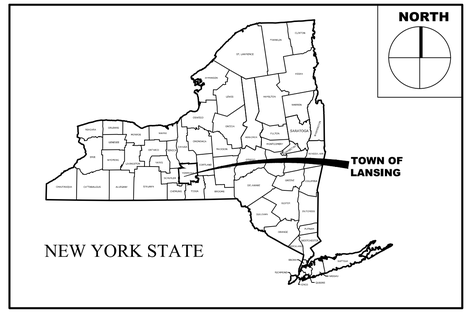
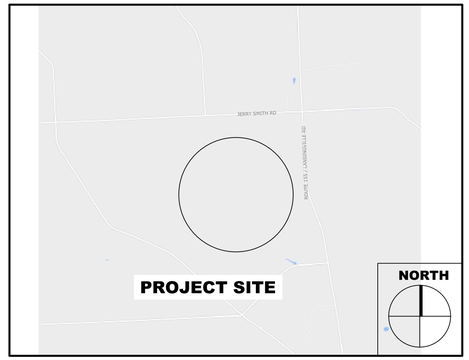
PROJECT NUMBER: 22.2303

LANSING 5MW (AC)/6.25MW(DC) PV SYSTEM
528 LANSINGVILLE RD, LANSING NY 14882

UTILITY SUBMISSION - MAY 24, 2022





SITE LOCATION MAP

DRAWING LIST

SHEET ID	SHEET TITLE	SHEET NUMBER
G-001	COVER PAGE	1
E-101	ELECTRICAL SITE PLAN	2
E-601	ELECTRICAL ONE-LINE DIAGRAM	3
E-602	ELECTRICAL THREE-LINE DIAGRAM	4
E-603	ELECTRICAL SCHEDULES	5

UTILITY SUBMISSION

C.T. MALE ASSOCIATES

Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.

50 CENTURY HILL DRIVE, LATHAM, NY 518.786.7400

COBLESKILL, NY ▪ GLENS FALLS, NY ▪ POUGHKEEPSIE, NY

JOHNSTOWN, NY ▪ RED HOOK, NY ▪ SYRACUSE, NY

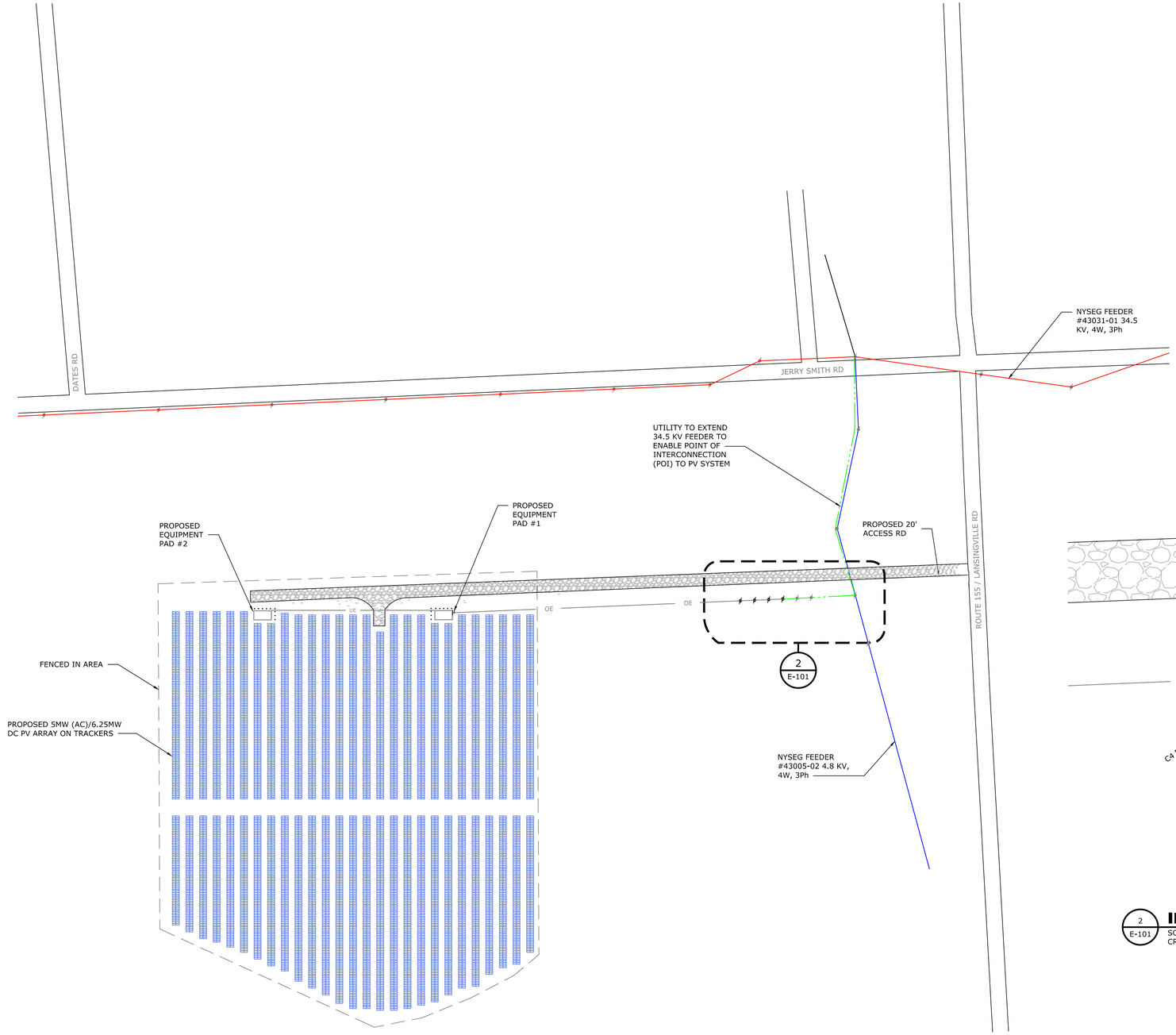
www.ctmale.com

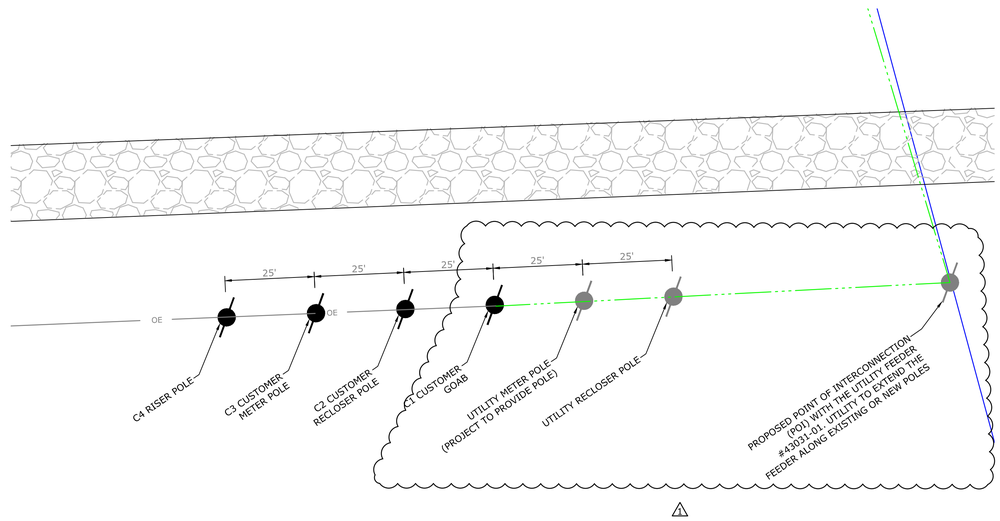
PROJECT NO. 22.2303
DRAWING NO.

G-001

PROJECT NUMBER: 22.2303

SYMBOLS LEGEND:	
	POLE
	BOLLARDS
OE	OVERHEAD ELECTRICAL
UE	UNDERGROUND ELECTRICAL
	EXISTING 4.8KV FEEDER
	EXISTING 34.5KV FEEDER
	PROPOSED UTILITY EXTENSION TO 34.5 KV FEEDER
	FENCE
	ACCESS ROAD





1 / E-101 **ELECTRICAL SITE PLAN**
SCALE: 1" = 100'
CROSS REFERENCE: NONE

BAR SCALE
100 0 50 100 200
1 inch = 100 ft.

2 / E-101 **INTERCONNECTION AREA SITE PLAN**
SCALE: 1" = 20"
CROSS REFERENCE: 1/E-101

BAR SCALE
20 0 10 20 40
1 inch = 20 ft.

UTILITY SUBMISSION

BRAD R. GARRISON
P.E. NO. 105776

STATE OF NEW YORK · BRAD R. GARRISON · 105776 · LICENSED PROFESSIONAL ENGINEER

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
6/24/22	1	SHOW DEMARCATIONS FOR UTILITY POLES	MNE	OPW	BRG
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				

DESIGNER: OPW
DRAFTED : MNE
CHECKED : BRG
PROJ. NO : 22.2303
SCALE : AS NOTED
DATE : JUNE 24, 2022

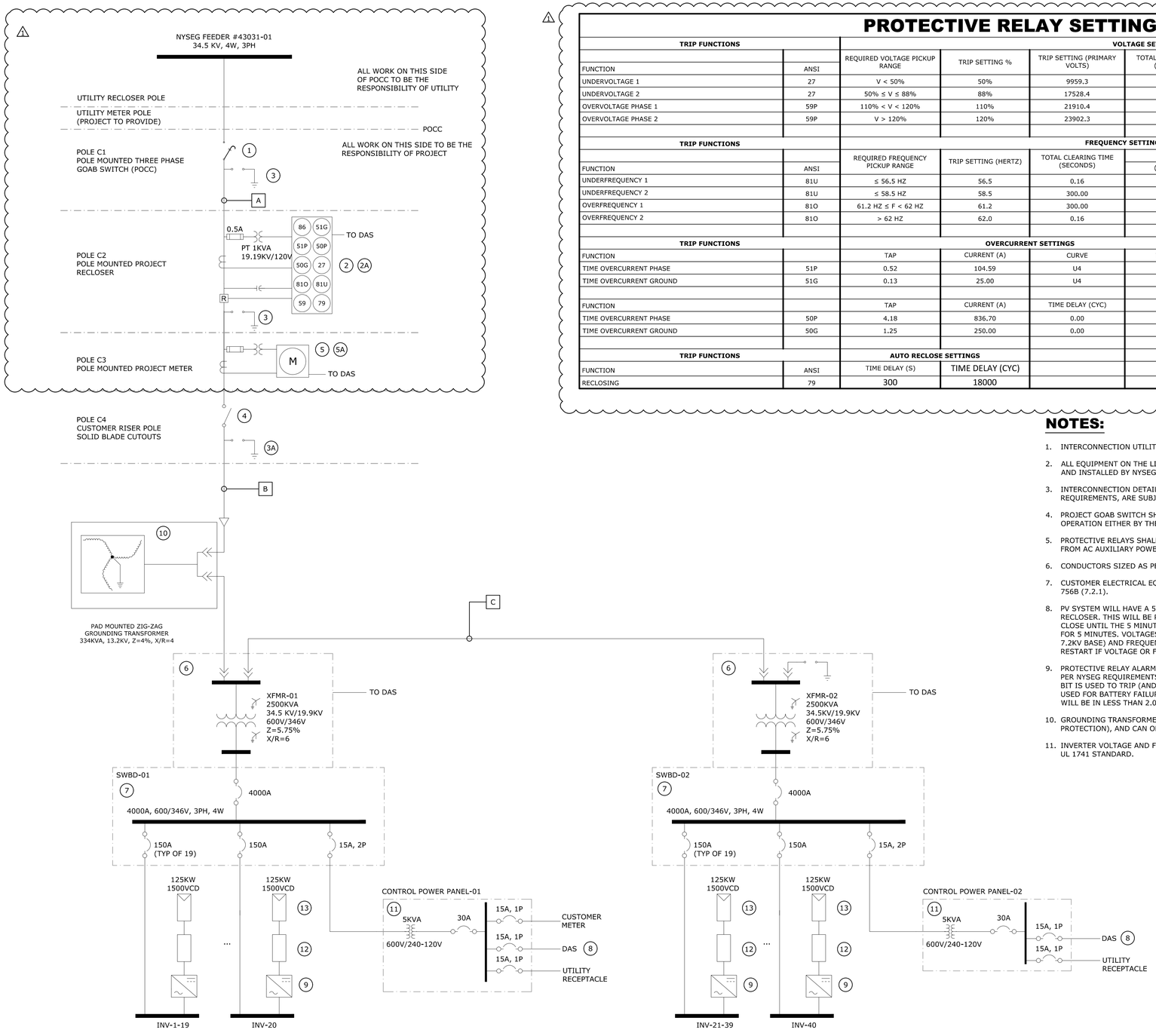
ELECTRICAL SITE PLAN

LANSING 5MW (AC)/6.25MW(DC) PV SYSTEM
528 LANSINGVILLE RD, LANSING NY 14882

TOWN OF LANSING — TOMPKINS COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110 PH: 518.786.7400
COBLESKILL, NY • GLENS FALLS, NY • POUGHKEEPSIE, NY
JOHNSTOWN, NY • RED HOOK, NY • SYRACUSE, NY
www.ctmale.com

E-101
SHEET 2 OF 5
DWG. NO: 22-2303



PROTECTIVE RELAY SETTINGS

TRIP FUNCTIONS		VOLTAGE SETTINGS							
		REQUIRED VOLTAGE PICKUP RANGE	TRIP SETTING %	TRIP SETTING (PRIMARY VOLTS)	TOTAL CLEARING TIME (SECONDS)	RELAY TD			
FUNCTION	ANSI					(SECONDS)	(CYCLES)	(SECONDS)	(CYCLES)
UNDERVOLTAGE 1	27	V < 50%	50%	9959.3	1.10	1.05	63.00	0.05	3.00
UNDERVOLTAGE 2	27	50% ≤ V ≤ 88%	88%	17528.4	2.00	1.95	117.00	0.05	3.00
OVERVOLTAGE PHASE 1	59P	110% < V < 120%	110%	21910.4	2.00	1.95	117.00	0.05	3.00
OVERVOLTAGE PHASE 2	59P	V > 120%	120%	23902.3	0.16	0.11	6.50	0.05	3.00

TRIP FUNCTIONS		FREQUENCY SETTINGS							
		REQUIRED FREQUENCY PICKUP RANGE	TRIP SETTING (HERTZ)	TOTAL CLEARING TIME (SECONDS)	RELAY TD		G&W VIPER ST		
FUNCTION	ANSI				(SECONDS)	(CYCLES)	(SECONDS)	(CYCLES)	
UNDERFREQUENCY 1	81U	≤ 56.5 HZ	56.5	0.16	0.11	6.25	0.05	3.00	
UNDERFREQUENCY 2	81U	≤ 58.5 HZ	58.5	300.00	299.94	17546.75	0.05	3.00	
OVERFREQUENCY 1	81O	61.2 HZ ≤ F < 62 HZ	61.2	300.00	299.94	18356.50	0.05	3.00	
OVERFREQUENCY 2	81O	> 62 HZ	62.0	0.16	0.11	6.75	0.05	3.00	

TRIP FUNCTIONS		OVERCURRENT SETTINGS							
FUNCTION		TAP	CURRENT (A)	CURVE	TIME DIAL	TIME DELAY (CYC)			
TIME OVERCURRENT PHASE	51P	0.52	104.59	U4	0.50	0			
TIME OVERCURRENT GROUND	51G	0.13	25.00	U4	0.50	0			
FUNCTION		TAP	CURRENT (A)	TIME DELAY (CYC)					
TIME OVERCURRENT PHASE	50P	4.18	836.70	0.00					
TIME OVERCURRENT GROUND	50G	1.25	250.00	0.00					

TRIP FUNCTIONS		AUTO RECLOSE SETTINGS							
FUNCTION	ANSI	TIME DELAY (S)	TIME DELAY (CYC)						
RECLOSING	79	300	18000						

SYMBOLS LEGEND:

- DEMARKS SEPARATION BETWEEN POLES
- COMMUNICATION (NON-POWER) CONNECTION
- POWER CONNECTION
- EQUIPMENT ENCLOSURE
- CIRCUIT BREAKER
- SOLID BLADE CUTOUT
- FUSED CUTOUT
- INVERTER
- SURGE ARRESTER
- TRANSFORMER
- WYE - GROUNDED
- (ID) EQUIPMENT TAG - SEE SHEET E-603
- [ID] CABLE TAG - SEE SHEET E-603

NOTES:

1. INTERCONNECTION UTILITY COMPANY IS NYSEG.
2. ALL EQUIPMENT ON THE LINE SIDE OF THE POINT OF COMMON COUPLING (POCC) IS TO BE PROVIDED AND INSTALLED BY NYSEG, UNLESS NOTED OTHERWISE.
3. INTERCONNECTION DETAILS E.G. LOCATIONS OF EQUIPMENT, SCOPE OF RESPONSIBILITY, TESTING REQUIREMENTS, ARE SUBJECT TO CHANGE AND NOT FINAL UNTIL APPROVED BY NYSEG.
4. PROJECT GOAB SWITCH SHALL BE READILY ACCESSIBLE (24/7) AND EQUIPPED WITH DOUBLE LOCKS FOR OPERATION EITHER BY THE PROJECT OR BY NATIONAL GRID.
5. PROTECTIVE RELAYS SHALL BE PROVIDED WITH DC BATTERY BACKUP AND FAIL-SAFE TRIP CHARGED FROM AC AUXILIARY POWER.
6. CONDUCTORS SIZED AS PER THE NEC 2017 REQUIREMENTS.
7. CUSTOMER ELECTRICAL EQUIPMENT WILL BE SERVICE ENTRANCE RATED AS IS REQUIRED BY NYSEG ESB 756B (7.2.1).
8. PV SYSTEM WILL HAVE A 5-MINUTE HEALTHY GRID RECONNECT FEATURE PROGRAMMED INTO THE RECLOSER. THIS WILL BE PROGRAMMED INTO THE RECLOSER TO DEFEAT THE CLOSE BUTTON AND BLOCK CLOSE UNTIL THE 5 MINUTE TIMER HAS COMPLETED. SETTINGS WILL BE PER IEEE 1547 SECTION 4.2.6 FOR 5 MINUTES. VOLTAGES WILL BE SET WITHIN ANSI C84.1 TABLE 1, RANGE B (6.84KV - 7.56KV ON 7.2KV BASE) AND FREQUENCY WILL BE WITHIN 59.3-60.5HZ. THE 5 MINUTE TIME INTERVAL WILL RESTART IF VOLTAGE OR FREQUENCY FALLS OUT OF THIS WINDOW.
9. PROTECTIVE RELAY ALARM CIRCUIT TO BE WIRED OR PROGRAMMED TO TRIP SWITCH FOR REDUNDANCY PER NYSEG REQUIREMENTS. THIS IS RELAY FAIL SAFE PROTECTION. FOR RECLOSER THE ALARM WORD BIT IS USED TO TRIP (AND BLOCK CLOSE) ON LOSS OF DC POWER AND ON RELAY FAULURES. BTFAIL IS USED FOR BATTERY FAILURE. LOSS OF 120VAC POWER TO THE RELAY WILL TRIP AND BLOCK/CLOSE. TRIP WILL BE IN LESS THAN 2.0 SECONDS.
10. GROUNDING TRANSFORMER IS PROTECTED BY RELAY (51G, WHICH IS ALSO USED FOR UTILITY PROTECTION), AND CAN ONLY BE DISCONNECTED BY RELAY.
11. INVERTER VOLTAGE AND FREQUENCY OUT-OF-RANGE DISCONNECTION TO BE IN ACCORDANCE WITH THE UL 1741 STANDARD.

PROJECT SUMMARY

PV MODULE MAKE / MODEL	PRISM SOLAR, PST-445W-M72H
STC MODULE POWER (WP)	445
QTY OF MODULES	14050
INVERTER MAKE / MODEL	CHINT CPS SCH125KTL-DO/US-600
INVERTER NAMEPLATE (KW)	125
QTY OF INVERTERS	40
MODULES PER STRING	25
STRINGS PER INVERTER	14 OR 15
TOTAL DC POWER RATING (MWDC)	6.252
TOTAL AC POWER RATING (MWAC)	5.000

UTILITY SUBMISSION

1 / ---- **ELECTRICAL ONE-LINE DIAGRAM**
SCALE: NONE
CROSS REFERENCE: NONE

BRAD GARRISON
P.E. NO. 105776

STATE OF NEW YORK · BRAD R. GARRISON · 105776 · LICENSED PROFESSIONAL ENGINEER

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
6/27/22	1	SHOW DEMARCATIONS FOR UTILITY POLES	MNE	OPW	BRG
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				

DESIGNER: OPW
DRAFTED : MNE
CHECKED : BRG
PROJ. NO : 22.2303
SCALE : AS NOTED
DATE : JUNE 27, 2022

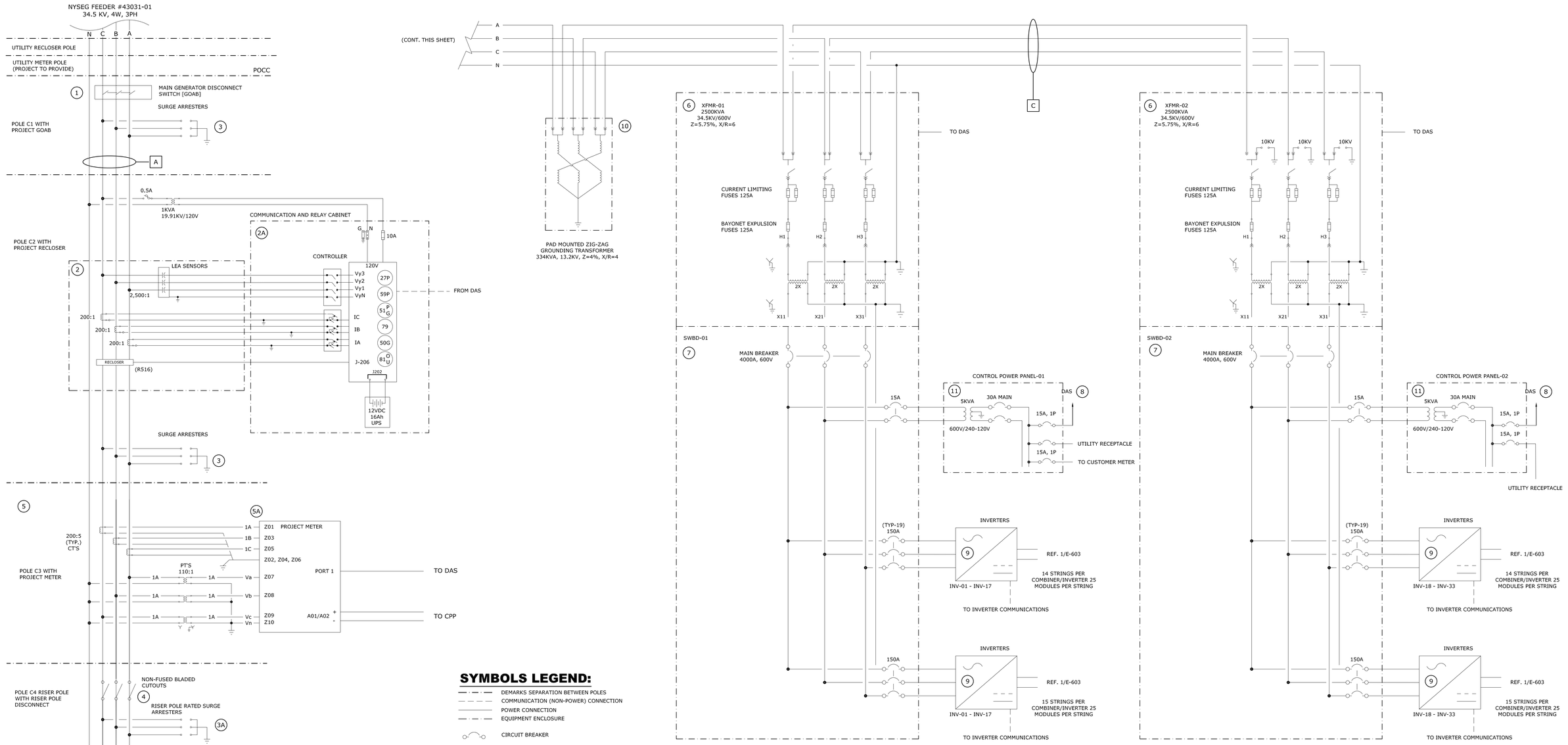
ELECTRICAL ONE-LINE DIAGRAM

LANSING 5MW (AC)/6.25MW(DC) PV SYSTEM
528 LANSINGVILLE RD, LANSING NY 14882

TOWN OF LANSING — TOMPKINS COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110 PH: 518.786.7400
COBLESKILL, NY • GLENS FALLS, NY • POUGHKEEPSIE, NY
JOHNSTOWN, NY • RED HOOK, NY • SYRACUSE, NY
www.ctmalic.com

E-601
SHEET 3 OF 5
DWG. NO: 22-2303



SYMBOLS LEGEND:

- DEMARKS SEPARATION BETWEEN POLES
- COMMUNICATION (NON-POWER) CONNECTION
- POWER CONNECTION
- EQUIPMENT ENCLOSURE
- CIRCUIT BREAKER
- SOLID BLADE CUTOUT
- FUSED CUTOUT
- INVERTER
- SURGE ARRESTER
- TRANSFORMER
- WYE - GROUNDED
- (?) EQUIPMENT ID - SEE SHEET E-603
- [?] CABLE / CONDUIT ID - SEE SHEET E-603

(1) / ---- **ELECTRICAL THREE-LINE DIAGRAM**
SCALE: NONE
CROSS REFERENCE: 1/E-603

UTILITY SUBMISSION

BRAD GARRISON
P.E. NO. 105776

STATE OF NEW YORK · BRAD R. GARRISON · 105776 · LICENSED PROFESSIONAL ENGINEER

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
6/27/22	1	SHOW DEMARCATIONS FOR UTILITY POLES	MNE	OPW	BRG
	2				
	3				
	4				
	5				
	6				
	7				
	8				

DESIGNER: OPW
DRAFTED : MNE
CHECKED : BRG
PROJ. NO : 22.2303
SCALE : AS NOTED
DATE : JUNE 27, 2022

ELECTRICAL THREE-LINE DIAGRAM

LANSING 5MW (AC)/6.25MW(DC) PV SYSTEM
528 LANSINGVILLE RD, LANSING NY 14882

TOWN OF LANSING — TOMPKINS COUNTY, NEW YORK

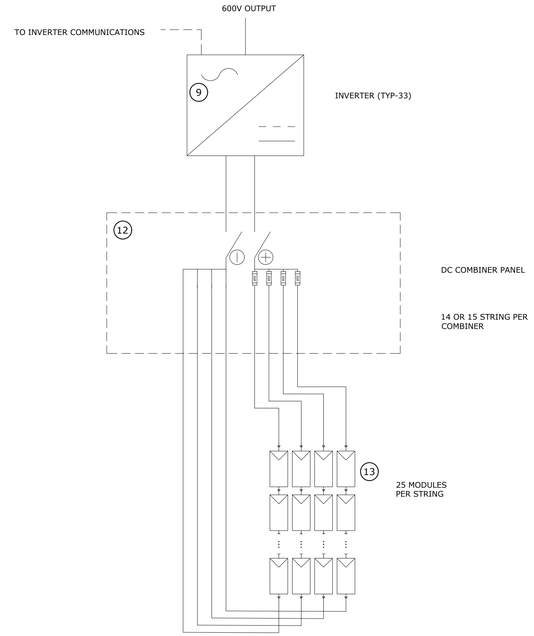
C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110 PH: 518.786.7400
COBLESKILL, NY • GLENS FALLS, NY • POUGHKEEPSIE, NY
JOHNSTOWN, NY • RED HOOK, NY • SYRACUSE, NY
www.ctmale.com

E-602
SHEET 4 OF 5
DWG. NO: 22-2303

CABLE SCHEDULE

ID	FROM	TO	# CONDUCTORS	VOLTAGE	MAX CURRENT (A)	MIN CONDUCTOR AMPACITY REQUIRED (A)	CONDUCTOR AMPACITY (A)	CONDUCTOR SIZE, DESCRIPTION	# NEUTRAL	NEUTRAL SIZE	# GROUND	GROUND SIZE	INSULATION TYPE	# CONDUIT	CONDUIT SIZE
A	POCC	RISER POLE	4	34500	83.7	104.6	185/110*	#2 AWG, ACSR SPARROW 6/1	1	#2 SPARROW	-	-	-	-	-
B	RISER POLE	XFMR-01	3	34500	83.7	104.6	130**	#2 AWG, AL, MV-105, 35KV, 133%, URD 1/3 NEUTRAL	-	CONCENTRIC	-	-	EPR	1	2" SCH 40 PVC
C	XFMR-01	XFMR-02	3	34500	41.8	52.3	75**	#6 AWG, AL, MV-105, 35KV, 133%, URD 1/3 NEUTRAL	-	CONCENTRIC	-	-	EPR	1	2" SCH 40 PVC

* UNDER 25 C AMBIENT WIND AND SUN CONDITIONS / UNDER 25C AMBIENT NO WIND AND SUN CONDITIONS
** CONDUCTOR AMPACITY BASED ON NEC (2017) TABLE 310.60(C)(78)



1 / E-603 **TYPICAL INVERTER CONFIGURATION**
SCALE: NONE
CROSS REFERENCE: 1/E-602

EQUIPMENT SCHEDULE

ID	EQUIPMENT NAME	QTY	MAKE / MODEL	VOLTAGE (V)	AMPERAGE (A)	NEMA RATING	KAIC RATING	DESCRIPTION
1	GOAB SWITCH	1	S&C OR EQUAL	-	600	-	N/A	34.5 KV, ALDUTI-RUPTER SWITCH
2	POLE MOUNTED RECLOSER	1	G&W ELECTRIC VIPER	-	800	3R	16	38 KV
3	RECLOSER CONTROLLER	1	SEL-651R-2	120	-	3R	-	SEL-0651R22CXGA8 AE112230XX
4	HEAVY DUTY DISTRIBUTION CLASS ARRESTER	6	HUBBELL, PDV-100 OR EQUAL	-	-	-	-	SURGE ARRESTER 27KV, 22 MCOV
5	PROJECT METER	1	ABB OR EQUAL	-	400	3R	N/A	38KV, 600A, 95KV BIL, 3PH, 60 HZ
6	SOLID-BLADE CUTOUT	3	ABB, NCX OR EQUAL	-	300	-	12KA	-
7	RISER POLE RATED - HEAVY DUTY DISTRIBUTION CLASS ARRESTER	3	HUBBELL, PDV-100 OR EQUAL	-	-	-	-	SURGE ARRESTER 27KV, 22 MCOV
8	STEP-UP XFMR	1	COOPER POWER ENVIROTRAN	-	-		N/A	2,500KVA, 34.5KV/19.9KV/600V/347V, Z=5.75%
9	SWITCHBOARD	1	EATON POW-R LINE C SWITCHBOARD	600	4,000	3R	35	SWITCHBOARD, 3-PHASE, 4W, 600V, 4000A, NEMA 3R, 4000A MCB
10	ZIG-ZAG GROUNDING TRANSFORMER	1	TBD	-	-	3R	-	-
11	INVERTER	40	CHINT CPS SCH125KTL-DO/US-600	600	120	4X	N/A	STRING INVERTER
12	CONTROL POWER PANEL	1	EATON P60G11S0512 OR EQUAL	1	30	3R	18	MINI-POWR ZONE WITH 5KVA XFMR
13	DAS	1	ALSO ENERGY OR EQUAL	120	-	4X	-	-
14	DC COMBINER PANEL	40	SOLARBOS OR EQUAL	1,500	400	3R	N/A	-
15	PHOTOVOLTAIC MODULE	14050	PRISM SOLAR, PST-445W-M72H	1,500	12	N/A	N/A	

UTILITY SUBMISSION

BRAD R. GARRISON
P.E. NO. 105776

STATE OF NEW YORK · BRAD R. GARRISON · 105776 · LICENSED PROFESSIONAL ENGINEER

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTER	CHECK	APPR.
6/27/22	1	SHOW DEMARCATIONS FOR UTILITY POLES	MNE	OPW	BRG
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				

DESIGNER: OPW
DRAFTED : MNE
CHECKED : BRG
PROJ. NO : 22.2303
SCALE : AS NOTED
DATE : JUNE 27, 2022

ELECTRICAL SCHEDULES

LANSING 5MW (AC)/6.25MW(DC) PV SYSTEM
528 LANSINGVILLE RD, LANSING NY 14882

TOWN OF LANSING — TOMPKINS COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110 PH: 518.786.7400
COBLESKILL, NY · GLENS FALLS, NY · POUGHKEEPSIE, NY
JOHNSTOWN, NY · RED HOOK, NY · SYRACUSE, NY
www.ctmale.com

E-603
SHEET 5 OF 5
DWG. NO: 22-2303