THREE PHASE FEEDER SCHEDULE

COPPER CONDUCTORS

CIRCUIT SYMBOL	CONDUCTORS (3 PH, 3W) WITH GROUND	CONDUIT SIZE	CONDUCTORS (3 PH, 4W) WITH GROUND	CONDUIT SIZE	OVERCURRENT RATING
1	3#12 & 1#12G	3/4"	4#12 & 1#12G	3/4"	15A
2	3#12 & 1#12G	3/4"	4#12 & 1#12G	3/4"	20A
2.5	3#10 & 1#10G	3/4"	4#10 & 1#10G	3/4"	25A
3	3#10 & 1#10G	3/4"	4#10 & 1#10G	3/4"	30A
3.5	3#8 & 1#10G	3/4"	4#8 & 1#10G	3/4"	35A
4	3#8 & 1#10G	3/4"	4#8 & 1#10G	1"	40A
4.5	3#8 & 1#10G	3/4"	4#8 & 1#10G	1"	45A
5	3#8 & 1#10G	1"	4#8 & 1#10G	1"	50A
6	3#6 & 1#10G	1"	4#6 & 1#10G	1"	60A
7	3#4 & 1#8G	1 1/4"	4#4 & 1#8G	1 1/4"	70A
8	3#4 & 1#8G	1 1/4"	4#4 & 1#8G	1 1/4"	80A
9	3#3 & 1#8G	1 1/4"	4#3 & 1#8G	1 1/4"	90A
10	3#3 & 1#8G	1 1/4"	4#3 & 1#8G	1 1/4"	100A
11	3#2 & 1#6G	1 1/4"	4#2 & 1#6G	1 1/2"	110A
12	3#1 & 1#6G	1 1/2"	4#1 & 1#6G	2"	125A
15	3#1/0 & 1#6G	2"	4#1/0 & 1#6G	2"	150A
17	3#2/0 & 1#6G	2"	4#2/0 & 1#6G	2"	175A
20	3#3/0 & 1#6G	2"	4#3/0 & 1#6G	2 1/2"	200A
22	3#4/0 & 1#4G	2 1/2"	4#4/0 & 1#4G	2 1/2"	225A
25	3#250KCMIL & 1#4G	3"	4#250KCMIL & 1#4G	3"	250A
30	3#350KCMIL & 1#4G	3"	4#350KCMIL & 1#4G	4"	300A
35	3#500KCMIL & 1#3G	4"	4#500KCMIL & 1#3G	4"	350A
40	3#600KCMIL & 1#3G	4"	4#600KCMIL & 1#3G	4"	400A
45	(2)3#4/0 & 1#2G	(2) 2 1/2"	2 SETS OF 4#4/0 & 1#2G	(2) 2 1/2"	450A
50	(2)3#250KCMIL & 1#2G	(2) 3"	2 SETS OF 4#250KCMIL & 1#2G	(2) 3"	500A
60	(2)3#350KCMIL & 1#2G	(2) 3"	2 SETS OF 4#350KCMIL & 1#2G	(2) 4"	600A
70	(2)3#500KCMIL & 1#1/0G	(2) 4"	2 SETS OF 4#500KCMIL & 1#1/0G	(2) 4"	700A
80	(2)3#600KCMIL & 1#1/0G	(2) 4"	2 SETS OF 4#600KCMIL & 1#1/0G	(2) 4"	800A
90	(3)3#350KCMIL & 1#2/0G	(3) 3"	3 SETS OF 4#350KCMIL & 1#2/0G	(3) 4"	900A
100	(3)3#500KCMIL & 1#2/0G	(3) 4"	3 SETS OF 4#500KCMIL & 1#2/0G	(3) 4"	1000A
120	(4)3#350KCMIL & 1#3/0G	(4) 3"	4 SETS OF 4#350KCMIL & 1#3/0G	(4) 4"	1200A
160	(4)3#600KCMIL & 1#4/0G	(4) 3"	4 SETS OF 4#600KCMIL & 1#4/0G	(4) 4"	1600A
200	5 SETS OF: 3#600KCMIL & 1#250KCMIL(G)	(5) 3"	5 SETS OF: 4#600KCMIL & 1#250KCMIL(G)	(5) 4"	2000A
250	6 SETS OF: 3#500KCMIL & 1#350KCMIL(G)	(6) 3"	6 SETS OF: 4#600KCMIL & 1#350KCMIL(G)	(6) 4"	2500A
300	8 SETS OF: 3#500KCMIL & 1#500KCMIL(G)	(8) 3"	8 SETS OF: 4#500KCMIL & 1#500KCMIL(G)	(8) 4"	3000A

NOTES:

1. CONDUIT SIZES ARE BASED ON THE NEC ANNEX C TABLES FOR EMT/SCH.40 WITH THHN/THWN CONDUCTORS. CONDUCTOR SIZES USED IN CONDUIT CALCULATION ARE BASED ON THE SIZE OF THE HOT CONDUCTORS OF CIRCUIT. EXAMPLE: 40A 3PH, 4W CONDUIT SIZE IS BASED ON 4#8 + 1#8G + 1#8 'SPACE'. FOR ACTUAL WIRE INSTALL USE QUANTITY AND SIZES WITHIN SCHEDULE.
2. UNLESS OTHERWISE INDICATED, CONDUCTOR SIZING SHALL MATCH THE SIZE INDICATED ABOVE FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CIRCUIT WHERE INDICATED.
3. PROVIDE MINIMUM SIZE CONDUIT INDICATED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
4. PROVIDE A 4-WIRE CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL.
5. PROVIDE TYPE OF RACEWAY OR CABLE AS INDICATED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
6. REFER TO PANELBOARD SCHEDULES AND ONE-LINE RISER DIAGRAM DRAWINGS FOR CONDUCTOR AND CONDUIT SIZE REQUIREMENTS.
7. ALL CONDUCTOR SIZES ARE BASED ON 75°C (167°F), ALL EQUIPMENT CONNECTED TO WIRES SHALL BE RATED OR 75°C (167°F)

DRY TYPE TRANSFORMER SCHEDULE

SIZE	KVA	PRIMARY AMPS	SECONDARY AMPS	480 VOLT OVERCURRENT	208 VOLT (NOTE4) OVERCURRENT	480 VOLT FEEDER**	208/120 VOLT FEEDER**	GEC (NOTE 5)	SSBJ (NOTE 6)
T1	9	11	25	20A, 3P	30A, 3P	3#12 & 1#12G - 3/4"C	4#10 - 3/4"C	1#8 - 3/4"C	1#8
T2	15	18	42	30A, 3P	50A, 3P	3#10 & 1#10G - 3/4"C	4#8 - 1"C	1#8 - 3/4"C	1#8
T3	30	36	83	60A, 3P	100A, 3P	3#4 & 1#10G - 1"C	4#1 - 1 1/2"C	1#6 - 3/4"C	1#6
T4	45	54	125	90A, 3P	150A, 3P	3#3 & 1#8G - 1 1/4"C	4#1/0 - 1 1/2"C	1#6 - 3/4"C	1#6
T5	75	90	208	150A, 3P	250A, 3P	3#1/0 & 1#6G - 1 1/2"C	4#250 KCMIL - 2 1/2"C	1#2 - 3/4"C	1#2
T6	112.5	135	313	200A, 3P	400A, 3P	3#3/0 & 1#6G - 2"C	4#600 KCMIL - 4"C	1#1/0 - 3/4"C	1#1/0
T7	150	181	417	300A, 3P	500A, 3P	3#350 KCMIL & 1#4G - 3"C	8#250 KCMIL - (2) 2 1/2"C	1#1/0 - 3/4"C	1#1/0
T8	225	270	625	400A, 3P	800A, 3P	3#400 KCMIL & 1#3G - 3 1/2"C	8#600 KCMIL - (2) 4"C	1#3/0 - 3/4"C	1#3/0
T9	300	361	834	600A, 3P	1000A, 3P	6#350 KCMIL & 2#1G - (2) 3"C	12#400 KCMIL - (3) 3"C	1#3/0 - 3/4"C	1#3/0
T10	500	600	1400	1000A, 3P	1800A, 3P	9#400 KCMIL & 3#2/0G - (3) 3"C	16#600 KCMIL - (4) 4"C	1#300 KCMIL- 1"C	1#300KCMIL

TRANSFORMER NOTES:

1. BOND NEUTRAL TRANSFORMER SECONDARY TO THE TRANSFORMER GROUND BAR AND CASE WITH SYSTEM BONDING JUMPER.
2. USE NEAREST AVAILABLE EFFECTIVELY GROUNDED WATER PIPE, STRUCTURAL STEEL AND/OR DRIVEN GROUND ROD IN ACCORDANCE WITH N.E.C. 250-81 AND 250-83 FOR THE SEPARATELY DERIVED SYSTEM GROUNDING ELECTRODE.
3. ALL CONDUCTOR SIZES ARE FOR COPPER CONDUCTORS. N.E.C. TABLE 310-16.
4. SECONDARY OVERCURRENT PROTECTION SHALL BE LOCATED WITH IN (10) FEET OF THE TRANSFORMER SECONDARY TERMINALS EITHER IN A PANELBOARD (MAIN BREAKER), AN INDIVIDUALLY MOUNTED CIRCUIT BREAKER, OR A FUSIBLE DISCONNECT SWITCH.
5. GROUNDING ELECTRODE CONDUCTOR TO BE RUN FROM GROUND BAR IN TRANSFORMER TO THE GROUNDING ELECTRODE FOR THE SEPARATELY DERIVED SYSTEM.
6. SYSTEM BONDING JUMPER/SUPPLY SIDE BONDING JUMPER TO BE INSTALLED BETWEEN THE TRANSFORMER GROUND BAR AND CASE AND BETWEEN THE GROUND BAR IN THE FIRST SUPPLY SIDE DISCONNECTING MEANS (PANELBOARD, ENCLOSED CIRCUIT BREAKER OR FUSIBLE DISCONNECT SWITCH) AND TRANSFORMER GROUND BAR. INSTALL MULTIPLE SUPPLY SIDE BONDING JUMPERS OF THE SIZE LISTED, (1) IN EACH FEEDER RACEWAY.
7. 600 KCMIL CONDUCTORS SHALL BE PROVIDED WITH MAC ADAPTERS AS REQUIRED TO COORDINATE WITH BREAKER LUG SIZES.

** **UNLESS NOTED OTHERWISE IN RISER DIAGRAM**

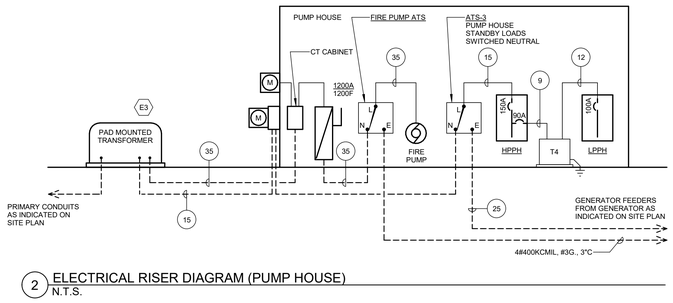
LEGEND OF FEEDER SIZES

SINGLE CONDUCTOR MI CABLE

FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE)	CONDUCTORS (3 PHASE, 4 WIRE)	NOMINAL AMPERE RATING
M1	3#10		40
M2		3#10, 1#10N	
M3	3#8		60
M4		3#8, 1#8N	
M5	3#8		70
M6		3#8, 1#8N	
M7	3#4		100
M8		3#4, 1#4N	
M9	3#4		125
M10		3#4, 1#4N	
M11	3#2		150
M12		3#2, 1#2N	
M13	3#1		175
M14		3#1, 1#1N	
M15	3#1/0		200
M16		3#1/0, 1#1/0N	
M17	3#1/0		225
M18		3#1/0, 1#1/0N	
M19	3#2/0		250
M20		3#2/0, 1#2/0N	
M21	3#3/0		300
M22		3#3/0, 1#3/0N	
M23	3#4/0		350
M24		3#4/0, 1#4/0N	
M25	3#250 KCMIL		400
M26		3#250 KCMIL, 1#250KCMIL (N)	
M27	3#350 KCMIL		500
M28		3#350 KCMIL, 1#350KCMIL (N)	

NOTES:

1. UNLESS OTHERWISE INDICATED, CONDUCTOR SIZING SHALL MATCH THE SIZE INDICATED ABOVE FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CONDUCTORS WHERE INDICATED, OR AS REQUIRED BY CODE.
2. SINGLE CONDUCTOR CABLES SHOULD BE RUN IN GROUPS HAVING ONE CABLE FROM EACH PHASE. WITH CABLES FASTENED TIGHTLY TOGETHER AND WITH CABLE EFFECTIVELY GROUNDED BY CONNECTING THE GLAND CONNECTOR AT EACH END OF THE CABLE RUN TO THE METAL ENCLOSURE.
3. CONDUCTOR SIZES ARE BASED ON 75°C. ALL EQUIPMENT AND CONDUCTOR TERMINATIONS CONNECTED TO WIRES SHALL MATCH THESE RATINGS.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL ELECTRICAL CONDUCTOR REQUIREMENTS.



2 ELECTRICAL RISER DIAGRAM (PUMP HOUSE)
N.T.S.

ELECTRICAL RISER DIAGRAM KEY NOTES

E1 PROVIDE THE FOLLOWING GENERATOR AUXILIARY CONNECTIONS, ALL UNDERGROUND IN TRENCH:
- 20A-1P CIRCUIT FOR BATTERY CHARGER, 2#12+1#12G, 3/4"C. TO BREAKER IN PANEL "PP1A"
- 30A-2P CIRCUIT FOR BLOCK HEATER, 2#10+1#10G, 3/4"C. TO BREAKER IN PANEL "PP1A"
- 1"C. WITH WIRING PER MFR. REQUIREMENTS TO ATS-1 FOR START CIRCUIT, THIS WIRING SHALL BE SINGLE-CONDUCTOR 2-HOUR RATED M.I. CABLE, MINIMUM #14AWG SIZE.
- 1"C. WITH WIRING PER MFR. REQUIREMENTS TO ATS-2 FOR START CIRCUIT
- 1"C. WITH WIRING PER MFR. REQUIREMENTS TO FIRE PUMP ATS FOR START CIRCUIT
- 1"C. WITH WIRING PER MFR. REQUIREMENTS TO GENERATOR ANNUNCIATOR PANEL (REFER TO FLOOR PLANS FOR LOCATION)
- 1"C. WITH WIRING PER MFR. REQUIREMENTS TO ATS-3 FOR START CIRCUIT.
- 1"C WITH 2#14 FOR ENGINE START MONITORING ALARM SIGNAL TO FIRE ALARM MONITOR MODULE IN BUILDING.

E2 GENERATOR SHALL BE GROUNDED AS A SEPARATELY DERIVED SYSTEM PER NEC ARTICLE 250.30 REQUIREMENTS. PROVIDE GROUNDING ELECTRODES AT GENERATOR PER NEC.

E3 TRANSFORMER SHALL HAVE (2) SETS OF SECONDARY LUGS FOR MULTIPLE CONNECTIONS.

E4 VOCATIONAL AREA PANELBOARD WITH REMOTE SHUTOFF SWITCH, AMPERAGE AS INDICATED - ASCO 911 SERIES REMOTE CONTROLLED SWITCH. REFER TO VOCATIONAL SHOP W/REMOTE SWITCH ELECTRICAL SHUT-OFF DETAIL FOR ADDITIONAL INFORMATION.

E5 KITCHEN AREA PANELBOARD WITH SHUNT TRIP MAIN BREAKER FOR ELECTRICAL SHUTOFF. REFER TO VOCATIONAL SHOP ELECTRICAL SHUTOFF DETAIL FOR ADDITIONAL INFORMATION

E6 SCIENCE CLASSROOM PANELBOARD WITH SHUNT TRIP MAIN BREAKER TIED INTO GAS & ELECTRIC SHUTOFF SYSTEM. REFER TO SCIENCE CLASSROOM EPO DETAIL 9/E-516 FOR ADDITIONAL INFORMATION.

E7 SPECIALTY ELEVATOR DISCONNECT SWITCH WITH INTEGRAL SHUNT-TRIP AND VOLTAGE MONITORING CAPABILITY, SEE DETAIL 6/E-510 FOR ADDITIONAL INFORMATION.

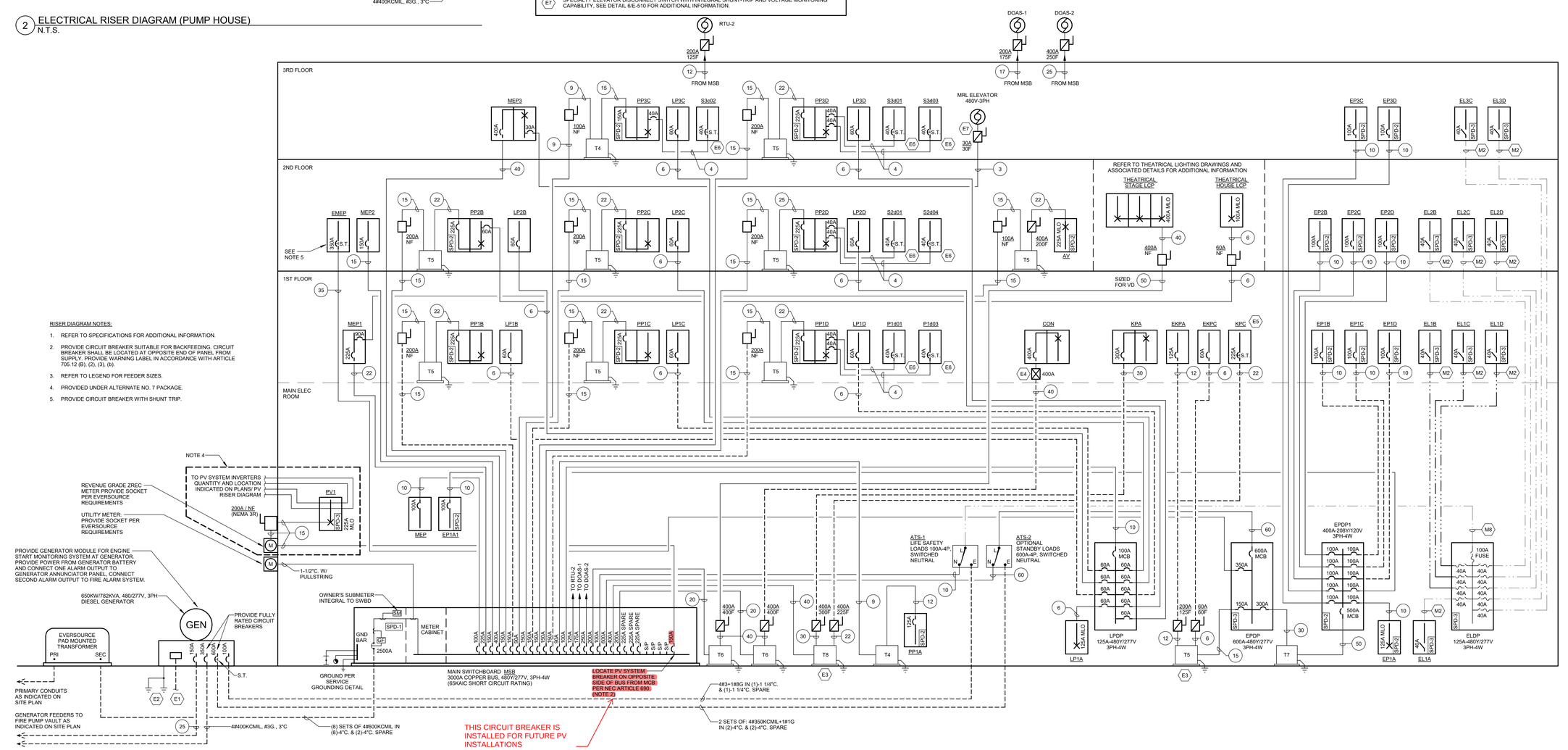
SURGE PROTECTIVE DEVICE (SPD) SCHEDULE

DESIGNATION	VOLTAGE	PHASE	WIRES	SURGE CAPACITY (PER PHASE)	ENCLOSURE	MOUNTING	MODES OF PROTECTION
SPD-1	480Y/277V	3	4	160,000	N / A	INTEGRAL	L-N, L-G, L-L
SPD-2	208Y/120V	3	4	80,000	N / A	INTEGRAL	L-N, L-G, L-L
SPD-3	480Y/277V	3	4	80,000	N / A	3-POLE	L-N, L-G, L-L

NOTE:
1. SPDs SHALL BEAR THE UL MARK AND SHALL BE LISTED TO THE MOST RECENT STANDARD EDITIONS OF UL 1449.
2. SPD AND PERFORMANCE PARAMETERS SHALL BE POSTED AT WWW.UL.COM UNDER CATGORY CODE: VZCA
3. SPD SHALL BE UL LABELED WITH 20 KAI NOMINAL (In) FOR COMPLIANCE TO UL 96A LIGHTNING PROTECTION MASTER LABEL AND NFPA 780.
4. SPD SHALL BE UL LABELED AS TYPE I.
5. SERVICE ENTRANCE SPD SHALL HAVE EMI/RFI FILTERING -50 dB FROM 10kHz TO 100MHz.
6. SPDs SHALL BE EQUIPPED WITH 1 SET OF NO/NC DRY CONTACTS.

FEEDER LINE TYPES

- FEEDER CONCEALED IN WALLS AND ABOVE CEILINGS
- FEEDER INSTALLED UNDERSLAB
- MI FEEDER CONCEALED IN WALLS AND ABOVE CEILINGS
- MI FEEDER INSTALLED UNDERSLAB



1 ELECTRICAL RISER DIAGRAM
N.T.S.

RISER DIAGRAM NOTES:

1. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. PROVIDE CIRCUIT BREAKER SUITABLE FOR BACKFEEDING. CIRCUIT BREAKER SHALL BE LOCATED AT OPPOSITE END OF PANEL FROM SUPPLY. PROVIDE WARNING LABEL IN ACCORDANCE WITH ARTICLE 705.12 (B), (2), (3), (b).
3. REFER TO LEGEND FOR FEEDER SIZES.
4. PROVIDED UNDER ALTERNATE NO. 7 PACKAGE.
5. PROVIDE CIRCUIT BREAKER WITH SHUNT TRIP.

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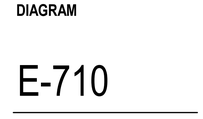

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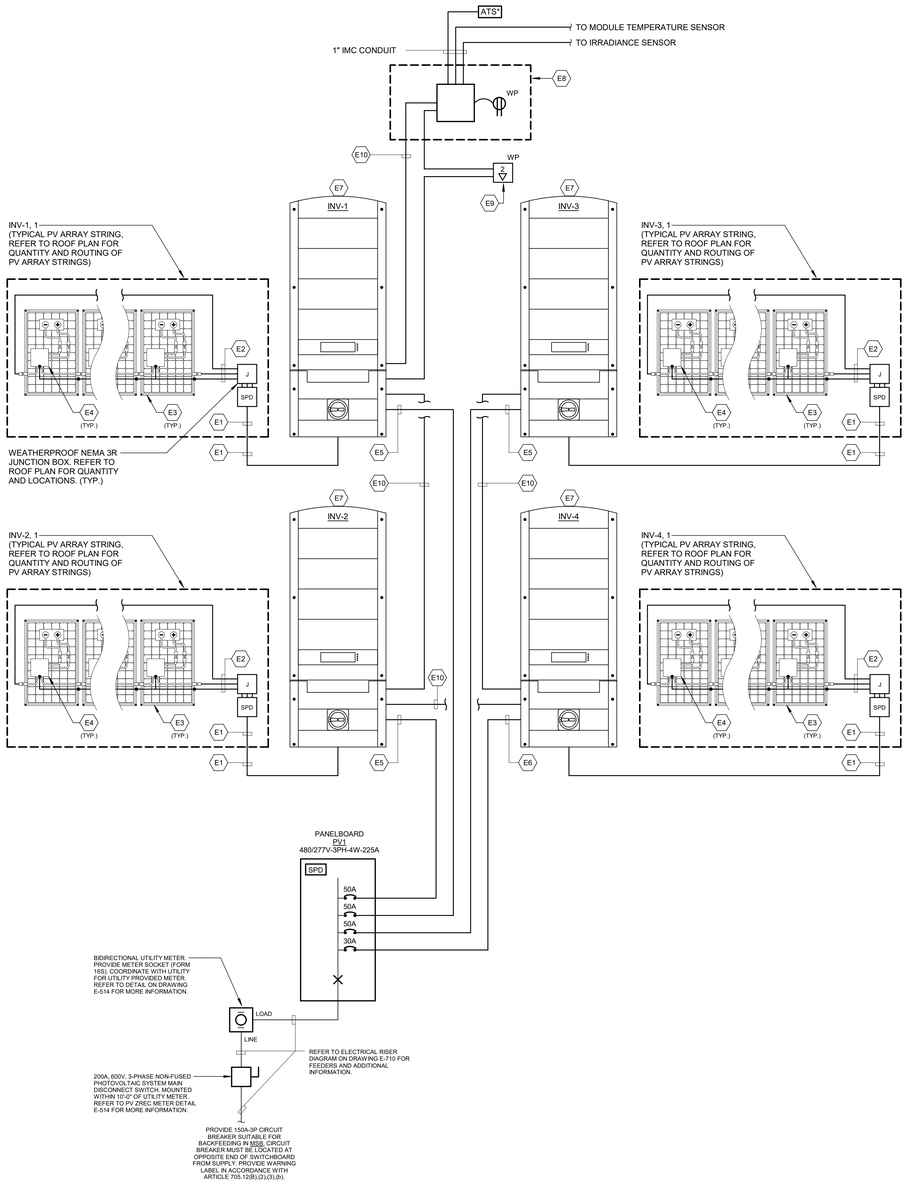
ELECTRICAL RISER DIAGRAM

E-710



1 NFHS - PV RISER DIAGRAM
N.T.S.

KEY NOTES - PV ARRAY RISER DIAGRAM

E1	PROVIDE 1000V RATED 2#10 DC WIRING & 1#10G, 1" IMC (INTERMEDIATE METAL CONDUIT) TO THE ROOF MOUNTED PV ARRAY. ROOF MOUNTED CONDUIT SHALL BE PROVIDED AT LEAST 3-1/2" ABOVE ROOF. THE CONTRACTOR MAY COMBINE MULTIPLE STRINGS IN A SINGLE 1" CONDUIT IF THE STRINGS ARE CONNECTED TO THE SAME INVERTER (AS INDICATED ON PLANS) AND ORIGINATE FROM THE SAME LOCATION - NOT TO EXCEED 3 DC CIRCUITS (UP TO 6 CURRENT CARRYING CONDUCTORS).
E2	1000V RATED 2#10 DC WIRING AND #6 GROUND WIRE TO SOLAR EDGE POWER OPTIMIZER. CONDUCTORS SHALL BE PROTECTED FROM PHYSICAL AND UV DAMAGE. PROVIDE CONDUIT PROTECTION WITH APPROVED BUSHINGS. PROVIDE WIRING BETWEEN ROWS IN CONDUIT. WIRING AT THE PV ARRAY SHALL BE SECURED WITH STAINLESS STEEL CLIPS AND POLYESTER COATED STAINLESS STEEL WIRETIES. GROUND ALL EQUIPMENT AS REQUIRED INCLUDING RACKING, MODULE, POWER OPTIMIZER, JUNCTION BOXES, ETC.
E3	LG NEON 2 72 CELL PV MODULE MOUNTED TO PV RACKING SYSTEM ON ROOF. REFER TO PV MODULE SCHEDULE.
E4	RACK MOUNTED SOLAR EDGE POWER OPTIMIZER P505. (1) POWER OPTIMIZER SERVES EACH PV MODULE. PROVIDE UL LISTED MOUNTING BRACKET AS REQUIRED BY SOLAR EDGE AND RACKING MANUFACTURER. PROVIDE CONNECTOR AND EXTENSION ADAPTORS AS REQUIRED. MOUNT POWER OPTIMIZER PER MANUFACTURER REQUIREMENTS. CAP ALL UNUSED CONNECTORS AT EACH POWER OPTIMIZER.
E5	4#8 & 1#10G, 1" IMC TO 50A/3P CIRCUIT BREAKER IN PANEL PV1, RATED FOR BACKFEED. USE THWN-2 WIRE.
E6	4#10 & 1#10G, 3/4" IMC TO 30A/3P CIRCUIT BREAKER IN PANEL PV1, RATED FOR BACKFEED. USE THWN-2 WIRE.
E7	WALL MOUNTED SOLAR EDGE PV INVERTER. REFER TO INVERTER SCHEDULE. PROVIDE SOLAREDGE RAPID SHUTDOWN KIT AND RS485 SPD KIT (#SE-RS485-SPD2-K1). PRODUCTION REPORTING: DAISY CHAIN INVERTERS TO FORM A MASTER/SLAVE CONFIGURATION AS REQUIRED BY SOLAR EDGE FOR COMPLETE SYSTEM REPORTING. PROVIDE A HARDWIRED MODEM KIT INCLUDING A SOLAREDGE DATA PLAN FOR EACH MASTER INVERTER (TYP). ENSURE PRODUCTION DATA REPORTING REMAINS OPERATIONAL FOR THE LIFE OF THE PV ARRAY. CONFIGURE PRODUCTION REPORTING WITH OWNERS IT REPRESENTATIVE.
E8	SOLAREDGE CONTROL AND COMMUNICATION GATEWAY IN NEMA 3R HOUSING. COMMUNICATION GATEWAY SHALL BE COMPATIBLE WITH THE SCHOOLS IT INFRASTRUCTURE TO REPORT TOTAL PV SYSTEM PERFORMANCE IN REAL TIME. REPORTING SYSTEM SHALL PROVIDE PV MODULE LEVEL DATA. DAISY CHAIN FROM INVERTERS VIA RS485 CONNECTION FOR COMPLETE SYSTEM REPORTING. PROVIDE WEATHERPROOF RECEPTACLE WITH 120V-20A CIRCUIT FOR CORD AND PLUG ADAPTER - REFER TO FLOOR PLANS FOR LOCATION AND CIRCUITING.
E9	DATA CONNECTION IN WEATHERPROOF ENCLOSURE ADJACENT TO INVERTER TO REPORT TO OWNERS IT INFRASTUCTURE. COORDINATE WITH OWNERS IT REPRESENTATIVE TO ENSURE DATA IS AVAILABBLE 24/7 TO THE OWNER FOR MONITORING AND DISPLAY FOR COMPLETE SYSTEM REPORTING. MASTER INVERTER SHALL BE CONFIGURED FOR REPORTING VIA HARDWIRED CONNECTION TO SMA MONITORING PORTAL.
E10	WEATHERPROOF RS485 COMMUNICATION WIRE TO MASTER INVERTER IN CONDUIT.

GENERAL NOTES - ELECTRICAL ALTERNATE NO. 7

NOTE:

THE PHOTOVOLTAIC SYSTEM AS SHOWN ON THIS DRAWING IS PART OF ALTERNATE NO. 7 PACKAGE ONLY.

INVERTER SCHEDULE

MANUFACTURER & MODEL	INVERTER NUMBERS	OUTPUT CURRENT	OUTPUT POWER	MPPTV	OPTIMIZER	WARRANTY
SOLAR EDGE SE30KUS	INV-1 INV-2 INV-3	36.25A	30,000W	400V	SOLAR EDGE P505	12 YEARS
SOLAR EDGE SE20KUS	INV-4	24.00A	20,000W	400V	SOLAR EDGE P505	12 YEARS

1. INVERTERS MEET UL1741 STANDARD AND PROVIDES AUTOMATIC DISONNECT/ISOLATION FROM UTLIITY COMPANY WHEN UTILITY POWER IS LOST.
2. ALL INVERTERS EQUIPPED WITH RAPID SHUT-DOWN EQUIPMENT TO CONTROL ALL PV ARRAYS AS REQUIRED.
3. REFER TO PANEL SCHEDULES AND DIAGRAMS FOR INVERTER CONNECTIONS TO SOURCE PANELS. REFER TO PHOTOVOLTAIC PLANS FOR STRINGING AND MODULE QUANTITIES.
4. PROVIDE SURGE SUPPRESSION DEVICES ON ALL AC INVERTER CIRCUITS AND DC CONNECTED CIRCUITS AS INDICATED.
5. POWER OPTIMIZERS SHALL HAVE A 25 YEAR WARRANTY.

PV MODULE SCHEDULE

LOCATION	MANUFACTURER & MODEL	Pmax (STC)	Voc	Vmp	Imp	Isc
ROOF	LG NEON 2 LG405N2W-V5	405W	49.4V	41.0V	9.86A	10.47A

1. MODEL ATTRIBUTES:
   A. DIMENSIONS: 79.69"x40.32"x1.58"
   B. WEIGHT: 44.75 LBS
   C. FRONT SIDE EFFICIENCY: 19.5%
   NOTE: ELECTRICAL STATISTICS BASED ON STANDARD TEST CONDITIONS (STC)
2. PV MODULES SHALL HAVE A 25 YEAR WARRANTY

PV RACKING SCHEDULE

LOCATION	MANUFACTURER & MODEL	TILT	MANUFACTURER ACCESSORIES
ROOF	AEROCOMPACT S10 7-10	10 DEGREES	ALUMINUM CONSTRUCTION, STAINLESS STEEL HARDWARE, BALLAST TRAYS, SNOWLOAD SUPPORTS, WINDSCREENS, WIRE MANAGEMENT, GROUNDING CLAMPS/LUGS, OPTIMIZER CLAMPS, ROOF PROTECTION PADS, CONCRETE BALLAST BLOCKS AND ALL OTHER EQUIPMENT REQUIRED BY MANUFACTURER.

1. PROVIDE ALL EQUIPMEN TPER STRUCTURAL AND ARCHITECTURAL REQUIREMENTS.
2. COORDINATE FINAL EQUIPMENT CONFIGURATION WITH MANUFACTURER BASED ON SITE CONDITIONS.
3. PROVIDE STRUCTURAL ENGINEERING DESIGN, REVIEW AND SEAL DRAWINGS FOR ALL RACKING ATTACHMENTS, LOADING AND WIND UPLIFT.
4. PROVIDE CONCRETE BALLAST BLOCKS TO WITHSTAND WIND LOADS AND SNOW LOADS IN ACCORDANCE WITH ASCE - 7-16 TO MATCH THE RISK CATEGORY OF THE SCHOOL.

GENERAL SOLAR PV NOTES

1. VOLTAGE DROPS SHALL BE LIMITED TO 3% BETWEEN INVERTER(S) AND THE EXTERIOR AC DISCONNECT.
2. ALL WIRING SHALL BE COPPER.
3. THE CONTRACTOR SHALL PROVIDE PROOF OF CONFORMITY TO THE ROOF WARRANTY AS IT PERTAINS TO THE PV ARRAY IN ITS ENTIRETY.
4. ANY DEVIATION FROM THE BASIS OF DESIGN SHALL REQUIRE A REDESIGN OF THE SYSTEM BY THE CONTRACTOR AS STIPULATED IN SPECIFICATIONS.
5. THE CONTRACTOR SHALL OBTAIN STAMPED STRUCTURAL DRAWINGS AS IT PERTAINS TO THE PV ARRAY IN ITS ENTIRETY BY A LICENSED CONNECTICUT STRUCTURAL ENGINEER.

PV SOURCE CIRCUIT NOTE

THESE DRAWINGS ARE DIAGRAMMATIC TO SHOW MODULES CONNECTED TO POWER OPTIMIZERS CONNECTED IN SERIES TO INVERTERS. PROVIDE POSITIVE/NEGATIVE STRING CONDUCTORS. PROVIDE CONDUIT SLEEVES BETWEEN ROWS AND JUNCTION BOXES. ROOF MOUNTED DC WIRING SHALL ADHERE, IN INTENT, TO THE ROUTING SHOWN ON PLANS. FINAL ROOF MOUNTED CONDUIT ROUTING SHALL BE FULLY COORDINATED WITH ALL OTHER INSTALLERS, BUILDING OWNERS, ARCHITECTS AND ENGINEERS.

PV SYSTEM DESIGN CRITERIA

BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE: 2018 CT STATE FIRE SAFETY CODE CHAPTER 605.11.
DESIGN WIND SPEED PER ATC: 140 MPH (3 SECOND GUST)
WIND EXPOSURE: B
RISK CATEGORY: III
GROUND SNOW LOAD: 35 PSF

SUPPLEMENTARY PV SYMBOLS LIST

ROOF PLAN	SITE PLAN	
		NOTE: REFER TO ELECTRICAL SYMBOLS, LEGENDS, NOTES AND ABBREVIATIONS ON SHEET E-000 HS FOR ADDITIONAL SYMBOLS AND INFORMATION.
		PV MODULE MOUNTED TO RACKING SYSTEM AND CONNECTED TO INVERTER AS NOTED.
		PHOTOVOLTAIC SYSTEM DC CIRCUIT: SHOWN TO DEPICT STRING CONFIGURATION. LINES SHOWN UNDER PV MODULE, DESIGNATES THAT THE MODULE IS WIRED, IN SERIES, VIA POWER OPTIMIZER, TO THE DESIGNATED STRING AND INVERTER. PV MODULE SHALL BE CIRCUITED PER THE PV RISER DIAGRAM DETAIL ON THIS SHEET.
INV-#, #	INV-#, #	INVERTER INPUT CIRCUIT: SHOWN TO DEPICT STRING & INVERTER WIRING CONFIGURATION. SYMBOL INDICATES DESIGNATED STRING NUMBER AND INVERTER NUMBER. EACH INVERTER SHALL BE CONNECTED TO STRINGS AS INDICATED ON PLANS.
	ATS*	AMBIENT TEMPERATURE SENSOR.
	MTS	MODULE TEMPERATURE SENSOR
	IRS	IRRADIANCE SENSOR - MOUNT PLUMB WITH ADJACENT PV MODULE.
	INV-#	WALL MOUNTED THREE PHASE PV INVERTER
	SPD	1000 VOLT DC SURGE PROTECTOR. PROVIDE PHOENIX CONTACT (#VAL-MS-T1/T2 1000DC-PV/2+V FM) IN WEATHER PROOF ENCLOSURE BY PHOENIX CONTACT PER MANUFACTURER REQUIREMENTS.

PHOTOVOLTAIC SYSTEM LABELING CHART

EQUIPMENT	LABEL	LOCATION	LABEL
COMBINER BOX	**WARNING** ELECTRICAL SHOCK HAZARD DO NOT TOUCH TERMINALS TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT NEC 690.17(E) **WARNING** ELECTRICAL SHOCK HAZARD IF A GROUND FAULT IS INDICATED NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED NEC 690.5(C)	STRING/CENTRALIZED INVERTERS	**WARNING** ELECTRICAL SHOCK HAZARD IF A GROUND FAULT IS INDICATED NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED NEC 690.5(C)
DC BREAKER OR DC DISCONNECT	MAXIMUM VOLTAGE MAXIMUM CIRCUIT CURRENT MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED) NEC 690.53 **WARNING** ELECTRICAL SHOCK HAZARD DO NOT TOUCH TERMINALS TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT NEC 690.17(E) PHOTOVOLTAIC DC DISCONNECT NEC 690.15 & NEC 690.13(B) REFLECTIVE MATERIAL REQUIRED	AC BREAKER, AC DISCONNECT, AC BREAKER PANEL	PHOTOVOLTAIC AC DISCONNECT MAXIMUM AC OPERATING CURRENT: NOMINAL OPERATING AC VOLTAGE: NEC 690.54 & NEC 690.13(B) **WARNING** ELECTRICAL SHOCK HAZARD DO NOT TOUCH TERMINALS TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION NEC 690.17(E) **WARNING** TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL NEC 110.27(C) & OSHA 1910.14(f)(7) WARNING INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE. NEC 705.12(D)(3)(b) WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM NEC 705.12(D)(3) & NEC 690.64
RAPID SHUTDOWN INITIATING DEVICE IF APPLICABLE	PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN NEC 690.56(C) REFLECTIVE MATERIAL REQUIRED	PRODUCTION/NET METER	CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED NEC 690.15 & NEC 690.13(B) **WARNING** ELECTRICAL SHOCK HAZARD IF A GROUND FAULT IS INDICATED NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED NEC 690.5(C)
CONDUIT, EMT, ENCLOSURES, CABLING ASSEMBLIES, ABOVE AND BELOW ALL PENETRATIONS REFLECTIVE MATERIAL REQUIRED	WARNING: PHOTOVOLTAIC POWER SOURCE NEC 690.31(G)(3)(4) REFLECTIVE MATERIAL REQUIRED SPACING NOT TO EXCEED 10FT WARNING PHOTOVOLTAIC POWER SOURCE NEC 690.31(G)(1) & NEC 690.4(F) FOR USE ON SHINGLED ROOFS WHERE CIRCUITS MAY BE EMBEDDED REFLECTIVE MATERIAL REQUIRED	DIRECTORY PLACARD	6" CAUTION POWER TO THIS SERVICE IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN. 3/4" 1/2" 4" SAMPLE NEC 690.56(B) FOR USE ON BUILDING/STRUCTURE. CLEARLY VISIBLE TO PROVIDE THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT LOCATED AT THE SAME LOCATION.

NOTES:

1. ALL LABELS SHALL BE COMPLAINT WITH NEC 110.21(B) 2017 VERSION AND ANSI Z535.4 UNLESS OTHERWISE NOTED.
2. ALL LABELS SHALL BE PERMANENTLY AFFIXED AND BE OF ADEQUATE DURABILITY TO WITHSTAND AND SURVIVE THE ENVIRONMENT INVOLVED.

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New Fairfield High School & Pool Locker Rooms

54 Gillotti Rd,
New Fairfield, CT 06812

091-0044W &
091-0046CV

JCJARCHITECTURE
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Consulting Engineering Services, Inc.
811 Middle Street
Middletown CT 06457
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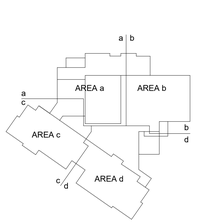
CES #2020128.01



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REVISIONS	

ELECTRICAL PV RISER AND DIAGRAMS

E-713

GENERAL NOTES - ELECTRICAL POWER

1. ALL CIRCUITS SHALL BE 2#12,#12G.,3/4"C., TO NEW 20A-1P CIRCUIT BREAKER IN PANEL INDICATED UNLESS NOTED OTHERWISE.
2. ALL 120V BRANCH CIRCUITS THAT EXCEED 150' IN LENGTH SHALL BE 2#10,#10G., 3/4"C. UNLESS NOTED OTHERWISE.
3. ALL DEVICES SHALL BE LABELED WITH SOURCE PANEL AND CIRCUIT NUMBER(S).
4. REFER TO ARCHITECTS REFLECTED CEILING PLAN FOR EXACT LOCATION OF CEILING MOUNTED ELECTRICAL DEVICES.
5. REFER TO DRAWING E-000 & E-001 FOR ELECTRICAL FIXTURE SCHEDULE, ELECTRICAL SYMBOLS, LEGENDS, AND ABBREVIATIONS.
6. UNLESS OTHERWISE INDICATED, REFER TO MOTOR CIRCUIT SCHEDULE FOR ELECTRICAL REQUIREMENTS OF ALL MECHANICAL EQUIPMENT (HVAC, PLUMBING, FIRE PROTECTION, ETC.). REFER TO DRAWINGS FOR EACH TRADE FOR EXACT LOCATION OF EQUIPMENT.
7. ALL RECEPTACLES WITHIN 6'-0" OF A WATER SOURCE SHALL BE GFCI TYPE OR PROTECTED BY A GFI CIRCUIT BREAKER.
8. PROVIDE FIRE STOPPING AND SMOKE BARRIER SEALING OF ALL PENETRATIONS THROUGH FIRE WALLS OR SMOKE BARRIERS AS REQUIRED. REFER TO ARCHITECTURAL FLOOR PLANS AND CODE SHEETS FOR RATED WALLS.
9. PROVIDE NYLON PULL STRING IN ALL EMPTY CONDUIT SYSTEMS FOR USE IN INSTALLING SYSTEM WIRING.
10. WIRE ELECTRIC CLOCKS (CL) TO NEAREST 120V RECEPTACLE CIRCUIT SERVING ROOM, UNLESS NOTED OTHERWISE.

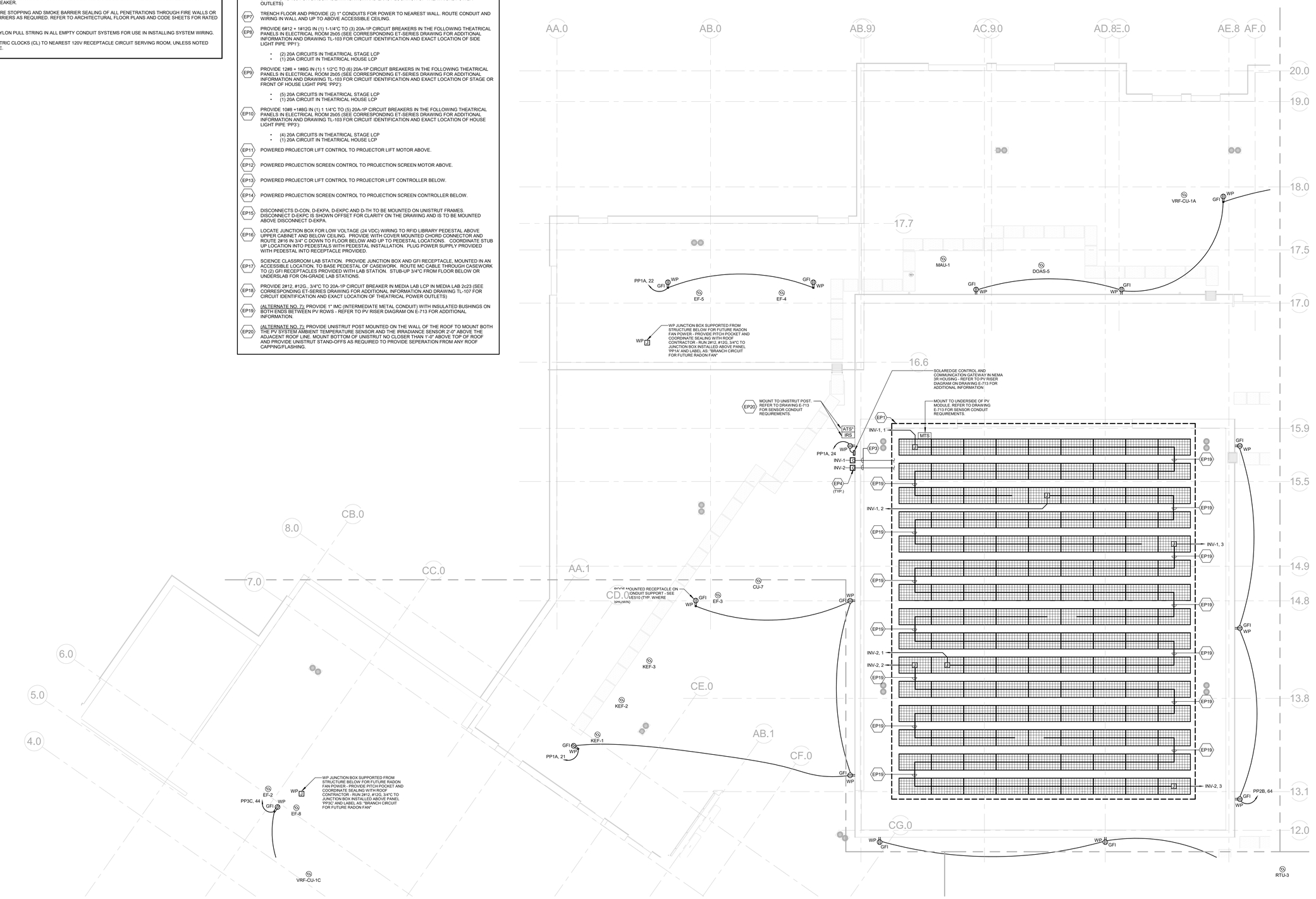
ELECTRICAL POWER KEY NOTES

- EP1 (ALTERNATE NO. 7) PV ARRAY 1: 54.68KW/DC SOLAR PV ARRAY CONSISTING OF 135 PV MODULES MOUNTED TO PV RACKING SYSTEM.
- EP2 (ALTERNATE NO. 7) PV ARRAY 2: 49.00KW/DC SOLAR PV ARRAY CONSISTING OF 121 PV MODULES MOUNTED TO PV RACKING SYSTEM.
- EP3 (ALTERNATE NO. 7): ROOF MOUNTED HIGH VOLTAGE DC WIRING (1000V RATED DC WIRING) IN IMC CONDUIT. PROVIDE MOUNTED TO ROOF SUPPORTS PER ROOFING MANUFACTURER'S REQUIREMENTS. PROVIDE CIRCUITS AS INDICATED ON DRAWINGS AND PV RISER DIAGRAM ON E-713 FOR THIS ARRAY. PROVIDE PV WARNING LABELS.
- EP4 (ALTERNATE NO. 7): WALL MOUNTED HIGH VOLTAGE DC WIRING (1000V RATED DC WIRING) IN IMC CONDUIT. PROVIDE PV WARNING LABELS.
- EP5 A/V RACK POWER. COORDINATE WITH RACK INSTALLATION.
- EP6 PROVIDE 2#12, #12G., 3/4"C TO 20A-1P CIRCUIT BREAKER IN THEATRICAL STAGE LCP IN ELECTRICAL ROOM 2b05 (SEE CORRESPONDING ET-SERIES DRAWING FOR ADDITIONAL INFORMATION AND DRAWING TL-103 FOR CIRCUIT IDENTIFICATION AND EXACT LOCATION OF THEATRICAL POWER OUTLETS)
- EP7 TRENCH FLOOR AND PROVIDE (2) 1" CONDUITS FOR POWER TO NEAREST WALL. ROUTE CONDUIT AND WIRING IN WALL AND UP TO ABOVE ACCESSIBLE CEILING.
- EP8 PROVIDE 6#12 + 1#12G IN (1) 1-1/4"C TO (3) 20A-1P CIRCUIT BREAKERS IN THE FOLLOWING THEATRICAL PANELS IN ELECTRICAL ROOM 2b05 (SEE CORRESPONDING ET-SERIES DRAWING FOR ADDITIONAL INFORMATION AND DRAWING TL-103 FOR CIRCUIT IDENTIFICATION AND EXACT LOCATION OF SIDE LIGHT PIPE 'PP1'):
  - (2) 20A CIRCUITS IN THEATRICAL STAGE LCP
  - (1) 20A CIRCUIT IN THEATRICAL HOUSE LCP
- EP9 PROVIDE 12#8 + 1#8G IN (1) 1 1/2"C TO (6) 20A-1P CIRCUIT BREAKERS IN THE FOLLOWING THEATRICAL PANELS IN ELECTRICAL ROOM 2b05 (SEE CORRESPONDING ET-SERIES DRAWING FOR ADDITIONAL INFORMATION AND DRAWING TL-103 FOR CIRCUIT IDENTIFICATION AND EXACT LOCATION OF STAGE OR FRONT OF HOUSE LIGHT PIPE 'PP2'):
  - (5) 20A CIRCUITS IN THEATRICAL STAGE LCP
  - (1) 20A CIRCUIT IN THEATRICAL HOUSE LCP
- EP10 PROVIDE 10#8 +1#8G IN (1) 1 1/4"C TO (5) 20A-1P CIRCUIT BREAKERS IN THE FOLLOWING THEATRICAL PANELS IN ELECTRICAL ROOM 2b05 (SEE CORRESPONDING ET-SERIES DRAWING FOR ADDITIONAL INFORMATION AND DRAWING TL-103 FOR CIRCUIT IDENTIFICATION AND EXACT LOCATION OF HOUSE LIGHT PIPE 'PP3'):
  - (4) 20A CIRCUITS IN THEATRICAL STAGE LCP
  - (1) 20A CIRCUIT IN THEATRICAL HOUSE LCP
- EP11 POWERED PROJECTOR LIFT CONTROL TO PROJECTOR LIFT MOTOR ABOVE.
- EP12 POWERED PROJECTION SCREEN CONTROL TO PROJECTION SCREEN MOTOR ABOVE.
- EP13 POWERED PROJECTOR LIFT CONTROL TO PROJECTOR LIFT CONTROLLER BELOW.
- EP14 POWERED PROJECTION SCREEN CONTROL TO PROJECTION SCREEN CONTROLLER BELOW.
- EP15 DISCONNECTS D-CON, D-EKPA, D-EKPC AND D-TH TO BE MOUNTED ON UNISTRUT FRAMES. DISCONNECT D-EKPC IS SHOWN OFFSET FOR CLARITY ON THE DRAWING AND IS TO BE MOUNTED ABOVE DISCONNECT D-EKPA.
- EP16 LOCATE JUNCTION BOX FOR LOW VOLTAGE (24 VDC) WIRING TO RFID LIBRARY PEDESTAL ABOVE UPPER CABINET AND BELOW CEILING. PROVIDE WITH COVER MOUNTED CHORD CONNECTOR AND ROUTE 2#16 IN 3/4" C DOWN TO FLOOR BELOW AND UP TO PEDESTAL LOCATIONS. COORDINATE STUB UP LOCATION INTO PEDESTALS WITH PEDESTAL INSTALLATION. PLUG POWER SUPPLY PROVIDED WITH PEDESTAL INTO RECEPTACLE PROVIDED.
- EP17 SCIENCE CLASSROOM LAB STATION. PROVIDE JUNCTION BOX AND GFI RECEPTACLE, MOUNTED IN AN ACCESSIBLE LOCATION, TO BASE PEDESTAL OF CASEWORK. ROUTE MC CABLE THROUGH CASEWORK TO (2) GFI RECEPTACLES PROVIDED WITH LAB STATION. STUB-UP 3/4"C FROM FLOOR BELOW OR UNDERSLAB FOR ON-GRADE LAB STATIONS.
- EP18 PROVIDE 2#12, #12G., 3/4"C TO 20A-1P CIRCUIT BREAKER IN MEDIA LAB LCP IN MEDIA LAB 2c23 (SEE CORRESPONDING ET-SERIES DRAWING FOR ADDITIONAL INFORMATION AND DRAWING TL-107 FOR CIRCUIT IDENTIFICATION AND EXACT LOCATION OF THEATRICAL POWER OUTLETS)
- EP19 (ALTERNATE NO. 7): PROVIDE 1" IMC (INTERMEDIATE METAL CONDUIT) WITH INSULATED BUSHINGS ON BOTH ENDS BETWEEN PV ROWS - REFER TO PV RISER DIAGRAM ON E-713 FOR ADDITIONAL INFORMATION.
- EP20 (ALTERNATE NO. 7): PROVIDE UNISTRUT POST MOUNTED ON THE WALL OF THE ROOF TO MOUNT BOTH THE PV SYSTEM AMBIENT TEMPERATURE SENSOR AND THE IRRADIANCE SENSOR 2'-0" ABOVE THE ADJACENT ROOF LINE. MOUNT BOTTOM OF UNISTRUT NO CLOSER THAN 1'-0" ABOVE TOP OF ROOF AND PROVIDE UNISTRUT STAND-OFFS AS REQUIRED TO PROVIDE SEPERATION FROM ANY ROOF CAPPING/FLASHING.

GENERAL NOTES - ELECTRICAL ALTERNATE NO. 7

NOTE:

THE PHOTOVOLTAIC SYSTEM AS SHOWN ON THIS DRAWING IS PART OF ALTERNATE NO. 7 PACKAGE ONLY.



1 NFHS ROOF LEVEL - ELECTRICAL POWER PLAN - AREA A
1/8" = 1'-0"

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New Fairfield High School & Pool Locker Rooms

54 Gillotti Rd,
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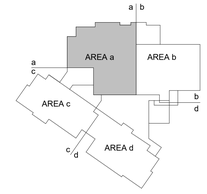

KEY PLAN

BID SET
06/07/2021

ISSUE	ISSUED FOR BID
JOB	2020128.01
DRAWN	MAL
SCALE	As indicated
REVISIONS	

ELECTRICAL POWER PLAN - ROOF LEVEL AREA A

EP-114a

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GENERAL NOTES - ELECTRICAL ALTERNATE NO. 7

NOTE:

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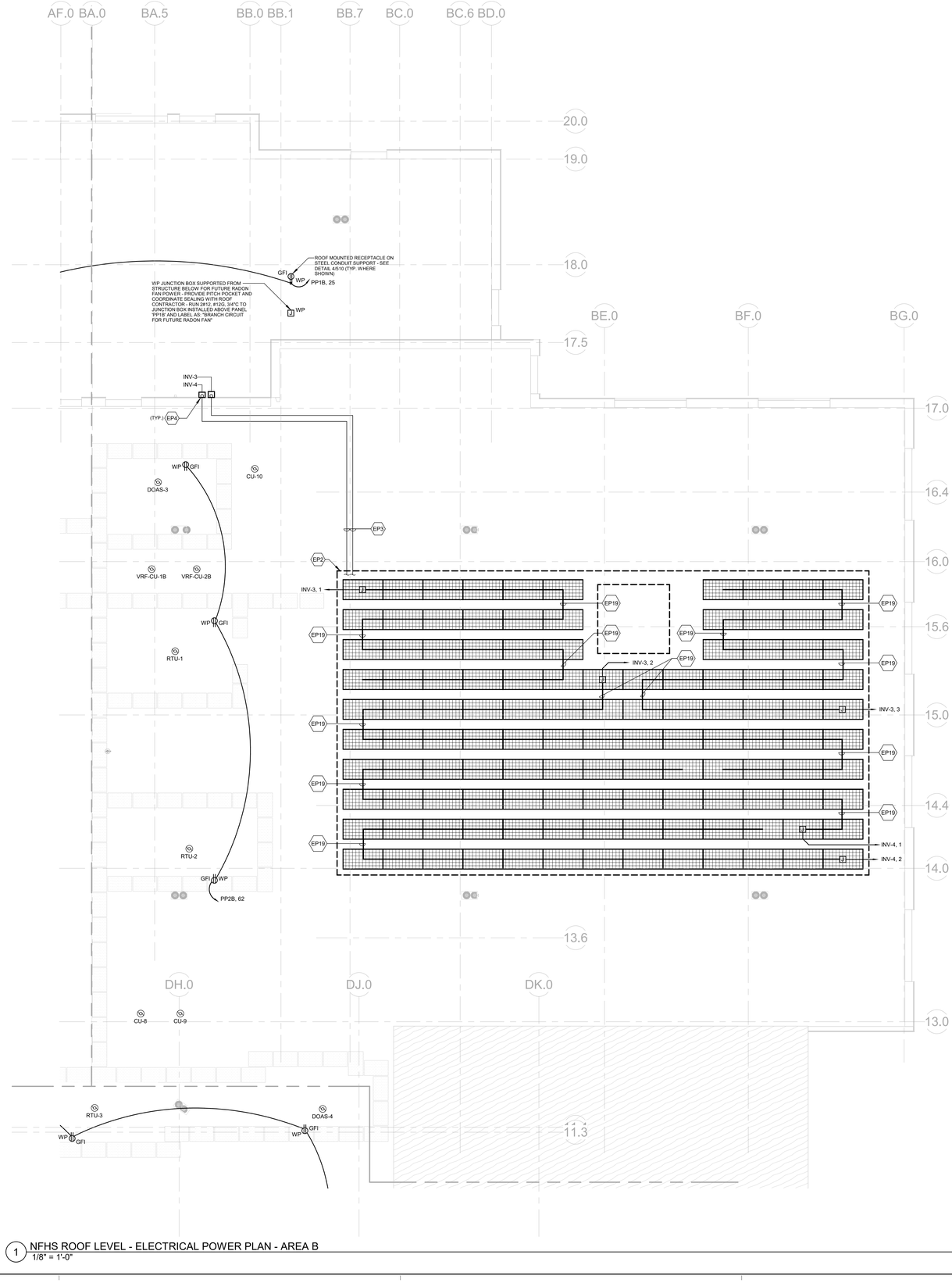

1 NFHS ROOF LEVEL - ELECTRICAL POWER PLAN - AREA B
1/8" = 1'-0"

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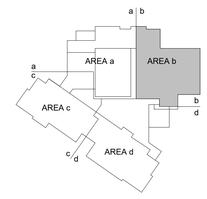

KEY PLAN

BID SET
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ISSUE	ISSUED FOR BID
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DRAWN	MAL
SCALE	As indicated

REVISIONS

ELECTRICAL POWER PLAN - ROOF LEVEL AREA B

EP-114b

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