

This document and the design it covers are the property of PARSONS. They are loaned only with the borrower's expressed written agreement that they will not be reproduced, copied, loaned, exhibited, or used in any other way, except by written consent from PARSONS to the borrower.

PLAN SYMBOLS

- RACEWAY EXPOSED, INCLUDING WITHIN PLENUMS, HUNG CEILING SPACES AND BELOW PLATFORMS.
- - - - - RACEWAY CONCEALED IN WALL, CEILING, BURIED IN EARTH OR EMBEDDED IN CONCRETE.
- WIRING BURIED IN EARTH OR EMBEDDED IN CONCRETE.
- VISIBLE, EXTENSION, PROJECTION, OR BACKGROUND.
- HIDDEN BACKGROUND.
- +— CENTER LINE.
- ~~~~~ FLEXIBLE RACEWAY.
- BOUNDARY OR MATCH LINE.
- ⊗ FLUSH GROUNDING SPOOL IN GROUND SYSTEM.
- ⊕ LIGHTNING PROTECTION AIR TERMINAL.
- ⊕ EXOTHERMIC WELD IN GROUND SYSTEM, BRAZING CLAMPING, BOLTING, OR WELDING SHALL NOT BE USED.
- ⊕ GROUND ROD IN GROUND SYSTEM.
- ⊕ GROUND WELL FOR PAVED AREA
- ⊕ GROUND WELL FOR UNPAVED AREA
- CONDUIT CAPPED.
- BREAK IN LINE FOR DRAFTING CLARITY.
- WIRING UP, CONTINUED IN ANOTHER VIEW
- WIRING DOWN TO ENCLOSURE OR CONTINUED IN ANOTHER VIEW.
- (HIGHER) (LOWER) WIRING DOWN IN SAME VIEW, CHANGING ELEV.
- CONDUIT SEALING FITTING, UL LABELED.
- JUNCTION BOX, PULL BOX, OR CONDUIT BODY, UL LABELED. FIELD SIZED PER NEC CODE. (NOTE 9)
- ENGINEERED BOX. J=JUNCTION BOX, P=PULL BOX, T=TERMINAL BOX, UL LABELED. SIZE AND FUNCTION AS SHOWN ON PLAN (H X W X D).
- GROSS MARKS INDICATE NUMBER OF #10 AWG (OR AS NOTED ON DWG) CONDUCTORS, INCLUDING NEUTRALS AND GREEN INSULATED GROUND WIRES.
- 3/4" C, 8" #10, LP01-1, 3, 5 & 7 HOME RUN TO CIRCUIT BREAKER PANEL. SHOWN MULTIPLE CIRCUIT 1, 3, 5 AND SEPARATE CIRCUIT 7 OF PANEL LP01.
- WIRING RUN IDENTIFICATION: SHOWN AS TWO CONDUITS EACH BEING ONE INCH ORS CONTAINING 5 #10 AWG THWV CONDUCTORS AND 2 #10 (GREEN) GROUND WIRES
- THREE PHASE CIRCUIT WITH DEDICATED NEUTRAL AND GROUND. PANEL RP01, CIRCUITS 1, 3 AND 5
- 3/4" C, 4" #12 & 1" #12 GND. RP01-1/3/5
- SURFACE MOUNT PANEL BOARD AS IDENTIFIED ON SINGLE LINE DIAGRAM AND IN PANEL SCHEDULE, UL LABELED.
- RECESSED MOUNTED PANEL BOARD AS IDENTIFIED ON SINGLE LINE DIAGRAM AND IN PANEL SCHEDULE, UL LABELED
- POWER PANEL
- CONTROL PANEL.
- SIGNAL OR COMMUNICATIONS CABINET AS IDENTIFIED ON PLAN. IP = INSTRUMENT PANEL. FP = FIRE ALARM PANEL.
- TELEPHONE TERMINAL CABINET.
- EMERGENCY BATTERY CABINET.
- SURFACE METAL RACEWAY AS IDENTIFIED ON PLAN, UL LABELED. NEMA #5-20R, 2P, 3W, 20A RECEPTACLES UNLESS OTHERWISE IDENTIFIED.
- MOTOR CONTROL CENTER OR SWITCHGEAR. SHOWN INCLUDING SPACE FOR FUTURE CUBICLE.
- CABLE TRAY, SIZE AND SHAPE IDENTIFICATION PER NEMA STANDARD VE1-1984.
- 30A 3W 4P SWITCH, NEMA 1 ENCLOSED UON, HORSEPOWER RATED DISCONNECT, UL LABELED. THREE WIRE FOUR POLE SHOWN. F = FUSED W = WIRE NF = NON-FUSED P = POLE
- MANUAL MOTOR STARTER, NEMA 1 ENCLOSED UON, UL LABELED.
- MAGNETIC CONTACTOR, NEMA 1 ENCLOSED UON, UL LABELED.
- MAGNETIC MOTOR STARTER, FULL LOAD NON-REVERSING, NEMA 1 ENCLOSED UON, UL LABELED.
- REVERSING MAGNETIC MOTOR STARTER, NEMA 1 ENCLOSED UON, UL LABELED.

PLAN SYMBOLS

- (HORIZ) (VERT) L-CS-XXX-P-01 MOTOR, SHOWING ORIENTATION OF TERMINAL BOX AND EQUIPMENT TAG NUMBER. REFER TO MOTOR CONTROL CENTER DRAWINGS.
- CENTERLINE OF SUPPORT ATTACHED TO STEEL COLUMN.
- S_{a, b} (2) SWITCHES-SINGLE POLE EACH, WITH COVER AND 2-GANG BOX, MOUNTED +4'-6" UON SWITCH LEGS a & b. TO MASTER FIXTURE
- D_{3a, b} DIMMER WITH COVER AND ENCLOSURE. MOUNTED +4'-6" UNLESS OTHERWISE NOTED. a, b, c, ETC = OUTLETS SWITCHED. 3=THREE WAY
- S_{3WP0} SWITCH, SINGLE POLE, WITH COVER AND ENCLOSURE, MOUNTED +4'-6" UNLESS OTHERWISE NOTED. 2 = TWO POLE. 3 = THREE WAY. 4 = FOUR WAY. a, b, c, ETC = OUTLETS SWITCHED. EP = EXPLOSION-PROOF. K = KEY OPERATED. WP = WEATHERPROOF. WP = FRICTIONAL MOTOR MANUAL STARTER
- TRACK LIGHTING FIXTURE
- WALL MOUNTING FIXTURE SEE PLAN FOR TYPE
- EMERGENCY LIGHTING UNIT. (SELF CONTAINED). TRANSFER TYPE
- FLOOD OR SPOT LIGHT. SHOWN WALL BRACKET MOUNTED. INCLUDING JUNCTION BOX WITH COVER. AP = AIMING POINT. OQ = ON GRADE. AG = ABOVE GRADE. OIW = ON WALL.
- 6a METAL HALIDE LIGHT FIXTURE FOR GLOBE TYPE LAMPS AS IDENTIFIED ON PLANS OR SCHEDULES. SUBSCRIPT INDICATES CIRCUIT AND SWITCH.
- INCANDESCENT LIGHT FIXTURE, CEILING MOUNTED
- FIXTURE, RECESSED 2'x 2' SEE PLAN FOR TYPE
- LIGHT FIXTURE. SEE PLAN FOR TYPE "E" FOR EMERGENCY CIRCUIT OPERATION "M" FOR MASTER BALLAST "S" FOR SATELLITE FIXTURE SURFACE, PENDANT OR RECESSED MOUNTED (TYPICAL).
- +8'-6" REFERENCE TO ELECTRICAL MATERIAL SCHEDULES FOR MOUNTING HEIGHT SEE NOTES 3 & 7.
- WP SINGLE RECEPTACLE, UL LABELED, 3 WIRE, 2 POLE, 20 AMP. GROUNDING TYPE. NEMA #5-20R. WP = WEATHER PROOF. EP = EXPLOSION PROOF.
- DUPLX RECEPTACLE UL LABELED, 3 WIRE, 2 POLE, 20 AMP GROUNDING TYPE NEMA #5-20R WALL MOUNTED
- DUPLX RECEPTACLE, UL LABELED, 3 WIRE, 2 POLE, 20 AMP. GROUNDING TYPE NEMA #5-20R. BOX INDICATES FLOOR MOUNTING, TYPICAL.
- DUAL DUPLX, WALL-MOUNTED RECEPTACLE ISOLATED UL LABELED, 3 WIRE, 2POLE, 20AMPERE, GROUNDING TYPE NEMA 5-20R
- DUAL DUPLX, FLOOR-MOUNTED RECEPTACLE ISOLATED UL LABELED, 3 WIRE, 2POLE, 20AMPERE, GROUNDING TYPE NEMA 5-20R
- SPECIAL PURPOSE RECEPTACLES, AS IDENTIFIED ON PLAN.
- WELDING OR OTHER SPECIAL PURPOSE RECEPTACLE AS IDENTIFIED ON PLAN.
- SPECIAL OUTLET: C = CLOCK. T=THERMOSTAT. H = HUMIDISTAT.
- EXIT LIGHT, WALL SURFACE MOUNTED WITH UNIVERSAL KNOCKOUT. DIRECTIONAL ARROWS (AS REQUIRED)
- EXIT LIGHT (SAME AS ABOVE, EXCEPT CEILING MOUNTED)
- ANNUNCIATOR. H = HORN S = SPEAKER.
- BELL.
- SMOKE DETECTOR. "P" DENOTES PHOTO-ELECTRIC TYPE. "Z" INDICATES ZONE OF SERVICE.
- BUZZER.
- PUSH BUTTON STATION (SHOWN WITH STANCHION MOUNT).
- MANUAL ALARM PULL STATION
- DEVICE AS IDENTIFIED ON PROCESS DIAGRAM
- NEW TELEPHONE OUTLET (WALL MOUNTED).
- DATA OUTLET (WALL MOUNTED).
- ELECTRICAL OR MECHANICAL EQUIPMENT AS IDENTIFIED ON PLAN.
- WARNING LIGHT, STROBE.

PLAN SYMBOLS

- [S] ELECTRICAL DEVICE WITH BOX OR ENCLOSURE.
 - CB = CIRCUIT BREAKER.
 - D = DOOR SWITCH.
 - E = EMERGENCY LIGHT SWITCH.
 - F = FLAME DETECTOR.
 - FC = FLOW RECORDER CONTROLLER.
 - FS = FLOW SWITCH.
 - FT = FLOW TRANSMITTER.
 - H = HEAT DETECTOR.
 - HL = HIGH LEVEL SWITCH.
 - I = IONIZATION DETECTOR.
 - LG = LEVEL GAGE.
 - LL = LOW LEVEL SWITCH.
 - LS = LIMIT SWITCH.
 - LT = LEVEL TRANSMITTER.
 - MP = MANUAL PULL FIRE ALARM STATION.
 - OFC = OIL FUSE CUTOFF.
 - P = PILOT OR INDICATING LIGHT.
 - PC = PHOTO ELECTRIC CELL.
 - PS = PRESSURE SWITCH.
 - PT = PRESSURE TRANSMITTER.
 - RS = ROPE SWITCH (EMERGENCY STOP).
 - S = SWITCH AS INDICATED ON PLAN.
 - HHL = HIGH-HIGH LEVEL SWITCH.
 - HOA = HAND-OFF-AUTOMATIC SWITCH.
 - LLL = LOW-LOW LEVEL SWITCH.
 - MOA = MANUAL-OFF-AUTOMATIC SWITCH.
 - OW/OFF = ON/OFF CONTROL SWITCH
 - ROA = REMOTE-OFF-AUTOMATIC.
 - TBS = TORN BELT SWITCH.
 - ZSS = ZERO SPEED SWITCH.
 - SD = SMOKE DETECTOR.
 - OV/OFF = ON/OFF CONTROL SWITCH
 - SSS = START-STOP SWITCH.
 - TS = TEMPERATURE CONTROLLER.
 - TC = TEST SWITCH.
 - TT = TEMPERATURE TRANSMITTER.
 - VS = VIBRATION SWITCH.
- 2BDFC 60/HZ EXISTING POLE WITH CONTINUING CONDUCTORS. SHOWN WITH POLE NUMBER, TYPE, HEIGHT, AND CLASS PER ANSI 05. 1-1987.
 - DFC = DOUGLAS FIR CREOSOTE TREATED.
 - DIFP = DOUGLAS FIR PENTA TREATED.
 - WRPC = WESTERN RED CEDAR UNTREATED.
 - WRCC = WPC CREOSOTE TREATED.
 - SP = SOUTHERN PINE UNTREATED.
 - SPC = SOUTHERN PINE CREOSOTE TREATED.
- P CIRCUIT IDENTIFICATION.
 - C = CONTROL.
 - F = FIRE ALARM.
 - I = INSTRUMENTATION.
 - P = PRIMARY.
 - S = SECONDARY.
 - T = TELEPHONE.
 - SD = SERVICE DROP.
- EXISTING POLE WITH SIDEWALK GUY.
- NEW POLE, WITH ANCHOR.
- HEAD GUY BETWEEN NEW POLES.
- △ EXISTING DISTRIBUTION TYPE TRANSFORMER.
- PAD MOUNTED TRANSFORMER.
- ▲ NEW DISTRIBUTION TYPE TRANSFORMER.
- SERVICE WEATHERHEAD.
- TXX EXISTING STEEL TOWER. IDENTIFY WITH SEQUENTIAL NUMBER (TYPICAL).
- TXX NEW STEEL TOWER. IDENTIFY WITH SEQUENTIAL NUMBER (TYPICAL).
- EAC2 ACCESS CHAMBER (AC) WITH SEQUENTIAL NUMBER.
 - E = ELECTRICAL. S = SECURITY SYSTEMS.
 - C = COMMUNICATIONS. T = TELEPHONE.
 - H = HANDHOLE. V = VAULT.
- UA OVERHEAD CONDUCTOR WITH SWITCH.
 - SS = TOP ARM SECTIONALIZING SWITCH. UA = UNDER ARM SWITCH.
 - PTD = POLE TOP DISCONNECT SWITCH. N.C. = NORMALLY CLOSED.
 - OFC = OIL FUSE CUTOFF. N.O. = NORMALLY OPEN.
 - PCF = PORCELAIN FUSED CUTOFF.
- POLE WITH CONDUCTOR DEADENDS AND JUMPER.
- G OVERHEAD CONDUCTOR WITH POLE MOUNTED SECTIONALIZER.
 - G = SF6 GAS.
 - V = VACUUM.
- 3" 2/0 ACSR OVERHEAD CONDUCTOR; QUANTITY, SIZE, AND TYPE IDENTIFICATION.
 - AAC = ALL ALUMINUM CONDUCTOR, IDENTIFIED WITH FLOWER NAME.
 - AAAC = ALL ALUMINUM ALLOY CONDUCTOR, IDENTIFIED WITH CITY NAME.
 - ACSR = ALUMINUM CABLE STEEL REINFORCED, IDENTIFIED WITH BIRD NAME.
 - AN = ANNEALED.
 - HD = HARD DRAWN.
 - MHD = MEDIUM HARD DRAWN.
 - CU = COPPER, SOFT OR ANNEALED, UON.
 - WP = WEATHERPROOF.
- OVERHEAD CONDUCTOR WITH POLE MOUNTED STREET LIGHT.
 - I = INCANDESCENT.
 - HPS = HIGH PRESSURE SODIUM.
 - MH = METAL HALIDE.
- OVERHEAD CONDUCTOR WITH POLE MOUNTED FLOODLIGHT.
- OVERHEAD CONDUCTOR WITH FUSED SWITCH. SHOWN WITH 6E FUSE.

NOTES:

- APPROPRIATE BOX AND COVER SHALL BE PROVIDED WITH ALL OUTLETS, SEE SPECIFICATIONS.
- GROUND UNDERGROUND PIPING TO MAIN GROUNDING COUNTERPOISE.
- MOUNTING HEIGHT OF EQUIPMENT, UNLESS OTHERWISE NOTED, SHALL BE ABOVE FINISHED FLOOR AS FOLLOWS:
 - A. LIGHTS OVER DOORS, 1'-0" ABOVE DOOR OPENING TO BOTTOM OF FIXTURE.
 - B. LOCAL SWITCHES, 4'-6" TO CENTERLINE.
 - C. OFFICE AND CONTROL ROOM RECEPTACLES 1'-6" TO CENTERLINE.
 - D. OTHER RECEPTACLES, 3'-6" TO CENTERLINE.
 - E. LIGHTING PANELS, 6'-0" MAXIMUM TO TOP CIRCUIT BREAKER.
- EMERGENCY LIGHTING SYSTEM BRANCH CIRCUIT RACEWAY AS WELL AS FIRE ALARM AND DETECTION RACEWAY SHALL BE INDEPENDENT OF OTHER RACEWAY SYSTEMS.
- MINIMUM CONDUCTOR SIZE FOR ALL LIGHTING AND 120V CONVENIENCE RECEPTACLE CIRCUITS SHALL BE AWG #12, 600V, TYPE THW INSULATION STRANDED COPPER WIRE, UNLESS OTHERWISE NOTED. CONNECTIONS SHALL BE MADE WITH CRIMP LUGS AND CRIMP CONNECTORS. WIRE NUTS SHALL NOT BE USED.
- FLEXIBLE CONDUIT SHALL BE USED FOR RECESSED FIXTURES FROM THE JUNCTION BOX TO THE FIXTURE NOT EXCEEDING A MAXIMUM LENGTH OF 6'-0". MINIMUM LENGTH FOR FLEXIBILITY SHALL BE 3'-0".
- MOUNTING HEIGHT OF LIGHTING FIXTURES, AS INDICATED ON THE DRAWINGS, IS FROM FINISHED FLOOR, PLATFORM, OR DECK TO BOTTOM OF FIXTURE.
- MINIMUM DISTANCE BETWEEN THE TOP OF CABLE TRAY AND BOTTOM OF THE STRUCTURAL STEEL DIRECTLY ABOVE IT SHALL BE 6". WHERE TWO TRAYS CROSS EACH OTHER, THE TOP OF THE LOWER TRAY TO THE BOTTOM OF THE TRAY ABOVE SHALL BE 6" MINIMUM.
- THE CONSTRUCTOR SHALL PROVIDE CONDUIT BODIES, FITTINGS, AND SUPPORTS NOT SHOWN ON THE DRAWINGS BUT REQUIRED BY JOB CONFIGURATION OR THE NEC.

POLELINE AND DUCTBANK PLAN SYMBOLS

- EXISTING POLE WITH CONTINUING CONDUCTORS. SHOWN WITH POLE NUMBER, TYPE, HEIGHT, AND CLASS PER ANSI 05. 1-1987.
 - DFC = DOUGLAS FIR CREOSOTE TREATED.
 - DIFP = DOUGLAS FIR PENTA TREATED.
 - WRPC = WESTERN RED CEDAR UNTREATED.
 - WRCC = WPC CREOSOTE TREATED.
 - SP = SOUTHERN PINE UNTREATED.
 - SPC = SOUTHERN PINE CREOSOTE TREATED.
- P CIRCUIT IDENTIFICATION.
 - C = CONTROL.
 - F = FIRE ALARM.
 - I = INSTRUMENTATION.
 - P = PRIMARY.
 - S = SECONDARY.
 - T = TELEPHONE.
 - SD = SERVICE DROP.
- EXISTING POLE WITH SIDEWALK GUY.
- NEW POLE, WITH ANCHOR.
- HEAD GUY BETWEEN NEW POLES.
- △ EXISTING DISTRIBUTION TYPE TRANSFORMER.
- PAD MOUNTED TRANSFORMER.
- ▲ NEW DISTRIBUTION TYPE TRANSFORMER.
- SERVICE WEATHERHEAD.
- TXX EXISTING STEEL TOWER. IDENTIFY WITH SEQUENTIAL NUMBER (TYPICAL).
- TXX NEW STEEL TOWER. IDENTIFY WITH SEQUENTIAL NUMBER (TYPICAL).
- EAC2 ACCESS CHAMBER (AC) WITH SEQUENTIAL NUMBER.
 - E = ELECTRICAL. S = SECURITY SYSTEMS.
 - C = COMMUNICATIONS. T = TELEPHONE.
 - H = HANDHOLE. V = VAULT.
- UA OVERHEAD CONDUCTOR WITH SWITCH.
 - SS = TOP ARM SECTIONALIZING SWITCH. UA = UNDER ARM SWITCH.
 - PTD = POLE TOP DISCONNECT SWITCH. N.C. = NORMALLY CLOSED.
 - OFC = OIL FUSE CUTOFF. N.O. = NORMALLY OPEN.
 - PCF = PORCELAIN FUSED CUTOFF.
- POLE WITH CONDUCTOR DEADENDS AND JUMPER.
- G OVERHEAD CONDUCTOR WITH POLE MOUNTED SECTIONALIZER.
 - G = SF6 GAS.
 - V = VACUUM.
- 3" 2/0 ACSR OVERHEAD CONDUCTOR; QUANTITY, SIZE, AND TYPE IDENTIFICATION.
 - AAC = ALL ALUMINUM CONDUCTOR, IDENTIFIED WITH FLOWER NAME.
 - AAAC = ALL ALUMINUM ALLOY CONDUCTOR, IDENTIFIED WITH CITY NAME.
 - ACSR = ALUMINUM CABLE STEEL REINFORCED, IDENTIFIED WITH BIRD NAME.
 - AN = ANNEALED.
 - HD = HARD DRAWN.
 - MHD = MEDIUM HARD DRAWN.
 - CU = COPPER, SOFT OR ANNEALED, UON.
 - WP = WEATHERPROOF.
- OVERHEAD CONDUCTOR WITH POLE MOUNTED STREET LIGHT.
 - I = INCANDESCENT.
 - HPS = HIGH PRESSURE SODIUM.
 - MH = METAL HALIDE.
- OVERHEAD CONDUCTOR WITH POLE MOUNTED FLOODLIGHT.
- OVERHEAD CONDUCTOR WITH FUSED SWITCH. SHOWN WITH 6E FUSE.

REFERENCES	DESCRIPTION
LA-E-001	ABBREVIATIONS & ACRONYMS
LA-E-003	SCHEMATIC & WIRING DIAGRAM SYMBOLS
LA-E-004	ONE & THREE LINE DIAGRAM SYMBOLS

NO.	DATE	BY	CHKD	ENGR	PROJ	DESCRIPTION
1	8-7-98	JE	RL	ML		ISSUED FOR AS-BUILT

ISSUED FOR CONSTRUCTION

DRAWN	M. M.	11-15-96
CHECKED	JCL	7-24-96
ENGINEER	KCR	10-25-96
PROJ	T. D. M.	11-15-96

AS-BUILT DRAWINGS

PARSONS

100 WEST WALNUT STREET
PASADENA, CALIFORNIA

LIGO

CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

LASER INTERFEROMETER
GRAVITATIONAL-WAVE OBSERVATORY
SITE NO. 2 - LIVINGSTON, LOUISIANA

ELECTRICAL STANDARD PLAN SYMBOLS

SCALE: NONE CONTRACT NUMBER: PPI50969 PROJECT NUMBER: 8094

SHEET NUMBER: **LA-E-002** REVISIONS:

TITLE: ELECTRICAL STANDARD PLAN SYMBOLS