

ONE LINE & ELEMENTARY DIAGRAMS

- GANG OPERATED HORN GAP SWITCH
- HIGH VOLTAGE PRIMARY FUSE CUTOFF
- DISCONNECT SWITCH - SIZE AS INDICATED (3 POLE UNLESS OTHERWISE NOTED)
- GROUNDING SWITCH
- LIGHTNING ARRESTER (NUMBER INDICATES QUANTITY)
- CAPACITOR
- DISCONNECT LINK
- TRANSFER SWITCH - SIZE AS INDICATED (A - AUTOMATIC, N - NORMAL, M - MANUAL, E - EMERGENCY, L - LOAD)
- GROUNDING TRANSFORMER (SIZE & RATING AS INDICATED)
- GROUND DETECTION CURRENT TRANSFORMER - NUMBER INDICATES QUANTITY - RATIO AS NOTED
- CURRENT TRANSFORMER - NUMBER INDICATES QUANTITY - RATIO AS NOTED
- BUSHING TYPE CURRENT TRANSFORMER (NUMBER INDICATES QUANTITY - RATIO AS NOTED)
- BUSHING TYPE POTENTIAL DEVICE (NUMBER INDICATES QUANTITY - RATING AS NOTED)
- POTENTIAL TRANSFORMER (NUMBER INDICATES QUANTITY - RATING AS NOTED)
- POWER TRANSFORMER (SIZE & RATING AS NOTED (NUMBER OF WINDINGS AS SHOWN))
- MEDIUM OR HIGH VOLTAGE DRAWOUT TYPE ELECTRICALLY OPERATED AIR CIRCUIT BREAKER, INTERRUPTING CAPACITY, SIZE & VOLTAGE AS NOTED
- AIR CIRCUIT BREAKER DRAWOUT TYPE ELECTRICALLY OPERATED, MAGNETIC OVERCURRENT TRIP - CURRENT RATING & INTERRUPTING CAPACITY AS NOTED (AIC = AMP INTERRUPTING CAPACITY, AF = AMP FRAME, AT = AMP TRIP, U = UNDERVOLTAGE ATTACHMENTS, M = MANUALLY OPERATED)
- AIR CIRCUIT BREAKER (3 POLE UNLESS OTHERWISE NOTED)
- GROUND CONNECTION
- DRAWOUT DISCONNECT DEVICE
- MAGNETIC STARTER WITH THERMAL OVERLOADS, SINGLE SPEED, NON-REVERSING FULL VOLTAGE - NUMBER INDICATES NEMA SIZE (SYMBOL WITH "RV" INDICATES REDUCED VOLTAGE)
- MAGNETIC STARTER WITH THERMAL OVERLOADS, SINGLE SPEED, REVERSING FULL VOLTAGE - NUMBER INDICATES NEMA SIZE (SYMBOL WITH "RV" INDICATES REDUCED VOLTAGE)
- MAGNETIC STARTER WITH THERMAL OVERLOADS, 2S-MULTI SPEED, NON-REVERSING, FULL VOLTAGE (NUMBER INDICATES NEMA SIZE)
- THIS SYMBOL ABOVE STARTER OR CONTACTOR INDICATES COMBINATION STARTER OR CONTACTOR (F INDICATES FUSED DISC SWITCH & FUSE, B - INDICATES CIRCUIT BREAKER, S - INDICATES UNFUSED DISC SWITCH)
- MAGNETIC CONTACTOR (NUMBER INDICATES NEMA SIZE)
- MANUAL MOTOR STARTER, 1 POLE WITH THERMAL OVERLOAD

- GENERATOR (SIZE & RATING AS NOTED)
- MOTOR - NUMBER INDICATES HORSEPOWER
- MOTOR - GENERATOR SET
- SYNCHRONOUS MOTOR - NUMBER INDICATES HORSEPOWER
- EXCITER
- BATTERY
- HEATER
- FUSE
- SHUNT
- RESISTOR
- RESISTANCE TEMPERATURE DETECTOR
- INTERLOCKS: E - ELECTRICAL, K - KEY, M - MECHANICAL
- NORMALLY OPEN, NORMALLY CLOSED
- CONTROL SWITCH WITH INDICATING LIGHTS
- START - STOP MAINTAINED CONTACT PUSH BUTTON
- START - STOP MAINTAINED CONTACT PUSH BUTTON WITH INDICATING LIGHTS
- START - STOP MOMENTARY CONTACT PUSH BUTTON
- START - STOP MOMENTARY CONTACT PUSH BUTTON WITH INDICATING LIGHTS
- INDICATING LIGHTS
- SELECTOR SWITCH WITH INDICATING LIGHTS
- STOP LOCK-OUT PUSH BUTTON
- PERMISSIVE SWITCH WITH INDICATING LIGHTS
- CONTROL DEVICE TYPE AS NOTED: TS - TEMP SW CONTACT, LVS - LEVEL SW CONTACT, PS - PRESS SW CONTACT, FS - FLOAT SW CONTACT, LS - LIMIT SW CONTACT, FR - FIRE RELAY CONTACT
- METERS & INSTRUMENTS: A - AMMETER, V - VOLTMETER, W - WATTMETER, VAR - VARIMETER, WH - WATTHOUR METER, F - FREQUENCY METER, WHD - DEMAND WATTHOUR METER, SY - SYNCHROSCOPE, PF - POWER FACTOR METER, THC - THERMAL CONVERTER, TR - TEMP RECORDER, TI - TEMP INDICATOR, TACH - TACHOMETER, TM - TRANSMITTER
- AS - SWITCHES
- TRANSFORMER CONNECTIONS: 3φ, 3W DELTA, 3φ, OPEN DELTA, SINGLE PHASE, 3φ, WYE OR STAR
- TRANSUCER
- VOLTAGE ADJUSTING RHEOSTAT

- BELAYS & DEVICES**
NUMBER NEXT TO SYMBOL DENOTES QUANTITY IF MORE THAN ONE IS REQUIRED
- 21 DISTANCE
 - 27 UNDERVOLTAGE
 - 30 ANNUN ALARM
 - 40 LOSS OF FIELD
 - 46 NEGATIVE SEQUENCE
 - 50 INSTANT OVERCURRENT
 - 50-1 INSTANT ELEMENT
 - 50-2 SHORT CIRCUIT TRIP
 - 50-3 LOCKED ROTOR TRIP
 - 50/51 OVERCURREN-INSTANT & TIME DELAY
 - 51 AC OVERCURRENT-TIME DELAY
 - 55 POWER FACTOR
 - 59 OVERVOLTAGE
 - 60 VOLTAGE BALANCE
 - CR CONTROL RELAY
 - AR AUXILIARY RELAY
 - LR LATCHING RELAY (LATCH OR UNLATCH COIL AS SHOWN)
 - TDR TIME DELAY RELAY
 - COLL-TDPU - TIME DELAY PICK UP
 - TDDO - TIME DELAY DROP OUT
 - CONTACT: TDOAE - TIME DELAY CLOSE AFTER ENERGIZATION, TDOOE - TIME DELAY OPEN AFTER ENERGIZATION, TDCAD - TIME DELAY CLOSE AFTER DE-ENERGIZATION, TDOAD - TIME DELAY OPEN AFTER DE-ENERGIZATION
 - DEVICES: 2 TIME DELAY CLOSING RELAY, 20 ELEC OPER VALVE, 33 POSITION OR LIMIT SW, 41 FIELD CIRCUIT BREAKER, 42 MOTOR STARTER, 52 AC CIRCUIT BREAKER
 - RELAY OR DEVICE "SUFFIX LETTERS": F FIELD, G GROUND, N NEUTRAL, TELM TELEMETRERING, V VOLTAGE, X AUXILIARY, GN GENERATOR DIFFERENTIAL, GD GENERATOR DISTANCE, GF GENERATOR FIELD, GG GENERATOR GROUND, GNS GENERATOR NEG SEQUENCE, GT GENERATOR TRANSFORMER, GOE GENERATOR OVER EXCITATION, TOP MAIN TRANSFORMER GAS, TN MAIN TRANSFORMER NEUTRAL, LGT LINE GEN TRANSF OVERALL, NGP NORM STA SERV TRANSF GAS, NT NORM STA SERV TRANSF, SGP START UP STA SERV, ST TRANSF GAS, ST START UP STA SERV TRANSF, STL 161KV LINE, EQP EMERG TRANSF GAS, TURBINE
 - IAS 4160V SWGR START-UP BKR 1A, IAN 4160V SWGR NORMAL BKR 1A, IBS 4160V SWGR START-UP BKR 1B, IBN 4160V SWGR NORMAL BKR 1B, ICS 4160V SWGR START-UP BKR 1C, ICN 4160V SWGR NORMAL BKR 1C, IDS 4160V SWGR START-UP BKR 1D, IDN 4160V SWGR NORMAL BKR 1D, IFS 4160V SWGR EMERG BKR 1F, IGS 4160V SWGR EMERG BKR 1G, D01 DIESEL GEN NO 1, D02 DIESEL GEN NO 2, IFE DIESEL GEN NO 1 BKR 1FE, IGE DIESEL GEN NO 2 BKR 1GE, NB 4160V SWGR NORMAL SUPPLY, SB 4160V SWGR START-UP SUPPLY
 - SOLENOID
 - WIRE TERMINAL POINT
 - WIRE CONNECTION POINT
 - INDICATING LIGHT WITH DROPPING RESISTOR (R-RED, B-BLUE, C-GREEN, W-WHITE, A-AMBER)
 - INDICATING LIGHT
 - TEST JACK CONNECTION POINT
 - PUSH BUTTON-MOMENTARY CONTACT NORMALLY CLOSED
 - PUSH BUTTON-MOMENTARY CONTACT NORMALLY OPEN
 - PUSH BUTTON-MAINTAINED CONTACT
 - MANUAL MOTOR STARTER - SINGLE POLE WITH THERMAL OVERLOAD
 - OVERLOADS (THREE LINE DIAGRAM)
 - BLOCKING DIODE
 - OVERLOADS
 - CONTACT - NORMALLY OPEN (NO)
 - CONTACT - NORMALLY CLOSED (NC)
 - BELL ALARM CONTACT (OPEN OR CLOSED AS INDICATED)
 - BREAKER CONTACT (OPEN WHEN BREAKER IS OPEN)
 - BREAKER CONTACT (CLOSED WHEN BREAKER IS OPEN)
 - BREAKER POSITION SWITCH (CLOSED WHEN BREAKER IS IN OPERATING POSITION)
 - BREAKER POSITION SWITCH (OPEN WHEN BREAKER IS IN OPERATING POSITION)
 - CONTROL SWITCH, CONTACTS AS INDICATED IN CONTROL SWITCH DEVELOPMENT
 - CONTROL SWITCH TEST, LOCATED AT 4160V SWGR (C - INDICATES CLOSED POSITION, T - INDICATES TEST POSITION)
 - MULTIPLE CONDUCTOR - SHIELDED CABLE (TWO CONDUCTOR SHOWN)
 - MULTIPLE CONDUCTOR - SHIELDED CABLE - SHIELDED GROUNDED (TWO CONDUCTOR SHOWN)
 - SIGNAL CONNECTOR (MULTI CONDUCTOR)

POWER, GROUNDING, & LIGHTING PLANS

- LIGHTING PANEL (SEE LIGHTING PANEL SCHEDULES)
- PANEL - MISCELLANEOUS AS NOTED ON PLAN DWGS
- POWER PANEL
- MOTOR HORIZONTALLY MOUNTED
- MOTOR - VERTICALLY MOUNTED
- CONTACTOR
- MOTOR STARTER OR CONTROLLER
- TRANSFER SWITCH-SIZE & TYPE AS NOTED
- DISCONNECT OR SAFETY SWITCH (SIZE AS NOTED)
- TRANSFORMER - DRAW TO SCALE (SIZE & RATING AS NOTED)
- MOTOR OPERATED VALVE
- AIR OPERATED VALVE
- SINGLE POLE MANUAL MOTOR STARTER WITH THERMAL OVERLOAD (SEL = SELECTOR SWITCH)
- J - JUNCTION BOX, TB - TERMINAL BOX, PB - PULL BOX
- RIGID CONDUIT - RUN EXPOSED
- RIGID CONDUIT - RUN CONCEALED
- CONDUIT OR CABLE TURNING UP OR TOWARDS OBSERVER
- CONDUIT OR CABLE TURNING DOWN OR AWAY FROM OBSERVER
- DIRECT BURIAL CABLE
- FLEXIBLE CONDUIT
- CONDUIT "SEALING" FITTING
- UNIT HEATER
- CONTROL DEVICES: TYPE AS NOTED: TS - TEMP SW, SV - SOLENOID VALVE, LVS - LEVEL SWITCH, PS - PRESSURE SWITCH, FS - FLOAT SWITCH, LS - LIMIT SWITCH, SS - SELECTOR SWITCH, CS - CONTROL SWITCH, PMS - PERMISSIVE SW, RTD - RESIST TEMP DETEC, T - THERMOSTAT, TE - TEMP ELEMENT
- PE - PNEU-ELECT RELAY, SP - ELECT-PNEU SWITCH, T/C - THERMOCOUPLE, H - HUMIDISTAT, FT - FLOW TRANSMITTER, PT - PRESSURE TRANS, LT - LEVEL TRANS, FI - FLOW INDICATOR, FLS - FLOW SWITCH, A - ALTERNATOR, SD - SMOKE DETECT, V - VALVE
- HOME RUN TO PANELBOARD - ALL UNMARKED CONDUITS ARE 3/4" IN SIZE AND CONTAIN 2#12 UNLESS OTHERWISE NOTED
- SWITCH & SINGLE CONVENIENCE RECEPTACLE COMBINATION
- SWITCH & DUPLEX CONVENIENCE RECEPTACLE COMBINATION 20A, 125VAC, GE 5951-1 OR EQUAL
- SINGLE RECEPTACLE, CONVENIENCE, 2P 3W 15A 125V HUBBELL TYPE 5261 OR APPVD EQUAL
- DUPLEX RECEPTACLE, CONVENIENCE, 2P 3W 15A 125V HUBBELL TYPE 5262 OR APPVD EQUAL
- DUPLEX RECEPTACLE, CONVENIENCE, 2P 3W 15A 125V "CR" INDICATES CORROSION RESISTANCE, HUBBELL TYPE 52CM62 WITH 52CM08 CAP OR APPVD EQUAL
- DUPLEX RECEPTACLE, CONVENIENCE, 2P 3W 15A 125V HUBBELL TYPE 52621 OR APPVD EQUAL - "R" INDICATES REGULATED VOLTAGE
- SINGLE RECEPTACLE 2P 3W GROUNDING 20A 250V NEMA 6-20R, HUBBELL TYPE 5481 WITH SUPER STAINLESS PLATE HUBBELL 93091 OR APPVD EQUAL
- POWER RECEPTACLE 3W 4P 60A 600VAC CROUSE-HINDS TYPE "ARCA" CAT NO. AREA6425 OR APPVD EQUAL
- POWER RECEPTACLE 3W 4P 30A 600VAC CROUSE-HINDS TYPE "ARCA" CAT NO. AREA3423 OR APPVD EQUAL
- PLUG-IN STRIP - TYPE AS NOTED ON DWGS
- CEILING MTD, WALL MTD, FN, FN, CK, CK, RL, RL, CC, CC, P, P, O, O
- ARC - INDICATES AUXILIARY RELAY CABINET
- INDICATES LOCAL DEVICE
- INDICATES LOCAL DEVICE ON LOCAL PANEL
- INDICATES EQUIPMENT LOCATED AT BENCHBOARD LETTER OR NUMBER DESIGNATION AS SHOWN
- INDICATES EQUIPMENT LOCATED AT CABINET NUMBER DESIGNATION AS SHOWN
- INDICATES EQUIPMENT LOCATED AT VERTICAL BOARD, LETTER OR NUMBER DESIGNATION AS SHOWN
- INDICATES EQUIPMENT LOCATED AT COMPUTER EQUIPMENT DESK, LETTER OR NUMBER DESIGNATION AS SHOWN
- INDICATES ANNUNCIATION - LETTER DENOTES BOARD OR PANEL LOCATION

FIRE ALARM & COMMUNICATION PLANS

- TELEPHONE SWITCHBOARD
- PUBLIC TELEPHONE CO. TELEPHONE WITH ACCESS TO PUBLIC EXCHANGE, DESK TYPE
- PUBLIC TELEPHONE IN FULL BOOTH
- INDUSTRIAL TYPE TELEPHONE (D = DESK SET, W = WALL SET, WP = WEATHERPROOF WALL SET)
- SOUND POWERED TELEPHONE SET
- JACK FOR SOUND POWERED TELEPHONE
- OUTLET FOR PLUG-IN PORTABLE INDUSTRIAL TELEPHONE
- LOUDSPEAKER, HORN TYPE, SINGLE UNIT
- LOUDSPEAKER, SPECIAL TYPE
- LOUDSPEAKER, OFFICE TYPE WITH VOLUME CONTROL
- TWO-WAY INTERCOM SET
- MICROPHONE (RADWASTE AREA)
- CLOSED CIRCUIT TELEVISION RECEIVER
- CLOSED CIRCUIT TELEVISION TRANSMITTER & CAMERA
- SWITCH - SINGLE POLE, 120V 20A TOGGLE
- INDICATES ASSOCIATED CONTROLLED FIXTURES
- INDICATES 3 WAY SWITCH
- INDICATES SWITCH WITH PILOT LIGHT
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- PLUG-IN STRIP - TYPE AS NOTED ON DWGS
- TRANSF - TRANSFORMER, SWGR - SWITCHGEAR, MCC - MOTOR CONTROL CENTER, PDP - POWER DISTRIBUTION PANEL, LDP - LIGHT DISTRIBUTION PANEL, PP - POWER PANEL, LP - LIGHTING PANEL, GND - GROUND, CND - CONDUIT, POT - POTENTIAL TRANSFORMER, CT - CURRENT TRANSFORMER, POS(+) - POSITIVE, NEG(-) - NEGATIVE, RP - RELAY PANEL, EP - EXPLOSION PROOF, WP - WEATHER PROOF, VT - VAPOR TIGHT, DT - DUST TIGHT, WT - WATER TIGHT (SUBMERSIBLE), EC - EMPTY CONDUIT, DP - DRIP PROOF

POLE LINE & UNDERGROUND DISTRIBUTION PLANS

- EXISTING POLE LENGTH & CLASS AS NOTED
- NEW POLE LENGTH & CLASS AS NOTED
- POLE WITH DOWN GUY & ANCHOR-LENGTH & CLASS & STRENGTH OF GUY IN POUNDS AS NOTED
- POLE WITH STREET LIGHTING FIXTURE LENGTH & CLASS AS NOTED
- SINGLE PHASE TRANSFORMER (RATING AS NOTED)
- THREE PHASE TRANSFORMER (RATING AS NOTED)
- STREET LIGHTING REGULATOR (RATING AS NOTED)
- SECTIONALIZING SWITCH-MOUNTED ON CROSSARM - NORMALLY OPEN
- SECTIONALIZING SWITCH-MOUNTED ON CROSSARM - NORMALLY CLOSED
- POLE TOP SWITCH
- LIGHTING ARRESTER IN EACH PHASE WIRE
- PRIMARY LINE - NO. & SIZE OF WIRE AS NOTED
- SERIES STREET LTG CKT 1/C OF SIZE NOTED
- SECONDARY LINE - NO. & SIZE OF WIRE AS NOTED
- SECONDARY LINE - NO. & SIZE OF WIRE AS NOTED
- CONDUCTOR DEAD END
- INDICATES NUMBER & ARRGT OF DUCTS IN DUCTBANK
- INDICATES # OF DUCTBANK (LOCATE WITH DIMENSIONS OR CO-ORDINATE NUMBERS)
- ARROW INDICATES DIRECTION OF DUCTBANK TOWARDS LOW POINT
- ABBREVIATIONS: TRANSF - TRANSFORMER, SWGR - SWITCHGEAR, MCC - MOTOR CONTROL CENTER, PDP - POWER DISTRIBUTION PANEL, LDP - LIGHT DISTRIBUTION PANEL, PP - POWER PANEL, LP - LIGHTING PANEL, GND - GROUND, CND - CONDUIT, POT - POTENTIAL TRANSFORMER, CT - CURRENT TRANSFORMER, POS(+) - POSITIVE, NEG(-) - NEGATIVE, RP - RELAY PANEL, EP - EXPLOSION PROOF, WP - WEATHER PROOF, VT - VAPOR TIGHT, DT - DUST TIGHT, WT - WATER TIGHT (SUBMERSIBLE), EC - EMPTY CONDUIT, DP - DRIP PROOF
- NOTES: 1. FOR ADDITIONAL SYMBOLS RELATED TO BENCHBOARD & CABINET DESIGNATIONS SEE DWG 3032.

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N.P.P.D.. RIMS

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DO NOT REVISE MANUALLY

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS

NO.	REVISIONS	DATE
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ELECTRICAL SYMBOL LIST
COOPER NUCLEAR STATION

BURNS & ROE

3070

NO. 606

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