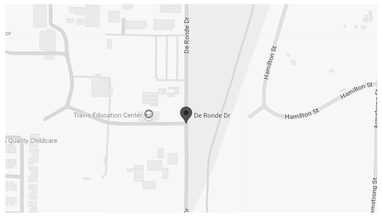
Travis Unified School District EV Fleet

27501 DeRonde Drive, Fairfield, CA 94533

VICINITY MAP



LOCATION MAP



SHEET LIST

SHEET NUMBER	REVISION	SHEET NAME
C-001		COVER SHEET
E-001		ELECTRICAL LEGEND
E-002		ELECTRICAL LEGEND
E-101		ELECTRICAL PANEL SCHEDULES
E-201		ELECTRICAL SPECIFICATIONS
E-202		ELECTRICAL SPECIFICATIONS
E-301		ELECTRICAL OVERALL SITE PLAN
E-302		ELECTRICAL ENLARGED PLAN
E-401		ELECTRICAL DETAILS
E-402		ELECTRICAL DETAILS
E-501		ELECTRICAL PARTIAL ONE-LINE DIAGRAM

CODE ANALYSIS

APPLICABLE BUILDING CODES

- BUILDING: CALIFORNIA BUILDING CODE (CBC 2022)
- ELECTRICAL: CALIFORNIA ELECTRICAL CODE (CEC 2022) & (NFPA 110/2019)
- ENERGY: TITLE 24 ENERGY CONSERVATION CODE

SCOPE OF WORK

1. THE EXISTING OVERALL SITE IS CURRENTLY SERVED BY SERVICE SWITCHBOARD EPB, CONNECTED TO A PG&E UTILITY PAD-MOUNTED TRANSFORMER LOCATED OUTSIDE THE BUILDING.
2. THE SCOPE OF WORK FOR THIS PERMIT INVOLVES DESIGN POWER DISTRIBUTION SYSTEM TO SUPPORT THE INSTALLATION OF EIGHT LEVEL 2 EV CHARGERS (208V) AND ONE LEVEL 3 EV CHARGER (480V). POWER FOR THESE CHARGERS WILL BE PROVIDED THROUGH A NEW 800A 120/208V SWITCHBOARD, WHICH WILL BE CONNECTED TO AN UPGRADED 300KVA UTILITY TRANSFORMER. TO SUPPLY THE LEVEL 3 CHARGER, A STEP-UP TRANSFORMER WILL BE INSTALLED TO CONVERT POWER FROM 208V TO 480V. THE EXISTING 1200A 120/208V SWITCHBOARD, WHICH IS ALREADY CONNECTED TO THE UTILITY TRANSFORMER, WILL REMAIN IN PLACE WITHOUT MODIFICATION.
3. THE EXISTING LIGHTING SYSTEM WILL BE MAINTAINED.
4. NOTE: THE BUILDING OCCUPANCY USE AND CONSTRUCTION TYPE OF THIS STRUCTURE ARE EXISTING TO REMAIN AND WILL NOT BE CHANGED DUE TO THE PROPOSED SCOPE OF WORK. REMAIN FULLY OCCUPIED AND FUNCTIONING THROUGH THE DURATION OF WORK.

CLIENT

PACIFIC POWER & SYSTEMS

PROJECT

Travis Unified School District EV Fleet
27501 DeRonde Drive, Fairfield, CA 94533

ENGINEER

WB Engineers+ Consultants

5934 GIBRALTAR DRIVE, SUITE 100
PLEASANTON, CA 94588
P. 925.399.6687

KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE



DRAWING TITLE

COVER SHEET

SCALE

JOB # 07PPS.240421

DATE 10/07/2025

DRAWN BY AJ

SHEET #

C-001

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ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE CEC ELECTRICAL AND LOCAL BUILDING CODE, NFPA, UL, BUILDING MANAGEMENT RULES AND REGULATIONS, AND ALL OTHER GOVERNING AGENCIES HAVING JURISDICTION.
2. ALL WORK SHALL BE INSTALLED CONCEALED UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS OF FINISHED CONSTRUCTION PRIOR TO FABRICATION AND INSTALLATION OF FIXTURES AND EQUIPMENT.
4. MOUNTING HEIGHTS OF EQUIPMENT AND DEVICES SHALL BE AS INDICATED ON THE ARCHITECTURAL DRAWINGS. WHERE MOUNTING HEIGHTS ARE NOT GIVEN ON THE ARCHITECTURAL DRAWINGS, UTILIZE THE FOLLOWING MOUNTING HEIGHTS UNLESS OTHERWISE NOTED (ALL DIMENSIONS TO CENTERLINE OF BOX):

   A. RECEPTACLES (WALL MOUNTED) - 18" A.F.F.
   B. TELEPHONE/DATA OUTLETS - SAME HEIGHT AS RECEPTACLES
   C. PANELBOARD -78" TO TOP OF ENCLOSURE

5. WHERE EQUIPMENT, LIGHTING FIXTURES AND WIRING DEVICES ARE SHOWN WITH CIRCUIT NUMBERS ONLY, THE MINIMUM BRANCH CIRCUITING REQUIREMENTS SHALL BE AS FOLLOWS:

   A. RECEPTACLES - 2#12, #12 EGC - 3/4" C
   B. BRANCH CIRCUIT BREAKERS (120 VOLT) - 1P, 20A
   C. BRANCH CIRCUIT BREAKERS (277 VOLT) - 1P, 20A

6. EXISTING EQUIPMENT AFFECTED BY THE WORK OF THIS CONTRACT SHALL BE COMPLETELY IDENTIFIED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS CONTRACT.
7. FINAL LOCATION OF CEILING MOUNTED EQUIPMENT SHALL BE IN ACCORDANCE WITH ARCHITECTURAL REFLECTED CEILING PLANS.
8. NO LOW VOLTAGE WIRING SHALL BE PERMITTED IN THE SAME RACEWAY AS POWER WIRING.
9. AT ALL EMPTY CONDUITS PROVIDE BUSHINGS AT ENDS AND PULL STRINGS.
10. ELECTRICAL CONTRACTOR SHALL PROVIDE AN ELECTRICAL INSPECTION APPROVAL CERTIFICATE TO BUILDING MANAGEMENT UPON COMPLETION OF WORK.
11. CONTRACTOR TO MAINTAIN THE CONTINUITY OF ALL ELECTRICAL SERVICES TO EXISTING AREAS WHICH ARE TO REMAIN. COORDINATE WITH CLIENT/BLDG. MANAGEMENT.
12. CIRCUIT ASSIGNMENTS FOR LIGHTING FIXTURES, RECEPTACLES, WIRING DEVICES, AND ELECTRICAL EQUIPMENT ARE DESIGNATED BY THE NUMBER SHOWN ADJACENT TO THESE DEVICES / EQUIPMENT. PROVIDE CONDUITS, WIRES AND BOXES REQUIRED TO ENERGIZE THE EQUIPMENT AS SHOWN.
13. CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. CIRCUIT NUMBERS ARE INTENDED TO BE USED FOR QUANTITIES AND FOR DESIGNATING WHAT OUTLETS (FIXTURES, EQUIPMENT, ETC.) WILL BE ON THE SAME CIRCUIT. CONTRACTOR SHALL REARRANGE CIRCUITS PER FIELD CONDITIONS AND TO BALANCE THE LOADS AT THE PANELS PER SPECIFICATIONS. THE ELECTRICAL CONTRACTOR SHALL PROVIDE CIRCUITS WITH PROPER PHASE SEQUENCES FOR EVERY REQUIRED NEUTRAL WIRE THAT IS SHARED. ELECTRICAL CONTRACTOR SHALL DOCUMENT ALL AFFECTED CIRCUITS, LABEL EACH OUTLET COVER WITH ACTUAL PANEL DESIGNATION AND CIRCUIT NUMBER, AND PROVIDE "AS-BUILT" PANEL DIRECTORIES AND DRAWINGS PER SPECIFICATIONS.
14. THE OPERATION OF THE ELECTRICAL INSTALLATION DOES NOT CONSTITUTE AN ACCEPTANCE OF THE WORK BY THE OWNER. FINAL ACCEPTANCE IS TO BE MADE AFTER THE CONTRACTOR HAS DEMONSTRATED THAT THE WORK FULFILLS THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS AND HAS FURNISHED ALL REQUIRED CERTIFICATES OF APPROVAL FROM THE STATE AUTHORITIES, MUNICIPAL AUTHORITIES AND UNDERWRITERS.
15. START OF WORK AND ALL ACCESS TO BUILDING ELECTRICAL CLOSETS MUST BE COORDINATED WITH BUILDING OFFICE. ANY ELECTRICAL CONTRACTOR WORKING IN AN ELECTRIC CLOSET WITHOUT CONSENT OF THE BUILDING OFFICE WILL BE BARRED FROM WORKING IN THE BUILDING.
16. DURING THE PROJECT DURATION, THE BUILDING MANAGEMENT OFFICE AND ITS DESIGNATED REPRESENTATIVE WILL INSPECT THE WORK IN PROGRESS. ANY WORK WHICH IS JUDGED UNSATISFACTORY FOR ANY REASON OR NOT IN COMPLIANCE WITH BUILDING STANDARDS SHALL BE REMOVED AND REPLACED AT THE EXPENSE OF THE CONTRACTOR.
17. PERFORM THE WORK AT SUCH TIME AND IN SUCH MANNER AS TO MINIMIZE INTERFERENCE WITH BUILDING'S NORMAL OPERATION. NOTIFY OWNER'S REPRESENTATIVES IN ADVANCE EACH TIME A SERVICE OUTAGE OR INTERRUPTION WILL BE REQUIRED FOR THE PERFORMANCE OF SOME PHASE OF THE WORK. SCHEDULE SUCH SERVICE OUTAGES OR INTERRUPTIONS ONLY AFTER HAVING RECEIVED APPROVAL OF DATE, HOUR, AND TIME INTERVAL REQUIRED THEREOF. SCHEDULE OF WORK AS DIRECTED SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. ALL CORING, CHOPPING, CHASING OF CONCRETE AND WORK WHICH RESULTS IN NOISE SHALL BE ACCOMPLISHED DURING 8:00 P.M. TO 6:00 A.M., DURING NORMAL WORKING DAYS OR ON WEEKENDS. COORDINATE AND OBTAIN APPROVAL FROM BUILDING MANAGEMENT FOR ALL WORK SCHEDULE.
18. UPON COMPLETION OF THE WORK, A SET OF "AS-BUILT" DRAWINGS SHALL BE SUBMITTED. PROVIDE 'AS-BUILT' DRAWINGS ON DISK, AUTOCAD 14 AND FULL SIZE PRINT DRAWINGS SHOWING ALL FEEDERS AND BRANCH CIRCUITS WIRE SIZE, CONDUIT, ACTUAL EQUIPMENT/DEVICES CIRCUIT NUMBERING OF ALL ELECTRICAL WORK AS ACTUALLY INSTALLED. CADD BACKGROUNDS TO BE SUPPLIED BY WB ENGINEERS+CONSULTANTS.
19. IN CONNECTION WITH THE ALTERATIONS TO THE EXISTING BUILDING, THERE WILL BE CERTAIN REMOVALS AND RELOCATIONS OF THE EXISTING ELECTRICAL WORK NECESSARY FOR THE SATISFACTORY PERFORMANCE OF THE WORK. THESE CHANGES CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS, BUT SHOULD BE TAKEN INTO CONSIDERATION BY THE CONTRACTOR IN PREPARING HIS PROPOSAL FOR THIS WORK.
20. ELECTRICAL CONTRACTOR SHALL VISIT AND EXAMINE CAREFULLY THE EXISTING AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THE WORK. CONTRACTOR SHALL PERFORM THIS, PRIOR TO SUBMITTING HIS PROPOSAL SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
21. ALL NEW MATERIALS REQUIRED SHALL CONFORM WITH THE STANDARDS OF THE UNDERWRITERS LABORATORIES, INC. IN EVERY CASE WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THE PARTICULAR TYPE OF MATERIAL IN QUESTION, UNLESS OTHERWISE NOTED.
22. BUILDING FIRE ALARM SYSTEM INTEGRITY SHALL BE MAINTAINED AT ALL TIMES (BEFORE, DURING AND AFTER DEMOLITION AND/OR CONSTRUCTION).
23. ALL WORK IS NEW UNLESS OTHERWISE NOTED. THE DRAWINGS INDICATE SIZE AND GENERAL LOCATION OF WORK. SCALE DIMENSIONS SHALL NOT BE USED. THE EXACT LOCATION AND ELEVATION OF ALL RECEPTACLES AND TELEPHONE/DATA OUTLETS, ETC., SHALL BE DETERMINED FROM THE ARCHITECT'S DRAWINGS, U.O.N.
24. ALL ELECTRIC POWER MUST BE DISCONNECTED BEFORE STARTING DEMOLITION.
25. FILE PLANS WITH THE BUILDING DEPARTMENT AND OBTAIN ALL PERMITS AND SIGNOFFS.
26. ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES AND CONFER WITH OTHER CONTRACTORS WHOSE WORK MIGHT AFFECT THIS INSTALLATION.
27. ELECTRICAL METALLIC TUBING (E.M.T.) SHALL BE USED WITH COMPRESSION TYPE FITTINGS ONLY.
28. PANEL DIRECTORIES SHALL BE UPDATED TO CONFORM TO WORK COMPLETED.
29. ELECTRIC PANEL COVERS ARE NOT TO BE LEFT OFF AT ANY TIME UNLESS MEN ARE WORKING ON SAME. COVERS SHALL BE REPLACED EACH NIGHT BEFORE LEAVING JOB SITE.
30. GREENFIELD MAY BE USED FOR FINAL CONNECTION TO MOTORS AND RECESSED FIXTURES ONLY. LENGTH SHALL NOT EXCEED 6 FEET.
31. WHEN USING TEMPORARY LIGHTING, THE CONTRACTOR SHALL CLEARLY LABEL PANELS AND BREAKERS USED FOR LIGHTING. LOCATION OF PANELS TO BE SHOWN ON FLOOR PLAN POSTED AT ENTRANCE TO WORK AREA. PROPER TEMPORARY LIGHTING AND POWER MUST BE INSTALLED AND MAINTAINED IN ALL WORK AREAS. TEMPORARY LIGHT AND POWER STRINGERS SHALL UTILIZE C-TAP TERMINATIONS. LAMPHOLDS SHALL HAVE LEFT HANDED SCREW SHELL LAMP HOLDERS AND NON-METALLIC LAMP GUARDS. CONNECTIONS TO EXISTING STAIRWELL AND EXIT LIGHT SYSTEMS ARE NOT PERMITTED.
32. THIS CONTRACTOR, BEFORE INSTALLING ANY OF THE WORK, SHALL SEE THAT IT DOES NOT INTERFERE WITH CLEARANCES REQUIRED FOR FINISHED COLUMNS, HUNG CEILINGS PILASTER, PARTITIONS, WALLS, ETC., AS SHOWN IN THE ARCHITECTURAL DRAWINGS AND DETAILS. IF ANY WORK IS SO INSTALLED AND IT LATER DEVELOPS THAT SUCH DETAILS OR DESIGN CANNOT BE FOLLOWED, THIS CONTRACTOR AT HIS OWN EXPENSE SHALL MAKE SUCH CHANGES IN THE WORK AS DIRECTED BY THE ARCHITECT, AS WELL AS TO PERMIT THE INSTALLATION OF THE ARCHITECTURAL WORK AS SHOWN ON THE PLANS AND DETAILS.
33. THE CONTRACTOR SHALL MAINTAIN CONTINUITY OF SERVICE ON ALL CIRCUITS WHICH ALSO SERVE AREAS NOT AFFECTED BY THESE CHANGES. WHENEVER IT IS REQUIRED THAT AN EXISTING CIRCUIT BE REVISED, DISCONNECTED OR REMOVED, IT SHALL BE UNDERSTOOD THAT THE CIRCUIT SHALL BE RECONNECTED AND SERVICE RE-ESTABLISHED IN THE REMAINING PORTION OF THE CIRCUIT WHICH IS OUTSIDE OF THE AREA AFFECTED BY THIS ALTERATION.
34. THE CONTRACTOR SHALL CUT BACK TO THE FLOOR, WALL OR CEILING, REMOVE WIRING AND PLUG BOTH ENDS OF CONCEALED CONDUITS MADE OBSOLETE BY THIS ALTERATION. EXPOSED CONDUITS, WIREWAYS, OUTLET BOXES, PULL BOXES, HANGERS, ETC. MADE OBSOLETE BY THE ALTERATION WORK SHALL BE REMOVED, UNLESS OTHERWISE NOTED.
35. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL BRANCH CIRCUITS AND FEEDERS.

ELECTRICAL GENERAL DEMOLITION NOTES

1. UPON COMPLETION OF WORK, PROVIDE UPDATED AS-BUILT DRAWINGS TO BOTH DESIGN AND BUILDING ENGINEERS.
2. THE ELECTRICAL CONTRACTOR SHALL FIELD EXAMINE THE ENTIRE AREA AFFECTED BY THIS CONSTRUCTION. THE CONTRACTOR SHALL REMOVE AND STORE ALL EXISTING ELECTRICAL EQUIPMENT AND OTHER DEVICES COMPLETE WITH ALL ASSOCIATED WIRING, CONDUITS, ETC. AS REQUIRED TO COMPLETE THE NEW WORK. ALL CONDUITS WITH NON-ACTIVE WIRING SHALL BE REMOVED AND/OR SAFED-OFF. AS PER DEMOLITION PLAN PROVIDE ALL DEMOLITION LABOR AS REQUIRED BY ARCHITECTS DEMOLITION NOTE AND AS INSTRUCTED IN FIELD BY G.C.. WHERE THE REMOVAL OF THESE ITEMS MAKE DEAD ELECTRICAL WIRING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND OTHER DEVICES AND PROVIDE BYPASS CONNECTIONS AS REQUIRED TO MAKE THE CIRCUITS AFFECTED CONTINUOUS AND READY FOR OPERATION. ITEMS TO BE REPLACED AT COMPLETION SHALL BE PROTECTED.
3. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW ARCHITECTURAL AND ELECTRICAL LAYOUTS AND SCHEMES IN FULL COORDINATION WITH THE ARCHITECT'S DEMOLITION PLAN. MAINTAIN EXISTING FEEDS FOR RECONNECTION AT LATER PHASE.
4. MAINTAIN CONTINUOUS SERVICE ON REMAINING FEEDERS, CIRCUITS OR PARTIAL CIRCUITS AND OUTLETS SERVICING ADJACENT REMAINING ACTIVE AREAS, EXCEPT WHERE GIVEN WRITTEN PERMISSION FOR OUTAGE FOR SPECIFIED TIME. ALL WORK REQUIRING SHUTDOWN OF EXISTING SYSTEMS SHALL BE PERFORMED ON OVERTIME (PREMIUM HOURS) AT HOURS AS APPROVED BY OWNER, ARCHITECT OR GENERAL CONTRACTOR AND AT NO ADDITIONAL COST TO THE OWNER. SUBMIT SCHEDULE OF REQUIRED OUTAGES FOR APPROVAL. PERFORM WORK IN A MANNER TO MINIMIZE SHUTDOWN TIME.
5. PROVIDE RECONNECTIONS AND TEMPORARY INSTALLATION AS REQUIRED; REMOVE AT JOB COMPLETION.
6. PROVIDE TEMPORARY CONSTRUCTION LIGHTING AND POWER AS REQUIRED BY THE CONTRACTORS OF ALL DISCIPLINES OF THIS CONTRACT.
7. EXISTING CONDUITS WHEN REUSED, SHALL BE THOROUGHLY CLEANED AND REFURBISHED BEFORE REUSING.
8. PROVIDE BLANK PLATES ON ALL UNUSED OUTLET BOXES.
9. UON, CONTRACTOR SHALL REMOVE ALL EXISTING ACCESSIBLE TELEPHONE AND DATA CABLES THAT ARE ABANDONED AND NOT BEING REUSED AS PART OF THIS PROJECT. ITEMS WHICH ARE TO REMAIN SHALL EITHER BE REMOVED OR SECURELY AND SAFELY LEFT CONNECTED WITH ADEQUATE PROTECTION TO DEVICE DURING WORK.
10. FOR ANY CIRCUITS MADE SPARE DURING WORK, SWITCH BREAKER TO 'OFF' POSITION AND LABEL "SPARE (WITH REMOVAL DATE)" ON PANEL DIRECTORY. PROVIDE NEW PANEL DIRECTORIES.
11. BEFORE COMMENCING WORK, EXAMINE ALL ADJOINING AREAS THAT MAY BE AFFECTED BY DEMOLITION. REPORT TO THE GENERAL CONTRACTOR ANY CONDITION THAT PREVENTS PERFORMANCE OF THE WORK.
12. BECOME THOROUGHLY FAMILIAR WITH EXISTING CONDITIONS WHERE CONNECTIONS MUST BE MADE, CHANGED OR ALTERED. THE INTENT OF THE WORK IS SHOWN ON THE DRAWINGS AND DESCRIBED HEREINAFTER AND NO CONSIDERATION WILL BE GRANTED BY REASON OF LACK OF FAMILIARITY ON THE PART OF THE CONTRACTOR WITH ACTUAL PHYSICAL CONDITIONS AT THE SITE. INSPECT EACH AND EVERY AREA AFFECTED BY THE ALTERATION OF THE SPACE BEFORE SUBMITTAL OF BID.
13. U.O.N., ALL CONDUCTORS AND CONDUIT ASSOCIATED WITH THE ELECTRICAL EQUIPMENT OR DEVICES TO BE REMOVED SHALL BE REMOVED COMPLETELY BACK TO ITS SOURCE OF POWER AND DISCONNECTED.
14. U.O.N., ON WALLS TO BE DEMOLISHED, DISCONNECT REMOVE ALL DEVICES, CONDUCTORS AND CONDUIT COMPLETELY BACK TO ITS SOURCE OF POWER. DEVICES ON THESE WALLS MAY NOT BE SHOWN.
15. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO TRACE AND RELOCATE ALL EXISTING FEEDERS AND BRANCH CIRCUIT WIRING WHICH PASSES THROUGH THE DEMOLITION AREA THAT SERVE EXISTING OCCUPIED SPACES TO REMAIN. COORDINATE WITH BUILDING MANAGER PRIOR TO ANY SHUTDOWNS OR DISRUPTIONS THAT MAY BE REQUIRED TO ACCOMPLISH THIS WORK. WHERE SUCH BRANCH CIRCUITS CANNOT BE RELOCATED DUE TO UN-ACCEPTABLE POWER INTERRUPTIONS OF LACK OF APPROVAL FROM BUILDING MANAGEMENT, SUCH CIRCUITS SHALL BE PROTECTED AND LABELED AT REGULAR INTERVALS.
16. DISPOSE OF ALL REMOVED EQUIPMENT, WHICH IS NOT INTENDED TO BE REUSED. PRIOR TO DISPOSAL, CONTACT BUILDING MANAGER AND TENANT TO DETERMINE IF ANY REMOVED EQUIPMENT IS DESIRED FOR STOCK.
17. EXISTING CIRCUIT BREAKERS IN PANEL(S) DESIGNATED TO REMAIN ARE TO BE RE-USED. ELECTRICAL CONTRACTOR TO DISCONNECT PANEL AND CIRCUIT BREAKERS WITH GREAT CARE TO ENSURE AGAINST DAMAGE. THIS CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS AS REQUIRED. (TYPE TO MATCH EXISTING, INCLUSIVE OF THE AIC RATING).
18. ALL POWER CONDUCTORS, CONTROL WIRING AND CONDUIT ASSOCIATED WITH MECHANICAL EQUIPMENT SUCH AS FANS, AIR CONDITIONING UNITS, PUMPS, ETC. DESIGNATED FOR REMOVAL ON THE HVAC AND PLUMBING DEMOLITION DRAWINGS SHALL BE REMOVED CLEAR BACK TO THE SOURCE OF POWER AND DISCONNECTED. ALL ASSOCIATED MOTOR STARTERS, DISCONNECT SWITCHES, CONTROL DEVICES, ETC. SHALL BE REMOVED. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
19. PROTECT AND MAINTAIN EXISTING TO REMAIN EQUIPMENT AS REQUIRED.
20. SEE ELECTRICAL PARTIAL RISER DIAGRAMS ON DRAWING E-501 FOR WORK SCOPE IN ELECTRIC CLOSETS (IF APPLICABLE).
21. CONTRACTOR IS RESPONSIBLE FOR TRACING ALL CIRCUIT ON PANELS CALLED OUT FOR DEMOLITION OR RELOCATION. ANY CIRCUITS THAT FEED LOADS NOT BEING DEMOLISHED AS A PART OF THIS PROJECT OR ARE LOCATED IN AN AREA THAT IS REMAINING SHALL BE RE-FED TO THE NEAREST AVAILABLE PANEL. ANY BRANCH CIRCUITS FOR LOADS NOT LOCATED ON THE SAME FLOOR AS THE PANEL SHALL BE IDENTIFIED BY THE CONTRACTOR AND THE ENGINEER SHALL GIVE DIRECTION ON WHERE CIRCUIT SHALL BE RE-FED.
22. UNLESS OTHERWISE NOTED, REMOVE ALL EXISTING RECEPTACLES AND OUTLETS FROM ALL WALLS TO BE DEMOLISHED.
23. UNLESS OTHERWISE NOTED, REMOVE ALL EXISTING J-BOXES, OUTLETS AND CONDUIT STUB-UPS FOR OLD TELECOM CABLES FROM ALL WALLS TO BE DEMOLISHED.
24. UNLESS OTHERWISE NOTED, REMOVE ALL UNUSED 120V BRANCH CIRCUITING TO EQUIPMENT, RECEPTACLES, LIGHTING AND OUTLETS BACK TO THE SOURCE PANELBOARDS IN THE ELECTRICAL CLOSETS.
25. ALL EXISTING LIGHTING TO REMAIN, UNLESS OTHERWISE NOTED.

ELECTRICAL SHEET LIST

SHEET NUMBER	SHEET NAME
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E-001	ELECTRICAL LEGEND
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ELECTRICAL ABBREVIATIONS

A	AMPERES
AF	AMPERE FRAME
AFF	ABOVE FINISH FLOOR
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BOD	BASIS OF DESIGN
C	CONDUIT
CAT	CATALOG
CB	CIRCUIT BREAKER
CD	CANDELA
CFSD	COMBINATION FIRE/SMOKE DAMPER
CKT	CIRCUIT
CLG	CEILING
CO	CONDUIT ONLY
CL	CLOSET
CU	COPPER
DACS	DIGITAL ALARM COMMUNICATION SYSTEM
DACT	DIGITAL ALARM COMMUNICATION TERMINAL
DGP	DATA GATHERING PANEL
DISC	DISCONNECT
DN	DOWN
DWG	DRAWING
E	EXISTING DEVICE TO REMAIN
EC	ELECTRICAL CONTRACTOR
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISH BY OTHER DIVISION OF WORK
FCO	FUSED CUTOUT BOX
FCS	FIRE COMMAND STATION
FIXT	FIXTURE
FL	FLOOR
FLEX	FLEXIBLE
FSS	FUSIBLE SAFETY SWITCH
FT	FEET OR FOOT
GA	GAUGE GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
G, GRD	GROUND
GC	GENERAL CONTRACTOR
GF	GROUND FAULT SENSOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HP	HORSEPOWER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING DIVISION OF WORK
HZ	HERTZ
JB	JUNCTION BOX
KVA	KILOVOLT AMPERE
KW	KILOWATT
LEMCS	LOCAL EMERGENCY CONTROL SYSTEM
LTG	LIGHTING
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MECH	MECHANICAL
MER	MECHANICAL EQUIPMENT ROOM
MFS	MAIN FUSED SWITCH
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MV	MEDIUM VOLTAGE
N	NEUTRAL
N.C.	NORMALLY CLOSED
NFSS	NON-FUSIBLE SAFETY SWITCH
NIC	NOT IN CONTRACT
NO	NUMBER
N.O.	NORMALLY OPEN
NL	NIGHT LIGHT
NTS	NOT TO SCALE
P	POLE
PH, Ø	PHASE
PNL	PANEL
POE	POWER OVER ETHERNET
SSBJ	SUPPLY SIDE BONDING JUMPER
SW	SWITCH
SWBD	SWITCHBOARD
TEL	TELEPHONE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UL	UNDERWRITERS LABORATORIES
VESDA	VERY EARLY SMOKE DETECTION APPARATUS
V	VOLTAGE
WP	WEATHERPROOF
WR	WEATHER RESISTANT

CLIENT

PACIFIC POWER & SYSTEMS

PROJECT

Travis Unified School District EV Fleet
27501 DeRonde Drive,
Fairfield, CA 94533

ENGINEER

WB Engineers+Consultants

5934 GIBRALTAR DRIVE, SUITE 100
PLEASANTON, CA 94588
P. 925.399.6687

KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
ANTHONY W. BRADLEY
No. E17411
ELECTRICAL
STATE OF CALIFORNIA

DRAWING TITLE

ELECTRICAL LEGEND

SCALE	JOB #
NTS	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

E-001

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SECURITY DEVICES LEGEND

SYMBOL	DESCRIPTION
CR	SECURITY SYSTEM CARD READER
CK	SECURITY SYSTEM CARD READER WITH KEYPAD
ES	ELECTRIC STRIKE
EL	ELECTRIC LOCK
MD	MOTION DETECTOR
DR	DOOR RELEASE
ML	MAGNETIC LOCKSET
HO	DOOR HOLD OPEN
PB	PUSH BUTTON
	CAMERA

SECURITY NOTES:
1. FOR ALL SECURITY DEVICES PROVIDE 1" CONDUIT FROM DEVICE TO 6" WITHIN NEAREST HUNG CEILING SPACE.
2. PROVIDE PULL STRINGS WITHIN ALL EMPTY CONDUITS.
3. PROVIDE PROTECTIVE GROMMETS ON ENDS OF ALL OPEN CONDUITS.
4. COORDINATE EXACT QUANTITIES, SIZES, LOCATIONS, MOUNTING HEIGHTS AND EXACT REQUIREMENTS WITH SECURITY CONTRACTOR.

POWER ONE LINE DIAGRAM SYMBOLS

SYMBOL	DESCRIPTION
100A	FIXED TRIP CIRCUIT BREAKER
100AF 100AT	ADJUSTABLE TRIP CIRCUIT BREAKER
100AF 100AT	DRAWOUT TYPE CIRCUIT BREAKER
100A	FUSE
100A 100A	SWITCH AND FUSE UNIT
G	GENERATOR
M	UTILITY METER
	TRANSFORMER
	GROUND
	BRANCH CIRCUIT PANELBOARD
N E L	AUTOMATIC TRANSFER SWITCH
	BATTERY
SPD	SURGE PROTECTIVE DEVICE
#HP	MOTOR, HP AS INDICATED

CIRCUITRY, RACEWAYS, AND FEEDERS LEGEND

SYMBOL	DESCRIPTION
	EXISTING FEEDER (CONDUIT & WIRE) TO REMAIN
	EXISTING FEEDER (CONDUIT & WIRE) TO BE DISCONNECTED AND REMOVED.
	NEW FEEDER/BRANCH CIRCUIT (CONDUIT & WIRE)
PNL(1,3)	CIRCUIT HOMERUN - PANEL NAME AND NUMERALS WHERE USED INDICATE CIRCUIT NUMBER FOR REFERENCE ONLY.
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN

TEL/DATA LEGEND

SYMBOL	DESCRIPTION
	WALL MOUNTED DOUBLE GANG WITH SINGLE GANG REDUCER BRACKET TEL/DATA COMMUNICATIONS OUTLET WITH 1-1/4" CONDUIT RUN TO 6" WITHIN NEAREST HUNG CEILING SPACE. PROVIDE PROTECTIVE GROMMET ON ENDS OF ALL OPEN CONDUITS.
	WALL MOUNTED SINGLE GANG TELEPHONE OUTLET MOUNTING HEIGHT AS PER ARCH. DRAWINGS. PROVIDE ¾" CONDUIT TO 6" WITHIN NEAREST HUNG CEILING SPACE OR TO NEAREST TELEPHONE CLOSET AS INDICATED.
	WALL MOUNTED DOUBLE GANG WITH SINGLE GANG REDUCER BRACKET TEL/DATA COMMUNICATIONS OUTLET WITH 2" CONDUIT RUN TO 6" WITHIN NEAREST HUNG CEILING SPACE. PROVIDE PROTECTIVE GROMMET ON ENDS OF ALL OPEN CONDUITS.
	CEILING MOUNTED SINGLE GANG TEL/DATA COMMUNICATIONS OUTLET WITH 1-1/4" CONDUIT RUN TO 6" WITHIN NEAREST HUNG CEILING SPACE. PROVIDE PROTECTIVE GROMMET ON END OF ALL OPEN CONDUITS.
RS	ROOM SCHEDULER - WALL MOUNTED DOUBLE GANG WITH SINGLE GANG REDUCER BRACKET TEL/DATA COMMUNICATIONS OUTLET WITH 3/4" CONDUIT RUN TO 6" WITHIN NEAREST HUNG CEILING SPACE. PROVIDE PROTECTIVE GROMMET ON ENDS OF ALL OPEN CONDUITS. WHERE INSTALLED ON GLASS MULLION OR SURFACE MOUNTED ON WALL, POE NETWORK CABLING TO THE DEVICE TO BE ROUTED THROUGH THE GLASS MULLION CAVITY OR IN WALL CAVITY FOR DIRECT DEVICE PLUG-IN. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECT AND/OR CONSTRUCTION MANAGER.

WIRING DEVICES LEGEND

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE OUTLET - 120V, 20A, NEMA 5-20R, LEGRAND 26352-W SERIES OR APPROVED EQUAL. DECORATOR STYLE WHITE COVER PLATE. • FC = INDICATES FULLY CONTROLLED RECEPTACLES CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS. PROVIDE WITH CONTROLLED RECEPTACLE MARKINGS. LEGRAND 26352-CDW SERIES OR APPROVED EQUAL. • HC = INDICATES HALF-CONTROLLED, SPLIT-WIRED RECEPTACLES CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS. PROVIDE WITH TOP RECEPTACLE CONTROLLED RECEPTACLE MARKINGS. LEGRAND 26352-CHW SERIES OR APPROVED EQUAL.
	DUPLEX RECEPTACLE OUTLET, CIRCUITED IN A SPLIT-WIRE CONFIGURATION. SAME BASIS OF DESIGN AS DUPLEX RECEPTACLE OUTLET UON.
	DOUBLE DUPLEX RECEPTACLE OUTLET - 120V, 20A, NEMA 5-20R, LEGRAND 26352-W SERIES OR APPROVED EQUAL. DECORATOR STYLE WHITE COVER PLATE. • HC = INDICATES RECEPTACLE CONTROL: ONE FULLY-CONTROLLED DUPLEX RECEPTACLE CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS AND ONE NON-CONTROLLED DUPLEX RECEPTACLE. CONTROLLED RECEPTACLE SHALL HAVE CONTROLLED RECEPTACLE MARKINGS: LEGRAND 26352-CHW SERIES OR APPROVED EQUAL.
	DUPLEX & USB (TYPE A AND TYPE C) CONVENIENCE RECEPTACLE OUTLET -120V, 20A, NEMA 5-20R, HUBBELL USB20ACSW SERIES OR APPROVED EQUAL. DECORATOR STYLE WHITE COVER PLATE.
	DEDICATED DUPLEX RECEPTACLE OUTLET. SAME BASIS OF DESIGN AS DUPLEX RECEPTACLE OUTLET UON.
	GFCI DUPLEX RECEPTACLE - 120V, 20A, NEMA 5-20R HUBBELL GFR5362 SERIES OR APPROVED EQUAL. DECORATOR STYLE WHITE COVER PLATE.
	SIMPLEX RECEPTACLE - 120V, 20A, NEMA 5-20R HUBBELL HBL5261 SERIES OR APPROVED EQUAL.
	CEILING MOUNTED DUPLEX RECEPTACLE OUTLET. SAME BASIS OF DESIGN AS DUPLEX RECEPTACLE OUTLET OR APPROVED EQUAL.
	CEILING MOUNTED DOUBLE DUPLEX RECEPTACLE OUTLET. SAME BASIS OF DESIGN AS DUPLEX RECEPTACLE OUTLET OR APPROVED EQUAL.
	SPECIAL PURPOSE RECEPTACLE OUTLET - REFER TO POWER PLANS FOR ADDITIONAL INFORMATION.
FCD	RECESSED STORAGE BOX FOR TWO DUPLEX RECEPTACLE OUTLETS, DATA AND AV WITH BREAK-AWAY EDGE ALLOWING COMPATIBILITY WITH 2.5" AND 3.5" STUDS. BASIS OF DESIGN CHIEF PACS25 SERIES OR APPROVED EQUAL. PROVIDE ONE DUPLEX RECEPTACLE, (1) 1-1/4" EMT CONDUIT FOR DATA, AND ONE (1) 1-1/4" EMT CONDUIT FOR AV TO 6" WITHIN NEAREST HUNG CEILING SPACE. ALL TELECOMM AND AV PLATE CONFIGURATIONS SHALL BE COORDINATED PRIOR TO PURCHASE. PROVIDE PULL STRINGS AND PROTECTIVE GROMMETS ON ENDS OF ALL OPEN CONDUITS.
FCDA	RECESSED STORAGE BOX FOR TWO DUPLEX RECEPTACLE OUTLETS, DATA AND AV WITH BREAK-AWAY EDGE ALLOWING COMPATIBILITY WITH 2.5" AND 3.5" STUDS. BASIS OF DESIGN CHIEF PACS01B SERIES OR APPROVED EQUAL. PROVIDE ONE DUPLEX RECEPTACLE, (1) 1-1/4" EMT CONDUIT FOR DATA, AND ONE (1) 1-1/4" EMT CONDUIT FOR AV TO 6" WITHIN NEAREST HUNG CEILING SPACE. ALL TELECOMM AND AV PLATE CONFIGURATIONS SHALL BE COORDINATED PRIOR TO PURCHASE. PROVIDE PULL STRINGS AND PROTECTIVE GROMMETS ON ENDS OF ALL OPEN CONDUITS.
AV	AV OUTLET - DOUBLE GANG BOX WITH 1 1/4" E.C. TO 6" WITHIN NEAREST HUNG CEILING SPACE. COORDINATE MOUNTING HEIGHT WITH ARCHITECT AND EXACT LOCATION WITH AV CONTRACTOR.
P D	WALL MOUNTED COMBINATION J-BOX TO SERVE FURNITURE POWER AND AND TEL/DATA (1¼" C.). THE G.C. SHALL COORDINATE WITH FURNITURE VENDOR FOR ALL REQUIREMENTS. • RC = INDICATES AUTOMATIC RECEPTACLE CONTROL FOR FURNITURE POWER BY TIMECLOCK OR OCCUPANCY SENSORS. PROVIDE RECEPTACLE CONTROL FOR GENERAL PURPOSE CIRCUITS ONLY, PC CIRCUITS SHALL NOT BE PERMITTED TO BE CONTROLLED. ALL CONTROLLED RECEPTACLES SHALL BE PROVIDED WITH CONTROLLED RECEPTACLE MARKINGS. COORDINATE EXACT REQUIREMENTS WITH FURNITURE VENDOR.
	FLUSH FLOOR MOUNTED FIRE RATED POKE-THRU DEVICE TO SERVE FURNITURE POWER AND TEL/DATA (1½"C.). WIREMOLD 4FFATC OR APPROVED EQUAL.THE G.C. SHALL COORDINATE WITH FURNITURE VENDOR FOR ALL REQUIREMENTS. THE NUMBER ADJACENT TO THE BOXES INDICATES THE NUMBER OF WORKSTATIONS SERVED THROUGH THE CONNECTION. • RC = INDICATES AUTOMATIC RECEPTACLE CONTROL FOR FURNITURE POWER BY TIMECLOCK OR OCCUPANCY SENSORS. PROVIDE RECEPTACLE CONTROL FOR GENERAL PURPOSE CIRCUITS ONLY, PC CIRCUITS SHALL NOT BE PERMITTED TO BE CONTROLLED. ALL CONTROLLED RECEPTACLES SHALL BE PROVIDED WITH CONTROLLED RECEPTACLE MARKINGS. COORDINATE EXACT REQUIREMENTS WITH FURNITURE VENDOR.
PP	POWER POLE TO SERVE FURNITURE POWER AND TEL/DATA (2"C.). THE G.C. SHALL COORDINATE WITH FURNITURE VENDOR FOR ALL REQUIREMENTS. • RC = INDICATES AUTOMATIC RECEPTACLE CONTROL FOR FURNITURE POWER BY TIMECLOCK OR OCCUPANCY SENSORS. PROVIDE RECEPTACLE CONTROL FOR GENERAL PURPOSE CIRCUITS ONLY, PC CIRCUITS SHALL NOT BE PERMITTED TO BE CONTROLLED. ALL CONTROLLED RECEPTACLES SHALL BE PROVIDED WITH CONTROLLED RECEPTACLE MARKINGS. COORDINATE EXACT REQUIREMENTS WITH FURNITURE VENDOR.
	FLUSH FLOOR MOUNTED FIRE RATED 4" POKE THRU DEVICE WITH DOUBLE DUPLEX POWER. HUBBELL #S1R4SPQUAD OR APPROVED EQUAL. • RC = INDICATES ONE (1) DUAL-CONTROLLED DUPLEX RECEPTACLE CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS AND ONE (1) NON-CONTROLLED DUPLEX RECEPTACLE. PROVIDE WITH CONTROLLED RECEPTACLE MARKINGS. LEGRAND 26352-CDW SERIES AND LEGRAND 26352-W SERIES OR APPROVED EQUAL.
	FLUSH FLOOR MOUNTED FIRE RATED 6" POKE THRU DEVICE WITH DOUBLE DUPLEX POWER AND DATA. WIREMOLD EVOLUTION 6AT SERIES OR HUBBELL S1R6PT SERIES OR APPROVED EQUAL. PROVIDE ONE (1) 1¼" EMT CONDUIT FOR DATA AND BOTTOM HOUSING ASSEMBLY AS REQUIRED TO ACCOMMODATE DATA CONDUITS. ALL PLATE CONFIGURATIONS SHALL BE COORDINATED PRIOR TO PURCHASE. PROVIDE PULL STRINGS AND PROTECTIVE GROMMETS ON ENDS OF ALL OPEN CONDUITS. • RC = INDICATES ONE (1) DUAL-CONTROLLED DUPLEX RECEPTACLE CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS AND ONE (1) NON-CONTROLLED DUPLEX RECEPTACLE. PROVIDE WITH CONTROLLED RECEPTACLE MARKINGS. LEGRAND 26352-CDW SERIES AND LEGRAND 26352-W SERIES OR APPROVED EQUAL.
AV	FLUSH FLOOR MOUNTED FIRE RATED 8" POKE THRU DEVICE WITH DOUBLE DUPLEX POWER, DATA AND AV. WIREMOLD EVOLUTION 8AT SERIES OR HUBBELL S1R8PT SERIES WITH S1R8SINC10 FITTING OR APPROVED EQUAL. PROVIDE ONE (1) 1¼" EMT CONDUIT FOR DATA AND ONE (1) 2" EMT CONDUIT FOR AV TO 6" WITHIN NEAREST HUNG CEILING SPACE. PROVIDE BOTTOM HOUSING ASSEMBLIES AS REQUIRED TO ACCOMMODATE DATA AND AV CONDUITS. ALL PLATE CONFIGURATIONS SHALL BE COORDINATED PRIOR TO PURCHASE. PROVIDE PULL STRINGS AND PROTECTIVE GROMMETS ON ENDS OF ALL OPEN CONDUITS. • RC = INDICATES ONE (1) DUAL-CONTROLLED DUPLEX RECEPTACLE CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS AND ONE (1) NON-CONTROLLED DUPLEX RECEPTACLE. PROVIDE WITH CONTROLLED RECEPTACLE MARKINGS. LEGRAND 26352-CDW SERIES AND LEGRAND 26352-W SERIES OR APPROVED EQUAL.

SCOPE OF WORK SYMBOLOGY

SYMBOL	DESCRIPTION
E	EXISTING DEVICE/EQUIPMENT TO REMAIN.
X	EXISTING EQUIPMENT SHALL BE DISCONNECTED AND REMOVED. CUT BACK AND MAKE SAFE ALL ASSOCIATED BRANCH CIRCUIT WIRING CONDUIT BACK TO POWER SOURCE AND LABEL BREAKER IN PANELBOARD AS SPARE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CIRCUITRY TO DEVICES UNAFFECTED BY DEMOLITION.
ER	EXISTING EQUIPMENT SHALL BE DISCONNECTED, REMOVED AND RELOCATED AS SHOWN. CUT BACK AND/OR EXTEND EXISTING BRANCH CIRCUIT WIRING AND CONDUIT AS REQUIRED SO AS TO PROVIDE A COMPLETE OPERATIONAL INSTALLATION.
RE	NEW LOCATION OF RELOCATED EXISTING EQUIPMENT.
	NEW EQUIPMENT.

NOTE: FUSIBLE DISCONNECT SYMBOL USED AS AN EXAMPLE. LINE WEIGHTS AND TYPES APPLICABLE TO ALL ELECTRICAL SYMBOLOGY.

KEY LEGEND

SYMBOL	DESCRIPTION
# #	DRAWING KEY NOTE DESIGNATION.
100N	FEEDER SCHEDULE DESIGNATION. REFER TO RISER / ONE-LINE DIAGRAM.
EQUIP123	SPECIALTY EQUIPMENT DESIGNATION. REFER TO POWER PLAN / SPECIALTY EQUIPMENT SCHEDULE.
T45K	TRANSFORMER SCHEDULE DESIGNATION. REFER TO RISER / ONE-LINE DIAGRAM.
X DWG	CALLOUT REFERENCE DESIGNATION X - INDICATES DETAIL NUMBER DESIGNATION DWG - INDICATES DRAWING REFERENCE NUMBER
XXX YYY	EQUIPMENT CONNECTION TAG, REFER TO EQUIPMENT CONNECTION SCHEDULE. XXX - EQUIPMENT ABBREVIATION YYY - EQUIPMENT DESIGNATION

EQUIPMENT LEGEND

SYMBOL	DESCRIPTION
	SWITCHBOARD / DISTRIBUTION BOARD / PANELBOARD
	DRY TYPE TRANSFORMER
J	CEILING JUNCTION BOX
J	FLOOR JUNCTION BOX
J	WALL JUNCTION BOX
	GROUNDING BAR
$T	THERMAL OVERLOAD MOTOR SWITCH
###A #P 3R	NON-FUSIBLE DISCONNECT SWITCH ###A - INDICATES SWITCH AMPERAGE RATING #P - INDICATES NUMBER OF POLES 3R - INDICATES NEMA 3R RATING
###A #P 3R	FUSIBLE DISCONNECT SWITCH ###AS - INDICATES SWITCH AMPERAGE RATING ###AF - INDICATES FUSE AMERAGE RATING 3R - INDICATES NEMA 3R RATING
###A #P 3R	COMBINATION MOTOR STARTER AND DISCONNECT SWITCH ###AS - INDICATES SWITCH AMPERAGE RATING ###AF - INDICATES FUSE AMERAGE RATING 3R - INDICATES NEMA 3R RATING
VFD	VARIABLE FREQUENCY DRIVE MOTOR CONTROLLER (STARTER) FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR
VFD BP	VARIABLE FREQUENCY DRIVE MOTOR CONTROLLER (STARTER) WITH BYPASS FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR
ECB ###A #P 3R	ENCLOSED CIRCUIT BREAKER ###AT - INDICATES TRIP AMPERAGE RATING #P - INDICATES NUMBER OF POLES 3R - INDICATES NEMA 3R RATING
CP	CONDENSATE PUMP ELECTRICAL CONNECTION; PROVIDE (1) J-BOX WITH THERMAL OVERLOAD SWITCH. CIRCUIT AS INDICATED ON PLAN. COORDINATE LOCATION WITH MECHANICAL/PLUMBING CONTRACTOR.
LD	LEAK DETECTION SYSTEM ELECTRICAL CONNECTION; PROVIDE (1) J-BOX WITH THERMAL OVERLOAD SWITCH. CIRCUIT AS INDICATED ON PLAN. COORDINATE LOCATION WITH MECHANICAL/PLUMBING CONTRACTOR.
MD	MOTORIZED DAMPER ELECTRICAL CONNECTION; PROVIDE (1) J-BOX WITH 120V/20A CIRCUIT AS INDICATED ON PLAN. COORDINATE LOCATION WITH MECHANICAL CONTRACTOR.
UP DN	BUS DUCT-VERTICAL RUN

ALTERNATE SCHEDULE

ALT #	DRAWING #	LOCATION	TYPE	DESCRIPTION
E1	E-###	OPEN CEILINGS	ADD	CONTRACTOR SHALL PROVIDE PRICE.

EQUIPMENT GROUNDING CONDUCTOR SIZING

RATING OR SETTING OF AUTOMATIC OVERCURRENT DEVICE IN CIRCUIT AHEAD OF EQUIPMENT NOT EXCEEDING AMPERES PER NEC T250.122.	SIZE (AWG OR KCMIL)	
	COPPER	ALUMINUM
15	14	12
20	12	10
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250
1600	4/0	350
2000	250	400
2500	350	600
3000	400	600
4000	500	(2) 400
5000	(2) 350	(3) 400
6000	(2) 400	(3) 400

CLIENT

PACIFIC POWER & SYSTEMS

PROJECT

Travis Unified School District EV Fleet
27501 DeRonde Drive,
Fairfield, CA 94533

ENGINEER

WB Engineers+Consultants
5934 GIBRALTAR DRIVE, SUITE 100
PLEASANTON, CA 94588
P. 925.399.6687

KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
ANDREW J. WOLF
No. 37411
ELECTRICAL
STATE OF CALIFORNIA

DRAWING TITLE
ELECTRICAL LEGEND

SCALE	JOB #
NTS	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

E-002

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EVSB — NEW PANEL — SWITCHBOARD SCHEDULE

MAX AMPS	MAIN TYPE	MAIN AMPS	VOLTAGE	PHASE:	WIRE:	ENCLOSURE	AIC:	SWITCHBOARD OPTIONS:
800A	MCB	800A	208/120 Wye	3	4	NEMA 3R	42,000	SPD

CKT	BREAKER NOTE	BREAKER TYPE	FRAME	TRIP	POLE	Ø	N	C	CIRCUIT DESCRIPTION	ØA	ØB	ØC
1	--	--	400.0 A	400 A	3	SR	SR	SR	PANEL EV	34.9 kVA	28.8 kVA	28.8 kVA
2	--	--	400.0 A	300 A	3	SR	SR	SR	TF -L03 (LEVEL 03 CHARGER)	22.2 kVA	22.2 kVA	22.2 kVA
3	--	--	400.0 A	400 A	3	--	--	--	NEW SPARE	0.0 kVA	0.0 kVA	0.0 kVA
4	--	--	400.0 A	400 A	3	--	--	--	NEW SPARE	0.0 kVA	0.0 kVA	0.0 kVA
5	--	--	--	--	3	--	--	--	SPD	--	--	--
6	--	--	--	--	3	--	--	--	SPACE	--	--	--
7	--	--	--	--	3	--	--	--	SPACE	--	--	--
8	--	--	--	--	3	--	--	--	SPACE	--	--	--
9	--	--	--	--	3	--	--	--	SPACE	--	--	--
10	--	--	--	--	3	--	--	--	SPACE	--	--	--
									TOTAL LOAD (kVA):	57.0 kVA	50.9 kVA	50.9 kVA
									TOTAL LOAD (AMPS):	475.4 A	424.5 A	424.5 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
RECEPTACLE	360 VA	100.00%	360 VA
CONTINUOUS	158560 VA	125.00%	198200 VA

SWITCHBOARD TOTALS

CONNECTED LOAD (kVA):	158.9 kVA
DEMAND LOAD (kVA):	198.6 kVA
CONNECTED LOAD (AMPS):	441.1 A
DEMAND LOAD (AMPS):	551.1 A
AMPACITY REQUIRED:	551.1 A

NOTES:

1	1. INSTALL SWITCHBOARD ON 3" HIGH CONCRETE PAD (LENGTH AND WIDTH EXCEEDING BASE BY 3" ON ALL SIDES.)

EV — NEW PANEL — PANELBOARD SCHEDULE

PANEL MAX AMPS	PANEL MAIN TYPE	PANEL MAIN AMPS	VOLTAGE	PHASE:	NEUTRAL:	WIRE:	ENCLOSURE	MOUNTING	AIC:	PANEL OPTIONS:
400A	MCB	400A	208/120 Wye	3	100%	4	NEMA 3R	SURFACE	42,000	--

CKT	TYPE	NOTE	TRIP	POLES	DESCRIPTION	Ø	N	C	Ø A	Ø B	Ø C	C	N	Ø	DESCRIPTION	POLES	TRIP	NOTE	TYPE	CKT
1			60 A	2	LEVEL 2 CHARGER	#4	--	1"	5.8	0.4				3/4"	#12	#12	GFI RECEPTACLE	1	20 A			2
3										5.8	0			--	--	--	NEW SPARE	1	20 A	--	--	4
5			60 A	2	LEVEL 2 CHARGER	#4	--	1"			5.8	0		--	--	--	NEW SPARE	1	20 A	--	--	6
7									5.8	--				--	--	--	SPACE	1	--	--	--	8
9			60 A	2	LEVEL 2 CHARGER	#4	--	1"		5.8	--			--	--	--	SPACE	1	--	--	--	10
11											5.8	--		--	--	--	SPACE	1	--	--	--	12
13			60 A	2	LEVEL 2 CHARGER	#4	--	1"	5.8	--				--	--	--	SPACE	1	--	--	--	14
15										5.8	--			--	--	--	SPACE	1	--	--	--	16
17			60 A	2	LEVEL 2 CHARGER	#4	--	1"			5.8	--		--	--	--	SPACE	1	--	--	--	18
19									5.8	--				--	--	--	SPACE	1	--	--	--	20
21			60 A	2	LEVEL 2 CHARGER	#4	--	1"		5.8	--			--	--	--	SPACE	1	--	--	--	22
23											5.8	--		--	--	--	SPACE	1	--	--	--	24
25			60 A	2	LEVEL 2 CHARGER	#4	--	1"	5.8	--				--	--	--	SPACE	1	--	--	--	26
27										5.8	--			--	--	--	SPACE	1	--	--	--	28
29			60 A	2	LEVEL 2 CHARGER	#4	--	1"			5.8	--		--	--	--	SPACE	1	--	--	--	30
31									5.8	--				--	--	--	SPACE	1	--	--	--	32
33	--	--	--	1	SPACE	--	--	--		--	--			--	--	--	SPACE	1	--	--	--	34
35	--	--	--	1	SPACE	--	--	--			--	--	--	--	--	--	SPACE	1	--	--	--	36
37	--	--	--	1	SPACE	--	--	--	--	--				--	--	--	SPACE	1	--	--	--	38
39	--	--	--	1	SPACE	--	--	--		--	--			--	--	--	SPACE	1	--	--	--	40
41	--	--	--	1	SPACE	--	--	--			--	--	--	--	--	--	SPACE	1	--	--	--	42
									TOTAL LOAD: (kVA)	34.9 kVA	28.8 kVA	28.8 kVA									
									TOTAL LOAD: (AMPS)	290.5 A	239.6 A	239.6 A									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
RECEPTACLE	360 VA	100.00%	360 VA
CONTINUOUS	92000 VA	125.00%	115000 VA

PANEL TOTALS

TOTAL CONNECTED LOAD (kVA):	92.4 kVA
TOTAL DEMAND LOAD (kVA):	115.4 kVA
TOTAL CONNECTED LOAD (AMPS):	256.4 A
TOTAL DEMAND LOAD (AMPS):	320.2 A
AMPACITY REQUIRED:	320

NOTES:

1	ABSENCE OF VALUES FOR Ø, N, AND C IN 1-POLE BREAKERS: PROVIDE #12 Ø, #12 N, 3/4"C.

TYPE	
ST	SHUNT-TRIP
GF	GFCI
AF	AFCI
GFP	GFPE
KK	KIRK-KEY

NOTES	
EX	EXISTING TO REMAIN LOAD
REX	REUSE EXISTING SPARE BREAKER
ME	NEW TO MATCH EXISTING
SR	SEE RISER
ES	SEE EQUIPMENT SCHEDULE
R:	RECEPTACLE LOAD
L:	LIGHTING LOAD

CLIENT

PACIFIC POWER & SYSTEMS

PROJECT

Travis Unified School District EV Fleet
27501 DeRonde Drive,
Fairfield, CA 94533

ENGINEER

WB Engineers+ Consultants
5934 GIBRALTAR DRIVE, SUITE 100
PLEASANTON, CA 94588
P. 925.399.6687

KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER — JOSHUA W. RIDLEY — No. E37411 — ELECTRICAL — STATE OF CALIFORNIA

DRAWING TITLE

ELECTRICAL PANEL SCHEDULES

SCALE	JOB #
	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

E-101

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GENERAL REQUIREMENTS

A. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE ELECTRICAL CODE OF THE STATE OF CALIFORNIA, THE CALIFORNIA ELECTRICAL CODE, BUILDING MANAGEMENT AND ALL AUTHORITIES HAVING JURISDICTION (AHJ). APPLICABLE NATIONAL, STATE AND LOCAL CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK SHALL BE INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS. CONTRACTOR IS TO INFORM ENGINEER OF ANY EXISTING WORK OR MATERIALS THAT VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED AT CONTRACTOR'S EXPENSE BY THIS CONTRACTOR AND AT NO EXPENSE TO THE OWNER.

B. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE EXISTING BUILDING RULES AND REGULATIONS.

C. PRIOR TO SUBMISSION OF BID, THE ELECTRICAL CONTRACTOR SHALL VISIT AND EXAMINE CAREFULLY THE EXISTING AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN UNDERTAKEN.

D. ENGINEERING DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK AND APPROXIMATE LOCATION OF EQUIPMENT. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS FOR FINAL LOCATIONS OF EQUIPMENT AND DEVICES, ETC. WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS. IF A CONFLICT OCCURS IN THE SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION SHALL APPLY.

E. PRIOR TO SUBMISSION OF BID, THIS CONTRACTOR SHALL REVIEW ALL DRAWINGS OF THE ENTIRE PROJECT (INCLUDING, BUT NOT LIMITED TO GENERAL CONSTRUCTION, DEMOLITION, ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM, TELECOMMUNICATIONS, AUDIO/VISUAL, SECURITY, ETC.) AND SHALL INCLUDE ANY WORK REQUIRED IN THE BID THAT IS INDICATED OR IMPLIED TO BE PERFORMED BY THIS TRADE IN OTHER SECTIONS OF THE WORK.

F. WORK NOT SHOWN ON THE DRAWINGS, BUT ITEMIZED IN THE SPECIFICATIONS, SHALL BE PROVIDED BY THIS CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER, UNLESS NOTED AS SPECIFICALLY NOT INCLUDED IN THE WRITTEN AND SUBMITTED BID.

G. ANY EQUIPMENT, PARTS, MATERIALS, ACCESSORIES AND LABOR THAT ARE NECESSARY FOR CODE COMPLIANCE AND FOR PROPER PERFORMANCE OF THE ELECTRICAL WORK, ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN, OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED AS IF CALLED FOR IN DETAIL WITHOUT ADDITIONAL COST.

H. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THIS WORK. FINAL ACCEPTANCE SHALL BE DEFINED AS THE TIME THAT THE ELECTRICAL WORK IS TAKEN OVER AND ACCEPTED BY THE OWNER, AND IS UNDER CARE, CUSTODY, AND CONTROL OF THE OWNER. ENGAGE THE SERVICES OF VARIOUS MANUFACTURERS SUPPLYING THE EQUIPMENT FOR THE PROPER STARTUP, OPERATION END-USER TRAINING AND SERVICING OF THE EQUIPMENT.

I. ALL MATERIALS SHALL BE NEW AND SHALL CONFORM TO THE STANDARDS OF THE UNDERWRITERS' LABORATORIES INC. MATERIALS SHALL BE FABRICATED IN ACCORDANCE WITH THE SPECIFICATIONS AND APPROVED RULES AND REGULATIONS OF NEMA AND SHALL BEAR THE UL INSPECTION LABEL. MATERIAL AND APPARATUS FOR USE SHALL BE BY THE SAME MANUFACTURER.

J. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND CONTRACTOR'S SERVICES NECESSARY FOR COMPLETE, SAFE INSTALLATION OF ALL ELECTRICAL WORK. THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
1. DISCONNECTION AND REMOVAL OF ELECTRICAL EQUIPMENT AS REQUIRED FOR NEW INSTALLATION, INCLUDING ALL CONDUCTORS AND CONDUIT BACK TO THEIR SOURCE. (SEE DEMOLITION NOTES).
2. PROVIDING OF LIGHT FIXTURES AND LAMPS INCLUDING EXIT AND EMERGENCY LIGHTING AND ALL ASSOCIATED COMPONENTS AND BRANCH CIRCUITING.
3. PROVIDING OF NEW RACEWAY AND CONDUCTORS FOR LIGHTING AND POWER.
4. PROVIDING OF COMPLETE LIGHTING CONTROL SYSTEM INCLUDING ALL CONTROLLERS, MODULES, SENSORS, SWITCHES, PANELS AND ASSOCIATED CONTROL WIRING.
5. PERFORMING GROUND PENETRATING RADAR (GPR) SCANNING OF ALL REQUIRED PENETRATIONS IN EXISTING WALLS AND FLOOR SLABS.
6. CUTTING, CHANNELING AND CHASING REQUIRED TO ACCOMMODATE THE ELECTRICAL INSTALLATION AND ROUGH PATCHING.
7. ADDITIONS AND MODIFICATIONS TO EXISTING ELECTRICAL POWER DISTRIBUTION EQUIPMENT AND RELATED FEEDERS.
8. PROVIDING OF HVAC POWER WIRING AND FINAL CONNECTIONS TO HVAC EQUIPMENT.
9. PROVIDING OF CONDUIT, JUNCTION BOXES, PULL BOXES, ETC., REQUIRED FOR THE AFOREMENTIONED EQUIPMENT.
10. MAINTENANCE AND PROPER OPERATION OF EXISTING BASE BUILDING SYSTEMS WITHIN THE CONTRACT AREA DURING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF BUILDING MANAGEMENT.
11. GROUNDING AND BONDING OF ALL EQUIPMENT AS REQUIRED BY CODE AND AS SHOWN ON THE DRAWINGS.
12. MAINTAIN CONTINUITY OF EXISTING CIRCUITING TO ADJACENT AREAS NOT AFFECTED BY THE NEW WORK.
13. PROVIDING TELEPHONE/DATA AND SIGNAL EMPTY CONDUIT, CABLE TRAY, WIRE BASKET, PULLBOXES, OUTLETS, SLEEVES AND FISHWIRES. PROVIDING SECURITY SYSTEM EMPTY CONDUIT, PULLBOXES, OUTLETS, SLEEVES AND FISHWIRES AS SPECIFIED BY OTHERS. PROVIDING AUDIO VISUAL EMPTY CONDUIT, PULLBOXES, OUTLETS, SLEEVES AND FISHWIRES.
14. COORDINATING WITH THE BUILDING FIRE ALARM MAINTENANCE CONTRACTOR TO PROVIDE ALL REQUIRED ADDITIONS AND MODIFICATIONS TO THE EXISTING BUILDING FIRE ALARM SYSTEM. REFER TO FIRE ALARM SPECIFICATIONS.
15. PROVIDING RECEPTACLES, LIGHT SWITCHES, DISCONNECT SWITCHES, FUSES, DIMMERS, OUTLET BOXES, CONTACTORS AND OTHER WIRING DEVICES INCLUDING RELATED BRANCH CIRCUIT WIRING.
16. PROVIDING ENGRAVED LAMICOID NAMEPLATES FOR NEW PANELBOARDS, SWITCHES, CABINETS, MOTOR STARTERS, ETC.
17. PROVIDING INSTALLATION OF DEVICES, EQUIPMENT, SYSTEMS, THAT ARE SUPPLIED BY OTHERS AS DETAILED ON DRAWINGS.
18. PROVIDING TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION.
19. COMMISSIONING AND END-USER TRAINING.
20. EMERGENCY POWER-OFF SYSTEMS (EPO).
21. UNINTERRUPTIBLE POWER SUPPLY SYSTEMS (UPS).
22. GROUND TESTING RESULTS.
23. SHORT-CIRCUIT COORDINATION STUDY.
24. COORDINATION OF THIS WORK WITH ALL OTHER TRADES.

K. PERFORM ANY NOISY WORK (E.G., CHOPPING, CORE DRILLING, DEMOLITION, ETC.) AND BASE BUILDING SYSTEM TEMPORARY SHUTDOWNS OUTSIDE OF NORMAL BUSINESS HOURS ON SAFE TIME (PREMIUM TIME). SAFE TIME WORK SHALL BE PERFORMED WHEN AND AS DIRECTED BY THE BUILDING MANAGEMENT.

L. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE LATEST COPY OF THE BUILDING RULES AND REGULATIONS TO DETERMINE THE EXTENT OF PREMIUM TIME WORK REQUIRED. BASE BUILDING SYSTEM INTERRUPTIONS ARE TO BE PERFORMED OUTSIDE OF NORMAL BUSINESS HOURS. COORDINATE WITH BUILDING MANAGEMENT FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE OF MINIMUM (4) WEEKS AS SPECIFIED IN THE BUILDING RULES AND REGULATIONS, OR AT THE DISCRETION OF THE BUILDING MANAGER.

M. ANY DAMAGE TO EXISTING PARTITIONS, FLOORS, CEILINGS OR ANY PART OF THE BUILDING OR EQUIPMENT HOUSED THEREIN CAUSED BY THE WORK OF THE CONTRACTOR SHALL BE REPAIRED AT NO ADDITIONAL EXPENSE TO THE OWNER.

N. DURING THE PROJECT DURATION, THE BUILDING MANAGEMENT OFFICE AND ITS DESIGNATED REPRESENTATIVE SHALL BE ABLE TO INSPECT THE WORK IN PROGRESS. ANY WORK WHICH THE BUILDING MANAGEMENT DEEMS UNACCEPTABLE SHALL BE REMOVED AND REPLACED AT THE EXPENSE OF CONTRACTOR/TENANT.

O. ALL EQUIPMENT INSTALLED OR CONNECTED TO THE BUILDING RISERS, SYSTEMS, AND INFRASTRUCTURE SHALL BE APPROVED IN ADVANCE BY THE BUILDING MANAGEMENT AND ENGINEER OF RECORD (EOR) PRIOR TO INSTALLATION.

P. SUBSTITUTIONS:
1. NO SUBSTITUTE MATERIAL OR MANUFACTURER OF EQUIPMENT SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL TO THE ENGINEER WHICH INCLUDES ALL DIMENSIONAL, PERFORMANCE, AND MATERIAL SPECIFICATIONS. ANY CHANGES IN LAYOUT, MECHANICAL CHARACTERISTICS, STRUCTURAL REQUIREMENTS, OR DESIGN DUE TO THE USE OF A SUBSTITUTION SHALL BE SUBMITTED TO THE ENGINEER AS PART OF THIS PROPOSAL. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE SUBSTITUTION AND ALL CHANGES RESULTING FROM SUBSTITUTION. ALL ITEMS SHALL BE SUBMITTED FOR REVIEW IN CONJUNCTION WITH THE SUBMITTAL OF THE ALTERNATE. ANY SUBSTITUTION MUST BE SUBMITTED WITH AN EXPLANATION WHY SUBSTITUTION IS BEING UTILIZED. IF THE SUBSTITUTED ITEM DEVIATES FROM THE SPECIFIED ITEM, THOSE DEVIATIONS ARE TO BE IDENTIFIED ON A LINE BY LINE BASIS. IF THE SUBSTITUTION IS BEING UTILIZED FOR FINANCIAL REASONS, THE ASSOCIATED CREDIT MUST BE SIMULTANEOUSLY SUBMITTED.
2. ALL SUBSTITUTED EQUIPMENT SHALL CONFORM TO SPACE REQUIREMENTS AND PERFORMANCE REQUIREMENTS SHOWN ON CONTRACT DOCUMENTS.
3. CONTRACTOR SHALL SUBMIT BID BASED ON SPECIFIED ITEMS AND SHALL SUPPLY AS AN ALTERNATE PRICE ANY SUBSTITUTIONS.
4. ALL EQUIPMENT SHALL BE APPROVED FOR USE IN STATE OF CALIFORNIA.

Q. SUBMIT SHOP DRAWINGS CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT ALL CERTIFIED EQUIPMENT CUTS WITH CONSTRUCTION WIRING DIAGRAMS. CHANGES MADE TO SHOP DRAWINGS BY THE CONSULTANT WILL NOT AFFECT THE CONTRACT PRICE. PROVIDE DIGITAL SUBMISSIONS OF ALL SHOP DRAWINGS AND PRODUCT/MATERIAL SUBMITTALS IN PDF FORMAT. ALL SHOP DRAWINGS AND SUBMITTALS SHALL BE SENT VIA EMAIL TO THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR OR UPLOADED TO THE ONLINE PROJECT PORTAL. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
1. SERVICE AND METERING EQUIPMENT, INCLUDING LAYOUT.
2. DISTRIBUTION EQUIPMENT (SWITCHBOARDS, SWITCHES, ETC.).
3. OVERCURRENT PROTECTIVE DEVICES (SWITCHES, FUSES AND CIRCUIT BREAKERS).
4. WIRING DEVICES.
5. COPIES OF ALL GPR SCANS, ANALYSES AND WHERE REQUIRED, FLOOR PLAN DRAWINGS WITH RECOMMENDATIONS FOR PENETRATION RELOCATIONS.
6. PANELBOARDS AND CIRCUIT BREAKERS.
7. GROUNDING EQUIPMENT/DEVICES/CONNECTORS/WIRE
8. CONDUIT, RACEWAYS, WIREWAYS, JUNCTION BOXES
9. CONDUCTORS (WIRING)
10. TESTING AND COMMISSIONING REPORTS
11. SCALED FIELD DRAWINGS
12. TRANSFORMERS
13. SWITCHGEAR
14. SHORT-CIRCUIT AND COORDINATION STUDY RESULTS

R. OPERATION AND MAINTENANCE MANUALS:
1. SUBMIT DIGITAL (PDF FORMAT) AND FOUR (4) HARD-COPY OPERATING AND MAINTENANCE MANUALS WITH INDEX AND INDEX TABS TO INCLUDE ALL SHOP DRAWINGS AND OPERATING AND MAINTENANCE INSTRUCTIONS ON ALL SYSTEMS. INCLUDE THE FOLLOWING INFORMATION IN THE OPERATIONS AND MAINTENANCE MANUALS:
   a. NAMES AND ADDRESS OF LOCAL SUPPLIERS FOR THE ITEMS INCLUDED.
   b. TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, EXPLODED VIEWS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
   c. THE CONSULTANTS REVIEWED SHOP DRAWINGS.
   d. CERTIFICATE(S) OF ACCEPTANCE FROM THE AUTHORITIES INSPECTION DEPARTMENT.
   e. VERIFICATION REPORTS AND CERTIFICATE(S) FOR ANY NEW FIRE ALARM COMPONENTS OR TIE-INS AND ANY BASE BUILDING TIE-INS FOR MISCELLANEOUS SYSTEMS (I.E. SECURITY, LIGHTING CONTROL, DIGITAL METERING).
   f. LOAD BALANCE REPORT.
   g. WRITTEN GUARANTEE.
   h. LIST OF EACH FIXTURE TYPE IDENTIFYING TYPE OF LAMP, WATTAGE AND MANUFACTURER'S CONTACT INFO.
2. REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUALS WITH THE TENANT'S OPERATING PERSONNEL AND LANDLORD'S OPERATING PERSONNEL WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE ELECTRICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

S. AS-BUILT DRAWINGS:
1. AT THE COMPLETION OF WORK AND BEFORE FINAL ACCEPTANCE, PROVIDE AS-BUILT DRAWINGS OF THE INSTALLATION, IN PDF AND AUTOCAD FORMATS (2014 OR NEWER). AN ELECTRONIC COPY (AUTOCAD FORMAT) OF ALL DRAWINGS WILL BE PROVIDED TO THE ELECTRICAL CONTRACTOR BY THE ENGINEER AT NO COST. THE DRAWINGS WILL REFLECT THE BID AND/OR CONSTRUCTION SET OF DRAWINGS.
2. INCORPORATE ALL CHANGES AND DEVIATIONS FROM BID DRAWINGS, (INCLUDING ALL SUBSEQUENT SKETCHES, BULLETINS, ADDENDA, AND FIELD COORDINATION) UTILIZING NORMAL RECOGNIZED DRAFTING PROCEDURES THAT MATCH THE ORIGINAL DRAFTING METHODOLOGY.
3. ALL MAIN BRANCH CONDUIT RUNS, JUNCTION BOX LOCATIONS, CONDUIT RUNS FOR ALL FLOOR OUTLETS, ETC., MUST BE REFLECTED ON THE DRAWINGS.
4. REMOVE THE ELECTRICAL ENGINEER'S STAMP FROM ALL AS-BUILT DRAWINGS.
5. REMOVE ALL ELECTRICAL ENGINEER'S DRAWING DIRECTIVE NOTES TO CONTRACTOR.
6. CLEARLY INDICATE THE WORDS "AS-BUILT" IN THE TITLE BLOCK COLUMN OF THE DRAWINGS AS WELL AS THE ELECTRICAL CONTRACTOR'S NAME, ADDRESS, CONTACT INFORMATION AND ANY SPECIFIC PROJECT NUMBER(S) HELPFUL FOR FUTURE IDENTIFICATION OF THE PROJECT.
7. AS-BUILT ELECTRICAL DRAWING SHALL INCLUDE PANEL SCHEDULES AND BRANCH CIRCUITING INDICATED ON PLANS.

T. DEFINITIONS:
1. "ELECTRICAL CONTRACTOR", "THIS CONTRACTOR" - THE PARTY OR PARTIES HAVE BEEN DULY AWARDED THE CONTRACT FOR AND ARE THEREBY MADE RESPONSIBLE FOR THE ELECTRICAL WORK AS DESCRIBED HEREIN.
2. "ARCHITECT", "ENGINEER", "OWNER'S REPRESENTATIVE" - THE PARTY OR PARTIES RESPONSIBLE FOR INTERPRETING, ACCEPTING AND OTHERWISE RULING ON THE PERFORMANCE UNDER THIS CONTRACT.
3. "FURNISH" - PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT, ALL AS PART OF THE ELECTRICAL WORK.
4. "INSTALL" - UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING INSTALLATION AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT, ALL AS PART OF THE ELECTRICAL WORK.
5. "PROVIDE" - "FURNISH" AND "INSTALL."
6. "RELOCATE" - MOVE EXISTING EQUIPMENT/DEVICES/FIXTURE AND ALL ACCESSORIES AS REQUIRED, INCLUDING THE EXTENSION OF EXISTING OR PROVIDING NEW CIRCUIT/CONDUCTORS/WIRING AS REQUIRED.
7. "REMOVE" - DISMANTLE AND CART AWAY FROM SITE INCLUDING ALL RELATED ACCESSORIES ALL OTHER EQUIPMENT AND OPERATIONS IN ANY WAY EFFECTED BY THE REMOVAL IS TO REMAIN IN FULL OPERATION. PROVIDE ALL NECESSARY COMPONENTS TO MAINTAIN SUCH OPERATION.
8. CEC - CALIFORNIA ELECTRICAL CODE

U. DEMOLITION WORK:
1. VISIT THE SITE, EXAMINE THE EXISTING CONDITIONS AND BECOME FAMILIAR WITH THE EXTENT OF THE NECESSARY REMOVAL, RELOCATION, RECONNECTING AND REROUTING OF ELECTRICAL EQUIPMENT, WIRING AND CONDUIT AS NECESSARY FOR THE COMPLETION OF THE PROJECT.
2. REVIEW AND CONFIRM WITH THE ARCHITECT/DESIGNER'S DRAWINGS FOR THE COMPLETE EXTENT OF DEMOLITION AND ALTERATION.
3. MAKE SAFE AND DISCONNECT ALL POWER AND SYSTEMS, AS AND WHEN, AND TO THE EXTENT REQUIRED TO FACILITATE WITH THE DEMOLITION.
4. ENSURE THAT ALL ELECTRICAL, LIFE SAFETY SERVICES, AND SERVICES FOR EXISTING EQUIPMENT, IN AREAS OUTSIDE THE AREAS OF THIS WORK, THAT ARE REQUIRED TO REMAIN IN SERVICE, SHALL DO SO.
5. RELOCATE ANY ELECTRICAL FEEDERS OR EQUIPMENT THAT ARE REQUIRED TO REMAIN IN SERVICE, THAT ARE SECURED TO EXISTING WALLS, FLOORS OR CEILINGS TO BE DEMOLISHED OR THAT ARE BURIED AND REQUIRED TO BE EXCAVATED FOR NEW WORK.
6. REMOVE AND REPLACE ANY ELECTRICAL EQUIPMENT ON WALLS OR CEILINGS THAT WILL BE DEMOLISHED AND REBUILT.
7. WHEN DELETING AND/OR MAKING SAFE EXISTING EQUIPMENT, ENSURE THAT IT INCLUDES ALL CONDUITS AND WIRING BACK TO THE ASSOCIATED PANELBOARD OR CONTROL PANEL. WHERE FLOORBOXES ARE BEING REMOVED, ENSURE UNDER-FLOOR WIRING IS REMOVED BACK TO SOURCE AND FILL ALL CORE HOLES, IN FLOORS AND WIN WALLS, WITH APPROPRIATE CONCRETE.
8. DISCONNECT, REMOVE, AND DISPOSE OF EXISTING LIGHT FIXTURES, DEVICES, OUTLETS, ETC. WHICH ARE NOT TO BE REUSED. CUT BACK AND CAP UNUSED RACEWAY AND OUTLETS AND REMOVED UNUSED WIRING AND CONDUIT BACK TO PANELBOARD IN AN APPROVED MANNER.
9. INCLUDE IN DEMOLITION WORK FOR REMOVAL OF ALL COMMUNICATION DEVICES, OUTLETS, CABLES, CONDUITS ETC., WHICH ARE NOT TO BE REUSED. ALL REDUNDANT CABLING AND CONDUIT SHALL BE REMOVED IN ITS ENTIRETY FROM TENANT SPACE BACK TO BASE BUILDING RISER ROOMS. REMOVE ALL UNNECESSARY CABLES AND EQUIPMENT IN HUB ROOMS AND/OR TELEPHONE ROOMS WITH EXTREME CARE TO AVOID ANY ACCIDENTAL SHUTDOWNS OF EXISTING SERVICES SERVING OTHER PARTS OF THE BUILDING.
10. PROVIDE BLANK COVER-PLATE WHERE OUTLETS ARE REMOVED FROM EXISTING WALLS TO REMAIN.
11. ALL EXISTING ELECTRICAL EQUIPMENT THAT IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF, OFF SITE.
12. THIS CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CLIENT.
13. CARRY OUT THE WORK WITH MINIMUM OF NOISE, DUST AND DISTURBANCE.

V. WORK IN NEW AND RENOVATED AREAS:
1. WHEN REMOVING AND/OR MAKING SAFE EXISTING ELECTRICAL WORK, ENSURE THAT IT INCLUDES REMOVAL OF ALL DISCONNECTED WIRING AND CONDUIT BACK TO THE ASSOCIATED PANELBOARD OR DISTRIBUTION EQUIPMENT.
2. DISCONNECT, REMOVE, AND DISPOSE OF EXISTING LUMINAIRES, DEVICES, OUTLETS, ETC., WHICH ARE NOT TO BE REUSED. CUT BACK AND CAP UNUSED RACEWAY AND OUTLETS AND REMOVE UNUSED WIRING AND CONDUIT BACK TO PANELBOARD IN AN APPROVED MANNER. REMOVE ALL REDUNDANT COMMUNICATIONS CABLES BACK TO HUB ROOMS AND/OR TELEPHONE RISER ROOMS.
3. ENSURE THAT ALL EXISTING EQUIPMENT TO BE REUSED AND/OR RELOCATED IS THOROUGHLY INSPECTED AND REFURBISHED TO ENSURE CORRECT OPERATION WHEN PUT BACK INTO SERVICE AND MEETS THE LOCAL ELECTRICAL SAFETY AUTHORITY'S APPROVAL. OUTLET BOXES AND WIRING AND/OR CONDUITS WHICH ARE CORRODED OR DAMAGED ARE TO BE REPLACED.
4. ALL EXISTING ELECTRICAL EQUIPMENT WHICH IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF, OFF SITE.
5. WHERE EXISTING OUTLET BOXES ARE REMOVED FROM EXISTING UNDER-FLOOR DUCTS, PLUG AND CAP EXISTING HOLES FLUSH WITH FLOOR USING APPROVED FITTINGS. REMOVE ALL REDUNDANT WIRE AND CABLE BACK TO SERVICE.
6. BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CLIENT.
7. CARRY OUT THE WORK WITH A MINIMUM OF NOISE, DUST AND DISTURBANCE.
8. PROVIDE TOOLS AND CLEAN UP EQUIPMENT. OBTAIN THE LANDLORD'S PERMISSION FOR THE USE OF ELECTRICAL, ELEVATOR, PLUMBING OR DRAINAGE FACILITIES.
9. PROVIDE DAILY CLEAN UP AND PROPER DISPOSAL OF DEBRIS GENERATED BY DAILY OPERATIONS. ON COMPLETION OF THE WORK, ALL TOOLS, SURPLUS MATERIALS AND WASTE MATERIALS SHALL BE REMOVED AND THE PREMISES LEFT IN A CLEAN AND PERFECT CONDITION.
10. CONDUITS WHICH ARE TO BE CUT BACK ARE TO TERMINATE IN A JUNCTION BOX.
11. CLEAN LUMINAIRE REFLECTORS AND LENSES, LAMPS AND WHERE SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT. CLEAN THE INSIDES AND OUTSIDES OF PANELBOARDS, SPLITTERS AND OTHER ELECTRICAL EQUIPMENT, AND COMPLETELY REMOVE ALL DEBRIS AND TOOLS FROM THE PROJECT.

W. SUBMIT THE FOLLOWING LIST OF UNIT PRICES:
1. RECEPTACLES - ADD/DEDUCT PRICE FOR EACH TYPE SPECIFIED ON DRAWINGS ($/RECEPTACLE)
2. DATA/TELEPHONE OUTLET -ADD/DEDUCT PRICE FOR WALL MOUNTED TELEPHONE OUTLET WITH 1" CONDUIT STUBBED INTO HUNG CEILING ($/OUTLET)
3. RACEWAYS - ALL SIZES ON PROJECT ($/LIN FT), CONDUCTORS ($/LIN FT), MC CABLE ($/LIN FT)
4. ELECTRICAL PANELS (ALL TYPES AND RATINGS INDICATED ON DRAWINGS)
5. TRANSFORMERS (ALL TYPES AND RATINGS INDICATED ON DRAWINGS)

X. EXISTING EQUIPMENT REFURBISHMENT:
1. WHERE PANELBOARDS, SWITCHES, CIRCUIT BEAKERS, TRANSFORMERS, ETC. ARE EXISTING TO BE REUSED THE CONTRACTOR SHALL CLEAN AND REFURBISH THE EQUIPMENT. THIS SHALL INCLUDE TIGHTENING ALL CONNECTIONS, REPLACING DEFECTIVE MECHANISMS, EXERCISING MECHANISMS AND PROVIDING ANY MISCELLANEOUS COMPONENTS SO THE EQUIPMENT IS IN FIRST CLASS WORKING ORDER.
2. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD SURVEY ALL EXISTING BASE BUILDING RECEPTACLE, LIGHTING AND EQUIPMENT CIRCUITS WHICH ARE EXISTING TO REMAIN. PROVIDE AS BUILT SURVEY PRIOR TO THE START OF ANY WORK AND SUBMIT TO ENGINEER FOR RECORD. CIRCUITS SHALL REMAIN IN EXISTING PANELS OR WHEN PANELBOARDS ARE REPLACED, RETERMINATED IN NEW PANELBOARD.

Y. PROTECTION:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AND EQUIPMENT UNTIL FINALLY INSPECTED, TESTED AND ACCEPTED. MATERIALS AND EQUIPMENT SHALL BE CAREFULLY STORED WHICH ARE NOT IMMEDIATELY INSTALLED AFTER DELIVERY TO SITE. CLOSE EXPOSED PARTS OF THE WORK WITH TEMPORARY COVERS OR PLUGS DURING CONSTRUCTION TO PREVENT ENTRY OF MOISTURE OR OBSTRUCTING MATERIALS.
2. PROTECT THE WORK AND MATERIAL OF OTHERS FROM DAMAGE INSTALLED AS PART OF THIS CONTRACT. RESTORE ANY WORK DAMAGED AND BE RESPONSIBLE FOR ALL CURRENT WORK AND ASSOCIATED COSTS.

Z. ACCEPTABLE MANUFACTURERS: (ENGINEER NOTE: REMOVE/REPLACE REGIONAL MANUFACTURERS)
1. DISCONNECT SWITCHES: SIEMENS, ABB, SCHNEIDER ELECTRIC, OR EATON
2. FUSES: EATON BUSSMAN, MERSEN / FERRAZ SHAWMUT, LITTLEFUSE
3. DRY TYPE TRANSFORMERS: ACME ELECTRIC CORP., SIEMENS, ABB, SCHNEIDER ELECTRIC, EATON, OR HAMMOND POWER SOLUTIONS
4. RACEWAY: NATIONAL WIRE PRODUCTS, TRIANGLE, REPUBLIC, ALLIED OR WHEATLAND.
5. WIRE/CABLE: GENERAL CABLE, SIMPLEX, SOUTHWIRE OR ENCORE.
6. PANELBOARDS/SWITCHBOARDS: SIEMENS, ABB, SCHNEIDER ELECTRIC, OR EATON (FOR NYC PROJECTS: ELECTROTECH, ALL-CITY SWITCHBOARD, OR LINCOLN ELECTRIC)
7. JUNCTION/PULL BOXES: APPLETON ELECTRIC, O.Z. / GEDNEY CO, OR THOMAS & BETTS.
8. FIRE STOP MATERIAL: HILTI, OR 3M (NOTE: MATERIAL MUST BE ACCEPTABLE TO LOCAL AHJ)
9. FITTINGS, COUPLINGS, BUSHINGS, CONNECTORS: OZ GEDNEY, BERNDY, NEPCO, OR THOMAS & BETTS.
10. FIRE RATED POKE-THROUGH: HUBBELL, WIREMOLD, OR STEEL CITY.
11. TYPE MC CABLE: AFC/ATKORE OR SOUTHWIRE.
12. ENCLOSED BUS ASSEMBLIES: SIEMENS, ABB, SCHNEIDER ELECTRIC, OR EATON
13. WIRING DEVICES: LEVITON, LEGRAND, HUBBELL

IDENTIFICATION OF ELECTRICAL SYSTEMS

A. IDENTIFICATION OF EQUIPMENT:
1. ALL PANELBOARDS, SWITCHBOARDS, CONTROL PANELS, AND CABINETS SPECIFIED HEREIN SHALL BE CLEARLY IDENTIFIED WITH THE EQUIPMENT DESIGNATION, FEEDER SOURCE DESIGNATION, FEEDER SIZE, AND VOLTAGE RATING. IDENTIFICATION SHALL BE PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERING ATTACHED BY SCREWS.
   a. FOR PANELBOARDS/EQUIPMENT FED FROM UTILITY SOURCE(S) ONLY, NAMEPLATE SHALL BE BLACK WITH WHITE LETTERING.
   b. FOR GENERATOR BACKED, NAMEPLATE SHALL BE RED WITH WHITE LETTERING.
   c. FOR UPS-BACKED, NAMEPLATE SHALL BE YELLOW WITH BLACK LETTERING.
2. ALL ELECTRICAL EQUIPMENT SPECIFIED HEREIN SHALL BE PROVIDED WITH A MEANS OF IDENTIFICATION OF UNGROUNDED CONDUCTORS INSTALLED, EITHER BY SEPARATE COLOR CODING, MARKING TAPE, TAGGING, OR OTHER APPROVED MEANS. A LABEL SHALL BE PROVIDED ON THE EQUIPMENT DOCUMENTING THE IDENTIFICATION PER **NYCEC (NEC)** ARTICLE 210.5(C)(1).
3. JUNCTION BOXES, SPLICE BOXES, ETC., SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS, FOR CIRCUITS CONTAINED THEREIN. FACEPLATE OF SWITCHES FOR EQUIPMENT SUCH AS MOTORIZED SCREENS, ETC., SHALL BE IDENTIFIED WITH THE NAME OF THE DEVICE CONTROLLED. IDENTIFICATION SHALL BE BY INDELIBLE MARKER IN CONCEALED LOCATIONS AND ADHESIVE ('P' TOUCH TYPE) LABELS IN EXPOSED LOCATIONS. EMERGENCY DEVICES SHALL BE IDENTIFIED IN RED.
4. TOGGLE SWITCHES AND SAFETY SWITCHES FOR MECHANICAL, PLUMBING, AND FIRE PROTECTION EQUIPMENT (PUMPS, FANS, AC UNITS, WATER HEATERS, ETC.) SHALL BE LABELED WITH THE EQUIPMENT DESIGNATION, SOURCE PANEL/CIRCUIT, AND WIRE SIZE.
5. CLEARLY LABEL ALL EXPOSED CONDUIT, PULLBOXES, JUNCTION BOXES, ETC TO INDICATE THE NATURE OF THE SERVICE.
6. EMPTY CONDUITS SHALL BE IDENTIFIED WITH TAGS AT BOTH ENDS INDICATING THE LOCATION OF TERMINATION OF THE OPPOSITE END.
7. FIRE ALARM SYSTEM JUNCTION BOXES SHALL BE PAINTED FIRE DEPARTMENT RED. APPROVED IDENTIFICATION CARDS SHALL BE FURNISHED ADJACENT TO ALL CONTROL PANELS AND MANUAL STATIONS. REFER TO FIRE ALARM SPECIFICATIONS.
8. ALL RECEPTACLES AND LIGHT SWITCHES SHALL HAVE CIRCUIT NUMBERS AND ASSOCIATED PANEL DESIGNATION CLEARLY IDENTIFIED ON THE RECEPTACLES (OR DISCONNECT, JUNCTION BOX, ETC…) FACEPLATE. IDENTIFICATION SHALL BE PERMANENT,

DRY TYPE TRANSFORMERS

A. SUBMITTALS SHALL INCLUDE CONSTRUCTION DETAILS, MATERIAL DESCRIPTIONS, DIMENSIONS OF INDIVIDUAL COMPONENTS AND PROFILES, AND FINISHES FOR EACH SIZE OF TRANSFORMER. ALSO INCLUDE RATED NAMEPLATE DATA, CAPACITIES, WEIGHTS, DIMENSIONS, MINIMUM CLEARANCES, INSTALLED DEVICES AND FEATURES, AND PERFORMANCE FOR EACH TYPE AND SIZE OF TRANSFORMER.
B. SHOP DRAWINGS – DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHODS OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION. INCLUDE DETAILS OF VIBRATION ISOLATION BASE, INCLUDING ANCHORING AND ATTACHMENTS TO STRUCTURE AND SUPPORTED EQUIPMENT. INCLUDE DIAGRAMS FOR POWER, SIGNAL, AND CONTROL WIRING.
C. CLOSEOUT SUBMITTALS – PROVIDE OPERATION AND MAINTENANCE DATA FOR TRANSFORMERS.
D. THREE PHASE STEP-DOWN TRANSFORMERS SHALL BE 480-VOLT DELTA PRIMARY, 208Y/120-VOLT, 3-PHASE, 4-WIRE SECONDARY, FACTORY-ASSEMBLED AND –TESTED, AIR-COOLED UNITS FOR 60 HZ. SERVICE, UNLESS OTHERWISE NOTED.
E. THREE-PHASE STEP-UP TRANSFORMERS SHALL BE 208-VOLT DELTA PRIMARY, 480Y/277-VOLT, 3-PHASE, 4-WIRE SECONDARY, FACTORY-ASSEMBLED AND -TESTED, AIR-COOLED UNITS FOR 60 HZ OPERATION, UNLESS OTHERWISE NOTED.
F. TRANSFORMERS 30KVA AND LARGER SHALL HAVE A MINIMUM OF TWO 2.5 PERCENT FULL CAPACITY TAPS ABOVE AND FOUR 2.5 PERCENT FULL CAPACITY TAPS BELOW NORMAL RATED PRIMARY VOLTAGES.
G. TRANSFORMERS 30KVA AND ABOVE SHALL BE 150 C TEMPERATURE RISE ABOVE 40 C AMBIENT UNLESS OTHERWISE NOTED.
H. ALL TRANSFORMERS SHALL HAVE CLASS 220 INSULATION.
I. TRANSFORMERS SHALL COMPLY WITH NEMA ST20 AND UL 1561.
J. TRANSFORMERS 30KVA AND LARGER SHALL BE IN A HEAVY GAUGE SHEET STEEL, VENTILATED ENCLOSURE, IN ACCORDANCE WITH UL, NEMA, AND NATIONAL ELECTRICAL CODE STANDARDS FOR VENTILATED ENCLOSURE.
K. TRANSFORMER WINDINGS SHALL BE OF COPPER, WITHOUT SPLICES, EXCEPT FOR TAPS.
L. TRANSFORMERS FOR NON-LINEAR LOADS SHALL BE UL-LISTED WITH A K-13 LABEL AND SHALL BE PROVIDED WITH A DOUBLE-SIZED NEUTRAL TERMINAL. THESE TRANSFORMERS SHALL BE 115 C TEMPERATURE RISE ABOVE 40 C AMBIENT, UNLESS OTHERWISE NOTED.

SWITCHBOARDS

A. FURNISH AND INSTALL THREE-PHASE, FOUR WIRE COPPER BUS SWITCHBOARDS AS INDICATED ON PLANS.
B. PROVIDE SWITCHBOARDS WITH FRONT ACCESS ONLY UNLESS OTHERWISE INDICATED ON PLANS.
C. COORDINATE LAYOUT AND INSTALLATION OF SWITCHBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS, AND ADJACENT SURFACES. MAINTAIN REQUIRED WORKSPACE CLEARANCES AND REQUIRED CLEARANCES FOR EQUIPMENT ACCESS DOORS AND PANELS.
D. PROVIDE AND COORDINATE SIZES AND LOCATIONS OF CONCRETE BASES WITH ACTUAL EQUIPMENT PROVIDED. CAST ANCHOR-BOLT INSERTS INTO BASES.
E. SWITCHBOARDS SHALL BE FABRICATED AND TESTED ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES.
F. PROVIDE BARRIERS BETWEEN ADJACENT SWITCHBOARD SECTIONS.
G. PHASE-AND NEUTRAL-BUS MATERIAL SHALL BE HARD-DRAWN COPPER OF 98 PERCENT MINIMUM CONDUCTIVITY, WITH TIN-PLATED ALUMINUM OR COPPER FEEDER CIRCUIT-BREAKER LINE CONNECTIONS.
   1. LOAD TERMINALS SHALL BE INSULATED, RIGIDLY BRACED, RUNBACK BUS EXTENSIONS, OF SAME MATERIAL AS THROUGH BUSES, EQUIPPED WITH COMPRESSION CONNECTORS FOR OUTGOING CIRCUIT CONDUCTORS. PROVIDE LOAD TERMINALS FOR FUTURE CIRCUIT-BREAKER POSITIONS AT FULL-AMPERE RATING OF CIRCUIT-BREAKER POSITION.
   2. GROUND BUS SHALL BE 1/4-BY-2-INCH MINIMUM-SIZE REQUIRED BY UL 891, HARD-DRAWN COPPER OF 98 PERCENT CONDUCTIVITY, EQUIPPED WITH COMPRESSION CONNECTORS FOR FEEDER AND BRANCH-CIRCUIT GROUND CONDUCTORS. FOR BUSWAY FEEDERS, EXTEND INSULATED EQUIPMENT GROUNDING CABLE TO BUSWAY GROUND CONNECTION AND SUPPORT CABLE AT INTERVALS IN VERTICAL RUN.
   3. MAIN PHASE BUSES AND EQUIPMENT GROUND BUSES SHALL BE UNIFORM CAPACITY FOR ENTIRE LENGTH OF SWITCHBOARD'S MAIN AND DISTRIBUTION SECTIONS. PROVIDE FOR FUTURE EXTENSIONS FROM BOTH ENDS.
   4. NEUTRAL BUSES SHALL BE RATED AT 100 PERCENT OF THE AMPACITY OF PHASE BUSES UNLESS OTHERWISE INDICATED AND EQUIPPED WITH COMPRESSION CONNECTORS FOR OUTGOING CIRCUIT NEUTRAL CABLES. BRACE BUS EXTENSIONS FOR BUSWAY FEEDER NEUTRAL BUS.
   5. ISOLATION BARRIER ACCESS PROVISIONS SHALL PERMIT CHECKING OF BUS-BOLT TIGHTNESS.
H. BUS-BAR INSULATION SHALL BE FACTORY-APPLIED, FLAME-RETARDANT, TAPE WRAPPING OF INDIVIDUAL BUS BARS OR FLAME-RETARDANT, SPRAY-APPLIED INSULATION. MINIMUM INSULATION TEMPERATURE RATING SHALL BE 105 DEG C.
I. MOLDED-CASE CIRCUIT BREAKERS (MCCB) SHALL COMPLY WITH UL 489, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.
   1. THERMAL-MAGNETIC CIRCUIT BREAKERS SHALL INCLUDE INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT-CIRCUITS. CIRCUIT BREAKERS SIZED AT 250A AND ABOVE SHALL BE PROVIDED WITH ADJUSTABLE MAGNETIC TRIP SETTINGS.
   2. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS SHALL INCLUDE A MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD ADJUSTABLE TRIP SETTING.
   3. ELECTRONIC TRIP CIRCUIT BREAKERS WITH RMS SENSING SHALL INCLUDE A FIELD-REPLACEABLE RATING PLUG OR FIELD-REPLICABLE ELECTRONIC TRIP; AND THE FOLLOWING FIELD-ADJUSTABLE SETTINGS:
      a. INSTANTANEOUS TRIP
      b. LONG- AND SHORT-TIME PICKUP LEVELS
      c. LONG- AND SHORT-TIME ADJUSTMENTS
      d. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND I^2T RESPONSE
   4. CURRENT-LIMITING CIRCUIT BREAKERS FRAME SIZES 400 A AND SMALLER SHALL HAVE LET-THROUGH RATINGS LESS THAN NEMA FU 1, RK-5.
   5. INTEGRALLY FUSED CIRCUIT BREAKERS SHALL INCLUDE A THERMAL-MAGNETIC TRIP ELEMENT WITH INTEGRAL LIMITER-STYLE FUSE LISTED FOR USE WITH CIRCUIT BREAKER. TRIP ACTIVATION SHALL OCCUR UPON FUSE OPENING OR OPENING OF FUSE COMPARTMENT DOOR.
   6. GFCI CIRCUIT BREAKERS SHALL BE SINGLE- AND TWO-POLE CONFIGURATIONS WITH CLASS A GROUND-FAULT PROTECTION (5 MILLIAMP TRIP).
   7. GROUND-FAULT EQUIPMENT PROTECTION (GFEP) CIRCUIT BREAKERS SHALL BE PROVIDED WITH CLASS B GROUND-FAULT PROTECTION (30 MILLIAMP TRIP).
   8. MOLDED-CASE CIRCUIT-BREAKER (MCCB) FEATURES AND ACCESSORIES:
      a. STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
      b. LUGS SHALL BE COMPRESSION STYLE, SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL UTILIZED.
      c. APPLICATION LISTING APPROPRIATE FOR APPLICATION; TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HID FOR FEEDING FLUORESCENT AND HIGH-INTENSITY DISCHARGE (HID) LIGHTING CIRCUITS.
      d. GROUND-FAULT PROTECTION INTEGRALLY MOUNTED RELAY AND TRIP UNIT WITH ADJUSTABLE PICKUP AND TIME-DELAY SETTINGS, PUSH-TO-TEST FEATURE, AND GROUND-FAULT INDICATOR.
      e. ZONE-SELECTIVE INTERLOCKING INTEGRAL WITH ELECTRONIC TRIP UNIT; FOR INTERLOCKING GROUND-FAULT PROTECTION FUNCTION.
      f. SHUNT TRIP 120-V TRIP COIL ENERGIZED FROM SEPARATE CIRCUIT, SET TO TRIP AT 55 PERCENT OF RATED VOLTAGE.
      g. UNDERVOLTAGE TRIP SET TO OPERATE AT 35 TO 75 PERCENT OF RATED VOLTAGE WITHOUT INTENTIONAL TIME DELAY.
      h. AUXILIARY CONTACTS TWO SPDT SWITCHES WITH "A" AND "B" CONTACTS; "A" CONTACTS MIMIC CIRCUIT-BREAKER CONTACTS, "B" CONTACTS OPERATE IN REVERSE OF CIRCUIT-BREAKER CONTACTS.
      i. KEY INTERLOCK KIT EXTERNALLY MOUNTED TO PROHIBIT CIRCUIT-BREAKER OPERATION; KEY SHALL BE REMOVABLE ONLY WHEN CIRCUIT BREAKER IS IN OFF POSITION.
      j. INSULATED-CASE CIRCUIT BREAKER (ICCB) FULLY RATED, SEALED, INSULATED-CASE POWER CIRCUIT BREAKER WITH INTERRUPTING CAPACITY RATING TO MEET AVAILABLE FAULT CURRENT.
J. BOLTED-PRESSURE CONTACT SWITCH: OPERATING MECHANISM USES ROTARY-MECHANICAL-BOLTING ACTION TO PRODUCE AND MAINTAIN HIGH CLAMPING PRESSURE ON THE SWITCH BLADE AFTER IT ENGAGES THE STATIONARY CONTACTS.
   1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      a. BOLTSWITCH, INC.
      b. PRINGLE ELECTRICAL MANUFACTURING COMPANY, INC.
   2. MAIN-CONTACT INTERRUPTING CAPABILITY: MINIMUM OF 12 TIMES THE SWITCH CURRENT RATING.
   3. OPERATING MECHANISM: MANUAL HANDLE OPERATION TO CLOSE SWITCH; STORES ENERGY IN MECHANISM FOR OPENING AND CLOSING.
      a. ELECTRICAL TRIP: OPERATION OF LEVER OR PUSH-BUTTON TRIP SWITCH, OR TRIP SIGNAL FROM GROUND-FAULT RELAY OR REMOTE-CONTROL DEVICE, CAUSES SWITCH TO OPEN.
   4. AUXILIARY SWITCHES: FACTORY INSTALLED, SINGLE POLE, DOUBLE THROW, WITH LEADS CONNECTED TO TERMINAL BLOCK, AND INCLUDING ONE SET MORE THAN QUANTITY REQUIRED FOR FUNCTIONAL PERFORMANCE INDICATED.
   5. SERVICE-RATED SWITCHES: LABELED FOR USE AS A SERVICE EQUIPMENT.
   6. OPEN-FUSE TRIP DEVICE: ARRANGED TO TRIP SWITCH OPEN IF A PHASE FUSE OPENS.
K. HIGH-PRESSURE, BUTT-TYPE CONTACT (HPC) SWITCH: OPERATING MECHANISM USES BUTT-TYPE CONTACTS AND A SPRING-CHARGED MECHANISM TO PRODUCE AND MAINTAIN HIGH-PRESSURE CONTACT WHEN SWITCH IS CLOSED.
   1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      a. GENERAL ELECTRIC COMPANY; GE CONSUMER & INDUSTRIAL – ELECTRICAL DISTRIBUTION.
   2. MAIN-CONTACT INTERRUPTING CAPABILITY: MINIMUM OF 12 TIMES THE SWITCH CURRENT RATING.
   3. OPERATING MECHANISM: MANUAL HANDLE OPERATION TO CLOSE SWITCH; STORES ENERGY IN MECHANISM FOR OPENING AND CLOSING.
      a. ELECTRICAL TRIP: OPERATION OF LEVER OR PUSH-BUTTON TRIP SWITCH, OR TRIP SIGNAL FROM GROUND-FAULT RELAY OR REMOTE-CONTROL DEVICE, CAUSES SWITCH TO OPEN.
   4. AUXILIARY SWITCHES: FACTORY INSTALLED, SINGLE POLE, DOUBLE THROW, WITH LEADS CONNECTED TO TERMINAL BLOCK, AND INCLUDING ONE SET MORE THAN QUANTITY REQUIRED FOR FUNCTIONAL PERFORMANCE INDICATED.
   5. SERVICE-RATED SWITCHES: LABELED FOR USE AS A SERVICE EQUIPMENT.
   6. OPEN-FUSE TRIP DEVICE: ARRANGED TO TRIP SWITCH OPEN IF A PHASE FUSE OPENS.
L. FUSED SWITCH: NEMA KS 1, TYPE HD; CLIPS TO ACCOMMODATE SPECIFIED FUSES; LOCKABLE HANDLE.
M. PROVIDE CONTINUOUSLY INTEGRATED MIMIC BUS FACTORY APPLIED TO FRONT OF SWITCHBOARD. ARRANGE IN SINGLE-LINE DIAGRAM FORMAT, USING SYMBOLS AND LETTER DESIGNATIONS CONSISTENT WITH FINAL MIMIC-BUS DIAGRAM.
N. INSTRUMENTATION
   1. INSTRUMENT TRANSFORMERS: IEEE C57.13, NEMA EI 21.1, AND THE FOLLOWING:
      a. POTENTIAL TRANSFORMERS: IEEE C57.13; VOLTAGE AS INDICATED ON PLANS, 60 HZ, TAPPED SECONDARY, DISCONNECTING TYPE WITH INTEGRAL FUSE MOUNTINGS. BURDEN AND ACCURACY SHALL BE CONSISTENT WITH CONNECTED METERING AND RELAY DEVICES.
      b. CURRENT TRANSFORMERS: IEEE C57.13; 5A, 60 HZ, SECONDARY; WOUND TYPE; SINGLE SECONDARY WINDING AND SECONDARY SHORTING DEVICE. BURDEN AND ACCURACY SHALL BE CONSISTENT WITH CONNECTED METERING AND RELAY DEVICES.
      c. CONTROL-POWER TRANSFORMERS: DRY TYPE, MOUNTED IN SEPARATE COMPARTMENTS FOR UNITS LARGER THEN 3 KVA.
   2. MULTIFUNCTION DIGITAL-METERING MONITOR: MICROPROCESSOR-BASED UNIT SUITABLE FOR 3 OR 4 WIRE SYSTEMS AND WITH THE FOLLOWING FEATURES:
      a. SWITCH SELECTABLE DIGITAL DISPLAY OF THE FOLLOWING VALUES WITH MAXIMUM ACCURACY TOLERANCES AS INDICATED.
      b. MOUNTING: DISPLAY AND CONTROL UNIT FLUSH OR SEMIFLUSH MOUNTED IN INSTRUMENT COMPARTMENT DOOR.
      c. MANUFACTURER: EATON MODEL PXM 1000 OR EQUIVALENT BY SQUARE D, ELECTRO INDUSTRIES OR SATEC.
O. EQUIPMENT MOUNTING: INSTALL SWITCHBOARDS ON CONCRETE BASE, 4-INCH (100-MM) NOMINAL THICKNESS.
   1. INSTALL DOWEL RODS TO CONNECT CONCRETE BASE TO CONCRETE FLOOR. UNLESS OTHERWISE INDICATED, INSTALL DOWEL RODS ON 19-INCH (450-MM) CENTERS AROUND THE FULL PERIMETER OF CONCRETE BASE.
   2. FOR SUPPORTED EQUIPMENT, INSTALL EPOXY-COATED ANCHOR BOLTS THAT EXTEND THROUGH CONCRETE BASE AND ANCHOR INTO STRUCTURAL CONCRETE FLOOR.
   3. PLACE AND SECURE ANCHORAGE DEVICES. USE SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
   4. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SWITCHBOARDS.
P. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS.
Q. REFER TO TESTING AND COMMISSIONING SECTION FOR ADDITIONAL REQUIREMENTS.

PANELBOARDS

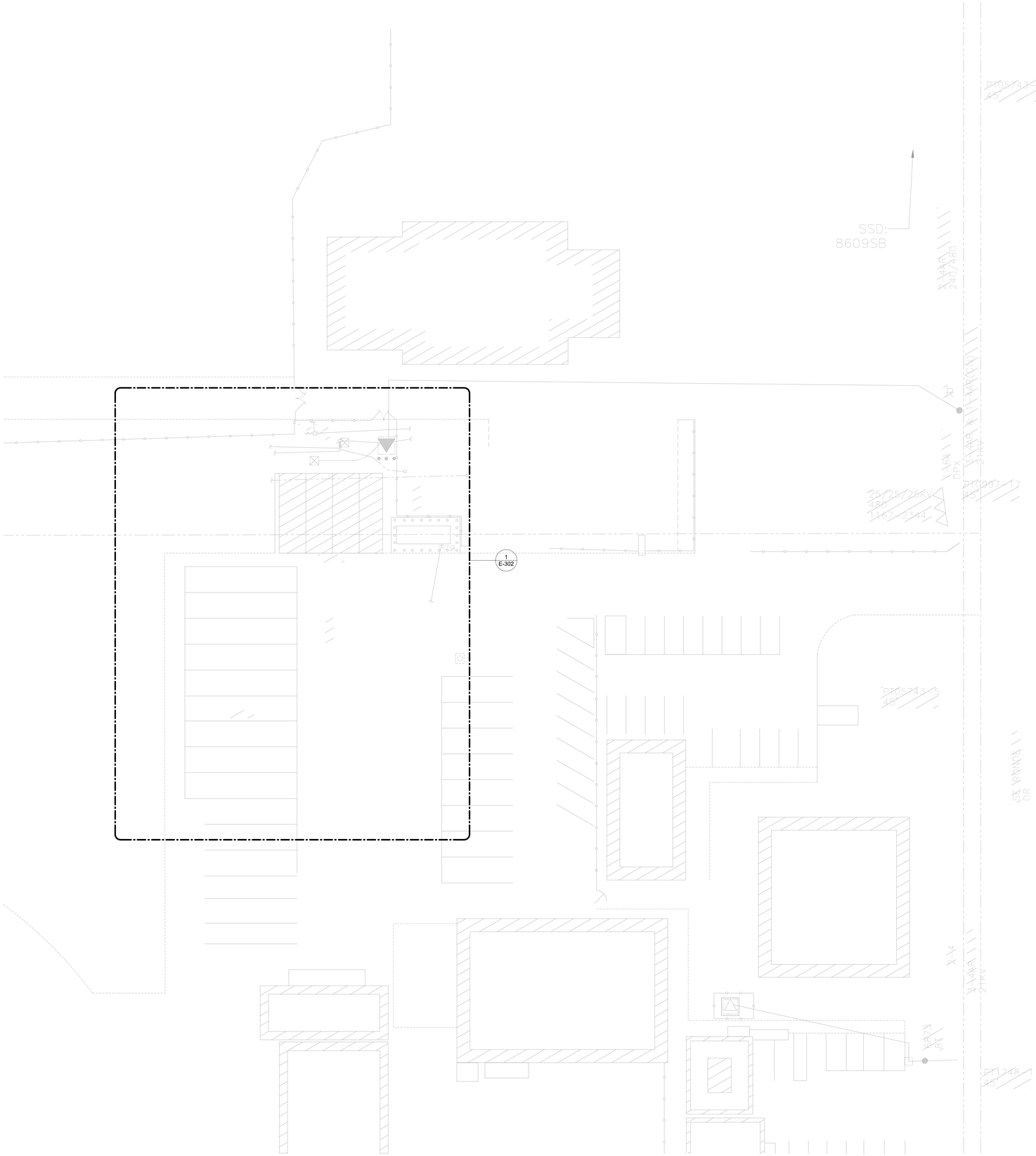
A. FURNISH AND INSTALL THREE-PHASE, 4 WIRE COPPER BUS PANELBOARDS AS INDICATED ON PANEL SCHEDULES.
B. PANELBOARDS SHALL BE IN INSTALLED IN ENCLOSURES FABRICATED OF CODE GAUGE GALVANIZED SHEET STEEL WITHOUT KNOCKOUTS. PANELBOARD ENCLOSURES SHALL BE RATED BASED ON INSTALLATION LOCATION.
   1. INDOOR, DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1 ENCLOSURE
   2. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R ENCLOSURE
C. ALL BUS BAR PLATING SHALL RUN THE ENTIRE LENGTH OF THE BUS. BUSES SHALL BE FULLY RATED FOR THE ENTIRE LENGTH OF THE BUS.
D. THE MAIN AND BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE SHALL BE MOLDED CASE CIRCUIT BREAKERS, LISTED IN ACCORDANCE WITH UL 489 AND WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS. THE CIRCUIT BREAKERS SHALL BE THERMAL-MAGNETIC WITH INVERSE TIME-CURRENT ELEMENT FOR LOW LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP FOR SHORT CIRCUITS. FOR BRANCH CIRCUITS PROVIDE BOLT-ON TYPE BREAKERS FOR FRAMES 125 A OR SMALLER.
E. CONDUCTOR CONNECTORS SHALL BE SUITABLE FOR USE WITH THE INDICATED CONDUCTOR SIZES.
F. CIRCUIT WIRING IN PANELBOARDS SHALL BE TRIMMED AND DRESSED IN A NEAT AND WORKMANLIKE MANNER. ALL WIRING SHALL BE TAGGED. PANELBOARDS SHALL BE PROVIDED WITH A DETAILED TYPE WRITTEN DIRECTORY.
G. CABINETS SHALL BE CODE-GAUGE GALVANIZED STEEL WITH DOOR-IN-DOOR LOCKABLE TRIM. LAP AND RIVET CORNERS OR FORM AS APPROVED. BACKBOX AND TRIM SHALL BE PRIMED AND FINISHED WITH GRAY ENAMEL. PANEL TRIM (OUTER DOOR) SHALL BE MOUNTED VIA TRIM CLAMPS OR SHALL BE SCREW MOUNTED. DOOR SHALL BE MOUNTED WITH FULL LENGTH PIANO HINGES AND SHALL BE PROVIDED WITH MULTI-PIN CYLINDER LOCKS WITH MILLED KEYS. ALL PANELS TO BE KEYED ALIKE AND KEYS TO BE CUT AS DIRECTED.
H. PROVIDE CODE GAUGE STEEL DOORS FOR ALL PANELBOARD BOXES. FRONT COVER SHALL BE A "DOOR WITHIN A DOOR" TYPE. THE OUTER DOOR (TRIM) SHALL ALLOW ACCESS TO ENTIRE PANELBOARD BOX INCLUDING GUTTER SPACES. OUTER DOOR (TRIM) SHALL BE ATTACHED DIRECTLY TO BOX BY A FULL-LENGTH PIANO HINGE. THE INNER DOOR SHALL ALLOW ACCESS TO CIRCUIT BREAKERS ONLY. PROVIDE LOCK AND SET OF KEYS FOR INNER DOOR PER PANELBOARD. TRIMS SHALL COVER ALL LIVE PARTS AND SHALL HAVE NO EXPOSED HARDWARE.
I. PANEL BUS BARS SHALL BE COPPER, [TEMPERATURE RISE-RATED] [HIGH DENSITY 1000A /SQ IN]. PROVIDE A COPPER EQUIPMENT GROUND BAR IN EACH PANEL, AND A COPPER ISOLATED GROUND BAR IN NOTED PANELS. ALL BUS BAR PARKING SHALL RUN THE ENTIRE LENGTH OF BUS. BUSES SHALL BE FULLY RATED FOR THE ENTIRE LENGTH.
J. PANELS SHALL BE PROVIDED WITH NEUTRAL BARS SIZED AT 100% OF THE PHASE BUS BARS UNLESS OTHERWISE NOTED ON THE DESIGN PANEL SCHEDULES.
K. ALL MAIN BREAKERS SHALL BE SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY.
L. ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT, INCLUDING PANELBOARDS AND/OR DISTRIBUTION PANELBOARDS SHALL BE INSTALLED ON A 4" HIGH CONCRETE BASE TO EXTEND 2" ON ALL SIDES WITH CHAMFERED CORNERS. ALL CONCRETE WORK TO BE INCLUDED IN THIS DIVISION.
M. REFER TO IDENTIFICATION OF ELECTRICAL SYSTEMS SPECIFICATION.
N. PHASE LEGS OF ALL PANELS SHALL BE BALANCED AT SUPPLY POINT TO WITHIN 10% AFTER ALL CIRCUITS ARE WIRED AND LOADS CONNECTED.
O. 208Y/120 VOLT PANELS SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 22,000 AMPERES, RMS SYMMETRICAL, UNLESS OTHERWISE NOTED. 480Y/277 VOLT PANELS SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 42,000 AMPERES, RMS SYMMETRICAL UNLESS OTHERWISE NOTED.
P. MINIMUM GUTTER SPACE: BOX SHALL BE OF SUFFICIENT SIZE TO ALLOW A GUTTER AT LEAST 5-3/4" IN WIDTH ENTIRELY SURROUNDING EACH SECTION OF BOARD. INCREASE GUTTER SIZE TO ACCOMMODATE FEEDER AND FEEDER TAPS.
Q. REFER TO TESTING AND COMMISSIONING SECTION FOR ADDITIONAL REQUIREMENTS.

TESTING AND COMMISSIONING

A. SYSTEM STARTUP SHALL BE PERFORMED BY A FACTORY TRAINED AND AUTHORIZED ENGINEERED SYSTEMS DISTRIBUTOR. CERTAIN FUNCTIONS OF THE SYSTEMS STARTUP PROCEDURE MAY BE PERFORMED BY A CONTRACTOR UNDER THE DIRECTION OF THE FACTORY TRAINED AND AUTHORIZED ENGINEERED SYSTEMS DISTRIBUTOR.
B. OWNER'S INSTRUCTION AND OPERATION MANUALS (SPECIFIC FOR THIS PROJECT) SHALL BE SUPPLIED TO THE BUILDING'S OPERATIONS STAFF BY THE FACTORY TRAINED AND AUTHORIZED ENGINEERED SYSTEMS DISTRIBUTOR. A "GENERIC" OR "TYPICAL" OWNERS' INSTRUCTION AND OPERATION MANUAL SHALL NOT BE ACCEPTABLE TO FULFILL THIS REQUIREMENT. SITE SPECIFIC SEQUENCE AND INSTRUCTION SHALL BE A REQUIRED SUPPLEMENT TO THE STANDARD O&M MANUALS PROVIDED.
C. LIFE SAFETY TESTING:
   1. AFTER COMPLETION OF THE PROJECT, PERFORM A TEST OF THE EMERGENCY EGRESS LIGHTING SYSTEM. TEST SHALL BE PERFORMED AFTER DARK (AT LEAST 1 HOUR AFTER SUNSET); SIMULATE POWER FAILURE ON ALL LIGHTING CIRCUITS. TAKE LIGHT LEVEL READINGS ALONG PATHS OF EGRESS AT FLOOR LEVEL UTILIZING A FOOT CANDLE METER; RECORD READINGS ON A REDUCED SCALE (1/16"=1'-0") FLOOR PLAN. READINGS SHALL BE TAKEN AT THE MIDPOINT BETWEEN EMERGENCY FIXTURES. SUBMIT SEALED AND SIGNED COPY OF THE FLOOR PLAN READINGS TO THE ENGINEER.
   2. THE ELECTRICAL CONTRACTOR SHALL PRETEST ALL SYSTEMS AND DEVICES AND SHALL SUBMIT A COMPLETION CERTIFICATE FROM THE MANUFACTURER'S REPRESENTATIVE, ON MANUFACTURER'S LETTERHEAD, THAT ALL SYSTEMS ARE OPERATIONAL AND PERFORM TO CONTRACT DOCUMENT SPECIFICATIONS. MANUFACTURER'S CERTIFICATE SHALL BE DELIVERED TO GENERAL CONTRACTOR/ CONSTRUCTION MANAGER, TENANT, AND ENGINEER A MINIMUM OF 10 DAYS PRIOR TO TENANT MOVE IN.
   3. COMMISSIONING OF LIGHTING CONTROL SYSTEM (PROGRAMMABLE SYSTEM CONTROLS, OCCUPANT SENSORS, PHOTOSENSORS, AND DAYLIGHT CONTROLS) SHALL BE READY FOR COMMISSIONING AGENT NO FEWER THAN 5 WORKING DAYS PRIOR TO TENANT MOVE IN.
D. SYSTEM COMMISSIONING
   1. CONTRACTOR'S RESPONSIBILITIES
      a. PRIOR TO SYSTEM ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A FUNCTIONAL DEMONSTRATION AND INTEGRATED TESTING OF ALL THE COMPONENTS OF THE ELECTRICAL AND MECHANICAL SYSTEMS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
         1. SWITCHBOARDS, PANELBOARDS, AND AUTOMATIC TRANSFER SWITCHES
         2. MAIN SERVICE CIRCUIT BREAKERS AND/OR SWITCHES
         3. GROUNDING SYSTEMS
         4. ENCLOSED BUS ASSEMBLIES
   2. THE CONTRACTOR SHALL SUBMIT RELEVANT COMMISSIONING CHECK LISTS AND PROCEDURES FOR ENGINEER'S REVIEW PRIOR TO SYSTEM COMMISSIONING. OPERATING FUNCTIONS SHALL BE PERFORMED IN THE PRESENCE OF A CLIENT'S REPRESENTATIVE.
   3. AFTER COMPLETION OF FUNCTIONAL STARTUP, THE CONTRACTOR SHALL SUBMIT A COMPLETE PACKAGE OF CHECKLISTS, TEST DATA, AND STARTUP CERTIFICATES FROM VENDORS.
   4. CONTRACTOR SHALL PROVIDE A WRITTEN STATEMENT STATING THAT THE FULL OPERATION OF ALL SYSTEMS, FUNCTIONS AND ALARMS HAVE BEEN DEMONSTRATED AND ARE OPERATIONAL AS WELL AS A LISTING OF ALL SYSTEMS, ALARMS AND FUNCTIONS THAT HAVE BEEN COMMISSIONED. ANY ADDITIONAL COSTS ARISING FROM SITE VISITS OR ADDITIONAL WORK AS A RESULT OF INCOMPLETE COMMISSIONING BY THE CONTRACTOR SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
   5. THIS TESTING SHALL TAKE PLACE AFTER HAVING SATISFACTORILY MET THE REQUIREMENTS OF SHOP DRAWING ACCEPTANCE.
E. ELECTRICAL EQUIPMENT TESTING REQUIREMENTS
   1. THE FOLLOWING EQUIPMENT, WHETHER PRE-PURCHASED OR PURCHASED BY THIS CONTRACTOR, SHALL BE TESTED ON SITE PRIOR TO BEING ENERGIZED IN ACCORDANCE WITH THE LATEST NETA TESTING STANDARDS:
      a. NEW SWITCHBOARDS
      b. NEW PANELBOARDS
      c. ALL NEW TWO-POLE AND THREE-POLE CIRCUIT BREAKERS 225A AND LARGER
      d. NEW 600V CABLES #8 AWG AND LARGER
      e. NEW TRANSFORMERS
      f. NEW GROUNDING SYSTEMS
   2. ALL TESTING SHALL BE PERFORMED BY A CERTIFIED THIRD-PARTY TESTING COMPANY AS APPROVED BY BUILDING MANAGEMENT.
   3. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER AND ENGINEER FOR REVIEW.
   4. ANY DEFICIENCIES NOTED IN THE TEST REPORTS SHALL BE CORRECTED AS FOLLOWS:
      a. PRE-PURCHASED EQUIPMENT SHALL BE REPLACED AND/OR REPAIRED AS DIRECTED BY THE CONSTRUCTION MANAGER.
      b. EQUIPMENT AND WIRING PROVIDED BY THIS CONTRACTOR SHALL BE REPLACED BY THIS CONTRACTOR AT NO ADDITIONAL COST.
      c. REPLACED/REPAIRED EQUIPMENT AND WIRING SHALL BE RETESTED.
   5. SUBMIT FINAL TEST RESULTS TO THE CONSTRUCTION MANAGER AND ENGINEER PRIOR TO ENERGIZING EQUIPMENT.
F. END-USER TRAINING
   1. UPON COMPLETION OF SUCCESSFUL SYSTEM CHECK-OUT DEMONSTRATION, END-USER TRAINING SESSION SHALL BE HELD. THREE (3) SESSIONS, TWO (2) HOURS IN DURATION, SHALL BE SCHEDULED AT LEAST ONE WEEK IN ADVANCE. THE CONTRACTOR SHALL BE PREPARED TO PROVIDE AT LEAST ONE (1) OF THE TRAINING SESSIONS DURING "AFTER HOURS". AT A TIME TO BE DEFINED BY THE OWNER AND THE CONSULTING ENGINEER.
   2. THE ATTENDEES OF EACH TRAINING SESSION SHALL BE DETERMINED BY THE OWNER, AND THE CONTRACTOR SHALL PROVIDE WRITTEN MATERIALS FOR A MINIMUM OF TEN (10) PEOPLE IN EACH OF THREE (3) SESSIONS (MINIMUM OF 30 SETS OF DOCUMENTATION).
   3. TRAINING INSTRUCTORS SHALL CONSIST OF A) FACTORY CERTIFIED PERSONNEL WITH GOOD COMMUNICATION SKILLS, VERSED IN THE DESIGN AND OPERATION OF THE SPECIFIED EQUIPMENT, B) ELECTRICAL FOREMAN AND C) LEAD TECHNICIAN WHO PARTICIPATED IN THE INSTALLATION OF THE NEW SYSTEM. THE CONTRACTOR SHALL SUBMIT, AS PART OF HIS/HER DESIGN SUBMITTAL, A SYLLABUS OR COURSE OUTLINE DETAILING ALL ASPECTS OF THE TRAINING SESSION TOPICS. THESE TRAINING SESSIONS SHALL ALSO INCLUDE TIME PROVISIONS FOR QUESTIONS FROM ATTENDEE.
   4. TOPICS FOR TRAINING SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO, THE FOLLOWING:
      a. SYSTEM DESIGN AND ARCHITECTURE
      b. EQUIPMENT LAYOUT AND DESCRIPTION
      c. SEQUENCES OF OPERATION
      d. INPUT/OUTPUT MATRIX
      e. MAINTENANCE, DIAGNOSTICS, AND TROUBLESHOOTING
      f. REVIEW OF USER DOCUMENTATION
      g. HANDS-ON USE OF SYSTEM

SHORT CIRCUIT, ARC FLASH AND COORDINATION STUDIES

A. CONTRACTOR SHALL PERFORM A SHORT-CIRCUIT CURRENT ANALYSIS TO DETERMINE AVAILABLE FAULT CURRENT LEVELS AT ALL NEW PANELBOARDS, SWITCHBOARDS, CIRCUIT BREAKERS OR FUSES IN THE DISTRIBUTION SYSTEM BASED ON THE AVAILABLE FAULT CURRENT ATTAINED FROM THE UTILITY COMPANY OR BUILDING ENGINEER. GENERATE APPROPRIATE SETTINGS FOR ALL RELAYS AND PROTECTIVE DEVICES INCLUDED IN THE SCOPE OF THE PROJECT. A PRELIMINARY ANALYSIS SHALL BE PERFORMED PRIOR TO PURCHASE OF ANY NEW EQUIPMENT OR DEVICES TO ENSURE RATINGS ARE SUFFICIENT FOR THE SHORT-CIRCUIT CURRENT AVAILABLE.
B. A COMPLETED SHORT CIRCUIT AND COORDINATION STUDY SHALL BE SUBMITTED TO ENGINEER FOR REVIEW PRIOR TO SUBMITTALS OR PURCHASING OF ANY NEW PANELBOARDS, SWITCHBOARDS, CIRCUIT BREAKERS AND/OR FUSES.
C. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, THE STUDY SHALL BE PERFORMED UTILIZING THE SKM SYSTEMS ANALYSIS, INC., SOFTWARE.
D. PROVIDE A COMPLETE, COMPREHENSIVE REPORT AT THE CONCLUSION OF THE SHORT-CIRCUIT COORDINATION STUDY CONSISTING OF THE FOLLOWING:
   1. A SET OF TIME-CURRENT CURVE CHARACTERISTICS FOR ALL PROTECTIVE DEVICES IN THE SYSTEM
   2. TIME-CURRENT DAMAGE CURVES FOR ALL TRANSFORMERS, MOTORS, AND CABLES
   3. A COMPLETE SCHEDULE OF ALL MAIN PROTECTIVE RELAYS, FUSES, AND OTHER PROTECTIVE DEVICES; SCHEDULE SHALL INCLUDE DEVICE LOCATIONS, MANUFACTURER, MODEL NUMBER, SIZE, RANGE, SETTINGS, ETC.
E. PROVIDE ALL PANELBOARDS AND SWITCHBOARDS WITH FIELD MARKING ON THE ENCLOSURE WITH THE AVAILABLE FAULT CURRENT AND DATE THE CALCULATION WAS PERFORMED. THE MARKING SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HANDWR



1 ELECTRICAL OVERALL SITE PLAN
1" = 20'-0"

POWER GENERAL NOTES

1. REFER TO GENERAL PROJECT NOTES AND SYMBOLS LIST / LEGEND FOR MORE INFORMATION.
2. BEFORE BID SUBMISSION AND COMMENCING WORK, CONTRACTOR SHALL FIELD INSPECT SCOPE OF PROJECT, AND SUBMIT A REQUEST OF INFORMATION TO THE ENGINEER FOR ANY DISCREPANCIES OR INCOMPATIBILITIES FOUND BETWEEN DESIGN AND ACTUAL CONDITIONS.
3. ALL JUNCTION OR OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO COVER. PROVIDE ARCHITECT APPROVED ACCESS DOORS OR PLATES AS REQUIRED IN AREAS WHERE UNOBSTRUCTED ACCESS TO BOX OR OUTLET IS NOT POSSIBLE.
4. ALL BRANCH CIRCUIT WIRING SHALL BE ROUTED CONCEALED IN WALLS AND IN HUNG CEILING CAVITY, U.O.N.
5. EQUIPMENT LOCATIONS, WHERE SHOWN, ARE APPROXIMATE. FIELD VERIFY AND REFER TO ARCHITECTURAL DRAWINGS FOR MORE DETAILED DIMENSIONS AND OTHER CONSTRUCTION RELATED INFORMATION.
6. PROVIDE TEMPORARY LIGHT AND POWER IN AREAS INDICATED WHERE PERMANENT LIGHTING IS BEING REMOVED.
7. EXISTING CONDUIT RISER AND PANEL LOCATIONS (WHERE SHOWN) ARE FOR INFORMATIONAL / REFERENCE PURPOSES.
8. WHEN TRANSITIONING EXISTING EQUIPMENT FROM TEMPORARY TO PERMANENT SOURCE, ELECTRICAL CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS TO SAFE-OFF ALL EXISTING DOWNSTREAM LOADS PRIOR TO RE-ENERGIZING ON NEW PERMANENT POWER. DOWNSTREAM LOADS SHALL BE RE-ENERGIZED ONE AT A TIME SO AS TO ISOLATE SHORT CIRCUITS, VERIFY PROPER CONNECTIONS, PHASE ROTATION, ETC. ELECTRICAL CONTRACTOR SHALL THOROUGHLY VERIFY AND UNDERSTAND EXISTING FIELD CONDITIONS AND PROJECT SCOPE. DEVELOP AND DOUBLE CHECK RESPECTIVE METHODS OF PROCEDURE (MOP) PRIOR TO PERFORMING WORK.
9. UON, EXISTING OUTLETS NOT SHOWN ON THIS PLAN, WITHIN AREAS OF WORK, ARE TO REMAIN - PROTECT AND MAINTAIN AS REQUIRED.
10. CIRCUIT ALL NEW OUTLETS PER CIRCUITING NOTES. ALL OUTLETS (NEW AND EXISTING) SHALL BE LABELED WITH ITS SOURCE PANEL AND CIRCUIT NUMBER. SEE DEMOLITION PLAN FOR CIRCUIT TRACING SCOPE. PROVIDE AS-BUILT DRAWINGS SHOWING FINAL CIRCUIT NUMBERS OF ALL DEVICES AT COMPLETION OF WORK.
11. OUTLET TYPE AND CIRCUITING REQUIREMENT FOR SPECIAL PURPOSE OFFICE EQUIPMENT WHERE SHOWN ARE FOR PRICING ONLY. COORDINATE EXACT REQUIREMENTS WITH CLIENT / ARCHITECT / EQUIPMENT MANUFACTURER.
12. CIRCUIT NUMBERS ARE INDICATED FOR INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL ADJUST ACCORDINGLY IN THE FIELD TO BALANCE THE CIRCUITS EVENLY ON ALL PHASES.
13. CIRCUITS ARE DESIGNATED BY THE NUMBER SHOWN ADJACENT TO EACH RECEPTACLE. WIRING IS SHOWN ONLY UNDER SPECIAL CIRCUMSTANCES. PROVIDE CONDUITS, WIRES, AND BOXES REQUIRED TO ENERGIZE THE EQUIPMENT AS SHOWN.
14. 3/4" SHALL BE THE MINIMUM CONDUIT INSTALLED.

CLIENT

PACIFIC POWER & SYSTEMS

PROJECT

Travis Unified School District EV Fleet
27501 DeRonde Drive, Fairfield, CA 94533

ENGINEER

WB Engineers+ Consultants
5934 GIBRALTAR DRIVE, SUITE 100
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KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
YOGESH M. PATEL
No. 37411
ELECTRICAL
STATE OF CALIFORNIA

DRAWING TITLE

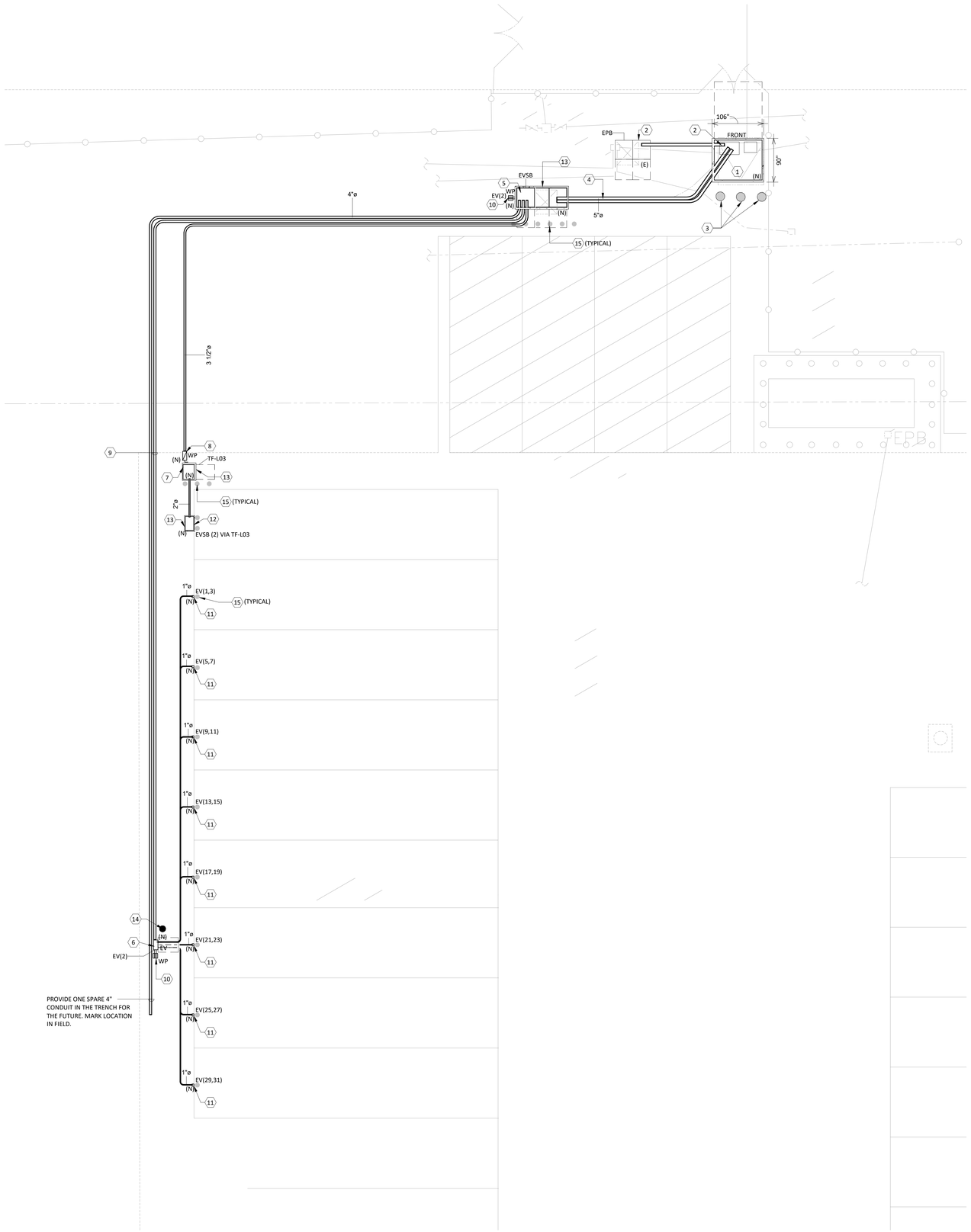
ELECTRICAL OVERALL SITE PLAN

SCALE	JOB #
As indicated	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

E-301

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1 ELECTRICAL ENLARGED PLAN
1/8" = 1'-0"

POWER GENERAL NOTES

1. REFER TO GENERAL PROJECT NOTES AND SYMBOLS LIST / LEGEND FOR MORE INFORMATION.
2. BEFORE BID SUBMISSION AND COMMENCING WORK, CONTRACTOR SHALL FIELD INSPECT SCOPE OF PROJECT, AND SUBMIT A REQUEST OF INFORMATION TO THE ENGINEER FOR ANY DISCREPANCIES OR INCOMPATIBILITIES FOUND BETWEEN DESIGN AND ACTUAL CONDITIONS.
3. ALL JUNCTION OR OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO COVER. PROVIDE ARCHITECT APPROVED ACCESS DOORS OR PLATES AS REQUIRED IN AREAS WHERE UNOBSTRUCTED ACCESS TO BOX OR OUTLET IS NOT POSSIBLE.
4. ALL BRANCH CIRCUIT WIRING SHALL BE ROUTED CONCEALED IN WALLS AND IN HUNG CEILING CAVITY, U.O.N.
5. EQUIPMENT LOCATIONS, WHERE SHOWN, ARE APPROXIMATE. FIELD VERIFY AND REFER TO ARCHITECTURAL DRAWINGS FOR MORE DETAILED DIMENSIONS AND OTHER CONSTRUCTION RELATED INFORMATION.
6. PROVIDE TEMPORARY LIGHT AND POWER IN AREAS INDICATED WHERE PERMANENT LIGHTING IS BEING REMOVED.
7. EXISTING CONDUIT RISER AND PANEL LOCATIONS (WHERE SHOWN) ARE FOR INFORMATIONAL / REFERENCE PURPOSES.
8. WHEN TRANSITIONING EXISTING EQUIPMENT FROM TEMPORARY TO PERMANENT SOURCE, ELECTRICAL CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS TO SAFE-OFF ALL EXISTING DOWNSTREAM LOADS PRIOR TO RE-ENERGIZING ON NEW PERMANENT POWER. DOWNSTREAM LOADS SHALL BE RE-ENERGIZED ONE AT A TIME SO AS TO ISOLATE SHORT CIRCUITS, VERIFY PROPER CONNECTIONS, PHASE ROTATION, ETC. ELECTRICAL CONTRACTOR SHALL THOROUGHLY VERIFY AND UNDERSTAND EXISTING FIELD CONDITIONS AND PROJECT SCOPE. DEVELOP AND DOUBLE CHECK RESPECTIVE METHODS OF PROCEDURE (MOP) PRIOR TO PERFORMING WORK.
9. UON, EXISTING OUTLETS NOT SHOWN ON THIS PLAN, WITHIN AREAS OF WORK, ARE TO REMAIN - PROTECT AND MAINTAIN AS REQUIRED.
10. CIRCUIT ALL NEW OUTLETS PER CIRCUITING NOTES. ALL OUTLETS (NEW AND EXISTING) SHALL BE LABELED WITH ITS SOURCE PANEL AND CIRCUIT NUMBER. SEE DEMOLITION PLAN FOR CIRCUIT TRACING SCOPE. PROVIDE AS-BUILT DRAWINGS SHOWING FINAL CIRCUIT NUMBERS OF ALL DEVICES AT COMPLETION OF WORK.
11. OUTLET TYPE AND CIRCUITING REQUIREMENT FOR SPECIAL PURPOSE OFFICE EQUIPMENT WHERE SHOWN ARE FOR PRICING ONLY. COORDINATE EXACT REQUIREMENTS WITH CLIENT / ARCHITECT / EQUIPMENT MANUFACTURER.
12. CIRCUIT NUMBERS ARE INDICATED FOR INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL ADJUST ACCORDINGLY IN THE FIELD TO BALANCE THE CIRCUITS EVENLY ON ALL PHASES.
13. CIRCUITS ARE DESIGNATED BY THE NUMBER SHOWN ADJACENT TO EACH RECEPTACLE. WIRING IS SHOWN ONLY UNDER SPECIAL CIRCUMSTANCES. PROVIDE CONDUITS, WIRES, AND BOXES REQUIRED TO ENERGIZE THE EQUIPMENT AS SHOWN.
14. 3/4" SHALL BE THE MINIMUM CONDUIT INSTALLED.

KEY NOTES

1. REPLACED EXISTING 150KVA PAD-MOUNTED UTILITY TRANSFORMER WITH NEW 300KVA PAD-MOUNTED UTILITY TRANSFORMER. PG&E TO PROVIDE AND INSTALL THE TRANSFORMER ON A PG&E-APPROVED 106" X 90" PRECAST PAD IN ACCORDANCE WITH UTILITY SPECIFICATIONS.
2. EXISTING SWITCHBOARD TO REMAIN. PG&E SHALL DISCONNECT THE EXISTING FEEDER FROM THE CURRENT UTILITY TRANSFORMER, THEN RECONNECT IT TO THE NEW UTILITY TRANSFORMER ONCE INSTALLED.
3. NEW 5" PROTECTIVE FIXED BOLLARDS PROVIDED AND INSTALED BY PG&E PER UTILITY STANDARDS. COORDINATE FINAL LOCATION PRIOR TO ROUGH-IN.
4. (2) 5" PVC UNDERGROUND CONDUITS FROM UTILITY TRANSFORMER TO NEW EV SWITCHBOARD "EVSB" PROVIDED AND INSTALLED BY PG&E. PG&E IS RESPONSIBLE FOR TRENCHING AND INSTALLING THE CONDUITS AND FEEDER FROM TRANSFORMER TO THE SWITCHBOARD. REFER TO SHEET E-501 FOR ADDITIONAL INFORMATION.
5. NEW PAD MOUNTED SERVICE ENTRANCE RATED SWITCHBOARD. REFER TO SHEET E-501 FOR MORE INFORMATION.
6. PROVIDE NEW 400A, 208V, 3PH, 4W, NEMA 3R EV PANELBOARD SUPPORTED BY UNISTRUT. REFER TO SHEET E-503 FOR MORE INFORMATION.
7. NEW 75 KVA STEP-UP TRANSFORMER, PRIMARY 208V & SECONDARY 480Y/277V.
8. PROVIDE NEW WEATHERPROOF 250A, 480V, 3PH, 4W PRIMARY FUSED DISCONNECT SWITCH SUPPORTED BY UNISTRUT FOR THE NEW STEP UP TRANSFORMER. REFER TO SHEET E-501 FOR MORE INFORMATION.
9. NEW (2) 4" UNDERGROUND CONDUIT PROVIDED BY ELECTRICAL CONTRACTOR. (1) 4" CONDUIT FOR EV PANEL AND (1) 4" SPARE CONDUIT FOR FUTURE. VERIFY EXACT ROUTING AND FINAL LOCATION IN FIELD. COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO ROUGH IN. REFER TO SHEET E-501 FOR MORE INFORMATION.
10. PROVIDE NEW GFI RECEPTACLE WITH WP COVER STUBBED UP ADJACENT TO PANEL.
11. NEW LEVEL 2 CHARGER. THE LEVEL 2 CHARGER SHALL BE MOUNTED ON A 4"X4" STEEL SQUARE POLE. PROVIDE 208V, 60A, 1PHASE, 3 WIRE CIRCUIT TO EACH CHARGING STATIONS. EACH POLE SHALL BE BONDED TO A 8' X 5/8" GROUND ROD AT EACH LOCATION. REFER TO SHEET E-501 FOR ADDITIONAL INFORMATION. (BASIS OF DESIGN : CYBER EV CHARGER CSE1, LEVEL 2 COMMERCIAL ELECTRIC VEHICLE CHARGER)
12. NEW PAD MOUNTED LEVEL 3 CHARGER. PROVIDE 480V, 150A, 3PHASE, 4 WIRE CIRCUIT TO CHARGING STATION VIA STEP-UP TRANSFORMER. (BASIS OF DESIGN :CHARGE POINT EXPRESS 250)
13. PROVIDE A 4" HIGH CONCRETE PAD FOR NEW SERVICE SWITCHBOARD, TRANSFORMER AND LEVEL 3 CHARGER. EXTEND CONCRETE PAD TO 3" TOWARDS ALL SIDE FROM EDGE OF EQUIPMENT. COORDINATE WITH STRUCTURAL/CIVIL ENGINEER FOR THE EQUIPMENT PAD DETAILS.
14. PROVIDE A FB GROUND BOX WITH GROUND ROD. COORDINATE FINAL LOCATION IN FIELD PRIOR TO ROUGH-IN.
15. NEW 5" PROTECTIVE BOLLARDS PROVIDED BY ELECTRICAL CONTRACTOR, WHERE BOLLARDS ARE INSTALLED IN FRONT OF EQUIPMENT THEY MUST BE REMOVABLE WITH THE ABILITY TO LOCK THEM IN PLACE. COORDINATE FINAL LOCATIONS PRIOR TO ROUGH-IN. REFER TO BOLLARD DETAIL ON SHEET E-401.

CLIENT

PACIFIC POWER & SYSTEMS

PROJECT

Travis Unified School District EV Fleet
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KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE



DRAWING TITLE

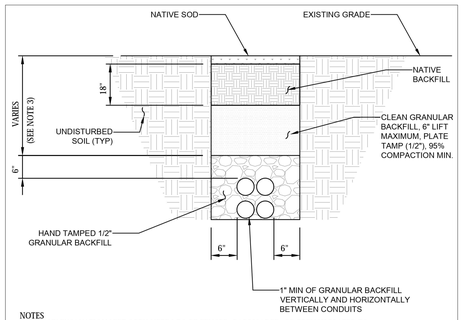
ELECTRICAL ENLARGED PLAN

SCALE	JOB #
As indicated	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

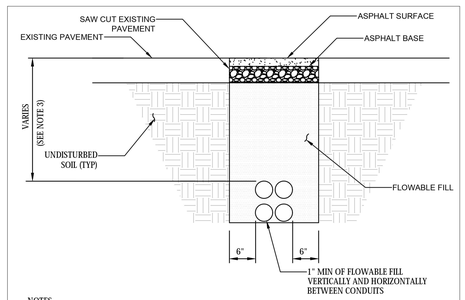
E-302

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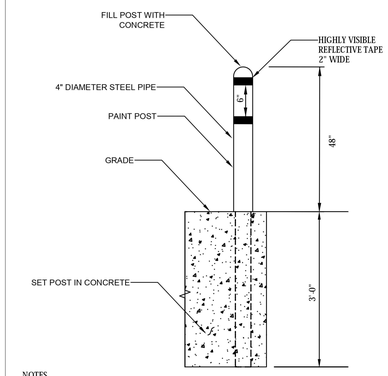
NOTES
1. ANY EXCAVATION LEFT OPEN NEEDS TO BE FENCED, BARRICADED, OR TRENCH PLATED TO INSURE THE SAFETY OF THE GENERAL PUBLIC.
2. ANY PAVEMENT DAMAGE DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO PRE CONSTRUCTION CONDITIONS OR BETTER.
3. TRENCH DEPTHS ARE REQUIRED TO BE 2'-0" MIN. OR 6" BELOW FROST LINE PER LOCAL JURISDICTION REQUIREMENTS.
4. EXACT NUMBER OF CONDUITS SHALL BE DETERMINED BY SHEET E-1 & E-2, EXACT CONDUIT PLACEMENT IN TRENCH SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD BASED ON PHYSICAL MEASUREMENTS AND JURISDICTIONAL REQUIREMENTS.

1 TYPICAL NON-UTILITY CONDUIT UNDER SOIL TRENCH NTS



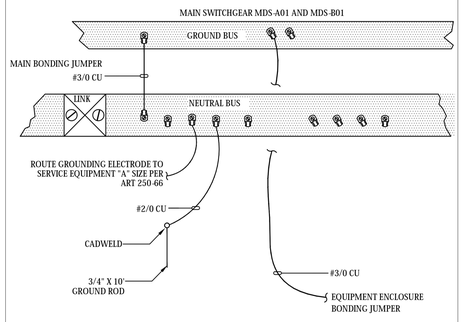
NOTES
1. ASPHALT SHALL COMPLY WITH STANDARD DOT OR LOCAL JURISDICTION SPEC. FOR HMA SURFACE COURSE.
2. ANY EXCAVATION LEFT OPEN NEEDS TO BE FENCED, BARRICADED, OR TRENCH PLATED TO INSURE THE SAFETY OF THE GENERAL PUBLIC.
3. TRENCH DEPTHS ARE REQUIRED TO BE 2'-0" MIN. OR 6" BELOW FROST LINE PER LOCAL JURISDICTION REQUIREMENTS.
4. ANY PAVEMENT DAMAGE DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO PRE CONSTRUCTION CONDITIONS OR BETTER.
5. EXACT NUMBER OF CONDUITS SHALL BE DETERMINED BY SHEET E-1 & E-2, EXACT CONDUIT PLACEMENT IN TRENCH SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD BASED ON PHYSICAL MEASUREMENTS AND JURISDICTIONAL REQUIREMENTS.

2 TYPICAL NON-UTILITY CONDUIT UNDER ASPHALT TRENCH NTS

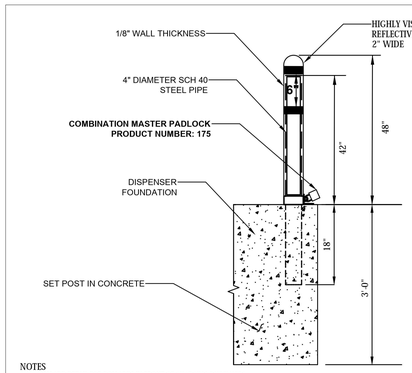


NOTES
1. REFER TO SITE PLAN FOR LOCATION OF BOLLARD

3 BOLLARD DETAIL (TYPICAL) NTS

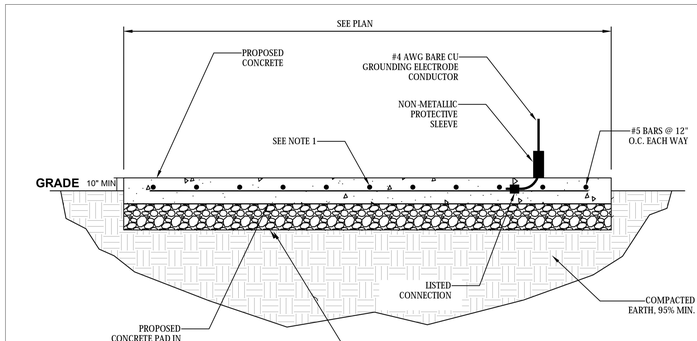


4 SERVICE GROUNDING & BONDING DETAIL NTS



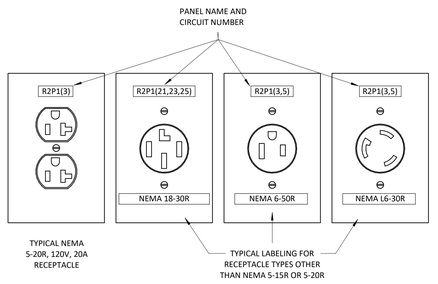
NOTES
1. BOLLARD DETAIL FOR BOLLARDS IN FRONT OF CHARGING DISPENSERS.
2. PRODUCT DETAILS: IDEAL SHIELD REMOVABLE LOCKING BOLLARD PART NUMBER : REM-LOCK-04-GALV

6 REMOVABLE LOCKING BOLLARD (TYPICAL) NTS



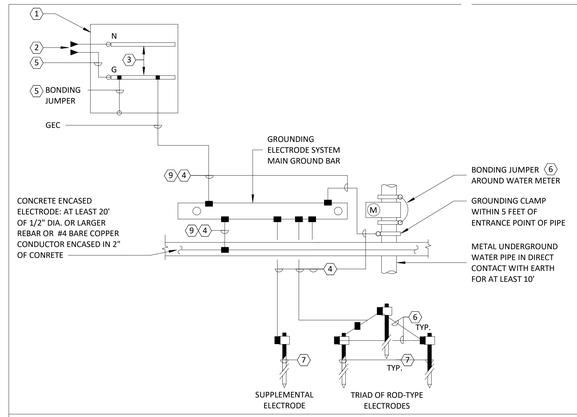
NOTE
1. REBAR BONDED TOGETHER WITH STEEL TIE WIRES OR EXOTHERMIC WELDING
2. COORDINATE EXACT PAD DETAILS REQUIREMENTS WITH ACE FOR PMT AND WITH SWITCHBOARD MANUFACTURER FOR SWITCHBOARD AS REQUIRED.

5 CONCRETE ENCASED ELECTRODE DETAIL NTS



NOTE:
1. ABBREVIATED PANEL NAME FOR REFERENCE AND EXAMPLE ONLY. CONTRACTOR SHALL PROVIDE LABEL INDICATING FULL PANEL NAME AND CIRCUIT NUMBER.
2. PROVIDE P-TOUCH LABELS ON DEVICES (BLACK TEXT ON CLEAR BACKGROUND).

8 DEVICE LABELING DETAIL NTS



7 GROUNDING - BUILDING / STRUCTURE SUPPLIED BY FEEDER OR BRANCH CIRCUIT NTS

KEY NOTES

1. DISCONNECTING MEANS IN SEPARATE BUILDING OR STRUCTURE SUPPLIED BY FEEDER OR BRANCH CIRCUIT.
2. EGC AND NEUTRAL RUN WITH THE SUPPLY CONDUCTORS FROM ANOTHER BUILDING / SOURCE.
3. NEUTRAL BUS SHALL BE ISOLATED FROM ENCLOSURE, NO NEUTRAL TO GROUND BOND SHALL BE MADE NEC 250.32(B)(1).
4. SIZED TO AT LEAST NEC 250.32(E), 250.66.
5. SIZED TO AT LEAST NEC 250.32(B)(1) OR 250.32(B)(2), 250.122.
6. MINIMUM #6 AWG COPPER CONDUCTOR.
7. 3/4" x 10' LONG COPPER-CLAD GROUND ROD DRIVEN WITH TOP 1'-0" BELOW GRADE, INSTALLED NOT LESS THAN 6' APART FROM OTHER ELECTRODES.
8. MINIMUM #2 AWG COPPER CONDUCTOR AT LEAST 20' LONG, INSTALLED NOT LESS THAN 30" BELOW SURFACE OF THE EARTH.
9. CONDUCTOR ENCLOSED IN 1-1/4" CONDUIT.

LEGEND

○ INDICATES BOLTED CONNECTION.
■ INDICATES EXOTHERMIC WELD CONNECTION, COMPATIBLE WITH MATERIALS BEING JOINED.

ATS = AUTOMATIC TRANSFER SWITCH
DIA = DIAMETER
G = GROUND BUS
GEC = GROUNDING ELECTRODE CONDUCTOR
N = NEUTRAL BUS
MBJ = MAIN BONDING JUMPER
NON-SDS = NON-SEPERATELY DERIVED SYSTEM
SDS = SEPARATELY DERIVED SYSTEM
SBJ = SYSTEM BONDING JUMPER
SSBJ = SUPPLY SIDE BONDING JUMPER

CLIENT

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PROJECT

Travis Unified School District EV Fleet
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Fairfield, CA 94533

ENGINEER

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KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER — ANTHONY JOSEPH — No. E17411 — ELECTRICAL — STATE OF CALIFORNIA

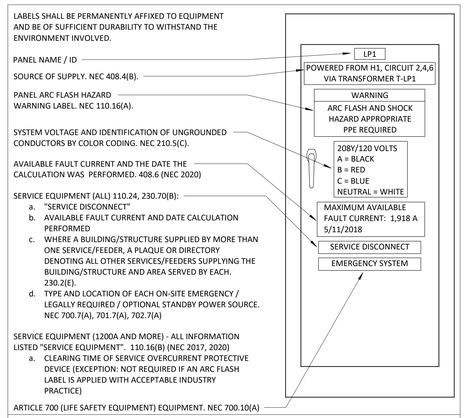
DRAWING TITLE
ELECTRICAL DETAILS

SCALE	JOB #
NTS	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

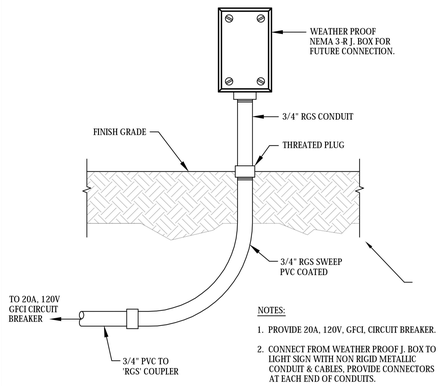
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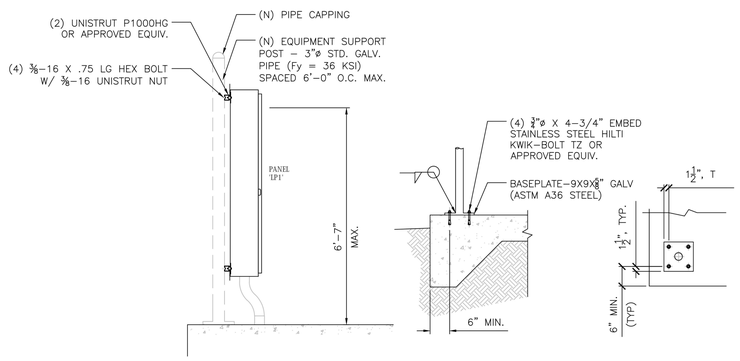
1 PANEL / DISTRIBUTION BOARD LABELING

NTS



2 CONNECTION - DETAIL

NTS



3 EQUIPMENT SUPPORT POST

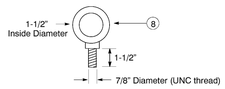
NTS

Concrete Pad for Three-Phase, Loop-Style, Pad-Mounted Transformers

Table 1 Bill of Materials for Concrete Transformer Pads

Item	Quantity	Description	Code	Document
1	1	Pad, Concrete, Reinforced (see Page 5)	–	–
2	As Required	Wire, #2 AWG, Solid, Soft Drawn, Bare Copper [1]	290074	–
3	2	Ground Rod, 5/8" x 8', Copperclad	187013	013109
4	2	Clamp, Ground Rod, for Item 3	187012	
5	As Required	Conduit, Type and Size (as required)	–	062288
6	As Required	Reinforcing Steel, Number 4 [2]	–	–
7	As Required	Compacted Backfill	–	–
8	Tool	Bolt, Eye, 7/8" Diameter x 1-1/2" Long, 1-1/2" Inside Diameter, Shoulder-Type	190013	–

1 When pad is installed for PG&E by others, the use of solid or stranded wire is acceptable.
2 Number 3 rebar at 12-inch maximum separation with 4x4 6-6 wire mesh over the entire surface may be substituted for the use of Number 4 rebar.



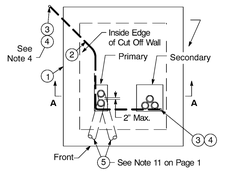
Detail A
Lifting Eye for Pad and Boxes

Concrete Pad for Three-Phase, Loop-Style, Pad-Mounted Transformers

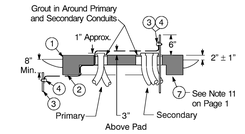
Pad Arrangements for Style IIA, IIB, IIC, IIF, and IIH Transformers

Notes

1. Primary conduits must be centered in the window.
2. Secondary conduits shall be grouped towards the front of the pad.
3. Precast pads do not have cut off walls.
4. A 6-foot minimum separation shall be maintained between ground rods.
5. The ground wire must be a continuous wire that runs from the outside ground rod, under the pad, to the primary window, then above the pad from the primary window, through the secondary window, to the secondary ground rod as shown below.



Plan View



Section A-A

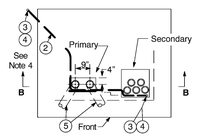
Figure 1
Style IIA, IIB, IIC, IIF, and IIH Pad Arrangement, Poured-in-Place Pad Shown

Concrete Pad for Three-Phase, Loop-Style, Pad-Mounted Transformers

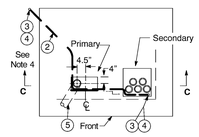
Pad Arrangements for Style IID, IIE, and IIG Transformers

Notes

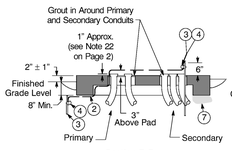
1. Install primary conduits as shown. Keep single primary conduit installation to the left as indicated to reduce strain on elbow terminators.
2. Secondary conduits shall be grouped towards the front of the pad.
3. Precast pads do not have cut off walls.
4. A 6-foot minimum separation shall be maintained between ground rods.
5. The ground wire must be a continuous wire that runs from the outside ground rod, under the pad, to the primary window, then above the pad from the primary window, through the secondary window, to the secondary ground rod as shown below.



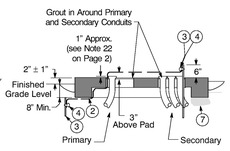
Plan View



Plan View



Section B-B



Section C-C

Figure 2
Loop Installation of Style IID, IIE, and IIGPad Arrangement, Poured-in-Place Pad Shown

Figure 3
Radial Installation of Style IID, IIE, and IIG Pad Arrangement, Poured-in-Place Pad Shown

4 PG&E TRANSFORMER DETAILS

NTS

Concrete Pad for Three-Phase, Loop-Style, Pad-Mounted Transformers

Concrete Pad Details for Style IIA, IIB, IIC, IIF, and IIH Transformers

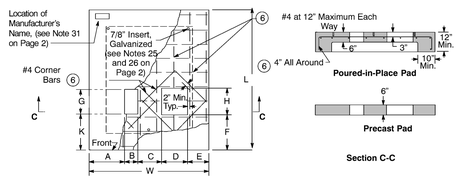


Figure 4
Construction Details of Style II A/B/C/F/H Pad (see Figure 1 on Page 5 for pad arrangement)

Table 2 Dimensions and Codes for Style IIA, IIB, IIC, IIF, and IIH Transformer Pads [1]

Transformer			Pad Dimensions (inches)										Code
Style	kVA Size	Approximate Maximum Weight (lbs)	A	B	C	D	E	F	G	H	K	L	W	
IIA	75	3,200	21	8	14	16	13	15	16	16	15	72	72	043436
	(112.5) [2]	3,200												
	150	3,500												
	(225) [2]	4,000												
	300	4,500												
IIB and IIF	(225) [2]	4,500	23				13					78	80	043538
	300	5,000												
	(500) [2]	6,000	29	8	19	17	23	15	16	19	15	100	96	040242
	750	9,000	32				22					112	98	040243
	1,000	11,000	36				26					117	106	040244
IIC and IIF	1,500	13,000	31	8	23	17	26	15	16	19	15	120	105	040245
	(2,000) [2]	15,000												
IIC and IIF	2,500	16,000												
IIH	2955/ 3325	22,000												

1 See Document 066211 for approved suppliers.
2 ( ) = Indicates a kVA size that is no longer purchased.

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PROJECT

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27501 DeRonde Drive,
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ENGINEER

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5934 GIBRALTAR DRIVE, SUITE 100
PLEASANTON, CA 94588
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KEY PLAN

NO.	DATE	ISSUE DESCRIPTION
	10/07/2024	85% CD PROGRESS SET
	10/18/2024	100% CD PERMIT SET

SEAL & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
ANTHONY JOSEPH MARTINEZ
No. 837411
ELECTRICAL
STATE OF CALIFORNIA

DRAWING TITLE

ELECTRICAL DETAILS

SCALE	JOB #
NTS	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

E-402

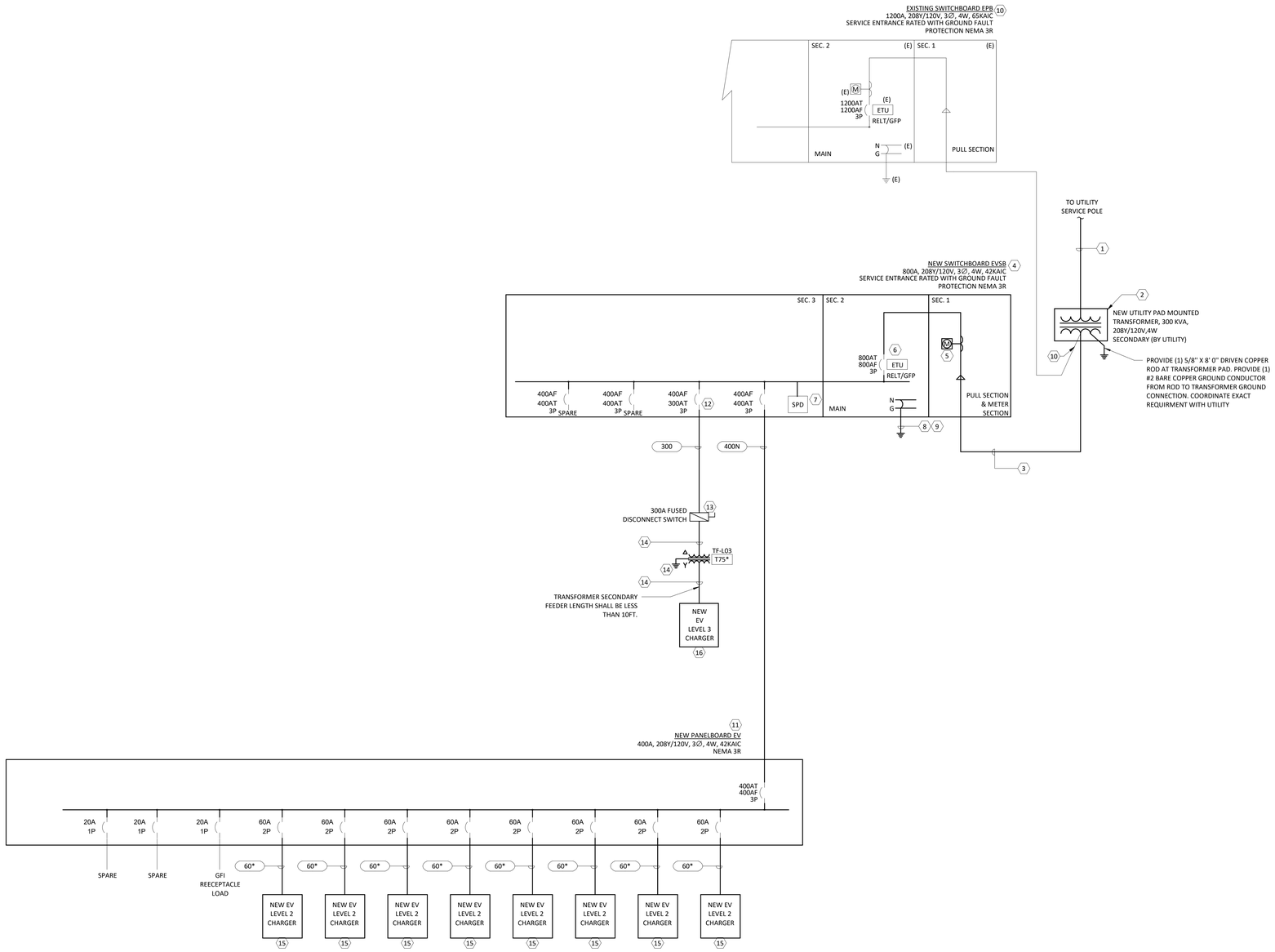
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TRANSFORMER SCHEDULE

TAG	DESCRIPTION	kVA	PRIMARY FLA	PRIMARY OCPD	PRIMARY FEEDER					SECONDARY FLA	SECONDARY OCPD	SECONDARY FEEDER						SYSTEM BONDING JUMPER	GROUNDING ELECTRODE CONDUCTOR
					PRIMARY FEEDER SETS	PRIMARY FEEDER PHASE	PRIMARY FEEDER EGC	PRIMARY FEEDER RACEWAY	PRIMARY FEEDER MATERIAL			SECONDARY FEEDER SETS	SECONDARY FEEDER PHASE	SECONDARY FEEDER NEUTRAL	SECONDARY FEEDER SUPPLY SIDE BONDING JUMPER	SECONDARY FEEDER RACEWAY	SECONDARY FEEDER MATERIAL		
T75*	208V DELTA - 480Y/277V WYE STEP UP	75	208	300A-3P	1	(3) #350 KCMIL	#2	3-1/2"	COPPER	90	150A-3P	1	(3) #1/0	#1/0	#6	2"	COPPER	#6	#6

FEEDER SCHEDULE

FEEDER TAG	MATERIAL	DESCRIPTION	SETS	PHASE	NEUTRAL	EGC	RACEWAY	AMPERES
60*	COPPER	1PH 3W	1	(2) #4	-	#10	1"	70
300	COPPER	3PH 3W	1	(3) 350 KCMIL	-	#4	3-1/2"	310
400N	COPPER	3PH 4W	1	(3) 600 KCMIL	600 KCMIL	#3	4"	420



1 ELECTRICAL PARTIAL ONE-LINE DIAGRAM
NTS

KEY NOTES

1. EXISTING TO REMAIN PRIMARY FEEDERS.
2. NEW PAD MOUNTED UTILITY TRANSFORMER TO BE PROVIDED AND INSTALLED BY PG&E. ELECTRICAL CONTRACTOR SHALL PROVIDE NEW CONCRETE PAD TO MEET PG&E REQUIREMENTS.
3. SECONDARY FEEDERS PROVIDED AND INSTALLED BY PG&E - (2) 750AL XLP QPX 600V IN 5" CONDUIT. COORDINATE WITH UTILITY FOR EXACT REQUIREMENTS.
4. NEW 800AF/800AT SERVICE ENTRANCE RATED SWITCHBOARD, 208Y/120V, 3PHASE, 4W, NEMA 3R PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.
5. UTILITY METER: COORDINATE WITH UTILITY FOR FINAL LOCATION AND EXACT REQUIREMENTS. COORDINATE WITH UTILITY ENGINEER PRIOR INSTALLATION. GEAR SHALL BE EUSERC 325 AND 322 APPROVED AS REQUIRED BY PG&E.
6. PROVIDE GROUND FAULT PROTECTION (GFP) FOR EQUIPMENT PER NEC 230.95 AS REQUIRED.
7. PROVIDE SPD. COORDINATE WITH THE SWITCHBOARD MANUFACTURER FOR ADDITIONAL INFORMATION.
8. PROVIDE GROUNDING ELECTRODE 5/8"X8'-0" COPPER CLAD GROUND ROD INSTALLATION PER NEC 250.52(A)(5), 250.53 (A) AND 250.68. EXTEND #4/0 SOLID AWG CU GROUNDING ELECTRODE CONDUCTOR PER NEC 250.66 (A) TO GROUND BUS OF SWITCHBOARD. REFER TO DETAIL #7, ON SHEET E-401.
9. PROVIDE CONCRETE ENCASED ELECTRODE PER NEC 250.52(A)(3)(1) OR (2). EXTEND #4 AWG BARE CU GROUNDING ELECTRODE CONDUCTOR PER NEC 250.66(B) TO GROUND BUS OF SWITCHBOARD. REFER TO GROUNDING DETAIL #7, ON SHEET E-401.
10. EXISTING SWITCHBOARD "EPB" TO REMAIN. REMOVE EXISTING FEEDER FROM EXISTING UTILITY TRANSFORMER AND RECONNECT TO NEW UTILITY TRANSFORMER AS REQUIRED. REFER TO SHEET E-302 FOR ADDITIONAL INFORMATION.
11. NEW 400AF/400AT PANELBOARD, 208Y/120V, 3PHASE, 4W, NEMA 3R PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.
12. CIRCUIT BREAKER TO BE LOCKABLE IN CLOSED POSITION.
13. PROVIDE NEW WEATHERPROOF 300A, 208V, 3PH, 3W PRIMARY FUSED LOCKABLE DISCONNECT SWITCH.
14. REFER TO TRANSFORMER SCHEDULE ON THIS SHEET FOR TRANSFORMER PRIMARY AND SECONDARY FEEDER INFORMATION.
15. PROVIDE NEW 208V LEVEL 2 CHARGING STATION. REFER TO SHEET E-302 FOR MORE INFORMATION.
16. PROVIDE NEW 480V LEVEL 3 CHARGING STATION. REFER TO SHEET E-302 FOR MORE INFORMATION.

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DRAWING TITLE

ELECTRICAL PARTIAL ONE-LINE DIAGRAM

SCALE	JOB #
NTS	07PPS.240421
DATE	DRAWN BY
10/07/2025	AJ

SHEET #

E-501

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