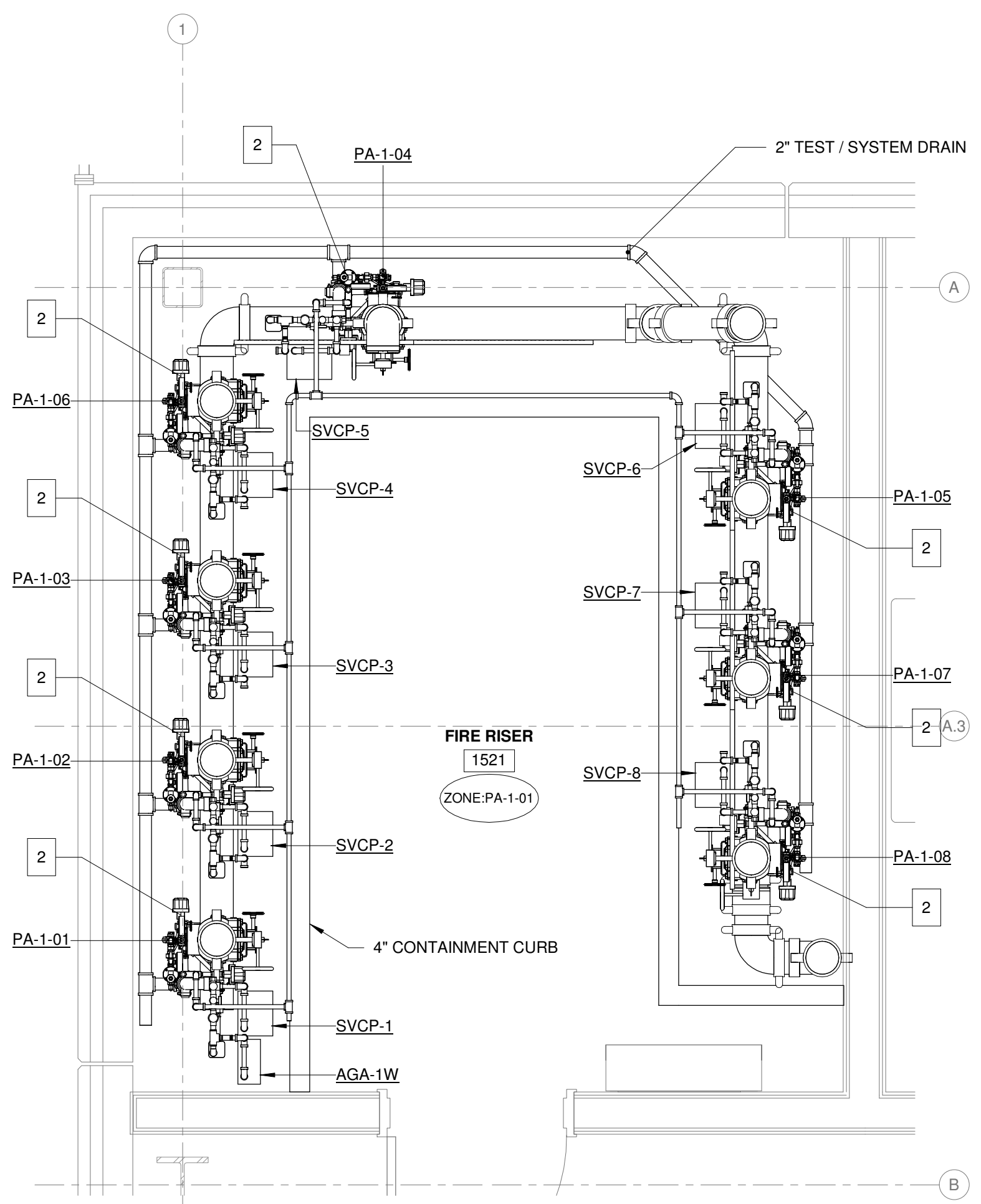
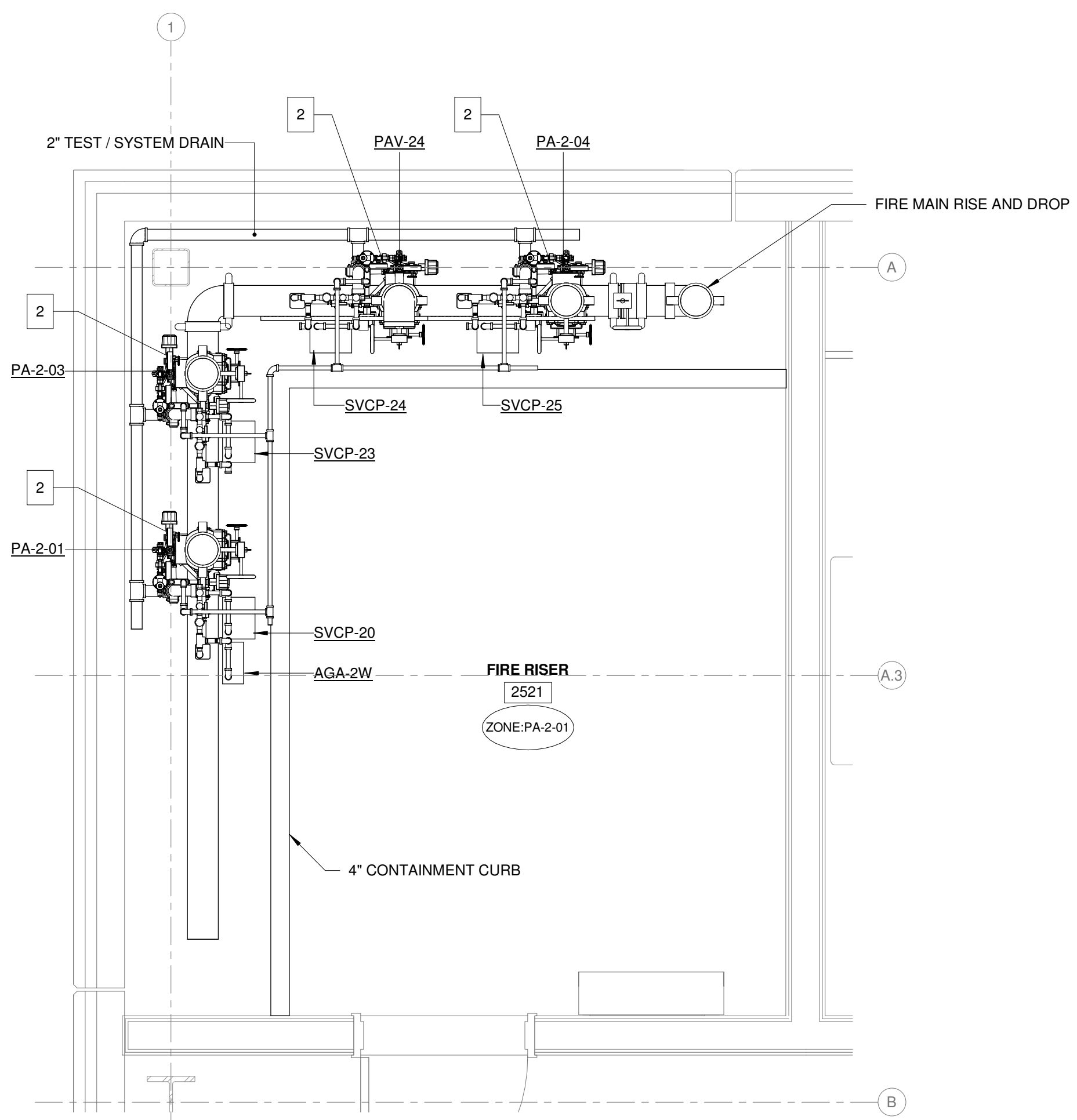


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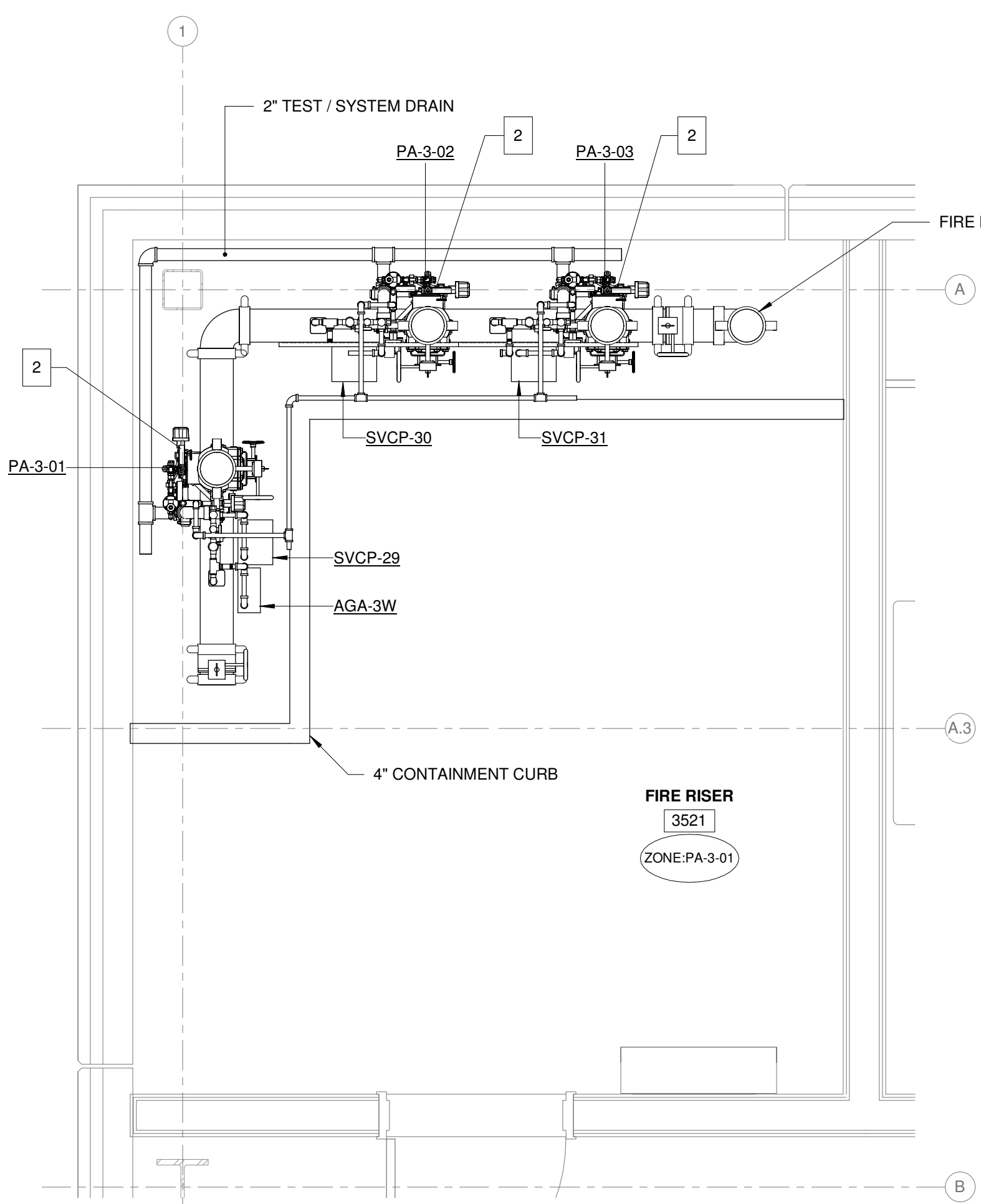
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| Docket Number: | 19-SPPE-03 |
| Project Title: | Sequoia Data Center |
| TN #: | 230357 |
| Document Title: | C1 Appendix TRANS DR-103 - Part IV of IV Response to DR Set 2 |
| Description: | N/A |
| Filer: | Scott Galati |
| Organization: | DayZenLLC |
| Submitter Role: | Applicant Representative |
| Submission Date: | 10/25/2019 11:06:29 AM |
| Docketed Date: | 10/25/2019 |



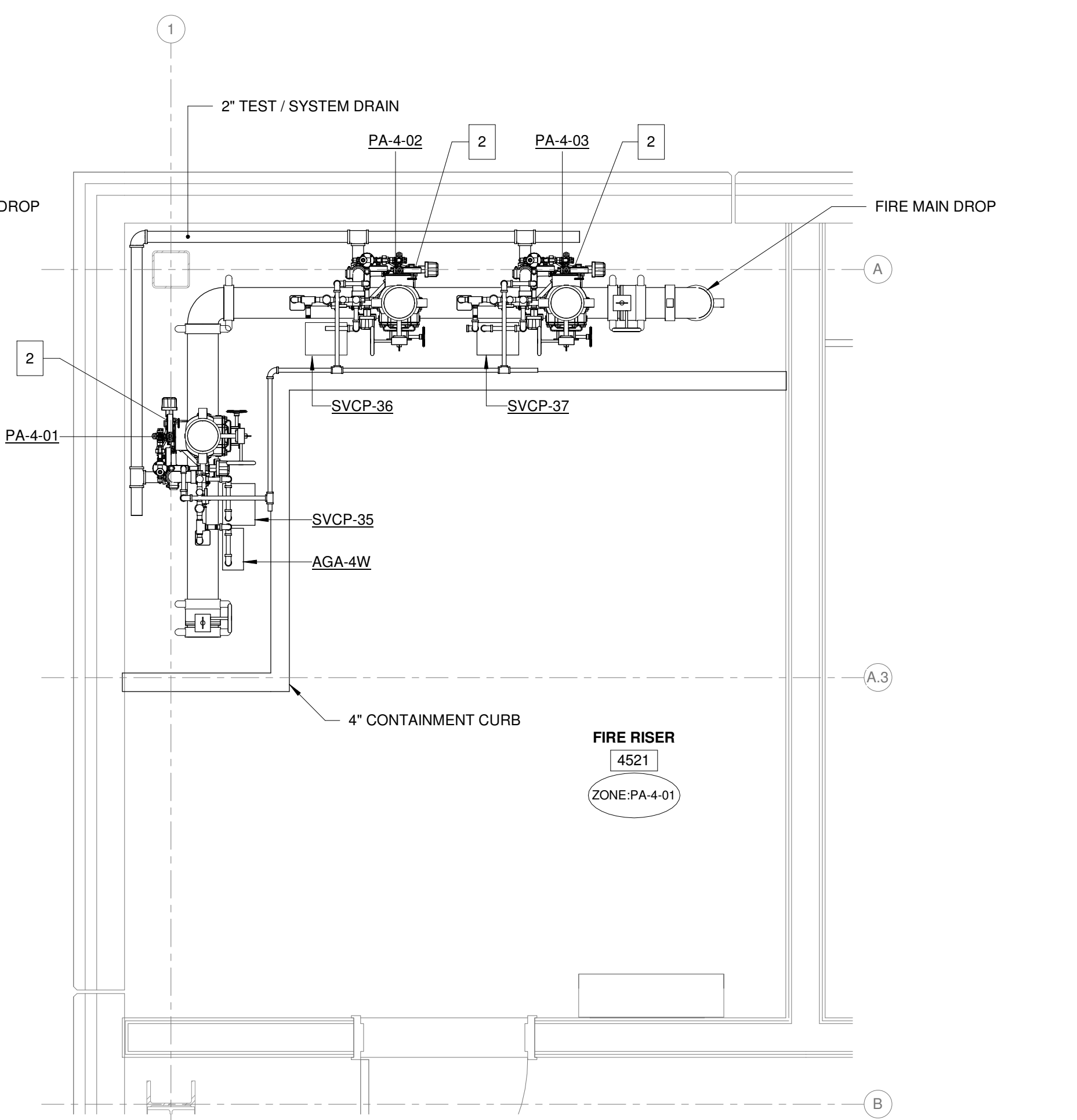
1 FIRE SUPPRESSION PLAN - LEVEL ONE - NORTHWEST RISER ROOM
1/2" = 1'-0"



2 FIRE SUPPRESSION PLAN - LEVEL TWO - NORTHWEST RISER ROOM
1/2" = 1'-0"



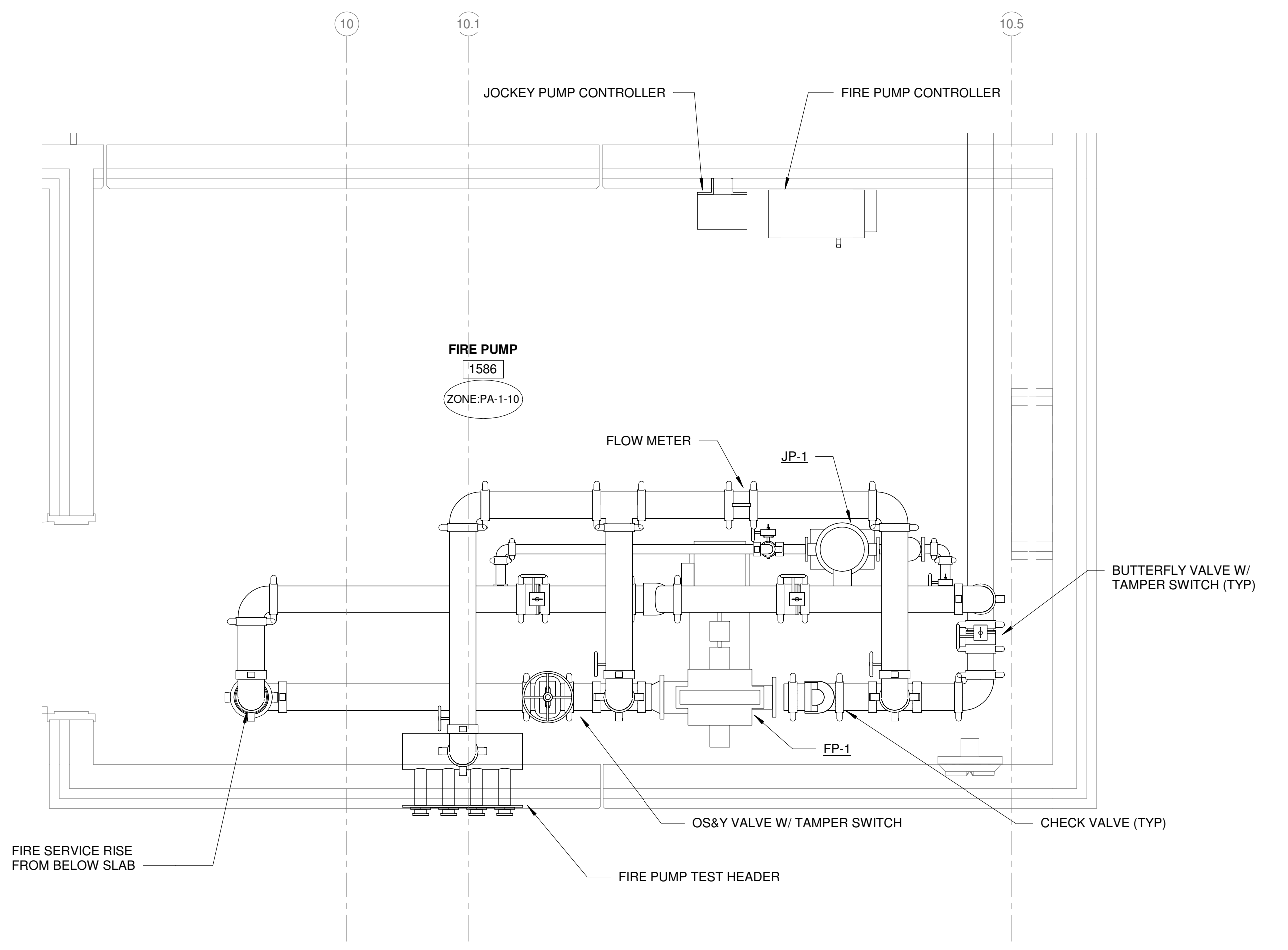
3 FIRE SUPPRESSION PLAN - LEVEL THREE - NORTHWEST RISER ROOM
1/2" = 1'-0"



4 FIRE SUPPRESSION PLAN - LEVEL FOUR - NORTHWEST RISER ROOM
1/2" = 1'-0"

FIRE PUMP SCHEDULE

| TYPE | RATED PRESSURE (PSI) | RATED FLOW (GPM) | DRIVER | HERTZ | RPM | POWER (HP) | NOTES |
|------|----------------------|------------------|----------------|-------|------|------------|--|
| FP-1 | 75 | 750 | ELECTRIC MOTOR | 60 | 1780 | 75 | HORIZONTAL SPLIT-CASE ELECTRIC FIRE PUMP, RIGHT-HANDED, 460 V, 3 PHASE. PUMP STARTS AT 145 PSI. |
| JP-1 | 90 | 10 | ELECTRIC MOTOR | 60 | 3500 | 1.5 | INLINE VERTICAL ELECTRIC JOCKEY PUMP, 460 V, 3 PHASE. PUMP STARTS AT 150 PSI AND STOPS AT 160 PSI. |



6 ENLARGED FIRE PUMP ROOM
1/2" = 1'-0"

| KEYNOTES | |
|----------|--|
| KEY | NOTE |
| 1 | DOUBLE INTERLOCKED PREACTION VALVE WITH PNEUMATIC/ELECTRIC RELEASE |
| 2 | DRY VALVE, TO BE CONVERTED TO DOUBLE INTERLOCKED PREACTION VALVE IN FUTURE |
| 3 | DRY VALVE |
| 4 | ALARM CHECK VALVE |



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214-748-2000 F: 214-653-8281

kw Mission Critical Engineering, d.p.c.
51 W. 3rd St. 3rd Floor, Tempe, AZ 85281

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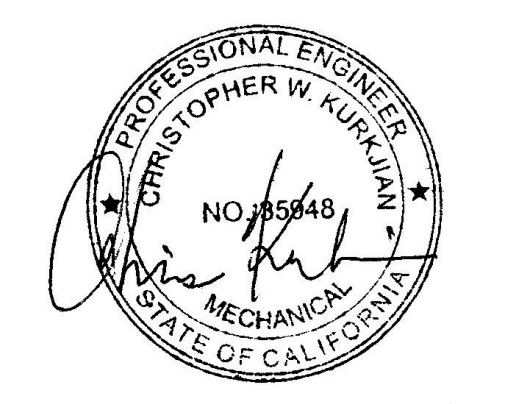
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| REVISIONS | |
|-----------|------------------------|
| 1 | 08/16/2019 ADDENDUM 01 |

kw Contact: Darren Keyser Phone: 518.391.9270
Christopher Kurkjian, P.E.
License #: 35948 Expiration Date: 06/30/20



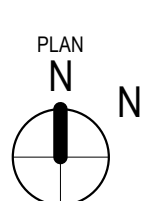
Date: 08/23/2019

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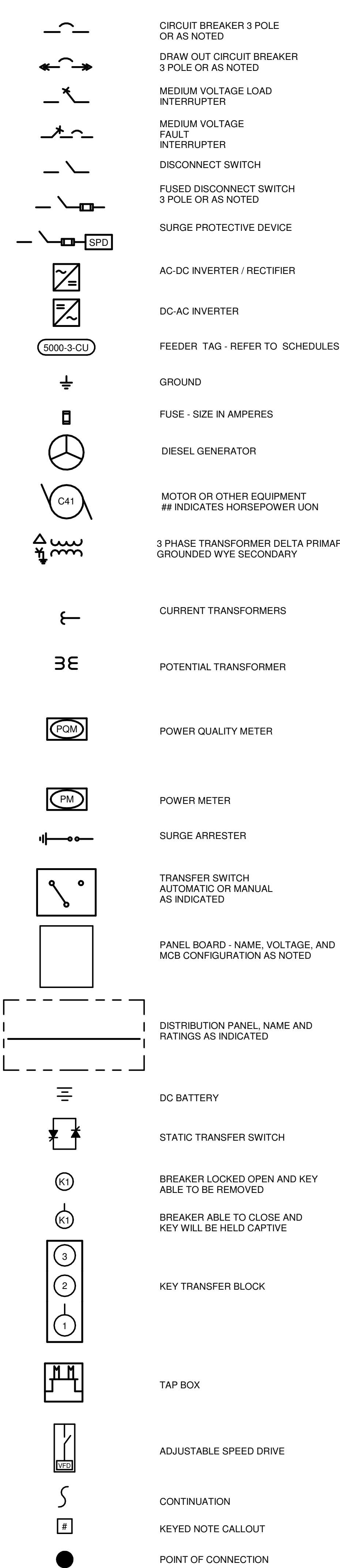
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ENLARGED FIRE SUPPRESSION PLANS

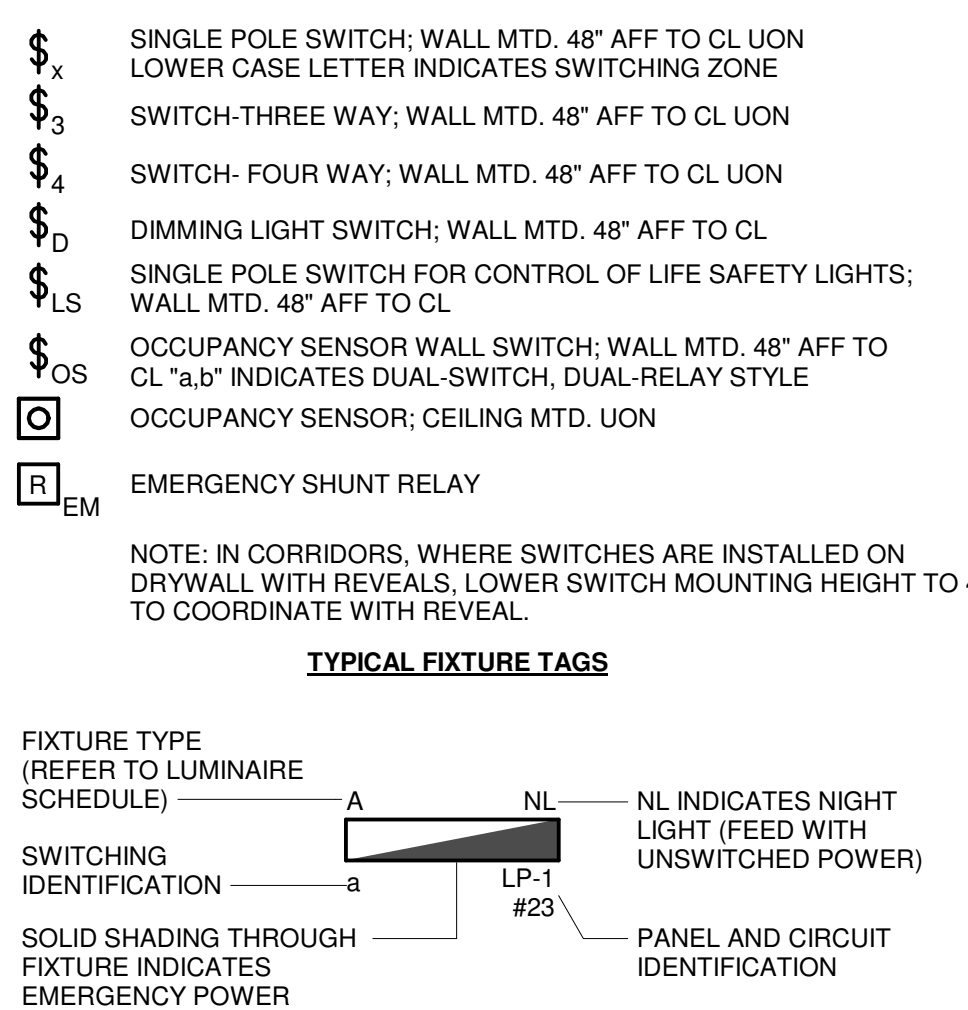
PROJECT NUMBER 19.030
DATE 08/23/2019
SHEET NUMBER



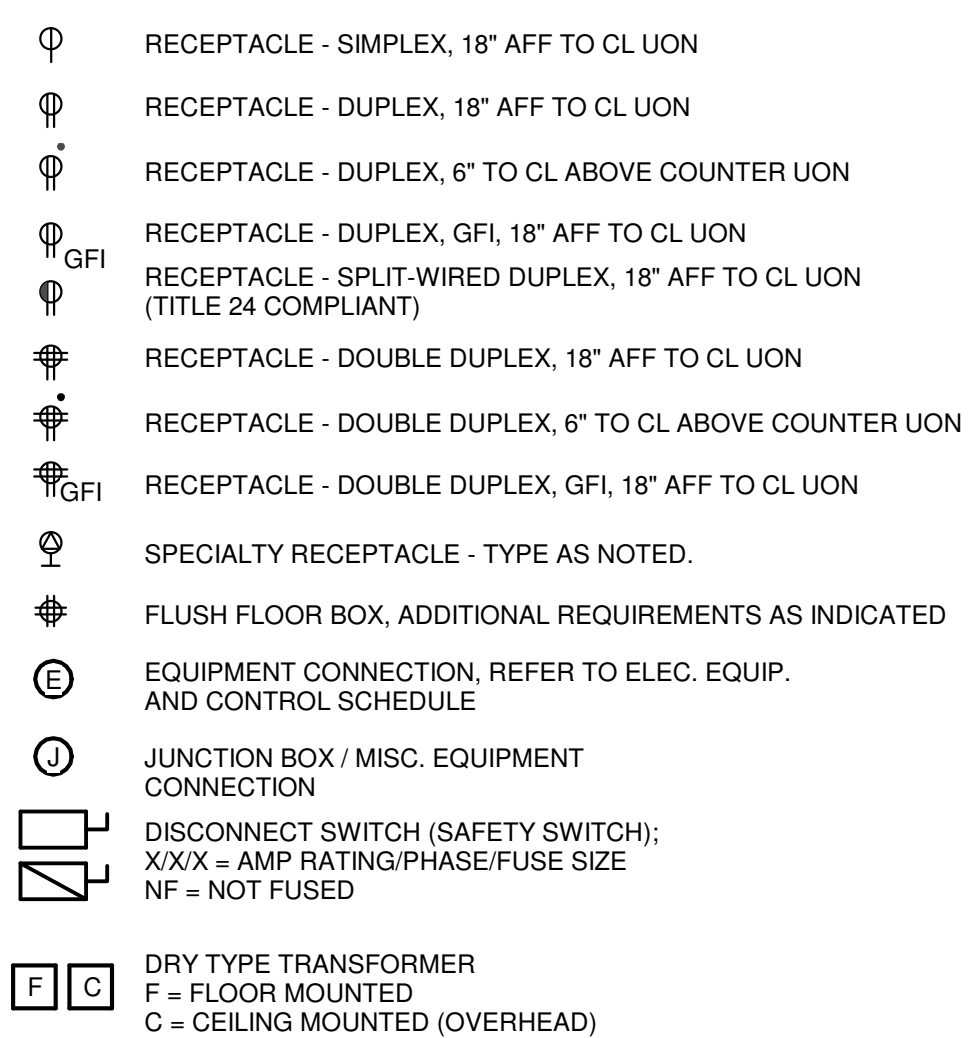
ONE LINE



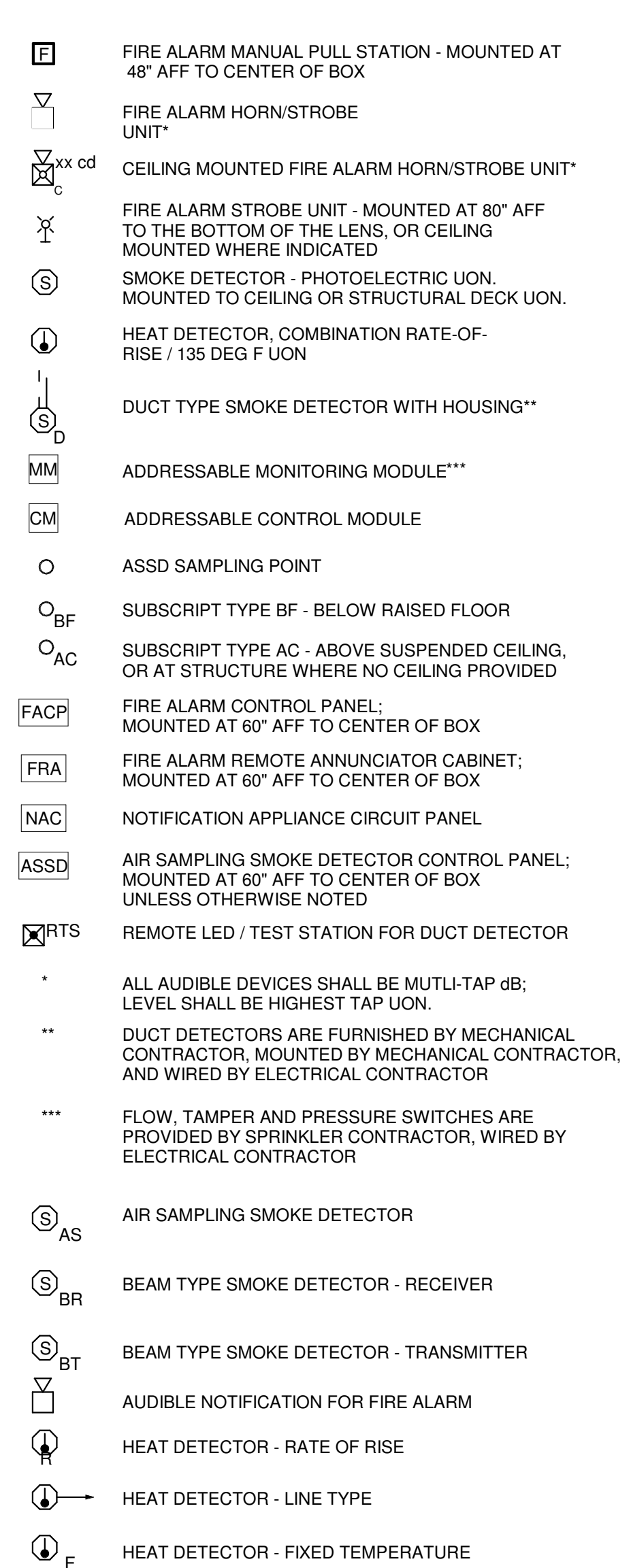
LIGHTING



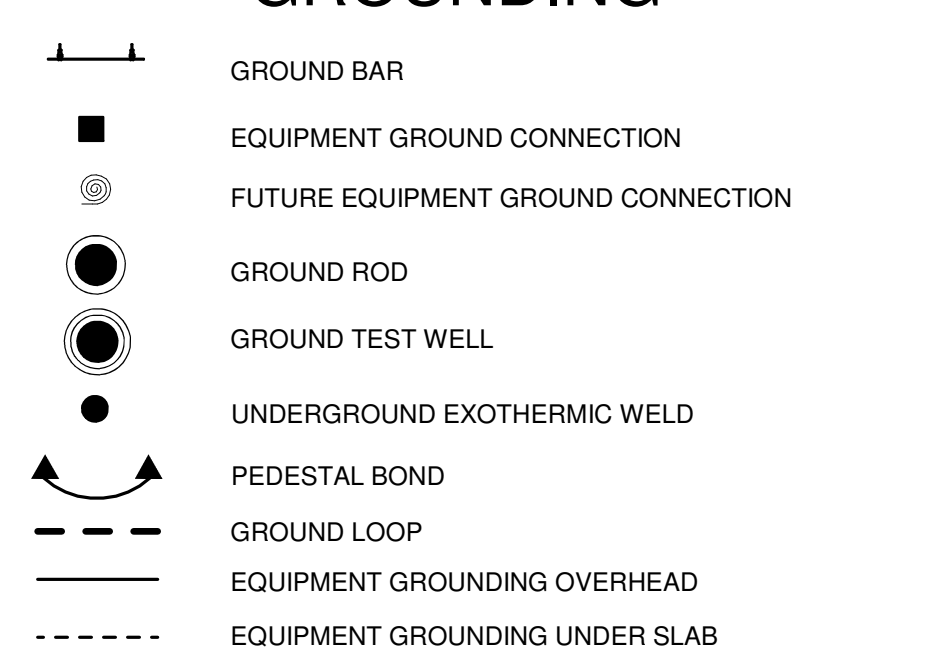
POWER



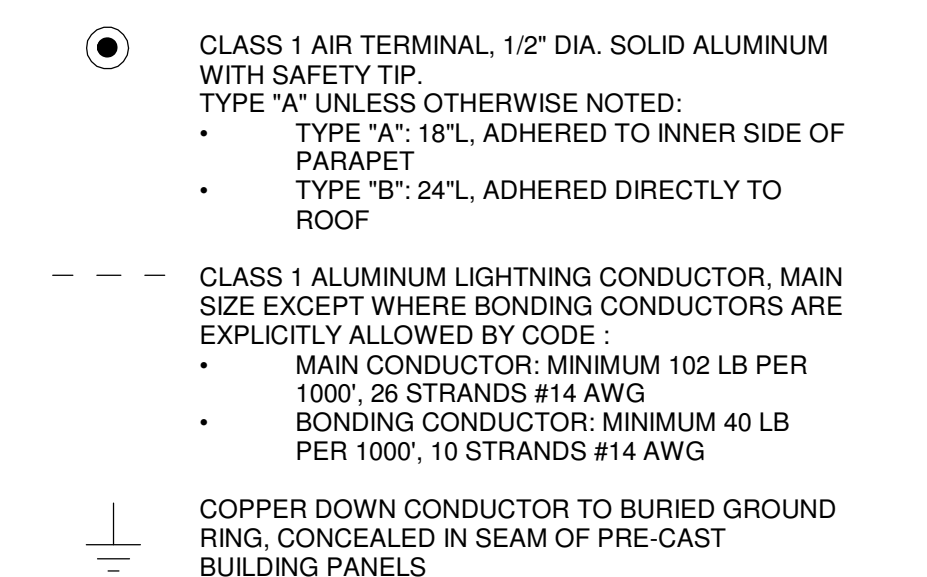
FIRE ALARM



GROUNDING



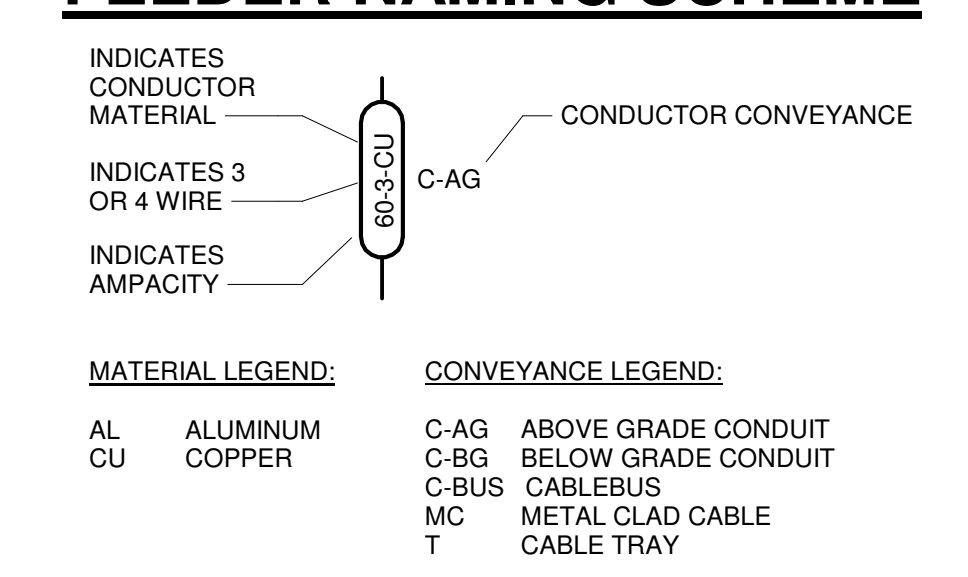
LIGHTNING PROTECTION



ABBREVIATIONS

| | | | |
|--------|--|--------|--|
| A | AMPERES | KILO | THOUSAND |
| AB | ABOVE | KA | KILO AMPERES |
| AC | ALTERNATING CURRENT | KCMIL | THOUSAND CIRCULAR MILS |
| AF | AMPERE FRAME | KVA | KILOVOLT-AMPERES |
| AFB | ABOVE FINISHED FLOOR | KVAR | KILOVARS |
| AFG | ABOVE FINISHED GRADE | KV | KILOVOLTS |
| AHJ | AIR HANDLING UNIT | KW | KILOWATTS |
| ALT | ALTERNATE | LHD | LINEAR HEAT DETECTOR |
| AIC | AMPERE INTERRUPTING CAPACITY | LTC | LONG TIME INSTANTANEOUS LIGHTS |
| ANN | ANNUNCIATOR | LTS(S) | LIGHTS |
| ASSD | AIR SAMPLING SMOKE DETECTION AMPERE TRIP | MA | MILLIAMPERE |
| ASTS | AUTOMATIC STATIC TRANSFER SWITCH | MAINT | MAINTAINED |
| ATS | AUTOMATIC TRANSFER SWITCH | MAN | MANUAL |
| AUTO | AUTOMATIC | MANX | MAXIMUM |
| AUX | AUXILIARY | MC | METAL CLAD CABLE |
| AWG | AMERICAN WIRE GAUGE | MCB | MAIN CIRCUIT BREAKER |
| BFF | BELOW FINISHED FLOOR | MCC | MOTOR CONTROL CENTER |
| BFG | BELOW FINISHED GRADE | MCS | MOLDED CASE SWITCH |
| BC/BF | DEVICES MOUNTED BELOW SUSPENDED CEILING AND BELOW RAISED FLOOR | MCP | MOLDED CASE CIRCUIT BREAKER |
| BATT | BATTERY | MDB | MAIN DISTRIBUTION PANEL |
| BF | BELOW RAISED FLOOR | MEGA | MILLION |
| BKR | BREAKER | MFR | MANUFACTURER |
| BLDG | BUILDING | MH | MANHOLE |
| C | CONDUIT | MIN | MINIMUM |
| CAB | CABINET | MLO | MAIN LUGS ONLY |
| CB | CIRCUIT BREAKER | MO | MANUALLY OPERATED MOUNT(ED) |
| C-BUS | CABLE BUS | MOT | MOTOR |
| CKT | CIRCUIT | MTR | MANUAL TRANSFER SWITCH |
| CL | CENTER LINE | MV | MEDIUM VOLTAGE |
| CLG | CEILING | MW | MEGA WATTS |
| CO | COMPANY | N | NORTH |
| COL | COLUMN | NAC | NOTIFICATION APPLIANCE CIRCUIT |
| COMM | COMMUNICATIONS | NC | NORMALLY CLOSED |
| CONC | CONCRETE | NEC | NATIONAL ELECTRICAL CODE |
| CONN | CONNECTION, CONNECT | NF | NON-FUSED |
| COORD | COORDINATE | NIC | NOT IN CONTRACT |
| CPAH | COMPUTER ROOM AIR HANDLER | NL | NIGHT LIGHT |
| CUH | CABINET UNIT HEATER | N.O. | NORMALLY OPEN |
| CU | CURRENT TRANSFORMER | NT | NEUTRAL TIME PROTOCOL |
| Δ | DELTA CONNECTION | NTS | NOT TO SCALE |
| DB | DECIBEL | OCPD | OVERCURRENT PROTECTIVE DEVICE |
| DC | DIRECT CURRENT | OH | OVERHEAD |
| DET | DETECTOR | ODD | OVERHEAD DOOR |
| DIA | DIAMETER | OL | OVERLOAD |
| DISC | DISCONNECT | OS | OCCUPANCY SENSOR |
| DIST | DISTRIBUTION | P | POLE(S) |
| DIV | DIVISION | P | PREFERRED |
| DN | DOWN | PC | PUSHBUTTON |
| DP | DISTRIBUTION PANEL | PB | PUSHBUTTON |
| DWG | DRAWING | PDU | POWER DISTRIBUTION UNIT |
| EA | EACH | PF | POWER FACTOR |
| EF | EXHAUST FAN | PFR | PREFERRED |
| EG | EQUIPMENT GROUND | PL | PILOT LIGHT |
| EL | ELEVATION | PNL | PANEL |
| ELEC | ELECTRICAL | PQM | POWER QUALITY METER |
| ELU | EMERGENCY LIGHT UNIT | PM | POWER METER |
| EMER | EMERGENCY | PR | PREPARED |
| EMT | ELECTRICAL METALLIC TUBING | PREP | PREPARED |
| EMH | ELECTRICAL MANHOLE | PR | PREPARED |
| ENCL | ENCLOSURE | PRI | PRIMARY |
| E.O. | ELECTRONICALLY OPERATED | PVC | POLYVINYL CHLORIDE |
| EPMS | ELECTRICAL POWER MONITORING SYSTEM | PWR | POWER |
| EPO | EMERGENCY POWER OFF | PH | PHASE |
| EPR | ETHYLENE PROPYLENE RUBBER INSULATION | QTY | QUANTITY |
| EQUIP | EQUIPMENT | RECEPT | RECEPTACLE |
| EUH | ELECTRIC UNIT HEATER | RECT | RECTIFIER |
| EWG | ELECTRIC WATER COOLER | REFR | REFRIGERATOR |
| EWV | ELECTRIC WALL HEATER | RGS | RIGID GALVANIZED STEEL CONDUIT |
| EXIST | EXISTING | RHW | RHW INSULATED WIRE |
| EXT | EXTERIOR | RM | ROOM |
| F | FUSE(D) | RM | RIGID METALLIC CONDUIT |
| FA | FIRE ALARM | RPP | REMOTE POWER PANEL |
| FACP | FIRE ALARM CONTROL PANEL | SCH | SCHEDULE |
| FAN | FAN COIL UNIT | SEC | SECONDARY |
| FCU | FLOOR COOL UNIT | SFL | SUB-FEED LUGS |
| FIXT | FIXTURE | SKRU | SOLENOID KEY RELEASE UNIT |
| FLA | FULL LOAD AMPERES | SHT | SHEET |
| FLR | FLOOR | ST | SHUNT TRIP |
| FLEX | FLEXIBLE | SPC | SPACE |
| FLUOR | FLUORESCENT | SPKR | SPEAKER |
| FO | FIBER OPTIC | SPR | SPARE |
| FTR | FUTURE | SQ | SQUARE |
| FURN | FURNISH | SS | STAINLESS STEEL |
| G, GND | GROUND | STP | SHIELDED TWISTED PAIR |
| GALV | GALVANIZED(D) | SUSP | SUSPENDED |
| GEN | GENERATOR | SW | SWITCH |
| GPEP | GROUND FAULT EQUIPMENT PROTECTION (30MA) | SWBD | SWITCHBOARD |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER | SWGR | SWITCHGEAR |
| GFP | GROUND FAULT PROTECTION | T | TRAY |
| GPS | GLOBAL POSITIONING SYSTEM | TYP | TYPICAL |
| HD | HEAVY DUTY | U | ULTRASONIC |
| HGT | HEIGHT | UC | UNDER COUNTER |
| HH | HAND HOLE | UG | UNDERGROUND |
| HID | HIGH INTENSITY DISCHARGE | UGC | UNDERGROUND COMMUNICATION |
| HO | HIGH OUTPUT | UGP | UNDERGROUND POWER |
| HOA | HAND-OFF-AUTOMATIC | UH | UNIT HEATER |
| HP | HORSEPOWER | UON | UNLESS OTHERWISE NOTED |
| HPF | HIGH POWER FACTOR | UPS | UNINTERRUPTIBLE POWER SUPPLY |
| HPS | HIGH PRESSURE SODIUM | UTL | UTILITY |
| HTR | HEATER | UTP | UNSHIELDED TWISTED PAIR |
| HV | HIGH VOLTAGE | V | VOLT(S) |
| IC | INTERCOMMUNICATION | VA | VOLT-AMPERES |
| ID | IDENTIFY, IDENTIFICATION | VAR | REACTIVE VOLT-AMPERES |
| IMC | INTERMEDIATE METAL CONDUIT | VAV | VARIABLE AIR VOLUME |
| INCAN | INCANDESCENT | VRLA | VALVE REGULATED LEAD ACID |
| INSUL | INSULATION | W | WIRE |
| IPS | INTERRUPTIBLE POWER SUPPLY | W | WATTS |
| IR | PASSIVE INFRARED | W | WITH |
| IR | PASSIVE INFRARED | WG | WIPE GUARD |
| JB | JUNCTION BOX | WP | WEATHERPROOF |
| JCT | JUNCTION | WT | WATERTIGHT |
| | | XP | EXPLOSION PROOF |
| | | XHHW | CROSS LINKED POLYETHYLENE INSULATED WIRE |
| | | XFMR | TRANSFORMER |
| | | Y | WYE CONNECTION |

FEEDER NAMING SCHEME



LINE TYPE LEGEND



ELECTRICAL SHEET LIST

| Sheet Number | Sheet Name |
|-----------------|-----------------------------------|
| E00-01 | LEGEND AND ABBREVIATIONS |
| E01-00A | ELECTRICAL FEEDER SCHEDULES |
| E01-00C | ONE-LINE DIAGRAM - MEDIUM VOLTAGE |
| E01-01A | ONE-LINE DIAGRAM - UPS ROOM A01 |
| E01-01B | ONE-LINE DIAGRAM - UPS ROOM B01 |
| E01-01C | ONE-LINE DIAGRAM - UPS ROOM C01 |
| E01-01D | ONE-LINE DIAGRAM - UPS ROOM D01 |
| E01-01E | ONE-LINE DIAGRAM - UPS ROOM E01 |
| E01-01F | ONE-LINE DIAGRAM - UPS ROOM F01 |
| E01-10A | ONE-LINE DIAGRAM - BACK OF HOUSE |
| E01-10B | ONE-LINE DIAGRAM - FRONT OF HOUSE |
| E01-20 | ONE-LINE DIAGRAM - FIRE PUMP |
| Grand total: 12 | |



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.653.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
47 Penimeter Central East,
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2850 Collier Canyon Rd
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| REVISIONS |
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| 1 08/16/2019 ADDENDUM 01 |

KW Contact: RICK SPARKMAN Phone: 971.221.6819

Stephen Coon, P.E.
License #: E22629 Expiration Date: 03/31/2021



Date: 08/23/2019

SANTA CLARA
2600 De La Cruz Blvd,
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LEGEND AND ABBREVIATIONS

PROJECT 19.030
NUMBER
DATE 08/01/2019
SHEET NUMBER

E00-01

| | |
|-------|------------------------|
| 67.5 | MW OF IT |
| 1.46 | PUE |
| 98.55 | MW TOTAL POWER DRAW |
| 0.95 | POWER FACTOR |
| 104 | MVA TOTAL POWER DRAW |
| 24.9 | KV UTILIZATION VOLTAGE |
| 2405 | A TOTAL POWER DRAW |

② LOAD SUMMARY
N.T.S.

ALUMINUM FEEDER SCHEDULE - MEDIUM VOLTAGE BELOW GRADE CONDUIT (C-BG)

| CODE | # OF SETS | PHASE | NEUTRAL | GROUND | CONDUIT | NOTES |
|------------|-----------|---------------|---------|----------|---------|---|
| MV100-3-AL | 1 | (3) #1/0 | - | (1) #4 | 6" | TYPE MV-105, 25KV SHIELDED POWER CABLES WITH 100% INSULATION LEVEL GROUND CONDUCTOR TO BE 600V |
| MV600-3-AL | 1 | (3) 750 KCMIL | - | (1) #2/0 | 6" | TYPE MV-105, 25KV SHIELDED POWER CABLES WITH 100% INSULATION LEVEL GROUND CONDUCTOR TO BE 600V |

COPPER FEEDER SCHEDULE - ABOVE GRADE CONDUIT (C-AG)

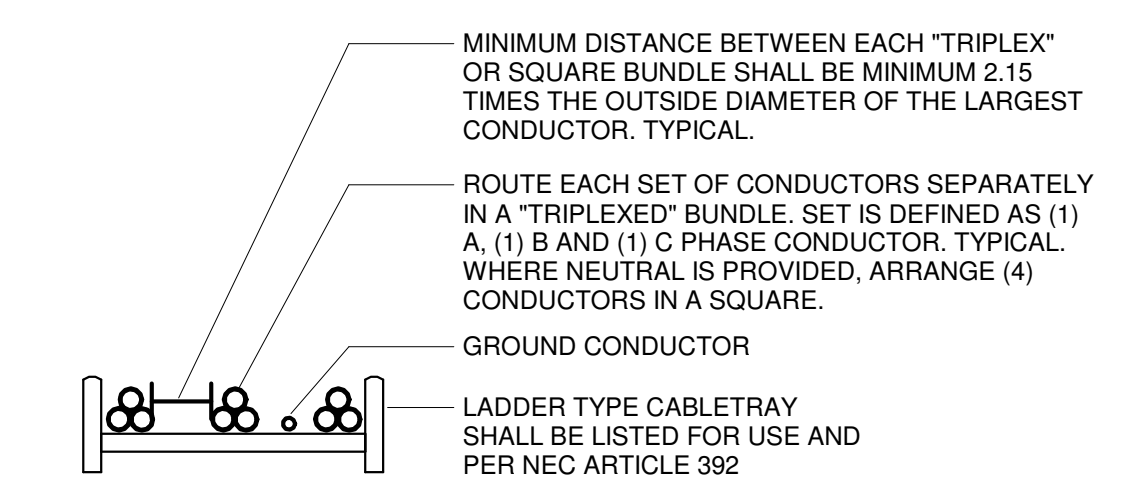
| CODE | # OF SETS | PHASE | NEUTRAL | GROUND | CONDUIT |
|-----------|-----------|---------------|---------------|----------|---------|
| 20-3-CU | 1 | (3) #12 | - | (1) #12 | 3/4" |
| 30-3-CU | 1 | (3) #10 | - | (1) #10 | 3/4" |
| 40-3-CU | 1 | (2) #8 | - | (1) #10 | 3/4" |
| 40-3-CU | 1 | (3) #8 | - | (1) #10 | 3/4" |
| 50-3-CU | 1 | (3) #8 | - | (1) #10 | 1" |
| 60-3-CU | 1 | (3) #6 | - | (1) #8 | 1" |
| 70-3-CU | 1 | (3) #4 | - | (1) #8 | 1" |
| 70-3-CU | 1 | (3) #4 | (1) #4 | (1) #8 | 1-1/4" |
| 90-3-CU | 1 | (3) #2 | - | (1) #8 | 1-1/4" |
| 100-3-CU | 1 | (3) #2 | (1) #2 | (1) #8 | 1-1/2" |
| 125-3-CU | 1 | (3) #1 | - | (1) #6 | 1-1/2" |
| 125-3-CU | 1 | (3) #1 | (1) #1 | (1) #6 | 2" |
| 150-3-CU | 1 | (3) #1/0 | - | (1) #6 | 1-1/2" |
| 150-3-CU | 1 | (3) #1/0 | (1) #1/0 | (1) #6 | 2" |
| 175-3-CU | 1 | (3) #2/0 | - | (1) #6 | 2" |
| 250-3-CU | 1 | (3) 250 KCMIL | - | (1) #4 | 2-1/2" |
| 250-3-CU | 1 | (3) 250 KCMIL | (1) 250 KCMIL | (1) #4 | 3" |
| 400-3-CU | 1 | (3) 600 KCMIL | (1) 600 KCMIL | (1) #3 | 3-1/2" |
| 1200-3-CU | 3 | (3) 600 KCMIL | - | (1) #3/0 | 3-1/2" |

ALUMINUM FEEDER SCHEDULE - ABOVE GRADE CONDUIT (C-AG)

| CODE | # OF SETS | PHASE | NEUTRAL | GROUND | CONDUIT |
|-----------|-----------|---------------|---------|---------------|---------|
| 100-3-AL | 1 | (3) #1/0 | - | (1) #6 | 1-1/2" |
| 225-3-AL | 1 | (3) 300 KCMIL | - | (1) #2 | 2-1/2" |
| 300-3-AL | 1 | (3) 500 KCMIL | - | (1) #2 | 3" |
| 400-3-AL | 2 | (3) 250 KCMIL | - | (1) # 1 | 2-1/2" |
| 1000-3-AL | 3 | (3) 600 KCMIL | - | (1) # 4/0 | 3-1/2" |
| 1200-3-AL | 4 | (3) 500 KCMIL | - | (1) 250 KCMIL | 3" |
| 2000-3-AL | 6 | (3) 600 KCMIL | - | (1) 400 KCMIL | 3-1/2" |

COPPER FEEDER SCHEDULE - CABLE TRAY (T)

| CODE | # OF SETS | PHASE | NEUTRAL | GROUND | MAX RUNG SPACE | MIN TRAY WIDTH | MIN WEIGHT PER FOOT |
|-----------|-----------|----------------|---------|---------------|----------------|----------------|---------------------|
| 4000-3-AL | 6 | (3) 1000 KCMIL | - | (1) 500 KCMIL | | | |



① CABLE TRAY LAYOUT
N.T.S.



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.653.8281

kw Mission Critical Engineering, d.p.c.
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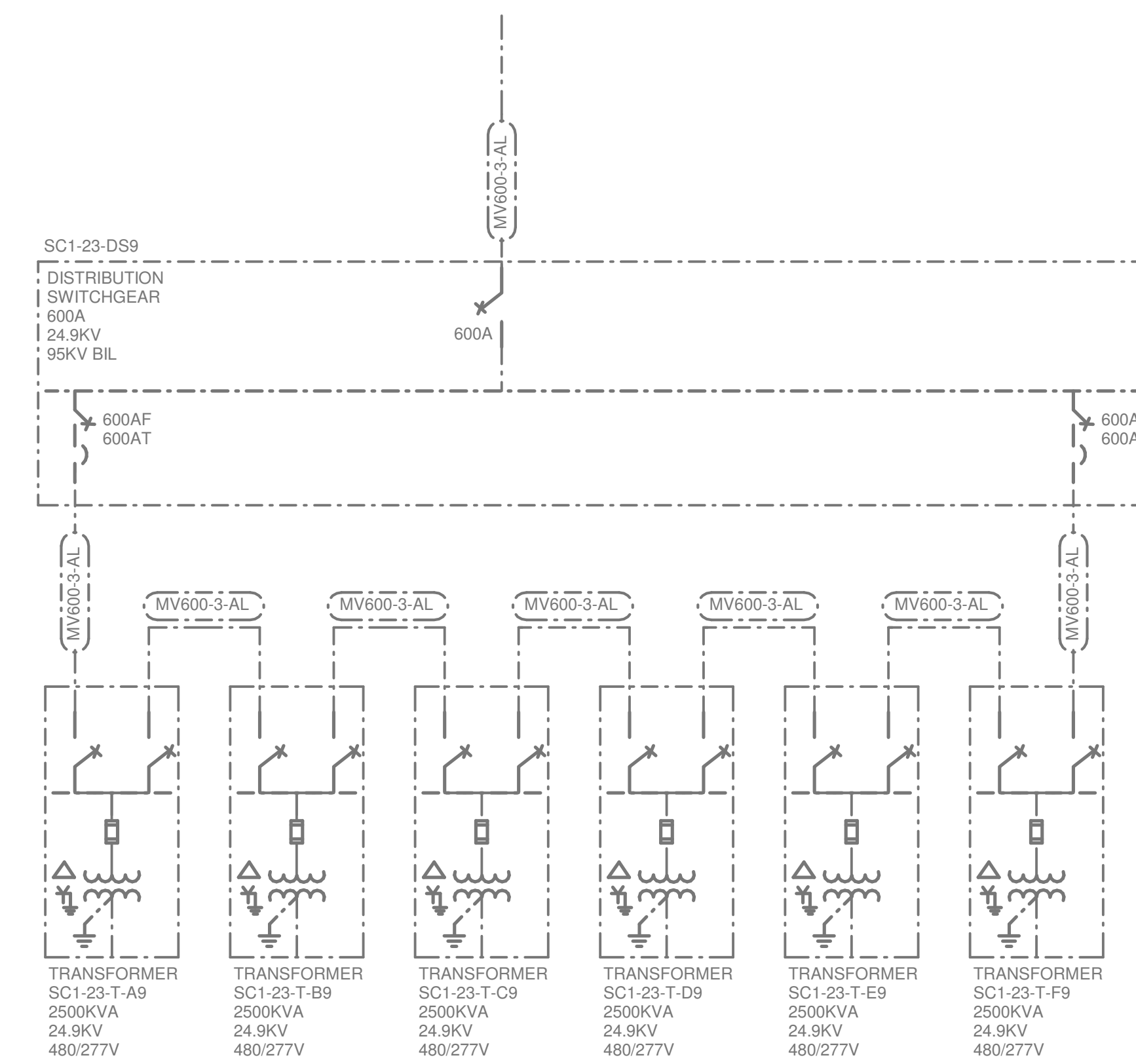
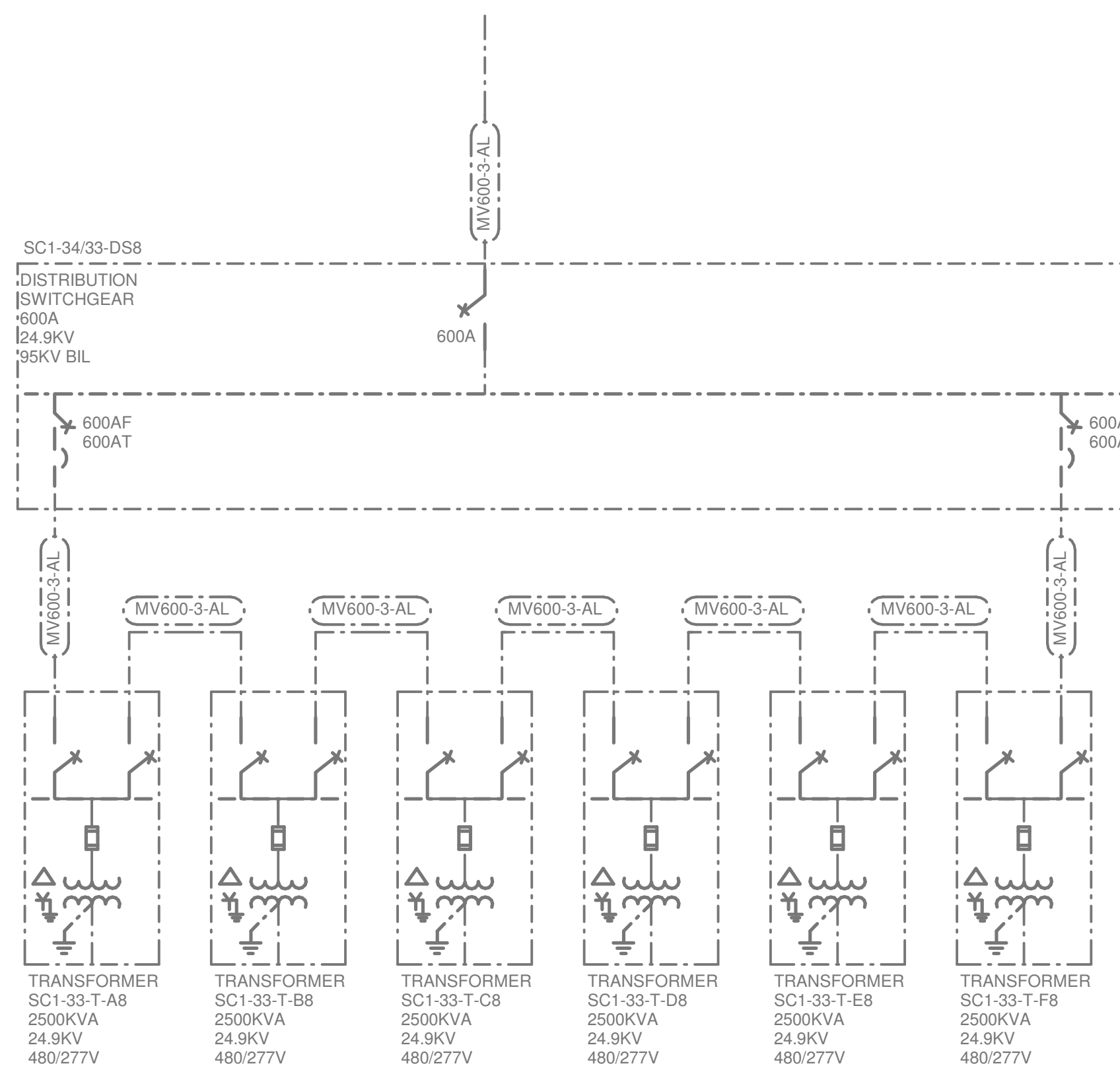
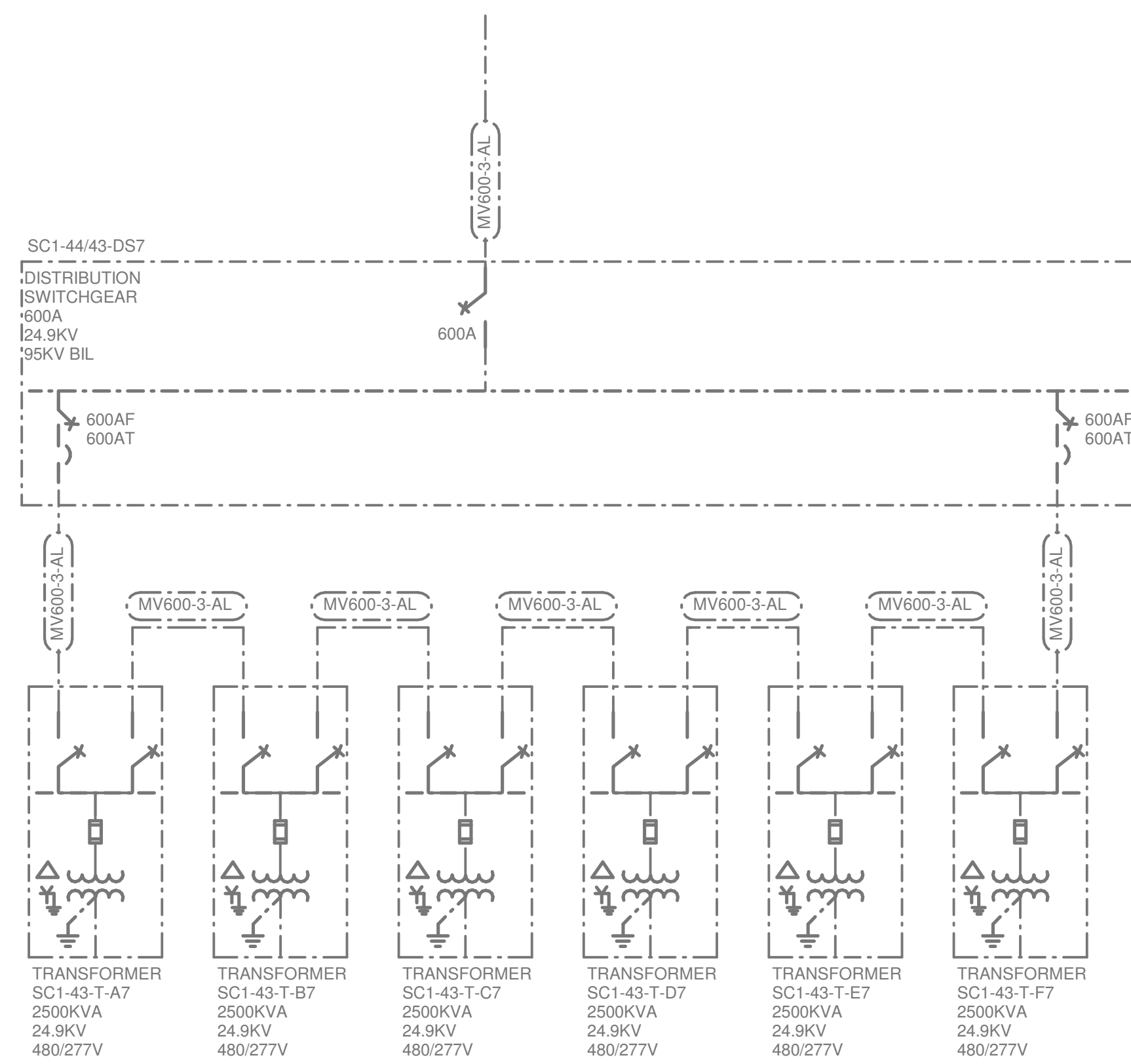
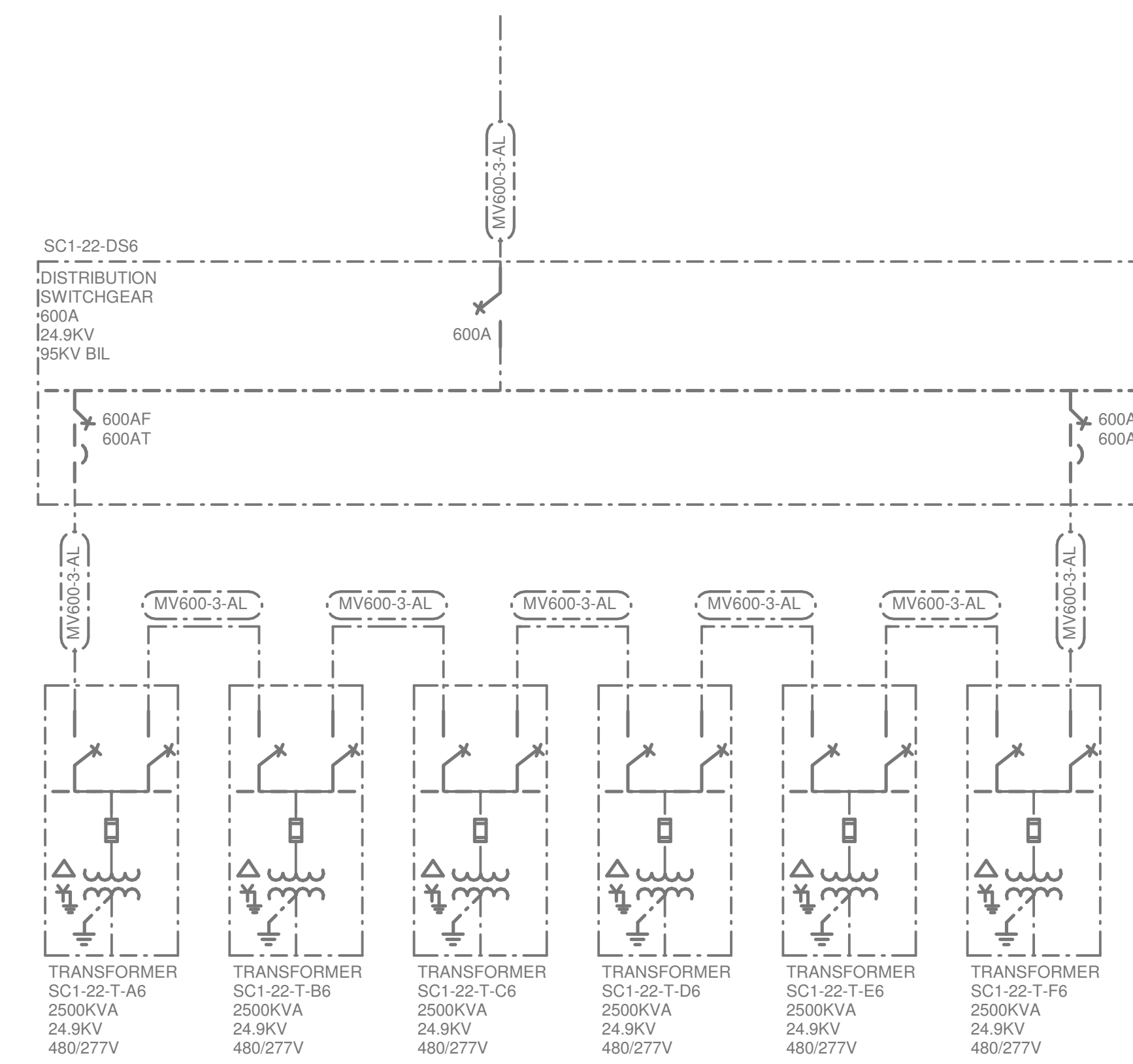
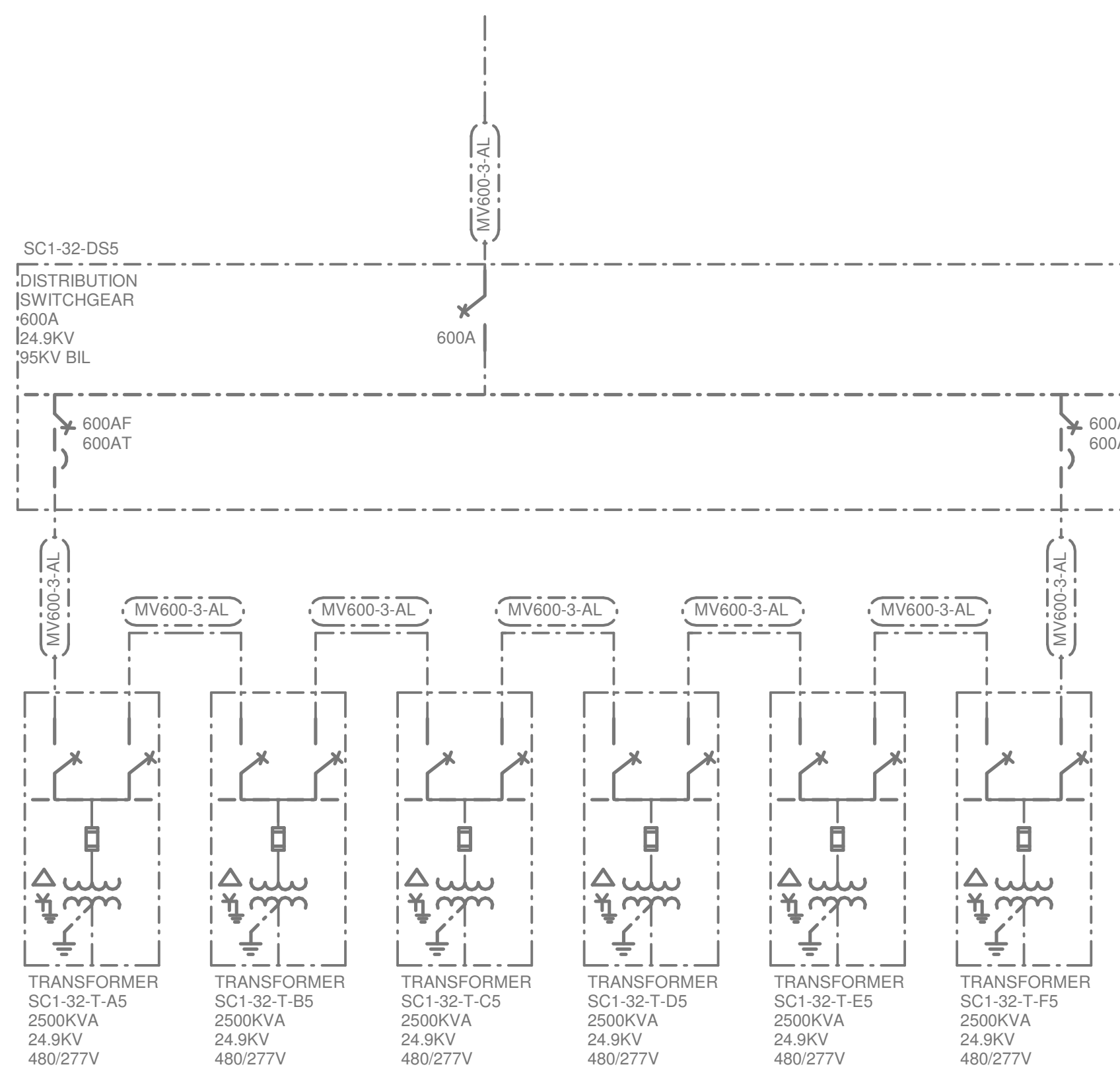
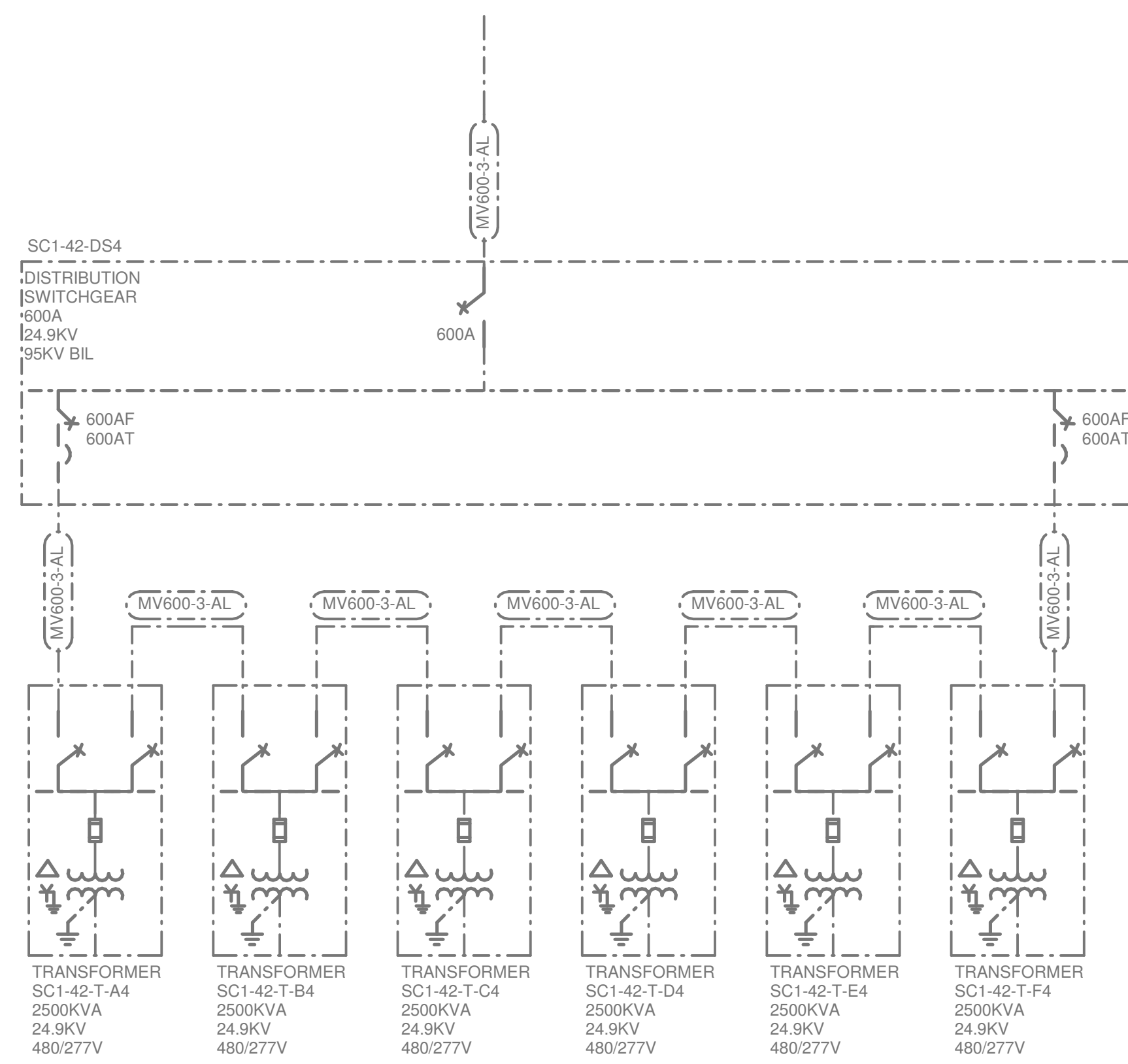
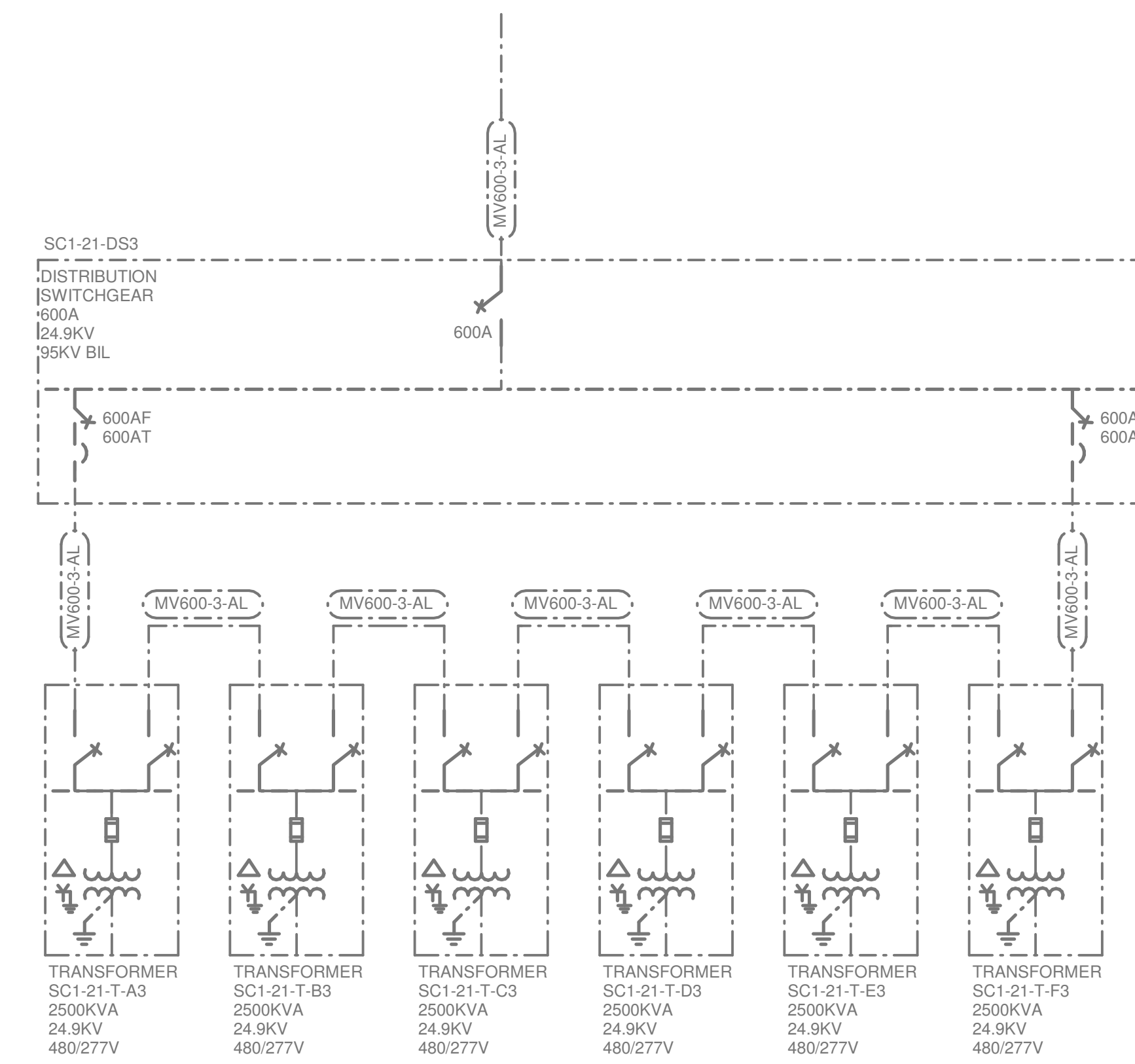
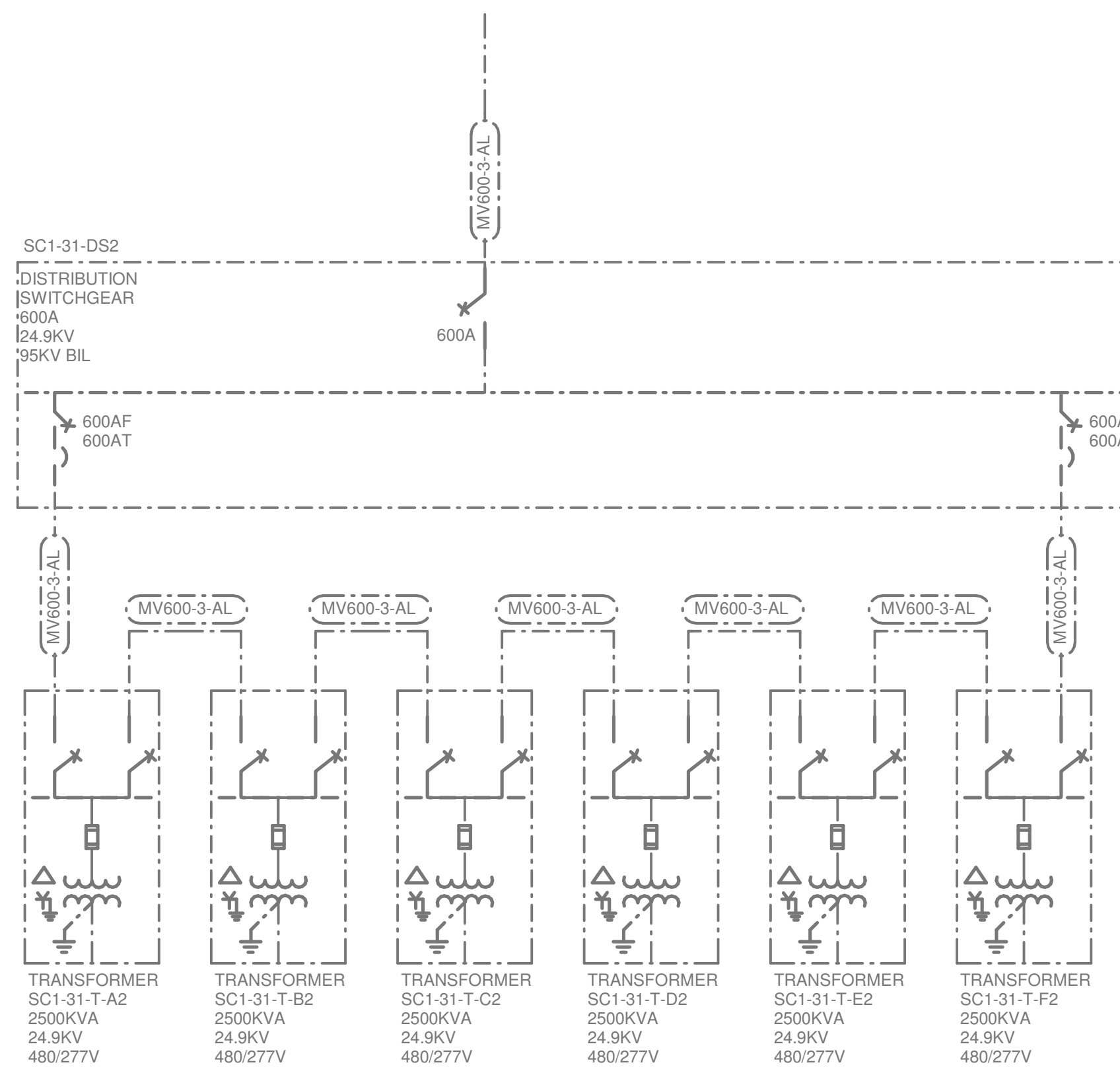
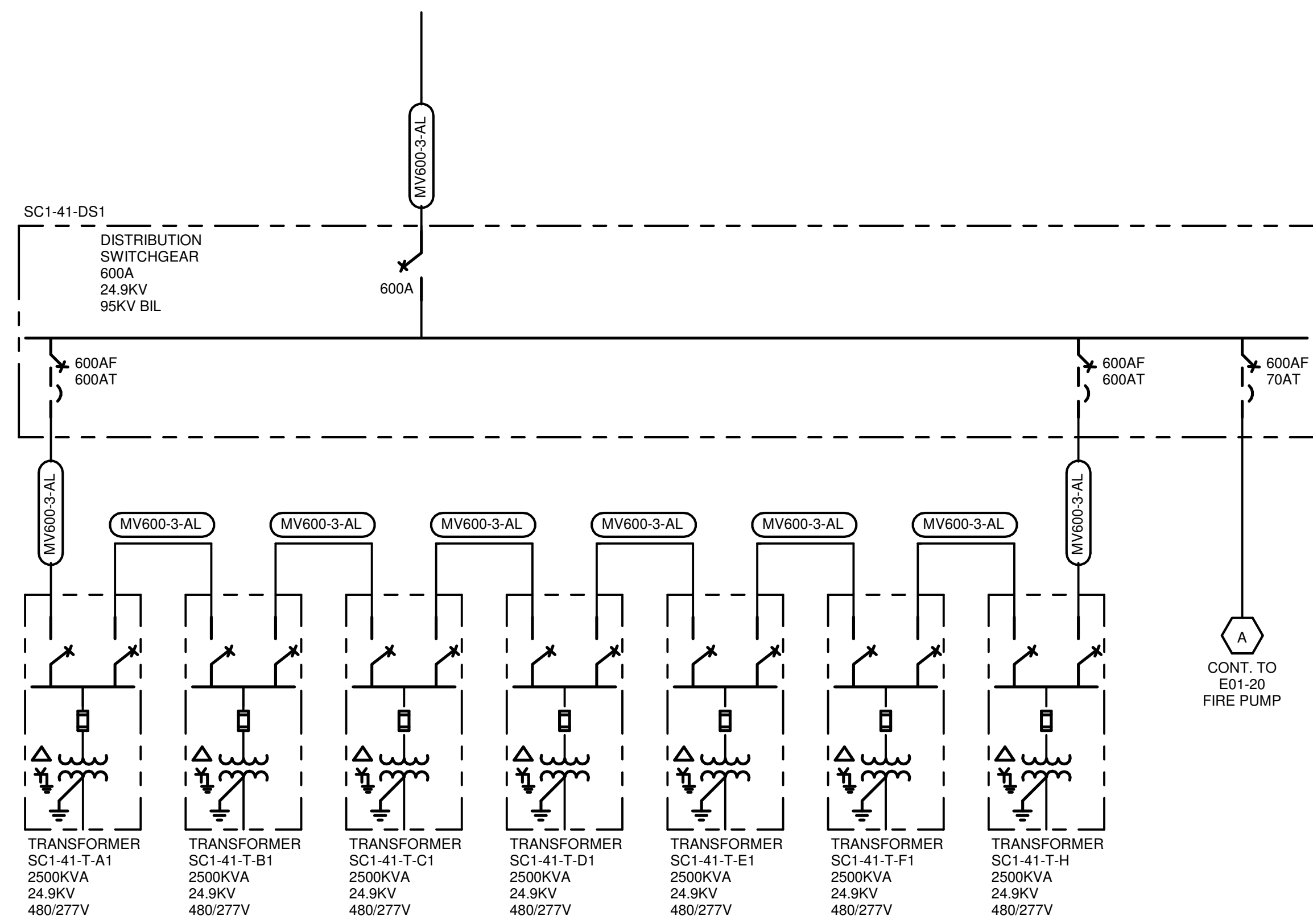


ELECTRICAL FEEDER SCHEDULES

PROJECT NUMBER 19.030
DATE 08/01/2019
SHEET NUMBER

E01-00A

9/16/2019 2:34:41 PM E01-00C ONE-LINE DIAGRAM - MEDIUM VOLTAGE



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.653.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

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| REVISIONS | |
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| 1 | 09/16/2019 ADDENDUM 01 |

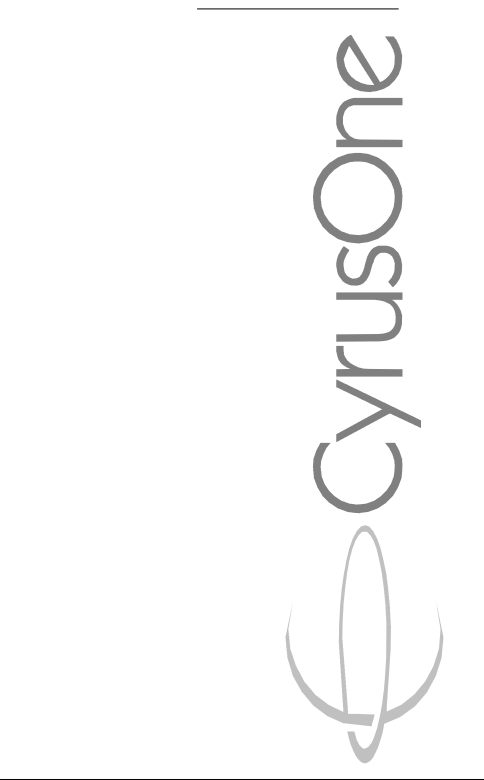
kw Contact: RICK SPARKMAN Phone: 971.221.6819

Stephen Coon, P.E.
License #: E22629 Expiration Date: 03/31/2021



Date: 08/23/2019

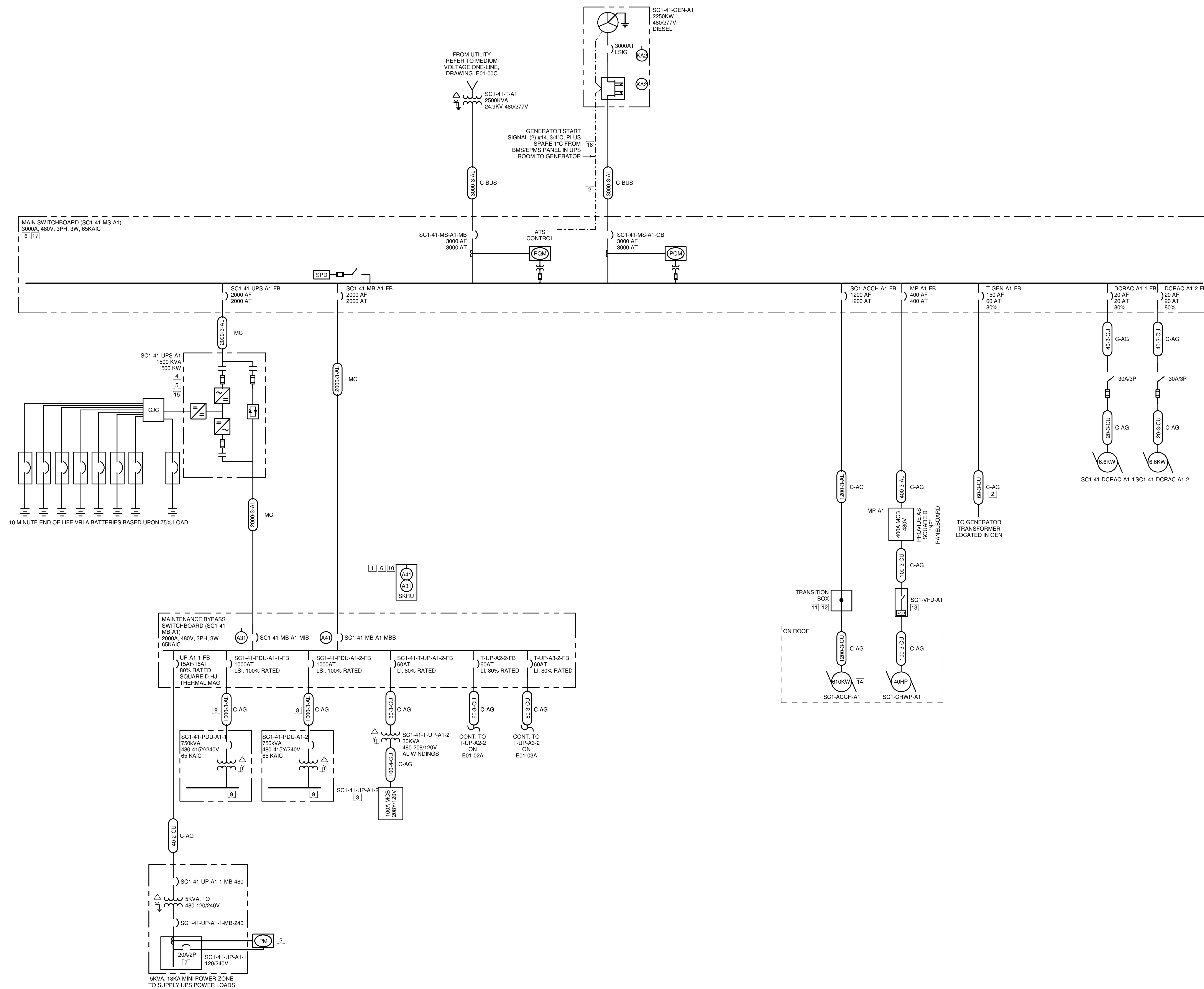
SANTA CLARA
2600 De La Cruz Blvd,
Santa Clara, CA 95050



ONE-LINE DIAGRAM - MEDIUM VOLTAGE

PROJECT 19.030
NUMBER
DATE 08/01/2019
SHEET NUMBER

E01-00C



MAIN SWITCHBOARD (SC1-41-MS-A1)
3000A, 480V, 3PH, 3W, 65KAIC

10 MINUTE END OF LIFE VRLA BATTERIES BASED UPON 75% LOAD.

MAINTENANCE BYPASS SWITCHBOARD (SC1-41-MB-A1)
2000A, 480V, 3PH, 3W, 65KAIC

UP-A1-1-FB 15AF/15AT 80% RATED SQUARE D HJ THERMAL MAG

SC1-41-PDU-A1-1-FB 1000AT LSI, 100% RATED

SC1-41-PDU-A1-2 750kVA 480-415Y/240V 65 KAIC

SC1-41-PDU-A1-1 750kVA 480-415Y/240V 65 KAIC

SC1-41-UP-A1-1 120/240V

SC1-41-UP-A1-1-MB-480 5kVA, 1Ø 480-120/240V

SC1-41-UP-A1-1-MB-240 20A/2P

SC1-41-UP-A1-1 120/240V

5kVA, 18KA MINI POWER-ZONE TO SUPPLY UPS POWER LOADS

GENERAL NOTES

- REFER TO E00-01 FOR LINE TYPE LEGEND.
- REFER TO THE E02-00 SERIES DRAWINGS FOR EQUIPMENT LOCATIONS.
- CIRCUIT BREAKERS ARE 3P, 100% RATED WITH LSI TRIP UNITS UNLESS NOTED OTHERWISE.
- EQUIPMENT IN PRE-PURCHASE MATRIX IS FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. MATERIALS (CABLE, RACEWAY, ETC.) REQUIRED FOR INSTALLATION AND CONNECTION OF PRE-PURCHASED EQUIPMENT IS BY CONTRACTOR UNLESS OTHERWISE NOTED. ANY EQUIPMENT NOT IN THE MATRIX AND NOT SPECIFICALLY CALLED OUT AS BEING OWNER FURNISHED SHALL BE FURNISHED AND INSTALLED COMPLETELY BY THE CONTRACTOR.
- THE ROUTING OF THIS CABLE SHALL BE NEAT AND A PLAN SHALL BE PRESENTED TO THE OWNER AND ENGINEER DETAILING PROPOSED ROUTING FOR APPROVAL PRIOR TO BEGINNING THIS WORK.
- ENGINEER SHALL PROVIDE ELECTRICAL CONTRACTOR A SPREADSHEET PRIOR TO COMMISSIONING WITH A LIST OF ALL THE CIRCUIT BREAKER TYPES AND PLUGS USED TO CONSTRUCT THE MODEL FOR THE COORDINATION STUDY. ELECTRICAL CONTRACTOR SHALL TAKE SPREADSHEET INTO THE FIELD AND VERIFY EACH BREAKER IN SHEET MATCHES WHAT IS INSTALLED. PROVIDE LIST OF DISCREPANCIES, IF ANY, TO THE ENGINEER WITHIN 3 WORKING DAYS OF RECEIPT OF DOCUMENT.
- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE SET OF AS-BUILT FEEDER CONFIGURATIONS AND LENGTHS TO THE ENGINEER FOR USE IN THE SHORT CIRCUIT AND ARC-FLASH STUDIES. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- REFER TO OWNER-FURNISHED EQUIPMENT SCHEDULE AND FEEDER SCHEDULES FOR ADDITIONAL INFORMATION.

KEYED NOTES

- REFER TO E01-40 FOR SKRU INTERLOCK SEQUENCE OF OPERATIONS. PROVIDE CONTROL POWER AND INTERCONNECTING CONTROL WIRING BETWEEN THE SKRU AND THE ASSOCIATED UPS MODULE AND MOUNT SKRU ON THE WALL ADJACENT TO THE MB SWITCHBOARD.
- (3) 1" CONDUITS FOR GENERATOR CIRCUITS. GENERATOR START SIGNAL FROM MAIN SWITCHBOARD CONTROL SECTION. GENERATOR MOTOR SERIAL CONNECTION FROM EPMS/BAS ENCLOSURE. 60A GENERATOR TRANSFORMER CIRCUIT FROM ASSOCIATED MAIN SWITCHBOARD SECTION.
- PROVIDE POWERLOGIC ENERGY METER, MODEL EM2010 WITH EMCB AND EMP2 ACCESSORIES. MOUNTED ADJACENT TO MPZ. PROVIDE 4# 1/2 IN 3/4" FROM 20A/2P BREAKER TO METER AND INSTALL CTs ON PANELBOARD MAIN FEEDER.
- TERMINATE (7) PARALLEL SETS OF CONDUCTORS ON THE AC INPUT, (7) PARALLEL SETS OF CONDUCTORS ON THE AC OUTPUT, AND INSTALL THE MANUFACTURER FURNISHED BUS JUMPER BETWEEN THE AC INPUT AND BYPASS BUSBARS. SEE DETAIL 6 ON E01-40 FOR UPS ARRANGEMENT. INSTALL THE MANUFACTURER FURNISHED DC CABLES IN AN 18" TRAY BETWEEN THE CENTER JUNCTION CABINET (CJC) AND UPS DC INPUTS, AND PROVIDE A #1 GROUND FROM THE UPS GROUND BUS TO THE CJC GROUND BUS.
- TERMINATE (6) SETS OF 777KCMIL DC CONDUCTORS BETWEEN THE CJC AND UPS MODULE. THESE CONDUCTORS ARE SUPPLIED WITH THE UPS AND CJC CABINET. SETS SHALL BE ROUTED IN A SINGLE ROW ON A CABLE TRAY BETWEEN THE UPS AND CJC. PROVIDE A 250KCMIL COPPER GROUNDING CONDUCTOR FROM THE CJC BUS TO UPS MODULE. CABLE TRAY TO BE SIZED TO ALLOW ONE ADDITIONAL SET OF (2) 350KCMIL DC CONDUCTORS FOR CONNECTION BETWEEN BATTERY CABINET & AND CJC.
- PROVIDE A 15A, 120V UPS CIRCUIT FROM THE UPS MINI-POWER ZONE TO THE EXTERNAL 120V CONTROL POWER INPUT ON THE MAIN SWITCHBOARD. CIRCUIT SHALL BE (2)#14,(1)#14G. THIS CIRCUIT SHALL ALSO SUPPLY THE SOLENOID KEY RELEASE UNIT (SKRU) ADJACENT TO THE MB SWITCHBOARD.
- PROVIDE SUFFICIENT BRANCH CIRCUIT BREAKERS IN EACH MINI POWER ZONE TO SUPPLY UPS LOADS WITHIN ROOM PLUS SPARE BREAKERS. UPS PANEL (UP), 20A/2P POWER METER, 20A/1P BTECH BATTERY MONITORING, 20A/1P BMS/EPMS CONTROL PANEL, 20A/1P VESDA SMOKE DETECTION, 15A/1P MAIN SWBD CONTROL POWER, 20A/1P SPARE (x4).
- REFER TO THE ROUTING DRAWINGS FOR ADDITIONAL INFORMATION. CONTRACTOR TO PROVIDE A MOCK UP OF FIRST TWO (2) PULLS ON EACH FLOOR FOR THE OWNERS APPROVAL PRIOR TO PERFORMING THE REMAINING ROUTING.
- 750KVA PDUS ARE PROVIDED WITH THREE (3) STAND ALONE SECONDARY SIDE 400A MOLDED CASE CIRCUIT BREAKERS TO SUPPLY LINE LOADS.
- REFER TO E01-40 FOR KEY INTERLOCK SEQUENCE OF OPERATIONS.
- FEEDER TO CHILLER TRANSITION BOX FROM MAIN SWITCHBOARD TO BE ALUMINUM. PROVIDE TRANSITION BOX INSIDE BUILDING PRIOR TO EXITING TO ROOF FOR TRANSITION TO COPPER. ROUTE FEEDER IN EMT THROUGH BUILDING AND TRANSITION TO RMC ON ROOF.
- PROVIDE UL LISTED COPPER-ALUMINUM REDUCING BUTT SPLICES, BUNRDY CATALOG NO. YR836U34 OR APPROVED EQUAL, PRE-FILLED WITH CORROSION INHIBITING COMPOUND. PROTECT SPLICE WITH UL LISTED HEAT SHRINK TUBING. TRANSITION FROM 600KCMIL ALUMINUM TO 400 KCMIL COPPER. PROVIDE PULLBOX TO ENCLOSE SPLICES AND TO SERVE AS A SUPPLEMENTAL PULL POINT PRIOR TO EXITING BUILDING TO ROOF.
- INSTALL CHILLED WATER PUMP DRIVE INSIDE GALLERY. REFER TO E00-00 SERIES DRAWINGS FOR LOCATION. COORDINATE WITH ALL TRADES.
- CHILLER CONTROL POWER CIRCUIT FOR TWO CONTROL PANELS MUST BE RERUN IN THE FIELD. ONE CONTROL PANEL AT EACH END OF CHILLER, TWO (2) MOTORIZED VALVES AT EACH CHILLER SHALL ALSO BE POWERED OFF CIRCUIT FEEDING CONTROL PANELS. REFER TO FLOOR PLANS FOR CIRCUIT ASSIGNMENTS AND DRAWING E01-40 FOR ADDITIONAL DETAILS.
- TERMINATE (2) 350 KCMIL DC CONDUCTORS FROM EACH OF EIGHT (8) BATTERY CABINETS TO CJC. THESE CONDUCTORS ARE SUPPLIED WITH THE UPS AND BATTERY CABINETS. PROVIDE A #1 COPPER GROUNDING CONDUCTOR FROM THE CJC BUS TO EACH BATTERY CABINET GROUND.
- CONTROL AND HOUSE POWER CONDUITS TO GENERATOR SHALL BE ROUTED OUT OF UPS ROOM AND FOLLOW THE ROUTE OF THE CABLEBUS TO THE GENERATOR. GENERATOR START SIGNAL (2#14, 3#4C) SHALL BE ROUTED FROM TRANSFER CONTROLLER TO GENERATOR TO ALLOW FOR START SIGNAL TO BE CONNECTED TO ROLL-UP GENERATOR AT TERMINAL STRIP.
- PROVIDE 2" BY 3" ADHESIVE WHITE LABEL WITH BLUE LETTERING AND AFFIX TO 3000A MAIN SWITCHBOARD. LABEL SHALL INDICATE AVAILABLE FAULT CURRENT AND DATE OF CALCULATION FOR ELECTRICAL SYSTEMS ANALYSIS. AVAILABLE FAULT CURRENT AND DATE OF CALCULATION TO BE PROVIDED BY THE ENGINEER AFTER AS-BUILT FEEDER LENGTHS ARE PROVIDED AND ARC-FLASH STUDY IS COMPLETED.



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.553.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
47 Perimeter Central East,
Suite 500 Atlanta, GA 30346

KIER+WRIGHT
2850 Collier Canyon Rd
Livermore, CA 94551

Design Consulting LLC
103 E Haring St. Howe TX 75459

NETT
2 Theatre Square, Suite 218, Orinda, CA 94563

| ISSUES | |
|--------|-------------------------------|
| 1 | 08/12/2019 DESIGN DEVELOPMENT |
| 2 | 08/01/2019 ISSUE FOR PERMIT |
| 3 | 08/23/2019 PCC REVIEW PACKAGE |

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| 1 | 09/16/2019 ADDENDUM 01 |

kw Contact: RICK SPARKMAN Phone: 971.221.6819

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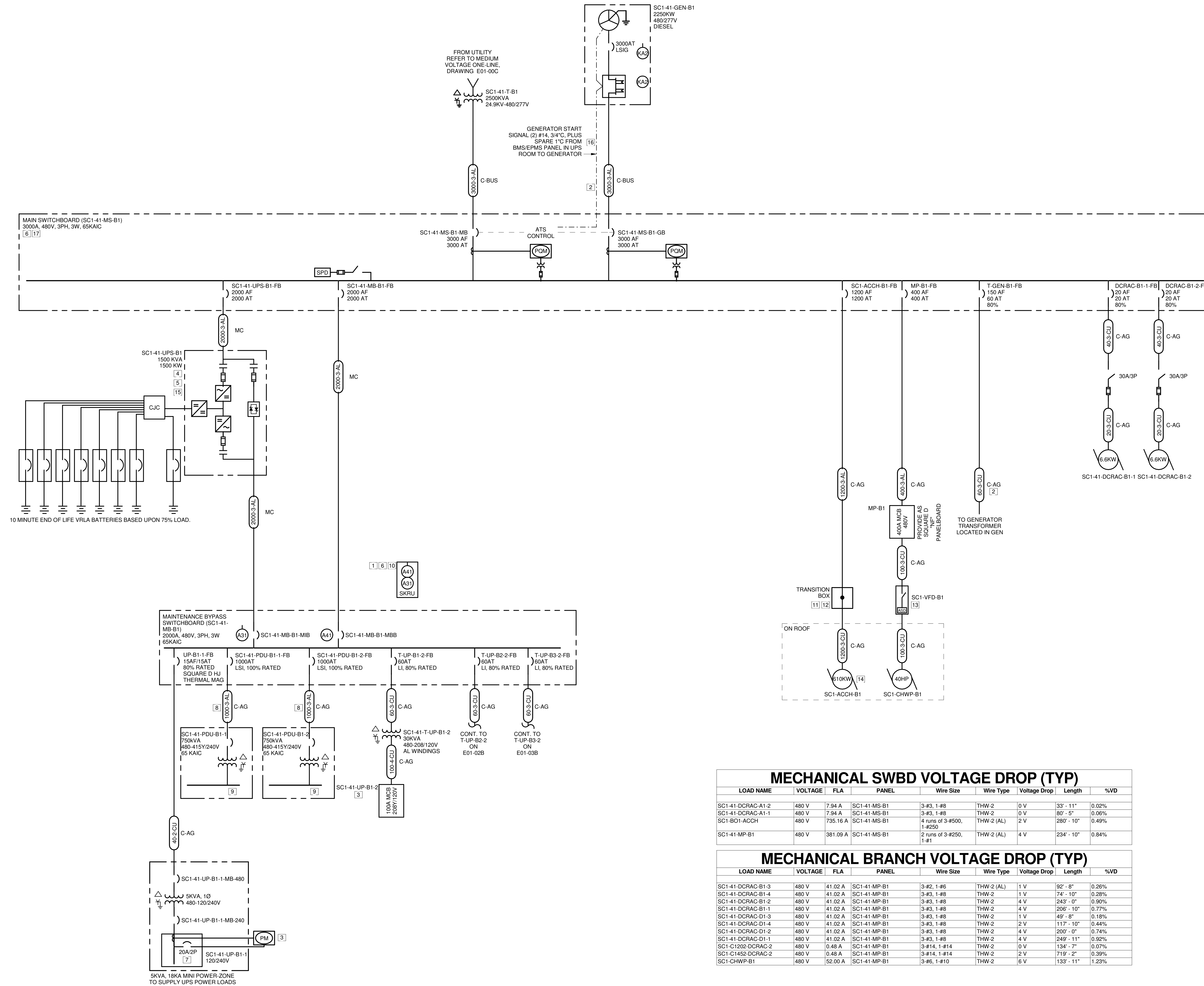
SANTA CLARA
2600 De La Cruz Blvd,
Santa Clara, CA 95050



ONE-LINE DIAGRAM - UPS ROOM A01

PROJECT NUMBER 19.030
DATE 08/01/2019
SHEET NUMBER

E01-01A



MECHANICAL SWBD VOLTAGE DROP (TYP)

| LOAD NAME | VOLTAGE | FLA | PANEL | Wire Size | Wire Type | Voltage Drop | Length | %VD |
|-------------------|---------|----------|--------------|-------------------------|------------|--------------|------------|-------|
| SC1-41-DCRAC-B1-2 | 480 V | 7.94 A | SC1-41-MS-B1 | 3-#3, 1-#8 | THW-2 | 0 V | 33' - 11" | 0.02% |
| SC1-41-DCRAC-A1-1 | 480 V | 7.94 A | SC1-41-MS-B1 | 3-#3, 1-#8 | THW-2 | 0 V | 80' - 5" | 0.06% |
| SC1-41-ACCH | 480 V | 735.16 A | SC1-41-MS-B1 | 4 nms of 3-#500, 1-#250 | THW-2 (AL) | 2 V | 280' - 10" | 0.49% |
| SC1-41-MP-B1 | 480 V | 381.09 A | SC1-41-MS-B1 | 2 nms of 3-#250, 1-#1 | THW-2 (AL) | 4 V | 234' - 10" | 0.84% |

MECHANICAL BRANCH VOLTAGE DROP (TYP)

| LOAD NAME | VOLTAGE | FLA | PANEL | Wire Size | Wire Type | Voltage Drop | Length | %VD |
|-------------------|---------|---------|--------------|--------------|------------|--------------|------------|-------|
| SC1-41-DCRAC-B1-3 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#2, 1-#6 | THW-2 (AL) | 1 V | 92' - 8" | 0.26% |
| SC1-41-DCRAC-B1-4 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 1 V | 74' - 10" | 0.28% |
| SC1-41-DCRAC-B1-2 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 4 V | 243' - 0" | 0.90% |
| SC1-41-DCRAC-B1-1 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 4 V | 206' - 10" | 0.77% |
| SC1-41-DCRAC-D1-3 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 1 V | 49' - 8" | 0.18% |
| SC1-41-DCRAC-D1-4 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 2 V | 117' - 10" | 0.44% |
| SC1-41-DCRAC-D1-2 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 4 V | 200' - 0" | 0.74% |
| SC1-41-DCRAC-D1-1 | 480 V | 41.02 A | SC1-41-MP-B1 | 3-#3, 1-#8 | THW-2 | 4 V | 249' - 11" | 0.92% |
| SC1-41-DCRAC-2 | 480 V | 0.48 A | SC1-41-MP-B1 | 3-#14, 1-#14 | THW-2 | 0 V | 134' - 7" | 0.07% |
| SC1-41-DCRAC-2 | 480 V | 0.48 A | SC1-41-MP-B1 | 3-#14, 1-#14 | THW-2 | 2 V | 719' - 2" | 0.39% |
| SC1-41-CHWP-B1 | 480 V | 52.00 A | SC1-41-MP-B1 | 3-#6, 1-#10 | THW-2 | 6 V | 133' - 11" | 1.23% |

GENERAL NOTES

- REFER TO E00-01 FOR LINE TYPE LEGEND.
- REFER TO THE E02-00 SERIES DRAWINGS FOR EQUIPMENT LOCATIONS.
- CIRCUIT BREAKERS ARE 3P, 100% RATED WITH LSI TRIP UNITS UNLESS NOTED OTHERWISE.
- EQUIPMENT IN PRE-PURCHASE MATRIX IS FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. MATERIALS (CABLE, RACEWAY, ETC.) REQUIRED FOR INSTALLATION AND CONNECTION OF PRE-PURCHASED EQUIPMENT IS BY CONTRACTOR UNLESS OTHERWISE NOTED. ANY EQUIPMENT NOT IN THE MATRIX AND NOT SPECIFICALLY CALLED OUT AS BEING OWNER FURNISHED SHALL BE FURNISHED AND INSTALLED COMPLETE BY THE CONTRACTOR.
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- REFER TO OWNER-FURNISHED EQUIPMENT SCHEDULE AND WIRING SCHEDULES FOR ADDITIONAL INFORMATION.

KEYED NOTES

- REFER TO E01-40 FOR SKRU INTERLOCK SEQUENCE OF OPERATIONS. PROVIDE CONTROL POWER AND INTERCONNECTING CONTROL WIRING BETWEEN THE SKRU AND THE ASSOCIATED UPS MODULE AND MOUNT SKRU ON THE WALL ADJACENT TO THE MB SWITCHBOARD.
- (3) 1" CONDUITS FOR GENERATOR CIRCUITS. GENERATOR START SIGNAL FROM MAIN SWITCHBOARD CONTROL SECTION. GENERATOR MOTOR SERIAL CONNECTION FROM EPMS/BAS ENCLOSURE. 60A GENERATOR TRANSFORMER CIRCUIT FROM ASSOCIATED MAIN SWITCHBOARD SECTION.
- PROVIDE POWERLOGIC ENERGY METER, MODEL EM2810 WITH EMCB AND EMP2 ACCESSORIES. MOUNTED ADJACENT TO MP2. PROVIDE 4x #12 IN 3/4" FROM 20A/2P BREAKER TO METER AND INSTALL CTs ON PANELBOARD MAIN FEEDER.
- TERMINATE (7) PARALLEL SETS OF CONDUCTORS ON THE AC INPUT, (7) PARALLEL SETS OF CONDUCTORS ON THE AC OUTPUT, AND INSTALL THE MANUFACTURER-FURNISHED BUS JUMPER BETWEEN THE AC INPUT AND BYPASS BUSBARS. SEE DETAIL 6 ON E01-40 FOR UPS ARRANGEMENT. INSTALL THE MANUFACTURER-FURNISHED DC CABLES IN AN 8" TRAY BETWEEN THE CENTER JUNCTION CABINET (CJC) AND UPS DC INPUTS, AND PROVIDE A #1 GROUND FROM THE UPS GROUND BUS TO THE CJC GROUND BUS.
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- PROVIDE A 15A, 120V UPS CIRCUIT FROM THE UPS MINI-POWER ZONE TO THE EXTERNAL 120V CONTROL POWER INPUT ON THE MAIN SWITCHBOARD. CIRCUIT SHALL BE (2)#14,(1)#14G. THIS CIRCUIT SHALL ALSO SUPPLY THE SOLENOID KEY RELEASE UNIT (SKRU) ADJACENT TO THE MB SWITCHBOARD.
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- REFER TO THE ROUTING DRAWINGS FOR ADDITIONAL INFORMATION. CONTRACTOR TO PROVIDE A MOCK UP OF FIRST TWO (2) POLS ON EACH FLOOR FOR THE OWNERS APPROVAL PRIOR TO PERFORMING THE REMAINING ROUTING.
- 750KVA PDUS ARE PROVIDED WITH THREE (3) STAND ALONE SECONDARY SIZE 400A MOLDED CASE CIRCUIT BREAKERS TO SUPPLY FUTURE LOADS.
- REFER TO E01-40 FOR KEY INTERLOCK SEQUENCE OF OPERATIONS.
- FEEDER TO CHILLER TRANSITION BOX FROM MAIN SWITCHBOARD TO BE ALUMINUM. PROVIDE TRANSITION BOX INSIDE BUILDING PRIOR TO EXITING TO ROOF FOR TRANSITION TO COPPER. ROUTE FEEDER IN EMT THROUGH BUILDING AND TRANSITION TO RMC ON ROOF.
- PROVIDE UL LISTED COPPER-ALUMINUM REDUCING BUTT SPLICES, BURNED CATALOG NO. YR836U34 OR APPROVED EQUAL, PRE-FILLED WITH CORROSION INHIBITING COMPOUND. PROTECT SPLICE WITH UL LISTED HEAT SHRINK TUBING. TRANSITION FROM 600KCMIL ALUMINUM TO 400 KCMIL COPPER. PROVIDE PULLBOX TO ENCLOSE SPLICES AND TO SERVE AS A SUPPLEMENTAL PULL POINT PRIOR TO EXITING BUILDING TO ROOF.
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- CONTROL AND HOUSE POWER CONDUITS TO GENERATOR SHALL BE ROUTED OUT OF UPS ROOM AND FOLLOW THE ROUTE OF THE CABLEBUS TO THE GENERATOR. GENERATOR START SIGNAL (2-#14, 3-#12) SHALL BE ROUTED FROM TRANSFER CONTROLLER TO GENERATOR TO ALLOW FOR START SIGNAL TO BE CONNECTED TO ROLL-UP GENERATOR AT TERMINAL STRIP.
- PROVIDE 2" BY 3" ADHESIVE WHITE LABEL WITH BLUE LETTERING AND AFFIX TO 3000A MAIN SWITCHBOARD. LABEL SHALL INDICATE AVAILABLE FAULT CURRENT AND DATE OF CALCULATION FOR ELECTRICAL SYSTEMS ANALYSIS. AVAILABLE FAULT CURRENT AND DATE OF CALCULATION TO BE PROVIDED BY THE ENGINEER AFTER AS-BUILT FEEDER LENGTHS ARE PROVIDED AND ARC-FLASH STUDY IS COMPLETED.



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.553.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
47 Perimeter Central East,
Suite 500 Atlanta, GA 30346

KIER+WRIGHT
2850 Collier Canyon Rd
Livermore, CA 94551

Design Consulting LLC
103 E Haring St. Howe TX 75459

NETT
2 Theatre Square, Suite 218, Orinda, CA 94563

ISSUES

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|---|------------|--------------------|
| 1 | 08/12/2019 | DESIGN DEVELOPMENT |
| 2 | 08/01/2019 | ISSUE FOR PERMIT |
| 3 | 08/23/2019 | PCC REVIEW PACKAGE |

REVISIONS

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| 1 | 09/16/2019 | ADDENDUM 01 |
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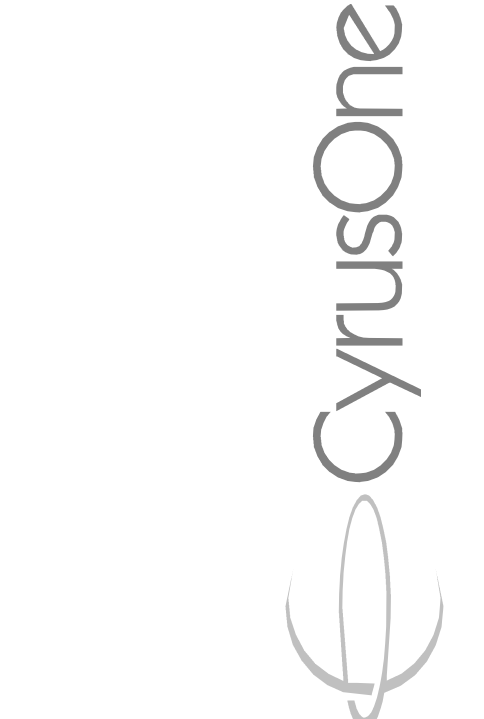
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Stephen Coon, P.E.
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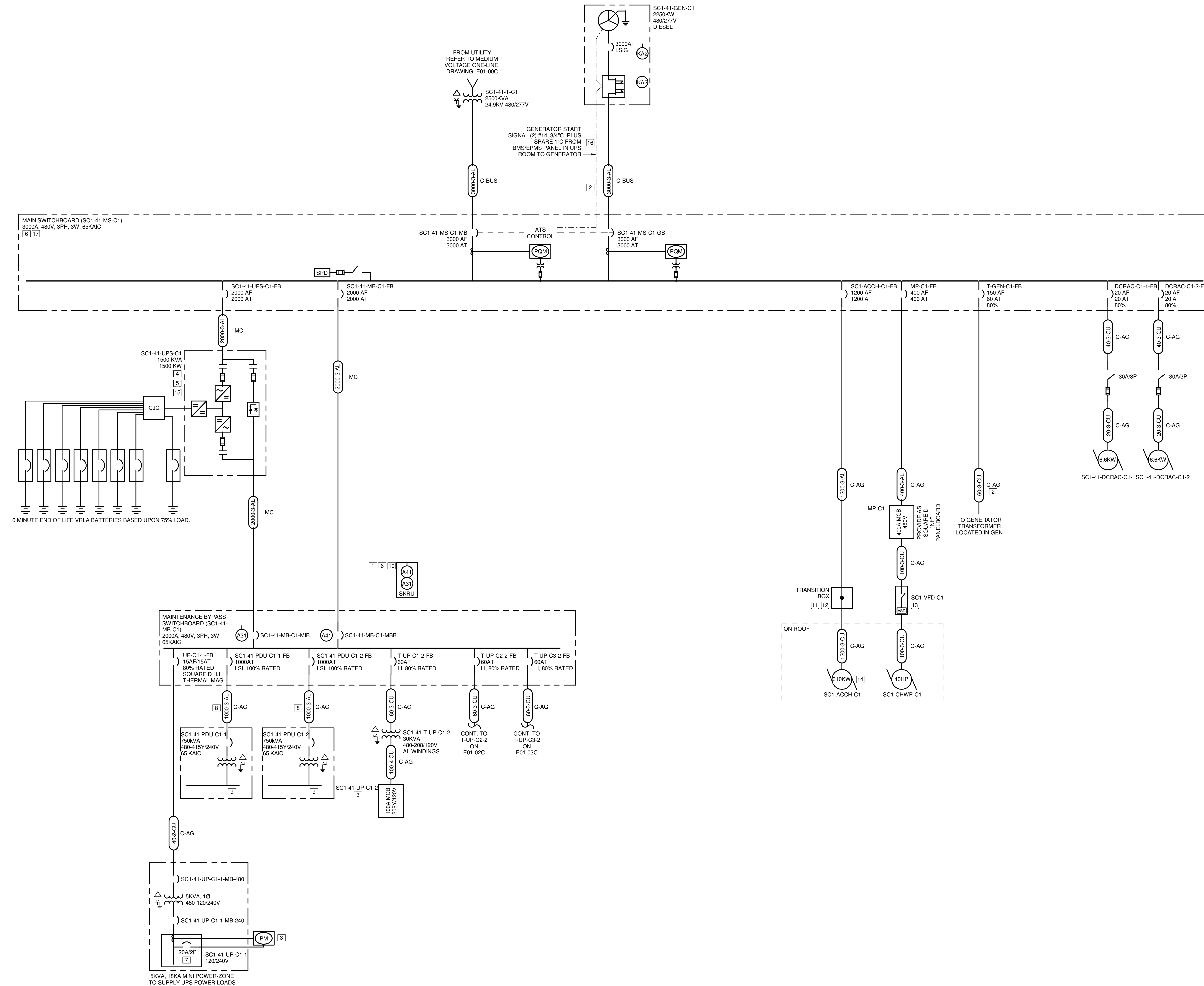
SANTA CLARA
2600 De La Cruz Blvd,
Santa Clara, CA 95050



ONE-LINE DIAGRAM - UPS ROOM B01

PROJECT NUMBER 19.030
DATE 08/01/2019
SHEET NUMBER

E01-01B



GENERAL NOTES

- REFER TO E00-01 FOR LINE TYPE LEGEND.
- REFER TO THE E02-00 SERIES DRAWINGS FOR EQUIPMENT LOCATIONS.
- CIRCUIT BREAKERS ARE 3P, 100% RATED WITH LSI TRIP UNITS UNLESS NOTED OTHERWISE.
- EQUIPMENT IN PRE-PURCHASE MATRIX IS FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. MATERIALS (CABLE, RACEWAY, ETC.) REQUIRED FOR INSTALLATION AND CONNECTION OF PRE-PURCHASED EQUIPMENT IS BY CONTRACTOR UNLESS OTHERWISE NOTED. ANY EQUIPMENT NOT IN THE MATRIX AND NOT SPECIFICALLY CALLED OUT AS BEING OWNER FURNISHED SHALL BE FURNISHED AND INSTALLED COMPLETELY BY THE CONTRACTOR.
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KEYED NOTES

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- (3) 1" CONDUITS FOR GENERATOR CIRCUITS. GENERATOR START SIGNAL FROM MAIN SWITCHBOARD CONTROL SECTION. GENERATOR MOTOR SERIAL CONNECTION FROM EPMS/BAS ENCLOSURE. 80A GENERATOR TRANSFORMER CIRCUIT FROM ASSOCIATED MAIN SWITCHBOARD SECTION.
- PROVIDE POWERLOGIC ENERGY METER, MODEL EM2010 WITH EMCB AND EMP2 ACCESSORIES. MOUNTED ADJACENT TO MP2. PROVIDE 4# 1/2" 3/4" C FROM 20A/2P BREAKER TO METER AND INSTALL CTs ON PANELBOARD MAIN FEEDER.
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- PROVIDE A 15A, 120V UPS CIRCUIT FROM THE UPS MINI-POWER ZONE TO THE EXTERNAL 120V CONTROL POWER INPUT ON THE MAIN SWITCHGEAR. CIRCUIT SHALL BE (2)#14,(1)#14G. THIS CIRCUIT SHALL ALSO SUPPLY THE SOLENOID KEY RELEASE UNIT (SKRU) ADJACENT TO THE MB SWITCHBOARD.
- PROVIDE SUFFICIENT BRANCH CIRCUIT BREAKERS IN EACH MINI POWER ZONE TO SUPPLY UPS LOADS WITHIN ROOM PLUS SPARE BREAKERS. UPS PANEL (UP), 20A/2P POWER METER, 20A/1P BTECH BATTERY MONITORING, 20A/1P BMS/EPMS CONTROL PANEL, 20A/1P VESDA SMOKE DETECTION, 15A/1P MAIN SWBD CONTROL POWER, 20A/1P SPARE (x4).
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- 750KVA PDUS ARE PROVIDED WITH THREE (3) STAND ALONE SECONDARY SIDE 400A MOLDED CASE CIRCUIT BREAKERS TO SUPPLY FUTURE LOADS.
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- FEEDER TO CHILLER TRANSITION BOX FROM MAIN SWITCHBOARD TO BE ALUMINUM. PROVIDE TRANSITION BOX INSIDE BUILDING PRIOR TO EXITING TO ROOF FOR TRANSITION TO COPPER. ROUTE FEEDER IN EMT THROUGH BUILDING AND TRANSITION TO RMC ON ROOF.
- PROVIDE UL LISTED COPPER-ALUMINUM REDUCING BUTT SPLICES, BUNRDY CATALOG NO. YRB36U34 OR APPROVED EQUAL. PRE-FILLED WITH CORROSION INHIBITING COMPOUND. PROTECT SPLICE WITH UL LISTED HEAT SHRINK TUBING. TRANSITION FROM 600KCMIL ALUMINUM TO 400 KCMIL COPPER. PROVIDE PULLBOX TO ENCLOSE SPLICES AND TO SERVE AS A SUPPLEMENTAL PULL POINT PRIOR TO EXITING BUILDING TO ROOF.
- INSTALL CHILLED WATER PUMP DRIVE INSIDE GALLERY. REFER TO E00-00 SERIES DRAWINGS FOR LOCATION. COORDINATE WITH ALL TRADES.
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- PROVIDE 2" BY 3" ADHESIVE WHITE LABEL WITH BLUE LETTERING AND AFFIX TO 300A MAIN SWITCHBOARD. LABEL SHALL INDICATE AVAILABLE FAULT CURRENT AND DATE OF CALCULATION FOR ELECTRICAL SYSTEMS ANALYSIS. AVAILABLE FAULT CURRENT AND DATE OF CALCULATION TO BE PROVIDED BY THE ENGINEER AFTER AS-BUILT FEEDER LENGTHS ARE PROVIDED AND ARC-FLASH STUDY IS COMPLETED.



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.553.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
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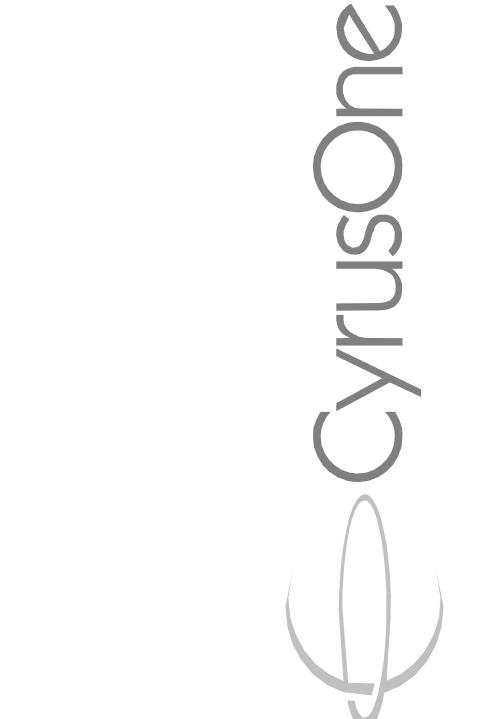
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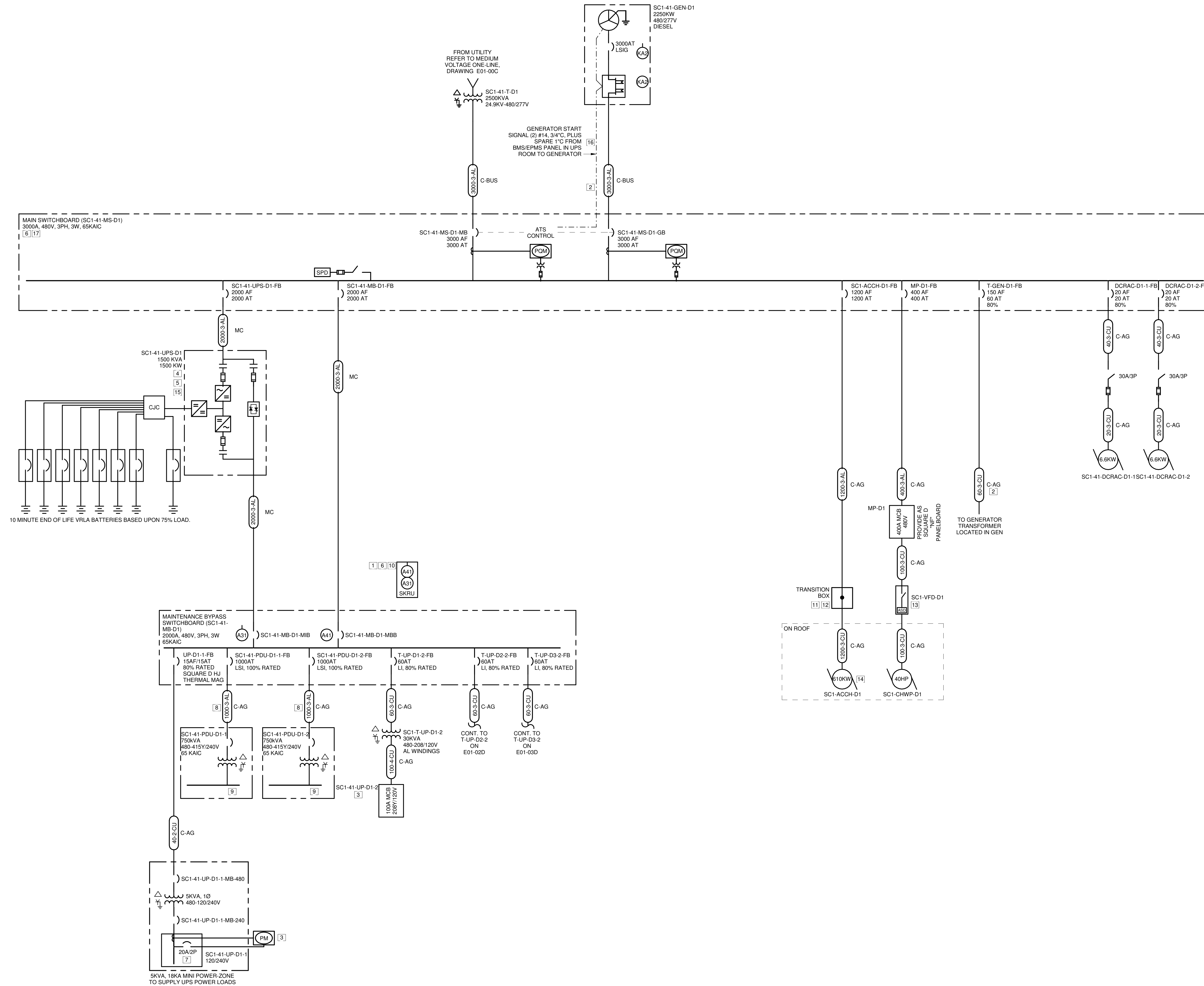
SANTA CLARA
2600 De La Cruz Blvd,
Santa Clara, CA 95050



ONE-LINE DIAGRAM - UPS ROOM C01

PROJECT 19.030
NUMBER
DATE 08/01/2019
SHEET NUMBER

E01-01C



GENERAL NOTES

- REFER TO E00-01 FOR LINE TYPE LEGEND.
- REFER TO THE E02-00 SERIES DRAWINGS FOR EQUIPMENT LOCATIONS.
- CIRCUIT BREAKERS ARE 3P, 100% RATED WITH LSI TRIP UNITS UNLESS NOTED OTHERWISE.
- EQUIPMENT IN PRE-PURCHASE MATRIX IS FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. MATERIALS (CABLE, RACEWAY, ETC.) REQUIRED FOR INSTALLATION AND CONNECTION OF PRE-PURCHASED EQUIPMENT IS BY CONTRACTOR UNLESS OTHERWISE NOTED. ANY EQUIPMENT NOT IN THE MATRIX AND NOT SPECIFICALLY CALLED OUT AS BEING OWNER FURNISHED SHALL BE FURNISHED AND INSTALLED COMPLETELY BY THE CONTRACTOR.
- THE ROUTING OF THIS CABLE SHALL BE NEAT AND A PLAN SHALL BE PRESENTED TO THE OWNER AND ENGINEER DETAILING PROPOSED ROUTING FOR APPROVAL PRIOR TO BEGINNING THIS WORK.
- ENGINEER SHALL PROVIDE ELECTRICAL CONTRACTOR A SPREADSHEET PRIOR TO COMMISSIONING WITH A LIST OF ALL THE CIRCUIT BREAKER TYPES AND PLUGS USED TO CONSTRUCT THE MODEL FOR THE COORDINATION STUDY. ELECTRICAL CONTRACTOR SHALL TAKE SPREADSHEET INTO THE FIELD AND VERIFY EACH BREAKER IN SHEET MATCHES WHAT IS INSTALLED. PROVIDE LIST OF DISCREPANCIES, IF ANY, TO THE ENGINEER WITHIN 3 WORKING DAYS OF RECEIPT OF DOCUMENT.
- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE SET OF AS-BUILT FEEDER CONFIGURATIONS AND LENGTHS TO THE ENGINEER FOR USE IN THE SHORT CIRCUIT AND ARC-FLASH STUDIES. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- REFER TO OWNER-FURNISHED EQUIPMENT SCHEDULE AND FEEDER SCHEDULES FOR ADDITIONAL INFORMATION.

KEYED NOTES

- REFER TO E01-40 FOR SKRU INTERLOCK SEQUENCE OF OPERATIONS. PROVIDE CONTROL POWER AND INTERCONNECTING CONTROL WIRING BETWEEN THE SKRU AND THE ASSOCIATED UPS MODULE AND MOUNT SKRU ON THE WALL ADJACENT TO THE MB SWITCHBOARD.
- (3) 1" CONDUITS FOR GENERATOR CIRCUITS. GENERATOR START SIGNAL FROM MAIN SWITCHBOARD CONTROL SECTION. GENERATOR MOTOR SERIAL CONNECTION FROM EPMS/BAS ENCLOSURE. 60A GENERATOR TRANSFORMER CIRCUIT FROM ASSOCIATED MAIN SWITCHBOARD SECTION.
- PROVIDE POWERLOGIC ENERGY METER, MODEL EM2010 WITH EMCB AND EMP2 ACCESSORIES. MOUNTED ADJACENT TO MP2. PROVIDE 4# 1/2 IN 3/4" FROM 20A/2P BREAKER TO METER AND INSTALL CTs ON PANELBOARD MAIN FEEDER.
- TERMINATE (7) PARALLEL SETS OF CONDUCTORS ON THE AC INPUT, (7) PARALLEL SETS OF CONDUCTORS ON THE AC OUTPUT, AND INSTALL THE MANUFACTURER-FURNISHED BUS JUMPER BETWEEN THE AC INPUT AND BYPASS BUSBARS. SEE DETAIL 6 ON E01-40 FOR UPS ARRANGEMENT. INSTALL THE MANUFACTURER-FURNISHED DC CABLES IN AN 18" TRAY BETWEEN THE CENTER JUNCTION CABINET (CJC) AND UPS DC INPUTS, AND PROVIDE A #1 GROUND FROM THE UPS GROUND BUS TO THE CJC GROUND BUS.
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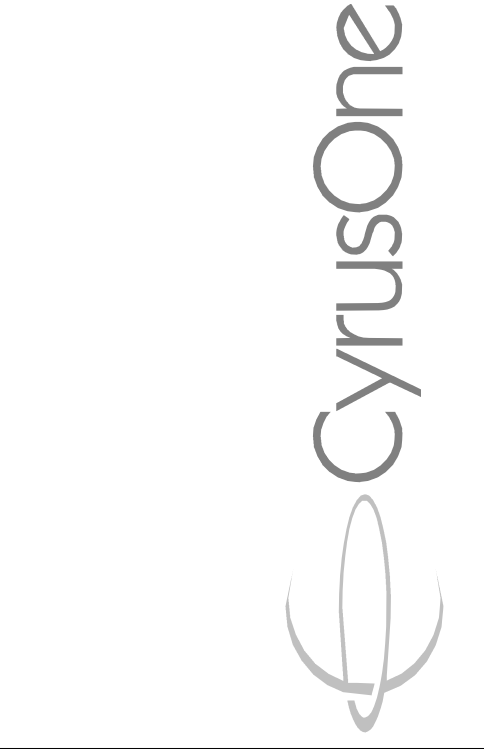
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| 1 | 09/16/2019 ADDENDUM 01 |

kw Contact: RICK SPARKMAN Phone: 971.221.6819

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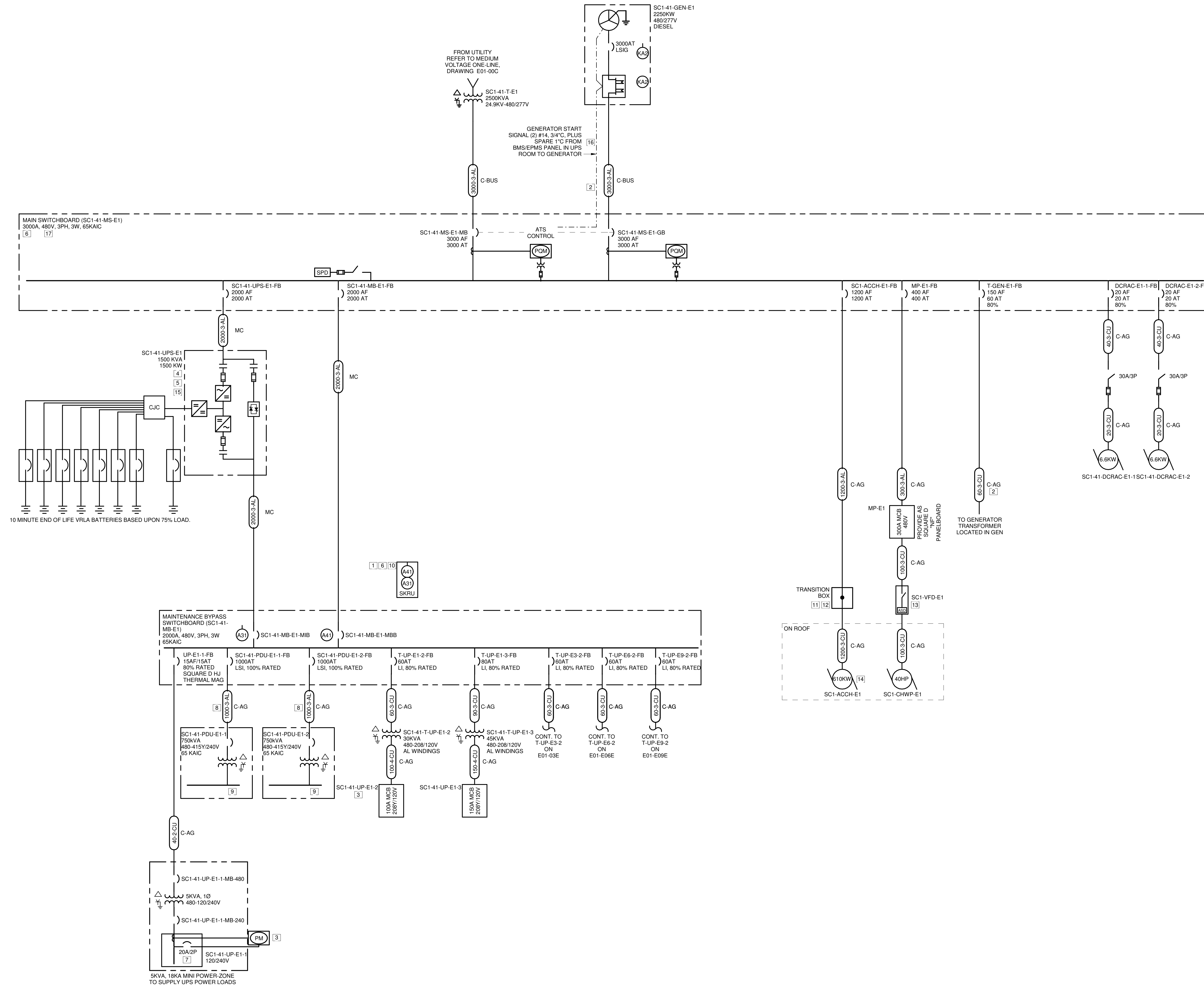
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ONE-LINE DIAGRAM - UPS ROOM D01

PROJECT 19.030
NUMBER
DATE 08/01/2019
SHEET NUMBER

E01-01D



MAIN SWITCHBOARD (SC1-41-MS-E1)
3000A, 480V, 3PH, 3W, 65KAIC

MAINTENANCE BYPASS SWITCHBOARD (SC1-41-MB-E1)
2000A, 480V, 3PH, 3W, 65KAIC

5KVA, 18KA MINI POWER-ZONE TO SUPPLY UPS POWER LOADS

10 MINUTE END OF LIFE VRLA BATTERIES BASED UPON 75% LOAD.

GENERAL NOTES

- REFER TO E00-01 FOR LINE TYPE LEGEND.
- REFER TO THE E02-00 SERIES DRAWINGS FOR EQUIPMENT LOCATIONS.
- CIRCUIT BREAKERS ARE 3P, 100% RATED WITH LSI TRIP UNITS UNLESS NOTED OTHERWISE.
- EQUIPMENT IN PRE-PURCHASE MATRIX IS FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. MATERIALS (CABLE, RACEWAY, ETC.) REQUIRED FOR INSTALLATION AND CONNECTION OF PRE-PURCHASED EQUIPMENT IS BY CONTRACTOR UNLESS OTHERWISE NOTED. ANY EQUIPMENT NOT IN THE MATRIX AND NOT SPECIFICALLY CALLED OUT AS BEING OWNER FURNISHED SHALL BE FURNISHED AND INSTALLED COMPLETELY BY THE CONTRACTOR.
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- (3) 1" CONDUITS FOR GENERATOR CIRCUITS. GENERATOR START SIGNAL FROM MAIN SWITCHBOARD CONTROL SECTION. GENERATOR MOTOR SERIAL CONNECTION FROM EPMS/BAS ENCLOSURE. 80A GENERATOR TRANSFORMER CIRCUIT FROM ASSOCIATED MAIN SWITCHBOARD SECTION.
- PROVIDE POWERLOGIC ENERGY METER, MODEL EM2010 WITH EMCB AND EMP2 ACCESSORIES. MOUNTED ADJACENT TO MP2. PROVIDE 4# 1/2 IN 3/4" FROM 20A/2P BREAKER TO METER AND INSTALL CTS ON PANELBOARD MAIN FEEDER.
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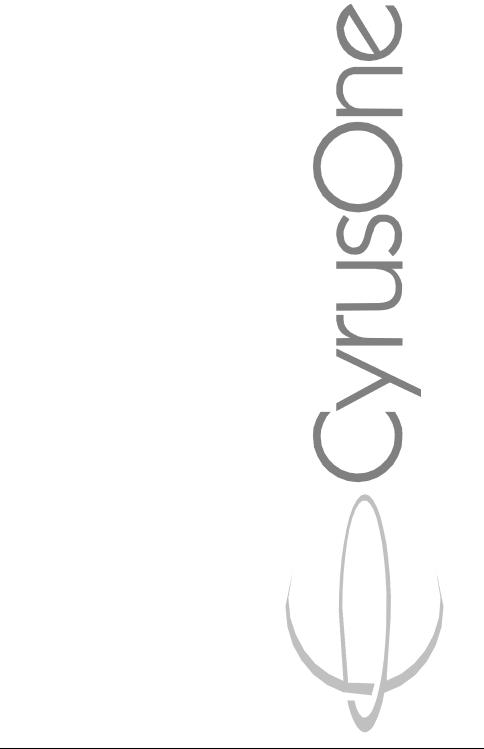
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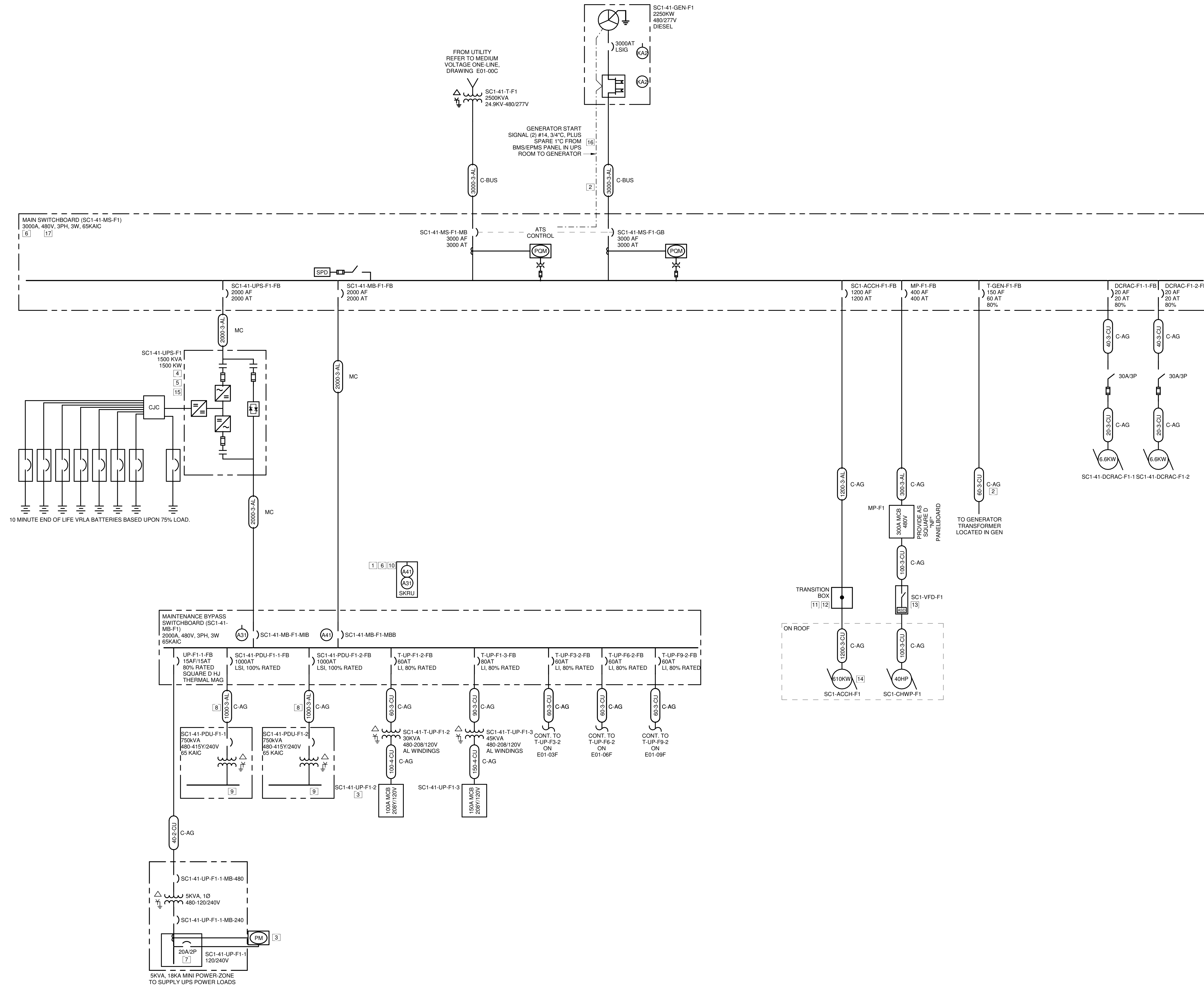
SANTA CLARA
2600 De La Cruz Blvd., Santa Clara, CA 95050



ONE-LINE DIAGRAM - UPS ROOM E01

PROJECT 19.030
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E01-01E



GENERAL NOTES

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- REFER TO THE E02-00 SERIES DRAWINGS FOR EQUIPMENT LOCATIONS.
- CIRCUIT BREAKERS ARE 3P, 100% RATED WITH LSI TRIP UNITS UNLESS NOTED OTHERWISE.
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- (3) 1" CONDUITS FOR GENERATOR CIRCUITS. GENERATOR START SIGNAL FROM MAIN SWITCHBOARD CONTROL SECTION. GENERATOR MOTOR SERIAL CONNECTION FROM EPMS/BAS ENCLOSURE. 60A GENERATOR TRANSFORMER CIRCUIT FROM ASSOCIATED MAIN SWITCHBOARD SECTION.
- PROVIDE POWERLOGIC ENERGY METER, MODEL EM2010 WITH EMCB AND EMP2 ACCESSORIES. MOUNTED ADJACENT TO MP2. PROVIDE 4# 1/2 IN 3/4" FROM 20A/2P BREAKER TO METER AND INSTALL CTs ON PANELBOARD MAIN FEEDER.
- TERMINATE (7) PARALLEL SETS OF CONDUCTORS ON THE AC INPUT, (7) PARALLEL SETS OF CONDUCTORS ON THE AC OUTPUT, AND INSTALL THE MANUFACTURER-FURNISHED BUS JUMPER BETWEEN THE AC INPUT AND BYPASS BUSBARS. SEE DETAIL 6 ON E01-40 FOR UPS ARRANGEMENT. INSTALL THE MANUFACTURER-FURNISHED DC CABLES IN AN 18" TRAY BETWEEN THE CENTER JUNCTION CABINET (CJC) AND UPS DC INPUTS, AND PROVIDE A #1 GROUND FROM THE UPS GROUND BUS TO THE CJC GROUND BUS.
- TERMINATE (6) SETS OF 777KCMIL DC CONDUCTORS BETWEEN THE CJC AND UPS MODULE. THESE CONDUCTORS ARE SUPPLIED WITH THE UPS AND CJC CABINET. SETS SHALL BE ROUTED IN A SINGLE ROW ON A CABLE TRAY BETWEEN THE UPS AND CJC. PROVIDE A 250KCMIL COPPER GROUNDING CONDUCTOR FROM THE CJC BUS TO UPS MODULE. CABLE TRAY TO BE SIZED TO ALLOW ONE ADDITIONAL SET OF (2) 350KCMIL DC CONDUCTORS FOR CONNECTION BETWEEN BATTERY CABINET & AND CJC.
- PROVIDE A 15A, 120V UPS CIRCUIT FROM THE UPS MINI-POWER ZONE TO THE EXTERNAL 120V CONTROL POWER INPUT ON THE MAIN SWITCHGEAR. CIRCUIT SHALL BE (2)#14,(1)#14G. THIS CIRCUIT SHALL ALSO SUPPLY THE SOLENOID KEY RELEASE UNIT (SKRU) ADJACENT TO THE MB SWITCHBOARD.
- PROVIDE SUFFICIENT BRANCH CIRCUIT BREAKERS IN EACH MINI POWER ZONE TO SUPPLY UPS LOADS WITHIN ROOM PLUS SPARE BREAKERS. UPS PANEL (UP), 20A/2P POWER METER, 20A/1P BTECH BATTERY MONITORING, 20A/1P BMS/EPMS CONTROL PANEL, 20A/1P VESDA SMOKE DETECTION, 15A/1P MAIN SWBD CONTROL POWER, 20A/1P SPARE (x4).
- REFER TO THE ROUTING DRAWINGS FOR ADDITIONAL INFORMATION. CONTRACTOR TO PROVIDE A MOCK UP OF FIRST TWO (2) PDUs ON EACH FLOOR FOR THE OWNERS APPROVAL PRIOR TO PERFORMING THE REMAINING ROUTING.
- 750KVA PDUS ARE PROVIDED WITH THREE (3) STAND ALONE SECONDARY SIDE 400A MOLDED CASE CIRCUIT BREAKERS TO SUPPLY FUTURE LOADS.
- REFER TO E01-40 FOR KEY INTERLOCK SEQUENCE OF OPERATIONS.
- FEEDER TO CHILLER TRANSITION BOX FROM MAIN SWITCHBOARD TO BE ALUMINUM. PROVIDE TRANSITION BOX INSIDE BUILDING PRIOR TO EXITING TO ROOF FOR TRANSITION TO COPPER. ROUTE FEEDER IN EMT THROUGH BUILDING AND TRANSITION TO RMC ON ROOF.
- PROVIDE UL LISTED COPPER-ALUMINUM REDUCING BUTT SPLICES, BUNRDY CATALOG NO. YRB36U34 OR APPROVED EQUAL, PRE-FILLED WITH CORROSION INHIBITING COMPOUND. PROTECT SPLICE WITH UL LISTED HEAT SHRINK TUBING. TRANSITION FROM 600KCMIL ALUMINUM TO 400 KCMIL COPPER. PROVIDE PULLBOX TO ENCLOSE SPLICES AND TO SERVE AS A SUPPLEMENTAL PULL POINT PRIOR TO EXITING BUILDING TO ROOF.
- INSTALL CHILLED WATER PUMP DRIVE INSIDE GALLERY. REFER TO E00-00 SERIES DRAWINGS FOR LOCATION. COORDINATE WITH ALL TRADES.
- CHILLER CONTROL POWER CIRCUIT FOR TWO CONTROL PANELS MUST BE RERUN IN THE FIELD. ONE CONTROL PANEL AT EACH END OF CHILLER, TWO (2) MOTORIZED VALVES AT EACH CHILLER SHALL ALSO BE POWERED OFF CIRCUIT FEEDING CONTROL PANELS. REFER TO FLOOR PLANS FOR CIRCUIT ASSIGNMENTS AND DRAWING E01-40 FOR ADDITIONAL DETAILS.
- TERMINATE (2) 350 KCMIL DC CONDUCTORS FROM EACH OF EIGHT (8) BATTERY CABINETS TO CJC. THESE CONDUCTORS ARE SUPPLIED WITH THE UPS AND BATTERY CABINETS. PROVIDE A #1 COPPER GROUNDING CONDUCTOR FROM THE CJC BUS TO EACH BATTERY CABINET GROUND.
- CONTROL AND HOUSE POWER CONDUITS TO GENERATOR SHALL BE ROUTED OUT OF UPS ROOM AND FOLLOW THE ROUTE OF THE CABLEBUS TO THE GENERATOR. GENERATOR START SIGNAL (2#14, 3#4C) SHALL BE ROUTED FROM TRANSFER CONTROLLER TO GENERATOR TO ALLOW FOR START SIGNAL TO BE CONNECTED TO ROLL-UP GENERATOR AT TERMINAL STRIP.
- PROVIDE 2" BY 3" ADHESIVE WHITE LABEL WITH BLUE LETTERING AND AFFIX TO 300A MAIN SWITCHBOARD. LABEL SHALL INDICATE AVAILABLE FAULT CURRENT AND DATE OF CALCULATION FOR ELECTRICAL SYSTEMS ANALYSIS. AVAILABLE FAULT CURRENT AND DATE OF CALCULATION TO BE PROVIDED BY THE ENGINEER AFTER AS-BUILT FEEDER LENGTHS ARE PROVIDED AND ARC-FLASH STUDY IS COMPLETED.



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.553.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
47 Perimeter Central East,
Suite 500 Atlanta, GA 30346

KIER+WRIGHT
2850 Collier Canyon Rd
Livermore, CA 94551

Design Consulting LLC
103 E Haring St, Howe TX 75459

NETT
2 Theatre Square, Suite 218, Orinda, CA 94563

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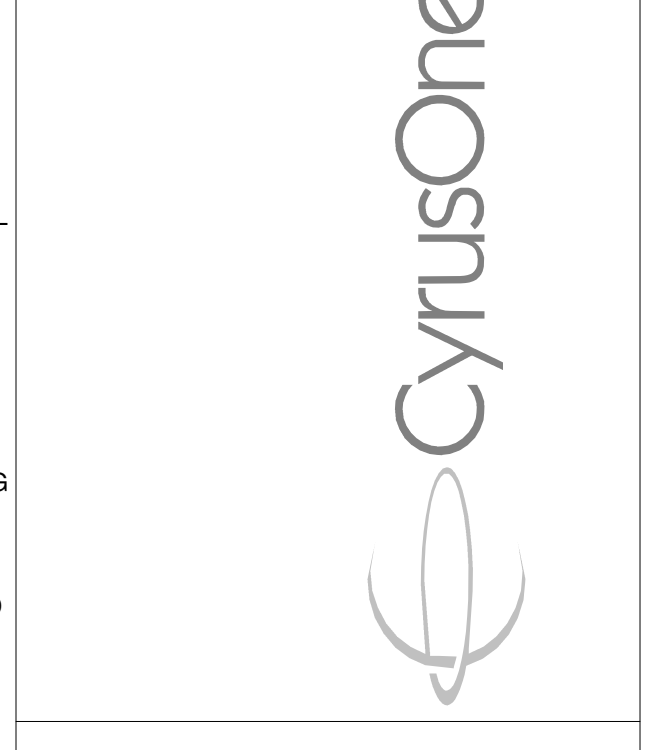
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2600 De La Cruz Blvd,
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ONE-LINE DIAGRAM - UPS ROOM F01

PROJECT NUMBER 19.030
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E01-01F



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401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.553.8281

kw Mission Critical Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
47 Penimeter Central East
Suite 500 Atlanta, GA 30346

KIER+WRIGHT
2850 Collier Canyon Rd
Livermore, CA 94551

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103 E Haring St. Howe TX 75459

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2850 Collier Canyon Rd, Orinda, CA 94563

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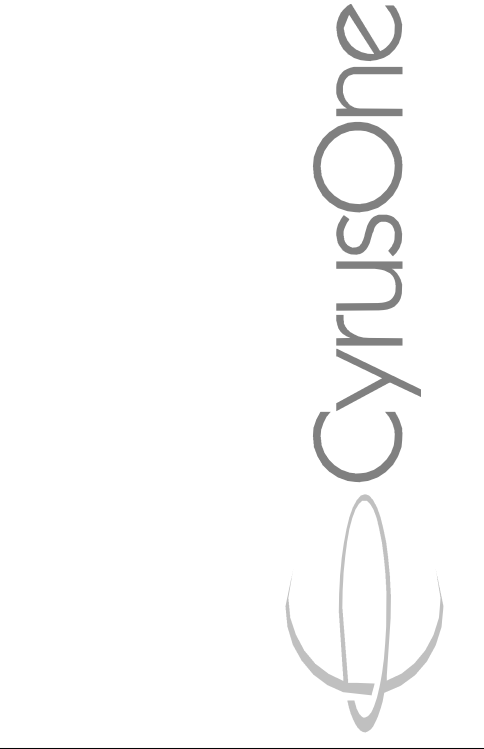
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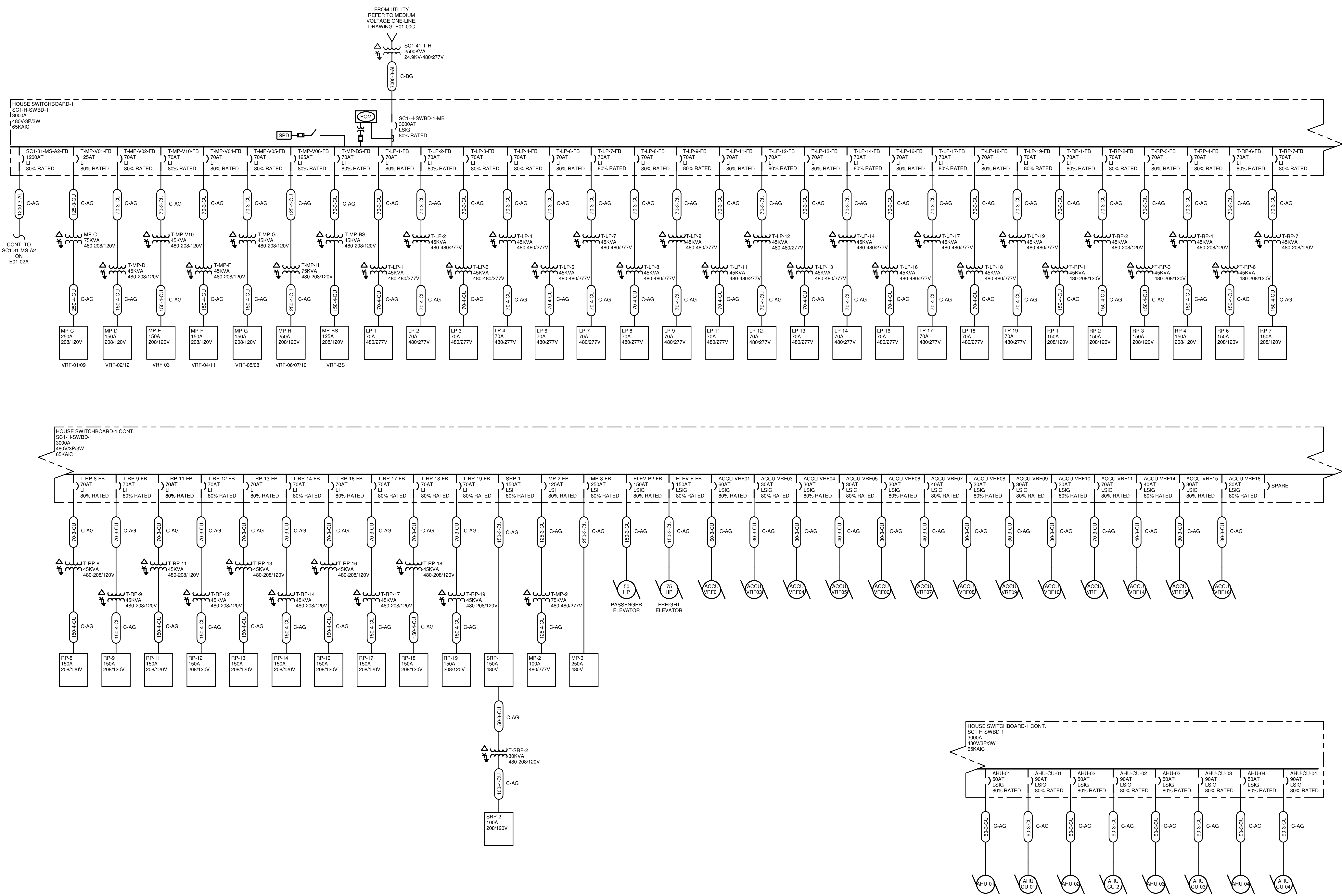


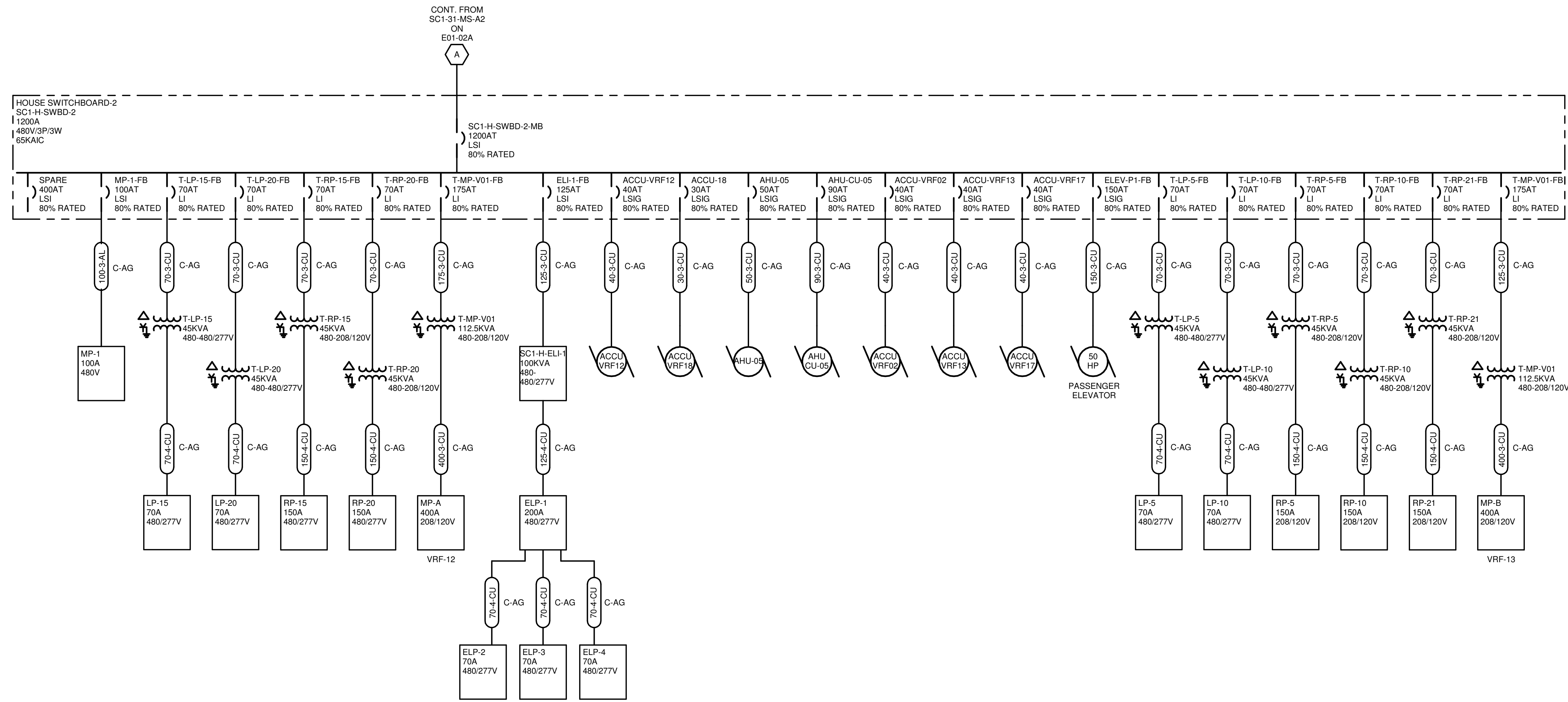
ONE-LINE DIAGRAM - BACK OF HOUSE

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401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.553.8281

kw Mission Critical
Engineering, d.p.c.
40 E. Rio Salado Pkwy 4th Floor, Tempe, AZ 85281

Bennett & Pless Inc.
47 Penimeter Central East,
Suite 500 Atlanta, GA 30334

KIER+WRIGHT
2850 Collier Canyon Rd
Livermore, CA 94551

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103 E Haning St. Howe TX 75459

JETT
Landscape Architecture + Design
2 Theatre Square, Suite 218, Orinda, CA 94563

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ONE-LINE DIAGRAM -
FRONT OF HOUSE

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E01-10B

Fire Pump Electrical Calculations

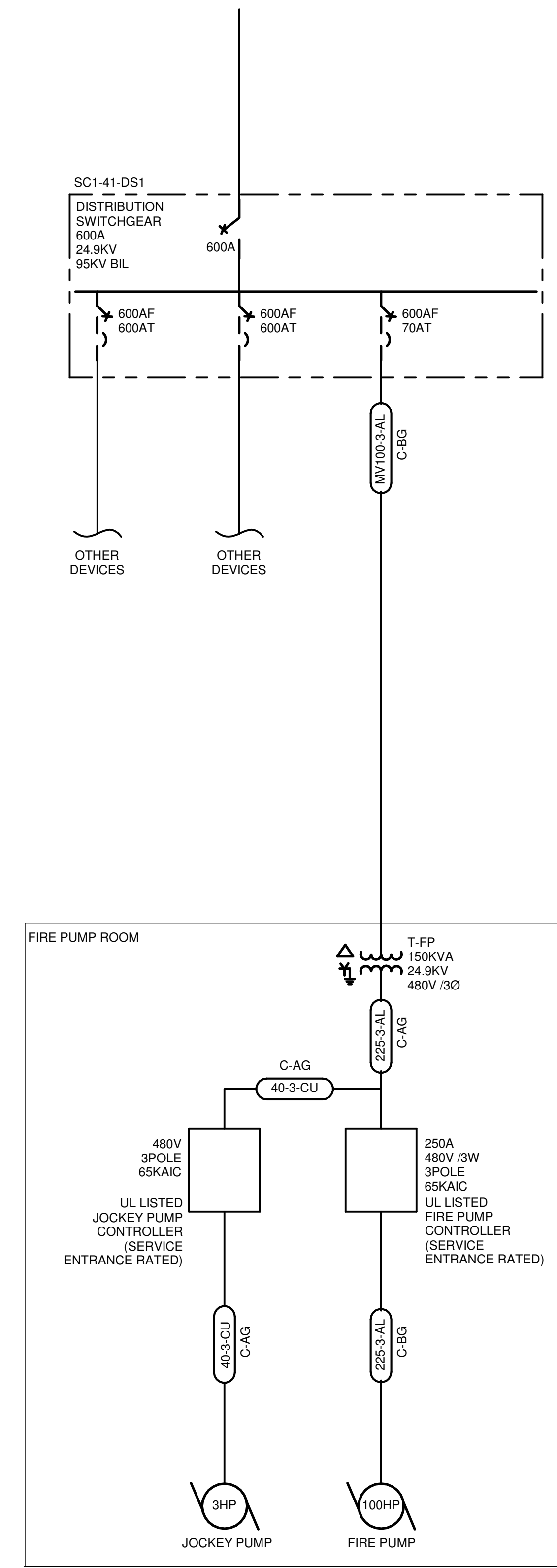
| System Description | | Calculated Results | |
|--------------------------------------|-----------|--|---------|
| Fire Pump Horsepower | 100 HP | Upstream Transformer Size (Minimum) | 128 kVA |
| Pressure Maintenance Pump Horsepower | 3 HP | Upstream Transformer OCPD (Upstream Only) | 15 A |
| Fire Pump Controller | N/A | OCPD (Utility) (Trip) | 800 A |
| Pressure Maintenance Pump Controller | N/A | OCPD (Generator) (Breaker Trip Low) (150%) | 200 A |
| Additional Loads In Room on Service | 0 A | OCPD (Generator) (Breaker Trip Max) (250%) | 322 A |
| Voltage (Primary) | 24900 VAC | Feeder 1 T-FP Cmil (Voltage Drop Only) | 5 kcmil |
| Voltage (Secondary) | 460 VAC | Feeder 2 N/A Cmil (Voltage Drop Only) | #VALUE! |
| Phase | 3 Ø | Feeder 1 T-FP Conductor Voltage Drop Minimum | 12 AWG |
| Distance T-FP Feeder 1 | 20 ft | Feeder 1 T-FP Conductor Ampacity Minimum | 4/0 |
| Distance H-GEN Feeder 2 | N/A | Feeder 2 N/A Conductor Voltage Drop Minimum | #VALUE! |
| Conductor Temperature | 75°C | Feeder 2 N/A Conductor Ampacity Minimum | 4/0 |
| Conductor Type | Aluminum | | |

| Full Load Current | | Transformer Size | |
|--------------------------------|--------------|--------------------------|-----------|
| Source: 2016 CEC Table 430.250 | | | |
| Fire Pump FLA | 124 A | Total FLA Current | 129 A |
| Pressure Maintenance Pump FLA | 5 A | FLA x 125% Sizing Factor | 161 A |
| Other Loads | 0 A | Voltage | 460 VAC |
| Total FLA Current | 129 A | Phase Factor (√3) | 1.73 |
| | | VA | 128276 VA |
| | | kVA | 128 kVA |

| OCPD Sizing (Generator) | | Transformer Protective Device | |
|-------------------------------|-------|-------------------------------|-----------|
| Source: 2016 CEC Table 430.52 | | | |
| Minimum | 150% | Voltage Primary | 24900 VAC |
| Maximum | 250% | Voltage Secondary | 460 VAC |
| Source: 2016 CEC 240.6 | | | |
| OCPD Generator Low | 193 A | Voltage Ratio | 0.0185 |
| Next Breaker Size | 200 A | Total LRC Current | 757 A |
| OCPD Generator (High) | 322 A | Minimum Protective Device | 14 A |
| | | Next Available Breaker Size | 15 A |

| Locked-Rotor Current | |
|-----------------------------------|--------------|
| Source: 2016 CEC Table 430.251(B) | |
| Fire Pump LRC | 725 A |
| Pressure Maintenance Pump LRC | 32 A |
| Other Loads | 0 A |
| Total LRC Current | 757 A |
| OCPD Sizing (Utility) | |
| Next Available Breaker Size | 800 |

| Feeder 1 T-FP | | Feeder 2 N/A | |
|--|-----------|--|---------|
| Pump Running Voltage Drop (5% Max) | | | |
| Voltage | 460 VAC | Voltage | 460 VAC |
| Phase Factor (√3) | 1.73 | Phase Factor (√3) | 1.73 |
| Current (FLA) | 129 A | Current (FLA) | 129 A |
| Current (FLA) x 125% | 161 A | Current (FLA) x 125% | 161 A |
| Length Feeder 1 | 20 ft | Length Feeder 2 | N/A |
| Resistance in Ohms per Foot | 12.9 | Resistance in Ohms per Foot | 21.2 |
| Voltage Drop | 5% | Voltage Drop | 5% |
| Steady State 5% Drop Size | 3128 Cmil | Steady State 5% Drop Size | #VALUE! |
| Pump Starting Voltage Drop (15% Max) | | | |
| Phase Factor (√3) | 1.73 | Phase Factor (√3) | 1.73 |
| Current (LRC) | 757 A | Current (LRC) | 757 A |
| Length Feeder 1 | 20 ft | Length Feeder 2 | N/A |
| Resistance in Ohms (Copper) | 12.9 | Resistance in Ohms-cmil/ft (Cu) | 21.2 |
| Voltage Drop | 15% | Voltage Drop | 15% |
| Motor Starting 15% Drop Size | 4903 Cmil | Motor Starting 15% Drop Size | #VALUE! |
| Find Larger Value | | | |
| Steady State 5% Drop Size | 3128 Cmil | Steady State 5% Drop Size | #VALUE! |
| Motor Starting 15% Drop Size | 4903 Cmil | Motor Starting 15% Drop Size | #VALUE! |
| Larger Value | 4903 Cmil | Larger Value | #VALUE! |
| Ampacity Conductor Size | | Ampacity Conductor Size | |
| Suggested Wire Size Feeder 1 (Voltage Drop Only) | 12 AWG | Suggested Wire Size Feeder 2 (Voltage Drop Only) | #VALUE! |
| Minimum Ampacity of Wire | 161 A | Minimum Ampacity of Wire | 161 A |
| Ampacity Conductor Size | 4/0 | Ampacity Conductor Size | 4/0 |



CORGAN
401 N Houston Street
Dallas, TX 75202
T: 214.748.2000 F: 214.653.8281

kw Mission Critical
Engineering, d.p.c.
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Bennett & Pless Inc.
47 Penimeter Central East,
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2850 Collier Canyon Rd
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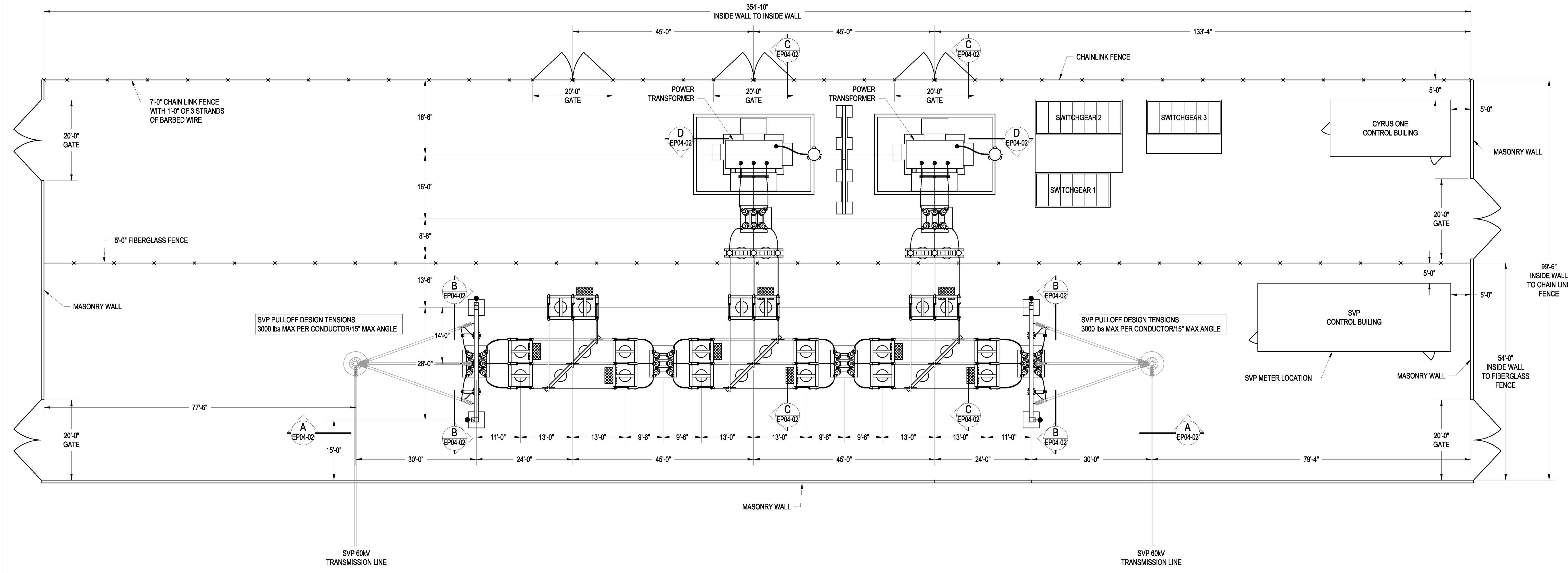
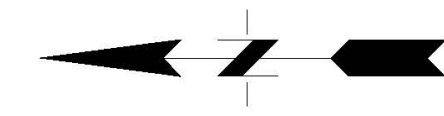


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ONE-LINE DIAGRAM - FIRE PUMP

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KEYPLAN

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60-24.9kV SUBSTATION ELECTRICAL EQUIPMENT PLAN

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