DATE: 09/03/98 TIME: 19:45:24
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ABBREVIATIONS AND ACRONYMS

A/C =AIR CONDITIONER.
A =AMPERE.
AC =ALTERNATING CURRENT, OR ACCESS CHAMBER.
AEIC =ASSOCIATION OF EDISON ILLUMINATING COMPANIES.
AFD =ADJUSTABLE FREQUENCY DRIVE.
AFF =ABOVE FINISHED FLOOR.
AFG =ABOVE FINISHED GRADE.
AHU =AIR HANDLING UNIT.
A.I.C. =AMPERE INTERRUPTING CAPACITY.
AL =ALUMINUM.
ANN =ANNUNCIATOR.
ANSI =AMERICAN NATIONAL STANDARDS INSTITUTE.
ANT =ANTENNA.
APPROX =APPROXIMATE.
ASME =AMERICAN SOCIETY OF MECHANICAL ENGINEERS.
AR =AS REQUIRED.
ARC =ARC WELD.
ARCH =ARCHITECTURE.
ASD =ADJUSTABLE SPEED DRIVE.
ASYM =ASYMMETRICAL.

ATM =ATMOSPHERE.
ATS =AUTOMATIC TRANSFER SWITCH.
AUTO =AUTOMATIC.
AWG =AMERICAN WIRE GAGE.
AX =AUXILIARY RELAY.
& =AND.

BAG =BARE ARMORED GROUND, UL LABELED.
BAT =BATTERY.
BC =BARE COPPER.
BD =BUS DUCT.
BHP =BRAKE HORSEPOWER.
BLDG =BUILDING.
BOC =BOTTOM OF CONDUIT.
BOP =BOTTOM OF PIPE.
BTE =BEAM TUBE ENCLOSURE
BTU =BRITISH THERMAL UNIT.

C =CONDUIT, PER SPECIFICATION, UL LABELED.
℄ =CENTER LINE.
CAPL =CADMIUM PLATED.
CAD =COMPUTER AIDED DESIGN.
CADD =COMPUTER AIDED DESIGN AND DRAFTING .
CAP =CAPACITOR.
CB =CIRCUIT BREAKER.
CCTV =CLOSED CIRCUIT TELEVISION.
CFE =CONTRACTOR FURNISHED EQUIPMENT.
CKT =CIRCUIT.
CNTLR =CONTROLLER
CO =CONDUIT ONLY.
COAX =COAXIAL CABLE.
COL =COLUMN.
CONC =CONCRETE.
CONT =CONTINUED.
CPB =COMMUNICATIONS PULL BOX.
CPU =CENTRAL PROCESSING UNIT.
CR =CONTROL RELAY.
CT =CURRENT TRANSFORMER.
CU =COPPER.

DB =DIRECT BURIED.
DC =DIRECT CURRENT.
DET =DETAIL.
DIA =DIAMETER.
DIAG =DIAGRAM.
DISC =DISCONNECT.
DN =DOWN.
DNA =DOES NOT APPLY.
DPDT =DOUBLE POLE DOUBLE THROW.
DPST =DOUBLE POLE SINGLE THROW.
DT =DUSTTIGHT, UL LABELED.
DWG =DRAWING.
°C =DEGREES CELSIUS (CENTIGRADE).
°F =DEGREES FAHRENHEIT.

E =EMERGENCY.
EA =EACH.
EL =ELEVATION.
ELEC =ELECTRIC.
ELU =EMERGENCY LIGHTING UNIT.
EMT =ELECTRICAL METALLIC TUBING, UL LABELED.
ENG =ENGINE.
EP =EXPLOSION PROOF, UL LABELED.
EPB =ELECTRICAL PULL BOX.
EPR =ETHYLENE PROPYLENE RUBBER (SYNTHETIC POLYMER) INSULATED, UL LABELED TO 35 KV, CERTIFIED TO AEIC SPECIFICATION, ABOVE 35 KV DO NOT IDENTIFY AS EP.
EQPT =EQUIPMENT.
ETC =ET CETERA.
EWC =ELECTRIC WATER COOLER.
EXIST =EXISTING.

FA =FIRE ALARM.
FACP =FIRE ALARM CONTROL PANEL
FC =FOOTCANDLE.
FDR =FEEDER.
FIG =FIGURE.
FIXT =FIXTURE.
FLA =FULL LOAD AMPERES
FLEX =FLEXIBLE CONDUIT, UL LABELED.
FLUOR =FLUORESCENT.
FM =FACTORY MUTUAL RESEARCH CORPORATION APPROVED AND LABELED: FACTORY MUTUAL SYSTEM APPROVED, FM APPROVED, OR FM.
FREQ =FREQUENCY.
FT =FOOT.
FUT =FUTURE
FVNR =FULL VOLTAGE NON-REVERSING.
FVR =FULL VOLTAGE REVERSING.

GA =GAGE (NOT GAUGE).
GALV =GALVANIZED.
GEN =GENERATOR.
GFE =GOVERNMENT FURNISHED EQUIPMENT.

ABBREVIATIONS AND ACRONYMS

GFI =GROUND FAULT INTERRUPTER.
GFS =GROUND FAULT SENSOR.
GND =GROUND.
G.R. =GROUND RELAY
GRN =GREEN INSULATED. UL LABELED TYPE TW CONDUCTOR WHEN WITH GND.
GRS =GALVANIZED RIGID STEEL CONDUIT, UL LABELED.

HH =HANDHOLE.
HID =HIGH INTENSITY DISCHARGE.
HP =HORSEPOWER.
HPS =HIGH PRESSURE SODIUM.
HT =HEIGHT.
HTR =HEATER.
HV =HIGH VOLTAGE.
HVAC =HEATING, VENTILATION, AND AIR CONDITIONING.
HZ =HERTZ.

ICEA =INSULATED CABLE ENGINEERS ASSOCIATION.
IE =INVERT ELEVATION.
IEEE =INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS.
IG =INERT GAS.
IGW =INERT GAS WELD.
IMC =INTERMEDIATE GRADE CONDUIT, UL LABELED.
IN =INCH.
INC =INCORPORATED.
INST =INSTANTANEOUS.
INSTR =INSTRUMENT.
INTERCOM =INTERCOMMUNICATION.
INV =INVERT ELEVATION
IR =INTERPOSING RELAY.

JB =JUNCTION BOX.
KA =KILOAMPERE.
KCMIL =THOUSAND CIRCULAR MILS
KILO =1,000.
KV =KILOVOLT.
KVA =KILOVOLT AMPERES.
KVAR =KILOVOLT AMPERES REACTIVE.
KW =KILOWATT.
KWH =KILOWATT HOURS.

LB =POUND.
LPS =LOW PRESSURE SODIUM.
LQ =LIQUID TIGHT FLEXIBLE CONDUIT, UL LABELED.
LTG =LIGHTING.
LV =LOW VOLTAGE.
LVEA =LASER VACUUM EQUIPMENT AREA

MAX =MAXIMUM.
MAINT =MAINTENANCE
MC =METAL CLAD CABLE, UL LABELED.
MCC =MOTOR CONTROL CENTER, UL LABELED.
MCP =MOTOR CIRCUIT PROTECTOR, UL LABELED.
MCS =MOLDED CASE SWITCH, UL LABELED.
MDF =MAIN DISTRIBUTION FRAME
MECH =MECHANICAL.
MEGA =1,000,000.
MFGR =MANUFACTURER.
MICRO =0.000001.
MILLI =0.001.
MI =MINERAL INSULATED COPPER SHEATHED CABLE. UL LABELED.
MIN =MINIMUM.
MISC =MISCELLANEOUS.
MTG =MOUNTING.
MH =MOUNTING HEIGHT
MTW =MACHINE TOOL WIRE, UL LABELED.
MSHA =MINE SAFETY AND HEALTH ADMINISTRATION.
MUX =MULTIPLEX.
MV =MEDIUM VOLTAGE (EQUIPMENT), OR MEDIUM VOLTAGE CABLE, UL LABELED, 133% INSULATED TYPE MV-90 PER NEC.

N =NORTH.
NA =NON AUTOMATIC.
N.C. =NORMALLY CLOSED
NEC =NATIONAL ELECTRICAL CODE.
NEMA =NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION.
NESC =NATIONAL ELECTRICAL SAFETY CODE.
NEUT =NEUTRAL.
NF =NON FUSED.
NFPA =NATIONAL FIRE PROTECTION ASSOCIATION.
NIC =NOT IN CONTRACT
NL =NIGHT LIGHT.
N.O. =NORMALLY OPEN
NPT =NATIONAL PIPE THREAD
NTS =NOT TO SCALE
#, NO. =NUMBER.

OAS =OVERALL SHIELD.
OC =ON CENTER.
OCB =OIL CIRCUIT BREAKER.
OD =OUTSIDE DIAMETER.
OFE =OWNER FURNISHED EQUIPMENT.
OH =OVERHEAD.
O.L. =OVERLOAD RELAY CONTACTS
OSB =OPERATIONS SUPPORT BUILDING
OSHA =OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

Ø =PHASE
PA =PUBLIC ADDRESS.
PABX =PRIVATE AUTOMATIC BRANCH EXCHANGE.
PB =PUSH BUTTON.
PF =POWER FACTOR.
PILC =PAPER INSULATED LEAD COVERED CABLE.
PNL =PANEL.
P&ID =PIPING AND INSTRUMENTATION DIAGRAM.
PLTC =POWER LIMITED TRAY CABLE, UL LABELED.
PR =PAIR.
PVC =POLYVINYL CHLORIDE CONDUIT

RAC =RIGID ALUMINUM CONDUIT, UL LABELED.
RCPT =RECEPTACLE.
REQ'D =REQUIRED.
RHW =RUBBER INSULATED HEAT AND MOISTURE RESISTANT WIRE, UL LABELED.
RM =ROOM.
RMS =ROOT MEAN SQUARE.
RPVC =RIGID POLYVINYL CHLORIDE CONDUIT SCHEDULE 40, UL LABELED.
RPVC-80 =RIGID POLYVINYL CHLORIDE CONDUIT SCHEDULE 80, UL LABELED.
RSB =RIGID SILICON-BRONZE CONDUIT, UL LABELED.
RT =RAINTIGHT, UL LABELED.
RVNR =REDUCED VOLTAGE NON-REVERSING.

ABBREVIATIONS AND ACRONYMS

1P =SINGLE POLE.
SC =SHORT CIRCUIT.
SCH =SCHEDULE.
SECT =SECTION.
SIS =SYNTHETIC INSULATED HEAT RESISTANT SWITCHBOARD WIRE, UL LABELED.
SH =SHIELDED.
SHT =SHEET.
SHTP =SHIELDED TWISTED PAIR.
SHTR =SHIELDED TWISTED TRIADS.
SHTQ =SHIELDED TWISTED QUADS.
SOV =SOLENOID OPERATED VALVE.

SPDT =SINGLE POLE DOUBLE THROW.
SPEC =SPECIFICATION.
SPST =SINGLE POLE SINGLE THROW.
SQ =SQUARE.
SST =STAINLESS STEEL, TYPE 316,

STD =STANDARD.
STR =STRUCTURAL.
SUBST =SUBSTATION.
SW =SWITCH.
SWBD =SWITCHBOARD.
SWGR =SWITCHGEAR.
SWRK =SWITCHRACK.
SYM =SYMMETRICAL.

2P =2 POLE.
3P =3 POLE.
3W =THREE WIRE.
TC =TRAY CABLE
TEL =TELEPHONE.
TERM =TERMINAL.
THHN =THERMOPLASTIC INSULATED HEAT RESISTANT NYLON JACKET WIRE, UL LABELED.
THW =THERMOPLASTIC INSULATED HEAT AND MOISTURE RESISTANT WIRE, UL LABELED.
THWN =THERMOPLASTIC INSULATED HEAT AND MOISTURE RESISTANT NYLON JACKET WIRE, UL LABELED.
TOC =TOP OF CONCRETE.
TOD =TOP OF DUCT.
TOS =TOP OF STEEL.
TP =TWISTED PAIR.
TW =THERMOPLASTIC INSULATED MOISTURE RESISTANT WIRE, UL LABELED.
TYP =TYPICAL

UBC =UNIFORM BUILDING CODE.
UL =UNDERWRITERS LABORATORIES INC.
UNC =UNIFIED NATIONAL COARSE SCREW THREAD (SEE NOTE 10).
UNF =UNIFIED NATIONAL FINE SCREW THREAD.
UN-8 =UNIFIED NATIONAL 8 THREAD SERIES.
UN-12 =UNIFIED NATIONAL 12 THREAD SERIES.
UN-16 =UNIFIED NATIONAL 16 THREAD SERIES.
UON =UNLESS OTHERWISE NOTED
UPS =UNINTERRUPTIBLE POWER SUPPLY.

V =VOLT.
VAR =VARIABLE OR VOLT AMPERES REACTIVE.
VEA =VACUUM EQUIPMENT AREA
VD =VOLTAGE DROP.
VT =VAPORTIGHT, UL LABELED.

W =WATT OR WIRE.
WP =WEATHERPROOF.
WT =WEIGHT.

XFMR =TRANSFORMER.
XHHW =SYNTHETIC INSULATED HEAT AND MOISTURE RESISTANT WIRE, UL LABELED.
XLPE =CROSSLINKED POLYETHYLENE INSULATED, UL LABELED TO 35 KV, CERTIFIED TO AEIC SPECIFICATION ABOVE 35 KV. DO NOT IDENTIFY AS XLP. DO NOT USE ICEA.

Z =IMPEDANCE.

TYPICAL SYMBOLS

(2) REFERENCE TO BILL OF MATERIALS

(C) COLUMN REFERENCE TO STRUCTURAL PLAN .

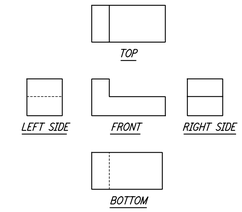
(3 / WA-E-401) DETAIL REFERENCE SHOWING REFERENCE TO DETAIL 3 ON DRAWING WA-E-401.

(3 / REF --- WA-E-201) DETAIL 3 SHOWING REFERENCED FROM WA-E-201

(C / WA-E-401) SECTION REFERENCE SHOWING REFERENCE TO SECTION C ON DRAWING WA-E-401.

(C / REF --- WA-E-201) SECTION C SHOWING REFERENCED FROM WA-E-201

TYPICAL DRAWING LAYOUT



AREA CLASSIFICATION SYMBOLS

CLASS (I, II, OR III), DIVISION 1, GROUP (A, B, C, D, E, F, OR G), HAZARDOUS AREA,

CLASS (I, II, OR III), DIVISION 2, GROUP (A, B, C, D, E, F, OR G), HAZARDOUS AREA,

CLASSIFIED NONHAZARDOUS,

LIGO-D960388-01-O

REFERENCES	
WA-E-002	STANDARD PLAN SYMBOLS
WA-E-003	SCHEMATIC/WIRING SYMBOLS
WA-E-004	ONE/THREE LINE SYMBOLS
DRAWING NO.	DESCRIPTION

REVISIONS							
1	6-15-98	J. G.					ISSUED FOR AS-BUILT
NO.	DATE	BY	CHKD	ENGR	PROJ		DESCRIPTION

ISSUED FOR CONSTRUCTION		
DRAWN	M. M.	6-25-96
CHECKED	J. K.	7-3-96
ENGINEER	K. R.	7-3-96
PROJ	M. D. W.	7-8-96

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. 1 - HANFORD, WASHINGTON

TITLE: ELECTRICAL STANDARD SYMBOLS, ABBREVIATIONS & ACRONYMS

SCALE	CONTRACT NUMBER	PROJECT NUMBER
NONE	PP150969	8094

SHEET NUMBER: WA-E-001 REVISIONS: 1