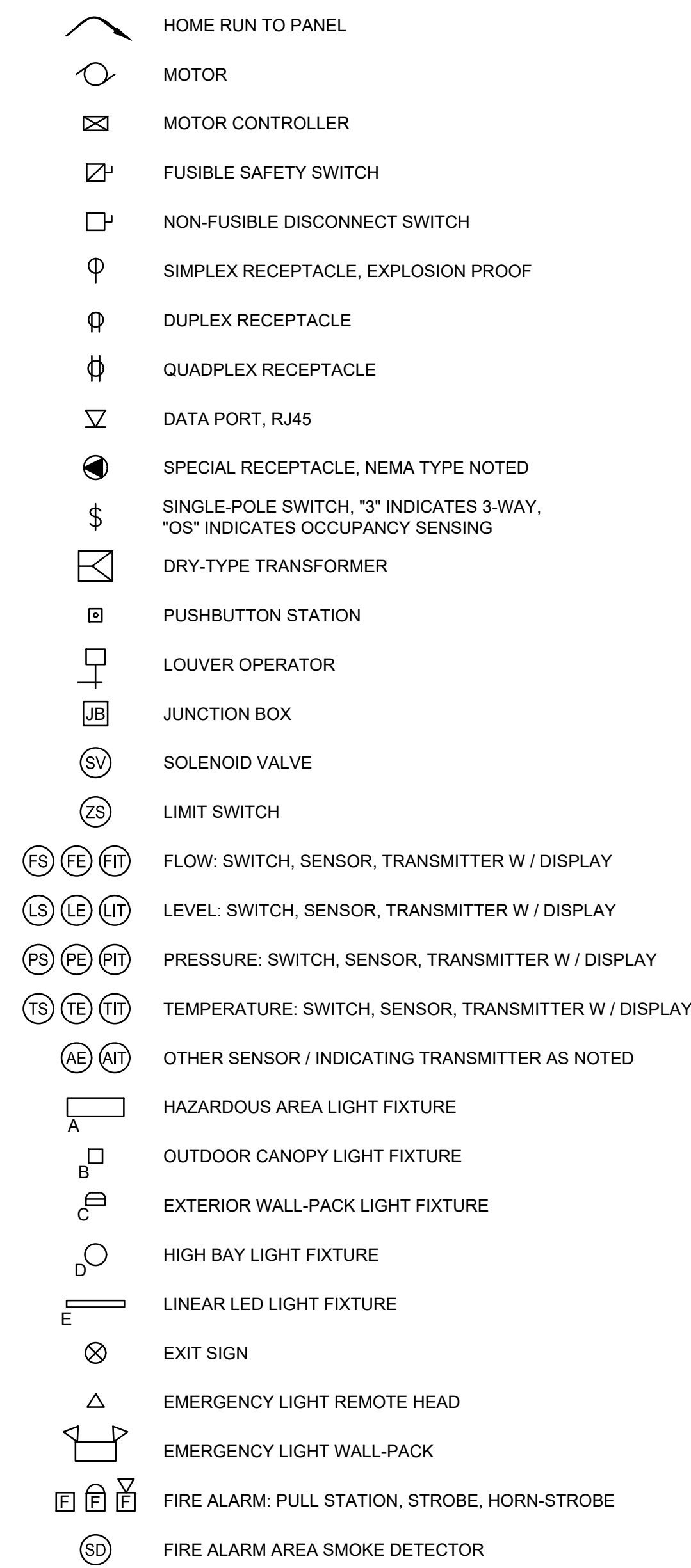
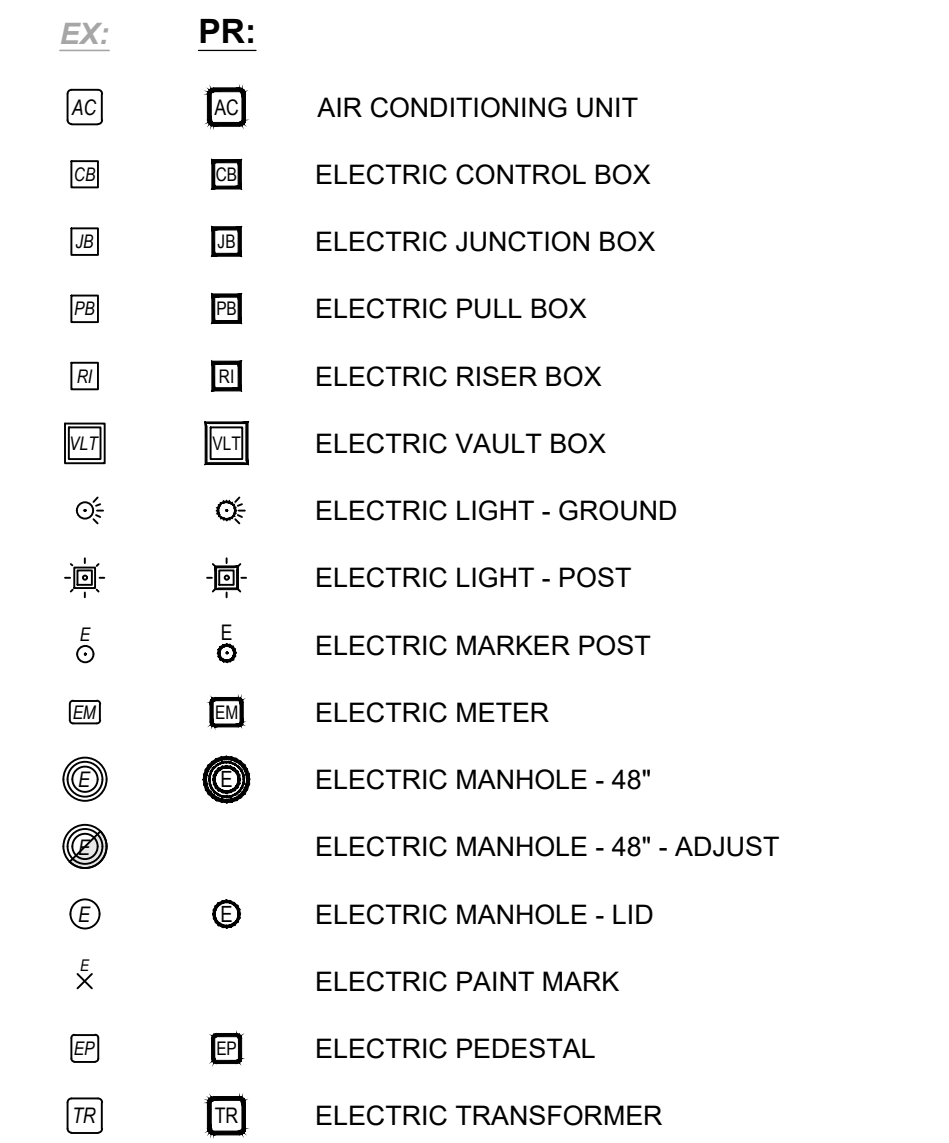


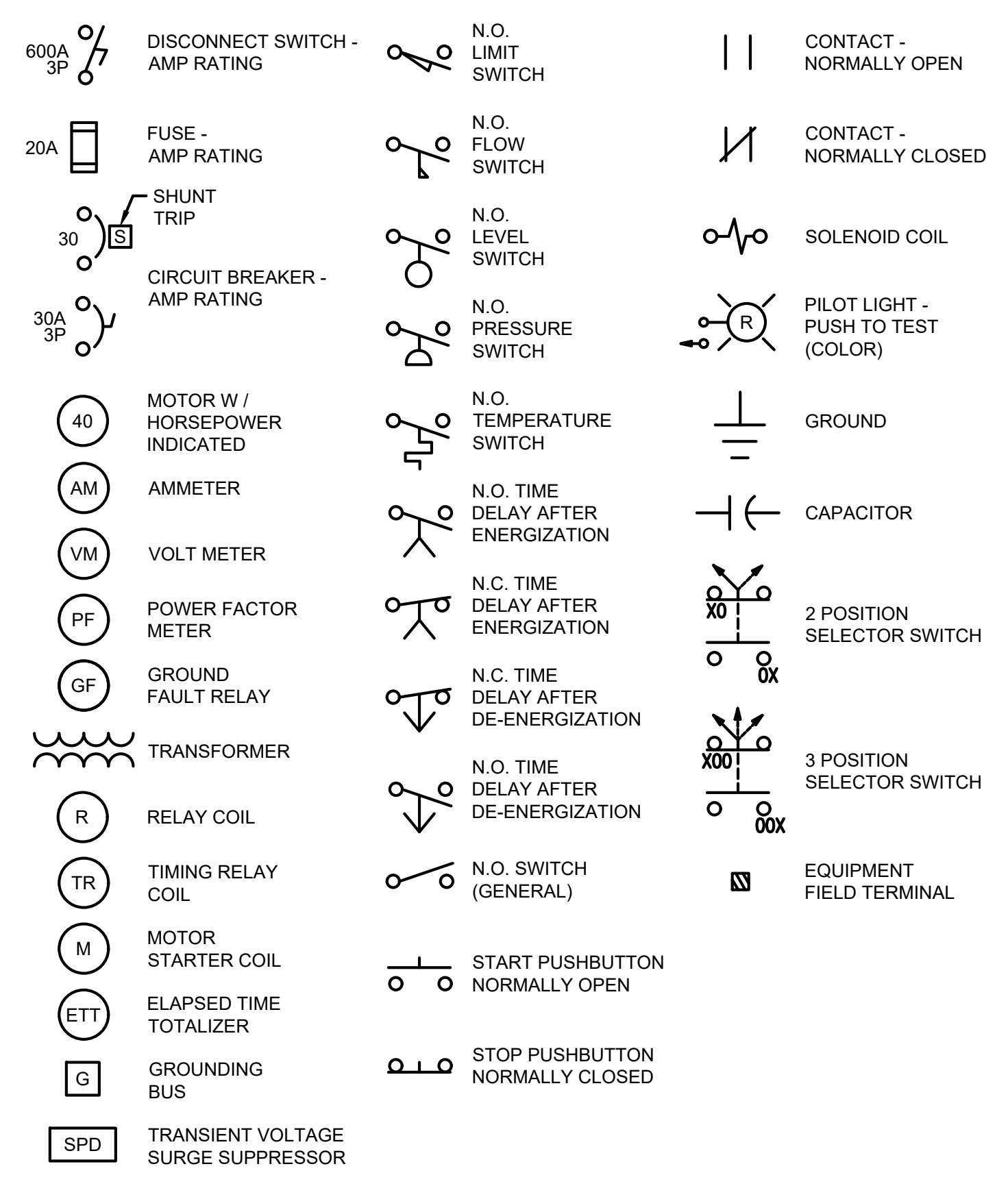
ELECTRICAL SYMBOLS - PLAN:



ELECTRIC SYMBOLS - UTILITIES:



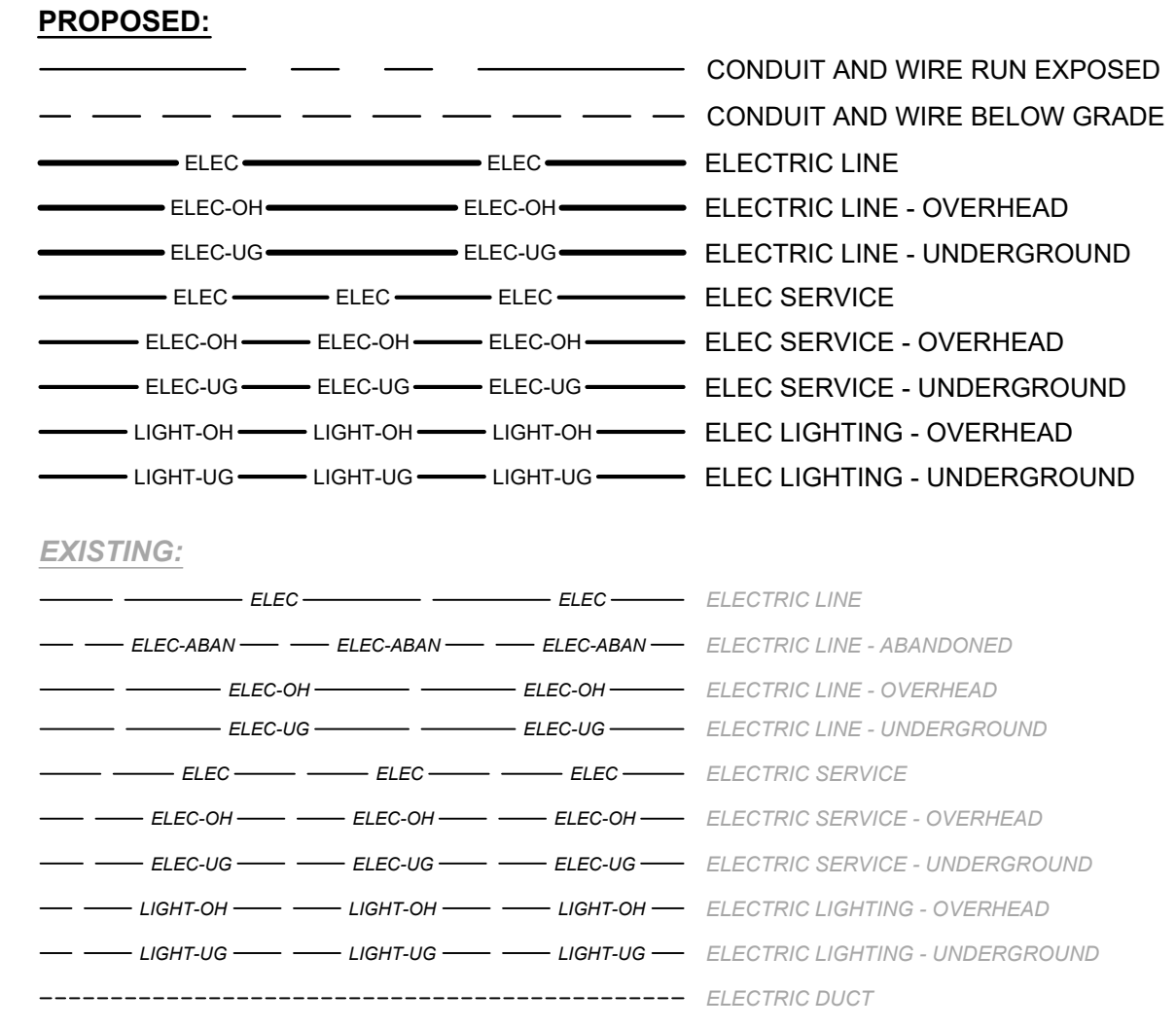
SINGLE LINE, ELEMENTARY, & INTERCONNECTION DIAGRAMS (ONLY) SYMBOLOGY:



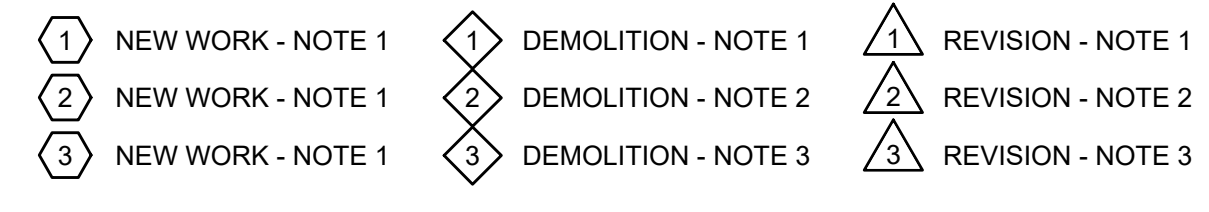
ABBREVIATIONS:

A	AMPS	IAW	IN ACCORDANCE WITH	PS	PRESSURE SWITCH
AF	AMPERE FRAME	ICP	INSTRUMENTATION & CONTROL PANEL	PT	POTENTIAL TRANSFORMER
AI	ANALOG INPUT (PLC)	IPP	INSTRUMENT POWER PANEL	R	RELAY
AL	ALUMINUM	JB	JUNCTION BOX	RCP	REINFORCED CONCRETE PIPE
AM	AMMETER	JBC	JUNCTION BOX-CONTROL	RL	RUN LIGHT
AO	ANALOG OUTPUT (PLC)	JBM	JUNCTION BOX-METERING	SCP	SURGE CONTROL PANEL
AP	ALARM PANEL	JBP	JUNCTION BOX-POWER	SCR	SILICON-CONTROLLED RECTIFIER
AT	AMPERE TRIP	KCM	KILO (1000) CIRCULAR MILL	SEC	SECONDARY
AWG	AMERICAN WIRE GAUGE	KVA	KILOVOLT AMPERES	SF	SUPPLY FAN
C	CONDUIT	KVAR	KILOVOLT AMPERES-REACTIVE	SHLD	SHIELDED
CAP	CAPACITOR	KW	KILOWATT	SP	SHEAR PIN SWITCH
CB	CIRCUIT BREAKER	LA	LIGHTING ARRESTOR	SPK	SPEAKER
CJB	CONTROL JUNCTION BOX	LGT	LIGHT	SS	SELECTOR SWITCH OR STAINLESS STEEL
CP	CONTROL PANEL	LOR	LOCAL/OFF/REMOTE SELECTOR SWITCH	SSOR	SOLID STATE OVERLOAD RELAY
CPT	CONTROL POWER TRANSFORMER	LP	LIGHTING PANEL	SSPB	START/STOP PUSHBUTTON
CR	CORROSION RESISTANT	LS	LEVEL SWITCH	SSS	SOLID STATE STARTER
CS	CONTROL STATION	MCC	MOTOR CONTROL CENTER	STD	STANDARD
CT	CURRENT TRANSFORMER	MCP	MOTOR CIRCUIT PROTECTOR	STRTR	STARTER
CU	COPPER	MDP	MAIN DISTRIBUTION PANEL	SV	SOLENOID VALVE
DB	DUCT BANK	MJB	METERING JUNCTION BOX	SW	SWITCH
DI	DIGITAL INPUT (PLC)	NEC	NATIONAL ELECTRICAL CODE	T	TELEPHONE
DO	DIGITAL OUTPUT (PLC)	NEMA	NATIONAL ELECTRICAL MFR ASSOC.	TB	TERMINAL BOARD
EAG	ELECTRICALLY ACTIVATED GATE	NEUT	NEUTRAL	TC	TIME CLOCK
EAV	ELECTRICALLY ACTIVATED VALVE	NFDS	NON-FUSED DISCONNECT SWITCH	TD	TRENCH DUCT
EF	EXHAUST FAN	OCSS	OPEN/CLOSE SELECTOR SWITCH	TEB	TELEPHONE EQUIPMENT BACKBOARD
ESPB	EMERGENCY STOP PUSHBUTTON (MAINTAINED)	OL	OVERLOAD	TEMP	TEMPERATURE
ETT	ELAPSED TIME TOTALIZER	OOSS	ON/OFF SELECTOR SWITCH	TOR	THERMAL OVERLOAD RELAY
EWD	ELEMENTARY WIRING DIAGRAM	OS	OCCUPANCY SENSING	TR	TIMING RELAY
FDS	FUSED DISCONNECT SWITCH	OT	OVER TORQUE SWITCH	TSP	TWISTED SHIELDED PAIR
FLA	FULL LOAD AMPERES	P	POLE	TSTAT	THERMOSTAT
FS	FLOW SWITCH	PB	PUSHBUTTON	TVSS	TRANSIENT VOLTAGE SUPPRESSOR
FVC	FULL VOLTAGE CONTACTOR	PBC	PULLBOX-CONTROL	UH	UNIT HEATER
FVNR-1	FULL VOLTAGE NON-REVERSING STARTER SIZE 1	PBM	PULLBOX-METERING	UON	UNLESS OTHERWISE NOTED
GFI	GROUND FAULT INTERRUPTER	PBP	PULLBOX-POWER	UPS	UNINTERRUPTIBLE POWER SUPPLY
GND	GROUND	PC	PHOTO CONTROL	V	VOLTS
GFR	GROUND FAULT RELAY	PF	POWER FACTOR	VC	VOLUME CONTROL
HOA	HAND/OFF/AUTO SELECTOR SWITCH	PH	PHASE	VFD	VARIABLE FREQUENCY DRIVE
HP	HORSEPOWER	PLC	PROGRAMMABLE LOGIC CONTROLLER	VM	VOLT METER
HT	HIGH TORQUE SWITCH	PJB	POWER JUNCTION BOX	XP	EXPLOSION PROOF
HTR	HEATER	PP	POWER PANEL	XFMR	TRANSFORMER
Hz	HERTZ	PRI	PRIMARY	WP	WATERPROOF
				ZS	LIMIT SWITCH

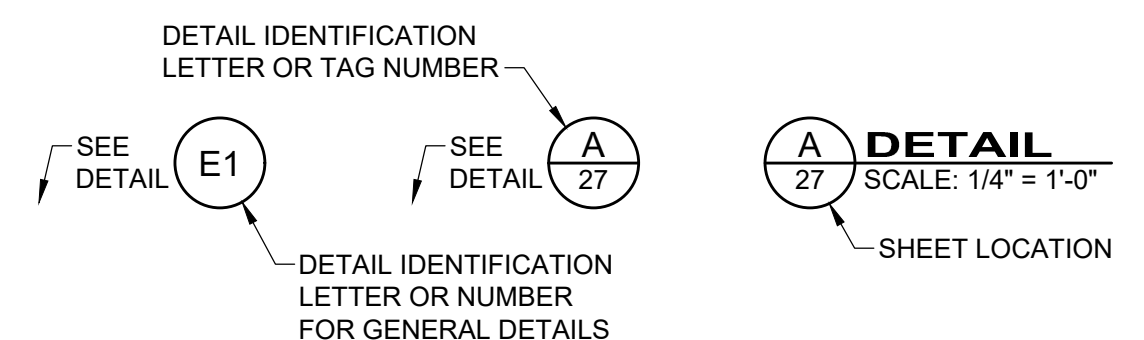
ELECTRICAL LINE SYMBOLOGY:



ELECTRICAL CODED NOTES:



ELECTRICAL DETAIL REFERENCE:



ELECTRICAL GENERAL NOTES:

- ALL ELECTRICAL EQUIPMENT AND MATERIALS WILL BE SELECTED AND INSTALLED IN COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL FIRE CODES, INCLUDING BUT NOT LIMITED TO ALL PERTINENT NFPA REGULATIONS. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPLIANCE WITH THESE CODES.
- DO NOT INSTALL DEVICES SCALED FROM THESE DRAWINGS. ALL DEVICES SHALL BE INSTALLED AT LOCATIONS SHOWN IN THE APPROVED CONDUIT/DEVICE LAYOUT DRAWINGS AND WITH DIMENSIONS TAKEN IN THE FIELD.
- ELECTRICIAN TO VISIT SITE AND VERIFY ALL EXISTING CONDITIONS PRIOR TO BID.
- NO DUCTWORK OR PIPING TO BE RUN ABOVE ELECTRICAL PANELS OR THROUGH ELECTRICAL EQUIPMENT ROOMS. ELECTRICIAN SHALL COORDINATE WITH ALL TRADES FOR EQUIPMENT LAYOUTS PRIOR TO ROUGH-IN OF ALL SYSTEMS.
- MANUFACTURERS AND CATALOG NUMBERS SHOWN IN THE LIGHT FIXTURE SCHEDULE ARE PROVIDED TO INDICATE DESIRED LIGHT FIXTURE CHARACTERISTICS. IT IS THE INTENT OF THE DOCUMENTS TO ALLOW ALTERNATE MANUFACTURERS TO PROVIDE LIGHTING PRODUCTS FOR THE PROJECT, AS LONG AS PROPOSED ALTERNATES PROVIDE THE SAME GENERAL DESIGN AND LIGHTING CHARACTERISTICS AS NOTED IN THE LIGHT FIXTURE DESCRIPTION.
- ELECTRICIAN TO CONFIRM LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND ELECTRICAL CHARACTERISTICS OF PROCESS EQUIPMENT PROVIDED BY OTHER TRADES PRIOR TO INSTALLING ROUGH-INS AS SHOWN ON THE ELECTRICAL PLANS. ALL SHOP DRAWING REQUIREMENTS WILL BE CONSIDERED AS THE MEANS AND METHODS OF INSTALLATION.
- THIS PROJECT INVOLVES WORK AT AN INDUSTRIAL FACILITY AND THE CONTRACTOR IS EXPECTED TO PROVIDE CRAFTSMANSHIP REFLECTING THE NATURE OF THE FACILITY. CONDUITS IN PROCESS AREAS ARE TO BE SURFACE MOUNTED RIGID GALVANIZED STEEL (RGS). IN CLASSIFIED AREAS SEAL ALL CONDUITS TO RESTRICT THE PASSAGE OF GASES AND VAPORS, AND ARRANGE SEALING FITTING DRAINS IN CONDUIT SYSTEMS TO PREVENT ACCUMULATION OF CONDENSATE ABOVE SEALS. ALL CONDUITS ENTERING OR LEAVING A MOTOR CONTROL CENTER, CONTROL PANEL, VALVE ACTUATOR, INSTRUMENT, A BUILDING, OR A PANELBOARD SHALL BE MADE WATERTIGHT USING AN INFLATABLE SEALED BLADDER DUCT SEALING SYSTEM, RAYCHEM 'RAYPLATE' DUCT SEALING SYSTEM RDSS OR APPROVED EQUAL. ALL HARDWARE IS TO BE STAINLESS STEEL UNLESS OTHERWISE DIRECTED.
- ALL ENCLOSURES ARE TO BE RATED AS FOLLOWS (UON):
 - OUTDOORS: NEMA 4X (STAINLESS STEEL)
 - CLASSIFIED AREAS: NEMA 7
 - INDOORS (CORROSIVE AREAS): NEMA 4X (STAINLESS STEEL)
 - INDOORS (CONTROLLED ENVIRONMENT) NEMA 12
- ELECTRICIAN SHALL REVIEW ALL OTHER TRADES' CONSTRUCTION DOCUMENTS AND/OR COORDINATE WITH OTHER TRADES AND VERIFY IF THERE ARE ANY ADDITIONAL ELECTRICAL REQUIREMENTS NOT SHOWN ON ELECTRICAL DRAWINGS. COST FOR WORK SHOWN ON OTHER TRADES' DRAWINGS SHALL BE INCLUDED IN BASE BID. ALL FIELD WIRING AND TERMINATIONS OF PROCESS EQUIPMENT AND INSTRUMENTATION AND CONTROLS SHALL BE THE RESPONSIBILITY OF THE ELECTRICIAN. ALL CABLES AND WIRES PROVIDED BY VENDORS SHALL BE INSTALLED AND TERMINATED BY THE ELECTRICIAN. WIRE ALL MISCELLANEOUS POWER AND CONTROLS AS REQUIRED TO PROVIDE A COMPLETE FUNCTIONING SYSTEM.
- A 4-20mA SIGNAL IS AN ANALOG SIGNAL USED TO TRANSMIT DATA (LEVEL, FLOW, ETC.) FOR PROCESS CONTROLS. THE ELECTRICIAN SHALL PROVIDE, INSTALL, AND TERMINATE TWISTED SHIELDED PAIRS (T.S.P.) WIRING IN RIGID GALVANIZED STEEL CONDUIT (RGS). RGS IS USED IN AN ATTEMPT TO REDUCE THE DISTORTION AFFECT FROM EMI AND RFI. BELOW GRADE CONDUITS SHALL BE PVC SCHED-40. PARALLEL RUNS OF DATA CONDUITS AND POWER CONDUITS SHALL BE SEPARATED BY 2 FEET. THE T.S.P. SHIELD SHALL BE GROUNDED AT THE CONTROL PANEL ONLY (DO NOT GROUND AT BOTH ENDS).
- THE ELECTRICIAN SHALL BE RESPONSIBLE FOR LAYOUT AND COORDINATION OF OPENINGS AND CHASES AND SHALL PERFORM ALL CUTTING AND PATCHING AS REQUIRED TO INSTALL THEIR WORK. ALL CONCRETE HOUSE KEEPING PADS SHALL BE FRAMED AND POURED BY THE ELECTRICIAN. PADS SHALL HAVE A 45 DEGREE, 1" CHAMFER AROUND UPPER EDGE.
- THE ELECTRICIAN SHALL INSTALL & DISTRIBUTE TEMPORARY POWER SERVICE FOR THE DURATION OF THIS PROJECT AS DEFINED IN DIVISION 1 SPECIFICATIONS. ALL COSTS ASSOCIATED WITH THE INSTALLATION, DISTRIBUTION AND MAINTENANCE OF THE TEMPORARY POWER IS THE RESPONSIBILITY OF THE ELECTRICIAN. THERE SHALL BE 480/277V, 3PH, 4W; 208/120V, 3PH, 4W; AND 120/240V, 1PH, 3W POWER AVAILABLE AT ALL LOCATIONS OF CONSTRUCTION AS DIRECTED IN FIELD AND AS SPECIFIED. ALL TEMPORARY EQUIPMENT, CONDUITS & CONDUCTORS SHALL BE COMPLETELY REMOVED AT COMPLETION OF PROJECT.
- ALL ELECTRICAL EQUIPMENT, DEVICES, LIGHTING FIXTURES, CONDUIT, AND WIRING SHOWN ON THE ELECTRICAL DRAWINGS IS NEW UNLESS CLEARLY CALLED OUT AS EXISTING. ALL EXISTING ELECTRICAL EQUIPMENT THAT IS CALLED OUT TO BE REUSED SHALL BE INSPECTED IN THE FIELD BY THE ELECTRICIAN AND THE CONSTRUCTION MANAGER TO DETERMINE ITS CONDITION PRIOR TO STARTING ANY WORK. PROVIDE DOCUMENTATION TO OWNER INDICATING CONDITION OF THE EXISTING EQUIPMENT, AND REUSE EXISTING EQUIPMENT ONLY IF ALL PARTIES AGREE THE CONDITION IS ACCEPTABLE. ALL EXISTING EQUIPMENT DETERMINED TO BE UNUSABLE SHALL BE REPLACED WITH LIKE KIND AS DIRECTED BY THE OWNER. ANY OF THE OWNERS EQUIPMENT DETERMINED TO BE REUSED THAT IS DAMAGED BY ANY CONTRACTOR DURING SWITCHOVER SHALL BE REPLACED BY THAT CONTRACTOR. ALL EXISTING EQUIPMENT IS THE PROPERTY OF THE OWNER (NOT THE CONTRACTOR) AND SHALL BE TREATED ACCORDINGLY.
- THE ELECTRICIAN SHALL BE HELD RESPONSIBLE TO ENSURE ALL CONTROLLERS TO BE INSTALLED ARE CAPABLE OF LOCKOUT / TAGOUT PRIOR TO INSTALLATION.
- CONFORM TO THE NEC, OSHA, FIRE MARSHAL, BUILDING DEPARTMENT AND OTHER APPLICABLE CODES AND REGULATIONS. OBTAIN PERMITS, PAY ALL FEES, AND ARRANGE FOR REQUIRED INSPECTIONS.
- ALL LIGHTING AND RECEPTACLE WIRING TO BE #12 XHHW WITH EQUIPMENT GROUND IN 3/4" C UNLESS OTHERWISE NOTED.
- DO NOT MOUNT ANY LIGHT FIXTURE DIRECTLY OVER PIPING OR EQUIPMENT THAT WILL INTERFERE WITH NORMAL LIGHTING DISTRIBUTION.
- SIZE JUNCTION BOXES AS REQUIRED PER NEC. PROVIDE BARRIER TYPE TERMINAL STRIPS, AND ALL WIRING TO BE IN CONDUIT.
- SIZE PULL BOXES (PB) AS REQUIRED PER NEC.
- PROVIDE SEPARATE PB'S FOR CONTROL AND POWER.
- MOTOR OVERLOAD SETTING SHALL BE FIELD SELECTED PER MOTOR NAME PLATE CURRENT AND INSTALLED ACCORDINGLY.
- MOUNT LOCAL CONTROLS AND SERVICE DISCONNECTS ON WALL NEAREST EQUIPMENT WHERE POSSIBLE. (MAXIMUM 60" ABOVE FINISHED FLOOR OR FINAL GRADE, MAXIMUM LATERAL DISTANCE FROM WALL TO EQUIPMENT - 10 FEET).
- ALL FEEDERS RUN BELOW GRADE SHALL BE RUN IN PVC CONDUIT AT MINIMUM 3'-0" BELOW FINISHED GRADE. TRANSITION TO ABOVE GRADE SHALL BE MADE USING FACTORY PVC COATED RIGID STEEL CONDUIT SWEEPS.
- CONTRACT TO HIRE SYSTEMS INTEGRATOR TO MODIFY ALL PROCESS CONTROLS, INCLUDING HARDWARE AND SOFTWARE, NEEDED TO ACHIEVE SYSTEM AND SUBSYSTEM FUNCTIONS OUTLINED IN SPECIFICATIONS AND AS NOTED IN THE DRAWINGS. ALL NEW FUNCTIONS & DEVICES TO BE INCORPORATED INTO EXISTING SCADA SYSTEM.

BID

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REVISIONS	
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VILLAGE OF CADIZ, OHIO
WATER TREATMENT PLANT HAB IMPROVEMENTS
HARRISON COUNTY
ELECTRICAL - 50 SERIES
CADIZ, OHIO
ELECTRICAL LEGEND & GENERAL NOTES

PROJECT NO.	
190599	
DISCIPLINE	
ELECTRICAL	
SHEET NAME	
E-01	
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34	46