

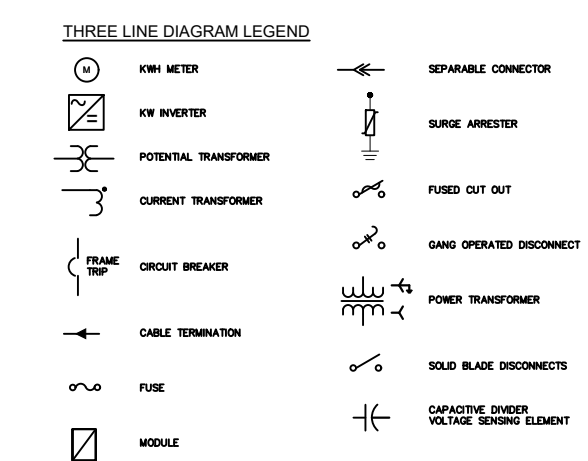
CABLE SCHEDULE						
CIRCUIT ID	VOLTAGE RATING	CONDUCTOR QUANTITY, SIZE AND MATERIAL	WIRE TYPE	QUANTITY OF CONDUITS	SIZE OF CONDUITS	CONDUIT TYPE
A	15kV	(3) #2/0 AWG AL (1) #2/0 AWG AL N	COVERED ACSR	-	-	-
A1	15kV	TAVRIDA UMBILICAL CABLE	-	-	-	-
B	15kV	(3) #4/0 AWG AL JACKETED CONCENTRIC NEUTRAL	MV-105	1	5"	PVC
C	600V	(3) #1 AWG AL (1) #1 AWG AL N (1) #6 AWG G	XHHW-2	1	2"	PVC
D	600V	(3) 250 KCMIL AL (1) 250 KCMIL AL N (1) #2 AWG AL G	XHHW-2	1	3"	PVC
E	600V	(3) #1/0 AWG (1) #1/0 AWG N (1) #2 AWG G	XHHW-2	1	1.5"	PVC
F	600V	(6) #10 AWG	XHHW-2	1	1"	PVC
G	-	(1) CAT5	-	1	1"	PVC
H	600V	(2) #1/0 AWG (1) #1/0 AWG N (1) #12 AWG G	XHHW-2	1	1"	PVC
I	600V	(3) #1/0 AWG (1) #1/0 AWG G	-	-	-	-
J	600V	(2) #1/0 AWG (1) #1/0 AWG G	RHW-2	-	-	-

ALL CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE NOTED

PROTECTIVE RELAY SETTINGS					
INVERTER PROTECTIVE FUNCTIONS	TRIP OUTPUT	VOLTAGE SETTING (SEC) PRI (PU)	FREQUENCY SETTING (HZ)	TOTAL CLEARING TIME CYC (SEC.)	CURRENT SETTING SEC (PRI)
27P1 - FAST UNDERVOLTAGE	X	(80) 3810.51 (50%)	-	66 (1.1)	-
27P2 - UNDERVOLTAGE	X	(106) 6708.5 (88%)	-	120 (2)	-
59P1 - OVERVOLTAGE	X	(132) 6383.13 (110%)	-	120 (2)	-
59P2 - FAST OVERVOLTAGE	X	(144) 6145.23 (120%)	-	9.6 (0.16)	-
81UP1 - UNDERFREQUENCY	X	-	56.5	9.6 (0.16)	-
81UP2 - UNDERFREQUENCY	X	-	56.5	18000 (300)	-
81OP1 - OVERFREQUENCY	X	-	61.2	18000 (300)	-
81OP2 - OVERFREQUENCY	X	-	62	9.6 (0.16)	-
51 - OVERCURRENT	X	-	CURVE: U4 T.M.2.4	1.09 (109)	-
51 G - GROUND OVERCURRENT	X	-	CURVE: U4 T.M.2.4	0.22 (22)	-
79 - RECLOSER	X	95% $\leq V \leq 105\%$	59.5hz $\leq f \leq 60.5$ Hz	5 MINUTES	SEE NOTE 20
ALARM	X	-	-	<120	-

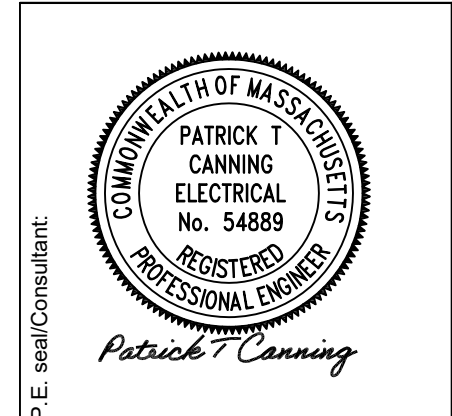
1. VOLTAGE SETTING VALUES ARE L-L.
2. TOTAL CLEARING TIME = TIME DELAY + CLEARING TIME OF 3 CYCLES

INVERTER PROTECTIVE SETTINGS			
INVERTER PROTECTIVE FUNCTIONS	VOLTAGE SETTING PU	FREQUENCY SETTING HZ	OPERATING TIME CYC (SEC.)
27 - FAST UNDERVOLTAGE	300 (50%)	-	66 (1.1)
27 - UNDERVOLTAGE	528 (88%)	-	120 (2)
59 - FAST OVERVOLTAGE	660 (110%)	-	120 (2)
59 - OVERVOLTAGE	720 (120%)	-	9.6 (0.16)
81 - UNDERFREQUENCY	-	56.5	9.6 (0.16)
81 - UNDERFREQUENCY	-	56.5	18000 (300)
81 - OVERFREQUENCY	-	61.2	18000 (300)
81 - OVERFREQUENCY	-	62	9.6 (0.16)



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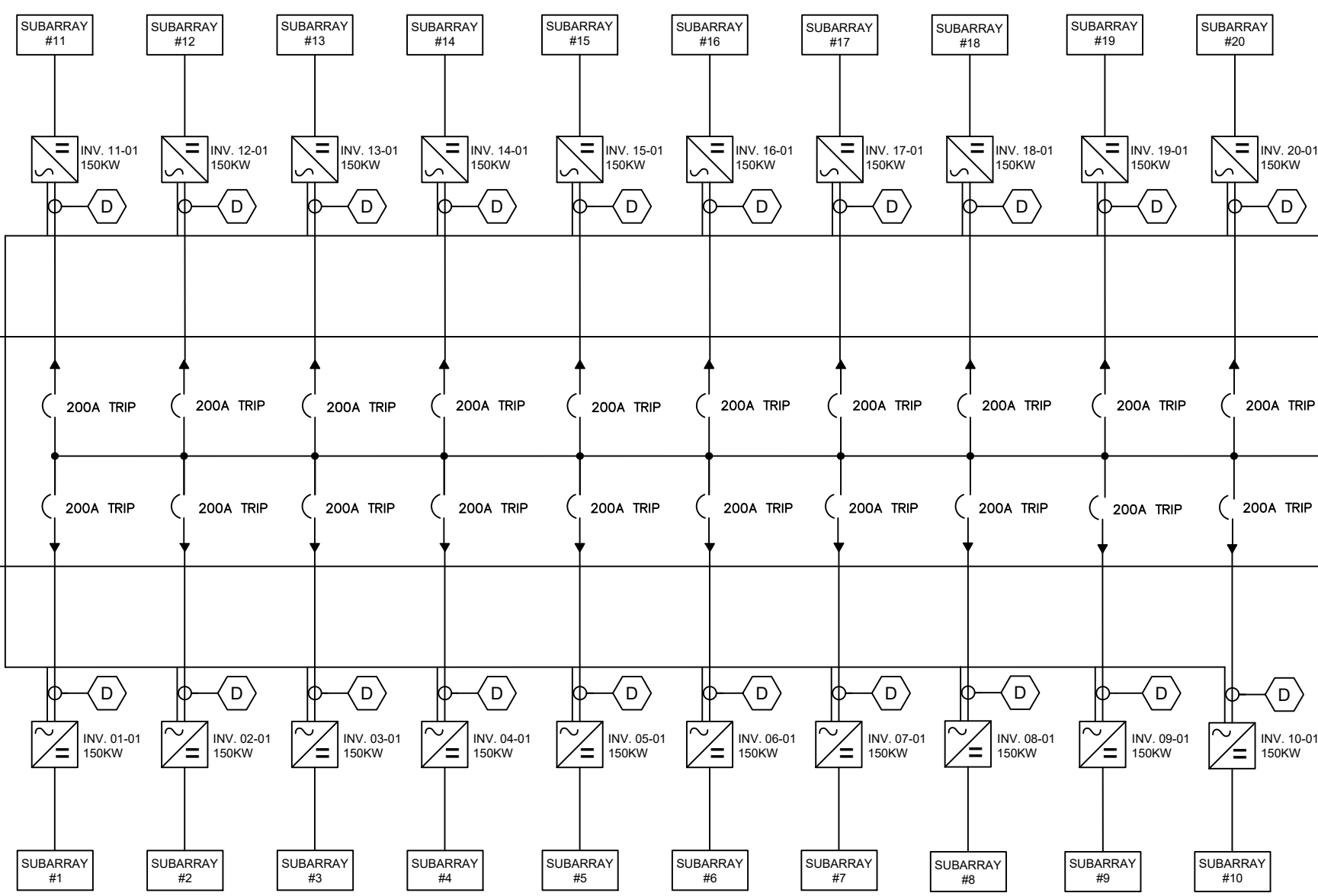


39256 Wilson Hill
469 Wilson Hill Rd
Hoosick Falls, NY 12090

AC Electrical Diagram (XFR.01)

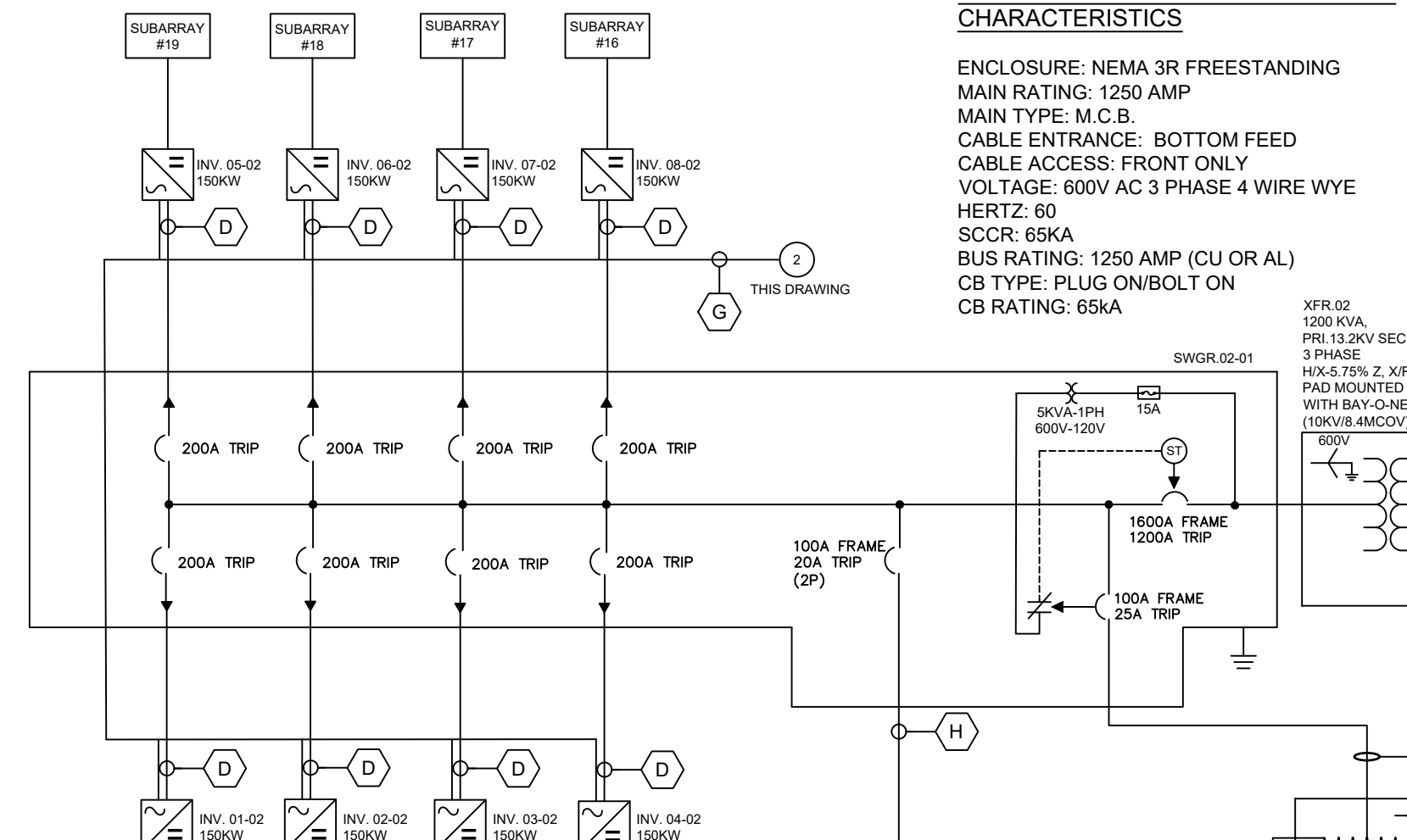
Dwg No: E-601 Size: D Sheet Rev: A

Scale: N.T.S. Approved by: N.Gonzalez



TYPICAL SWITCHBOARD ELECTRICAL CHARACTERISTICS

ENCLOSURE: NEMA 3R FREESTANDING
MAIN RATING: 3500 AMP
MAIN TYPE: M.C.B.
CABLE ENTRANCE: BOTTOM FEED
CABLE ACCESS: FRONT ONLY
VOLTAGE: 600V AC 3 PHASE 4 WIRE WYE
HERTZ: 60
SCCR: 65KA
BUS RATING: 3500 AMP (CU OR AL)
CB TYPE: PLUG ON/BOLT ON
CB RATING: 65KA

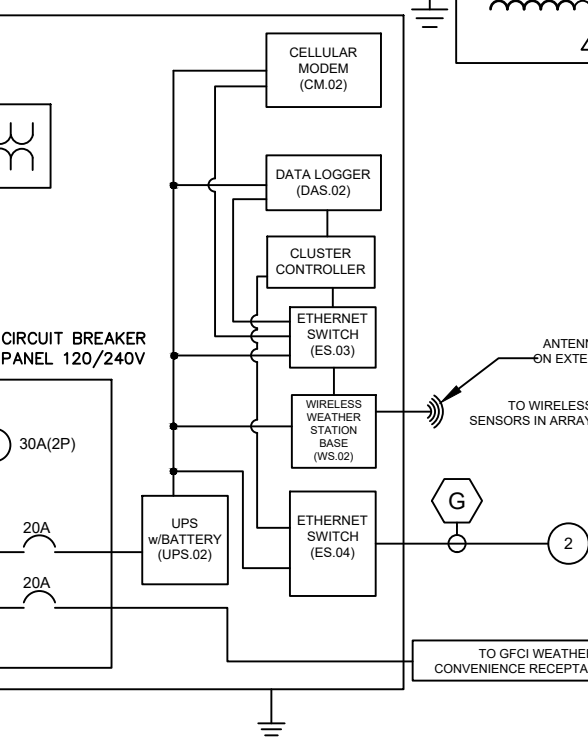


TYPICAL SWITCHBOARD ELECTRICAL CHARACTERISTICS

ENCLOSURE: NEMA 3R FREESTANDING
MAIN RATING: 750 AMP
MAIN TYPE: M.C.B.
CABLE ENTRANCE: BOTTOM FEED
CABLE ACCESS: FRONT ONLY
VOLTAGE: 600V AC 3 PHASE 4 WIRE WYE
HERTZ: 60
SCCR: 65KA
BUS RATING: 750 AMP (CU OR AL)
CB TYPE: PLUG ON/BOLT ON
CB RATING: 65KA

TYPICAL SWITCHBOARD ELECTRICAL CHARACTERISTICS

ENCLOSURE: NEMA 3R FREESTANDING
MAIN RATING: 1250 AMP
MAIN TYPE: M.C.B.
CABLE ENTRANCE: BOTTOM FEED
CABLE ACCESS: FRONT ONLY
VOLTAGE: 600V AC 3 PHASE 4 WIRE WYE
HERTZ: 60
SCCR: 65KA
BUS RATING: 1250 AMP (CU OR AL)
CB TYPE: PLUG ON/BOLT ON
CB RATING: 65KA



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 - ALL WORK SHALL BE INSTALLED IN A NEAT AND WORK LIKE MANNER AND IN ACCORDANCE WITH THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE (NEC), COMPLIED WITH STATE CODE AND ALL OTHER LAWS AND STANDARDS.
 - UTILITY INTERCONNECTION IS ASSUMED. ACTUAL EQUIPMENT AND CONFIGURATION SHALL BE VERIFIED BY CENTRAL HUDSON.
 - RECLOSER CONTROLLERS SHALL BE SEL-651R OR ENGINEER APPROVED EQUAL.
 - RECLOSER CONTROLLERS SHALL BE EQUIPPED WITH FRONT RS-232 PORT AND CAPABLE OF COMMUNICATION IN DNP PROTOCOL.
 - 79 FUNCTION IS ONLY ENABLED ON VOLTAGE AND FREQUENCY DISTURBANCES. A 5 MINUTE DELAY FOR THE 79 FUNCTION IS ENABLED ON VOLTAGE AND FREQUENCY DISTURBANCES ONLY. A 5 MINUTE DELAY WILL BE SET FOR RECLOSING UPON GOOD QUALITY VOLTAGE. RECLOSER WILL LOCKOUT ON OVERCURRENT OPERATION.
 - SEL-651R CONTROLLER SHALL BE EQUIPPED WITH AN EIGHT (8) HOUR BATTERY BACKUP.
 - TAVRIDA RECLOSER SHALL BE EQUIPPED WITH THE SAFE TRIP FUNCTION. THIS FUNCTION WILL BE USED TO TRIP THE RECLOSER ON LOSS OF DC. THE OUTPUT CONTACT (OUT201) IS WIRED TO AN AUXILIARY RELAY MOUNTED UP AT THE RECLOSER. UPON LOSS OF ALL POWER TO THE RELAY THE AUXILIARY RELAY WILL DROP OUT AND THE RECLOSER WILL TRIP.
 - MAIN BONDING JUMPER AND GROUNDING ELECTRODE CONNECTION SHALL BE MADE WITHIN THE SWITCHGEAR. THIS SHALL BE THE ONLY BOND POINT FOR THE GROUNDING CONDUCTOR. CONTRACTOR SHALL REMOVE XO BOND LINK IN TRANSFORMER PRIOR TO ENERGIZING.
 - RS-232 COMMUNICATION CABLES SHALL NOT EXCEED 50 FEET IN TOTAL LENGTH. INSULATION LEVEL SHALL BE 600V.
 - RS-485 COMMUNICATION CABLES SHALL NOT EXCEED 4000 FEET IN TOTAL LENGTH.
 - CAT5 COMMUNICATION CABLES SHALL NOT EXCEED 300FT IN TOTAL LENGTH.
 - 120VAC POWER CIRCUITS WITHIN DAS/CABINET SHALL BE INSTALLED IN CONDUIT.
 - COMPONENT AND WIRING WITHIN DAS/CABINET SHALL BE FACTORY INSTALLED.
 - ALL SINGLE PHASE DISCONNECT SHALL BE LEFT CLOSED UNTIL THE RECLOSER AND GANG OPERATED DISCONNECT SWITCH HAS BEEN OPENED AND LOCKED OUT.
 - RECLOSER AND GANG OPERATED DISCONNECT SWITCH SHALL BE OPENED AND LOCKED OUT PRIOR TO ANY WORK INVOLVING EXPOSED ELECTRICAL CIRCUIT PARTS.
 - (3) SMA HIGHPOWER PEAKS 150W AND ARE USED.
 - THE SIZE OF THE PROJECT IS 6633 90MWD / 4950WAC AND 4950VA.

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CABLE SCHEDULE							
CIRCUIT ID	VOLTAGE RATING	CONDUCTOR QUANTITY, SIZE AND MATERIAL	WIRE TYPE	QUANTITY OF CONDUITS	SIZE OF CONDUITS	CONDUIT TYPE	NOTES
A	15kV	(3) #20 AWG AL, (1) #20 AWG AL N	COVERED ACSB	-	-	-	
A1	15kV	TAVRIDA UMBILICAL CABLE	-	-	-	-	
B	15kV	(3) #40 AWG AL, JACKETED CONCENTRIC NEUTRAL	MV-105	1	5"	PVC	EPR-133%
C	600V	(3) #1 AWG AL, (1) #1 AWG AL N, (1) #6 AWG G	XHHW-2	1	2"	PVC	
D	600V	(3) 250 KCMIL AL, (1) 250 KCMIL AL N, (1) #2 AWG AL G	XHHW-2	1	3"	PVC	
E	600V	(3) #10 AWG, (1) #10 AWG N	XHHW-2	1	1.5"	PVC	
F	600V	(6) #10 AWG	XHHW-2	1	1"	PVC	
G	-	(1) CAT5	-	1	1"	PVC	
H	600V	(2) #10 AWG, (1) #10 AWG N, (1) #12 AWG G	XHHW-2	1	1"	PVC	
I	600V	(3) #10 AWG, (1) #10 AWG G	-	-	-	-	
J	600V	(2) #10 AWG, (1) #10 AWG G	RHW-2	-	-	-	

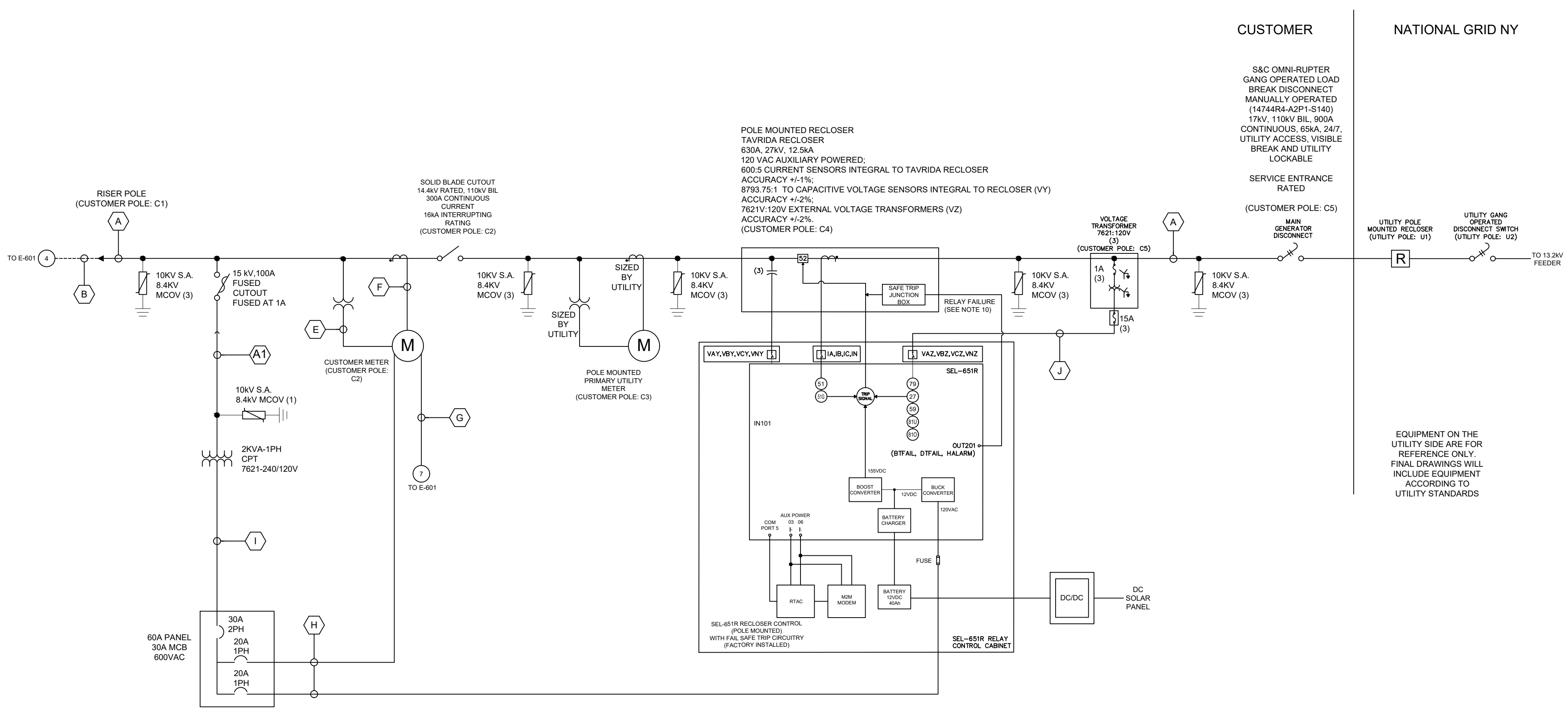
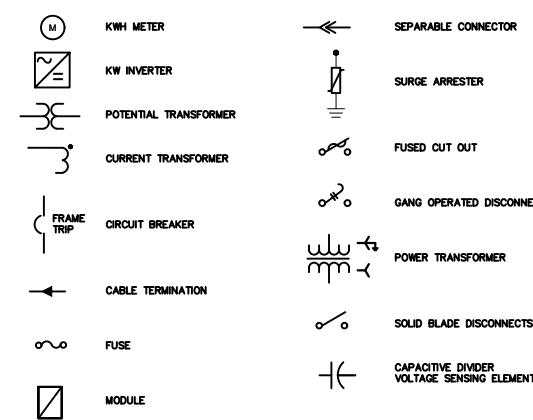
ALL CONDUCTORES SHALL BE COPPER UNLESS OTHERWISE NOTED

PROTECTIVE RELAY SETTINGS					
INVERTER PROTECTIVE FUNCTIONS	TRIP OUTPUT	VOLTAGE SETTING (SEC) PRI (PU)	FREQUENCY SETTING (HZ)	TOTAL CLEARING TIME CYC. (SEC.)	CURRENT SETTING SEC. (PRI)
27P1 - FAST UNDERVOLTAGE	X	(60) 3810.51 (50%)	-	66 (1.1)	-
27P2 - UNDERVOLTAGE	X	(106) 6706.5 (86%)	-	120 (2)	-
59P1 - OVERVOLTAGE	X	(132) 8383.13 (110%)	-	120 (2)	-
59P2 - FAST OVERVOLTAGE	X	(144) 9145.23 (120%)	-	9.6 (0.16)	-
81UP1 - UNDERFREQUENCY	X	-	56.5	9.6 (0.16)	-
81UP2 - UNDERFREQUENCY	X	-	58.5	18000 (300)	-
81OP1 - OVERFREQUENCY	X	-	61.2	18000 (300)	-
81OP2 - OVERFREQUENCY	X	-	62	9.6 (0.16)	-
51 - OVERCURRENT	X	-	-	CURVE: U4 T.M.2	1.09 (109)
51 G - GROUND OVERCURRENT	X	-	-	CURVE: U4 T.M.2.4	0.22 (22)
79 - RECLOSER	X	95% ≤ V ≤ 105%	59.5Hz ≤ f ≤ 60.5Hz	5 MINUTES	SEE NOTE 20
ALARM	X	-	-	<120	-

1. VOLTAGE SETTING VALUES ARE L-N
2. TOTAL CLEARING TIME = TIME DELAY + CLEARING TIME OF 3 CYCLES

INVERTER PROTECTIVE SETTINGS			
INVERTER PROTECTIVE FUNCTIONS	VOLTAGE SETTING PU	FREQUENCY SETTING HZ	OPERATING TIME CYC. (SEC.)
27 - FAST UNDERVOLTAGE	300 (50%)	-	66 (1.1)
27 - UNDERVOLTAGE	528 (86%)	-	120 (2)
59 - FAST OVERVOLTAGE	660 (110%)	-	120 (2)
59 - OVERVOLTAGE	720 (120%)	-	9.6 (0.16)
81 - UNDERFREQUENCY	-	56.5	9.6 (0.16)
81 - UNDERFREQUENCY	-	58.5	18000 (300)
81 - OVERFREQUENCY	-	61.2	18000 (300)
81 - OVERFREQUENCY	-	62	9.6 (0.16)

THREE LINE DIAGRAM LEGEND

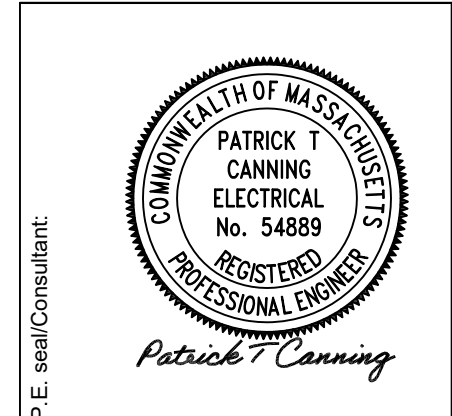


CUSTOMER
S&C OMNI-RUPTER GANG OPERATED LOAD BREAK DISCONNECT MANUALLY OPERATED (1474R4-A2P1-S140) 17kV, 110kV BIL, 900A CONTINUOUS, 65kA, 247, UTILITY ACCESS, VISIBLE BREAK AND UTILITY LOCKABLE
SERVICE ENTRANCE RATED
(CUSTOMER POLE: C5)

NATIONAL GRID NY
UTILITY POLE MOUNTED RECLOSER (UTILITY POLE: U1)
UTILITY GANG OPERATED DISCONNECT SWITCH (UTILITY POLE: U2)
TO 15.2KV FEEDER

POLE MOUNTED RECLOSER TAVRIDA RECLOSER
630A, 27kV, 12.5kA
120 VAC AUXILIARY POWER:
600.5 CURRENT SENSORS INTEGRAL TO TAVRIDA RECLOSER
ACCURACY ±1.1%
7621V-120V EXTERNAL VOLTAGE SENSORS INTEGRAL TO RECLOSER (VY)
ACCURACY ±2%
7621V-120V EXTERNAL VOLTAGE TRANSFORMERS (VZ)
ACCURACY ±2%
(CUSTOMER POLE: C4)

Date Issued	11/02/2020
Issued For	Interconnection Application
Rev	A



Project: 39256 Wilson Hill
469 Wilson Hill Rd
Hoosick Falls, NY 13090

Drawing Title: AC Electrical Diagram (XFR.01)
Drawing by: N.Gonzalez
Scale: N.T.S.
Approved by:

Dwg No: E-602
Size: D
Sheet Rev: A

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 - RS-485 COMMUNICATION CABLES SHALL NOT EXCEED 4000 FEET IN TOTAL LENGTH.
 - CATS COMMUNICATION CABLES SHALL NOT EXCEED 300FT IN TOTAL LENGTH.
 - 120VAC POWER CIRCUITS WITHIN DISCONNECT CABINET SHALL BE INSTALLED IN CONDUIT.
 - COMPONENT AND WIRING WITHIN DAS CABINET SHALL BE FACTORY INSTALLED.
 - ALL SINGLE PHASE DISCONNECT SHALL BE LEFT CLOSED UNTIL THE RECLOSER AND GANG OPERATED DISCONNECT SWITCH HAS BEEN OPENED AND LOCKED OUT.
 - RECLOSER AND GANG OPERATED DISCONNECT SWITCH SHALL BE OPENED AND LOCKED OUT PRIOR TO ANY WORK INVOLVING EXPOSED ELECTRICAL CIRCUIT PARTS.
 - (S) 500A HIGH-POWER PEAKS 1500W AND ARE USED.
 - THE SIZE OF THE PROJECT IS 9603.90WDC/14950WAC AND 4950VA.

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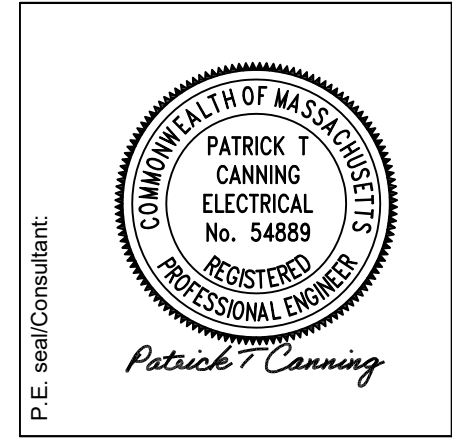
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Project: 39256 Wilson Hill
 469 Wilson Hill Rd
 Hoosick Falls, NY 13090

Drawing Title: AC Electrical Diagram (XFR.01)
 Drawn by: NGonzalez Scale: N.T.S. Approved by:
 Dwg No: E-602 Size: D Sheet Rev: A

PROTECTIVE RELAY SETTINGS

INVERTER PROTECTIVE FUNCTIONS	TRIP OUTPUT	VOLTAGE SETTING (SEC) PRI (PU)	FREQUENCY SETTING (HZ)	TOTAL CLEARING TIME CYC. (SEC.)	CURRENT SETTING SEC (PRI)
27P1 - FAST UNDERVOLTAGE	X	(60) 3810.51 (50%)	-	66 (1.1)	-
27P2 - UNDERVOLTAGE	X	(106) 6706.5 (88%)	-	120 (2)	-
59P1 - OVERVOLTAGE	X	(132) 8383.13 (110%)	-	120 (2)	-
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81UP1 - UNDERFREQUENCY	X	-	56.5	9.6 (0.16)	-
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81OP1 - OVERFREQUENCY	X	-	61.2	18000 (300)	-
81OP2 - OVERFREQUENCY	X	-	62	9.6 (0.16)	-
51 - OVERCURRENT	X	-	-	CURVE: U4 T.M:2	1.09 (109)
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ALARM	X	-	-	<120	-

- VOLTAGE SETTING VALUES ARE L-N.
- TOTAL CLEARING TIME = TIME DELAY + CLEARING TIME OF 3 CYCLES

INVERTER PROTECTIVE SETTINGS

INVERTER PROTECTIVE FUNCTIONS	VOLTAGE SETTING PU	FREQUENCY SETTING HZ	OPERATING TIME CYC. (SEC.)
27 - FAST UNDERVOLTAGE	300 (50%)	-	66 (1.1)
27 - UNDERVOLTAGE	528 (88%)	-	120 (2)
59 - FAST OVERVOLTAGE	660 (110%)	-	120 (2)
59 - OVERVOLTAGE	720 (120%)	-	9.6 (0.16)
81 - UNDERFREQUENCY	-	56.5	9.6 (0.16)
81 - UNDERFREQUENCY	-	58.5	18000 (300)
81 - OVERFREQUENCY	-	61.2	18000 (300)
81 - OVERFREQUENCY	-	62	9.6 (0.16)

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