANT - 4,560 kWac / 6,156 kWdc

ENNIS SOLAR, LLC
447 SHERIFF JOHNSON ROAD, LILLINGTON, NC 27546
ISSUED FOR CONSTRUCTION

REVISIONS	
DATE	COMMENT
10-31-2018	Inv. 77, 78, 79 adjusted
11-21-2018	Fence updated by civil
12-13-2018	MLC & Meteo rack added
01-18-2019	Mounting racks adjusted
01-24-2019	MC-1, Meter & F.O. adjusted

PROJ #	2250 - 003
DRWN	GG / PB
CHKD	CE / JAC
SCALE	N/S
DATE	12-21-2018

MONITORING LAYOUT & DETAILS

E-302