INDEX OF DRAWINGS VOLUME 7

DRAWING NUMBER	DESCRIPTION
SD317A-G-003	ELECTRICAL NOTES AND SHEET INDEX
W17.10-E-001	LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES - SHEET 1
W17.10-E-002	LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES - SHEET 2
W17.10-E-040	SITE PLAN - MAIN SUBSTATION NEW INSTALLATION
W17.10-E-040.D	SITE PLAN - MAIN SUBSTATION EXISTING SUBSTATION REMOVAL WORK
W17.10-E-101	PGS 2 TO MAIN SUBSTATION - CONDUIT AND CABLE ROUTING
W17.10-E-102	MAIN SUBSTATION AREA UG CONDUIT, GROUNDING AND MANHOLES
W17.10-E-120	CONDUIT AND CABLE SCHEDULE MAIN SUBSTATION - SHEET 1
W17.10-E-121	CONDUIT AND CABLE SCHEDULE MAIN SUBSTATION - SHEET 2
W17.10-E-201	SINGLE LINE METER AND RELAY DIAGRAM - MAIN SUBSTATION 15KV H1/H2 SWITCHGEARS
W17.10-E-202	SINGLE LINE METER AND RELAY DIAGRAM - 5KV M1-WEST SWITCHGEAR
W17.10-E-203	SINGLE-LINE METER AND RELAY DIAGRAM - 5KV M1-EAST SWITCHGEAR
W17.10-E-204	MAIN SUBSTATION SWITCHGEAR H2 - AUTOMATIC SYNCHRONIZING SCHEME
W17.10-E-210	MAIN SUBSTATION SWITCHGEAR M1-WEST AND M1-EAST MAIN-TIE-MAIN AUTO TRANSFER DESCRIPTION OF OPERATION
W17.10-E-211	MAIN SUBSTATION SWITCHGEARS H1/H2 - THREE LINE PT SCHEMATICS - SYNCHRONIZING POTENTIALS
W17.10-E-212	MAIN SUBSTATION SWITCHGEAR H1 MODIFICATION - THREE LINE AC SCHEMATIC - SHEET 1
W17.10-E-213	MAIN SUBSTATION SWITCHGEAR H1 MODIFICATION - THREE LINE AC SCHEMATIC - SHEET 2
W17.10-E-220	MAIN SUBSTATION SWITCHGEAR H2 PLAN AND ELEVATION - SHEET 1
W17.10-E-221	MAIN SUBSTATION SWITCHGEAR H2 PLAN AND ELEVATION - SHEET 2
W17.10-E-222	MAIN SUBSTATION SWITCHGEAR H2, NAMEPLATE SCHEDULE
W17.10-E-222A	MAIN SUBSTATION SWITCHGEAR H2, DEVICE LIST
W17.10-E-223	MAIN SUBSTATION SWITCHGEAR H1 - MODIFICATION ELEVATION, NAMEPLATE SCHEDULE AND NEW DEVICE LIST
W17.10-E-224	MAIN SUBSTATION SWITCHGEAR M1-EAST MODIFICATIONS ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST
W17.10-E-225	MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATIONS ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST
W17.10-E-226	MAIN SUBSTATION SWITCHGEAR M1-EAST MODIFICATIONS - THREE LINE AC SCHEMATIC
W17.10-E-227	MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATIONS - THREE LINE AC SCHEMATIC
W17.10-E-230	MAIN SUBSTATION SWITCHGEAR H2 - AC AND DC PANEL SCHEDULES
W17.10-E-301	MAIN SUBSTATION SWITCHGEAR H2 - FEEDER PGS 2 DC CONTROL SCHEMATIC
W17.10-E-302	MAIN SUBSTATION SWITCHGEAR H2 - FEEDER T20 DC CONTROL SCHEMATIC
W17.10-E-302A	MAIN SUBSTATION SWITCHGEAR H2 - XFMR T20 DIFF. PROTECTION DC CONTROL SCHEMATIC
W17.10-E-303	MAIN SUBSTATION SWITCHGEAR H2 - FEEDER T21 DC CONTROL SCHEMATIC
W17.10-E-303A	MAIN SUBSTATION SWITCHGEAR H2 - XFMR T21 DIFF. PROTECTION DC CONTROL SCHEMATIC
W17.10-E-304	MAIN SUBSTATION SWITCHGEAR H2 - FEEDER T23 DC CONTROL SCHEMATIC
W17.10-E-304A	MAIN SUBSTATION SWITCHGEAR H2 - XFMR T23 DIFF. PROTECTION DC CONTROL SCHEMATIC
W17.10-E-305	MAIN SUBSTATION SWITCHGEAR H2, FEEDER H2-H1 TIE-A DC CONTROL SCHEMATIC
W17.10-E-306	MAIN SUBSTATION SWITCHGEAR H2, FEEDER H2-H1 TIE-B DC CONTROL SCHEMATIC
W17.10-E-307	MAIN SUBSTATION SWITCHGEAR H2, PROTECTIVE RELAYS CONTACT TABLES - SHEET 1
W17.10-E-308	MAIN SUBSTATION SWITCHGEAR H2, PROTECTIVE RELAYS CONTACT TABLES AUTO-SYNC. RELAY SEL 451-4 - SHEET 2
W17.10-E-309	MAIN SUBSTATION SWITCHGEAR H1, CONTROL SCHEMATICS
W17.10-E-310	MAIN SUBSTATION SWITCHGEAR H1, CONTROL SCHEMATICS
W17.10-E-311	MAIN SUBSTATION SWITCHGEAR H1, CONTROL SCHEMATICS
W17.10-E-312	MAIN SUBSTATION SWITCHGEAR M1-EAST - TYPICAL FEEDER BREAKER DC CONTROL SCHEMATIC MODIFICATIONS
W17.10-E-313	MAIN SUBSTATION SWITCHGEAR M1-WEST - TYPICAL FEEDER BREAKER DC CONTROL SCHEMATIC MODIFICATIONS
W17.10-E-314	MAIN SUBSTATION SWITCHGEAR M1-WEST, TIE BREAKER (UNIT 102) DC CONTROL SCHEMATIC
W17.10-E-315	MAIN SUBSTATION SWITCHGEAR M1-WEST, MAIN (UNIT 101) BREAKER DC CONTROL SCHEMATIC
W17.10-E-316	MAIN SUBSTATION SWITCHGEAR M1-EAST, MAIN (UNIT 201) BREAKER DC CONTROL SCHEMATIC
W17.10-E-317	MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATIONS, PGS 1 INCOMING BREAKER UNITS 303 & 302 DC CONTROL SCHEMATIC - SHEET 1
W17.10-E-317A	MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATIONS, PGS 1 INCOMING BREAKER UNITS 303 & 302 DC CONTROL SCHEMATIC - SHEET 2
W17.10-E-317B	MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATIONS, PGS 1 INCOMING BREAKER UNITS 303 & 302 THREE-LINE SCHEMATIC
W17.10-E-318	MAIN SUBSTATION SWITCHGEAR H2, H2A BUS DIFFERENTIAL AND BREAKER FAILURE LOCKOUT RELAYS SCHEMATICS
W17.10-E-319	MAIN SUBSTATION SWITCHGEAR H2, H2B BUS DIFFERENTIAL AND BREAKER FAILURE LOCKOUT RELAYS SCHEMATICS
W17.10-E-320	MAIN SUBSTATION SWITCHGEAR H2, TIE BREAKER H2-150 DC CONTROL SCHEMATIC
W17.10-E-321	MAIN SUBSTATION SWITCHGEAR H2, FEEDER BREAKER H2-101 DC CONTROL SCHEMATIC
W17.10-E-322	MAIN SUBSTATION SWITCHGEAR H2, FEEDER BREAKER H2-102 DC CONTROL SCHEMATIC
W17.10-E-323	MAIN SUBSTATION SWITCHGEAR H2, FEEDER BREAKER H2-201 DC CONTROL SCHEMATIC
W17.10-E-324	MAIN SUBSTATION SWITCHGEAR H2, FEEDER BREAKER H2-202 DC CONTROL SCHEMATIC
W17.10-E-540	MAIN SUBSTATION SWITCHGEAR H1, I/O PROCESSOR SEL-2411-H1 SCHEMATIC
W17.10-E-541	MAIN SUBSTATION SWITCHGEAR H1, REMOTE I/O MODULE SEL-2506-H1 SCHEMATIC
W17.10-E-542	MAIN SUBSTATION SWITCHGEAR H2, I/O PROCESSOR SEL-2411-H2A SCHEMATIC
W17.10-E-543	MAIN SUBSTATION SWITCHGEAR H2, REMOTE I/O MODULE SEL-2506-H2A1 SCHEMATIC
W17.10-E-544	MAIN SUBSTATION SWITCHGEAR H2, REMOTE I/0 MODULE SEL-2506-H2B1 SCHEMATIC
W17.10-E-545	MAIN SUBSTATION SWITCHGEAR M1-EAST, I/O PROCESSOR SEL-2411-M1B1 SCHEMATIC
W17.10-E-546	MAIN SUBSTATION SWITCHGEAR M1-EAST, REMOTE I/O MODULE SEL-2506-M1B1 SCHEMATIC
W17.10-E-547	MAIN SUBSTATION SWITCHGEAR M1-EAST, REMOTE I/O MODULE SEL-2506-M1B2 SCHEMATIC
W17.10-E-548	MAIN SUBSTATION SWITCHGEAR M1-EAST, REMOTE I/O MODULE SEL-2506-M1B3 SCHEMATIC
W17.10-E-549	MAIN SUBSTATION SWITCHGEAR M1-EAST, I/O PROCESSOR SEL-2411-M1B2 SCHEMATIC
W17.10-E-550	MAIN SUBSTATION SWITCHGEAR M1-WEST, REMOTE I/O MODULE SEL-2506-M1A1 SCHEMATIC
W17.10-E-551	MAIN SUBSTATION SWITCHGEAR M1-WEST, REMOTE I/O MODULE SEL-2506-M1A2 SCHEMATIC
W17.10-E-552	MAIN SUBSTATION SWITCHGEAR M1-WEST, REMOTE I/O MODULE SEL-2506-M1A3 SCHEMATIC
W17.10-E-553	MAIN SUBSTATION SWITCHGEAR M1-WEST, I/O PROCESSOR SEL-2411-M1A2 SCHEMATIC
W17.10-E-554	MAIN SUBSTATION SWITCHGEAR H2, I/O PROCESSOR SEL-2411-H2B SCHEMATIC
W17.10-E-555	MAIN SUBSTATION SWITCHGEAR M1-WEST, I/O PROCESSOR SEL-2411-M1A1 SCHEMATIC
W17.10-E-560	SCADA AND LOAD SHEDDING SYSTEM NETWORK TOPOLOGY
W17.10-E-561	MAIN SUBSTATION SWGR H1/H2 SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM
W17.10-E-562	MAIN SUBSTATION SWITCHGEAR M1-EAST SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM

INDEX OF DRAWINGS VOLUME 7 - CONTINUED

DRAWING NUMBER	DESCRIPTION
W17.10-E-563	MAIN SUBSTATION SWITCHGEAR M1-WEST SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM
W17.10-E-901	ELECTRICAL DETAILS MAIN SUBSTATION
W17.10-E-902	ELECTRICAL DETAILS MAIN SUBSTATION
W17.10-E-903	ELECTRICAL DETAILS
W17.10-E-904	ELECTRICAL DETAILS MAIN SUBSTATION MANHOLE DEVELOPMENTS
W17.10-E-905	ELECTRICAL DETAILS MAIN SUBSTATION - T-23 ON CONDUITS
W17.10-E-906	ELECTRICAL DETAILS MAIN SUBSTATION - CABLE VAULT
W28.20-E-001	LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES - SHEET 1
W28.20-E-002	LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES - SHEET 2
W28.20-E-004	PGS 2 MANHOLE DEVELOPMENTS
W28.20-E-040	SUBSTATION U29/U30 ARRANGEMENT PLAN
W28.20-E-040D	ELECTRICAL DEMOLITION PLAN
W28.20-E-043	PGS 2 BUILDING EQUIPMENT ARRANGEMENT
W28.40-E-080	HAZARDOUS AREA CLASSIFICATION SITE PLAN GAS COMPRESSOR LOCATION
W28.40-E-081	HAZARDOUS AREA CLASSIFICATION SITE PLAN GAS CONDITIONING LOCATION
W28.20-E-082	HAZARDOUS AREA CLASSIFICATION SITE PLAN TURBINE/GENERATOR LOCATION
W28.50-E-101	U29/U30 UG CONDUITS, MANHOLES AND GROUNDING PGS 2 BUILDING AREA
W28.50-E-102	PGS1/PGS2 AREA CONDUITS, TRAYS AND GAS COMPRESSOR SKID GROUNDING PLAN
W28.20-E-103	PGS 2 BUILDING UG CONDUIT
W28.20-E-104	PGS 2 BUILDING GROUNDING SYSTEM
W28.20-E-120	CONDUIT AND CABLE SCHEDULE - MEDIUM VOLTAGE POWER
W28.20-E-121	CONDUIT AND CABLE SCHEDULE - LOW VOLTAGE POWER AND CONTROL SHEET 1
W28.20-E-122	CONDUIT AND CABLE SCHEDULE - LOW VOLTAGE POWER AND CONTROL SHEET 2
W28.20-E-123	CONDUIT AND CABLE SCHEDULE - LOW VOLTAGE POWER AND CONTROL SHEET 3
W28.20-E-124	CONDUIT AND CABLE SCHEDULE - LOW VOLTAGE POWER AND CONTROL SHEET 4
W28.20-E-125	CONDUIT AND CABLE SCHEDULE - LOW VOLTAGE POWER AND CONTROL SHEET 5
W28.20-E-126	INSTRUMENTATION AND CONTROL CABLE SCHEDULE SHEET 1
W28.20-E-127	INSTRUMENTATION AND CONTROL CABLE SCHEDULE SHEET 2
W28.20-E-128	INSTRUMENTATION AND CONTROL CABLE SCHEDULE SHEET 3
W28.20-E-130	PGS 2 BUILDING OVERHEAD CONDUIT AND TRAY SYSTEM
W28.20-E-130A	PGS 2 BUILDING SECTION THRU COLUMN LINE 5
W28.20-E-131	ELECTRICAL DISTRIBUTION SITE PLAN - OUTDOOR OVERHEAD FEEDER CABLE TRAY SYSTEM
W28.40-E-132	GAS CONDITIONING SYSTEM - PLAN
W28.20-E-140	PGS 2 BUILDING LIGHT FIXTURE SCHEDULE
W28.20-E-141	PGS 2 BUILDING TITLE 24 COMPLIANCE
W28.20-E-142	PGS 2 BUILDING LIGHTING WIRING DIAGRAM AND DETAILS
W28.20-E-150	PGS 2 BUILDING - LIGHTING PLAN
W28.20-E-152	PGS 2 BUILDING CANOPY - LIGHTING PLAN
W28.20-E-153	COOLING WATER LOOP PUMPS - POWER PLAN
W28.20-E-154	COOLING LOOP SECTIONS AND DETAILS
W28.20-E-160	PGS 2 BUILDING - POWER PLAN
W28.10-E-161	NO. 3 COOLING WATER PUMPS POWER PLAN
W28.20-E-202	SINGLE LINE METER AND RELAY DIAGRAM - PGS 2
W28.10-E-203	SINGLE LINE METER AND RELAY DIAGRAM - PGS 1
W28.50-E-204	PRIMARY UNIT SUBSTATION U30 5KV SWITCHGEAR AND MV MOTOR CONTROLLER
W28.20-E-205	PGS 2 MOTOR CONTROL CENTER MCC-1 (GEN. UNIT GT-1)
W28.20-E-207	PGS 2 MOTOR CONTROL CENTER MCC 5 - GAS COMPRESSOR
W28.20-E-208	PGS 2 MOTOR CONTROL CENTER MCC 4 - AUXILIARIES AND BUILDING SERVICES
W28.20-E-210	PGS 2 GENERATOR BREAKER THREE-LINE AC SCHEMATIC
W28.20-E-211	PGS 2 15KV SWITCHGEAR BUS 3-LINE POTENTIAL SCHEMATIC
W28.20-E-211A	PGS 2 15KV SWITCHGEAR 3-LINE AC CURRENT SCHEMATIC BUS DIFFERENTIAL PROTECTION
W28.50-E-212	PRIMARY UNIT SUBSTATION U30 - 5KV MOTOR CONTROLLER AC SCHEMATIC
W28.20-E-220	15KV INDOOR SWITCHGEAR PGS 2 - PLAN AND ELEVATION
W28.20-E-221	15KV INDOOR SWITCHGEAR PGS 2 - PANEL NAMEPLATE SCHEDULE AND DEVICE LIST
W28.50-E-222	PGS 2 SECONDARY UNIT SUBSTATION U29 - PLAN ELEVATION AND NAMEPLATE SCHEDULE
W28.20-E-223	PGS 2 MANUAL CONTROL PANEL ELEVATION, PANEL NAMEPLATE SCHEDULE AND DEVICE LIST
W28.50-E-224	PRIMARY UNIT SUBSTATION U30 - ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST
W28.20-E-230	PGS 2 BUILDING 480V AND 208V PANEL SCHEDULES
W28.10-E-231	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATION - UNITS 7, 8 & 9
W28.10-E-231A	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS - PANEL 7 & 9 NAMEPLATE SCHEDULE AND DEVICE LIST
W28.10-E-232	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATION - FEEDER CONDUITS INSTALLATION
W28.20-E-301	PGS 2 GENERATOR BREAKER DC CONTROL SCHEMATIC
W28.20-E-302	PGS 2 GENERATOR PROTECTIVE RELAY SEL-300G CONTACT TABLE
W28.20-E-303	PGS 2 15KV SWITCHGEAR MAIN BREAKER PGS2-100 DC CONTROL SCHEMATIC
W28.20-E-304	PGS 2 15KV SWITCHGEAR MAIN BREAKER PGS2-100 LINE PROTECTIVE RELAYS CONTACT TABLES
W28.20-E-305	PGS 2 15KV SWITCHGEAR MAIN BREAKER PGS2-100 PROTECTIVE RELAYS CONTACT TABLES AUTO-SYNCHRONIZING RELAY
W28.20-E-306	PGS 2 15KV SWITCHGEAR FEEDER BREAKER PGS2-103 DC CONTROL SCHEMATIC
W28.20-E-307	PGS 2 15KV SWITCHGEAR FEEDER BREAKERS PROTECTIVE RELAYS CONTACT TABLE
W28.20-E-308	PGS 2 15KV SWITCHGEAR FEEDER BREAKER PGS2-101 (U29) DC CONTROL SCHEMATIC
W28.20-E-308B	PGS 2 SWITCHGEAR BUS DIFFERENTIAL & BREAKER FAILURE LOCKOUT RELAYS SCHEMATICS
W28.20-E-308C	15KV INDOOR SWITCHGEAR PGS 2 XFMR T-22 DIFF. PROTECTION DC CONTROL SCHEMATIC
W28.10-E-309	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS U30 FEEDER BREAKER DC CONTROL SCHEMATIC
W28.10-E-309A	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS U28 FEEDER BREAKER DC CONTROL SCHEMATIC
W28.10-E-309B	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS MAIN BREAKER DC CONTROL SCHEMATIC
W28.10-E-310	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS FEEDERS U28 & U30 PROTECTIVE RELAYS CONTACT TABLES
W28.10-E-311	PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS PROTECTIVE RELAYS CONTACT TABLES AUTO-SYNC. RELAY SEL 451-4

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DRAWING NUMBER	DESCRIPTION
W28.50-E-312	PRIMARY UNIT SUBSTATION U30 5KV PGS1 TIE FEEDER BREAKER DC CONTROL SCHEMATIC
W28.50-E-313	PRIMARY UNIT SUBSTATION U30 MAIN BREAKER DC CONTROL SCHEMATIC
W28.50-E-314	PRIMARY UNIT SUBSTATION U30 5KV BREAKERS PROTECTIVE RELAYS CONTACT TABLES
W28.50-E-314A	PRIMARY UNIT SUBSTATION U30 BUS DIFFERENTIAL PROTECTION SCHEMATIC
W28.20-E-315	PGS 2 15KV SWITCHGEAR DC PANEL SCHEDULE
W28.20-E-316	PGS 2 CONTROL SCHEMATICS - ON SKID MOTORS AND LUBE OIL TANK HEATER
W28.20-E-317	PGS 2 CONTROL SCHEMATICS - OFF SKID MOTORS
W28.20-E-318	PGS 2 CONTROL SCHEMATICS - PLANT AUXILIARIES
W28.20-E-319	GT-1 TURBINE CONTROL BOX INTERCONNECTION WIRING
W28.20-E-320	GT-1 GENERATOR CONTROL BOX INTERCONNECTION WIRING
W28.20-E-320A	GT-1 GENERATOR CONTROL BOX INTERCONNECTION WIRING
W28.20-E-323	GT-1 TURBINE CONTROL BOX - WIRING DIAGRAM
W28.20-E-324	GT-1 GENERATOR CONTROL BOX - WIRING DIAGRAM
W28.20-E-540	PGS 2 SWITCHGEAR I/O PROCESSOR SEL-2411-PGS2 SCHEMATIC
W28.20-E-541	PGS 2 SWITCHGEAR REMOTE I/O MODULE SEL-2506-PGS2 SCHEMATIC
W28.10-E-542	PGS 1 SWITCHGEAR REMOTE I/O MODULE SEL-2506-PGS1 SCHEMATIC (LOAD SHED MODULE)
W28.50-E-543	PRIMARY UNIT SUBSTATION U30 I/O PROCESSOR SEL-2411-U30 SCHEMATIC
W28.50-E-544	PRIMARY UNIT SUBSTATION U30 REMOTE I/O MODULE SEL-2506-U30 SCHEMATIC
W28.10-E-545	PGS 1 SWITCHGEAR MODIFICATION I/O PROCESSOR SEL-2411-PGS1 SCHEMATIC
W28.20-E-560	PGS 1 AND PGS 2 SWITCHGEAR SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM
W28.20-E-701	PGS 2 BUILDING FIRE ALARM PLAN
W28.20-E-750	PGS 2 BUILDING FIRE ALARM SYSTEM - RISER DIAGRAM
W28.20-E-801	PGS 2 BUILDING TELEPHONE, PA SYSTEM AND DATA COMMUNICATION PLAN
W28.20-E-850	PGS 2 BUILDING PA SYSTEM BLOCK DIAGRAM
W28.20-E-901	ELECTRICAL DETAILS
W28.20-E-902	ELECTRICAL DETAILS
W28.20-E-903	ELECTRICAL DETAILS
W28.20-E-904	CABLE TRAYS THRU BUILDING WALL AND BELOW CANOPIES, SECTIONS AND DETAILS
W28.20-E-905	PARTIAL CABLE TRAY PLAN BETWEEN PGS 2 AND PGS 1 BUILDINGS
W28.20-E-906	GENERATOR CABLE TERMINATION DETAIL AND BATTERY CHARGER/DC STARTER MOUNTING DETAIL
W28.20-E-907	TURBINE SKID CABLE ENTRIES DETAILS
W28.20-E-908	ELECTRICAL DETAILS
W28.20-E-909	ELECTRICAL DETAILS
W28.20-E-910	DETAIL - PGS2 REMOTE ALARM & PGS1 & PGS1 ALARM RESET & REMOTE EMERGENCY AT PGS2

SD317A-W28-I-001	LEGEND, SYMBOLS AND ABBREVIATIONS
W28.40-I-101	P&ID - GAS CONDITIONING AND STORAGE
W28.30-I-102	P&ID - GAS COMPRESSORS
W28.20-I-103	P&ID - GAS TURBINE GENERATOR NO. 1
W28.20-I-201	P&ID - HEAT RECOVER UNIT NO. 1
W28.20-I-203	P&ID - COOLING SYSTEM NO. 3 WATER PUMPS
W28.20-I-204	P&ID - COOLING SYSTEM COOLING WATER PUMPS
W28.20-I-205	P&ID - COOLING SYSTEM HEAT EXCHANGERS AND COOLING TOWERS
W28.20-I-206	P&ID - GAS TURBINE GENERATOR NO. 1 LUBE OIL SYSTEM
SD317A-W28-I-301	P&ID - MISCELLANEOUS SYSTEMS
W28.20-I-530	PANEL PCM-PGS 2 ELEVATION
SD317A-W28-I-560	PGS2 NETWORK BLOCK DIAGRAM
SD317A-W28-I-901	TYPICAL INSTRUMENTATION DETAIL 1
SD317A-W28-I-902	TYPICAL INSTRUMENTATION DETAIL 2
SD317A-W28-I-903	TYPICAL INSTRUMENTATION DETAIL 3
SD317A-W28-I-904	TYPICAL INSTRUMENTATION DETAIL 4

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
INDEX OF DRAWINGS - VOLUME 7

SCALE NONE
DATE JAN2009

SD317A-G-003
DRAWING NUMBER

1
REV.

USER: vuong
DATE: 18-SEP-2014 10:08
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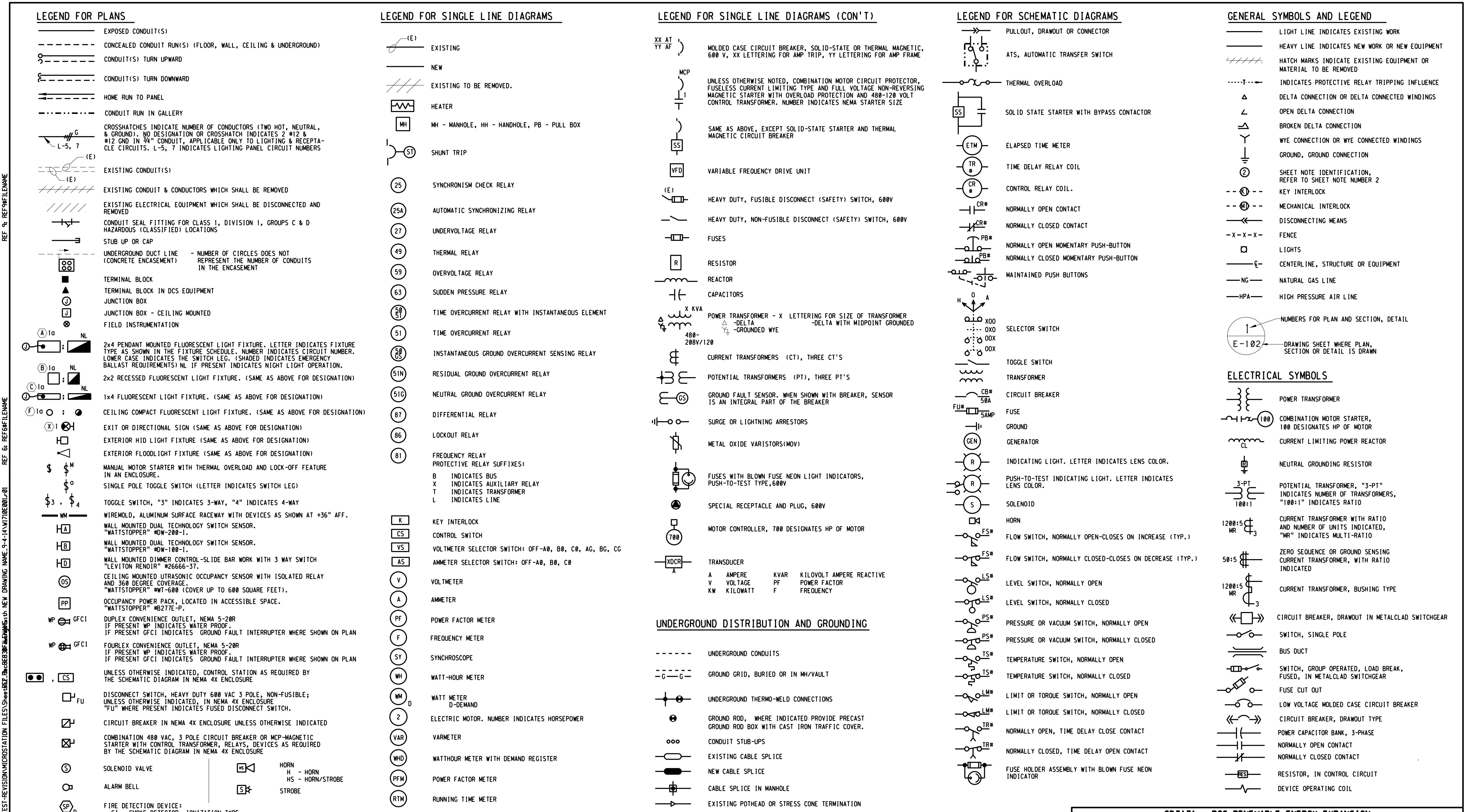
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME



LEGEND FOR PLANS

	EXPOSED CONDUIT(S)
	CONCEALED CONDUIT RUN(S) (FLOOR, WALL, CEILING & UNDERGROUND)
	CONDUIT(S) TURN UPWARD
	CONDUIT(S) TURN DOWNWARD
	HOME RUN TO PANEL
	CONDUIT RUN IN GALLERY
G L-5, 7	CROSSHATCHES INDICATE NUMBER OF CONDUCTORS (TWO HOT, NEUTRAL, & GROUND). NO DESIGNATION OR CROSSHATCH INDICATES 2 #12 & #12 GND IN ¾" CONDUIT, APPLICABLE ONLY TO LIGHTING & RECEPTACLE CIRCUITS. L-5, 7 INDICATES LIGHTING PANEL CIRCUIT NUMBERS
(E) (E)	EXISTING CONDUIT(S)
	EXISTING CONDUIT & CONDUCTORS WHICH SHALL BE REMOVED
	EXISTING ELECTRICAL EQUIPMENT WHICH SHALL BE DISCONNECTED AND REMOVED
	CONDUIT SEAL FITTING FOR CLASS 1, DIVISION 1, GROUPS C & D HAZARDOUS (CLASSIFIED) LOCATIONS
	STUB UP OR CAP
	UNDERGROUND DUCT LINE (CONCRETE ENCASEMENT) - NUMBER OF CIRCLES DOES NOT REPRESENT THE NUMBER OF CONDUITS IN THE ENCASEMENT
■	TERMINAL BLOCK
▲	TERMINAL BLOCK IN DCS EQUIPMENT
Ⓙ	JUNCTION BOX
J	JUNCTION BOX - CEILING MOUNTED
⊗	FIELD INSTRUMENTATION
A 1a NL J	2x4 PENDANT MOUNTED FLUORESCENT LIGHT FIXTURE. LETTER INDICATES FIXTURE TYPE AS SHOWN IN THE FIXTURE SCHEDULE. NUMBER INDICATES CIRCUIT NUMBER. LOWER CASE INDICATES THE SWITCH LEG. (SHADED INDICATES EMERGENCY BALLAST REQUIREMENTS) NL IF PRESENT INDICATES NIGHT LIGHT OPERATION.
B 1a NL	2x2 RECESSED FLUORESCENT LIGHT FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
C 1a NL J	1x4 FLUORESCENT LIGHT FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
F 1a	CEILING COMPACT FLUORESCENT LIGHT FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
X 1	EXIT OR DIRECTIONAL SIGN (SAME AS ABOVE FOR DESIGNATION)
	EXTERIOR HID LIGHT FIXTURE (SAME AS ABOVE FOR DESIGNATION)
	EXTERIOR FLOODLIGHT FIXTURE (SAME AS ABOVE FOR DESIGNATION)
\$ \$M	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD AND LOCK-OFF FEATURE IN AN ENCLOSURE.
\$a	SINGLE POLE TOGGLE SWITCH (LETTER INDICATES SWITCH LEG)
\$3 , \$4	TOGGLE SWITCH, "3" INDICATES 3-WAY, "4" INDICATES 4-WAY
WM	WIREMOLD, ALUMINUM SURFACE RACEWAY WITH DEVICES AS SHOWN AT +36" AFF.
A	WALL MOUNTED DUAL TECHNOLOGY SWITCH SENSOR. "WATTSTOPPER" #DW-200-I.
B	WALL MOUNTED DUAL TECHNOLOGY SWITCH SENSOR. "WATTSTOPPER" #DW-100-I.
D	WALL MOUNTED DIMMER CONTROL-SLIDE BAR WORK WITH 3 WAY SWITCH "LEVITON RENOIR" #26666-37.
OS	CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR WITH ISOLATED RELAY AND 360 DEGREE COVERAGE. "WATTSTOPPER" #WT-600 (COVER UP TO 600 SQUARE FEET).
PP	OCCUPANCY POWER PACK, LOCATED IN ACCESSIBLE SPACE. "WATTSTOPPER" #B277E-P.
WP GFCI	DUPLEX CONVENIENCE OUTLET, NEMA 5-20R IF PRESENT WP INDICATES WATER PROOF. IF PRESENT GFCI INDICATES GROUND FAULT INTERRUPTER WHERE SHOWN ON PLAN
WP GFCI	FOURLEX CONVENIENCE OUTLET, NEMA 5-20R IF PRESENT WP INDICATES WATER PROOF. IF PRESENT GFCI INDICATES GROUND FAULT INTERRUPTER WHERE SHOWN ON PLAN
●● , CS	UNLESS OTHERWISE INDICATED, CONTROL STATION AS REQUIRED BY THE SCHEMATIC DIAGRAM IN NEMA 4X ENCLOSURE
FU	DISCONNECT SWITCH, HEAVY DUTY 600 VAC 3 POLE, NON-FUSIBLE; UNLESS OTHERWISE INDICATED, IN NEMA 4X ENCLOSURE "FU" WHERE PRESENT INDICATES FUSED DISCONNECT SWITCH.
	CIRCUIT BREAKER IN NEMA 4X ENCLOSURE UNLESS OTHERWISE INDICATED
	COMBINATION 480 VAC, 3 POLE CIRCUIT BREAKER OR MCP-MAGNETIC STARTER WITH CONTROL TRANSFORMER, RELAYS, DEVICES AS REQUIRED BY THE SCHEMATIC DIAGRAM IN NEMA 4X ENCLOSURE
S	SOLENOID VALVE
	ALARM BELL
SP D	FIRE DETECTION DEVICE: SI - SMOKE DETECTOR, IONIZATION TYPE SP - SMOKE DETECTOR, PHOTOELECTRIC TYPE HF - HEAT DETECTOR, FIXED TEMP. HR - HEAT DETECTOR, RATE OF RISE SH - SMOKE/HEAT DETECTOR D - DUCT DETECTOR (TEXT OUTSIDE OF SYMBOL)
IM	INTERFACE MONITORING MODULE
	TELEPHONE OUTLET
D	DATA OUTLET
F	FAX OUTLET
PA	PA SYSTEM SPEAKER
HS	HORN H - HORN HS - HORN/STROBE
S	STROBE
T	TELEPHONE TONE/RINGER SPEAKER
M	MANUAL FIRE ALARM BOX
TH	THERMOSTAT

3" ON ORIGINAL DOCUMENT
0 1 2 3

LEGEND FOR SINGLE LINE DIAGRAMS

(E)	EXISTING
	NEW
	EXISTING TO BE REMOVED.
	HEATER
MH	MH - MANHOLE, HH - HANDHOLE, PB - PULL BOX
ST	SHUNT TRIP
25	SYNCHRONISM CHECK RELAY
25A	AUTOMATIC SYNCHRONIZING RELAY
27	UNDERVOLTAGE RELAY
49	THERMAL RELAY
59	OVERVOLTAGE RELAY
63	SUDDEN PRESSURE RELAY
50/51	TIME OVERCURRENT RELAY WITH INSTANTANEOUS ELEMENT
51	TIME OVERCURRENT RELAY
50/GS	INSTANTANEOUS GROUND OVERCURRENT SENSING RELAY
51N	RESIDUAL GROUND OVERCURRENT RELAY
51G	NEUTRAL GROUND OVERCURRENT RELAY
87	DIFFERENTIAL RELAY
86	LOCKOUT RELAY
81	FREQUENCY RELAY

PROTECTIVE RELAY SUFFIXES:

B	INDICATES BUS
X	INDICATES AUXILIARY RELAY
T	INDICATES TRANSFORMER
L	INDICATES LINE

K	KEY INTERLOCK
CS	CONTROL SWITCH
VS	VOLTMETER SELECTOR SWITCH: OFF-A0, B0, C0, AG, BG, CG
AS	AMMETER SELECTOR SWITCH: OFF-A0, B0, C0
V	VOLTMETER
A	AMMETER
PF	POWER FACTOR METER
F	FREQUENCY METER
SY	SYNCHROSCOPE
WH	WATT-HOUR METER
WM D	WATT METER D-DEMAND
2	ELECTRIC MOTOR. NUMBER INDICATES HORSEPOWER
VAR	VARMETER
WHD	WATTHOUR METER WITH DEMAND REGISTER
PFM	POWER FACTOR METER
RTM	RUNNING TIME METER
EDM	ELECTRONIC DISPLAY METER
A	ANNUNCIATOR
INLK	INTERLOCK

LEGEND FOR SINGLE LINE DIAGRAMS (CON'T)

XX AT / YY AF	MOLDED CASE CIRCUIT BREAKER, SOLID-STATE OR THERMAL MAGNETIC, 600 V, XX LETTERING FOR AMP TRIP, YY LETTERING FOR AMP FRAME
MCP 1	UNLESS OTHERWISE NOTED, COMBINATION MOTOR CIRCUIT PROTECTOR, FUSELESS CURRENT LIMITING TYPE AND FULL VOLTAGE NON-REVERSING MAGNETIC STARTER WITH OVERLOAD PROTECTION AND 480-120 VOLT CONTROL TRANSFORMER. NUMBER INDICATES NEMA STARTER SIZE
SS	SAME AS ABOVE, EXCEPT SOLID-STATE STARTER AND THERMAL MAGNETIC CIRCUIT BREAKER
VFD	VARIABLE FREQUENCY DRIVE UNIT
(E)	HEAVY DUTY, FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V
	HEAVY DUTY, NON-FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V
	FUSES
R	RESISTOR
	REACTOR
	CAPACITORS
X KVA 480-208V/120	POWER TRANSFORMER - X LETTERING FOR SIZE OF TRANSFORMER △ -DELTA -DELTA WITH MIDPOINT GROUNDED -GROUNDED WYE
	CURRENT TRANSFORMERS (CT), THREE CT'S
	POTENTIAL TRANSFORMERS (PT), THREE PT'S
GS	GROUND FAULT SENSOR. WHEN SHOWN WITH BREAKER, SENSOR IS AN INTEGRAL PART OF THE BREAKER
	SURGE OR LIGHTNING ARRESTORS
	METAL OXIDE VARISTORS(MOV)
	FUSES WITH BLOWN FUSE NEON LIGHT INDICATORS, PUSH-TO-TEST TYPE,600V
	SPECIAL RECEPTACLE AND PLUG, 600V
700	MOTOR CONTROLLER, 700 DESIGNATES HP OF MOTOR
XDCR A	TRANSDUCER

A	AMPERE	KVAR	KILOVOLT AMPERE REACTIVE
V	VOLTAGE	PF	POWER FACTOR
KW	KILOWATT	F	FREQUENCY

UNDERGROUND DISTRIBUTION AND GROUNDING

	UNDERGROUND CONDUITS
G G	GROUND GRID, BURIED OR IN MH/VAULT
	UNDERGROUND THERMO-WELD CONNECTIONS
	GROUND ROD, WHERE INDICATED PROVIDE PRECAST GROUND ROD BOX WITH CAST IRON TRAFFIC COVER.
ooo	CONDUIT STUB-UPS
	EXISTING CABLE SPLICE
	NEW CABLE SPLICE
	CABLE SPLICE IN MANHOLE
	EXISTING POTHEAD OR STRESS CONE TERMINATION
	NEW POTHEAD OR STRESS CONE TERMINATION
H-1	PADMOUNTED TRANSFORMER MANHOLE, H-1 INDICATES ID

LEGEND FOR SCHEMATIC DIAGRAMS

	PULLOUT, DRAWOUT OR CONNECTOR
	ATS, AUTOMATIC TRANSFER SWITCH
	THERMAL OVERLOAD
SS	SOLID STATE STARTER WITH BYPASS CONTACTOR
ETM	ELAPSED TIME METER
TR #	TIME DELAY RELAY COIL
CR #	CONTROL RELAY COIL.
CR#	NORMALLY OPEN CONTACT
CR#	NORMALLY CLOSED CONTACT
PB#	NORMALLY OPEN MOMENTARY PUSH-BUTTON
PB#	NORMALLY CLOSED MOMENTARY PUSH-BUTTON
	MAINTAINED PUSH BUTTONS
H O A XOO OXO OOX OOX	SELECTOR SWITCH
	TOGGLE SWITCH
	TRANSFORMER
CB# 50A	CIRCUIT BREAKER
FU# 5AMP	FUSE
	GROUND
GEN	GENERATOR
R	INDICATING LIGHT. LETTER INDICATES LENS COLOR.
R	PUSH-TO-TEST INDICATING LIGHT. LETTER INDICATES LENS COLOR.
S	SOLENOID
	HORN
FS#	FLOW SWITCH, NORMALLY OPEN-CLOSES ON INCREASE (TYP.)
FS#	FLOW SWITCH, NORMALLY CLOSED-CLOSES ON DECREASE (TYP.)
LS#	LEVEL SWITCH, NORMALLY OPEN
LS#	LEVEL SWITCH, NORMALLY CLOSED
PS#	PRESSURE OR VACUUM SWITCH, NORMALLY OPEN
PS#	PRESSURE OR VACUUM SWITCH, NORMALLY CLOSED
TS#	TEMPERATURE SWITCH, NORMALLY OPEN
TS#	TEMPERATURE SWITCH, NORMALLY CLOSED
LM#	LIMIT OR TORQUE SWITCH, NORMALLY OPEN
LM#	LIMIT OR TORQUE SWITCH, NORMALLY CLOSED
TR#	NORMALLY OPEN, TIME DELAY CLOSE CONTACT
TR#	NORMALLY CLOSED, TIME DELAY OPEN CONTACT
	FUSE HOLDER ASSEMBLY WITH BLOWN FUSE NEON INDICATOR

GENERAL SYMBOLS AND LEGEND

	LIGHT LINE INDICATES EXISTING WORK
	HEAVY LINE INDICATES NEW WORK OR NEW EQUIPMENT
	HATCH MARKS INDICATE EXISTING EQUIPMENT OR MATERIAL TO BE REMOVED
T	INDICATES PROTECTIVE RELAY TRIPPING INFLUENCE
△	DELTA CONNECTION OR DELTA CONNECTED WINDINGS
∠	OPEN DELTA CONNECTION
	BROKEN DELTA CONNECTION
Y	WYE CONNECTION OR WYE CONNECTED WINDINGS
⏚	GROUND, GROUND CONNECTION
②	SHEET NOTE IDENTIFICATION, REFER TO SHEET NOTE NUMBER 2
KI	KEY INTERLOCK
MI	MECHANICAL INTERLOCK
	DISCONNECTING MEANS
-X-X-X-	FENCE
	LIGHTS
℄	CENTERLINE, STRUCTURE OR EQUIPMENT
NG	NATURAL GAS LINE
HPA	HIGH PRESSURE AIR LINE
1	NUMBERS FOR PLAN AND SECTION, DETAIL
E-102	DRAWING SHEET WHERE PLAN, SECTION OR DETAIL IS DRAWN

ELECTRICAL SYMBOLS

	POWER TRANSFORMER
100	COMBINATION MOTOR STARTER, 100 DESIGNATES HP OF MOTOR
CL	CURRENT LIMITING POWER REACTOR
R	NEUTRAL GROUNDING RESISTOR
3-PT 100:1	POTENTIAL TRANSFORMER, "3-PT" INDICATES NUMBER OF TRANSFORMERS, "100:1" INDICATES RATIO
1200:5 MR 3	CURRENT TRANSFORMER WITH RATIO AND NUMBER OF UNITS INDICATED, "MR" INDICATES MULTI-RATIO
50:5	ZERO SEQUENCE OR GROUND SENSING CURRENT TRANSFORMER, WITH RATIO INDICATED
1200:5 MR 3	CURRENT TRANSFORMER, BUSHING TYPE
	CIRCUIT BREAKER, DRAWOUT IN METALCLAD SWITCHGEAR
	SWITCH, SINGLE POLE
	BUS DUCT
	SWITCH, GROUP OPERATED, LOAD BREAK, FUSED, IN METALCLAD SWITCHGEAR
	FUSE CUT OUT
	LOW VOLTAGE MOLDED CASE CIRCUIT BREAKER
	CIRCUIT BREAKER, DRAWOUT TYPE
	POWER CAPACITOR BANK, 3-PHASE
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
RES	RESISTOR, IN CONTROL CIRCUIT
	DEVICE OPERATING COIL

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carollo

NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

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R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES
SHEET 1

SCALE NONE
DATE JAN2009
W17.10-E-001
DRAWING NUMBER
1
REV.

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ABBREVIATIONS

A

A	AMMETER, AMPERES
A/C	ASPHALT CONCRETE
AC	ALTERNATING CURRENT
ACU	AIR CONDITIONING UNIT
ACB	AIR CIRCUIT BREAKER
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFR	ARC FLASH REDUCTION
AI	ANALOG INPUT
AIC	AMPERES INTERRUPTING CAPACITY
APPROX	APPROXIMATE
ARR	ARRESTER
AS	AMMETER SWITCH
AT	AMPERE TRIP
AT&T	AMERICAN TELEPHONE AND TELEGRAPH
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX.	AUXILIARY
AWG	AMERICAN WIRE GAUGE

B

BATT.	BATTERY
B.C.	BARE COPPER
BCW	BARE COPPER WIRE
BET.	BETWEEN
BKR	BREAKER
BLDG.	BUILDING
BLU	BLUE
BLK	BLACK
BD	BUS DUCT
BOM	BILL OF MATERIALS
BRG	BEARING

C

C	CONDUIT
CAB	CABINET
CAP	CAPACITOR
CB	CATCH BASIN
CHGR.	CHARGER
CKT	CIRCUIT
CL,CLE	CURRENT LIMITING, CURRENT LIMITING "E" FUSE
CMP	COMPRESSOR
COMM	COMMUNICATION
COMP	COMPARTMENT
CONT.	CONTROL
CNTL	CONTROL
CON'T	CONTINUE, CONTINOUS
CONC	CONCRETE
COND.	CONDUCTOR
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY, CORROSION-RESISTANT
C.S.	CONTROL SWITCH
CSR	CONTROL SWITCH REALY
CSCP	CHEMICAL STORAGE CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
CUB	CUBICLE

D

D	DEEP
DB	DUCT BANK
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
D.E.	DEAD END
DET	DETECTOR
DEV	DEVICE
D.I.	DIGITAL INPUT
DIA	DIAMETER
DIAG	DIAGRAM
DIFF.	DIFFERENTIAL
DIM	DIMENSION
DISC	DISCONNECT
DISP	DISPLAY
DIST.	DISTRIBUTION
DLDB	DEAD LINE DEAD BUS
DN	DOWN
DP	DISTRIBUTION PANEL
DPU	DISTRIBUTED PROCESSING UNIT
DSLC	DIGITAL SYNCHRONIZER AND LOAD CONTROL
D.O.	DIGITAL OUTPUT
DWG	DRAWING

E

(E)	EXISTING
EA	EACH
EDM	ELECTRONIC DISPLAY METER
ELEC	ELECTRIC, ELECTRICAL
EMERG	EMERGENCY
EL.	ELEVATION
ENCL.	ENCLOSURE
EO	ELECTRICALLY OPERATED
EPR	ETHYLENE PROPYLENE RUBBER
EQUIP	EQUIPMENT
ETM	ELAPSED TIME METER
EYS	ELECTRICAL WYE SEAL

F

F, FREQ	FREQUENCY
FA	FORCED AIR (TRANSFORMER RATING)
FACP	FIRE ALARM CONTROL PANEL
FB	FIRE ALARM BELL
FDSCP	FIRE DETECTION SYSTEM CONTROL PANEL
FDR	FEEDER
FLUOR	FLUORESCENT
FO	FIBER OPTIC
FS	FLOW SWITCH
FT	FOOT, FEET
FUT.	FUTURE
F,FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
FWD	FORWARD

G

GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GCB	GENERATOR CONTROL BOX
GCS	GAS CONDITIONING SYSTEM
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
G,GND,GRD	GROUND
G.L.	GRADE LEVEL
G	GREEN

H

HDPE	HIGH DENSITY POLYETHYLENE CONDUIT
HT	HEIGHT
HH	HANDHOLE
HMI	HUMAN MACHINE INTERFACE
HN	HALF NEUTRAL
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HTR	HEATER
HR	HAND RESET
HV	HIGH VOLTAGE
HVMH	HIGH VOLTAGE MANHOLE
HZ	HERTZ

I

IC	INTERRUPTING CAPACITY
ID	IDENTIFICATION
I.D.	INSIDE DIMENSION
IN	INCH
IND	INDICATION
INST	INSTANTANEOUS
INS	INSULATOR, INSULATION
INSTR	INSTRUMENT, INSTRUMENTATION
I/O	INPUT/OUTPUT
IRIG	INTERNATIONAL RANGE INSTRUMENTATION GUIDE
ISO	INDEPENDENT SYSTEM OPERATOR

J

J, JB	JUNCTION BOX

K

KCM	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOURS

L

L	LONG, LENGTH
LA	LIGHTNING ARRESTER
LBS	POUNDS
LCP	LIGHTING CONTROL PANEL
LED	LIGHT EMITTING DIODE
L-L	LINE TO LINE
L-N	LINE TO NEUTRAL
LIS	LOAD INTERRUPTER SWITCH/SWGR
LOS	LOCK-OUT-STOP
LP	LIGHTING PANEL
LPDG	LOW PRESSURE DIGESTER GAS
LPGH	LOW PRESSURE GAS HOLDER
LTG	LIGHTING
LxWxH	LENGTH, WIDTH AND HEIGHT
LLDB	LIVE LINE - DEAD BUS
LOR	LOCKOUT RELAY
LSIG	LONG TIME DELAY, SHORT TIME DELAY, INSTANTANEOUS, AND GROUND FAULT PROTECTION
LVMH	LOW VOLTAGE MANHOLE

M

M	MOTOR
MA	MILLIAMPERES
MAINT.	MAINTENANCE
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MCR	MASTER CONTROL RELAY
MECH.	MECHANICAL
MFR.	MANUFACTURER
MG/KG	MILLIGRAM PER KILOGRAM
MH	MANHOLE
MHTR	MOTOR SPACE HEATER
MI	MECHANICAL INTERLOCK
MIN	MINIMUM
MIP	MASTER INSTRUMENTATION PANEL
MISC	MISCELLANEOUS
MMR	MOTOR MANAGEMENT RELAY
MO	MANUALLY OPERATED
MOV	MOTOR OPERATED VALVE, METAL OXIDE VARISTORS
MR	MULTI-RATIO
MS	MANUAL PULL STATION
MSLC	MASTER SYNCHRONIZER AND LOAD CONTROL
MTD	MOUNTED
MTG	MOUNTING
MTRS	METERS
MV	MEDIUM VOLTAGE
MVA	MEGA-VOLT AMPERE
MW	MEGAWATT
MWWTP	MAIN WASTEWATER TREATMENT PLANT

N

(N)	NEW
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGR	NEUTRAL GROUNDING RESISTOR
NGT	NEUTRAL GROUNDING TRANSFORMER
N.I.C.	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
NP	NAMEPLATE
NPT	NATIONAL PIPE THREAD

O

OA	AIR COOLED (TRANSFORMER RATING)
O.C.	ON CENTER
O/C	OVER CURRENT
O.D.	OUTSIDE DIMENSION
OH	OVERHEAD
OL	OVERLOAD
OPER.	OPERATING, OPERATOR

P

PA	PAGING
PB	PULL BOX
PBC	PUSH-BUTTON - CLOSE
PBO	PUSH-BUTTON - OPEN
PBS	PUSH-BUTTON - STOP
PC	PERSONAL COMPUTER
PCB	POLYCHLORINATED BIPHENYLS
PCR	POWER CONTROL ROOM
PCS	PVC COATED RIGID STEEL CONDUIT
PE	PHOTOELECTRIC
PEC	PHOTOELECTRIC CELL
PF	POWER FACTOR
PH	PHASE
PIT	PRESSURE INDICATOR TRANSMITTER
PL	PILOT LIGHT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL.	PANEL
PQM	POWER QUALITY METER
PRI	PRIMARY
PROC.	PROCESSOR
PROT	PROTECTION
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PWR	POWER
PWRS	POWER SUPPLY
PG&E	PACIFIC GAS & ELECTRIC
PGS	POWER GENERATING STATION

R

RED	RED
RCPT	RECEPTACLE
REG	REGULAR
REQ'D	REQUIRED
REM	REMOTE
RES	RESISTOR, RESISTANCE
REV	REVERSE
RIO	REMOTE INPUT/OUTPUT
RM	ROOM
RMS	ROOT MEAN SQUARE
RSG	RIGID STEEL GALVANIZED
RTD	RESISTANCE TEMPERATURE DETECTOR

S

S.A.	SURGE ARRESTERS
S.C	SURGE CAPACITOR
SD	STORM DRAIN, SMOKE (FIRE) DETECTION DEVICE
SEC	SECONDARY
SECT	SECTION
SHLD.	SHIELDED
SHT	SHEET
SLT	SEALTIGHT-LIQUID-TIGHT FLEXIBLE CONDUIT
SN	SOLID NEUTRAL
SOL	SOLENOID
SPDT	SINGLE POLE, DOUBLE THROW
SPEC	SPECIFICATION
SP	SPARE
SQ. FT.	SQUARE FEET
SS	STAINLESS STEEL
SST	SOLID STATE TRIP
SSW	SELECTOR SWITCH
STA.	STATION
SUB	SUBSTATION
SVCE	SERVICE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
SYNC	SYNCHRONIZING, SYNCHRONISM

T

TB	TERMINAL BLOCK
TBL	TROUBLE
TC	TELEPHONE CABINET, TELEPHONE CABLE
TCB	TURBINE CONTROL BOX
TCO	TRIP CUTOUT
TD	TIME DELAY RELAY
TEL	TELEPHONE
TELEM	TELEMETERING
TEMP	TEMPORARY, TEMPERATURE
TERM.	TERMINAL
T/G	TURBINE/GENERATOR
TRANSF.	TRANSFORMER
TS	TEST SWITCH
TSP	TWISTED SHIELDED PAIR
TYP.	TYPICAL

U

UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
U.O.N.	UNLESS OTHERWISE NOTED
UV	UNDER VOLTAGE

V

V	VOLTS, VOLMETER
VA	VOLT-AMPERES, VALVE
VAR	VOLT-AMPERES REACTIVE
VCB	VACUUM CIRCUIT BREAKER
VERT	VERTICAL
VFD/AFD	VARIABLE FREQUENCY DRIVE
VS	VOLTMETER SWITCH
V.T.	VOLTAGE TRANSFORMER

W

W/	WITH
W	WIRE, WATTS, WIDE
WHM	WATTHOUR METER
WHRS	WEIGHT HEAT RECOVER SYSTEM
WM	WATT-METER
WT	WEIGHT
WP	WEATHERPROOF
WWHT	WATTT/WATTHOUR TRANSDUCER

X

X	REACTOR, REACTANCE
XDCR	TRANSDUCER
XFMR	TRANSFORMER
XFR	TRANSFER
XMTR	TRANSMITTER

Z

Z	IMPEDANCE

GENERAL NOTES:

G1. THESE DRAWINGS ARE DIAGRAMMATIC ONLY; EXACT LOCATIONS OF ELECTRICAL EQUIPMENT SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE INSTALLATION OF ALL EQUIPMENT SHOWN ON THESE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE LATEST EDITIONS OF ALL APPLICABLE CODES AND UTILITY COMPANY STANDARDS. CONTACT THE UTILITY COMPANY REPRESENTATIVES AND VERIFY THEIR REQUIREMENTS.

G2. THIS IS A GENERALIZED LEGEND SHEET. THIS CONTRACT MAY NOT USE ALL INFORMATION SHOWN.

G3. NOTIFY THE ENGINEER IMMEDIATELY IF CONFLICTS IN THE EQUIPMENT LOCATIONS ARE DISCOVERED OR IF PROBLEMS ARISE DUE TO FIELD CONDITIONS, LACK OF INFORMATION OR ANY OTHER REASON. NO PAYMENT WILL BE MADE FOR CHANGES WHICH HAVE NOT BEEN FAVORABLY REVIEWED BY THE ENGINEER.

G4. INFORMATION SHOWN MAY NOT BE ALL INCLUSIVE. SEE ALSO ANSI C37.2, Y1.1, Y32.2, AND Y32.9.

G5. VERIFY ALL REQUIREMENTS BEFORE ORDERING MATERIALS.

G6. REFER TO THE MECHANICAL DRAWINGS FOR CERTAIN CONTROL DIAGRAMS AND EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND FOR CERTAIN CONNECTIONS TO BE MADE TO ELECTRICAL CIRCUITS.

G7. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL CONDUIT SUPPORTS PER SPECIFICATION 16070.

G8. CONTRACTOR SHALL X-RAY ALL EXISTING CONCRETE WALLS, SLABS AND STRUCTURES FOR REBAR LOCATIONS TO AVOID, PRIOR TO CORE DRILLING FOR CONDUIT PENETRATIONS.

PLAN NOTES:

P1. CONDUIT SIZE AND FILL SHALL BE AS INDICATED. WHERE NO SIZE IS SHOWN, THE CONDUIT SHALL BE SIZED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE ADOPTED BY THE AUTHORITY HAVING CODE ENFORCEMENT JURISDICTION. PROVIDE 3/16 INCH NYLON PULL ROPE IN EACH EMPTY CONDUIT, UNLESS OTHERWISE SPECIFIED.

P2. LOWER CASE LETTERS ADJACENT TO A SWITCH OR LIGHT FIXTURE INDICATE A SWITCHED CIRCUIT. FOR FOUR LAMP FLUORESCENT FIXTURES WIRED IN PAIRS WITHIN EACH FIXTURE, THE "a" SWITCH CONTROLS THE OUTER LAMPS AND THE "b" SWITCH CONTROLS THE INNER LAMPS; WIRE 3 LAMP FIXTURES SIMILARLY.

P3. CONDUIT AND WIRE LAYOUT FOR WIRING AND RECEPTACLES, NOT SHOWN. PROVIDE PER NEC.

P4. ALL WIRING AND CONDUITS NOT SHOWN BUT NECESSARY TO MAKE A FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES
SHEET 2

SCALE NONE
DATE JAN2009
W17.10-E-002
DRAWING NUMBER
1
REV.

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
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REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: 16.079545:1
USER: vuong
DATE: 24-SEP-2014 13:28
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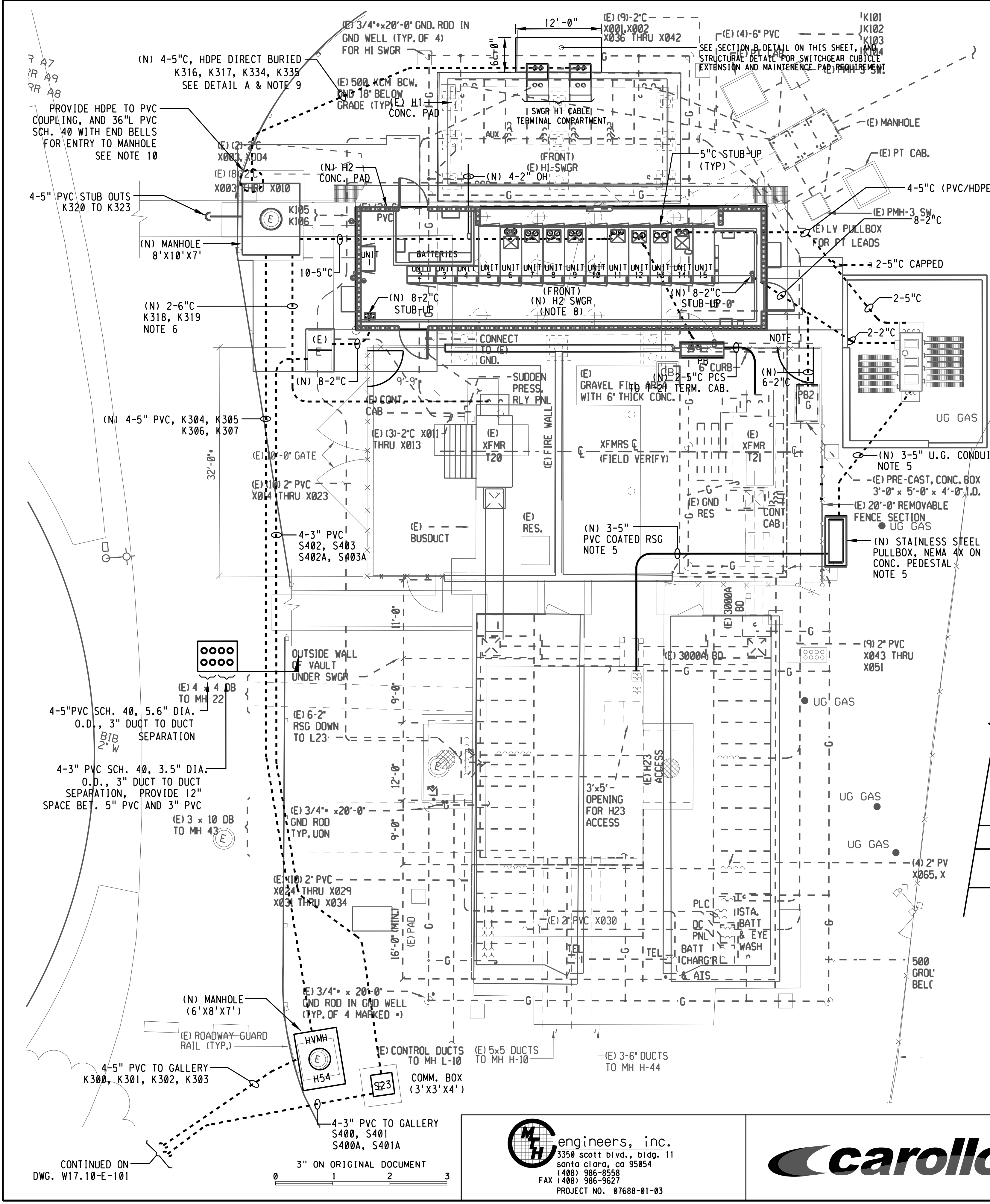
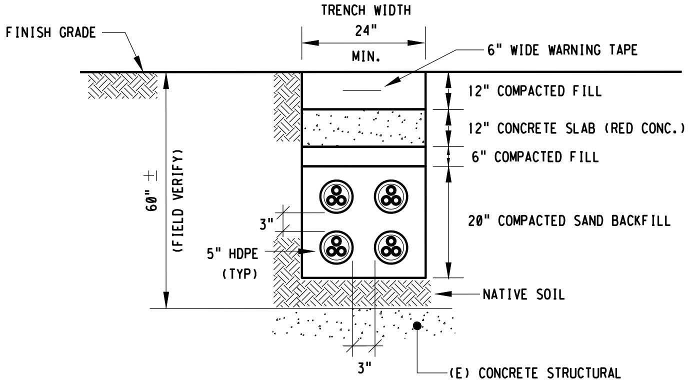


(E) 3/4"⌀x20'-0" GND. ROD IN GND WELL (TYP. OF 4) FOR H1 SWGR
12'-0"
(E) (9)-2"C X001, X002 X036 THRU X042
K101 K102 K103 K104
(E) (4)-6" PVC
SEE SECTION B DETAIL ON THIS SHEET, AND STRUCTURAL DETAIL FOR SWITCHGEAR CUBICLE EXTENSION AND MAINTENENCE PAD REQUIREMENT
(N) 4-5"C, HDPE DIRECT BURIED K316, K317, K334, K335 SEE DETAIL A & NOTE 9
(E) 500 KCM BCW, GND 18" BELOW GRADE (TYP)
(E) H1 CONC. PAD
SWGR H1 CABLE TERMINAL COMPARTMENT
PROVIDE HDPE TO PVC COUPLING, AND 36"L PVC SCH. 40 WITH END BELLS FOR ENTRY TO MANHOLE SEE NOTE 10
(E) (2)-2"C X003, X004
(E) (8)-2"C X003 THRU X010
(E) MANHOLE
(E) PT CAB.
AS
5"C STUB-UP (TYP)
(FRONT)
(E) H1-SWGR
AUX
(N) H2 CONC. PAD
(N) 4-2" OH
4-5" PVC STUB OUTS K320 TO K323
K105 K106
4-5"C (PVC/HDPE/PVC)
(E) PMH-3 SW 8-2"C
(N) LV PULLBOX FOR PT LEADS
(N) MANHOLE 8'X10'X7'
BATTERIES
UNIT 1
UNIT 2 UNIT 3 UNIT 4 UNIT 5 UNIT 6 UNIT 7 UNIT 8 UNIT 9 UNIT 10 UNIT 11 UNIT 12 UNIT 13 UNIT 14 UNIT 15
2-5"C CAPPED
10-5"C
(N) 8-2"C STUB-UP
(FRONT)
(N) H2 SWGR (NOTE 8)
(N) 8-2"C STUB-UP
2-5"C
(N) 2-6"C K318, K319 NOTE 6
2-2"C
NOTE
(E) E
CONNECT TO (E) GND.
6" CURB
(N) 2-5"C PCS TO H2/4 TERM. CAB.
6-2"C
(N) 8-2"C
SUDDEN PRESS. RLY PNL
(E) GRAVEL FILL WITH 6" THICK CONC.
PB2 G
UG GAS
(E) CONT CAB
(N) 4-5" PVC, K304, K305 K306, K307
(E) (3)-2"C X011 THRU X013
(E) XFMR T20
(E) FIRE WALL
XFMRS ℄ (FIELD VERIFY)
(E) XFMR T21
(N) 3-5" U.G. CONDUITS (PVC/HDPE/PCS) NOTE 5
(E) 10'-0" GATE
32'-0"
(E) (10) 2" PVC X014 THRU X023
(E) PRE-CAST, CONC. BOX 3'-0" x 5'-0" x 4'-0" I.D.
(E) 20'-0" REMOVABLE FENCE SECTION
(E) GND RES
CONT CAB
UG GAS
4-3" PVC S402, S403 S402A, S403A
(E) BUSDUCT
(E) RES.
(N) 3-5" PVC COATED RSG NOTE 5
(N) STAINLESS STEEL PULLBOX, NEMA 4X ON CONC. PEDESTAL NOTE 5
(E) 3000A BD
11'-0"
(9) 2" PVC X043 THRU X051
OUTSIDE WALL OF VAULT UNDER SWGR
(E) 3000A BD
(E) 4 x 4 DB TO MH 22
9'-0"
UG GAS
4-5"PVC SCH. 40, 5.6" DIA. O.D., 3" DUCT TO DUCT SEPARATION
(E) 6-2" RSG DOWN TO L23
BIB 2" W
12'-0"
(E) H23 ACCESS
4-3" PVC SCH. 40, 3.5" DIA. O.D., 3" DUCT TO DUCT SEPARATION, PROVIDE 12" SPACE BET. 5" PVC AND 3" PVC
3'x5' OPENING FOR H23 ACCESS
UG GAS
(E) 3/4"⌀x20'-0" GND ROD TYP. UON
(E) 3 x 10 DB TO MH 43
9'-0"
UG GAS
(4) 2" PV X065, X
(E) (10) 2" PVC X024 THRU X029 X031 THRU X034
16'-0" (MIN.)
(E) PAD
(E) 2" PVC X030
PLC DC PNL BATT CHARG'R & AIS
STA. BATT & EYE WASH
TEL
TEL
500 GROU BEL
(N) MANHOLE (6'X8'X7')
(E) 3/4"⌀ x 20'-0" GND ROD IN GND WELL (TYP. OF 4 MARKED ⌀)
(E) ROADWAY GUARD RAIL (TYP.)
HVMH
H54
4-5" PVC TO GALLERY K300, K301, K302, K303
(E) CONTROL DUCTS TO MH L-10
(E) 5x5 DUCTS TO MH H-10
(E) 3-6" DUCTS TO MH H-44
S23
COMM. BOX (3'X3'X4')
4-3" PVC TO GALLERY S400, S401 S400A, S401A
CONTINUED ON DWG. W17.10-E-101
3" ON ORIGINAL DOCUMENT
0 1 2 3

GENERAL NOTES:

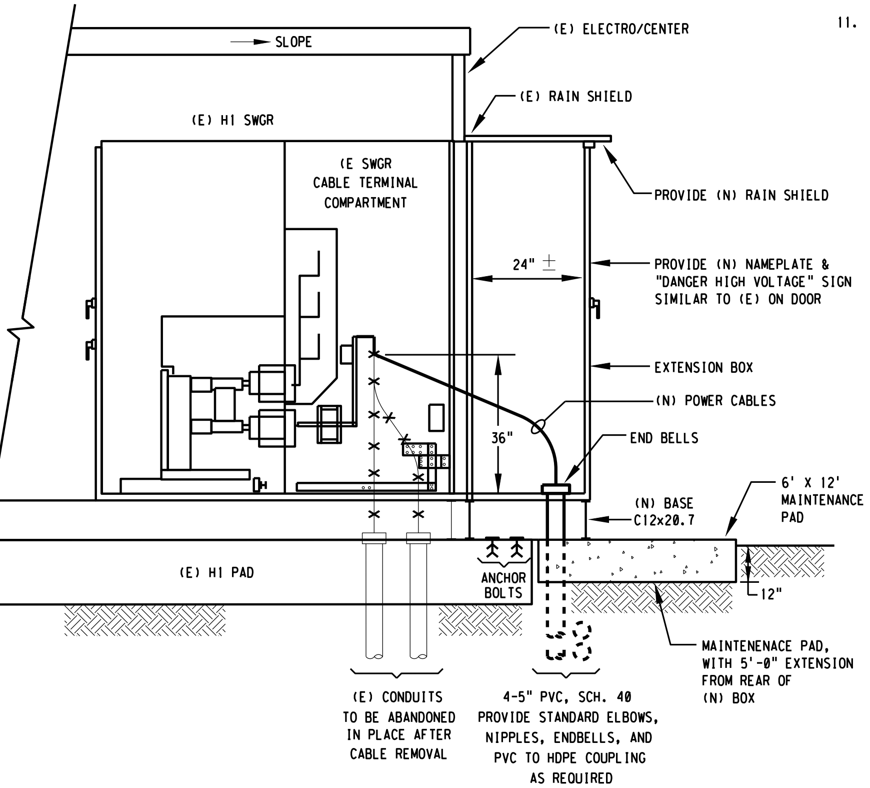
EXISTING UNDERGROUND CONDUITS, WHERE SHOWN, ARE DRAWN DIAGRAMMATICALLY, AND MAY NOT REFLECT THE AS-BUILT CONDITIONS. OTHER EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN FOR CLARITY. CONTRACTOR SHALL FIELD DETERMINE ALL EXISTING UNDERGROUND INSTALLATIONS BEFORE TRENCHING, AND SHALL PERFORM TRENCHING AND INSTALLATION OF STRUCTURES, FOUNDATIONS AND MANHOLES BY HAND-DIGGING TOOLS ONLY.

① SEE CIVIL DRAWING W28.20-C-047.D FOR ALL KNOWN EXISTING UNDERGROUND INSTALLATION IN THE MAIN SUBSTATION AREA.



A DIRECT BURIED HDPE CONDUIT INSTALLATION

- NONE



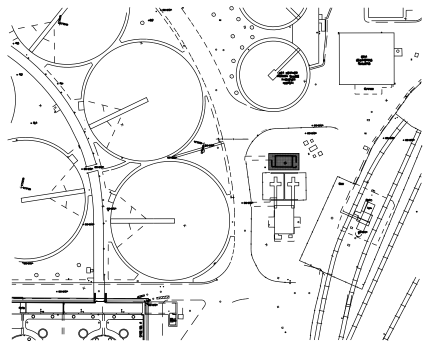
SLOPE
(E) ELECTRO/CENTER
(E) RAIN SHIELD
(E) H1 SWGR
(E SWGR CABLE TERMINAL COMPARTMENT
PROVIDE (N) RAIN SHIELD
24" ±
PROVIDE (N) NAMEPLATE & "DANGER HIGH VOLTAGE" SIGN SIMILAR TO (E) ON DOOR
EXTENSION BOX
(N) POWER CABLES
36"
END BELLS
(N) BASE C12x20.7
6' X 12' MAINTENANCE PAD
(E) H1 PAD
ANCHOR BOLTS
12"
MAINTENENACE PAD, WITH 5'-0" EXTENSION FROM REAR OF (N) BOX
(E) CONDUITS TO BE ABANDONED IN PLACE AFTER CABLE REMOVAL
4-5" PVC, SCH. 40 PROVIDE STANDARD ELBOWS, NIPPLES, ENDBELLS, AND PVC TO HDPE COUPLING AS REQUIRED

B H1 SWGR REAR EXTENSION BOX SECTION DETAIL

- NONE

NOTES:

1. PERMANENTLY CLOSE THE (E) GATES AND PROVIDE (N) GATES FOR PERSONNEL ACCESS TO T20 & T21. ②
2. OUTDOOR NEMA 4X STAINLESS STEEL BOX 12"X12"X12" ON CONC. PEDESTAL, 12" ABOVE GRADE, FOR ISO COMM. REQUIREMENTS. PROVIDE 2-2" PVC COATED RSG. ON WALL OF (E) H1 SWITCHGEAR PCR. PROVIDE PVC COATED CONDUIT LB TO ENTER THE H1 SWITCHGEAR PCR FOR CONDUIT RUN INSIDE PCR. TERMINATE EACH CONDUIT RUN INSIDE TO RESPECTIVE PG&E METERING CUBICLE.
3. INSTALL THE (N) 2"C (X516) TO STUB-UP OUTSIDE THE H1 PCR, CLEAR OF THE PCR DOOR. PROVIDE 2" PVC COATED RSG CONDUIT UP THE PCR EXTERIOR WALL PANEL, PENETRATE THE BUILDING WALL AND RUN THE 2" RSG TO A NEW 24-PORT FIBER PATCH PANEL (EMERSON FIBERCONN, OR APPROVED EQUAL). INSTALL THE NEW PATCH PANEL ON THE INSIDE WALL PANEL OPPOSITE SWITCHGEAR CUBICLE 105. PROVIDE 1" RSG FROM THE PATCH PANEL TO H1 SWITCHGEAR CUBICLE 105 FOR FIBER OPTIC CABLES TO DEVICES SEL 2032-H1 AND SEL 2506-H1.
4. PROVIDE NEW PHENOLIC NAMEPLATES, 8" x 12" MINIMUM SIZE, WITH 2" HIGH BLACK LETTERS ON WHITE BACKGROUND TO IDENTIFY "SWITCHGEAR H1", "SWITCHGEAR H2", "SWITCHGEAR M1-EAST", AND "SWITCHGEAR M1-WEST". AN IDENTIFICATION NAMEPLATE SHALL BE SECURED, USING SELF-TAPPING STAINLESS STEEL SCREWS TO EACH EXTERIOR AISLE WAY ACCESS DOOR OF THE ABOVE SWITCHGEAR ASSEMBLIES.
5. SEE DRAWINGS W17.10-E-905 AND W17.10-E-906 FOR DETAILED INSTALLATION.
6. CONDUITS FOR 15 KV POWER CABLES SHALL BE PROVIDED WITH A 6 FT MINIMUM LENGTH OF HDPE CONDUIT, WHERE INDICATED, TO ALLOW FOR DIFFERENTIAL MOVEMENT BETWEEN MANHOLES AND STATION STRUCTURES. CONDUIT TERMINATIONS AT MANHOLES AND SWITCHGEAR SHALL BE MADE WITH PVC CONDUIT. HDPE CONDUIT LENGTHS SHALL BE DIRECT BURIED.
7. PROVIDE 6 FT MINIMUM SECTION OF HDPE CONDUIT AT EACH END OF DUCT BANK. CONDUIT TERMINATION AT MANHOLE SHALL BE WITH PVC CONDUIT. CONDUIT TERMINATION AT TRANSFORMER SHALL BE WITH PVC COATED RSG CONDUIT.
8. SEE DRAWING W17.10-E-220 FOR EQUIPMENT ARRANGEMENT WITHIN NEW H2 SWITCHGEAR BUILDING.
9. HDPE CONDUIT SHALL BE PROVIDED WITH SIMILAR INTERNAL DIAMETER AS 5" DIAMETER PVC SCHEDULE 40 CONDUIT.
10. CONDUIT TERMINATION AT MANHOLE HVMH-H55 SHALL BE APPROXIMATELY 30"-33" BELOW GRADE TO TOP OF CONDUIT.
11. PROVIDE REINFORCING #4 @12" EW (SINGLE MAT).



KEY MAP

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NO.	DATE	REVISION	BY	REC.	APP.
④	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
③	07/17/10	REVISED CONDUIT ROUTING BETWEEN H1 SWGR & HVMH-H55	CGT		
②	02/10/10	REVISED FOR ISO METERING - COR#15.1	CGT		
①	02/25/09	REVISED GENERAL NOTE 1	ASC	JLW	EHM

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SITE PLAN - MAIN SUBSTATION
NEW INSTALLATION

SCALE 1/8"=1'
DATE MAR2010
W17.10-E-040
DRAWING NUMBER
4
REV.

USER: vuong PLOT SCALE: 16.079545:1
DATE: 05-SEP-2014 10:30
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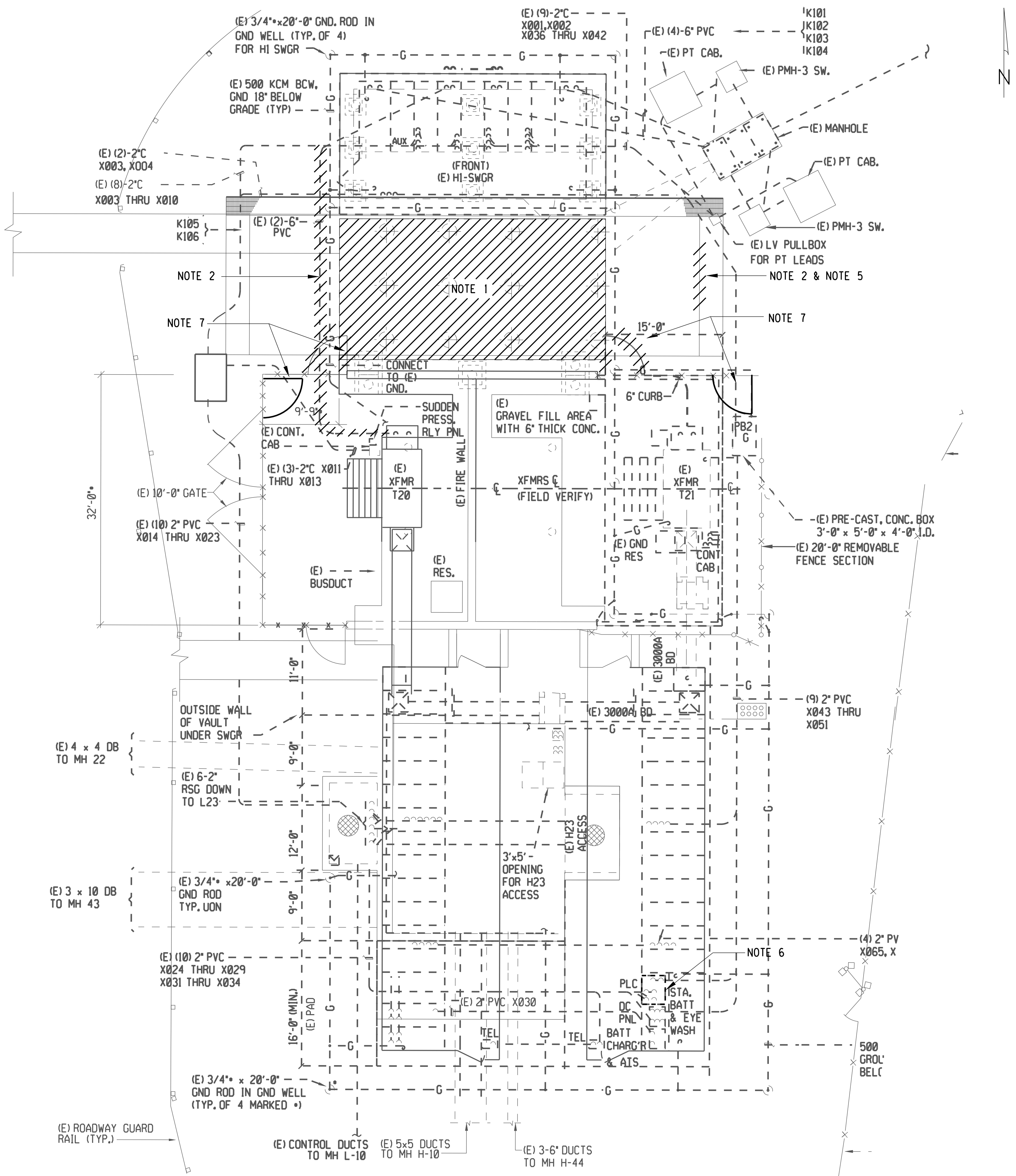
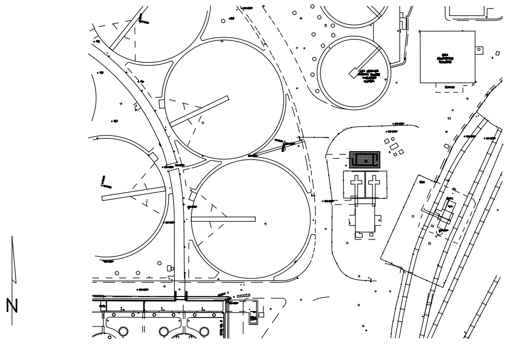

(E) 3/4"⌀×20'-0" GND. ROD IN GND WELL (TYP. OF 4) FOR HI SWGR
(E) 500 KCM BCW, GND 18" BELOW GRADE (TYP)
(E) (9)-2"C X001, X002 X036 THRU X042
(E) (4)-6" PVC
(E) PT CAB.
K101
K102
K103
K104
(E) PMH-3 SW.
(E) MANHOLE
(E) PT CAB.
(E) PMH-3 SW.
(E) LV PULLBOX FOR PT LEADS
N
(E) (2)-2"C X003, X004
(E) (8)-2"C X003 THRU X010
AUX
(FRONT)
(E) HI-SWGR
K105
K106
(E) (2)-6" PVC
NOTE 2
NOTE 1
NOTE 2 & NOTE 5
NOTE 7
NOTE 7
15'-0"
CONNECT TO (E) GND.
SUDDEN PRESS. RLY PNL
(E) GRAVEL FILL AREA WITH 6" THICK CONC.
6" CURB
PB2
(E) CONT. CAB
(E) (3)-2"C X011 THRU X013
(E) XFMR T20
(E) FIRE WALL
XFMRS ℄ (FIELD VERIFY)
(E) XFMR T21
32'-0"
(E) 10'-0" GATE
(E) (10) 2" PVC X014 THRU X023
(E) BUSDUCT
(E) RES.
(E) GND RES
CONT CAB
(E) PRE-CAST, CONC. BOX 3'-0" × 5'-0" × 4'-0" I.D.
(E) 20'-0" REMOVABLE FENCE SECTION
(E) 3000A BD
(E) 3000A BD
(9) 2" PVC X043 THRU X051
11'-0"
OUTSIDE WALL OF VAULT UNDER SWGR
(E) 4 × 4 DB TO MH 22
9'-0"
(E) 6-2" RSG DOWN TO L23
12'-0"
(E) H23 ACCESS
3'×5' OPENING FOR H23 ACCESS
(E) 3 × 10 DB TO MH 43
(E) 3/4"⌀ ×20'-0" GND ROD TYP. UON
9'-0"
(4) 2" PV X065, X
NOTE 6
(E) (10) 2" PVC X024 THRU X029 X031 THRU X034
PLC
STA. BATT & EYE WASH
(E) 2" PVC X030
DC PNL
BATT CHARG'R & AIS
16'-0" (MIN.)
(E) PAD
TEL
TEL
500 GROL BELC
(E) 3/4"⌀ × 20'-0" GND ROD IN GND WELL (TYP. OF 4 MARKED ⌀)
(E) ROADWAY GUARD RAIL (TYP.)
(E) CONTROL DUCTS TO MH L-10
(E) 5x5 DUCTS TO MH H-10
(E) 3-6" DUCTS TO MH H-44
G

GENERAL NOTES:

1. REMOVE EXISTING SLAB (APPROX. DIMENSION = 34'X18') INCLUDING U.G. ABANDONED CONDUITS FOR INSTALLATION OF NEW PILE SUPPORTED CONCRETE PAD. SEE STRUCTURAL DRAWINGS FOR DETAIL.
2. REMOVE PORTIONS OF U.G. 6" PRIMARY CONDUIT INDICATED BY HATCHED SECTIONS.
3. WORK SEQUENCE SHALL PROVIDE FOR DE-ENERGIZING XFMR T20 WHILE MAINTAINING SERVICE TO PLANT THRU XFMR T21 UNTIL NEW H2 SWITCHGEAR IS INSTALLED, CONNECTED AND ENERGIZED TO PROVIDE POWER TO XFMR T20.
4. INSTALLATION WORK ON XFMR T23 SHALL BE STARTED ONLY AFTER XFMR T20 IS BACK IN SERVICE.
5. REMOVAL OF THIS SECTION OF T21 FEEDER SHALL BE DONE DURING INSTALLATION OF T23.
6. EXISTING GE 90-30 PLC, PLC EXPANSION BASE, INTERPOSING RELAYS, UPS & DATA LOGGER TO BE REMOVED. ENCLOSURE & TERMINAL BLOCKS SHALL BE RETAINED. PROVIDE COVER PLATE FOR CUT-OUT IN HINGED PANEL LEFT BY REMOVAL OF DATA LOGGER. PROVIDE NEW NAMEPLATE ON ENCLOSURE TO IDENTIFY CABINET AS, "M1-EAST J-BOX NO. 1"
7. PERMANENTLY CLOSE EXISTING GATES AND PROVIDE NEW GATES FOR PERSONNEL ACCESS TO T20 AND T21.



KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

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△1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		EHM

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

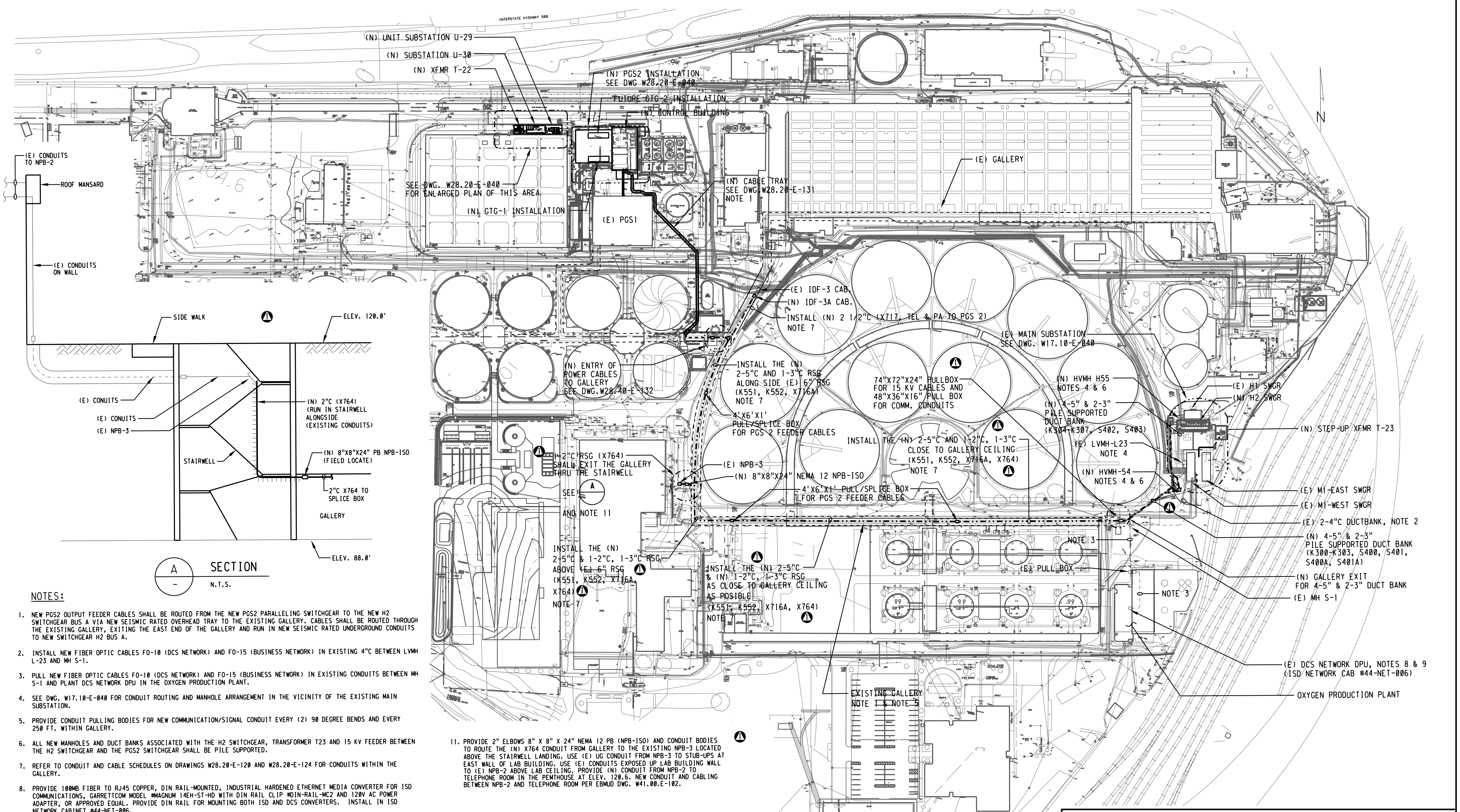
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SITE PLAN - MAIN SUBSTATION
EXISTING SUBSTATION REMOVAL WORK

SCALE 1/8"=1'
DATE JAN2009

W17.10-E-040.D
DRAWING NUMBER

1
REV.



NOTES:

1. NEW PGS2 OUTPUT FEEDER CABLES SHALL BE ROUTED FROM THE NEW PGS2 PARALLELING SWITCHGEAR TO THE NEW H2 SWITCHGEAR BUS A VIA NEW SEISMIC RATED OVERHEAD TRAY TO THE EXISTING GALLERY. CABLES SHALL BE ROUTED THROUGH THE EXISTING GALLERY, EXITING THE EAST END OF THE GALLERY AND RUN IN NEW SEISMIC RATED UNDERGROUND CONDUITS TO NEW SWITCHGEAR H2 BUS A.

2. INSTALL NEW FIBER OPTIC CABLES FO-10 (DCS NETWORK) AND FO-15 (BUSINESS NETWORK) IN EXISTING 4"C BETWEEN LVMH L-23 AND MH S-1.

3. PULL NEW FIBER OPTIC CABLES FO-10 (DCS NETWORK) AND FO-15 (BUSINESS NETWORK) IN EXISTING CONDUITS BETWEEN MH S-1 AND PLANT DCS NETWORK DPU IN THE OXYGEN PRODUCTION PLANT.

4. SEE DWG. W17.10-E-040 FOR CONDUIT ROUTING AND MANHOLE ARRANGEMENT IN THE VICINITY OF THE EXISTING MAIN SUBSTATION.

5. PROVIDE CONDUIT PULLING BODIES FOR NEW COMMUNICATION/SIGNAL CONDUIT EVERY (2) 90 DEGREE BENDS AND EVERY 250 FT. WITHIN GALLERY.

6. ALL NEW MANHOLES AND DUCT BANKS ASSOCIATED WITH THE H2 SWITCHGEAR, TRANSFORMER T23 AND 15 KV FEEDER BETWEEN THE H2 SWITCHGEAR AND THE PGS2 SWITCHGEAR SHALL BE PILE SUPPORTED.

7. REFER TO CONDUIT AND CABLE SCHEDULES ON DRAWINGS W28.20-E-120 AND W28.20-E-124 FOR CONDUITS WITHIN THE GALLERY.

8. PROVIDE 100MB FIBER TO RJ45 COPPER, DIN RAIL-MOUNTED, INDUSTRIAL HARDENED ETHERNET MEDIA CONVERTER FOR ISD COMMUNICATIONS, GARRETTCOM MODEL #MAGNUM 14EH-ST-HD WITH DIN RAIL CLIP #DIN-RAIL-MC2 AND 120V AC POWER ADAPTER, OR APPROVED EQUAL. PROVIDE DIN RAIL FOR MOUNTING BOTH ISD AND DCS CONVERTERS. INSTALL IN ISD NETWORK CABINET #44-NET-006.

9. PROVIDE FIBER OPTIC TO RS-232, INDUSTRIAL HARDENED MEDIA CONVERTER FOR DCS COMMUNICATIONS. MEDIA CONVERTER SHALL BE GARRETTCOM #5843HRT WITH MOUNTING BRACKET #ACC-LCS, DIN RAIL CLIP #DIN-RAIL-MC2, PIGTAIL CABLE #ACC-CBL1 AND AC POWER ADAPTER #4310, OR APPROVED EQUAL. MOUNT CONVERTER ON DIN RAIL WITH ISD SYSTEM ETHERNET MEDIA CONVERTER. PROVIDE 6 POINT TERMINAL BLOCK FOR PIGTAIL TERMINATION.

10. CONDUIT INSTALLATION IN THE GALLERY SHALL BE PROVIDED WITH EXPANSION FITTINGS AND BONDING JUMPERS FOR EVERY 100 FT. OF STRAIGHT RUN, FOR EVERY CONDUIT TERMINATING TO PULL BOX, AD FOR CONDUIT CHANGE IN DIRECTION.

11. PROVIDE 2" ELBOWS 8" X 8" X 24" NEMA 12 PB (NPB-ISO) AND CONDUIT BODIES TO ROUTE THE (N) X764 CONDUIT FROM GALLERY TO THE EXISTING NPB-3 LOCATED ABOVE THE STAIRWELL LANDING. USE (E) UG CONDUIT FROM NPB-3 TO STUB-UPS AT EAST WALL OF LAB BUILDING. USE (E) CONDUITS EXPOSED UP LAB BUILDING WALL TO (E) NPB-2 ABOVE LAB CEILING. PROVIDE (N) CONDUIT FROM NPB-2 TO TELEPHONE ROOM IN THE PEMTHOUSE AT ELEV. 120.6. NEW CONDUIT AND CABLING BETWEEN NPB-2 AND TELEPHONE ROOM PER EBMUD DWG. W41.00.E-102. ⚠1

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carollo

NO.	DATE	REVISION	BY	REC.	APP.
1	02/10/10	REVISED FOR ISO METERING - COR#15.1	CT		

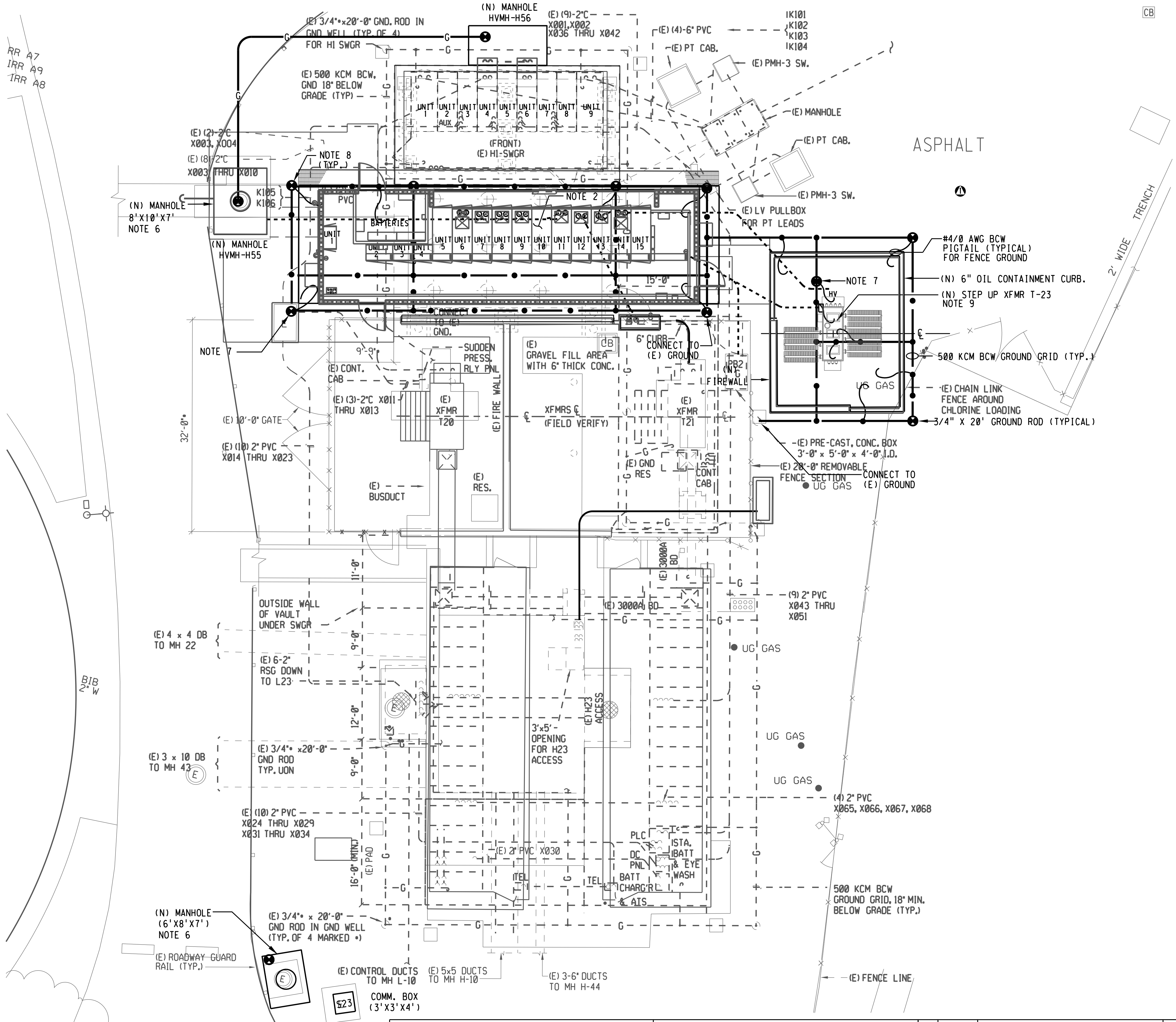
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 TO MAIN SUBSTATION
CONDUIT AND CABLE ROUTING

SCALE 1"=80'
DATE JAN2009
W17.10-E-101
DRAWING NUMBER
2
REV.



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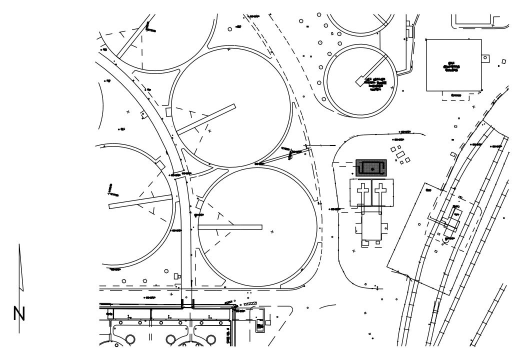
GENERAL NOTES:

1. EXISTING UNDERGROUND UTILITIES, WHERE SHOWN, ARE DRAWN DIAGRAMMATICALLY, AND MAY NOT REFLECT THE AS-BUILT CONDITIONS. CONTRACTOR SHALL FIELD DETERMINE ALL EXISTING UNDERGROUND INSTALLATIONS BEFORE TRENCHING OR DRIVING GROUND RODS. TRENCHING WORK SHALL BE PERFORMED WITH HAND-DIGGING TOOLS ONLY.

NOTES:

1. SEE DRAWING W17.10-E-040 FOR INSTALLATION OF NEW CONDUITS AND DUCT BANKS.
2. SEE DRAWING W17.10-E-220 FOR EQUIPMENT ARRANGEMENT WITHIN NEW H2 SWITCHGEAR BUILDING.
3. MAIN GROUND GRID SHALL BE 500 KCM, BARE COPPER, BURIED 18" BELOW GRADE.
4. GROUND TAPS TO SWITCHGEAR, TRANSFORMER, AND MANHOLES SHALL BE 500 KCM, BARE COPPER.
5. GROUND TAPS TO CHAIN LINK FENCE AND GATE POSTS SHALL BE #4/0 AND BARE COPPER.
6. CONNECT DUCT BANK GROUND CONDUCTOR TO GROUND ROD IN MANHOLE.
7. PROVIDE GROUND ROD IN GROUND ROD BOX AT THE LOCATIONS SHOWN ON THE PLAN. SEE DETAIL 2 ON DWG. W17.10-E-902.
8. SEE DETAIL 3 ON DWG. W17.10-E-902 FOR TYPICAL THERMITE CONNECTIONS OF GROUND RODS AND EQUIPMENT PIGTAIL TAPS TO MAIN GRID CONDUCTOR.
9. GROUND TRANSFORMER BASE AT TWO LOCATIONS AND PROVIDE GROUND FOR HIGH AND LOW VOLTAGE CABLE TERMINATION COMPARTMENT.



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NO.	DATE	REVISION		BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
①	08/14/09	REVISED AS SHOWN				

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
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	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
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EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION AREA UG CONDUIT,
GROUNDING AND MANHOLES

SCALE 1/8"=1'
DATE JAN2009
W17.10-E-102
DRAWING NUMBER
2
REV.

CONDUIT NO.	CONDUIT SIZE	CONDUCTORS		FROM	TO	REMARKS
		CABLE I.D.	CABLE SIZE			
K300	5" PVC	PGS 2 FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV, 1-2/0 G	GALLERY	MH H54	MAIN FEEDER, PGS 2-H2A SWGR
K301	5" PVC	PGS 2 FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV, 1-2/0 G	GALLERY	MH H54	MAIN FEEDER, PGS 2-H2A SWGR
K302	5" PVC	-	-	GALLERY	MH H54	SPARE DUCT
K303	5" PVC	-	-	GALLERY	MH H54	SPARE DUCT
K304	5" PVC	PGS 2 FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV, 1-2/0 G	MH H54	MH H55	MAIN FEEDER, PGS 2-H2A SWGR
K305	5" PVC	PGS 2 FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV, 1-2/0 G	MH H54	MH H55	MAIN FEEDER, PGS 2-H2A SWGR
K306	5" PVC	-	-	MH H54	MH H55	SPARE DUCT
K307	5" PVC	-	-	MH H54	MH H55	SPARE DUCT
K308	5" PVC	-	-	MH H55	H2 SWGR UNIT #6	SPARE (FUTURE)
K309	5" PVC	-	-	MH H55	H2 SWGR UNIT #6	SPARE (FUTURE)
K310	5" PVC	PGS 2 FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV, 1-2/0 G	MH H55	H2 SWGR UNIT #7	MAIN FEEDER, PGS 2-H2A SWGR
K311	5" PVC	PGS 2 FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV, 1-2/0 G	MH H55	H2 SWGR UNIT #7	MAIN FEEDER, PGS 2-H2A SWGR
K312	5" PVC	T20 12KV FDR 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	H2 SWGR UNIT #8	H2A-T20 FEEDER H2-104
K313	5" PVC	T20 12KV FDR 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	H2 SWGR UNIT #8	H2A-T20 FEEDER H2-104
K314	5" PVC	H2A-H1A-TIE 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	H2 SWGR UNIT #9	H2A-H1A TIE
K315	5" PVC	H2A-H1A-TIE 1B A,∅, B,∅, C,∅,	3-750 KCM, 15 KV	MH H55	H2 SWGR UNIT #9	H2A-H1A TIE
K316	6" PVC	H2A-H1A-TIE 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	H1 SWGR H1A	SWGR H2A-H1A TIE (NEW CONDUIT INTERCEPTED AND JOINED TO OLD K105)
K317	6" PVC	H2A-H1A-TIE 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	H1 SWGR H1A	SWGR H2A-H1A TIE (NEW CONDUIT INTERCEPTED AND JOINED TO OLD K106)
K318	6" PVC	T20 12KV FDR 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	T20 TERM. CAB	H2A-T20 FEEDER H2-104
K319	6" PVC	T20 12KV FDR 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H55	T20 TERM. CAB	H2A-T20 FEEDER H2-104
K320	5" PVC	-	-	MH H55	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K321	5" PVC	-	-	MH H55	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K322	5" PVC	-	-	MH H55	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K323	5" PVC	-	-	MH H55	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K324	5" PVC	-	-	MH H56	H2 SWGR UNIT #14	SPARE (FUTURE)
K325	5" PVC	-	-	MH H56	H2 SWGR UNIT #14	SPARE (FUTURE)
K326	5" PVC	T23 12KV FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H56	H2 SWGR UNIT #13	T23 FEEDER H2-203
K327	5" PVC	T23 12KV FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H56	H2 SWGR UNIT #13	T23 FEEDER H2-203
K328	5" PVC	T21 12KV FDR 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	H2 SWGR UNIT #12	T21 FEEDER H2-204
K329	5" PVC	T21 12KV FDR 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	H2 SWGR UNIT #12	T21 FEEDER H2-204
K330	5" PVC	H2B-H1B-TIE 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	H2 SWGR UNIT #11	H2B-H1B TIE
K331	5" PVC	H2B-H1B-TIE 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	H2 SWGR UNIT #11	H2B-H1B TIE
K332	5" PVC	T23 12KV FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H56	T23 TERM. CAB	15 KV T23 FEEDER H2-203
K333	5" PVC	T23 12KV FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H56	T23 TERM. CAB	15 KV T23 FEEDER H2-203
K334	6" PVC	H2B-H1B-TIE 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	H1 SWGR H1B	SWGR H2B-H1B TIE (NEW CONDUIT INTERCEPTED AND JOINED TO OLD K107)
K335	6" PVC	H2B-H1B-TIE 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	H1 SWGR H1B	SWGR H2B-H1B TIE (NEW CONDUIT INTERCEPTED AND JOINED TO OLD K108)
K336	6" PVC	T21 12KV FDR 1A A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	T21 TERM. CAB	H2B-T21 FEEDER (NEW CONDUIT INTERCEPTED AND JOINED TO OLD K107)
K337	6" PVC	T21 12KV FDR 1B A∅, B∅, C∅,	3-750 KCM, 15 KV	MH H56	T21 TERM. CAB	H2B-T21 FEEDER (NEW CONDUIT INTERCEPTED AND JOINED TO OLD K108)
K338	5" PVC	-	-	MH H56	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K339	5" PVC	-	-	MH H56	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K340	5" PVC	-	-	MH H56	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K341	5" PVC		-	MH H56	STUB-OUT	PROVISIONS FOR FUTURE EXTENSION
K342	5" PVC	T23 5KV FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H57	T23 TERM. CAB	5 kV FEEDER-T23
K343	5" PVC	T23 5KV FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H57	T23 TERM. CAB	5 kV FEEDER-T23
K344	5" PVC	T23 5KV FDR 1C A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H57	T23 TERM. CAB	5 kV FEEDER-T23
K345	5" PVC	-	-	MH H57	T23 TERM. CAB	SPARE DUCT
K346	5" PVC/PCS	T23 5KV FDR 1A A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H57	VAULT H23	5 kV FEEDER-T23
K347	5" PVC/PCS	T23 5KV FDR 1B A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H57	VAULT H23	5 kV FEEDER-T23
K348	5" PVC/PCS	T23 5KV FDR 1C A∅, B∅, C∅,	3-500 KCM, 15 KV	MH H57	VAULT H23	5 kV FEEDER-T23
K349	5" PVC/PCS		-	MH H57	VAULT H23	SPARE DUCT
						△1
S400	3" PVC	ISO-TEL △1	△1 24-PR/48 FIBER, 50 MICRON FO CABLES	GALLERY	S23	ISO-TEL. CABLE
S401	3" PVC	FO-2, 3, 4, 5, 11, 12, 14, 16, 17, 24	10- 6 PR FO CABLES	GALLERY	S23	F/O SIGNAL CABLES
S402	3" PVC	ISO-TEL △1	△1 24-PR/48 FIBER, 50 MICRON FO CABLES	S23	PB1	
S403	3" PVC	FO-2, 3, 4, 5, 11, 12, 14, 16, 17, 24	10- 6 PR FO CABLES	S23	PB1	F/O SIGNAL CABLES △1
						ISO-TEL. CABLE
X016	2" PVC (E)	FO-10, 15	2-6 PR FO CABLES	PB1	MH L23	F/O SIGNAL CABLES FOR BUSINESS NETWORK & DCS, NOTE 19
X067	2" PVC (E)	FO-26	1-6 PR FO CABLES	M1-EAST, SECT.12	M1-WEST, SECT. 5	F/O SIGNAL CABLES FOR MIRRORED BIT COMM. BETWEEN 351S-T20 & 351S-T21
X500	2" PVC	ISO-TEL △1	△1 24-PR/48 FIBER, 50 MICRON FO CABLES	PB1	H2 SWGR, UNIT 1	ISO-TEL. CABLE
X501	2" PVC	FO-11, 12, 14, 16, 17, 24	6-6 PR FO CABLES	PB1	H2 SWGR, UNIT 2	F/O SIGNAL CABLES △1
X502	2" PVC	FO-2, 3, 4, 5, 10, 15	6-6 PR FO CABLES	PB1	H2 SWGR, UNIT 2	F/O SIGNAL CABLES
X503	2" PVC	NEXUS L1107, FO-6, 7, FO-18, 19, 20	CAT 5E, 5-6 PR FO CABLES	PB1	H2 SWGR, UNIT 2	SIGNAL CABLES -NOTE 6 & NOTE 7
X504	2" PVC	H2-100CTD,H2-100CTSP,T20CTN,101CTD,101CTSP	5-4/C #10	PB1	H2 SWGR, UNIT 4	CT CABLES -NOTES 1, 2, 3
X505	2" PVC	M1-302S, 86T23C	2-4/C #12	PB1	H2 SWGR, UNIT 4	BKR M1-302 STATUS AND 86-T23 TRIP/PERMIT CLOSE CABLES, -NOTE 18
X506	2" PVC	H1A BUS PT, 302CTD	4/C #12, 4/C #10	PB1	H2 SWGR, UNIT 4	PT CABLES-INPUT TO SEL 451-4 FOR AUTO SYNC. & T23 DIFF. CT- NOTES 4 & 17
X507	2" PVC	T20C,86T20C,M1-101S, 86L1C,H1-104S,86BF-A	6-4/C #12	PB1	H2 SWGR, UNIT 4	T20 63/49,86-T20,86-L1,86BF-H2A CONT. & BKR STATUS CABLES, -NOTES 5 & 16
X508	2" PVC	H2-200CTD,H2-200CTSP,T21CTN,201CTD,201CTSP	5-4/C #10	PB2	H2 SWGR	CT CABLES-NOTES 8, 9, 10
X509	2" PVC			PB2	H2 SWGR	SPARE
X510	2" PVC	H1B BUS PT	4/C #12	PB2	H2 SWGR	PT CABLES-INPUT TO SEL 451-4 FOR AUTO-SYNC. - NOTE 12
X511	2" PVC	T21C,86T21C,M1-201S,86L2C,H1-106S,86BF-B	6-4/C #12	PB2	H2 SWGR	T21 63/49,86-T21,86-L2,86BF-H2B CONT. & BKR STATUS CABLES, -NOTES 13, 14, 15
X512	2" PVC			PB2	H2 SWGR	SPARE
X513	2" PVC	FO-8, 9, FO-21, 22, 23	5-6 PR FO CABLES	PB2	H2 SWGR	F/O SIGNAL CABLES, NOTE 11

NOTES:

1. ASSIGN (N) 2-4/C #10 CT WIRES FOR DIFF. CT CIRCUIT BETWEEN H2-A & H1-A USE EXISTING CONDUIT X005 BETWEEN PB1 AND H1A SWITCHGEAR BY REMOVING THE (E) 2-4/C #10 DIFF. WIRES AND INSTALLING THE NEW 2-4/C #10 DIFF. CKT. WIRES.
2. ASSIGN (N) 1-4/C #10 CT WIRES FOR T20 GROUND, CT INPUT TO H2A RELAY SEL-387A. REMOVE EXISTING 1-4/C #10 CT WIRES AND PULL NEW 1-4/C #10 CT WIRES IN (E) CONDUIT X011 BETWEEN PB1 AND T20.
3. ASSIGN (N) 2-4/C #10 CT WIRES FOR T-20 DIFF. RELAYING. REMOVE (E) 2-4/C #10 CT WIRES IN (E) CONDUIT X015 BETWEEN PB1 AND MANHOLE L23 AND INSTALL THE (N) 2-4/C #10 CT WIRES IN SAME CONDUIT TO M1-WEST.
4. USE SPARE CONDUIT X008 (PB1-H1A SWITCHGEAR) TO COMPLETE INSTALLATION OF THE PT WIRES FOR AUTO SYNC.
5. USE (E) SPARE CONDUITS X009 (PB1-H1A SWITCHGEAR) AND X022 (PB1-L23) FOR NEW CONTROL WIRES. LIFT AND TAG AS SPARES AT BOTH ENDS THE (E) WIRES WHICH ARE NOT REQUIRED BY THE (N) INSTALLATION. SEE SCHEMATIC DRAWINGS, FOR WIRES TO BE LIFTED. TERMINATE THE (N) WIRES ON THE SWITCHGEAR AS REQUIRED.
6. USE (E) SPARE CONDUIT X010 (PB1-H1A SWITHCGEAR) FOR THE CAT 5E CABLES BETWEEN (E) NEXUS 1250 IN (E) H1A SWITCHGEAR AND MANAGED ETHERNET SWITCH IN (N) H2A SWITCHGEAR.
7. USE (E) SPARE CONDUIT X014 (PB1-L23) FOR INSTALLATION OF FO-6, FO-7, FO-18, FO-19, AND FO-20 LOAD SHED SIGNAL AND COMMUNICATION PROCESSOR CABLES BETWEEN H2A AND M1-WEST SWITCHGEAR.
8. ASSIGN (N) 2-4/C #10 CT WIRES FOR DIFF. CT CIRCUIT BETWEEN H2B AND H1B. USE (E) CONDUIT XO36 BETWEEN PB2 AND H1B SWITCHGEAR REMOVE (E) CT WIRES TO INSTALL NEW CT WIRES.
9. ASSIGN (N) 1-4/C #10 CT WIRES FOR T-21 GROUND CT INPUT TO H2B RELAY SEL 387A. REMOVE EXISTING 1-4/C #10 CT WIRES IN CONDUIT X052 AND INSTALL (N) WIRES IN SAME CONDUIT.
10. ASSIGN (N) 2-4/C #10 CT WIRES FOR T-21 DIFF. RELAYING. REMOVE (E) 2-4/C #10 IN (E) X044 CONDUITS (PB2 - M1-EAST SWITCHGEAR) AND INSTALL NEW CT WIRES IN SAME CONDUIT.
11. INSTALL FO CABLES FROM (E) PB2 TO M1-EAST SWITCHGEAR IN EXISTING X043 CONDUIT. REMOVE EXISTING SPARE 2-4/C #12 CABLES BETWEEN M1-EAST AND PB2 IN CONDUIT X043 AND BETWEEN PB2 AND H1 SWITCHGEAR IN CONDUIT X038.
12. INSTALL PT CABLE IN EXISTING CONDUIT X038 BETWEEN PB2 AND H1 SWITCHGEAR. REMOVE SPARE CABLES AS REQUIRED (SEE NOTE 11, THIS SHEET).
13. INSTALL CABLES FROM PB2 TO H1 SWITCHGEAR IN EXISTING CONDUIT X038.
14. INSTALL CIRCUIT T21C (TRANSFORMER T21 SUDDEN PRESSURE AND WINDING TEMP TRIP CONTROL) FROM PB2 TO TRANSFORMER T21 CONTROL CABINET IN EXISTING SPARE 2" CONDUIT X054.
15. INSTALL CABLES FROM PB2 TO M1 SWITCHGEAR IN EXISTING CONDUIT X043.
16. INSTALL CIRCUIT T20C (TRANSFORMER T20 SUDDEN PRESSURE AND WINDING TEMP TRIP CONTROL) FROM PB1 TO TRANSFORMER T20 CONTROL CABINET IN EXISTING 2" CONDUIT X012. REMOVE EXISTING 2-4/C AWG CABLES (TRANSFORMER T20 SUDDEN PRESSURE AND WINDING TEMP TRIP CONTROL) BETWEEN T20 AND H1 SWITCHGEAR. EXERCISE CARE WHEN REMOVING EXISTING CABLES AND INSTALLING NEW CABLE TO AVOID DAMAGING EXISTING 3-4/C #12 TRANSFORMER ALARM CABLING WHICH IS TO REMAIN IN CONDUIT.
17. INSTALL CIRCUIT 302CTD (TRANSFORMER T23 DIFF. PROTECTION CT CIRCUIT) FROM PB1 TO MANHOLE L23 IN EXISTING 2" CONDUIT X015 TOGETHER WITH TRANSFORMER T20 DIFF. CT CABLING.
18. INSTALL CIRCUITS M1-302S (BREAKER STATUS) AND 86T23C (TRANSFORMER TRIP/PERMIT CLOSE CONTROL MANHOLE L23 IN EXISTING 2" CONDUIT X022 TOGETHER WITH CIRCUITS M1-101S AND 86T20C.
19. SEE DRAWING W17.10-E-101 FOR ROUTING OF FIBER CABLES TO THE OXYGEN PRODUCTION PLANT.

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△2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
MAIN SUBSTATION - SHEET 1

SCALE NONE
DATE JAN2009
W17.10-E-120
DRAWING NUMBER
2
REV.

USER: vuong
DATE: 05-SEP-2014 11:02
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USER: vuong
DATE: 05-SEP-2014 11:05
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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

CONDUIT NO.	CONDUIT SIZE	CONDUCTORS		FROM	TO	REMARKS
		CABLE I.D.	CABLE SIZE			
X514	2" PVC	T23DC, T23C, T23AL1, T23AL2	4-4/C #12	T23 CONTROL CAB	H2 SWGR	DC PWR, CONTROL AND ALARM WIRES
X515	2" PVC	T23CTN, T23AC	2-4/C #10	T23 CONTROL CAB	H2 SWGR	CT WIRES AND AC PWR
X516	2" PVC	FO-1, FO-13	2-6 PR FO CABLES	H2 SWGR, UNIT 2	H1 SWGR	F/O SIGNAL CABLES
X517	2" PVC	ISO-1	CAT 5E	H2 SWGR, UNIT 1	H1 SWGR ①	ISO COMMUNICATION CABLE TO REV. METER, PG&E LINE 1 (CIRCUIT L1107),
X518	2" PVC	ISO-2 ①	CAT 5E ①	H2 SWGR, UNIT 1	H1 SWGR	ISO COMMUNICATION CABLE TO REV. METER, PG&E LINE 2 (CIRCUIT C1151),
						①

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0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	02/10/10	REVISED FOR ISO METERING - COR#15.1	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
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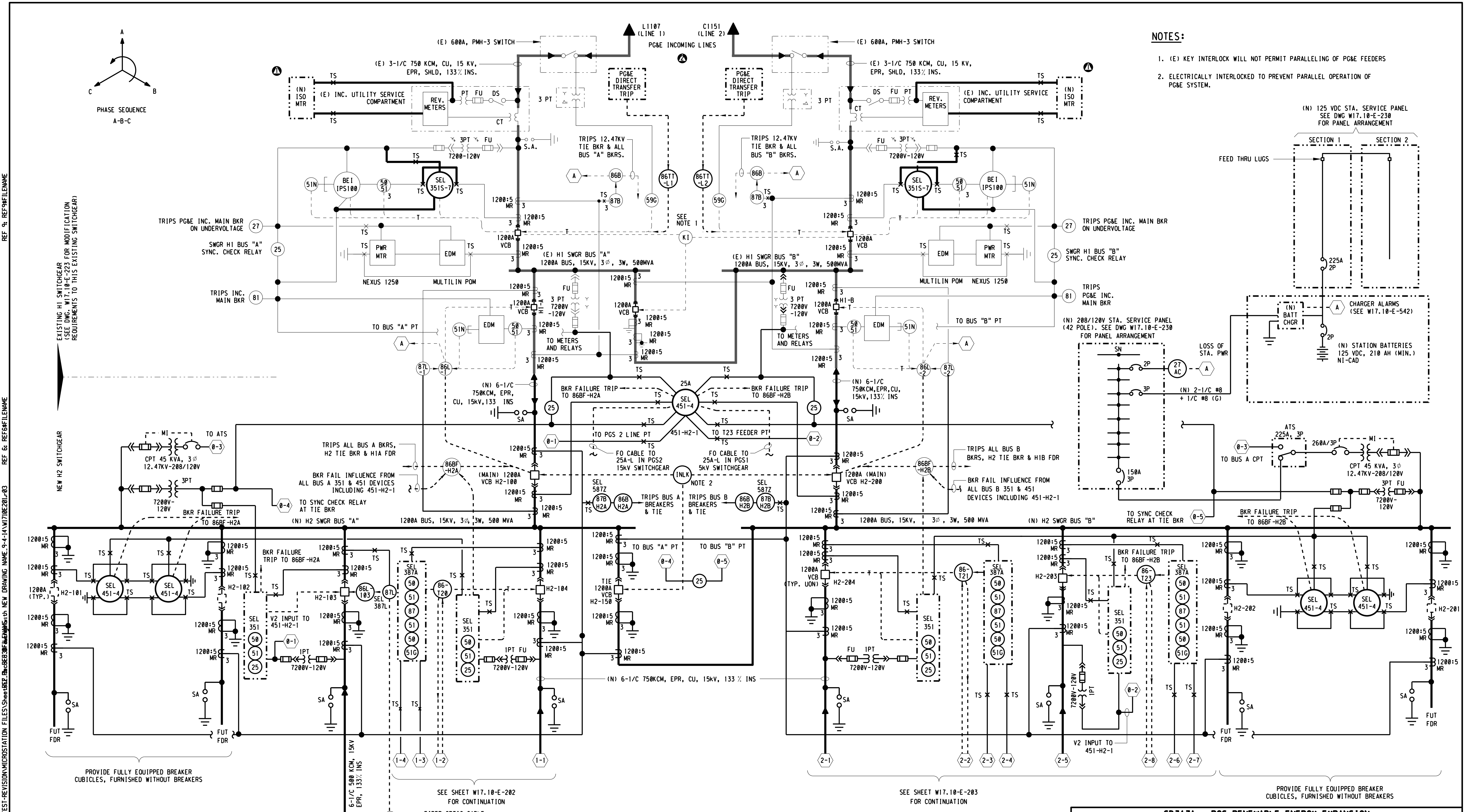
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
MAIN SUBSTATION - SHEET 2

SCALE NONE
DATE JAN2009
W17.10-E-121
DRAWING NUMBER
2
REV.


PHASE SEQUENCE
A-B-C
L1107
(LINE 1)
C1151
(LINE 2)
PG&E INCOMING LINES
(E) 600A, PMH-3 SWITCH
(E) 3-1/C 750 KCM, CU, 15 KV, EPR, SHLD, 133% INS.
(N) ISO MTR
(E) INC. UTILITY SERVICE COMPARTMENT
REV. METERS
PT FU DS
CT
PG&E DIRECT TRANSFER TRIP
3 PT
3PT FU
7200-120V
S.A.
TRIPS 12.47KV TIE BKR & ALL BUS "A" BKRS.
TRIPS 12.47KV TIE BKR & ALL BUS "B" BKRS.
86B
87B
86TT -L1
86TT -L2
59G
51N
BEI IPS100
50 51
SEL 351S-7
1200:5 MR
SEE NOTE 1
K1
TRIPS PG&E INC. MAIN BKR ON UNDERVOLTAGE
SWGR H1 BUS "A" SYNC. CHECK RELAY
SWGR H1 BUS "B" SYNC. CHECK RELAY
PWR MTR
EDM
NEXUS 1250
MULTILIN POM
1200A VCB
(E) H1 SWGR BUS "A"
1200A BUS, 15KV, 3∅, 3W, 500MVA
(E) H1 SWGR BUS "B"
1200A BUS, 15KV, 3∅, 3W, 500MVA
TRIPS INC. MAIN BKR
TRIPS PG&E INC. MAIN BKR
H1-A
H1-B
3 PT 7200V -120V
TO METERS AND RELAYS
TO BUS "A" PT
TO BUS "B" PT
87L
86L
(N) 6-1/C 750KCM, EPR, CU, 15kV, 133 INS
(N) 6-1/C 750KCM, EPR, CU, 15kV, 133% INS
SA
25A
SEL 451-4
BKR FAILURE TRIP TO 86BF-H2A
BKR FAILURE TRIP TO 86BF-H2B
TO PGS 2 LINE PT
TO T23 FEEDER PT
451-H2-1
FO CABLE TO 25A-L IN PGS2 15kV SWITCHGEAR
FO CABLE TO 25A-L IN PGS1 5kV SWITCHGEAR
INLK
NOTE 2
TRIPS ALL BUS A BKRS, H2 TIE BKR & H1A FDR
TRIPS ALL BUS B BKRS, H2 TIE BKR & H1B FDR
BKR FAIL INFLUENCE FROM ALL BUS A 351 & 451 DEVICES INCLUDING 451-H2-1
BKR FAIL INFLUENCE FROM ALL BUS B 351 & 451 DEVICES INCLUDING 451-H2-1
86BF -H2A
86BF -H2B
(MAIN) 1200A VCB H2-100
1200A (MAIN) VCB H2-200
SEL 587Z
87B H2A
86B H2A
87B H2B
86B H2B
TRIPS BUS A BREAKERS & TIE
TRIPS BUS B BREAKERS & TIE
MI
TO ATS
CPT 45 KVA, 3∅ 12.47KV-208/120V
7200V- 120V
TO SYNC CHECK RELAY AT TIE BKR
TO SYNC CHECK RELAY AT TIE BKR
(N) H2 SWGR BUS "A"
1200A BUS, 15KV, 3∅, 3W, 500 MVA
(N) H2 SWGR BUS "B"
1200A BUS, 15KV, 3∅, 3W, 500 MVA
1200A (TYP.)
H2-101
H2-102
H2-103
H2-104
SEL 351
50 51 25
V2 INPUT TO 451-H2-1
86L -103
SEL 387L
SEL 387A
50 51 87 51 50 51G
86- T20
86- T21
86- T23
IPT FU
TIE 1200A VCB H2-150
TO BUS "A" PT
TO BUS "B" PT
25
(N) 6-1/C 750KCM, EPR, CU, 15kV, 133 % INS
1200A VCB (TYP. UON)
H2-204
H2-203
H2-202
H2-201
7200V-120V
FUT FDR
6-1/C 500 KCM, 15KV EPR, 133% INS
FIBER OPTIC CABLE TO SEL-387L AT PGS2
TO PGS 2 SWGR SEE DWG.W28.20-E-202
1-4 1-3 1-2 1-1
2-1 2-2 2-3 2-4 2-5 2-8 2-6 2-7
0-1 0-2 0-3 0-4 0-5
(N) 125 VDC STA. SERVICE PANEL SEE DWG W17.10-E-230 FOR PANEL ARRANGEMENT
SECTION 1
SECTION 2
FEED THRU LUGS
225A 2P
(N) BATT CHGR
CHARGER ALARMS (SEE W17.10-E-542)
(N) STATION BATTERIES 125 VDC, 210 AH (MIN.) NI-CAD
(N) 208/120V STA. SERVICE PANEL (42 POLE). SEE DWG W17.10-E-230 FOR PANEL ARRANGEMENT
SN
2P
3P
27 AC
LOSS OF STA. PWR
(N) 2-1/C #8 + 1/C #8 (G)
150A 3P
ATS 225A, 3P
260A/3P
TO BUS A CPT
CPT 45 KVA, 3∅ 12.47KV-208/120V
3PT FU
EXISTING H1 SWITCHGEAR (SEE DWG. W17.10-E-223 FOR MODIFICATION REQUIREMENTS TO THIS EXISTING SWITCHGEAR)
NEW H2 SWITCHGEAR

PROVIDE FULLY EQUIPPED BREAKER CUBICLES, FURNISHED WITHOUT BREAKERS

SEE SHEET W17.10-E-202 FOR CONTINUATION

SEE SHEET W17.10-E-203 FOR CONTINUATION

PROVIDE FULLY EQUIPPED BREAKER CUBICLES, FURNISHED WITHOUT BREAKERS

NOTES:

1. (E) KEY INTERLOCK WILL NOT PERMIT PARALLELING OF PG&E FEEDERS
2. ELECTRICALLY INTERLOCKED TO PREVENT PARALLEL OPERATION OF PG&E SYSTEM.

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PLOT SCALE: 0.168561:1

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION		BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
2	07/15/10	ADDED PG&E DIRECT TRANSFER TRIP		CGT		
1	02/10/10	REVISED FOR ISO METERING - COR#15.1		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SINGLE LINE METER AND RELAY DIAGRAM
MAIN SUBSTATION 15KV H1/H2 SWITCHGEARS

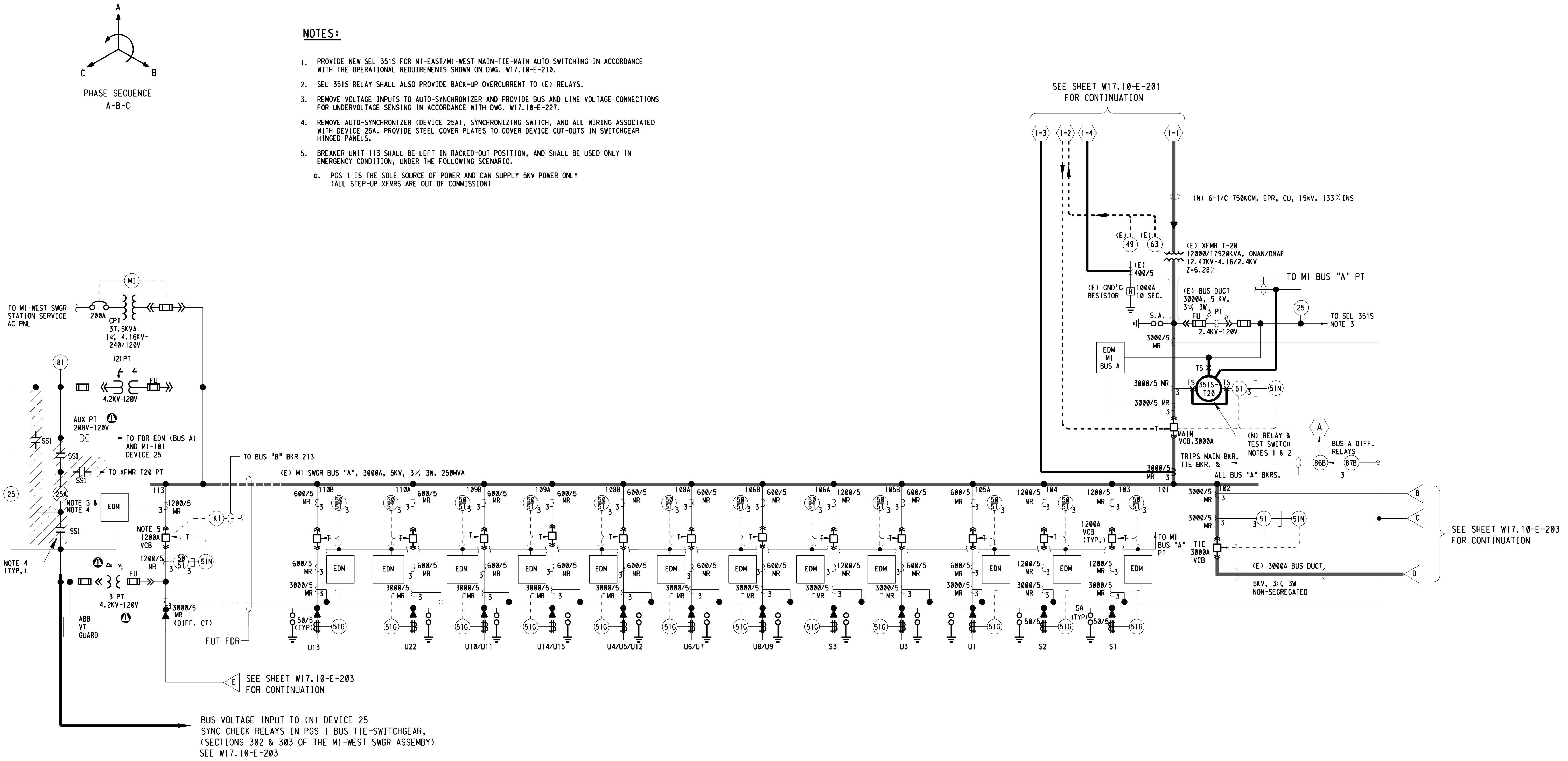
SCALE NONE
DATE JUL2010

W17.10-E-201
DRAWING NUMBER

3
REV.

NOTES:

1. PROVIDE NEW SEL 351S FOR M1-EAST/M1-WEST MAIN-TIE-MAIN AUTO SWITCHING IN ACCORDANCE WITH THE OPERATIONAL REQUIREMENTS SHOWN ON DWG. W17.10-E-210.
2. SEL 351S RELAY SHALL ALSO PROVIDE BACK-UP OVERCURRENT TO (E) RELAYS.
3. REMOVE VOLTAGE INPUTS TO AUTO-SYNCHRONIZER AND PROVIDE BUS AND LINE VOLTAGE CONNECTIONS FOR UNDERVOLTAGE SENSING IN ACCORDANCE WITH DWG. W17.10-E-227.
4. REMOVE AUTO-SYNCHRONIZER (DEVICE 25A), SYNCHRONIZING SWITCH, AND ALL WIRING ASSOCIATED WITH DEVICE 25A. PROVIDE STEEL COVER PLATES TO COVER DEVICE CUT-OUTS IN SWITCHGEAR HINGED PANELS.
5. BREAKER UNIT 113 SHALL BE LEFT IN RACKED-OUT POSITION, AND SHALL BE USED ONLY IN EMERGENCY CONDITION, UNDER THE FOLLOWING SCENARIO.
   a. PGS 1 IS THE SOLE SOURCE OF POWER AND CAN SUPPLY 5KV POWER ONLY (ALL STEP-UP XFMRS ARE OUT OF COMMISSION)



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NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	01/26/12	REVISED M1-113, 213, 301 & 302 PT CONN.	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SINGLE LINE METER AND RELAY DIAGRAM
5KV M1-WEST SWITCHGEAR

SHEET NO.172

SCALE NONE
DATE JAN2009

W17.10-E-202
DRAWING NUMBER

2
REV.

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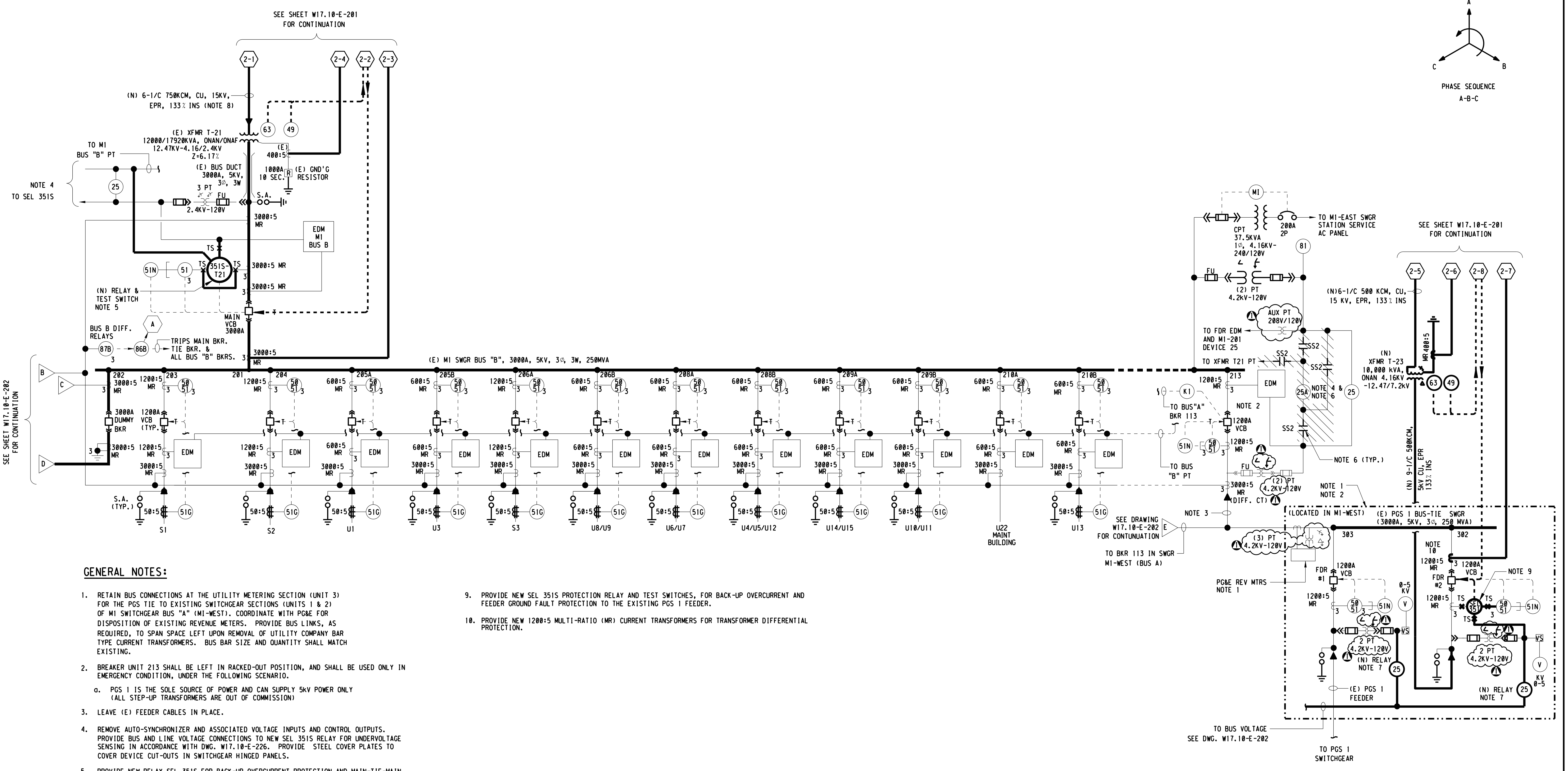

GENERAL NOTES:

1. RETAIN BUS CONNECTIONS AT THE UTILITY METERING SECTION (UNIT 3) FOR THE PGS TIE TO EXISTING SWITCHGEAR SECTIONS (UNITS 1 & 2) OF M1 SWITCHGEAR BUS "A" (M1-WEST). COORDINATE WITH PG&E FOR DISPOSITION OF EXISTING REVENUE METERS. PROVIDE BUS LINKS, AS REQUIRED, TO SPAN SPACE LEFT UPON REMOVAL OF UTILITY COMPANY BAR TYPE CURRENT TRANSFORMERS. BUS BAR SIZE AND QUANTITY SHALL MATCH EXISTING.
2. BREAKER UNIT 213 SHALL BE LEFT IN RACKED-OUT POSITION, AND SHALL BE USED ONLY IN EMERGENCY CONDITION, UNDER THE FOLLOWING SCENARIO.
   a. PGS 1 IS THE SOLE SOURCE OF POWER AND CAN SUPPLY 5kV POWER ONLY (ALL STEP-UP TRANSFORMERS ARE OUT OF COMMISSION)
3. LEAVE (E) FEEDER CABLES IN PLACE.
4. REMOVE AUTO-SYNCHRONIZER AND ASSOCIATED VOLTAGE INPUTS AND CONTROL OUTPUTS. PROVIDE BUS AND LINE VOLTAGE CONNECTIONS TO NEW SEL 351S RELAY FOR UNDERVOLTAGE SENSING IN ACCORDANCE WITH DWG. W17.10-E-226. PROVIDE STEEL COVER PLATES TO COVER DEVICE CUT-OUTS IN SWITCHGEAR HINGED PANELS.
5. PROVIDE NEW RELAY SEL 351S FOR BACK-UP OVERCURRENT PROTECTION AND MAIN-TIE-MAIN AUTOMATIC SWITCHING CONTROL FOR M1-EAST AND M1-WEST. CONTROLS FOR AUTOMATIC TRANSFER SYSTEM SHALL BE IN ACCORDANCE WITH OPERATIONAL REQUIREMENTS SHOWN ON DRAWING W17.10-E-210.
6. REMOVE ALL SYNCHRONIZING SWITCHES ASSOCIATED WITH DEVICE 25A.
7. PROVIDE (N) SYNCHRONIZING CHECK RELAY FOR DEADBUS-DEADLINE PERMISSIVE CLOSING OF CIRCUIT BREAKERS ONLY.
8. EXISTING CABLES FROM H1 SWITCHGEAR TO TRANSFORMER T21 SHALL BE REMOVED AND REPLACED WITH NEW CABLES FROM THE H2 SWITCHGEAR.
9. PROVIDE NEW SEL 351S PROTECTION RELAY AND TEST SWITCHES, FOR BACK-UP OVERCURRENT AND FEEDER GROUND FAULT PROTECTION TO THE EXISTING PGS 1 FEEDER.
10. PROVIDE NEW 1200:5 MULTI-RATIO (MR) CURRENT TRANSFORMERS FOR TRANSFORMER DIFFERENTIAL PROTECTION.

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USER: vuong
DATE: 30-OCT-2014 11:01
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NO.	DATE	REVISION		BY	REC.	APP.
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1	01/26/12	REVISED M1-113, 213, 301 & 302 PT CONN.		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT		
DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

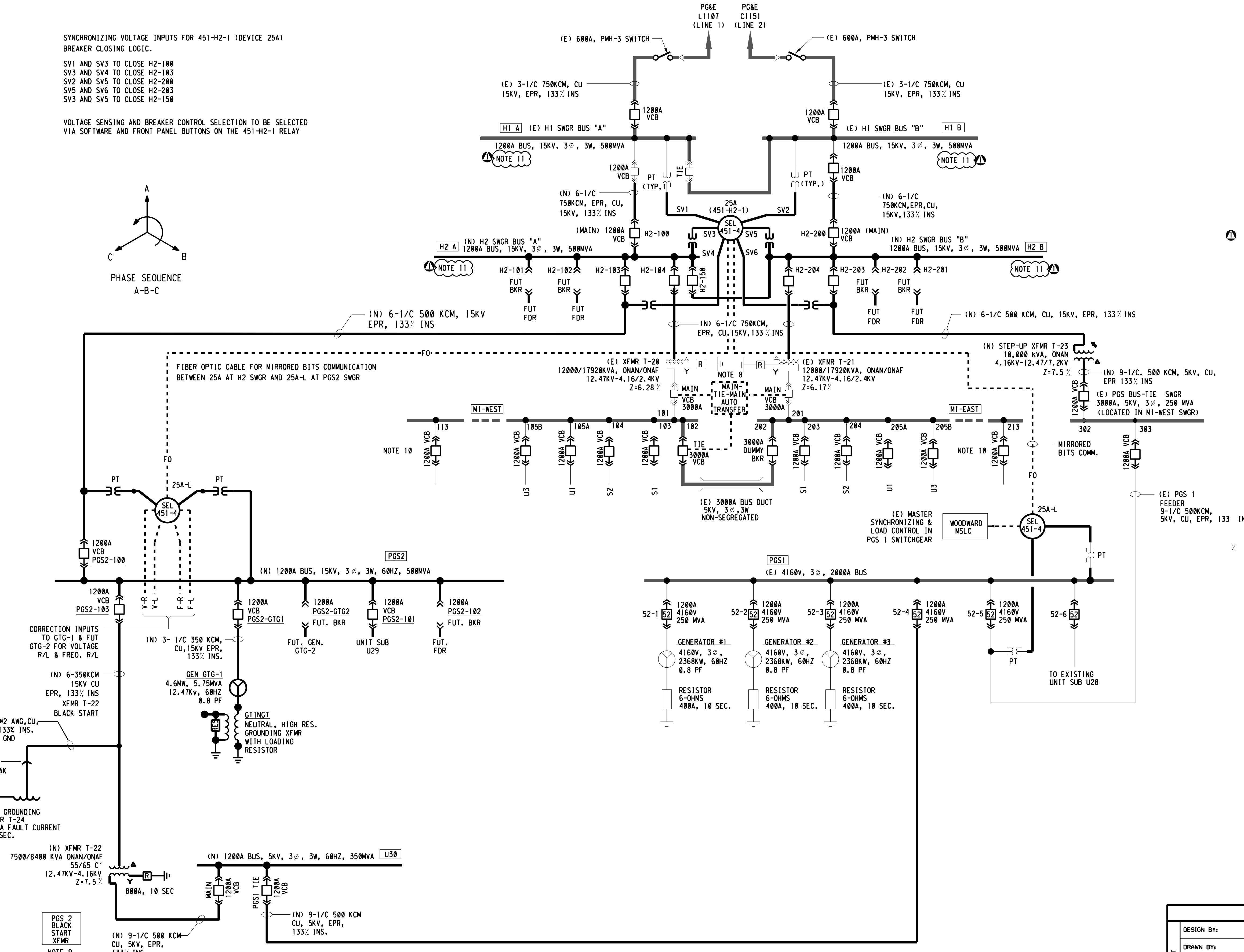
MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SINGLE LINE METER AND RELAY DIAGRAM
5KV M1-EAST SWITCHGEAR

SCALE NONE
DATE JAN2012
W17.10-E-203
DRAWING NUMBER
2
REV.

SYNCHRONIZING VOLTAGE INPUTS FOR 451-H2-1 (DEVICE 25A)
BREAKER CLOSING LOGIC.

SV1 AND SV3 TO CLOSE H2-100
SV3 AND SV4 TO CLOSE H2-103
SV2 AND SV5 TO CLOSE H2-200
SV5 AND SV6 TO CLOSE H2-203
SV3 AND SV5 TO CLOSE H2-150

VOLTAGE SENSING AND BREAKER CONTROL SELECTION TO BE SELECTED VIA SOFTWARE AND FRONT PANEL BUTTONS ON THE 451-H2-1 RELAY



GENERAL NOTES:

1. H1 SWGR CIRCUIT BREAKERS HAVE SYNC. CHECK RELAYS ONLY.
2. THE 5KV DISTRIBUTION SWITCHGEARS M1-WEST AND M1-EAST ARE PROVIDED WITH SYNC. CHECK RELAYS ONLY.
3. PG&E LINES L1107 AND C1151 ARE NOT PERMITTED TO OPERATE IN PARALLEL.
4. DISTRIBUTION XFMRS T20 AND T21 ARE NOT OPERATED IN PARALLEL.
5. PGS1 SWGR BREAKER 52-5 (LINE TO MAIN SUBSTATION) SHALL BE PROVIDED WITH NEW REMOTE SYNC. RELAY SEL 451-4 FOR ENGINE-GENERATOR SPEED AND VOLTAGE ADJUSTMENT.
6. H1 SWGR. TIE BREAKER CAN CLOSE BY MANUAL OPERATION ONLY, THRU PERMISSIVE CONTACTS OF L1107 OR C1151 BREAKER OPEN.
7. H2 SWGR TIE BREAKER H2-150 CAN CLOSE THRU 451-H2-1 (25A) AND THRU PERMISSIVE BREAKER OPEN CONTACTS OF L1107 OR C1151.
8. M1-WEST AND M1-EAST SWGRS. SHALL BE PROVIDED WITH MAIN-TIE-MAIN TRANSFER CONTROL SCHEME. SEE DWG. W17.10-E-210 FOR REQUIREMENTS.
9. PGS1 SWGR BREAKER TO SWGR U30 IS OPERATED NORMALLY OPEN AND WILL BE CLOSED ONLY TO PROVIDE BLACK START CAPABILITY TO PGS2.
10. THESE BREAKERS ARE PLACED IN RACKED OUT POSITION AND USED ONLY AS EMERGENCY FEEDER BREAKERS FOR PGS1 SUPPLY TO M1 SWITCHGEAR.
11. REFER TO DRAWING W17.10-E-201 FOR THE SINGLE-LINE METER & RELAY DIAGRAM OF THE H1 AND H2 SWITCHGEARS INCLUDING PG&E AND ISO METERING

SYSTEM OPERATING MODE:

I SPLIT SYSTEM:

A. NORMAL OPERATION:

1. ALL SWITCHGEAR TIE BREAKERS ARE OPEN.
2. PGS2 IS CONNECTED TO M1-WEST THRU T20 AND TO PG&E SYSTEM THRU L1107.
3. PGS1 IS CONNECTED TO M1-EAST THRU T23 AND T21, AND TO PG&E SYSTEM THRU C1151.
4. SYSTEM LOADS ARE DIVIDED BETWEEN M1-WEST AND M1-EAST SWGRS.
   SYSTEM LOAD IS APPROXIMATELY
   6 MW DURING DRY WEATHER CONDITION
   12 MW DURING WET WEATHER CONDITION
5. PGS1 GENERATORS 1,2, AND 3 ARE OPERATING AND SUPPLYING MAX. OUTPUT OF 6 MW TO H2-B SWGR.
6. PGS2 GENERATOR GTG-1 IS OPERATING AND SUPPLYING MAX. OUTPUT OF 3.7 MW TO H2-A SWGR.

B. ISLAND OPERATION UPON LOSS OF PG&E L1107 CONNECTION:

1. LOSS OF PG&E CIRCUIT L1107 WILL ISLAND PGS2 AND M1-WEST, H1-A MAIN BREAKER FOR LINE L1107 WILL BE TRIPPED BY RELAYS. H2-A SWITCHGEAR MAIN BREAKER H2-100 TO H1 SWITCHGEAR BUS A WILL BE OPENED BY THE LOAD SHED SYSTEM.
   WHEN PG&E LINE L1107 IS RESTORED, H1 SWITCHGEAR MAIN BREAKER L1107 IS CLOSED MANUALLY. CONNECTION OF SWGR BUS H2-A TO THE PG&E LINE IS ACCOMPLISHED BY MANUALLY INITIATING AUTOSYNCHRONIZATION ACROSS BREAKER H2-100 VIA RELAY 451-H2-1. DEVICE 451-H2-1 (25A), WITH AUTO-SYNC. FUNCTIONALITY, MEASURES VOLTAGE ON BOTH SIDES OF THE BREAKER AND SENDS CORRECTION SIGNALS VIA MIRRORED BITS COMMUNICATION TO 25A-L (SEL 451-4) AT THE PGS2 SWITCHGEAR. THE FREQUENCY RAISE/LOWER AND VOLTAGE RAISE/LOWER SIGNALS FROM DEVICE 451-H2-1 ARE MIRRORED AMD CONVERTED TO RELAY CONTACT OUTPUTS BY DEVICE 25A-L FOR CONTROL OF GENERATOR GTG-1.
2. LOSS OF MAIN 15KV FEEDER BETWEEN PGS2 SWITCHGEAR AND H2-A SWITCHGEAR WILL ISLAND THE PGS2 SYSTEM. AUTO-SYNC. IS ACCOMPLISHED VIA 25A-L (SEL 451-4 WITH AUTO-SYNC. FEATURES)

C. ISLAND OPERATIONS UPON LOSS OF PG&E LINE C1151 CONNECTIONS:

1. LOSS OF PG&E LINE C1151 WILL ISLAND PGS1 AND M1-EAST. H1-B MAIN BREAKER FOR LINE C1151 WILL BE TRIPPED BY RELAYS. H2-B SWITCHGEAR MAIN BREAKER H2-200 TO H1 SWITCHGEAR BUS B WILL BE OPENED BY THE LOAD SHED SYSTEM.
2. RE-SYNCHRONIZATION OF PGS1 TO THE PG&E SYSTEM IS ACCOMPLISHED BY MANUALLY INITIATING AUTOSYNCHRONIZATION ACROSS BREAKER H2-200 VIA RELAY 451-H2-1. DEVICE 451-H2-1 WILL SEND FREQUENCY AND VOLTAGE ADJUST SIGNALS TO NEW DEVICE 25A-L AT THE PGS1 SWITCHGEAR FOR CONTROLLING EXISTING GENERATORS 1, 2 AND 3.

II COMBINED SYSTEM:

A. NORMAL OPERATION

1. PGS2 AND PGS1 ARE IN PARALLEL OPERATION AT THE H2 SWITCHGEAR AND ARE CONNECTED TO ONE PG&E LINE.

B. SYSTEM ISLANDED FROM PG&E

1. SYSTEM RECONNECTION TO PG&E IS ACCOMPLISHED BY PLACING PGS1 GENERATORS IN DROOP MODE AND PGS2 GENERATORS ARE CONTROLLED TO AUTO-SYNC. THE SYSTEM VIA THE SEL 451-4 RELAYS.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	04/04/12	ADD GENERAL NOTE 11		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
AUTOMATIC SYNCHRONIZING SCHEME

SCALE NONE
DATE APR2012
W17.10-E-204
DRAWING NUMBER
2
REV.

USER: vuong
DATE: 30-OCT-2014 11:19
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REF 2: REF2$FILENAME
REF 4: REF4$FILENAME
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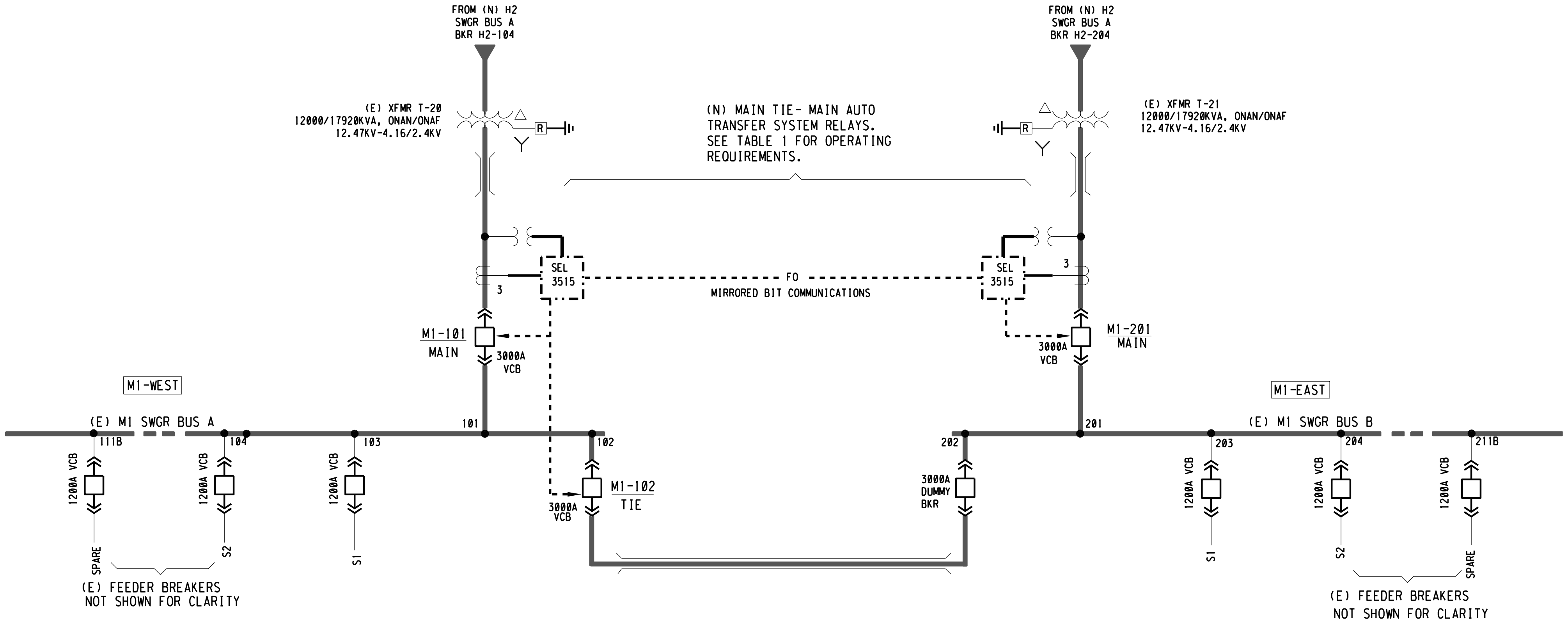

TABLE 1

MI-EAST AND MI-WEST AUTO TRANSFER SYSTEM OPERATING REQUIREMENTS

CONDITION	EVENT	VOLTAGE AT T20 SECONDARY	VOLTAGE AT T21 SECONDARY	43AM POSITION NOTE 1	M1-101	M1-102	M1-201	REMARKS
					MAIN	TIE	MAIN	
1	NORMAL	YES	YES	AUTO	CLOSED	OPEN	CLOSED	
2	LOSS OF POWER THRU T20	NO	YES	AUTO	OPEN	CLOSED	CLOSED	AUTOMATIC TRANSFER FROM CONDITION 1 CONFIGURATION TO CONDITION 2 CONFIGURATION.
2A	RETURN OF POWER THRU XFMR T20	YES	YES	AUTO	OPEN	CLOSED	CLOSED	OPERATOR INITIATION REQUIRED TO RETRANSFER BACK TO CONDITION 1 CONFIGURATION.
2B	LOSS OF POWER THRU XFMR T21 AFTER RETURN OF POWER THRU XFMR T20	YES	NO	AUTO	CLOSED	CLOSED	OPEN	AUTOMATIC TRANSFER FROM CONDITION 2A CONFIGURATION TO CONDITION 2B CONFIGURATION AFTER 60 SECONDS (ADJUSTABLE) TIME DELAY.
2C	LOSS OF POWER THRU XFMR T21 WITH POWER UNAVAILABLE THRU T20	NO	NO	AUTO	OPEN	CLOSED	OPEN	AUTOMATIC TRANSFER FROM CONDITION 2 CONFIGURATION TO CONDITION 2C CONFIGURATION.
2C.1	RETURN OF POWER THRU XFMR T20 ONLY	YES	NO	AUTO	CLOSED	CLOSED	OPEN	AUTOMATIC TRANSFER FROM CONDITION 2C CONFIGURATION TO CONDITION 2C.1 CONFIGURATION AFTER 60 SECONDS (ADJUSTABLE) TIME DELAY.
2C.2	RETURN OF POWER THRU XFMR T21 ONLY.	NO	YES	AUTO	OPEN	CLOSED	CLOSED	AUTOMATIC TRANSFER FROM CONDITION 2C CONFIGURATION TO CONDITION 2C.2 CONFIGURATION AFTER 60 SECONDS (ADJUSTABLE) TIME DELAY.
2C.3	RETURN OF POWER THRU BOTH XFMRS T20 AND T21	YES	YES	AUTO	CLOSED	CLOSED	OPEN	AUTOMATIC TRANSFER FROM CONDITION 2C CONFIGURATION TO CONDITION 2C.3 CONFIGURATION AFTER 60 SECONDS (ADJUSTABLE) TIME DELAY.
3	LOSS OF POWER THRU T21	YES	NO	AUTO	CLOSED	CLOSED	OPEN	AUTOMATIC TRANSFER FROM CONDITION 1 CONFIGURATIONTO CONDITION 3 CONFIGURATION.
3A	RETURN OF POWER THRU XFMR T21	YES	YES	AUTO	CLOSED	CLOSED	OPEN	OPERATOR INITIATION REQUIRED TO RETRANSFER BACK TO CONDITION 1 CONFIGURATION.
3B	LOSS OF POWER THRU XFMR T20 AFTER RETURN OF POWER THRU XFMR T21	NO	YES	AUTO	OPEN	CLOSED	CLOSED	AUTOMATIC TRANSFER FROM CONDITION 3A CONFIGURATION TO CONDITION 3B CONFIGURATION AFTER 60 SECONDS (ADJUSTABLE) TIME DELAY.
3C	LOSS OF POWER THRU XFMR T20 WITH POWER UNAVAILABLE THRU T21	NO	NO	AUTO	OPEN	CLOSED	OPEN	AUTOMATIC TRANSFER FROM CONDITION 3 CONFIGURATION TO CONDITION 3C CONFIGURATION.
3C.1	RETURN OF POWER THRU XFMR T20 ONLY	YES	NO	AUTO	CLOSED	CLOSED	OPEN	SAME OPERATION AS FOR CONDITION 2C.1.
3C.2	LOSS OF POWER THRU XFMR T21 ONLY	NO	YES	AUTO	OPEN	CLOSED	CLOSED	SAME OPERATION AS FOR CONDITION 2C.2.
3C.3	RETURN OF POWER THRU BOTH XFMRS T20 AND T21	YES	YES	AUTO	CLOSED	CLOSED	OPEN	SAME OPERATION AS FOR CONDITION 2C.3.

NOTE:

1. WHEN AUTO/MANUAL SWITCH, DEVICE 43AM, IS IN THE MANUAL POSITION, ALL AUTOMATIC TRANSFER CONTROLS SHALL BE DISABLED.

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PROJECT NO. 07688-01-03

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	
DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUB SWGR M1-WEST & M1-EAST MAIN-TIE-MAIN
AUTO TRANSFER DISCRIPTION OF OPERATION

SCALE NONE
DATE JAN2009
W17.10-E-210
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 25-SEP-2014 10:37
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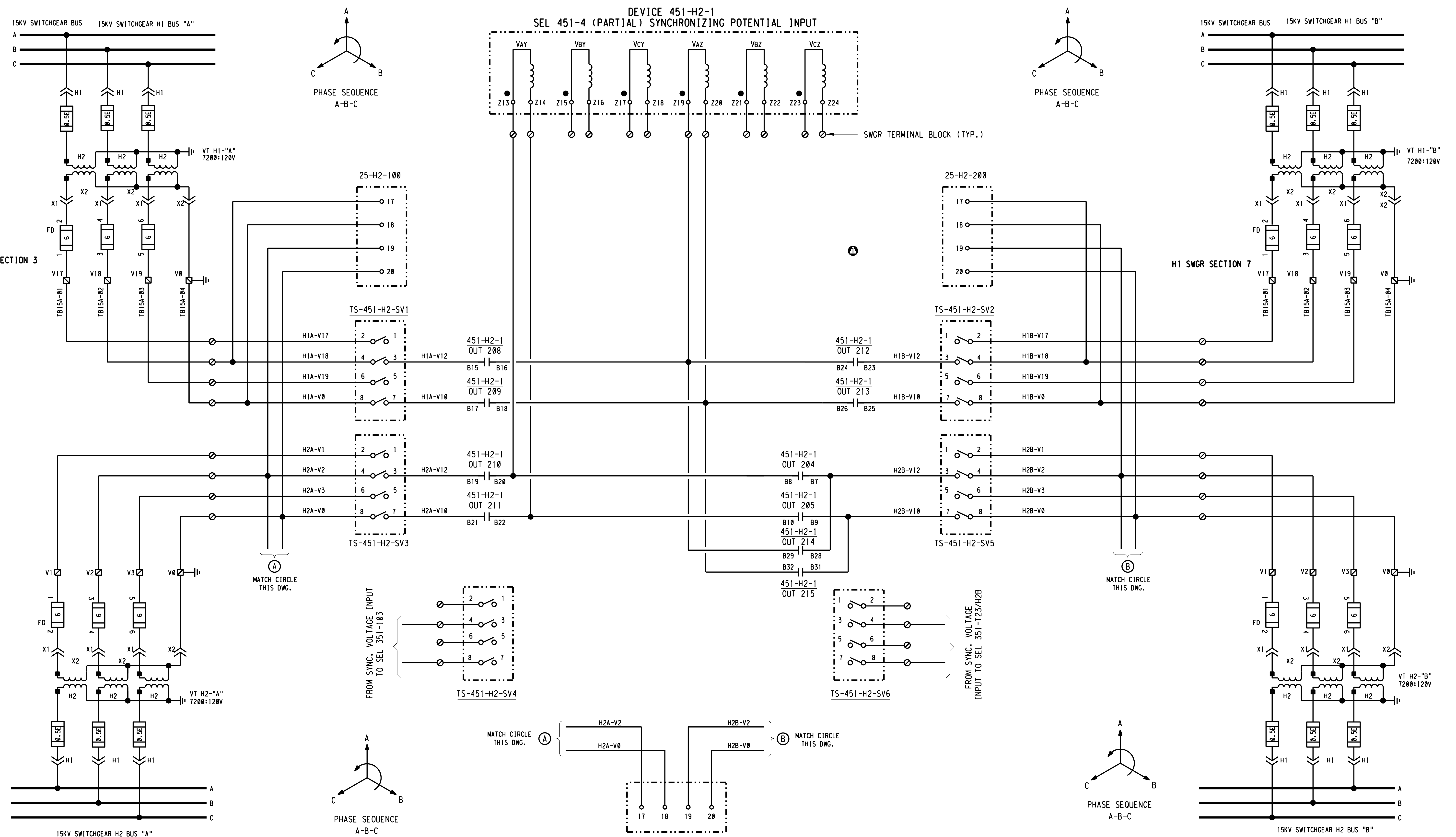

3" ON ORIGINAL DOCUMENT
0 1 2 3

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NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	02/24/10	ADDED AUTO SYNCH. VOLTAGE INPUTS	SEL		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	
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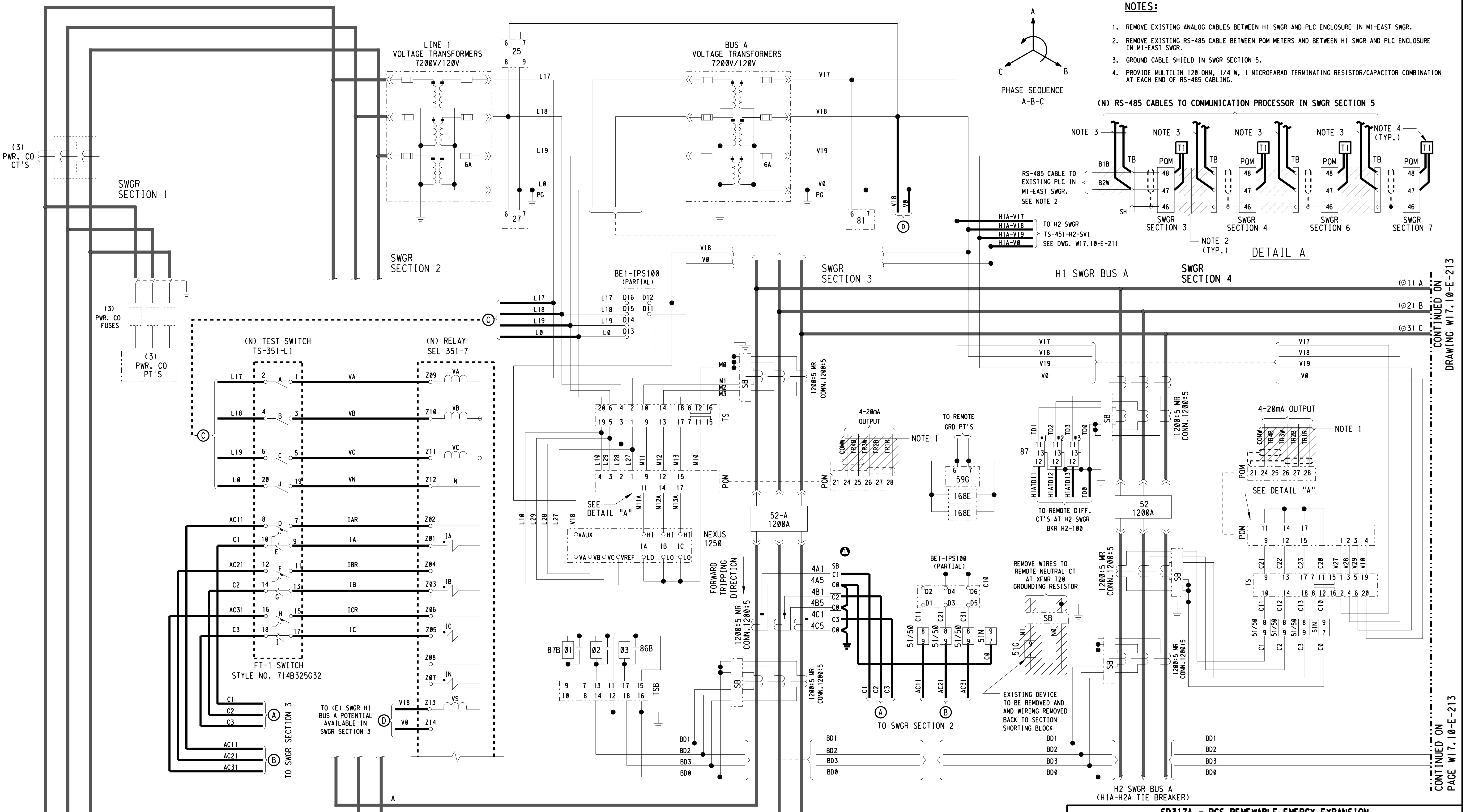
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1/H2
THREE LINE PT SCHEMATICS SYNCHRONIZING POTENTIALS

SCALE NONE
DATE JAN2009
W17.10-E-211
DRAWING NUMBER
2
REV.



NOTES:

1. REMOVE EXISTING ANALOG CABLES BETWEEN H1 SWGR AND PLC ENCLOSURE IN M1-EAST SWGR.
2. REMOVE EXISTING RS-485 CABLE BETWEEN POM METERS AND BETWEEN H1 SWGR AND PLC ENCLOSURE IN M1-EAST SWGR.
3. GROUND CABLE SHIELD IN SWGR SECTION 5.
4. PROVIDE MULTILIN 120 OHM, 1/4 W, 1 MICROFARAD TERMINATING RESISTOR/CAPACITOR COMBINATION AT EACH END OF RS-485 CABLING.

THIS DRAWING IS REDRAWN FROM
CUTLER-HAMMER DRAWING 8787Y01
(VENDOR'S AS-BUILT DRAWING)

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NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	04/05/10	REVISED CT-4 WIRING SWGR SECTION 3	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY: ART CENIZAL
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DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1 MODIFICATION
THREE-LINE AC SCHEMATIC - SHEET 1

SCALE NONE
DATE APR2010
W17.10-E-212
DRAWING NUMBER
2
REV.

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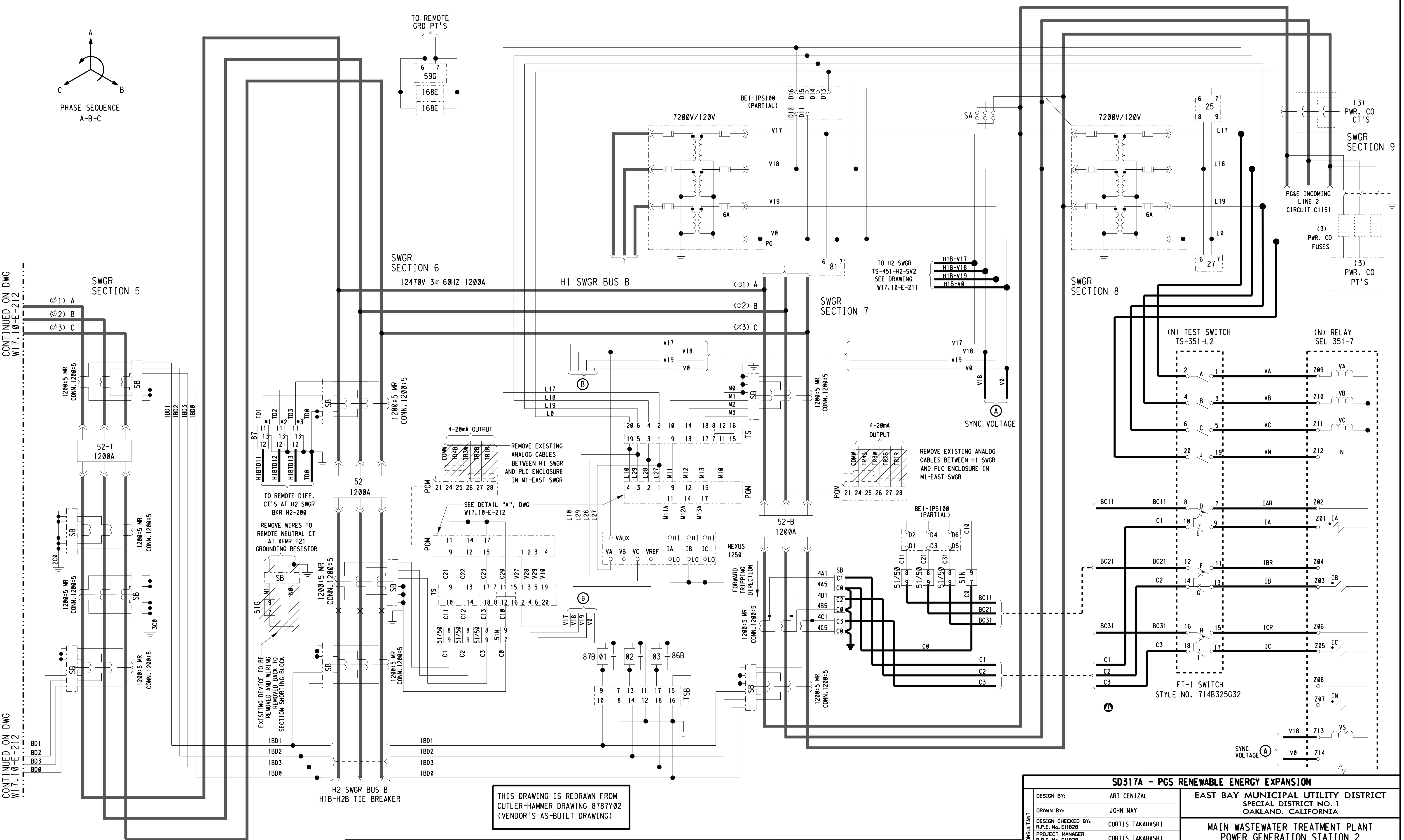

REMOVE EXISTING ANALOG CABLES BETWEEN H1 SWGR AND PLC ENCLOSURE IN M1-EAST SWGR

THIS DRAWING IS REDRAWN FROM
CUTLER-HAMMER DRAWING 8787Y02
(VENDOR'S AS-BUILT DRAWING)

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②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	04/05/10	REVISED CT-4 WIRING SWGR SECTION 7	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
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	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
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	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1 MODIFICATION
THREE-LINE AC SCHEMATIC - SHEET 2

SCALE NONE
DATE APR2010

W17.10-E-213
DRAWING NUMBER

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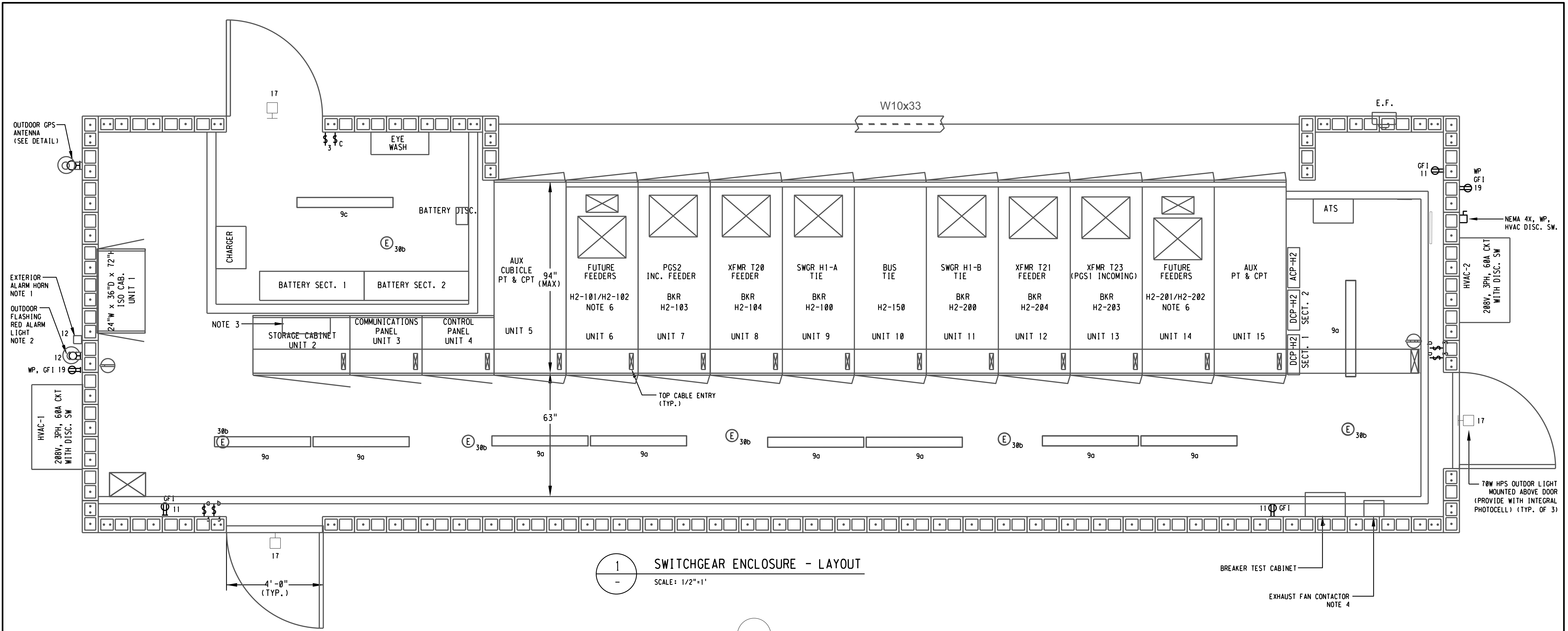
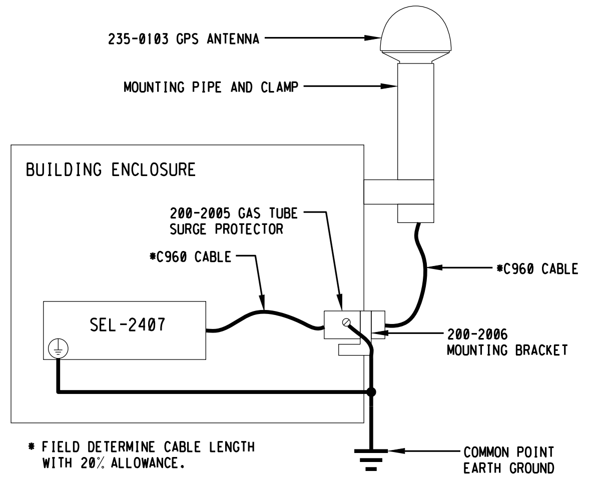

W10x33
E.F.
17
$_3$ $_c$
EYE WASH
OUTDOOR GPS ANTENNA (SEE DETAIL)
9c
BATTERY DISC.
CHARGER
E 30b
BATTERY SECT. 1
BATTERY SECT. 2
24"W x 36"D x 72"H ISO CAB. UNIT 1
EXTERIOR ALARM HORN NOTE 1
OUTDOOR FLASHING RED ALARM LIGHT NOTE 2
12
WP, GFI 19
NOTE 3
STORAGE CABINET UNIT 2
COMMUNICATIONS PANEL UNIT 3
CONTROL PANEL UNIT 4
AUX CUBICLE PT & CPT
UNIT 5
94" (MAX)
FUTURE FEEDERS H2-101/H2-102 NOTE 6 UNIT 6
PGS2 INC. FEEDER BKR H2-103 UNIT 7
XFMR T20 FEEDER BKR H2-104 UNIT 8
SWGR H1-A TIE BKR H2-100 UNIT 9
BUS TIE H2-150 UNIT 10
SWGR H1-B TIE BKR H2-200 UNIT 11
XFMR T21 FEEDER BKR H2-204 UNIT 12
XFMR T23 (PGS1 INCOMING) BKR H2-203 UNIT 13
FUTURE FEEDERS H2-201/H2-202 NOTE 6 UNIT 14
AUX PT & CPT UNIT 15
ATS
ACP-H2
DCP-H2 SECT. 2
DCP-H2 SECT. 1
9a
GFI 11
WP GFI 19
NEMA 4X, WP, HVAC DISC. SW.
HVAC-2 208V, 3PH, 60A CKT WITH DISC. SW
TOP CABLE ENTRY (TYP.)
63"
HVAC-1 208V, 3PH, 60A CKT WITH DISC. SW
30b
9a
GFI 11
$_3$ $_3$ a b
17
4'-0" (TYP.)
70W HPS OUTDOR LIGHT MOUNTED ABOVE DOOR (PROVIDE WITH INTEGRAL PHOTOCELL) (TYP. OF 3)
11 GFI
BREAKER TEST CABINET
EXHAUST FAN CONTACTOR NOTE 4

1
-
SWITCHGEAR ENCLOSURE - LAYOUT
SCALE: 1/2"=1'


235-0103 GPS ANTENNA
MOUNTING PIPE AND CLAMP
BUILDING ENCLOSURE
200-2005 GAS TUBE SURGE PROTECTOR
*C960 CABLE
*C960 CABLE
SEL-2407
200-2006 MOUNTING BRACKET
COMMON POINT EARTH GROUND
* FIELD DETERMINE CABLE LENGTH WITH 20% ALLOWANCE.

2
-
TYPICAL SURGE-PROTECTOR INSTALLATION

NOTES:

1. EXTERIOR ALARM HORN SHALL BE EDWARDS # 876-N5, OR APPROVED EQUAL.
2. OUTDOOR BEACON LIGHT SHALL BE EDWARDS ADAPTABEACON # 94A-N5 OR APPROVED EQUAL, WITH WALLMOUNT BRACKET.
3. PROVIDE SURFACE MOUNT FIBER PATCH PANEL WITH ENCLOSURE WITHIN SWGR SECTION 2 FOR TERMINATION OF FIBER OPTIC CABLES TRANSITIONING IN/OUT OF THE SWITCHGEAR. PATCH PANEL SHALL ACCOMMODATE DIRECT TERMINATION OF UP TO 96 FIBERS USING MODULAR PORT ADAPTER PANELS. PROVIDE PANEL WITH A MINIMUM OF 64 FIBER PORTS. PATCH PANEL SHALL BE EMERSON FIBERCONN OR APPROVED EQUAL.
4. EXHAUST FAN SHALL BE PROVIDED WITH COMBINATION MOTOR STARTER WITH HAND-OFF-AUTO CONTROL SELECTOR SWITCH. IN AUTOMATIC CONTROL MODE, FAN SHALL BE THERMOSTAT CONTROLLED.
5. PROVIDE "BATTERY COMPARTMENT" NAMEPLATE ON DOOR TO BATTERY SECTION.
6. PROVIDE FULLY EQUIPPED TWO-HIGH BREAKER CUBICLE, FURNISHED WITHOUT CIRCUIT BREAKERS.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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carollo

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②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	02/10/10	REVISED FOR ISO METERING - COR#15.1	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
PLAN AND ELEVATION - SHEET 1

SCALE 1/2"=1'
DATE JAN2009
W17.10-E-220
DRAWING NUMBER
2
REV.

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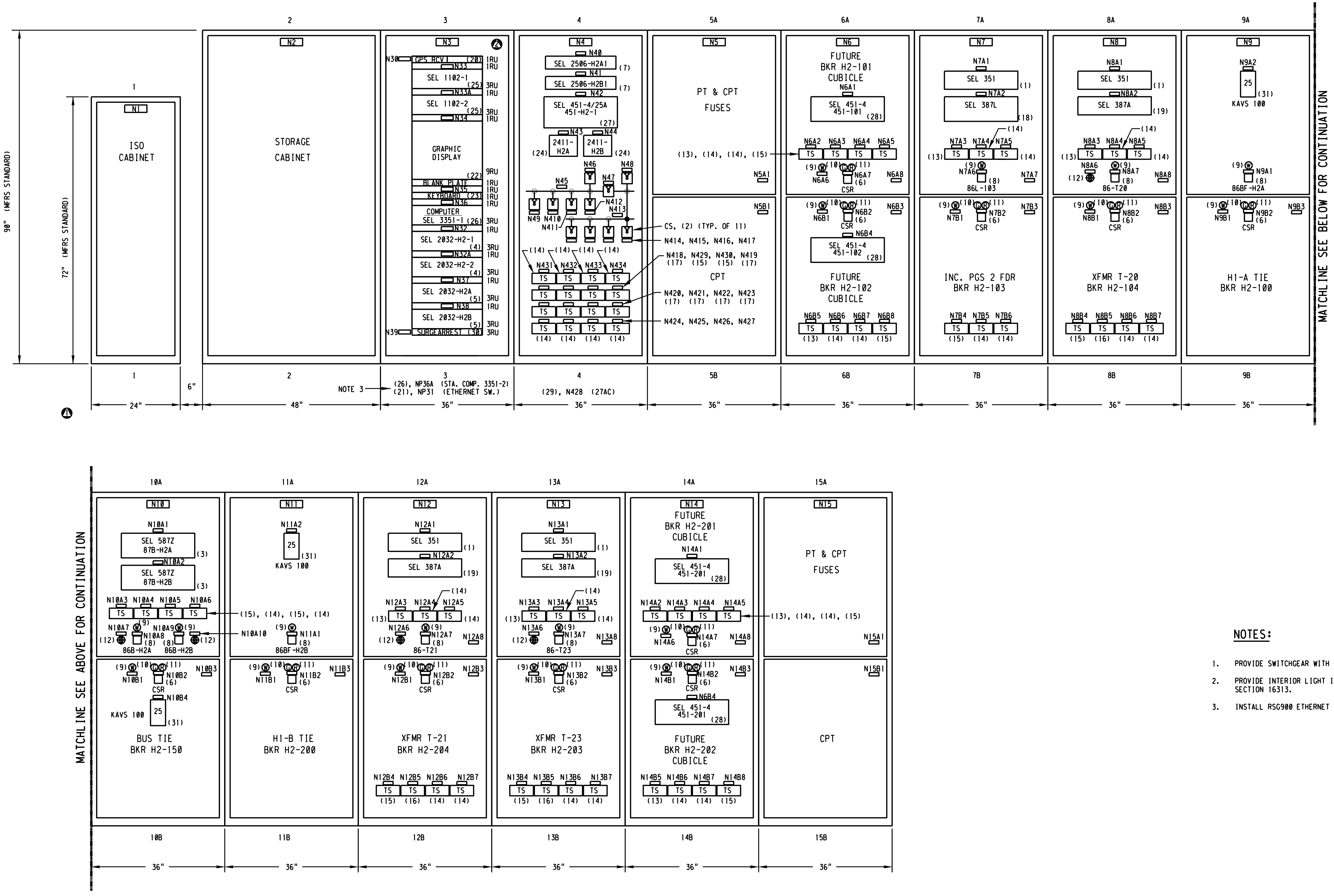

1 SWGR H2 - 15 KV SWITCHGEAR ELEVATION
- NONE

NOTES:

1. PROVIDE SWITCHGEAR WITH EQUIPMENT FOR REMOTE RACKING OF CIRCUIT BREAKER WITH UNIT DOOR CLOSED.
2. PROVIDE INTERIOR LIGHT IN SWITCHGEAR COMPARTMENTS IN ACCORDANCE WITH SPECIFICATION SECTION 16313.
3. INSTALL RSG900 ETHERNET SWITCH AND ADDITIONAL SEL-3351 INSIDE OF PANEL USING PANEL MOUNT BRACKETS.

USER: vuong
DATE: 05-SEP-2014 11:43
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with NEW DRAWING NAME_9-4-14\W1710E221.r03

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	05/22/10	REVISED PER SEL VECP #1	MTH		
1	02/10/10	REVISED FOR ISO METERING - COR#15.1	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
PLAN AND ELEVATION - SHEET 2

SCALE NONE
DATE MAY2010
W17.10-E-221
DRAWING NUMBER
3
REV.

NAMEPLATE SCHEDULE

NP NO.	MTG. LOCATIONS *	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING		
				FIRST LINE	SECOND LINE	THIRD LINE
N1	AS, RD	2 x 6	3/8	UNIT 1	CALIFORNIA ISO △1	RACK CABINET △1
N2	△1 AS	2 x 6	3/8	UNIT 2	STORAGE CABINET	
N3	AS	2 x 6	3/8	UNIT 3	COMMUNICATIONS	PANEL
N30	AS, BS	1 x 3	3/16	GPS RECEIVER		
N31	AS, BS	1 x 3	3/16	MANAGED ETHERNET	SWITCH	
N32	AS, BS	1 x 3	3/16	MASTER	COMM. PROCESSOR	2032-H2-1 △2
N32A	AS, BS	1 x 3	3/16	MASTER	COMM. PROCESSOR	2032-H2-2
N33	AS, BS	1 x 3	3/16	LOAD SHED	PROCESSOR	1102-1
N33A	AS, BS	1 x 3	3/16	LOAD SHED	PROCESSOR	1102-2
N34	AS, BS	1 x 3	3/16	GRAPHIC DISPLAY		△2
N35	AS, BS	1 x 3	3/16	KEYBOARD		
N36	AS, BS	1 x 3	3/16	STATION COMPUTER	3351-1	
N36A	AS	1 x 3	3/16	STATION COMPUTER	3351-2 △2	
N37	AS, BS	1 x 3	3/16	COMM. PROCESSOR	2032-H2A	
N38	AS, BS	1 x 3	3/16	COMM. PROCESSOR	2032-H2B	
N39	AS	1 x 3	3/16	120V AC POWER STRIP		
N4	AS	2 x 6	3/8	UNIT 4	H2 SWGR	CONTROL PANEL
N40	AS, BS	1 x 3	3/16	LOAD SHED SYSTEM	REMOTE I/O MODULE	2506-H2A1
N41	AS, BS	1 x 3	3/16	LOAD SHED SYSTEM	REMOTE I/O MODULE	2506-H2B1
N42	AS, BS	1 x 3	3/16	AUTO-SYNCHRONIZER	451-H2-1	DEVICE 25A
N43	AS, BS	1 x 3	3/16	I/O PROCESSOR	2411-H2A	
N44	AS, BS	1 x 3	3/16	I/O PROCESSOR	2411-H2B	
N45	AS, BS	1 x 3	3/16	H2 SWGR BUS A		
N46	AS, BS	1 x 3	3/16	BKR H2-100	H1-A TIE	REMOTE CONTROL SW
N47	AS, BS	1 x 3	3/16	BKR H2-150	H2 SWGR BUS TIE	REMOTE CONTROL SW
N48	AS, BS	1 x 3	3/16	BKR H2-200	H1-B TIE	REMOTE CONTROL SW
N49	AS, BS	1 x 3	3/16	BKR H2-101	SPARE FDR	REMOTE CONTROL SW
N410	AS, BS	1 x 3	3/16	BKR H2-102	SPARE FDR	REMOTE CONTROL SW
N411	AS, BS	1 x 3	3/16	BKR H2-103	INC. PGS2 FDR	REMOTE CONTROL SW
N412	AS, BS	1 x 3	3/16	BKR H2-104	XFMR T-20 FDR	REMOTE CONTROL SW
N413	AS, BS	1 x 3	3/16	H2 SWGR BUS B		
N414	AS, BS	1 x 3	3/16	BKR H2-204	XFMR T-21 FDR	REMOTE CONTROL SW
N415	AS, BS	1 x 3	3/16	BKR H2-203	XFMR T-23 FDR	REMOTE CONTROL SW
N416	AS, BS	1 x 3	3/16	BKR H2-202	SPARE FDR	REMOTE CONTROL SW
N417	AS, BS	1 x 3	3/16	BKR H2-201	SPARE FDR	REMOTE CONTROL SW
N418	AS, BS	1 x 3	3/16	TS-451-H2-SV1	H1-A BUS POT.	TEST SWITCH
N419	AS, BS	1 x 3	3/16	TS-451-H2-SV2	H1-B BUS POT.	TEST SWITCH
N420	AS, BS	1 x 3	3/16	TS-451-H2-SV3	H2-A BUS POT.	TEST SWITCH
N421	AS, BS	1 x 3	3/16	TS-451-H2-SV4	INC. PGS2 POT.	TEST SWITCH
N422	AS, BS	1 x 3	3/16	TS-451-H2-SV5	H2-B BUS POT.	TEST SWITCH
N423	AS, BS	1 x 3	3/16	TS-451-H2-SV6	INC. PGS1 POT.	TEST SWITCH
N424	AS, BS	1 x 3	3/16	TSA-451-H2-1	DEVICE I/O	TEST SWITCH
N425	AS, BS	1 x 3	3/16	TSB-451-H2-1	DEVICE I/O	TEST SWITCH
N426	AS, BS	1 x 3	3/16	TSC-451-H2-1	DEVICE I/O	TEST SWITCH
N427	AS, BS	1 x 3	3/16	TSD-451-H2-1	DEVICE I/O	TEST SWITCH
N428	AS	1 x 3	3/16	STA. SERVICE	UV ALARM RELAY	DEVICE 27AC
N429	AS, BS	1 x 3	3/16	TS-451-H2-100	CURRENT	TEST SWITCH
N430	AS, BS	1 x 3	3/16	TS-451-H2-200	CURRENT	TEST SWITCH
N431	AS, BS	1 x 3	3/16	TSA-2506-H2A1	DEVICE I/O	TEST SWITCH
N432	AS, BS	1 x 3	3/16	TSB-2506-H2A1	DEVICE I/O	TEST SWITCH
N433	AS, BS	1 x 3	3/16	TSA-2506-H2B1	DEVICE I/O	TEST SWITCH
N434	AS, BS	1 x 3	3/16	TSB-2506-H2B1	DEVICE I/O	TEST SWITCH
N5	AS, RD	2 x 6	3/8	UNIT 5	H2 SWGR BUS A	CPT AND BUS VT'S
N5A1	AS	1 x 3	3/16	CPT AND VT	FUSES	
N5B1	AS	1 x 3	3/16	H2 SWGR BUS A	CPT COMPARTMENT	
N6	AS, RD	2 x 6	3/8	UNIT 6	FUTURE FDR BREAKERS	H2-101 AND H2-102
N6A1	AS, BS	1 x 3	3/16	FEEDER PROTECTION	RELAY 451-101	
N6A2	AS, BS	1 x 3	3/16	TS-451-101-W	CURRENT & POT.	TEST SWITCH
N6A3	AS, BS	1 x 3	3/16	TSA-451-101	DEVICE I/O	TEST SWITCH
N6A4	AS, BS	1 x 3	3/16	TSB-451-101	DEVICE I/O	TEST SWITCH
N6A5	AS, BS	1 x 3	3/16	TS-451-102-X	CURRENT	TEST SWITCH
N6A6	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N6A7	AS, BS	1 x 3	3/16	BKR H2-101	CONTROL SWITCH	
N6A8	AS	1 x 3	3/16	FEEDER BREAKER	H2-101	
N6B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N6B2	AS, BS	1 x 3	3/16	BKR H2-102	CONTROL SWITCH	
N6B3	AS	1 x 3	3/16	FEEDER BREAKER	H2-102	
N6B4	AS, BS	1 x 3	3/16	FEEDER PROTECTION	RELAY 451-102	
N6B5	AS, BS	1 x 3	3/16	TS-451-102-W	CURRENT & POT.	TEST SWITCH
N6B6	AS, BS	1 x 3	3/16	TSA-451-102	DEVICE I/O	TEST SWITCH
N6B7	AS, BS	1 x 3	3/16	TSB-451-102	DEVICE I/O	TEST SWITCH
N6B8	AS, BS	1 x 3	3/16	TS-451-101-X	CURRENT	TEST SWITCH
N7	AS, RD	2 x 6	3/8	UNIT 7	PGS2 INC. FEEDER	H2-103
N7A1	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-103	
N7A2	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	PROT. RELAY	DEVICE 87L-103
N7A3	AS, BS	1 x 3	3/16	TS-351-103	CURRENT & POT.	TEST SWITCH
N7A4	AS, BS	1 x 3	3/16	TSA-351-103	DEVICE I/O	TEST SWITCH
N7A5	AS, BS	1 x 3	3/16	TSB-351-103	DEVICE I/O	TEST SWITCH
N7A6	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	LOCKOUT RELAY	DEVICE 86L-103
N7A7	AS	1 x 3	3/16	PGS2 FEEDER	LINE VT COMPARTMENT	
N7B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N7B2	AS, BS	1 x 3	3/16	BKR H2-103	CONTROL SWITCH	
N7B3	AS	1 x 3	3/16	FEEDER BREAKER	H2-103	
N7B4	AS, BS	1 x 3	3/16	TS-87L-103	CURRENT	TEST SWITCH
N7B5	AS, BS	1 x 3	3/16	TSA-87L-103	DEVICE I/O	TEST SWITCH
N7B6	AS, BS	1 x 3	3/16	TSB-87L-103	DEVICE I/O	TEST SWITCH
N8	AS, RD	2 x 6	3/8	UNIT 8	XFMR T-20 FEEDER	H2-104
N8A1	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-104	
N8A2	AS, BS	1 x 3	3/16	XFMR T-20	DIFFERENTIAL PROT.	DEVICE 87-T20
N8A3	AS, BS	1 x 3	3/16	TS-351-104	CURRENT & POT.	TEST SWITCH
N8A4	AS, BS	1 x 3	3/16	TSA-351-104	DEVICE I/O	TEST SWITCH
N8A5	AS, BS	1 x 3	3/16	TSB-351-104	DEVICE I/O	TEST SWITCH
N8A6	AS, BS	1 x 3	3/16	XFMR T-20	DEVICE 63/49	TRIP CUTOUT
N8A7	AS, BS	1 x 3	3/16	XFMR T-20	DIFF. LOCKOUT RELAY	DEVICE 86-T20
N8A8	AS	1 x 3	3/16	H2-104 LINE VT	COMPARTMENT	

* NAMEPLATE MTG LOCATION:

AS - MOUNTED ON PANEL AS SHOWN
BS - MOUNTED ON BACK OF DEVICE PANEL
RD - MOUNTED REAR DOOR
FD - MOUNTED ON FRONT DOOR

NAMEPLATE SCHEDULE

NP NO.	MTG. LOCATIONS *	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING		
				FIRST LINE	SECOND LINE	THIRD LINE
N8B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N8B2	AS, BS	1 x 3	3/16	BKR H2-104	CONTROL SWITCH	
N8B3	AS	1 x 3	3/16	FEEDER BREAKER	H2-104	
N8B4	AS, BS	1 x 3	3/16	TS-87-T20-P	CURRENT	TEST SWITCH
N8B5	AS, BS	1 x 3	3/16	TS-87-T20-S	CURRENT	TEST SWITCH
N8B6	AS, BS	1 x 3	3/16	TSA-87-T20	DEVICE I/O	TEST SWITCH
N8B7	AS, BS	1 x 3	3/16	TSB-87-T20	DEVICE I/O	TEST SWITCH
N9	AS, RD	2 x 6	3/8	UNIT 9	SWGR H1 BUS A TIE	H2-100
N9A1	AS, BS	1 x 3	3/16	BREAKER FAILURE	LOCKOUT RELAY	DEVICE 86BF-H2A
N9A2	AS, BS	1 x 3	3/16	SYNC CHECK RELAY	DEVICE 25-H2-100	
N9B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N9B2	AS, BS	1 x 3	3/16	BKR H2-100	CONTROL SWITCH	
N9B3	AS	1 x 3	3/16	H1-A TIE BREAKER	H2-100	
N10	AS, RD	2 x 6	3/8	UNIT 10	H2 SWGR BUS TIE	H2-150
N10A1	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	PROTECTION RELAY	DEVICE 87B-H2A
N10A2	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	PROTECTION RELAY	DEVICE 87B-H2B
N10A3	AS, BS	1 x 3	3/16	TS-87B-H2A	CURRENT	TEST SWITCH
N10A4	AS, BS	1 x 3	3/16	TSA-87B-H2A	DEVICE I/O	TEST SWITCH
N10A5	AS, BS	1 x 3	3/16	TS-87B-H2B	CURRENT	TEST SWITCH
N10A6	AS, BS	1 x 3	3/16	TSA-87B-H2B	DEVICE I/O	TEST SWITCH
N10A7	AS, BS	1 x 3	3/16	87B-H2A	TRIP CUTOUT	
N10A8	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	LOCKOUT RELAY	DEVICE 86B-H2A
N10A9	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	LOCKOUT RELAY	DEVICE 86B-H2B
N10A10	AS, BS	1 x 3	3/16	87B-H2B	TRIP CUTOUT	
N10B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N10B2	AS, BS	1 x 3	3/16	BKR H2-150	CONTROL SWITCH	
N10B3	AS	1 x 3	3/16	BUS TIE BREAKER	H2-150	
N10B4	AS, BS	1 x 3	3/16	SYNC CHECK RELAY	DEVICE 25-H2-150	
N11	AS, RD	2 x 6	3/8	UNIT 11	SWGR H1 BUS B TIE	H2-200
N11A1	AS, BS	1 x 3	3/16	BREAKER FAILURE	LOCKOUT RELAY	DEVICE 86BF-H2B
N11A2	AS, BS	1 x 3	3/16	SYNC CHECK RELAY	DEVICE 25-H2-200	
N11B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N11B2	AS, BS	1 x 3	3/16	BKR H2-200	CONTROL SWITCH	
N11B3	AS, BS	1 x 3	3/16	H1-B TIE BREAKER	H2-200	
N12	AS, RD	2 x 6	3/8	UNIT 12	XFMR T-21 FEEDER	H2-204
N12A1	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-204	
N12A2	AS, BS	1 x 3	3/16	XFMR T-21	DIFFERENTIAL PROT.	DEVICE 87-T21
N12A3	AS, BS	1 x 3	3/16	TS-351-204	CURRENT & POT.	TEST SWITCH
N12A4	AS, BS	1 x 3	3/16	TSA-351-204	DEVICE I/O	TEST SWITCH
N12A5	AS, BS	1 x 3	3/16	TSB-351-204	DEVICE I/O	TEST SWITCH
N12A6	AS, BS	1 x 3	3/16	XFMR T-21	DEVICE 63/49	TRIP CUTOUT
N12A7	AS, BS	1 x 3	3/16	XFMR T-21	DIFF. LOCKOUT RELAY	DEVICE 86-T21
N12A8	AS	1 x 3	3/16	H2-204 LINE VT	COMPARTMENT	
N12B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N12B2	AS, BS	1 x 3	3/16	BKR H2-204	CONTROL SWITCH	
N12B3	AS, BS	1 x 3	3/16	FEEDER BREAKER	H2-204	
N12B4	AS, BS	1 x 3	3/16	TS-87-T21-P	CURRENT	TEST SWITCH
N12B5	AS, BS	1 x 3	3/16	TS-87-T21-S	CURRENT	TEST SWITCH
N12B6	AS, BS	1 x 3	3/16	TSA-87-T21	DEVICE I/O	TEST SWITCH
N12B7	AS, BS	1 x 3	3/16	TSB-87-T21	DEVICE I/O	TEST SWITCH
N13	AS, RD	2 x 6	3/8	UNIT 13	XFMR T-23 FEEDER	H2-203
N13A1	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-203	
N13A2	AS, BS	1 x 3	3/16	XFMR T-23	DIFFERENTIAL PROT.	DEVICE 87-T23
N13A3	AS, BS	1 x 3	3/16	TS-351-203	CURRENT & POT.	TEST SWITCH
N13A4	AS, BS	1 x 3	3/16	TSA-351-203	DEVICE I/O	TEST SWITCH
N13A5	AS, BS	1 x 3	3/16	TSB-351-203	DEVICE I/O	TEST SWITCH
N13A6	AS, BS	1 x 3	3/16	XFMR T-23	DEVICE 63/49	TRIP CUTOUT
N13A7	AS, BS	1 x 3	3/16	XFMR T-23	DIFF. LOCKOUT RELAY	DEVICE 86-T23
N13A8	AS	1 x 3	3/16	H2-203 LINE VT	COMPARTMENT	
N13B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N13B2	AS, BS	1 x 3	3/16	BKR H2-203	CONTROL SWITCH	
N13B3	AS	1 x 3	3/16	FEEDER BREAKER	H2-203	
N13B4	AS, BS	1 x 3	3/16	TS-87-T23-P	CURRENT	TEST SWITCH
N13B5	AS, BS	1 x 3	3/16	TS-87-T23-S	CURRENT	TEST SWITCH
N13B6	AS, BS	1 x 3	3/16	TSA-87-T23	DEVICE I/O	TEST SWITCH
N13B7	AS, BS	1 x 3	3/16	TSB-87-T23	DEVICE I/O	TEST SWITCH
N14	AS, RD	2 x 6	3/8	UNIT 14	FUTURE FDR BREAKERS	H2-201 AND H2-202
N14A1	AS, BS	1 x 3	3/16	FEEDER PROTECTION	RELAY 451-201	
N14A2	AS, BS	1 x 3	3/16	TS-451-201-W	CURRENT & POT.	TEST SWITCH
N14A3	AS, BS	1 x 3	3/16	TSA-451-201	DEVICE I/O	TEST SWITCH
N14A4	AS, BS	1 x 3	3/16	TSB-451-201	DEVICE I/O	TEST SWITCH
N1415	AS, BS	1 x 3	3/16	TS-451-202-X	CURRENT	TEST SWITCH
N14A6	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N14A7	AS, BS	1 x 3	3/16	BKR H2-201	CONTROL SWITCH	
N14A8	AS	1 x 3	3/16	FEEDER BREAKER	H2-201	
N14B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N14B2	AS, BS	1 x 3	3/16	BKR H2-202	CONTROL SWITCH	
N14B3	AS	1 x 3	3/16	FEEDER BREAKER	H2-202	
N14B4	AS, BS	1 x 3	3/16	FEEDER PROTECTION	RELAY 451-202	
N14B5	AS, BS	1 x 3	3/16	TS-451-202-W	CURRENT & POT.	TEST SWITCH
N14B6	AS, BS	1 x 3	3/16	TSA-451-202	DEVICE I/O	TEST SWITCH
N14B7	AS, BS	1 x 3	3/16	TSB-451-202	DEVICE I/O	TEST SWITCH
N14B8	AS, BS	1 x 3	3/16	TS-451-201-X	CURRENT	TEST SWITCH
N15	AS, RD	2 x 6	3/8	UNIT 15	H2 SWGR BUS B	CPT AND BUS VT'S
N15A1	AS	1 x 3	3/16	CPT AND VT	FUSES	
N15B2	AS	1 x 3	3/16	H2 SWGR BUS B	CPT COMPARTMENT	

3" ON ORIGINAL DOCUMENT
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(408) 986-8558
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
△3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△2	05/12/10	REVISED PER SEL VECP #1	MTH		
△1	02/10/10	REVISED FOR ISO METERING - COR#15.1	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
NAMEPLATE SCHEDULE

SCALE NONE
DATE MAY2010

W17.10-E-222
DRAWING NUMBER

3
REV.

USER: vuong
DATE: 05-SEP-2014 11:44
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\[illegible] with NEW DRAWING NAME_9-4-14\W1710E222.r03
PLOT SCALE: 0.166667:1
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

DEVICE LIST

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 351; DIRECTIONAL OVERCURRENT AND RECLOSING RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, HORIZONTAL PANEL MOUNT.	SEL 351-7 03517033554XX1
2	DEVICE CS; CIRCUIT BREAKER CONTROL SWITCH WITH INTEGRAL "SMART" LIGHTED NAMEPLATE, SERIES 24, PISTOL GRIP HANDLE, MOMENTARY CONTACTS, SPRING RETURN TO NORMAL POSITION, FIVE DECK FRAME, INTEGRAL AND REPLACEABLE RED AND GREEN LED INDICATORS, 38-140V DC OPERATING RANGE, 11-YEAR LED LIFE WITH TARGET.	ELECTROSWITCH SERIES 24, 24PB57D
3	DEVICE 87B-H2A, 87B-H2B; HIGH IMPEDANCE DIFFERENTIAL RELAY FOR SWITCHGEAR BUS PROTECTION. 5A NOMINAL CURRENT INPUT, 48/125 VDC POWER SUPPLY, PANEL MOUNT.	SEL 587Z 0587Z0X325312XX
4	DEVICE 2032-H2; COMMUNICATION PROCESSOR FOR USE WITH INTEGRATING COMMUNICATIONS AND DISTRIBUTING IRIG-B TIME SYNCHRONIZATION SIGNAL TO SWITCHGEAR DIGITAL PROTECTIVE RELAYS AND OTHER ELECTRONIC DEVICES, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL RACK MOUNT. PROVIDE WITH TWO ETHERNET CARDS, DNP3 PROTOCOL, AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS SHOWN ON DWG. W17.10-E-561.	SEL 2032 203203X444G0G0
5	DEVICE 2032-H2A, 2032-H2B; COMMUNICATION PROCESSOR, SIMILAR TO ITEM NO. 1, ABOVE, EXCEPT PROVIDE WITH ONE ETHERNET CARD. PROVIDE WITH ALL REQUIRED SEL 2812 FIBER TRANSCEIVER PAIRS SHOWN ON DWG. W17.10-E-561.	SEL 2032 203203X444G0XX
6	DEVICE CSR, CIRCUIT BREAKER CONTROL SWITCH, ELECTRICALLY OPERATED CONTROL SWITCH RELAY, FOR BOTH MANUAL AND REMOTE CONTROL OF POWER CIRCUIT BREAKER, 125V DC COIL VOLTAGE, 5 DECKS, STANDARD CIRCUIT B, PISTOL GRIP HANDLE, SPRING RETURN TO NORMAL POSITION, SLIP CONTACTS, WITH TARGET.	ELECTROSWITCH SERIES 24, CSR, 8857DB
7	DEVICE 2506-H2A1,-H2B1; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
8	HIGH-SPEED MULTI-CONTACT LOCKOUT RELAY, MANUAL RESET, 125V DC OPERATING COIL VOLTAGE, 9 DECK.	ELECTROSWITCH SERIES 24, LOR, 7809G
9	WHITE INDICATING LIGHT, 125V DC, WHITE LED LAMP WITH CLEAR TRANSPARENT CAP. PROVIDE WITH LEDTRONICS ULTRA PALE WHITE CLUSTERED REPLACEMENT LAMP OR EQUAL, FOR G.E. ET-16 LAMP ASSY.	G.E. TYPE ET-16 116B6708G43XXXC4
10	GREEN INDICATING LIGHT, 125V DC, GREEN LED LAMP WITH GREEN TRANSPARENT COLOR CAP.	G.E. TYPE ET-16 116B6708G43G73G4
11	RED INDICATING LIGHT, 125V DC, RED LED LAMP WITH RED TRANSPARENT COLOR CAP.	G.E.TYPE ET-16 116B6708G43R73R4
12	DEVICE TCO; SWITCH, ELECTROSWITCH SERIES 101, 90 DEGREE SNAP ACTION, 2-DECK, DOUBLE-POLE, DOUBLE-THROW, INTERRUPTING RATING OF 10A AT 125V DC, 15A AT 120V AC, WITH OVAL HANDLE AND BLACK COLORED NAMEPLATE. ESCUTCHEON PLATE MARKED "CUT-IN" "CUT-OUT".	ELECTROSWITCH SERIES 101 #102602LN* (* FACTORY TO CONFIRM)
13	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T T C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 498A010G01
14	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01
15	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 6-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: X X X X C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 9672A72G01
16	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 8-POLE, 600V, 30A RATED, 4 CURRENT SHORTING ASSY, BLACK HANDLES, SWITCH ARRANTEMENT: C-C C-C C-C X X C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 1586C41G01
17	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 4-POLE, 600V, 30A RATED, 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES, SWITCH ARRANTEMENT: T T T T X X X X X X.	ABB FLEXI-TEST SWITCH TYPE FT-1 9688A79G01
18	DEVICE 387L; LINE CURRENT DIFFERENTIAL RELAY REQUIRING NO SETTINGS ON DIFFERENTIAL OPERATING SYSTEM, 5A NOMINAL AC CURRENT INPUTS. 125 VDC POWER SUPPLY, 7 STANDARD SPEED OUTPUTS, 6 HIGH-SPEED OUTPUTS, 6 6 OPTOISOLATED INPUTS, 1300nm 62.5 MICRON FIBER-OPTIC COMMUNICATIONS.	SEL 387L 0387L03D03X54X1
19	DEVICE 387A; CURRENT DIFFERENTIAL RELAY FOR TWO WINDING TRANSFORMER PROTECTION, PROGRAMMABLE SINGLE- OR DUAL-SLOPE PERCENTAGE RESTRAINT, SUPERVISED BY CHOICE OF SECOND AND FOURTH HARMONIC BLOCKING OR RESTRAINT ELEMENTS, PLUS FIFTH HARMONIC AND DC BLOCKING ELEMENTS. PROVIDE RELAY WITH 5A NOMINAL PHASE AND 5A NEUTRAL AC CURRENT INPUTS, 125 VDC POWER SUPPLY, STANDARD I/O CONFIGURATION WITH 6 INPUTS AND 8 OUTPUT CONTACTS, 125 VDC CONTROL INPUT VOLTAGE, DNP3 LEVEL 2 SLAVE, HORIZONTAL PANEL MOUNT.	SEL 387A 0387A0103X3X341
20	GPS SATELLITE SYNCHRONIZED CLOCK, UNIVERSAL POWER SUPPLY FOR 18-300 VDC, BUILT-IN TIME DISPLAY, SIX DEMODULATED IRIG-B TIME CODE OUTPUTS, 19-INCH RACK MOUNT WITH RACK MOUNT BRACKET P/N 190-2981. PROVIDE WITH EXTERIOR ACTIVE GPS ANTENNA (P/N 235-0103), RG-6 CABLE (P/N C960, LENGTH DETERMINED BY MANUFACTURER) WITH TNC CONNECTORS, GAS TUBE SURGE PROTECTOR P/N 200-2005 AND SURGE PROTECTOR MOUNTING BRACKET P/N 200-2006.	SEL 2407 24070001B W/ ACCESSORIES

DEVICE LIST (CONT.)

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
21	MANAGED ETHERNET SWITCH, PANEL MOUNT (BRACKET MOUNTED INSIDE COMM. PANEL), 9-PORT, -40 TO 185 DEG. F OPERATING TEMPERATURE RANGE, 5 % TO 95 % (NON-CONDENSING) RELATIVE HUMIDITY, FRONT LED INDICATORS, 88 - 300V DC POWER SUPPLY, (7) 10/100BASE-TX PORTS, (2) 100FX MULTIMODE 1300nm FIBER PORTS (ST CONNECTORS), IEEE 1613 COMPLIANT FOR CLASS 2 ENVIRONMENTAL STANDARD FOR ELECTRIC POWER SUBSTATIONS, UL LISTED, FCC PART 15, CLASS A COMPLIANT, PROVIDE WITH ALARM RELAY CONTACTS.	RUGGEDCOM RS900 RS900-H1-P-MTMT-TX △1
22	GRAPHIC DISPLAY; RACK MOUNT, 19-INCH COLOR ACTIVE MATRIX TFT LIQUID CRYSTAL DISPLAY, CAPACITIVE TOUCHSCREEN, PROTECTED FROM IMPACT, 1280 x 1024 NATIVE RESOLUTION, 0 TO 50 DEG. C OPERATING TEMPERATURE RANGE, SHOCK AND VIBRATION RESISTANT, 90-264V, 100W, AC POWER SUPPLY FOR USE AT 125V DC.	AYDIN DISPLAYS CAMBRIDGE SERIES CFP19R2
23	KEYBOARD; 19-INCH RACK MOUNT USB KEYBOARD AND LOCKABLE DRAWER. KEYBOARD WITH 104 KEYS AND CURSOR CONTROL KEYS, NUMERIC KEYPAD, PADDED WRIST-REST AND INTEGRATED TOUCHPAD DEVICE, 10 MILLION LIFE CYCLE SWITCH LIFE. PROVIDE WITH USB CABLE. FINISH COLOR OF THE DRAWER SHALL MATCH THE COLOR OF THE CONTROL PANEL.	ADESSO ACK-730UB-MRP, OR APPROVED EQUAL
24	DEVICE 2411; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 5, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS-232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 22 DIGITAL INPUTS AND 15 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X1A3A3A0100
25	DEVICE 1102, LOAD SHED PROCESSOR; COMPUTING PLATFORM WITH PENTIUM M 1.1 GHZ CPU WITH 1 GB DDR SDRAM, 125V DC POWER SUPPLY, 16 SERIAL PORTS, PORT 1 SELECTABLE BETWEEN 10/100BASE-T AND 100BASE-FX ETHERNET CONNECTION, PORT 2 CONFIGURED FOR 100BASE-FX, 1 GB PRIMARY COMPACT FLASH MEMORY, 19-INCH HORIZONTAL RACK MOUNT. FURNISH WITH SEL-2815 FIBER TRANSCEIVERS AS SHOWN ON DWG. SD317A-W17-E-561 FOR MIRRORED BIT COMMUNICATIONS WITH REMOTE I/O MODULES. ADDITIONAL REQUIREMENTS SPECIFIED IN SPECIFICATION SECTION 16930.	SEL 1102-1, 1102-2 △1 1102043X562XXHXX KEY: 9607
26	DEVICE 3351, STATION COMPUTERR; COMPUTING PLATFORM WITH PENTIUM M 1.1 GHZ CPU WITH 1 GB DDR SDRAM, 125V DC POWER SUPPLY, 16 SERIAL PORTS, 10/100BASE-T ETHERNET INTERFACE, 8 GB PRIMARY AND 8 GB SECONDARY COMPACT FLASH MEMORY, 19-INCH HORIZONTAL RACK MOUNT, WINDOWS XP PRO OPERATING SYSTEM, MASTER AND SLAVE PROTOCOLS INCLUDING DNP3 SERIAL, DNP3 LAN/WAN, MODBUS SERIAL, AND MODBUS TCP/IP. PROVIDE WITH CALCULATOR, PORT SERVER AND DATA LOGGER APPLICATIONS. ADDITIONAL REQUIREMENTS SPECIFIED IN SPECIFICATION SECTION 16930.	SEL 3351 335135788H0004EG700 KEY: 0476
27	DEVICE 451-4 (25A); BAY CONTROL, AUTOMATION, AND PROTECTION SYSTEM RELAY TO PROVIDE AUTOMATIC SYNCHRONIZER CONTROL. RELAY SHALL BE HORIZONTAL PANEL MOUNT, (6) INDEPENDENT 300 VAC CONTINUOUS VOLTAGE INPUTS, 5A NOMINAL CURRENT INPUTS, 125 VDC POWER SUPPLY, STANDARD INPUT/OUTPUT, ADDITIONAL 8 INDEPENDENT INPUTS AND 13 STANDARD FORM A AND 2 FORM C OUTPUTS, DUAL MIRRORED BIT COMMUNICATION CHANNELS, ETHERNET CARD WITH (1) 10/100BASE-T AND (1) 10BASE-FL CONNECTOR. SYSTEM SHALL INCLUDE: GENERATOR FREQUENCY AND VOLTAGE MATCHING CONTROL BREAKER CLOSE DELAY COMPENSATION ENABLE ANTI-MOTORING INPUTS WITH TWO SELECTABLE MASTER FREQUENCY TRACKING INPUTS. SOFT SYNCH-SCOPE SYSTEM CLOSE FAIL ALARM CLOSE LOCKOUT ALARM SYNCH OPERATIONAL PARAMETERS DISPLAY 24 FRONT PANEL LED INDICATORS AND 12 MEMBRANE PUSHBUTTONS	SEL 451-4 045144152B3AX331XXXXX WITH ADDITIONAL AUTO-SYNC PROGRAMMING
28	DEVICE 451-101/102 AND 451-201/202; OVERCURRENT PROTECTION AND CONTROL WITH BREAKER FAILURE PROTECTION FOR TWO FEEDER DISTRIBUTION BREAKERS, RELAY SHALL BE HORIZONTAL PANEL MOUNT, RATED FOR 300V AC VOLTAGE INPUT, 5A NOMINAL CURRENT INPUTS, 125V DC POWER SUPPLY, STANDARD INPUT/OUTPUT WITH 3 HIGH-CURRENT INTERRUPTING OUTPUTS, 2 STANDARD SPEED FORM A OUTPUTS, 3 STANDARD SPEED FORM C OUTPUTS AND 7 LEVEL-SENSITIVE INPUTS. PROVIDE ETHERNET CARD WITH (1) 10/100BASE-T AND (1) 10BASE-FL CONNECTOR.	SEL 451-4 045144152B3AX31XXXXXX
29	DEVICE 27AC; AC TIMING RELAY, CLASS 8501, TYPE X, 0.2 - 60 SEC. OFF DELAY TIMING MODE, TWO TIMED CONVERTIBLE CONTACTS, 208V AV COIL.	SQUARE D, CLASS 8501 XO00XTD1V08
30	POWER STRIP; (9) NEMA 5-15R OUTLETS, 125V, 15A, 1875W, SURGE PROTECTED UP TO 1700 JOULES (L-N, L-G, N-G), INTEGRAL BREAKER, ROCKER SWITCH AND INDICATING LEDS. UL AND ETL LISTED AND APPROVED. SURFACE MOUNT WITHIN PANEL.	APC SURGEARREST NET9RMBLK OR APPROVED EQUAL
31	DEVICE 25; SYNCHRONISM CHECK RELAY, 48V-250V DC POWER SUPPLY, 57.7/120V INPUT VOLTAGE (Vn) RATING, FLUSH MOUNTED.	AREVA TYPE KAVS100 KAVS 100-01-T1-5-J-E

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0 1 2 3

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3350 scott blvd., bldg. 11
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(408) 986-8558
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
△2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△1	05/22/10	REVISED PER SEL VECP #1	MTH		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
DEVICE LIST

SCALE NONE
DATE MAY2010

W17.10-E-222A
DRAWING NUMBER

2
REV.

USER: vuong
DATE: 05-SEP-2014 11:49
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets[illegible]with NEW DRAWING NAME_9-4-14\W1710E222a.r02

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REF 6: REF6$FILENAME
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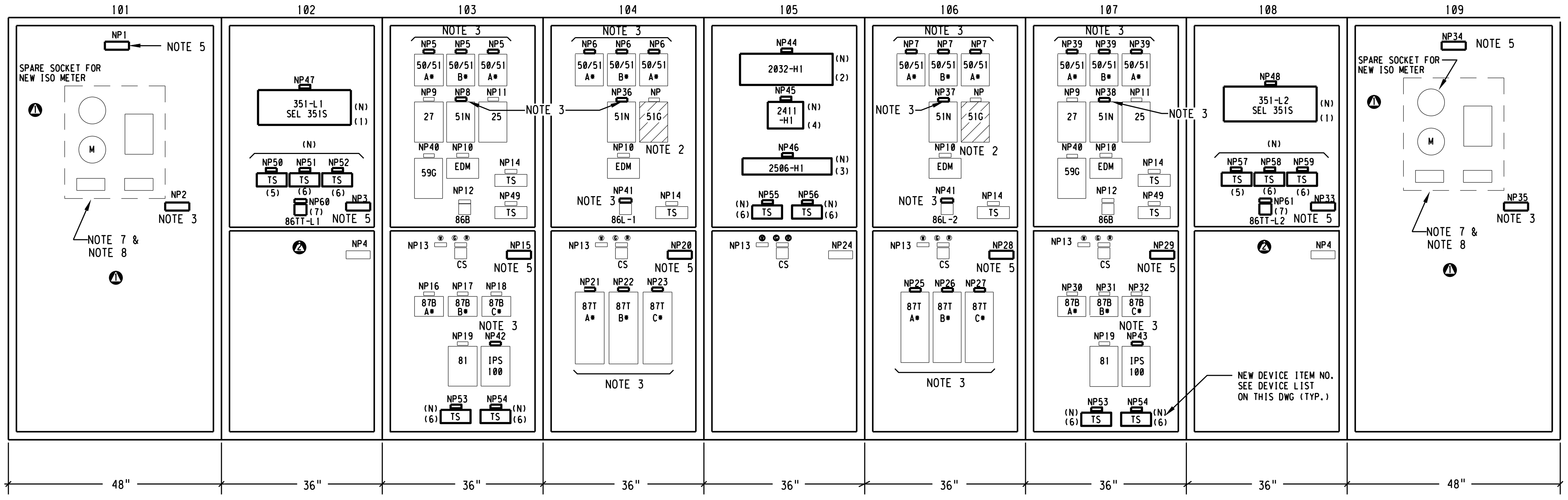
USER: vuong
DATE: 05-SEP-2014 13:51
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet[illegible] with NEW DRAWING NAME_9-4-14\W1710E223.r03



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FRONT ELEVATION

NONE

NOTES:

1. NEW DEVICES AND NAMEPLATES ARE SHOWN ON FRONT ELEVATION IN HEAVY LINES.
2. DISCONNECT AND REMOVE THESE 51G DEVICES (XFMR GROUND RELAY) AND PROVIDE BLANK PLATE. REMOVE NAMEPLATE AS REQUIRED.
3. REPLACE EXISTING NAMEPLATE WITH NEW NAMEPLATE AS INDICATED.
4. NAMEPLATES MARKED WITH ASTERISK (*) ARE NEW. REMOVE EXISTING NAMEPLATES AND PROVIDE NEW NAMEPLATES AS SHOWN.
5. REPLACE EXISTING NAMEPLATE WITH NEW NAMEPLATES AS INDICATED. NAMEPLATES SHALL BE PROVIDED ON THE FRONT HINGED PANEL AND EXTERIOR REAR DOOR OF THE SWITCHGEAR. NAMEPLATE SIZE AND ENGRAVING STYLE SHALL MATCH EXISTING.
6. PROVIDE NEW NAMEPLATE FOR NEW DEVICES.
7. ⚠1 PG&E WILL MAKE FINAL WIRE TERMINATIONS ON THEIR METERING TRANSFORMER CURRENT AND VOLTAGE CIRCUITS FOR NEW ISO METERING CT AND VT CONNECTIONS.
8. PROVIDE NEW CALIFORNIA ISO COMPLAINT METERING IN THESE SECTIONS.

PANEL NAMEPLATE SCHEDULE

NOTE 4 (TYP.) →

	ITEM NO.	FACE COLOR	ENGRAVING	MTG. LOCATIONS	* SIZE
*	NP1	WHITE	PG&E INCOMING LINE 1 CKT L1107	AS, RD	MATCH EXISTING
*	NP2	WHITE	PG&E/ISO REVENUE METERING - LINE 1 ⚠1	AS	1" X 3"
*	NP3	WHITE	LINE 1 PT	AS, RD	MATCH EXISTING
	NP4	WHITE	EMPTY CUBICLE	AS	1" X 3"
*	NP5	WHITE	PG&E LINE 1 O/C DEV. 50/51- (A*),(B*),(C*)	AS, BS	1" X 3"
*	NP6	WHITE	H1A-H2A TIE O/C DEV. 50/51- (A*),(B*),(C*)	AS, BS	↓
*	NP7	WHITE	H1B-H2B TIE O/C DEV. 50/51- (A*),(B*),(C*)	AS, BS	↓
*	NP8	WHITE	PG&E LINE 1 RESIDUAL O/C DEV. 51N	AS, BS	↓
	NP9	WHITE	UNDERVOLTAGE RELAY DEV. 27	AS, BS	↓
	NP10	WHITE	POWER MONITOR	AS, BS	↓
	NP11	WHITE	SYNC CHECK RELAY DEV. 25	AS, BS	↓
	NP12	WHITE	LOCKOUT RELAY DEV. 86B	AS, BS	↓
	NP13	WHITE	CLOSING SPRING CHARGED	AS, BS	↓
	NP14	WHITE	POWER MONITOR TEST SWITCH	AS, BS	↓
*	NP15	WHITE	INCOMING LINE 1 MAIN BREAKER	AS, RD	MATCH EXISTING
	NP16	WHITE	BUS A DIFF. RELAY DEV. 87B - A*	AS, BS	1" X 3"
	NP17	WHITE	BUS A DIFF. RELAY DEV. 87B - B*	AS, BS	↓
	NP18	WHITE	BUS A DIFF. RELAY DEV. 87B - B*	AS, BS	↓
	NP19	WHITE	UNDERFREQ. RELAY DEV. 81	AS, BS	↓
*	NP20	WHITE	H1A-H2A TIE BREAKER	AS, RD	MATCH EXISTING
*	NP21	WHITE	H1A-H2A TIE DEV. 87L-1 - A*	AS, BS	1" X 3"
*	NP22	WHITE	H1A-H2A TIE DEV. 87L-1 - B*	AS, BS	↓
*	NP23	WHITE	H1A-H2A TIE DEV. 87L-1 - C*	AS, BS	↓
	NP24	WHITE	TIE BREAKER	AS, RD	1" X 3"
*	NP25	WHITE	H1B-H2B TIE DEV. 87L-2 - A*	AS, BS	1" X 3"
*	NP26	WHITE	H1B-H2B TIE DEV. 87L-2 - B*	AS, BS	1" X 3"
*	NP27	WHITE	H1B-H2B TIE DEV. 87L-2 - C*	AS, BS	1" X 3"
*	NP28	WHITE	H1B-H2B TIE BREAKER	AS, RD	1" X 3"
*	NP29	WHITE	INCOMING LINE 2 MAIN BREAKER	AS, RD	MATCH EXISTING

NAMEPLATE MTG LOCATION:
AS - MOUNTED ON PANEL AS SHOWN
BS - MOUNTED ON BACK OF RELAY PANEL
RD - MOUNTED SWITCHGEAR REAR DOOR

PANEL NAMEPLATE SCHEDULE (CONTINUED)

NOTE 4 (TYP.) →

NOTE 6 (NP44–NP59)

	ITEM NO.	FACE COLOR	ENGRAVING	MTG. LOCATIONS	* SIZE
	NP30	WHITE	BUS B DIFF. RELAY DEV. 87B - A*	AS, BS	1" X 3"
	NP31	WHITE	BUS B DIFF. RELAY DEV. 87B - B*	AS, BS	↓
	NP32	WHITE	BUS B DIFF. RELAY DEV. 87B - C*	AS, BS	↓
*	NP33	WHITE	LINE 2 PT	AS, RD	MATCH EXISTING
*	NP34	WHITE	PG&E INCOMING LINE 2 CKT CP3/C1151	AS, RD	MATCH EXISTING
*	NP35	WHITE	PG&E/ISO REVENUE METERING - LINE 2 ⚠1	AS	1" X 3"
*	NP36	WHITE	H1A-H2A TIE RESIDUAL O/C DEV. 51N	AS, BS	1" X 3"
*	NP37	WHITE	H1B-H2B TIE RESIDUAL O/C DEV. 51N	AS, BS	↓
*	NP38	WHITE	PG&E LINE 2 RESIDUAL O/C DEV. 51N	AS, BS	↓
*	NP39	WHITE	PG&E LINE 2 O/C DEV. 50/51 - (A*),(B*),(C*)	AS, BS	↓
	NP40	WHITE	GROUND DETECTION OVER VOLTAGE RELAY DEV. 59G	AS, BS	↓
*	NP41	WHITE	LOCKOUT RELAY DEVICE 86L-1 (86L-2)	AS, BS	↓
*	NP42	WHITE	BACKUP INTERTIE PROT. - L1107	AS, BS	↓
*	NP43	WHITE	BACKUP INTERTIE PROT. - C1151	AS, BS	↓
	NP44	WHITE	COMM. PROCESSOR 2032-H1	AS, BS	↓
	NP45	WHITE	I/O PROCESSOR 2411-H1	AS, BS	↓
	NP46	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-H1	AS, BS	↓
	NP47	WHITE	PG&E LINE 1 INTERTIE PROT. RELAY 351S	AS, BS	↓
	NP48	WHITE	PG&E LINE 2 INTERTIE PROT. RELAY 351S	AS, BS	↓
	NP49	WHITE	TEST SWITCH BUS DIFF. RELAY	AS, BS	↓
	NP50	WHITE	TS-351-L1 CURRENT & POT. TEST SWITCH	AS, BS	↓
	NP51	WHITE	TSA-351-L1 DEVICE I/O TEST SWITCH	AS, BS	↓
	NP52	WHITE	TSB-351-L1 DEVICE I/O TEST SWITCH	AS, BS	↓
	NP53	WHITE	TSA-IPS100-L1 (-L2) DEVICE I/O TEST SWITCH	AS, BS	↓
	NP54	WHITE	TSB-IPS100-L1 (-L2) DEVICE I/O TEST SWITCH	AS, BS	↓
	NP55	WHITE	TSA-2506-H1 DEVICE I/O TEST SWITCH	AS, BS	↓
	NP56	WHITE	TSB-2506-H1 DEVICE I/O TEST SWITCH	AS, BS	↓
	NP57	WHITE	TS-351-L2 CURRENT & POT. TEST SWITCH	AS, BS	↓
	NP58	WHITE	TSA-351-L2 DEVICE I/O TEST SWITCH	AS, BS	↓
	NP59	WHITE	TSB-351-L2 DEVICE I/O TEST SWITCH	AS, BS	↓
	NP60	WHITE	86TT-L1 DTT LOCKOUT RELAY	AS, BS	↓
	NP61	WHITE	86TT-L2 DTTLOCKOUT RELAY	AS, BS	↓

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DEVICE LIST

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 351S-L1 (-L2); PROTECTION AND BREAKER CONTROL RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, HORIZONTAL PANEL MOUNT.	SEL 351S-7 0351S71343554X1 2
2	DEVICE 2032-H1; COMMUNICATION PROCESSOR FOR USE WITH INTEGRATING COMMUNICATIONS AND DISTRIBUTING IRIG-B TIME SYNCHRONIZATION SIGNAL TO SWITCHGEAR DIGITAL PROTECTIVE RELAYS AND OTHER ELECTRONIC DEVICES, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL PANEL MOUNT. PROVIDE WITH ONE ETHERNET CARD, DNP3 PROTOCOL, AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS AND SEL-2886 INTERFACE CONVERTERS SHOWN ON DWG. W17.10-E-561.	SEL 2032 203233X444G0XX PROVIDE SEL-9321 125V-5V DC POWER SUPPLY AND CABLES FOR SEL-2886 CONVERTERS
3	DEVICE 2506-H1; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
4	DEVICE 2411-H1; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 2, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS-232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 22 DIGITAL INPUTS AND 15 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X1A3A3A0100
5	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T C-C C-C C-C T.	ABB FLEXI-TEST SWITCH TYPE FT-1 714B325G32
6	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01
7	HIGH-SPEED MULTI-CONTACT LOCKOUT RELAY. MANUAL RESET, 125 VDC OPERATING COIL VOLTAGE, 3 DECK.	ELECTROSWITCH SERIES 24, LOR, 7803D

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(408) 986-8558
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
⚠3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
⚠2	04/24/10	ADDED PG&E DTT LOCKOUT RELAY	CGT		
⚠1	02/10/10	REVISED FOR ISO METERING - COR#15.1	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1 MODIFICATION
ELEVATION, NAMEPLATE SCHEDULE AND NEW DEVICE LIST

SCALE NONE
DATE APR, 2010
W17.10-E-223
DRAWING NUMBER
3
REV.

M1 SWITCHGEAR BUS B

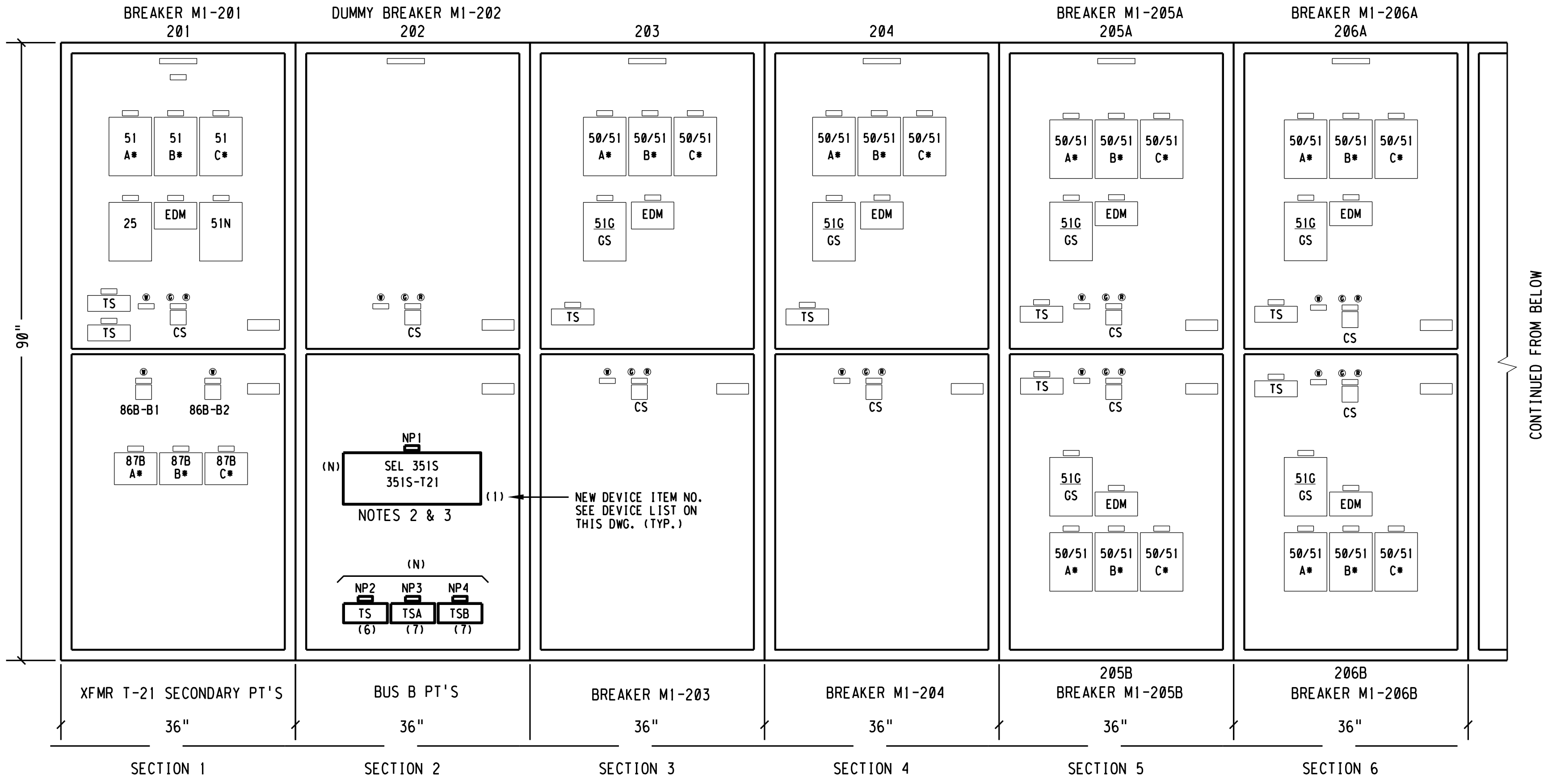
PANEL NAMEPLATE SCHEDULE

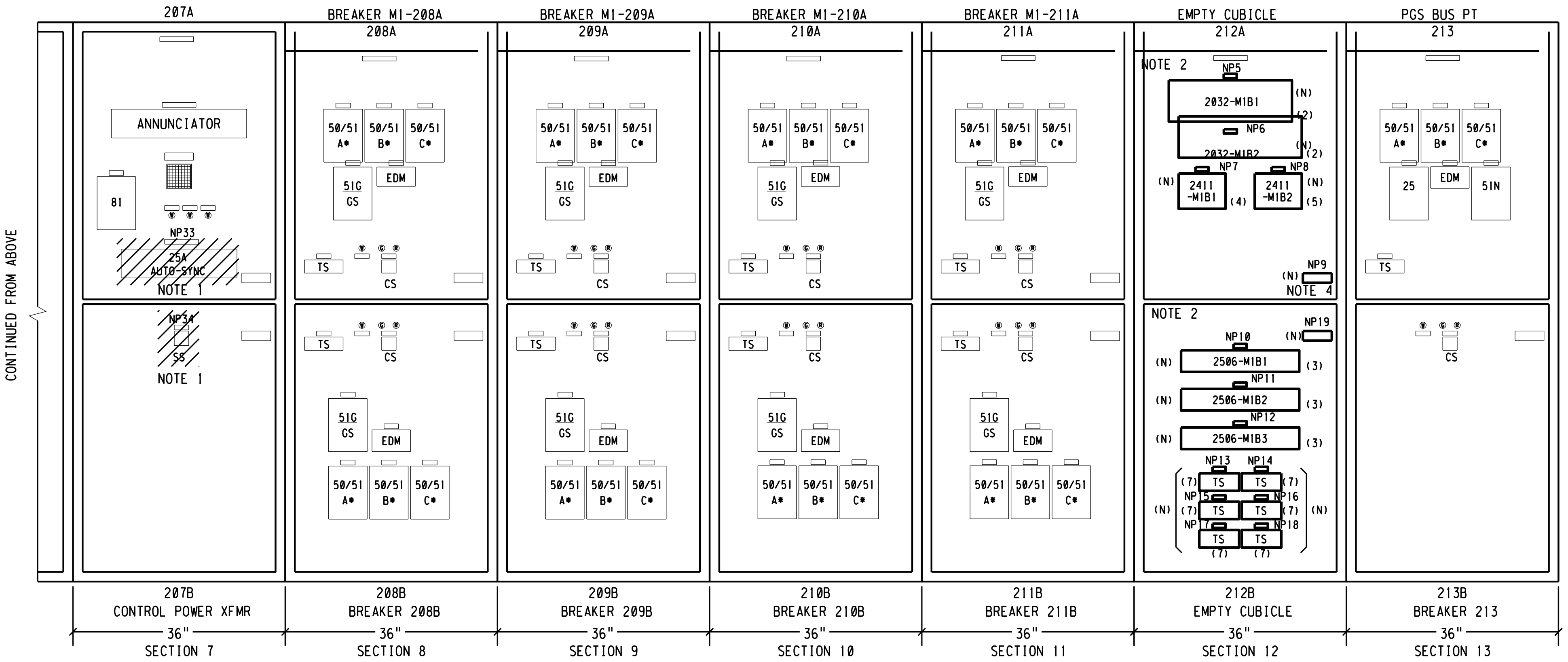
ITEM NO.	FACE COLOR	ENGRAVING	MTG. LOCATIONS *	SIZE
NP1	WHITE	AUTO XFR & BACKUP O/C DEV. 351S-T21	AS, BS	1" X 3"
NP2	WHITE	TS-351S-T21 CURRENT & POT. TEST SWITCH	AS, BS	
NP3	WHITE	TSA-351S-T21 DEVICE I/O TEST SWITCH	AS, BS	
NP4	WHITE	TSB-351S-T21 DEVICE I/O TEST SWITCH	AS, BS	
NP5	WHITE	COMM. PROCESSOR 2032-M1B1	AS, BS	
NP6	WHITE	COMM. PROCESSOR 2032-M1B2	AS, BS	
NP7	WHITE	I/O PROCESSOR 2411-M1B1	AS, BS	
NP8	WHITE	I/O PROCESSOR 2411-M1B2	AS, BS	
NP9	WHITE	COMMUNICATIONS PANEL	AS, RD	MATCH EXISTING
NP10	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-M1B1	AS, BS	1" X 3"
NP11	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-M1B2	AS, BS	
NP12	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-M1B3	AS, BS	
NP13	WHITE	TSA-2506-M1B1 DEVICE I/O TEST SWITCH	AS, BS	
NP14	WHITE	TSB-2506-M1B1 DEVICE I/O TEST SWITCH	AS, BS	
NP15	WHITE	TSA-2506-M1B2 DEVICE I/O TEST SWITCH	AS, BS	
NP16	WHITE	TSB-2506-M1B2 DEVICE I/O TEST SWITCH	AS, BS	
NP17	WHITE	TSA-2506-M1B3 DEVICE I/O TEST SWITCH	AS, BS	
NP18	WHITE	TSB-2506-M1B3 DEVICE I/O TEST SWITCH	AS, BS	
NP19	WHITE	LOAD SHED SYSTEM REMOTE I/O PANEL	AS, RD	MATCH EXISTING

* NAMEPLATE MTG LOCATION:
AS - MOUNTED ON PANEL AS SHOWN
BS - MOUNTED ON BACK OF RELAY PANEL
RD - MOUNTED SWITCHGEAR REAR DOOR

NOTES:

1. EXISTING BASLER AUTO SYNCHRONIZING RELAY (DEVICE 25A), SYNCH SWITCH (DEVICE SS) AND ASSOCIATED WIRING SHALL BE REMOVED. PROVIDE BLANK PLATES TO COVER DEVICE CUTOUTS IN HINGED DOORS. RETURN AUTO SYNCHRONIZER TO THE DISTRICT.
2. CONTRACTOR SHALL PROVIDE ADDITIONAL 600V, 30A, 12-POINT TERMINAL BLOCKS WITHIN SWITCHGEAR CUBICLES FOR TERMINATION OF NEW DEVICE WIRING.
3. CONTRACTOR SHALL FIELD VERIFY DEPTH OF SPACE BEHIND FRONT HINGED PANEL AND PROVIDE PROJECTION MOUNT TYPE RELAY IF REQUIRED TO AVOID CONFLICT WITH DRAWOUT EQUIPMENT.
4. REPLACE EXISTING NAMEPLATE WITH NEW NAMEPLATE AS INDICATED. NAMEPLATES SHALL BE PROVIDED ON THE FRONT HINGED PANEL AND EXTERIOR REAR DOOR OF THE SWITCHGEAR. NAMEPLATE SIZE AND ENGRAVING STYLE SHALL MATCH EXISTING.
5. INSTALL NEW 24-PORT, WALL MOUNTED, ENCLOSED, FIBER PATCH PANEL INSIDE SWITCHGEAR BUILDING. ROUTE NEW FIBER OPTIC CABLES FROM H2 SWGR IN MIN. 1" RSG FROM POINT OF ENTRY INTO SWGR BUILDING TO PATCH PANEL PRIOR TO TERMINATING AT NEW DEVICES IN SWGR SECTION 12. PATCH PANEL SHALL BE EMERSON FIBERCONN, OR APPROVED EQUAL.





DEVICE LIST

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 351S-T21; PROTECTION AND BREAKER CONTROL RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, CONFIGURABLE LABELS, HORIZONTAL PANEL MOUNT.	SEL 351S-7 0351S71343554X1 NOTE 3
2	DEVICE 2032-M1B1, -M1B2; COMMUNICATION PROCESSOR FOR USE WITH INTEGRATING COMMUNICATIONS AND DISTRIBUTING IRIG-B TIME SYNCHRONIZATION SIGNAL TO SWITCHGEAR DIGITAL PROTECTIVE RELAYS AND OTHER ELECTRONIC DEVICES, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL PANEL MOUNT. PROVIDE WITH ONE ETHERNET CARD, DNP3 PROTOCOL, AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS AND SEL-2886 INTERFACE CONVERTERS SHOWN ON DWG. W17.10-E-562.	SEL 2032 203233X444G0XX PROVIDE (2) SEL-9321 125VDC-5VDC POWER SUPPLIES AND CABLES FOR SEL-2886 SERIAL CONVERTERS
3	DEVICE 2506-M1B1,-M1B2,-M1B3; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
4	DEVICE 2411-M1B1; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 2, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS-232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 2 DIGITAL INPUTS AND 35 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X2X2X2X0100
5	DEVICE 2411-M1B2; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 2, PROCESSOR SHALL BE SIMILAR TO ITEM 4, EXCEPT CONFIGURED WITH 26 DIGITAL INPUTS AND 11 DIGITAL OUTPUTS.	SEL 2411 241101A2X3A3A3A0100
6	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T C-C C-C C-C T.	ABB FLEXI-TEST SWITCH TYPE FT-1 714B325G32
7	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01

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0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012	RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST MODIFICATION
ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST
SHEET NO. 184

SCALE NONE
DATE JAN2009
W17.10-E-224
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 25-SEP-2014 13:18
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REF 6: REF6$FILENAME
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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

M1 SWITCHGEAR BUS A

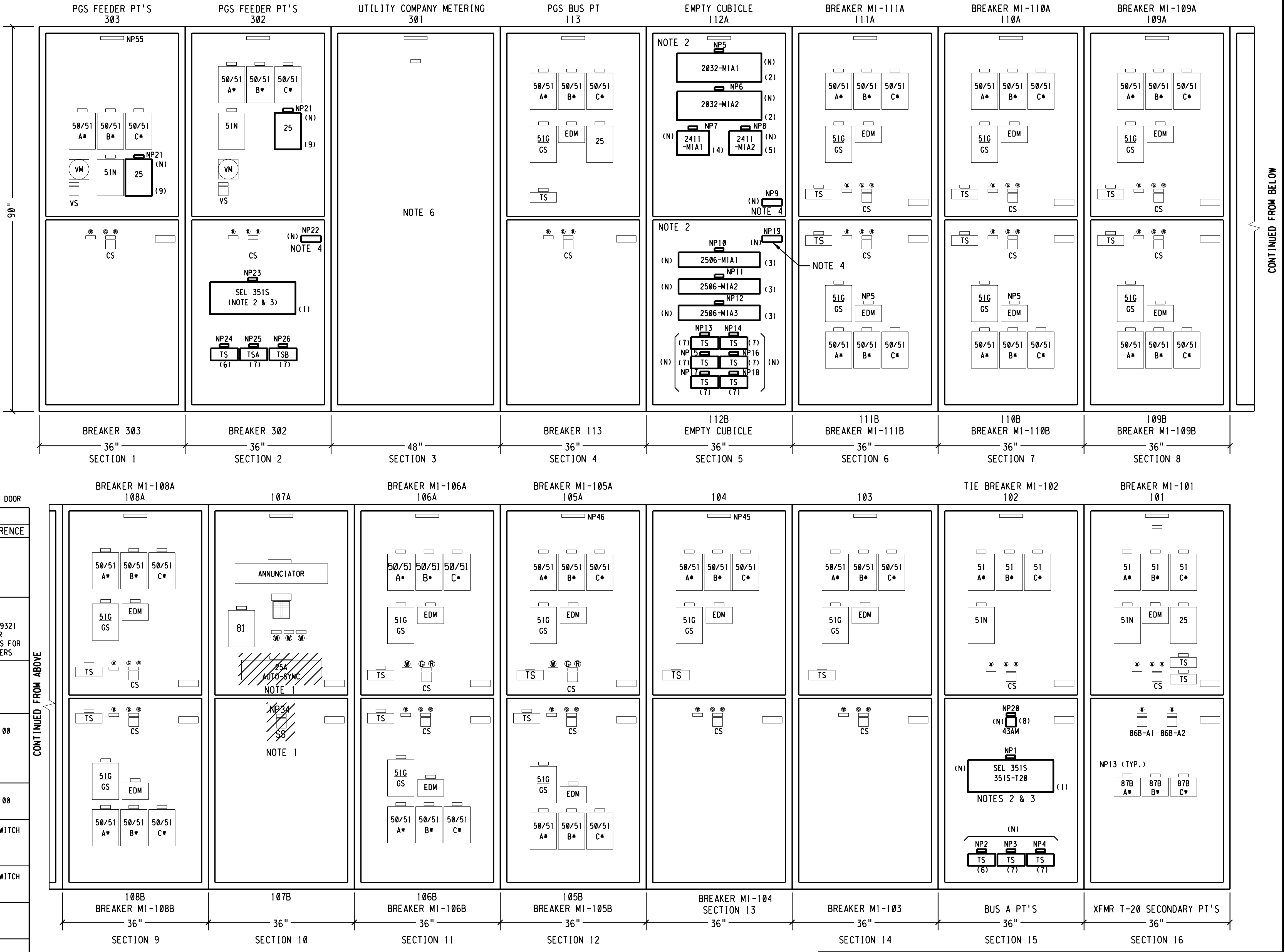
PANEL NAMEPLATE SCHEDULE

ITEM NO.	FACE COLOR	ENGRAVING	MTG. LOCATIONS *	SIZE
NP1	WHITE	AUTO TRANSFER & BACKUP O/C DEV. 351-T20	AS, BS	1" x 3"
NP2	WHITE	TS-351S-T20 CURRENT & POT. TEST SWITCH	AS, BS	1" x 3"
NP3	WHITE	TSA-351S-T20 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP4	WHITE	TSB-351S-T20 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP5	WHITE	COMM. PROCESSOR 2032-M1A1	AS, BS	1" x 3"
NP6	WHITE	COMM. PROCESSOR 2032-M1A2	AS, BS	1" x 3"
NP7	WHITE	I/O PROCESSOR 2411-M1A1	AS, BS	1" x 3"
NP8	WHITE	I/O PROCESSOR 2411-M1A2	AS, BS	1" x 3"
NP9	WHITE	COMMUNICATIONS PANEL	AS, RD	MATCH EXISTING
NP10	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-M1A1	AS, BS	1" x 3"
NP11	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-M1A2	AS, BS	1" x 3"
NP12	WHITE	LOAD SHED SYSTEM REMOTE I/O MODULE 2506-M1A3	AS, BS	1" x 3"
NP13	WHITE	TSA-2506-M1A1 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP14	WHITE	TSB-2506-M1A1 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP15	WHITE	TSA-2506-M1A2 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP16	WHITE	TSB-2506-M1A2 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP17	WHITE	TSA-2506-M1A3 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP18	WHITE	TSB-2506-M1A3 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP19	WHITE	LOAD SHED SYSTEM REMOTE I/O PANEL	AS, RD	MATCH EXISTING
NP20	WHITE	AUTO TRANSFER SYSTEM MODE SELECTOR SW. DEV. 43AM	AS, BS	1" x 3"
NP21	WHITE	SYNC. CHECK RELAY DEV. 25	AS, BS	1" x 3"
NP22	WHITE	TRANSFORMER T-23 FEEDER	AS, RD	MATCH EXISTING
NP23	WHITE	PGS 1 FEEDER BACK-UP RELAY DEV. 351S	AS, BS	1" x 3"
NP24	WHITE	TS-351S-302 CURRENT AND POT. TEST SWITCH	AS, BS	1" x 3"
NP25	WHITE	TSA-351S-302 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"
NP26	WHITE	TSB-351S-302 DEVICE I/O TEST SWITCH	AS, BS	1" x 3"

* NAMEPLATE MTG LOCATION:
AS - MOUNTED ON PANEL AS SHOWN, BS - MOUNTED ON BACK OF RELAY PANEL, RD - MOUNTED ON SWITCHGEAR REAR DOOR

DEVICE LIST

ITEM #	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 351S-T20 AND 351S-302; PROTECTION AND BREAKER CONTROL RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, CONFIGURABLE LABELS, HORIZONTAL PANEL MOUNT.	SEL 351S-7 0351S71343554X1 NOTE 3
2	DEVICE 2032-M1A1,-M1A2; COMMUNICATION PROCESSOR, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL PANEL MOUNT. PROVIDE WITH ONE ETHERNET CARD, DNP3 PROROCOL, AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS AND AND SEL-2886 INTERFACE CONVERTERS SHOWN ON DWG. W17.10-E-563.	SEL 2032 203233X444G0XX PROVIDE (2) SEL-9321 125VDC-5VDC POWER SUPPLIES & CABLES FOR SEL-2886 CONVERTERS
3	DEVICE 2506-M1A1,-M1A2,-M1A3; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
4	DEVICE 2411-M1A1; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR USE IN CONJUNCTION WITH ITEM 2, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 2 DIGITAL INPUTS AND 35 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X2X2X2X0100
5	DEVICE 2411-M1A2; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, PROCESSOR SHALL BE SIMILAR TO ITEM 4, EXCEPT CONFIGURED WITH 26 DIGITAL INPUTS AND 11 DIGITAL OUTPUTS.	SEL 2411 241101A2X3A3A3A0100
6	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T C-C C-C C-C T.	ABB FLEXI-TEST SWITCH TYPE FT-1 714B325G32
7	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01
8	CONTROL SELECTOR SWITCH, DETENT ACTION ROTARY SWITCH, MAINTAINED CONTACTS, 2 DECK, 125V DC, 30A CONTACT RATING, FIXED OVAL HANDLE. ENGRAVING AND CONTACT ARRANGEMENT PER DEVICE CONTACT CHART ON DWG. W17.10-E-315.	ELECTROSWITCH SERIES 24
9	DEVICE 25; SYNCHRONISM CHECK RELAY, 125V DC POWER SUPPLY, VOLTAGE MONITOR, 0.1-99 SEC. TIMING, SEMI-FLUSH MOUNTING, MATCH EXISTING IN SWGR SECTION 4.	BASLER BE1-25 BE1-25-M1GA6PA4SOF



NOTES:

1. EXISTING BASLER AUTO SYNCHRONIZING RELAY (DEVICE 25A), SYNCH SWITCH (DEVICE SS) AND ASSOCIATED WIRING SHALL BE REMOVED. PROVIDE BLANK PLATES TO COVER CUTOUTS IN HINGED DOORS. RETURN AUTO SYNCHRONIZER TO THE DISTRICT.
2. CONTRACTOR SHALL PROVIDE ADDITIONAL 600V, 30A, 12-POINT TERMINAL BLOCKS WITHIN SWITCHGEAR CUBICLES FOR TERMINATION OF NEW DEVICE WIRING.
3. CONTRACTOR SHALL FIELD VERIFY DEPTH OF SPACE BEHIND FRONT HINGED PANEL AND PROVIDE PROJECTION MOUNT TYPE RELAY IF REQUIRED TO AVOID CONFLICT WITH DRAWOUT EQUIPMENT.
4. REPLACE EXISTING NAMEPLATE WITH NEW NAMEPLATE AS INDICATED. NAMEPLATES SHALL BE PROVIDED ON THE FRONT HINGED PANEL AND EXTERIOR REAR DOOR OF THE SWITCHGEAR. NAMEPLATE SIZE AND ENGRAVING STYLE SHALL MATCH EXISTING.
5. PROVIDE NEW FIBER PATCH PANEL WITHIN SWGR BUILDING SIMILAR TO THAT CALLED FOR ON DWG. W17.10-E-224 FOR THE M1-EAST SWITCHGEAR BUILDING.
6. COORDINATE WITH PG&E FOR REMOVAL OF REVENUE METERING AND RELATED EQUIPMENT IN THE M1-WEST SWGR. SEE DWG. W17.10-E-203 FOR ADDITIONAL WORK.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATION
ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST

SCALE NONE
DATE JAN2009
W17.10-E-225
DRAWING NUMBER
1
REV.

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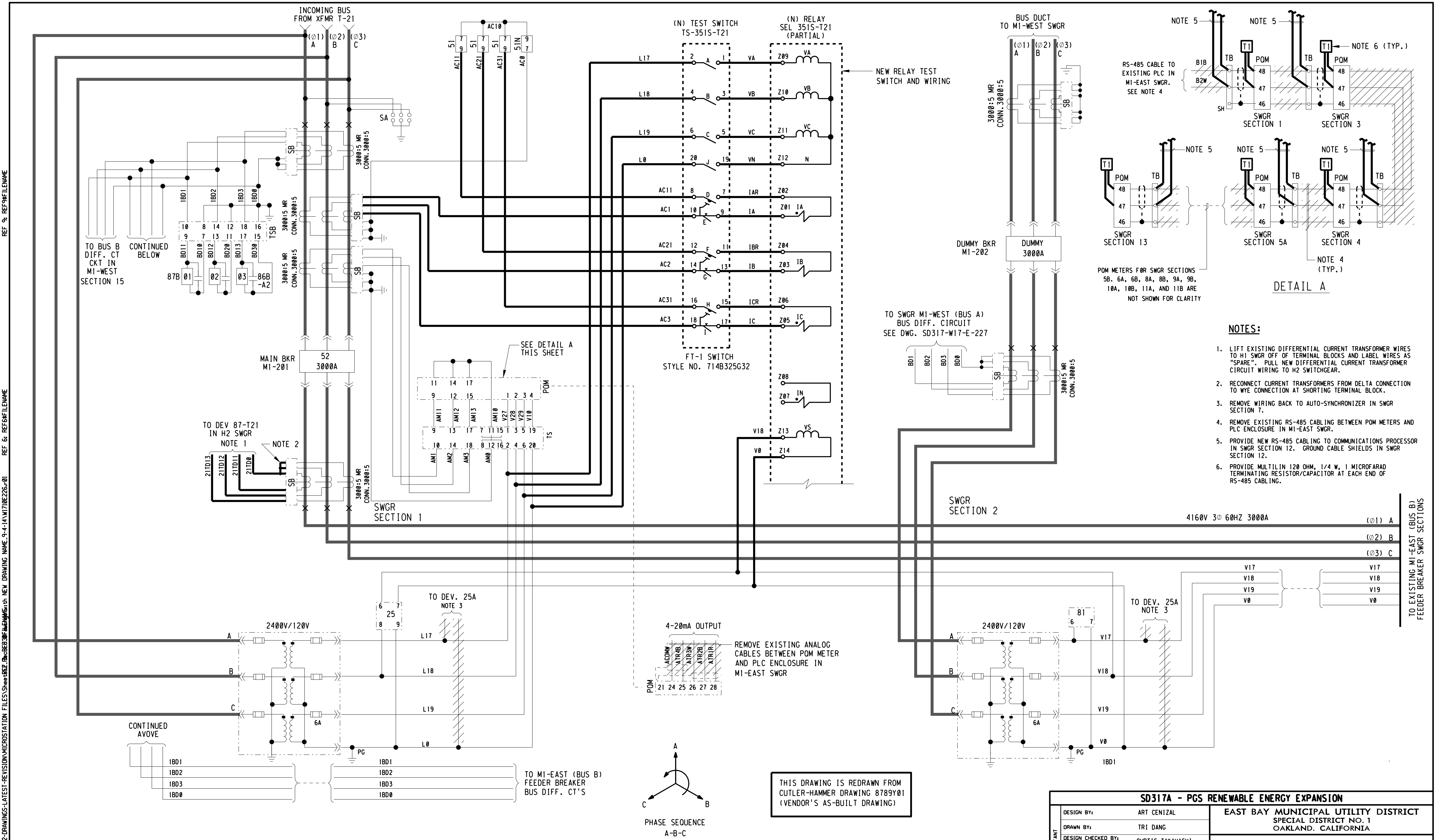

DETAIL A

NOTES:

1. LIFT EXISTING DIFFERENTIAL CURRENT TRANSFORMER WIRES TO H1 SWGR OFF OF TERMINAL BLOCKS AND LABEL WIRES AS "SPARE". PULL NEW DIFFERENTIAL CURRENT TRANSFORMER CIRCUIT WIRING TO H2 SWITCHGEAR.
2. RECONNECT CURRENT TRANSFORMERS FROM DELTA CONNECTION TO WYE CONNECTION AT SHORTING TERMINAL BLOCK.
3. REMOVE WIRING BACK TO AUTO-SYNCHRONIZER IN SWGR SECTION 7.
4. REMOVE EXISTING RS-485 CABLING BETWEEN PQM METERS AND PLC ENCLOSURE IN M1-EAST SWGR.
5. PROVIDE NEW RS-485 CABLING TO COMMUNICATIONS PROCESSOR IN SWGR SECTION 12. GROUND CABLE SHIELDS IN SWGR SECTION 12.
6. PROVIDE MULTILIN 120 OHM, 1/4 W, 1 MICROFARAD TERMINATING RESISTOR/CAPACITOR AT EACH END OF RS-485 CABLING.

THIS DRAWING IS REDRAWN FROM
CUTLER-HAMMER DRAWING 8789Y01
(VENDOR'S AS-BUILT DRAWING)

▲ CT'S ARE SHIPPED SHORTED AT T.B.
CUSTOMER TO FORM DELTA AS REQD.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST MODIFICATIONS
THREE-LINE AC SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-226
DRAWING NUMBER
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REV.

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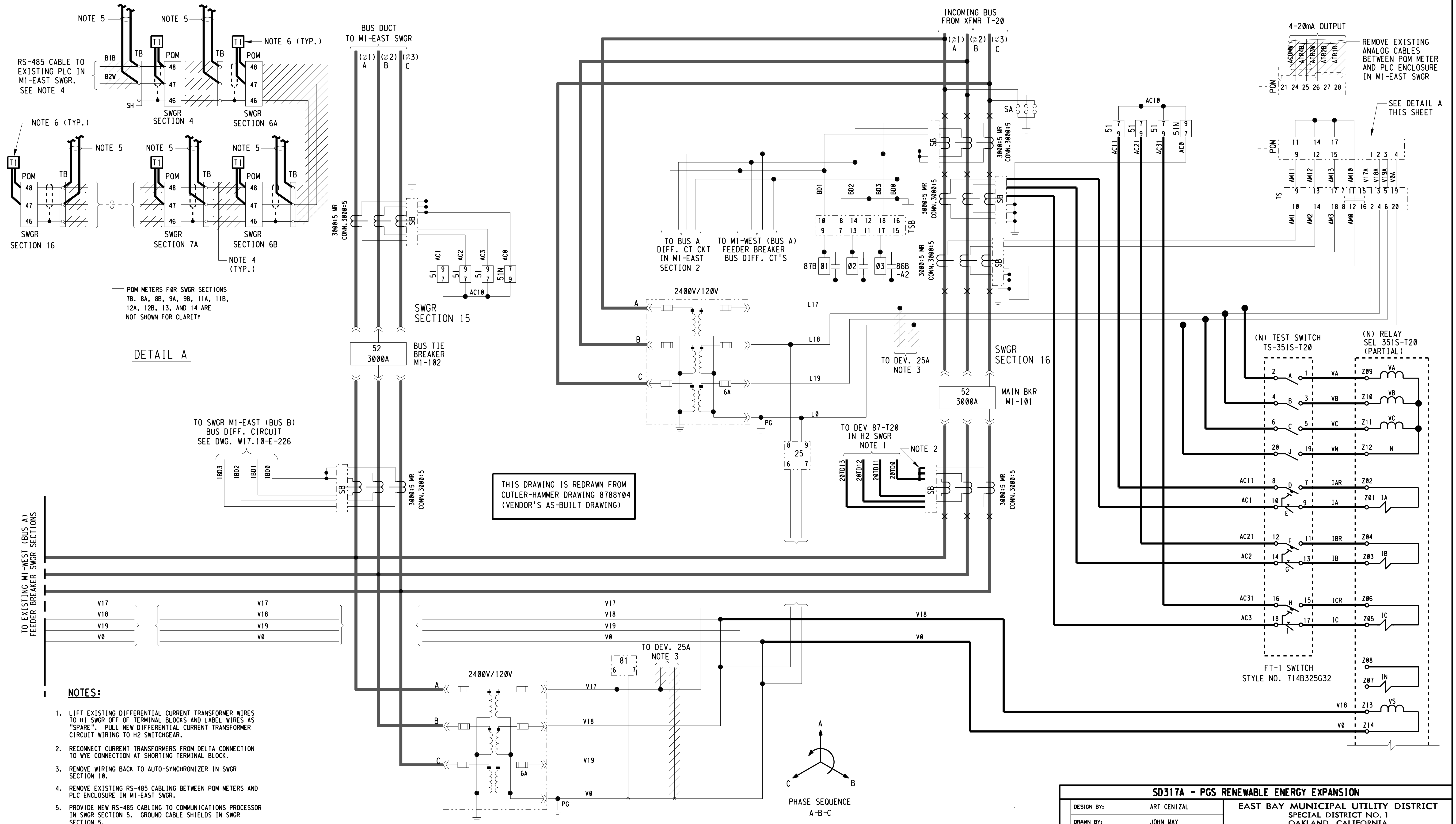
NOTE 5
NOTE 5
NOTE 6 (TYP.)
RS-485 CABLE TO EXISTING PLC IN M1-EAST SWGR. SEE NOTE 4
B1B
B2W
SH
TB
POM
T1
48
47
46
SWGR SECTION 4
SWGR SECTION 6A
SWGR SECTION 16
SWGR SECTION 7A
SWGR SECTION 6B
NOTE 4 (TYP.)
POM METERS FOR SWGR SECTIONS 7B, 8A, 8B, 9A, 9B, 11A, 11B, 12A, 12B, 13, AND 14 ARE NOT SHOWN FOR CLARITY
DETAIL A
BUS DUCT TO M1-EAST SWGR
(Ø1) A
(Ø2) B
(Ø3) C
3000:5 MR CONN.3000:5
SB
AC1
AC2
AC3
AC0
51
51N
AC10
SWGR SECTION 15
52 3000A
BUS TIE BREAKER M1-102
INCOMING BUS FROM XFMR T-20
SA
BD1
BD2
BD3
BD0
TSB
87B
01
02
03
86B -A2
TO BUS A DIFF. CT CKT IN M1-EAST SECTION 2
TO M1-WEST (BUS A) FEEDER BREAKER BUS DIFF. CT'S
AC11
AC21
AC31
4-20mA OUTPUT
ACOMM
ATR4B
ATR3W
ATR2B
ATR1R
REMOVE EXISTING ANALOG CABLES BETWEEN POM METER AND PLC ENCLOSURE IN M1-EAST SWGR
SEE DETAIL A THIS SHEET
AM11
AM12
AM13
AM10
V17A
V18A
V19A
V0A
AM1
AM2
AM3
AM0
TS
2400V/120V
L17
L18
L19
L0
6A
PG
TO DEV. 25A NOTE 3
SWGR SECTION 16
52 3000A
MAIN BKR M1-101
25
TO DEV 87-T20 IN H2 SWGR NOTE 1
NOTE 2
20TD13
20TD12
20TD11
20TD0
TO SWGR M1-EAST (BUS B) BUS DIFF. CIRCUIT SEE DWG. W17.10-E-226
1BD3
1BD2
1BD1
1BD0
THIS DRAWING IS REDRAWN FROM CUTLER-HAMMER DRAWING 8788Y04 (VENDOR'S AS-BUILT DRAWING)
(N) TEST SWITCH TS-351S-T20
(N) RELAY SEL 351S-T20 (PARTIAL)
VA
VB
VC
VN
IAR
IA
IBR
IB
ICR
IC
Z09
Z10
Z11
Z12
Z02
Z01
Z04
Z03
Z06
Z05
Z08
Z07
IN
Z13
Z14
VS
N
FT-1 SWITCH STYLE NO. 714B325G32
TO EXISTING M1-WEST (BUS A) FEEDER BREAKER SWGR SECTIONS
V17
V18
V19
V0
81
TO DEV. 25A NOTE 3
PHASE SEQUENCE A-B-C

NOTES:

1. LIFT EXISTING DIFFERENTIAL CURRENT TRANSFORMER WIRES TO H1 SWGR OFF OF TERMINAL BLOCKS AND LABEL WIRES AS "SPARE". PULL NEW DIFFERENTIAL CURRENT TRANSFORMER CIRCUIT WIRING TO H2 SWITCHGEAR.
2. RECONNECT CURRENT TRANSFORMERS FROM DELTA CONNECTION TO WYE CONNECTION AT SHORTING TERMINAL BLOCK.
3. REMOVE WIRING BACK TO AUTO-SYNCHRONIZER IN SWGR SECTION 10.
4. REMOVE EXISTING RS-485 CABLING BETWEEN POM METERS AND PLC ENCLOSURE IN M1-EAST SWGR.
5. PROVIDE NEW RS-485 CABLING TO COMMUNICATIONS PROCESSOR IN SWGR SECTION 5. GROUND CABLE SHIELDS IN SWGR SECTION 5.
6. PROVIDE MULTILIN 120 OHM, 1/4 W, 1 MICROFARAD TERMINATING RESISTOR/CAPACITOR AT EACH END OF RS-485 CABLING.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST MODIFICATIONS
THREE-LINE AC SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-227
DRAWING NUMBER
1
REV.

ENCLOSURE NEMA 1, INTERRUPTING DUTY BREAKER 22,000 A, 208/120 VOLT, 3 PHASE, 4 WIRE
MOUNTING SURFACE, 150 A. MAIN BREAKER, 225 A. BUS

DESCRIPTION	LOADS-VA A	LOADS-VA B	LOADS-VA C	BKR./POLE	CKT. NO.	PHASE A	PHASE B	PHASE C	CKT. NO.	BKR./POLE	LOADS-VA A	LOADS-VA B	LOADS-VA C	DESCRIPTION
H2 SWGR CUBICLE HEATERS	-			20/1	1	●			2	20/1	-			H2 SWGR CUBICLE HEATERS
↓		-			3		●		4			-		↓
H2 SWGR CUBICLE RECEPTS.			-		5			●	6				-	H2 SWGR CUBICLE RECEPTS.
↓	-				7	●			8		-			H2 SWGR CUBICLE RECEPTS.
H2 SWGR PCR LIGHTING		-			9		●		10			-		H2 SWGR CUBICLE LIGHTING
H2 SWGR PCR REC.			-		11			●	12	↓			-	OUTDOOR ALARM LT & HORN
H2 SWGR PCR EXHAUST FAN	-				13	●			14	15/	-			DEVICE 27AC
XFMR T-23 CONTROL CAB.		-			15		●		16	/2		-		↓
H2 SWGR EXTERIOR LTS.			-		17			●	18	20/1			-	SPARE △1
H2 SWGR OUTDOOR REC.	-				19	●			20		-			ISO RACK CABINET POWER
SPARE		-			21		●		22			-		SPARE
			-		23			●	24				-	
	-				25	●			26		-			
		-			27		●		28			-		
			-		29			●	30				-	
	-				31	●			32		-			
		-			33		●		34			-		
↓			-	↓	35			●	36	↓			-	↓
BATTERY CHARGER (NOTE 1)	-			40/	37	●			38	60/	-			PCR HVAC (NOTE 1)
		-			39		●		40			-		
↓			-	/3	41			●	42	/3			-	↓
	-	-	-								-	-	-	

TOTAL: - KVA. PANEL # "ACP-H2" FEEDER SIZE BY MFR

ENCLOSURE NEMA 1, INTERRUPTING DUTY BREAKER 10,000 A, 125 VOLT DC,
MOUNTING SURFACE, 225 A. MAIN BREAKER, 225 A. BUS

DESCRIPTION	LOADS/WATTS P	LOADS/WATTS N	BKR./POLE	CKT. NO.	POLE P	POLE N	CKT. NO.	BKR./POLE	LOADS/WATTS P	LOADS/WATTS N	DESCRIPTION
BKR H2-100 (H2A-H1A TIE) DC CNTL PWR	-	-	30/2	1	●	●	2	30/2	-	-	BKR H2-200 (H2B-H1B TIE) DC CNTL PWR
BKR H2-103 (PGS2 FDR) DC CNTL PWR	-	-	30/2	3	●	●	4	30/2	-	-	BKR H2-203 (T23 FDR - PGS1) DC CNTL PWR
BKR H2-104 (T20 FDR) DC CNTL PWR	-	-	30/2	5	●	●	6	30/2	-	-	BKR H2-204 (T21 FDR) DC CNTL PWR
BKR H2-101 (FUTURE FDR BREAKER) DC CNTL PWR	-	-	30/2	7	●	●	8	30/2	-	-	BKR H2-201 (FUTURE FDR BREAKER) DC CNTL PWR
BKR H2-102 (FUTURE FDR BREAKER) DC CNTL PWR	-	-	30/2	9	●	●	10	30/2	-	-	BKR H2-202 (FUTURE FDR BREAKER) DC CNTL PWR
BKR H2-150 (TIE BKR) DC CNTL PWR	-	-	30/2	11	●	●	12	30/2	-	-	SWGR H2B BUS DIFF. PROTECTION
SEL 451-4 (25A) DC PWR	-	-	30/2	13	●	●	14	30/2	-	-	TRANSFORMER T20 DIFF. PROTECTION
SWGR H2A BUS DIFF PROTECTION	-	-	30/2	15	●	●	16	30/2	-	-	TRANSFORMER T21 DIFF. PROTECTION
SEL 2506-H2A1 & 2506-H2B1	-	-	20/2	17	●	●	18	30/2	-	-	TRANSFORMER T23 DIFF. PROTECTION
LOAD SHED PROC. SEL 1102-1 PWR	-	-	20/2	19	●	●	20	20/2	-	-	TRANSFORMER T23 SUDDEN PRESSURE DEVICE
COMM. PROC. SEL 2032-H2, 2032-H2A & 2032-H2B PWR	-	-	20/2	21	●	●	22	20/2	-	-	SEL 2411-H2A & 2411-H2B
SPARE	-	-	20/2	23	●	●	24	20/2	-	-	SPARE
	-	-			☐	☐ FEED-THRU LUGS			-	-	

TOTAL: - KVA PANEL # "DCP-H2" (SECT. 1) FEEDER SIZE BY MFR

ENCLOSURE NEMA 1, INTERRUPTING DUTY BREAKER 10,000 A, 125 VOLT DC,
MOUNTING SURFACE, FEED-THRU FROM SECTION 1 MAIN BREAKER, 225 A. BUS

DESCRIPTION	LOADS/WATTS P	LOADS/WATTS N	BKR./POLE	CKT. NO.	POLE P	POLE N	CKT. NO.	BKR./POLE	LOADS/WATTS P	LOADS/WATTS N	DESCRIPTION
STATION COMPUTER SEL-3351-1 PWR	-	-	20/2	25	●	●	26	20/2	-	-	SEL 2407-H2 GPS RECEIVER
MANAGED ETHERNET SWITCH	-	-	20/2	27	●	●	28	30/2	-	-	BREAKER TEST CABINET
19" RACK MOUNT COMPUTER MONITOR	-	-	20/2	29	●	●	30	20/2	-	-	PCR EMERGENCY LIGHTS
SPARE	-	-	20/2	31	●	●	32	20/2	-	-	SPARE
SPARE	-	-	20/2	33	●	●	34	20/2	-	-	SPARE
SPARE	-	-	20/2	35	●	●	36	20/2	-	-	SPARE
SPACE	-	-		37	●	●	38		-	-	SPACE
	-	-		39	●	●	40		-	-	
	-	-		41	●	●	42		-	-	
	-	-		43	●	●	44		-	-	
	-	-		45	●	●	46		-	-	
↓	-	-		47	●	●	48		-	-	↓
	-	-			☐	☐ MAIN LUGS			-	-	

TOTAL: - KVA PANEL # "DCP-H2" (SECT. 2) FEEDER SIZE BY MFR

NOTES:

1. SWITCHGEAR MANUFACTURER SHALL CONFIRM REQUIRED CIRCUIT BREAKER RATING.

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION		BY	REC.	APP.
△2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
△1	02/10/10	REVISED FOR ISO METERING - COR#15.1		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
AC AND DC PANEL SCHEDULES

SCALE NONE
DATE JAN2009
W17.10-E-230 DRAWING NUMBER
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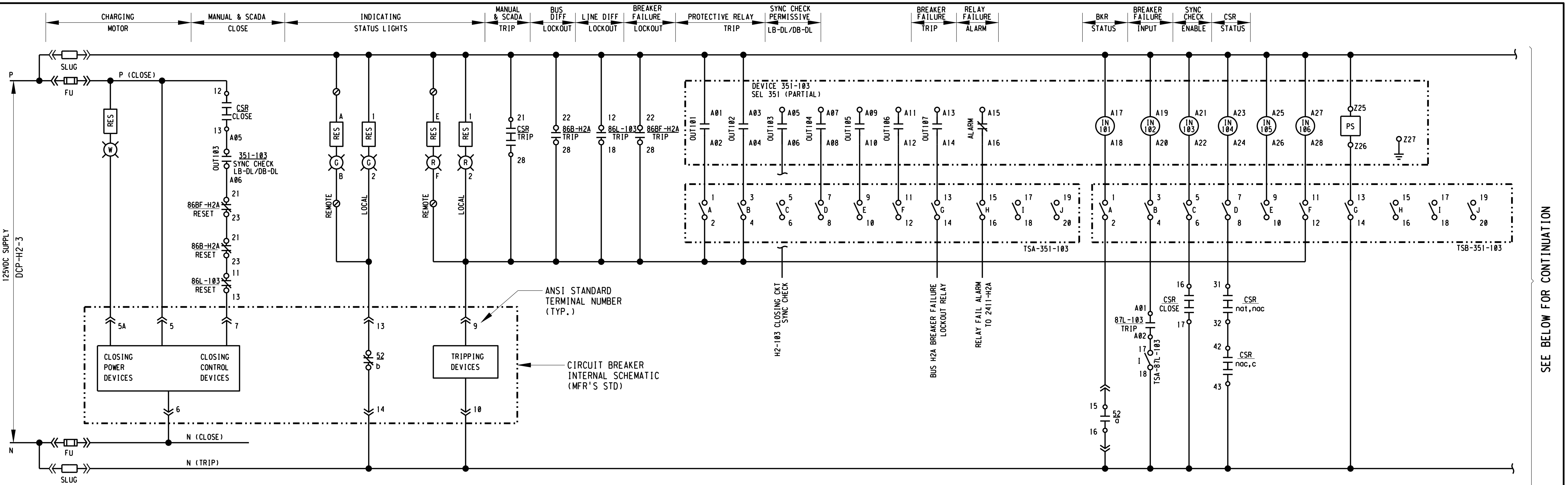
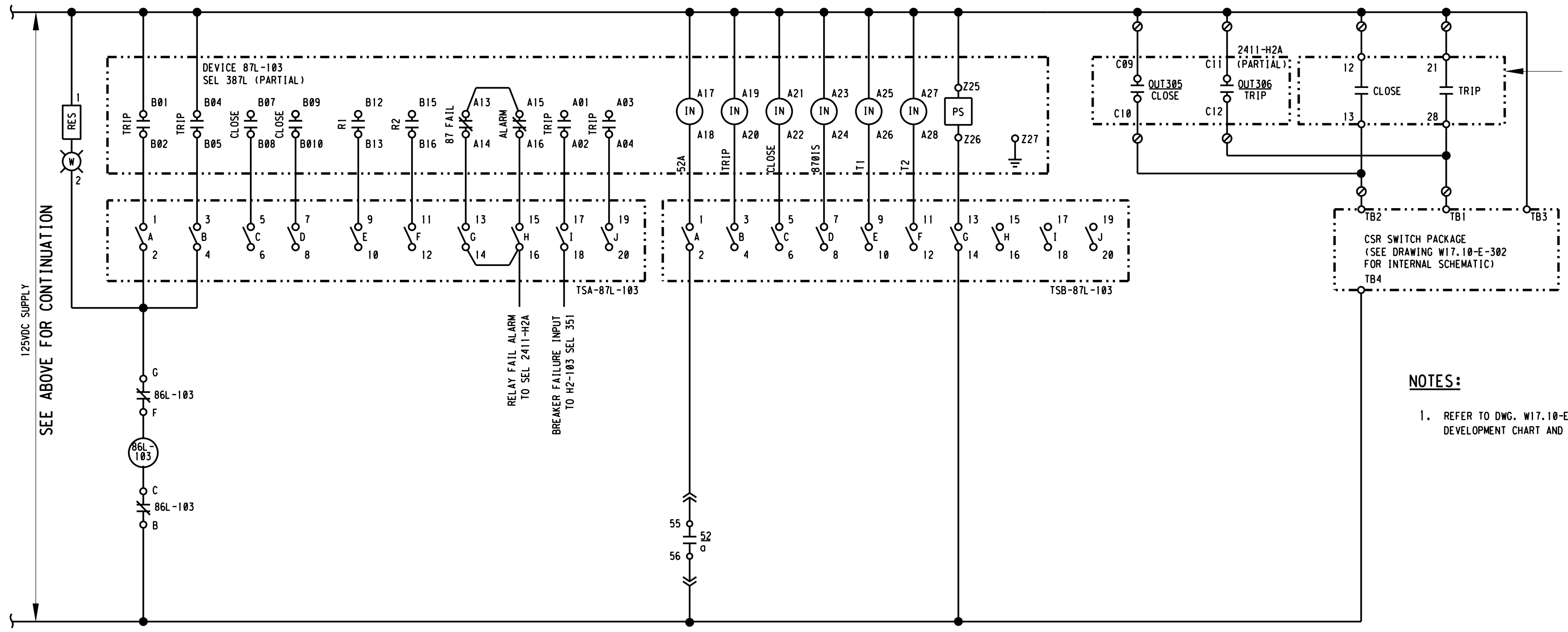


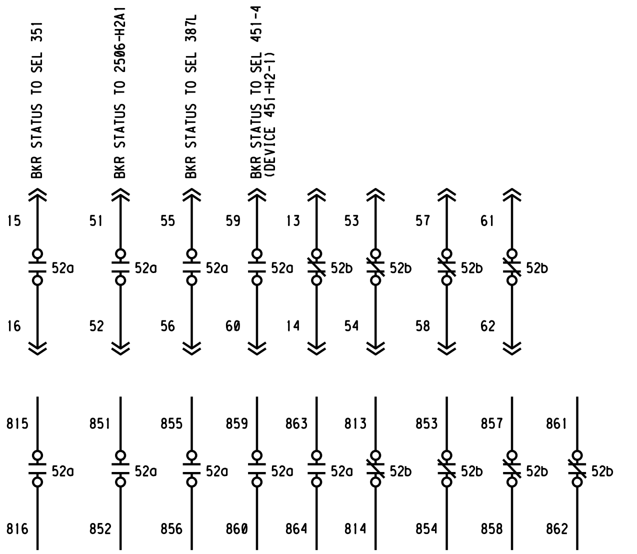
STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 - INCOMING PGS2 BREAKER H2-103 CONTROL SCHEMATIC

NONE



SEE ABOVE FOR CONTINUATION
125VDC SUPPLY
RES
W
DEVICE 87L-103
SEL 387L (PARTIAL)
TRIP
CLOSE
R1
R2
87 FAIL
ALARM
TSA-87L-103
TSB-87L-103
IN
PS
52A
TRIP
CLOSE
87DIS
T1
T2
RELAY FAIL ALARM TO SEL 2411-H2A
BREAKER FAILURE INPUT TO H2-103 SEL 351
86L-103
52 a
2411-H2A (PARTIAL)
OUT305 CLOSE
OUT306 TRIP
CLOSE
TRIP
CSR SWITCH PACKAGE (SEE DRAWING W17.10-E-302 FOR INTERNAL SCHEMATIC)
TB1
TB2
TB3
TB4
REMOTE CONTROL SWITCH ON SWITCHGEAR SECTION 4



NOTES:

1. REFER TO DWG. W17.10-E-302 FOR CSR CONTACT SWITCH DEVELOPMENT CHART AND ESCUTCHEON PLATE REQUIREMENTS.

2 - BREAKER AUX. CONTACTS

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

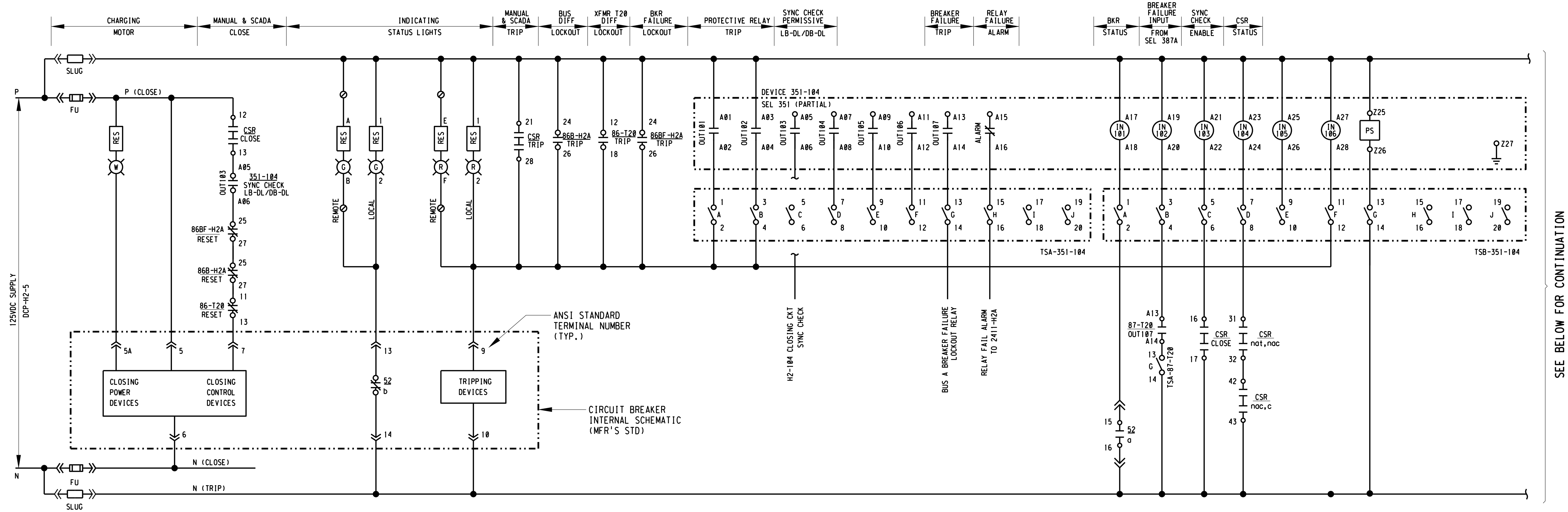
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	
DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

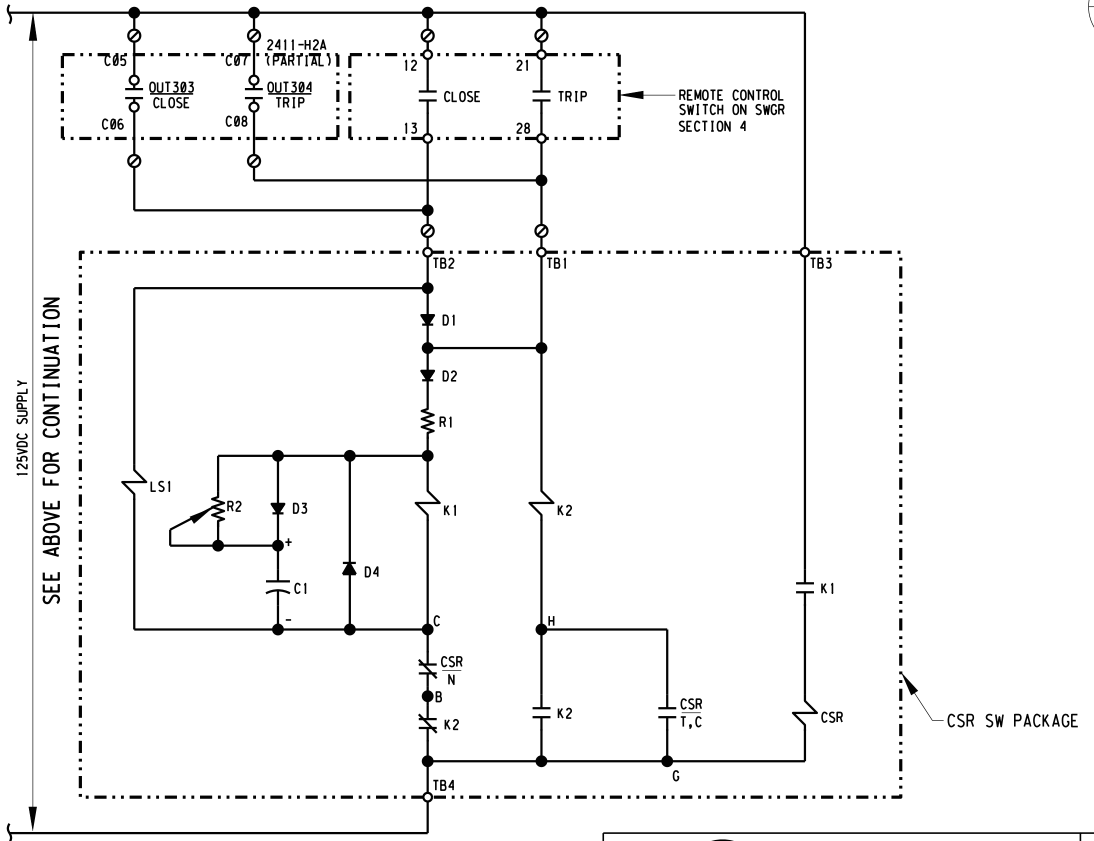
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
FEEDER PGS 2 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-301
DRAWING NUMBER
1
REV.



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)



1 TRANSFORMER T20 FEEDER BREAKER H2-104 CONTROL SCHEMATIC

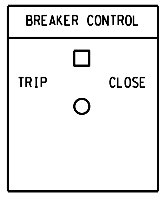
NONE

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 – 13				X
	16 – 17				X
2	21 – 28	X			
	24 – 25	X			
3	31 – 32		X	X	
	35 – 36		X	X	
4	42 – 43			X	X
	46 – 47			X	X
5	51 – 52	X	X		
	55 – 56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

CIRCUIT BREAKER
CONTROL SWITCH

UNIVERSAL
CIRCUIT 57



(TYPICAL PLATE)

2 CSR CONTACT CHART

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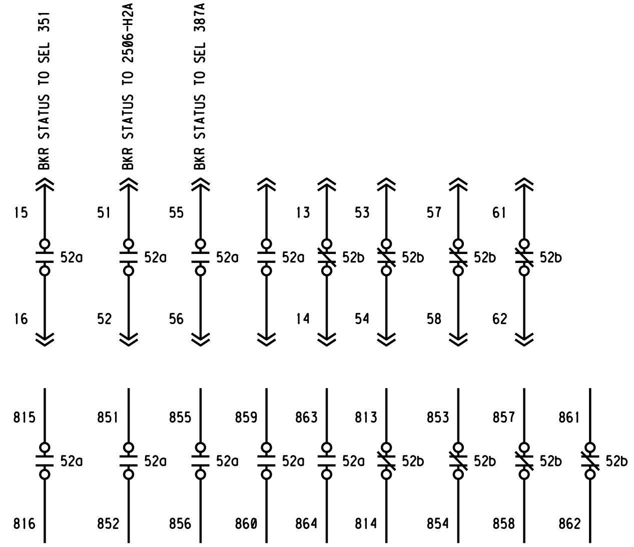

3 BREAKER AUX. CONTACTS

NONE

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
FEEDER T20 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-302
DRAWING NUMBER

1
REV.

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

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PROJECT NO. 07688-01-03

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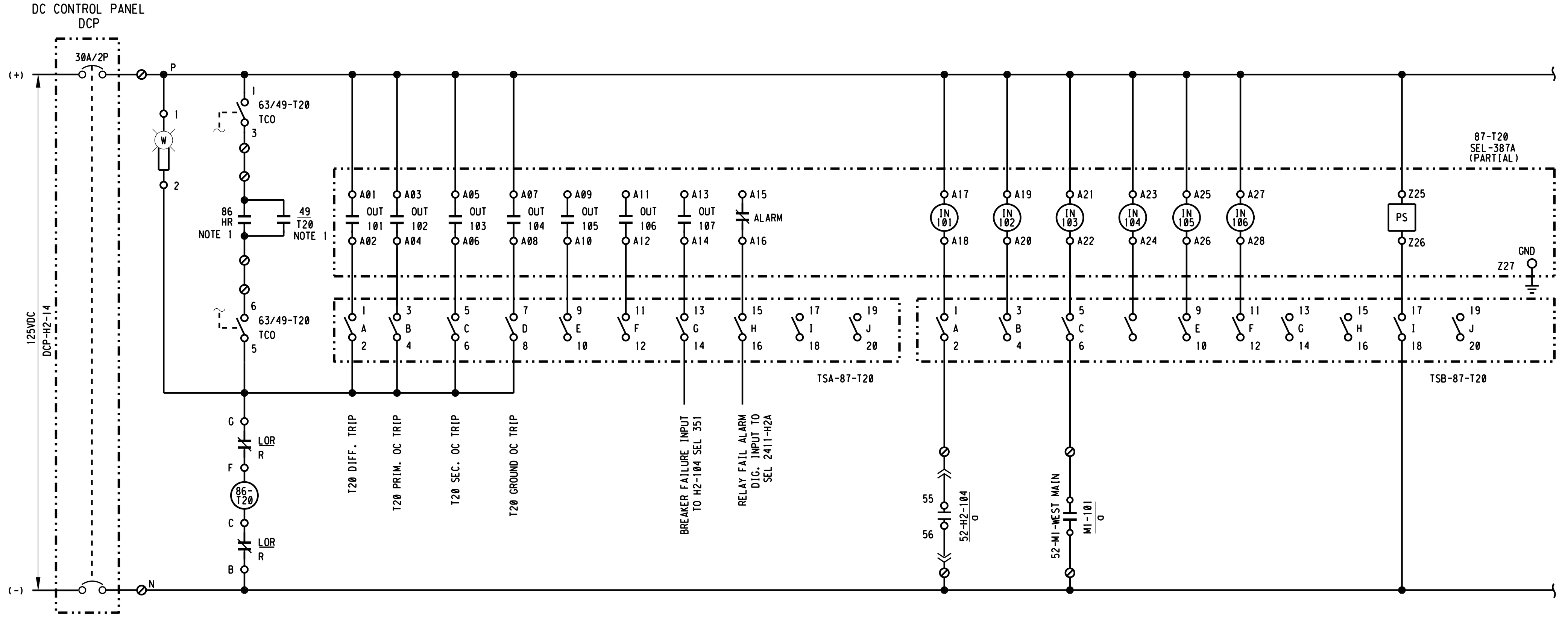
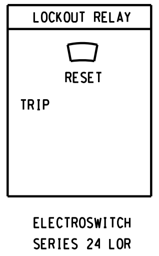


1
-

TRANSFORMER T20 DIFFERENTIAL PROTECTION CONTROL SCHEMATIC

NONE



ELECTROSWITCH
SERIES 24 LOR

DECK	CONTACTS	POSITION		FUNCTION
		TRIP	RESET	
1	11 13		X	PERMISSIVE CLOSE BREAKER H2-104
	12 18	X		TRIP BREAKER H2-104
	15 17		X	SPARE
	14 16	X		SPARE
2	21 23		X	PERMISSIVE CLOSE MAIN BREAKER M1-101
	22 28	X		TRIP MAIN BREAKER M1-101
	25 27		X	SPARE
	24 26	X		SPARE
3	31 33		X	SPARE
	32 38	X		SPARE
	35 37		X	SPARE
	34 36	X		SPARE
4	41 43		X	SPARE
	42 48	X		SPARE
	45 47		X	SPARE
	44 46	X		SPARE
5	51 53		X	SPARE
	52 58	X		SPARE
	55 57		X	SPARE
	54 56	X		SPARE
6	61 63		X	SPARE
	62 68	X		SPARE
	65 67		X	SPARE
	64 66	X		INPUT TO SEL 2411-H2A

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

2
-

LOCKOUT RELAY 86-T20 CONTACT CHART

NONE

NOTES:

1. TRANSFORMER SUDDENT PRESSURE LOCKOUT RELAY AND HIGH WINDING TEMPERATURE DEVICE CONTACTS LOCATED IN TRANSFORMER CONTROL CABINET.

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NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012	RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
XFMR T20 DIFF. PROTECTION DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-302A
DRAWING NUMBER

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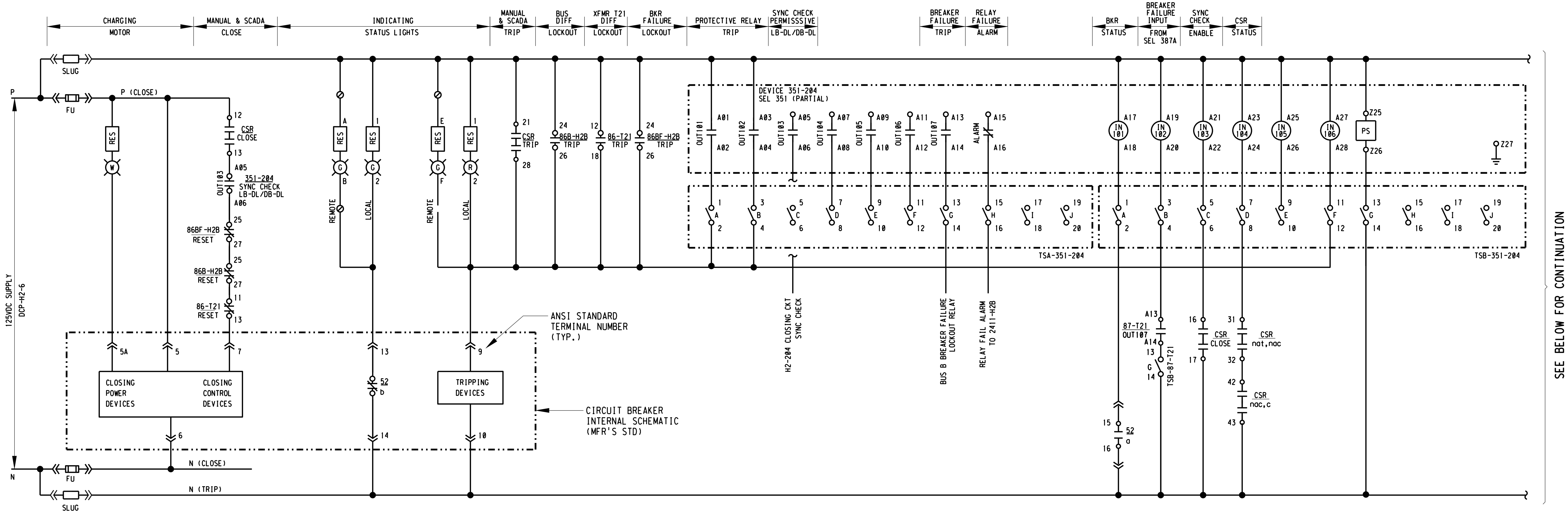
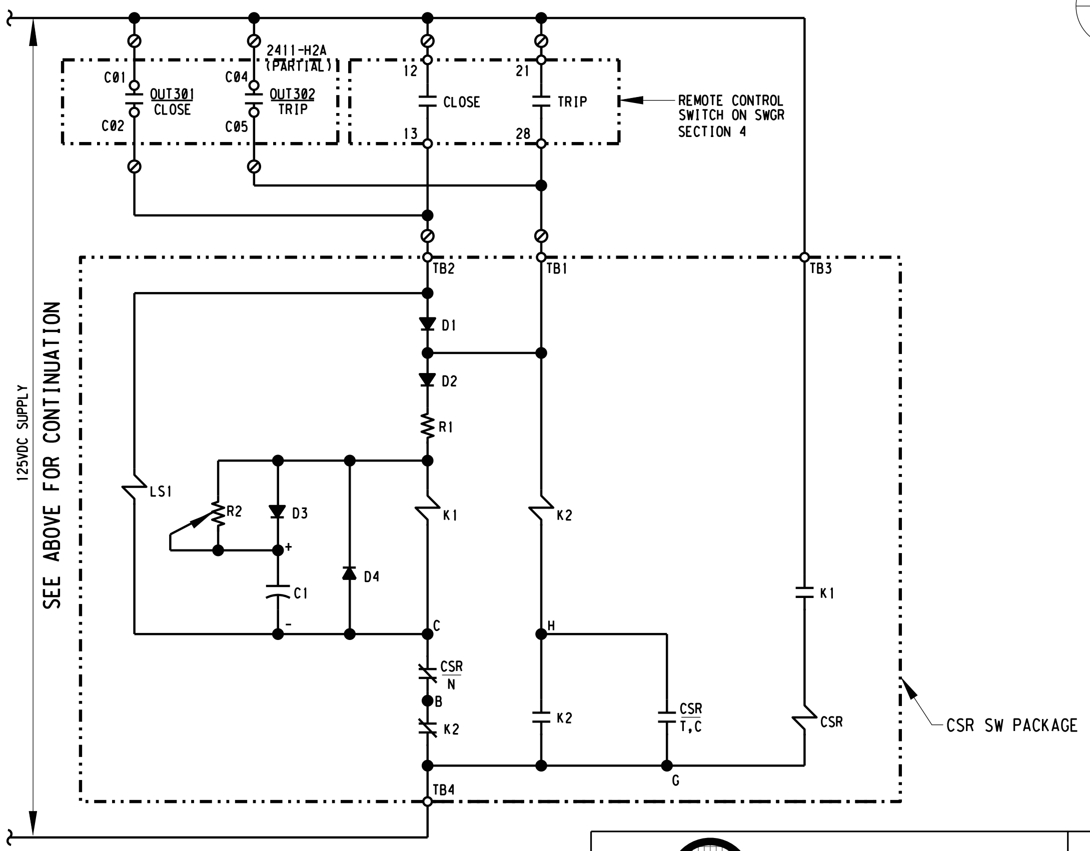


1 TRANSFORMER T21 FEEDER BREAKER H2-204 CONTROL SCHEMATIC

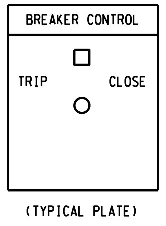
NONE

STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)



CIRCUIT BREAKER CONTROL SWITCH

UNIVERSAL CIRCUIT 57



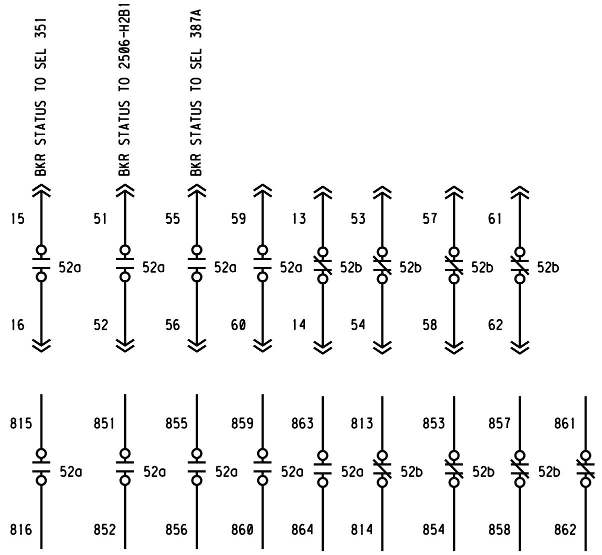
(TYPICAL PLATE)

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12–13				☒
	16–17				☒
2	21–28	☒			
	24–25	☒			
3	31–32		☒	☒	
	35–36		☒	☒	
4	42–43			☒	☒
	46–47			☒	☒
5	51–52	☒	☒		
	55–56	☒	☒		

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

NONE



3 BREAKER AUX. CONTACTS

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

CONSULTANT
EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
FEEDER T21 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-303
DRAWING NUMBER

1
REV.

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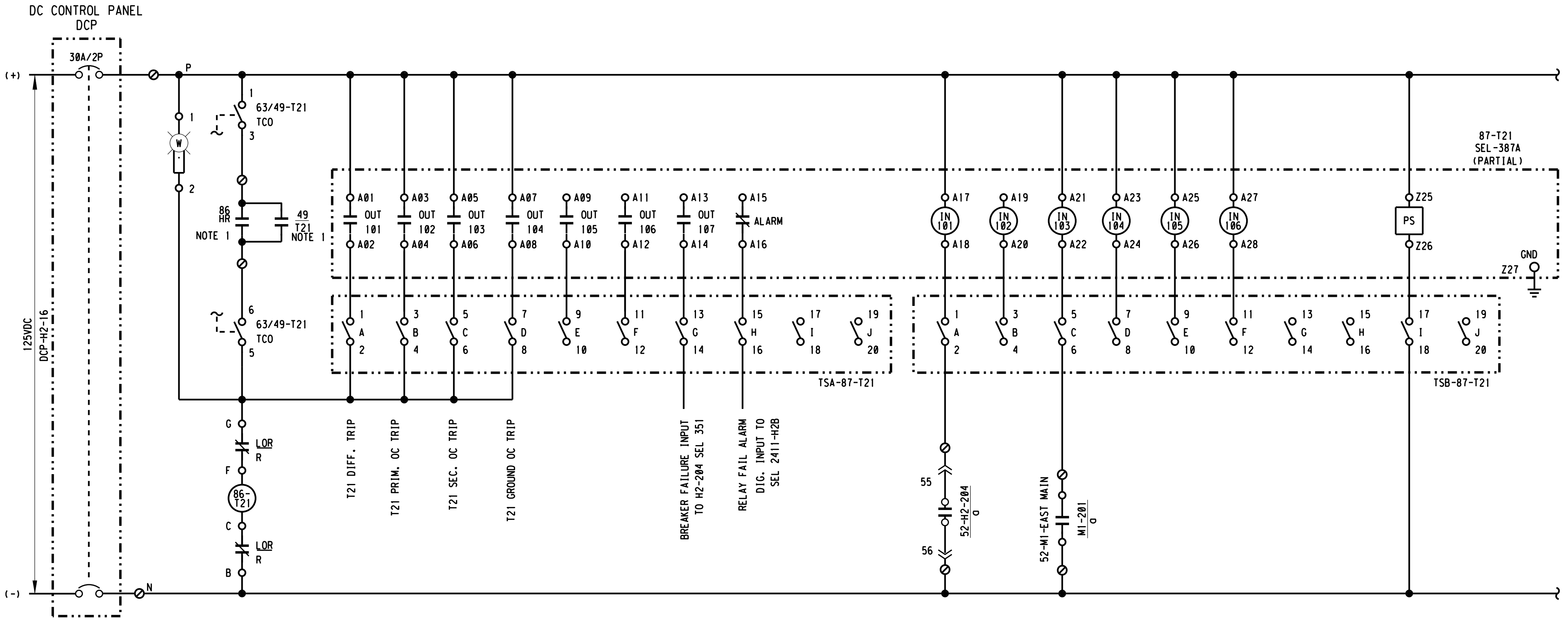
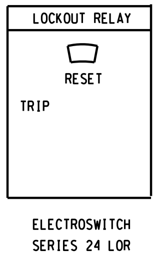


1 - TRANSFORMER T21 DIFFERENTIAL PROTECTION CONTROL SCHEMATIC

NONE



ELECTROSWITCH
SERIES 24 LOR

DECK	CONTACTS	POSITION		FUNCTION
		TRIP	RESET	
1	11–13		✕	PERMISSIVE CLOSE BREAKER H2-204
	12–18	✕		TRIP BREAKER H2-204
	15–17		✕	SPARE
	14–16	✕		SPARE
2	21–23		✕	PERMISSIVE CLOSE MAIN BREAKER M1-201
	22–28	✕		TRIP MAIN BREAKER M1-201
	25–27		✕	SPARE
	24–26	✕		SPARE
3	31–33		✕	SPARE
	32–38	✕		SPARE
	35–37		✕	SPARE
	34–36	✕		SPARE
4	41–43		✕	SPARE
	42–48	✕		SPARE
	45–47		✕	SPARE
	44–46	✕		SPARE
5	51–53		✕	SPARE
	52–58	✕		SPARE
	55–57		✕	SPARE
	54–56	✕		SPARE
6	61–63		✕	SPARE
	62–68	✕		SPARE
	65–67		✕	SPARE
	64–66	✕		INPUT TO SEL 2411-H2B

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

2 - LOCKOUT RELAY 86-T21 CONTACT CHART

NONE

NOTES:

1. TRANSFORMER SUDDENT PRESSURE LOCKOUT RELAY AND HIGH WINDING TEMPERATURE DEVICE CONTACTS LOCATED IN TRANSFORMER CONTROL CABINET.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

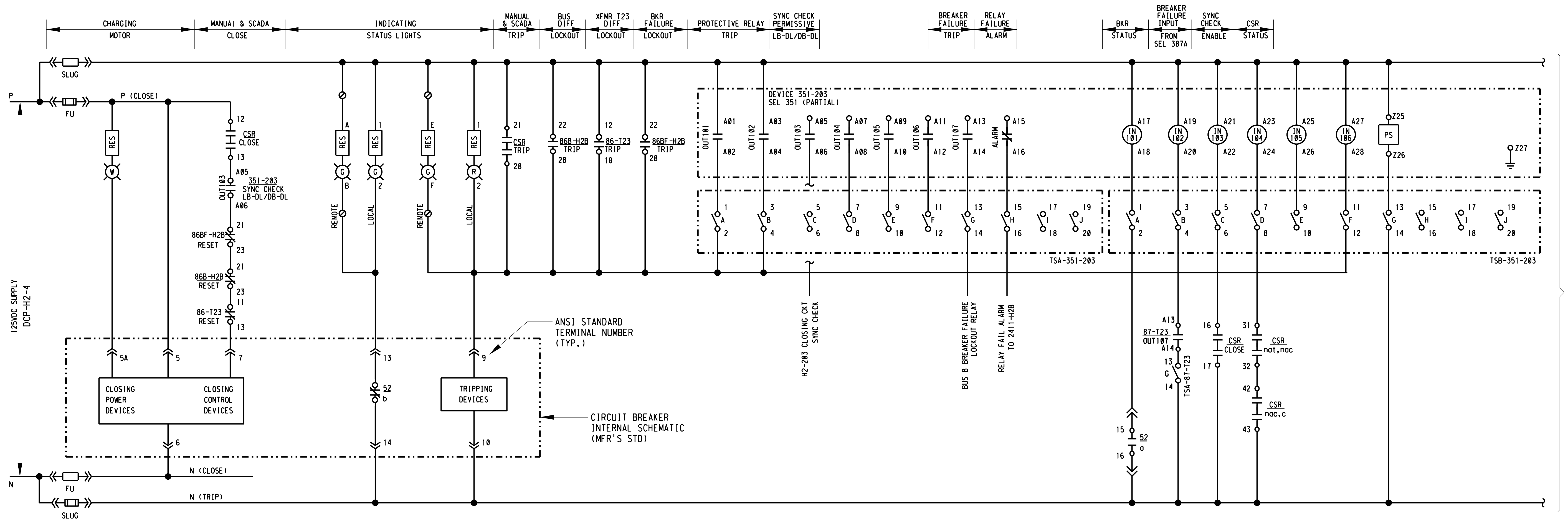
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
XFMR T21 DIFF. PROTECTION DC CONTROL SCHEMATIC

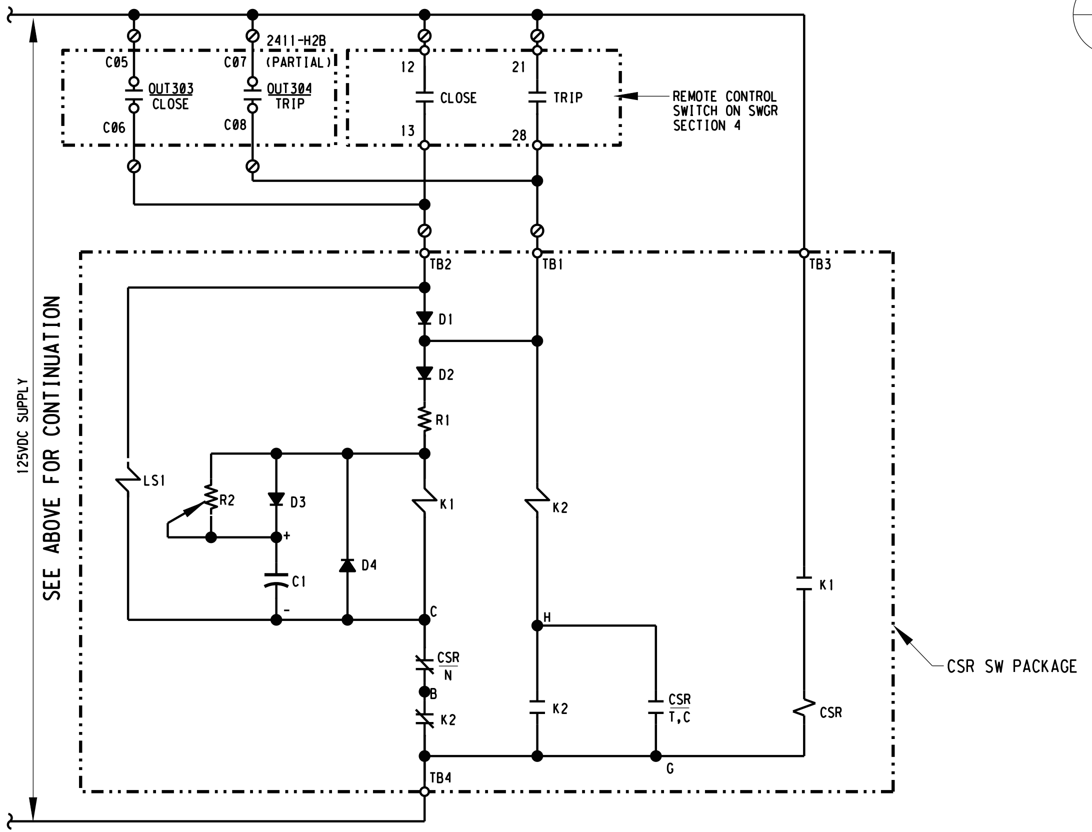
SCALE NONE
DATE JAN2009
W17.10-E-303A
DRAWING NUMBER
1
REV.



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 XFMR T-23 (INCOMING PGS1) BREAKER H2-203 CONTROL SCHEMATIC

- NONE



DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12–13				X
	16–17				X
2	21–28	X			
	24–25	X			
3	31–32		X	X	
	35–36		X	X	
4	42–43			X	X
	46–47			X	X
5	51–52	X	X		
	55–56	X	X		

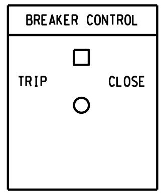
nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

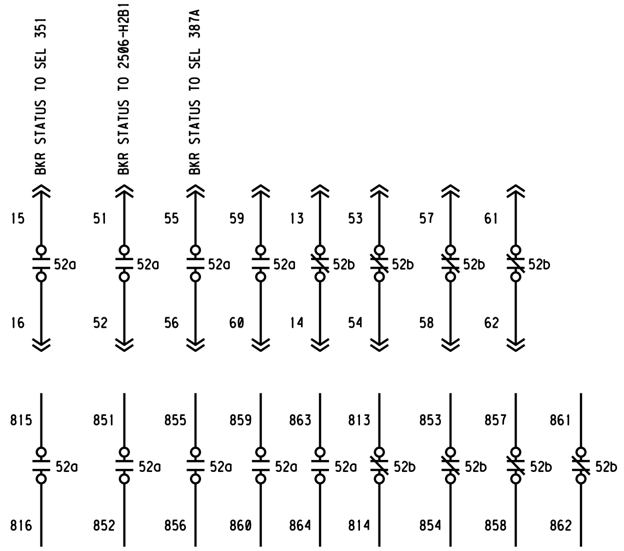
- NONE

CIRCUIT BREAKER CONTROL SWITCH

UNIVERSAL CIRCUIT 57



(TYPICAL PLATE)



3 BREAKER AUX. CONTACTS

- NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
FEEDER T23 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-304
DRAWING NUMBER

1
REV.

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REF 9: REF9$FILENAME

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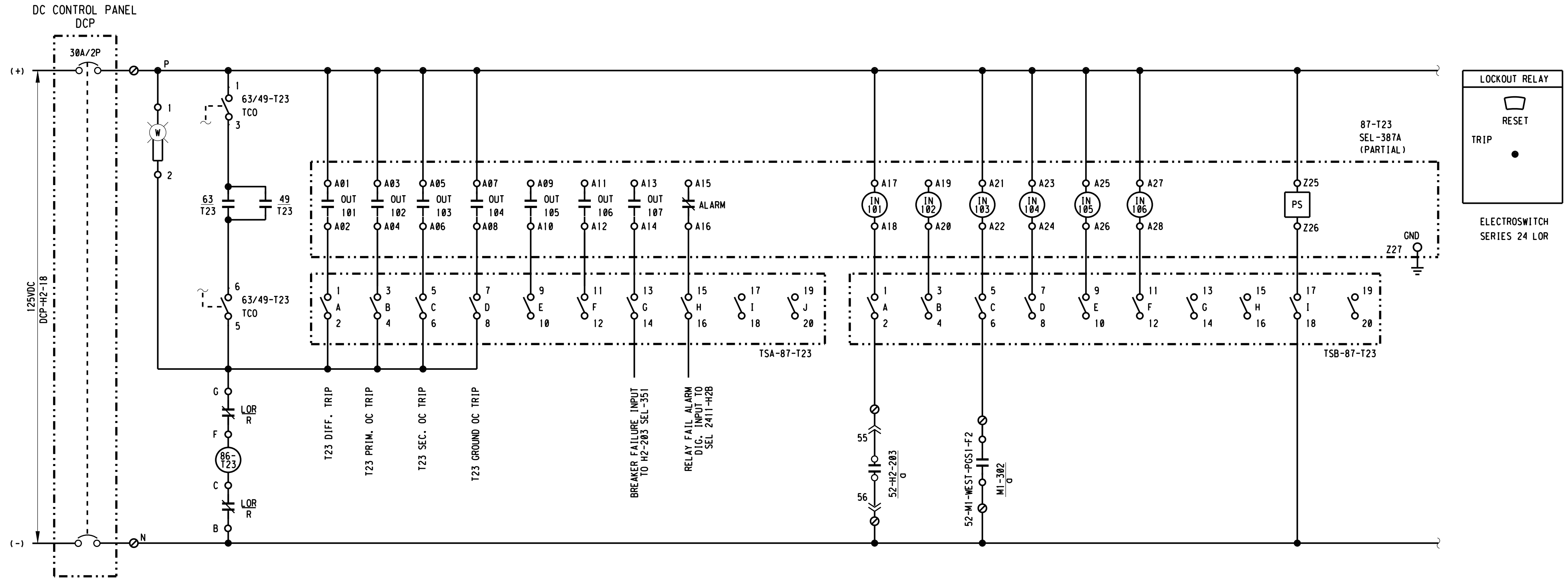

1 TRANSFORMER T23 DIFFERENTIAL PROTECTION CONTROL SCHEMATIC

-

NONE

DECK	CONTACTS	POSITION		FUNCTION
		TRIP	RESET	
1	11 – 13		X	PERMISSIVE CLOSE BREAKER H2-203
	12 – 18	X		TRIP BREAKER H2-203
	15 – 17		X	SPARE
	14 – 16	X		PERMISSIVE CLOSE BREAKER M1-302 (PGS1 BUS TIE SWGR FEEDER BREAKER F2)
2	21 – 23		X	TRIP BREAKER M1-302 (PGS1 BUS TIE SWGR FEEDER BREAKER F2)
	22 – 28	X		SPARE
	25 – 27		X	SPARE
	24 – 26	X		SPARE
3	31 – 33		X	SPARE
	32 – 38	X		SPARE
	35 – 37		X	SPARE
	34 – 36	X		SPARE
4	41 – 43		X	SPARE
	42 – 48	X		SPARE
	45 – 47		X	SPARE
	44 – 46	X		SPARE
5	51 – 53		X	SPARE
	52 – 58	X		SPARE
	55 – 57		X	SPARE
	54 – 56	X		SPARE
6	61 – 63		X	SPARE
	62 – 68	X		SPARE
	65 – 67		X	SPARE
	64 – 66	X		INPUT TO SEL 2411-H2B

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

2 LOCKOUT RELAY 86-T23 CONTACT CHART

-

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2
XFMR T23 DIFF. PROTECTION DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-304A
DRAWING NUMBER
1
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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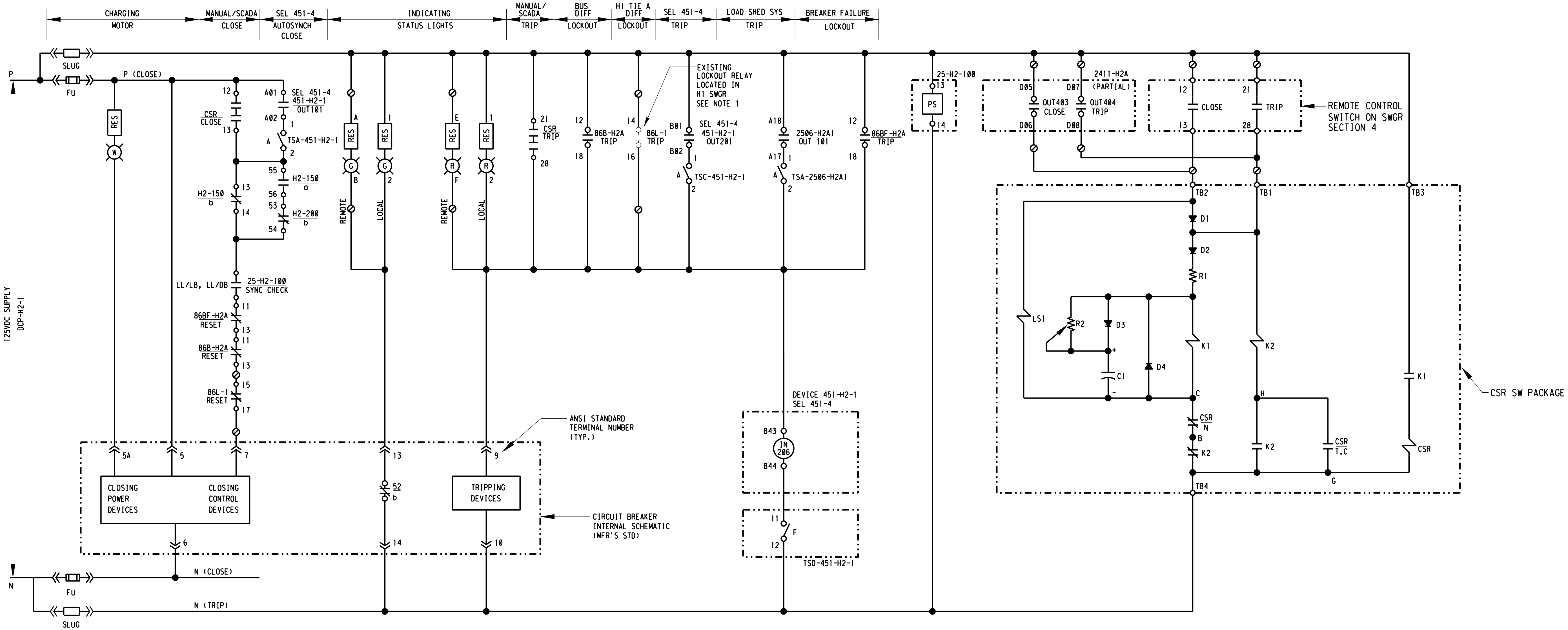
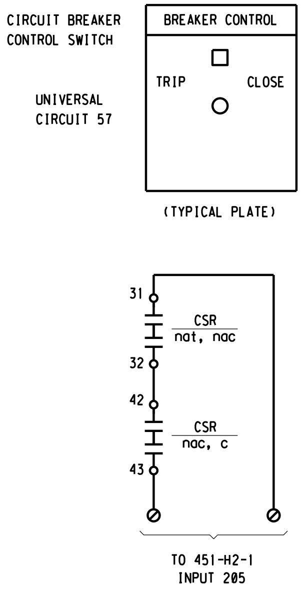


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 H2-H1 TIE A BREAKER H2-100 CONTROL SCHEMATIC

- NONE



DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 —┤├┤├— 13				╳
	16 —┤├┤├— 17				╳
2	21 —┤├┤├— 28	╳			
	24 —┤├┤├— 25	╳			
3	31 —┤├┤├— 32		╳	╳	
	35 —┤├┤├— 36		╳	╳	
4	42 —┤├┤├— 43			╳	╳
	46 —┤├┤├— 47			╳	╳
5	51 —┤├┤├— 52	╳	╳		
	55 —┤├┤├— 56	╳	╳		

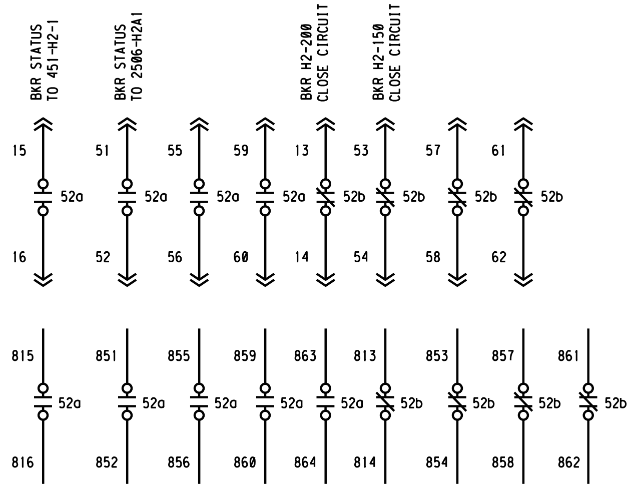
nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

- NONE

NOTES:

1. THE 86L-1 FEEDER DIFFERENTIAL LOCKOUT RELAY IS EXISTING AND LOCATED IN THE EXISTING H1 SWITCHGEAR. REMOVE EXISTING LOCKOUT RELAY TRIP AND CLOSE PERMISSIVE WIRES THAT PRESENTLY ARE WIRED TO M1-WEST SWITCHGEAR USE THE SAME CONTACTS FOR TRIP AND CLOSE PERMISSIVE WIRING FUNCTIONS AS SHOWN ON THIS DRAWING.



3 BREAKER AUX. CONTACTS

- NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
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santa clara, ca 95054
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PROJECT NO. 07688-01-03

carollo

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1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

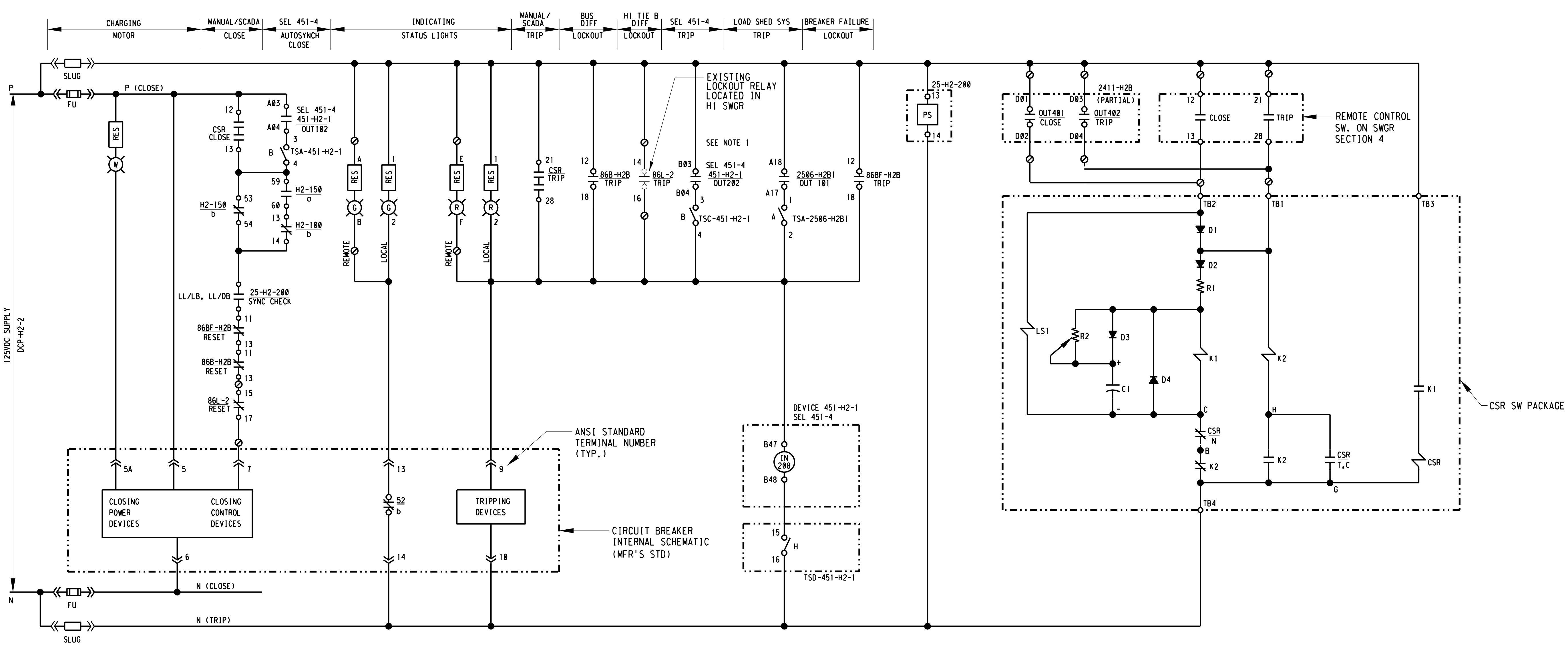
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
FEEDER H2-H1 TIE-A DC CONTROL SCHEMATIC

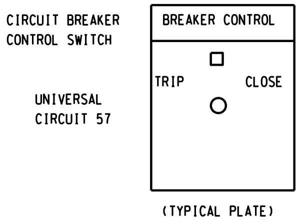
SCALE NONE
DATE JAN2009
W17.10-E-305
DRAWING NUMBER
1
REV.

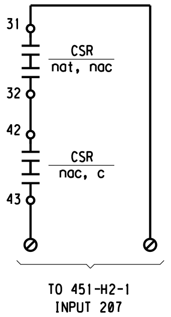


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 H2-H1 TIE B BREAKER H2-200 CONTROL SCHEMATIC

NONE





DECK	CONTACTS	POSITION TRIP	nat	nac	CLOSE
1	12–13				X
	16–17				X
2	21–28	X			
	24–25	X			
3	31–32		X	X	
	35–36		X	X	
4	42–43			X	X
	46–47			X	X
5	51–52	X	X		
	55–56	X	X		

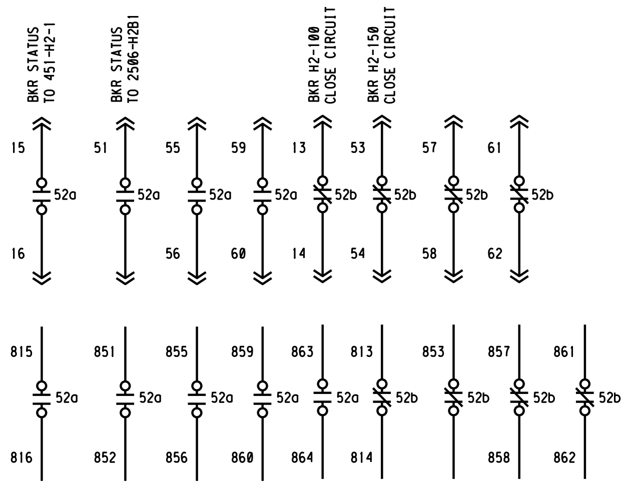
nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

NONE

NOTES:

1. THE 86L-2 FEEDER DIFFERENTIAL LOCKOUT RELAY IS EXISTING AND LOCATED IN THE EXISTING H1 SWITCHGEAR. REMOVE EXISTING LOCKOUT RELAY TRIP AND CLOSE PERMISSIVE WIRES THAT PRESENTLY ARE WIRED TO M1-EAST SWITCHGEAR USE THE SAME CONTACTS FOR TRIP AND PERMISSIVE CLOSE WIRING FUNCTIONS AS SHOWN ON THIS DRAWING.



3 BREAKER AUX. CONTACTS

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
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santa clara, ca 95054
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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
FEEDER H2-H1 TIE-B DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-306
DRAWING NUMBER
1
REV.

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REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
USER: vuong
DATE: 08-OCT-2014 13:29
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PLOT SCALE: 0.167614:1

BREAKER H2-103
(INCOMING PGS2 FEEDER)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 IN 101 A18	BREAKER STATUS	W17.10-E-301
A19 IN 102 A20	BREAKER FAILURE INPUT FROM SEL 387L	W17.10-E-301
A21 IN 103 A22	SYNC CHECK ENABLE	W17.10-E-301
A23 IN 104 A24	CSR INPUT	W17.10-E-301
A25 IN 105 A26		
A27 IN 106 A28	TRIP COIL MONITOR (BREAKER CONTACT WEAR)	W17.10-E-301
Z01 IA Z02 Z03 IB Z04 Z05 IC Z06 Z07 IN Z08	CURRENT INPUTS	W17.10-E-201
Z09 VA Z10 VB Z11 VC Z12 Z13 VS Z14	VOLTAGE INPUTS	W17.10-E-201
OUT101 A01 A02 OUT102 A03 A04	BREAKER TRIP	W17.10-E-301
OUT103 A05 A06	BREAKER SYNC CHECK PERMISSIVE CLOSE	W17.10-E-301
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12	BREAKER FAILURE TRIP	W17.10-E-318
OUT107 A13 A14	RELAY FAILURE ALARM	W17.10-E-542
ALARM A15 A16		
Z25 + POWER SUPPLY - Z26 BATT.MONITOR	125V DC SUPPLY	W17.10-E-301
Z27	CHASSIS GROUND	W17.10-E-301
(REAR) PORT 1 RS485 (REAR) IRIG-B 7 8 (REAR) PORT 2 EIA-232 (REAR) PORT 3 EIA-232 (FRONT) PORT F EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W17.10-E-561

BREAKER H2-104
(TRANSFORMER T20 FEEDER)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 IN 101 A18	BREAKER STATUS	W17.10-E-302
A19 IN 102 A20	BREAKER FAILURE INPUT FROM SEL 387A	W17.10-E-302
A21 IN 103 A22	SYNC CHECK ENABLE	W17.10-E-302
A23 IN 104 A24	CSR INPUT	W17.10-E-302
A25 IN 105 A26		
A27 IN 106 A28	TRIP COIL MONITOR (BREAKER CONTACT WEAR)	W17.10-E-302
Z01 IA Z02 Z03 IB Z04 Z05 IC Z06 Z07 IN Z08	CURRENT INPUTS	W17.10-E-201
Z09 VA Z10 VB Z11 VC Z12 Z13 VS Z14	VOLTAGE INPUTS	W17.10-E-201
OUT101 A01 A02	BREAKER TRIP	W17.10-E-302
OUT102 A03 A04		
OUT103 A05 A06	SYNC CHECK PERMISSIVE CLOSE	W17.10-E-302
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14	BREAKER FAILURE TRIP	W17.10-E-318
ALARM A15 A16	RELAY FAILURE ALARM	W17.10-E-542
Z25 + POWER SUPPLY - Z26 BATT.MONITOR	125V DC SUPPLY	W17.10-E-302
Z27	CHASSIS GROUND	W17.10-E-302
(REAR) PORT 1 RS485 (REAR) IRIG-B 7 8 (REAR) PORT 2 EIA-232 (REAR) PORT 3 EIA-232 (FRONT) PORT F EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W17.10-E-561

BREAKER H2-204
(TRANSFORMER T21 FEEDER)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 IN 101 A18	BREAKER STATUS	W17.10-E-303
A19 IN 102 A20	BREAKER FAILURE INPUT FROM SEL 387A	W17.10-E-303
A21 IN 103 A22	SYNC CHECK ENABLE	W17.10-E-303
A23 IN 104 A24	CSR INPUT	W17.10-E-303
A25 IN 105 A26		
A27 IN 106 A28	TRIP COIL MONITOR (BREAKER CONTACT WEAR)	W17.10-E-303
Z01 IA Z02 Z03 IB Z04 Z05 IC Z06 Z07 IN Z08	CURRENT INPUTS	W17.10-E-201
Z09 VA Z10 VB Z11 VC Z12 Z13 VS Z14	VOLTAGE INPUTS	W17.10-E-201
OUT101 A01 A02	BREAKER TRIP	W17.10-E-303
OUT102 A03 A04		
OUT103 A05 A06	SYNC CHECK PERMISSIVE CLOSE	W17.10-E-303
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14	BREAKER FAILURE TRIP	W17.10-E-319
ALARM A15 A16	RELAY FAILURE ALARM	W17.10-E-554
Z25 + POWER SUPPLY - Z26 BATT.MONITOR	125V DC SUPPLY	W17.10-E-303
Z27	CHASSIS GROUND	W17.10-E-303
(REAR) PORT 1 RS485 (REAR) IRIG-B 7 8 (REAR) PORT 2 EIA-232 (REAR) PORT 3 EIA-232 (FRONT) PORT F EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W17.10-E-561

BREAKER H2-203
(TRANSFORMER T23 FEEDER)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 IN 101 A18	BREAKER STATUS	W17.10-E-304
A19 IN 102 A20	BREAKER FAILURE INPUT FROM SEL 387A	W17.10-E-304
A21 IN 103 A22	SYNC CHECK ENABLE	W17.10-E-304
A23 IN 104 A24	CSR INPUT	W17.10-E-304
A25 IN 105 A26		
A27 IN 106 A28	TRIP COIL MONITOR (BREAKER CONTACT WEAR)	W17.10-E-304
Z01 IA Z02 Z03 IB Z04 Z05 IC Z06 Z07 IN Z08	CURRENT INPUTS	W17.10-E-201
Z09 VA Z10 VB Z11 VC Z12 Z13 VS Z14	VOLTAGE INPUTS	W17.10-E-201
OUT101 A01 A02	BREAKER TRIP	W17.10-E-304
OUT102 A03 A04		
OUT103 A05 A06	SYNC CHECK PERMISSIVE CLOSE	W17.10-E-304
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14	BREAKER FAILURE TRIP	W17.10-E-319
ALARM A15 A16	RELAY FAILURE ALARM	W17.10-E-554
Z25 + POWER SUPPLY - Z26 BATT.MONITOR	125V DC SUPPLY	W17.10-E-304
Z27	CHASSIS GROUND	W17.10-E-304
(REAR) PORT 1 RS485 (REAR) IRIG-B 7 8 (REAR) PORT 2 EIA-232 (REAR) PORT 3 EIA-232 (FRONT) PORT F EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W17.10-E-561

USER: vuong
DATE: 09-SEP-2014 15:09
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REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
PROTECTIVE RELAYS CONTACT TABLES - SHEET 1

SCALE NONE
DATE JAN2009
W17.10-E-307
DRAWING NUMBER
1
REV.

USER: vuong PLOT SCALE: 0.166667:1
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REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

SYNCHRONIZING RELAY SEL 451-4 (451-H2-1) CONTACT TABLE (ONE ADD. I/0 - 4U)

CONTACTS	FUNCTION	DRAWING
A20 IN 101 A21	H2A-H1A FEEDER BREAKER H2-100 STATUS	W17.10-E-305
A22 IN 102 A23	PGS2-H2A FEEDER BREAKER H2-103 STATUS	W17.10-E-301
A24 IN 103 A25	H2B-H1B FEEDER BREAKER H2-200 STATUS	W17.10-E-306
A26 IN 104 A27	PGS1/T23 FEEDER BREAKER H2-203 STATUS	W17.10-E-304
A28 IN 105 A29	H2A-H2B TIE BREAKER H2-150 STATUS	
A31 IN 106 A30		
IN 107 A32		
Z01 IAW Z02 Z03 IBW Z04 Z05 ICW Z06	CURRENT INPUTS FROM BREAKER H2-100	W17.10-E-201
Z07 IAX Z08 Z09 IBX Z10 Z11 ICX Z12	CURRENT INPUTS FROM BREAKER H2-200 ①	W17.10-E-201
Z13 VAY Z14 Z15 VBY Z16 Z17 VCY Z18	SYNC. VOLTAGE/FREQ. (REF.)	W17.10-E-211
Z19 VAZ Z20 Z21 VBZ Z22 Z23 VCZ Z24	SYNC. VOLTAGE/FREQ. (SLIP)	W17.10-E-211
A01 + OUT 101 A02	CLOSE H2A-H1A TIE A BREAKER H2-100	W17.10-E-305
A03 + OUT 102 A04	CLOSE H2B-H1B TIE B BREAKER H2-200	W17.10-E-306
A05 + OUT 103 A06	CLOSE H2A-H2B TIE BREAKER H2-150	W17.10-E-320
A07 OUT 104 A08		
A09 OUT 105 A10		
A12 OUT 106 A11 A13		
A15 OUT 107 A14 A16		
A18 OUT 108 A17 A19	RELAY FAIL ALARM	W17.10-E-542
+ Z25 BATT.MONITOR Z26 -		
+ Z27 BATT.MONITOR Z28 -		
+ Z29 POWER SUPPLY Z30 -	125V DC POWER SUPPLY	
Z31	CHASSIS GROUND	②
(REAR) IRIG-B	IRIG-B TIME SIGNAL INPUT	W17.10-E-561
(REAR) PORT 1 EIA-232	AUTO-SYNC. INTERFACE W/3351-1	W17.10-E-561
(REAR) PORT 2 EIA-232	MIRRORED BIT COMM. TO 451-PGS1	W17.10-E-561
(REAR) PORT 3 EIA-232	MIRRORED BIT COMM. TO 451-PGS2	W17.10-E-561
(REAR) PORT 5 ETHERNET		
(FRONT) PORT F EIA-232		

CONTACTS	FUNCTION	DRAWING
B01 OUT 201 B02	TRIP H2A-H1A TIE A BREAKER H2-100	W17.10-E-305
B03 OUT 202 B04	TRIP H2B-H1B TIE B BREAKER H2-200	W17.10-E-306
B05 OUT 203 B06		
B07 OUT 204 B08	SYNC. SW (H2B/VAY)	W17.10-E-211 ①
B09 OUT 205 B10	SYNC. SW (H2B/VAY)	W17.10-E-211
B11 OUT 206 B12	BUS H2A BREAKER FAILURE LOCKOUT RELAY	W17.10-E-318
B13 OUT 207 B14	BUS H2B BREAKER FAILURE LOCKOUT RELAY	W17.10-E-319
B15 OUT 208 B16	SYNC. SW (H1A/VAZ)	W17.10-E-211 ①
B17 OUT 209 B18	SYNC. SW (H1A/VAZ)	W17.10-E-211
B19 OUT 210 B20	SYNC. SW (H2A/VAY)	W17.10-E-211
B21 OUT 211 B22	SYNC. SW (H2A/VAY)	W17.10-E-211
B23 OUT 212 B24	SYNC. SW (H1B/VAZ)	W17.10-E-211
B25 OUT 213 B26	SYNC. SW (H1B/VAZ)	W17.10-E-211
B28 OUT 214 B27 B29	SYNC. SW (H2B/VAZ)	W17.10-E-211
B31 OUT 215 B30 B32	SYNC. SW (H2B/VAZ)	W17.10-E-211
B33 IN 201 B34	H1 SWGR, H1A-H2A LINE BREAKER STATUS	
B35 IN 202 B36	H1 SWGR, H1B-H2B LINE BREAKER STATUS	
B37 IN 203 B38	UTILITY POWER AVAILABLE AT PGS1 (INPUT FROM 2506-H2A1)	W17.10-E-543
B39 IN 204 B40	UTILITY POWER AVAILABLE AT PGS2 (INPUT FROM 2506-H2A1)	W17.10-E-543
B41 IN 205 B42	H2-100 CSR SLIP & OFF CONTACTS	W17.10-E-305
B43 IN 206 B44	H2-100 TRIP COIL MONITOR (BREAKER CONTACT WEAR)	W17.10-E-305
B45 IN 207 B46	H2-200 CSR SLIP & OFF CONTACTS	W17.10-E-306
B47 IN 208 B48	H2-200 TRIP COIL MONITOR (BREAKER CONTACT WEAR)	W17.10-E-306

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PROJECT NO. 07688-01-03

NO.	DATE	REVISION	BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
②	01/24/11	REVISED PER SEL 01/14/11 FAT MARK-UPS	CGT		
①	02/24/10	REVISED AUTO SYNCH. VOLTAGE INPUTS	SEL		

SD317A - PGS RENEWABLE ENERGY EXPANSION

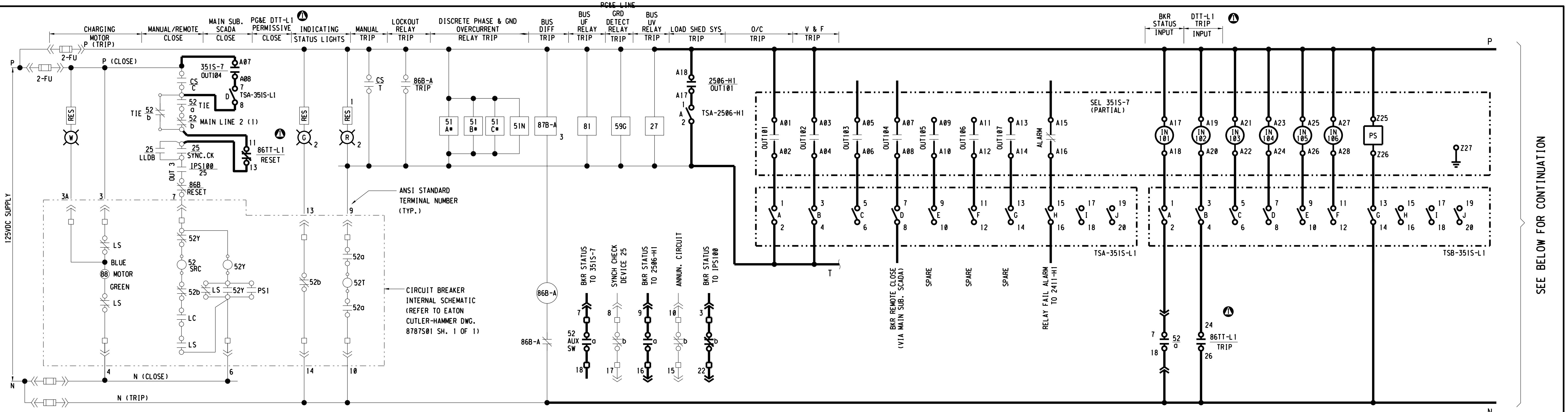
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED:
PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR H2 PROTECTIVE RELAYS CONTACT TABLES AUTO-SYNC. RELAY SEL-451-4 - SHEET 2

SCALE NONE
DATE JAN2009
W17.10-E-308
DRAWING NUMBER
3
REV.



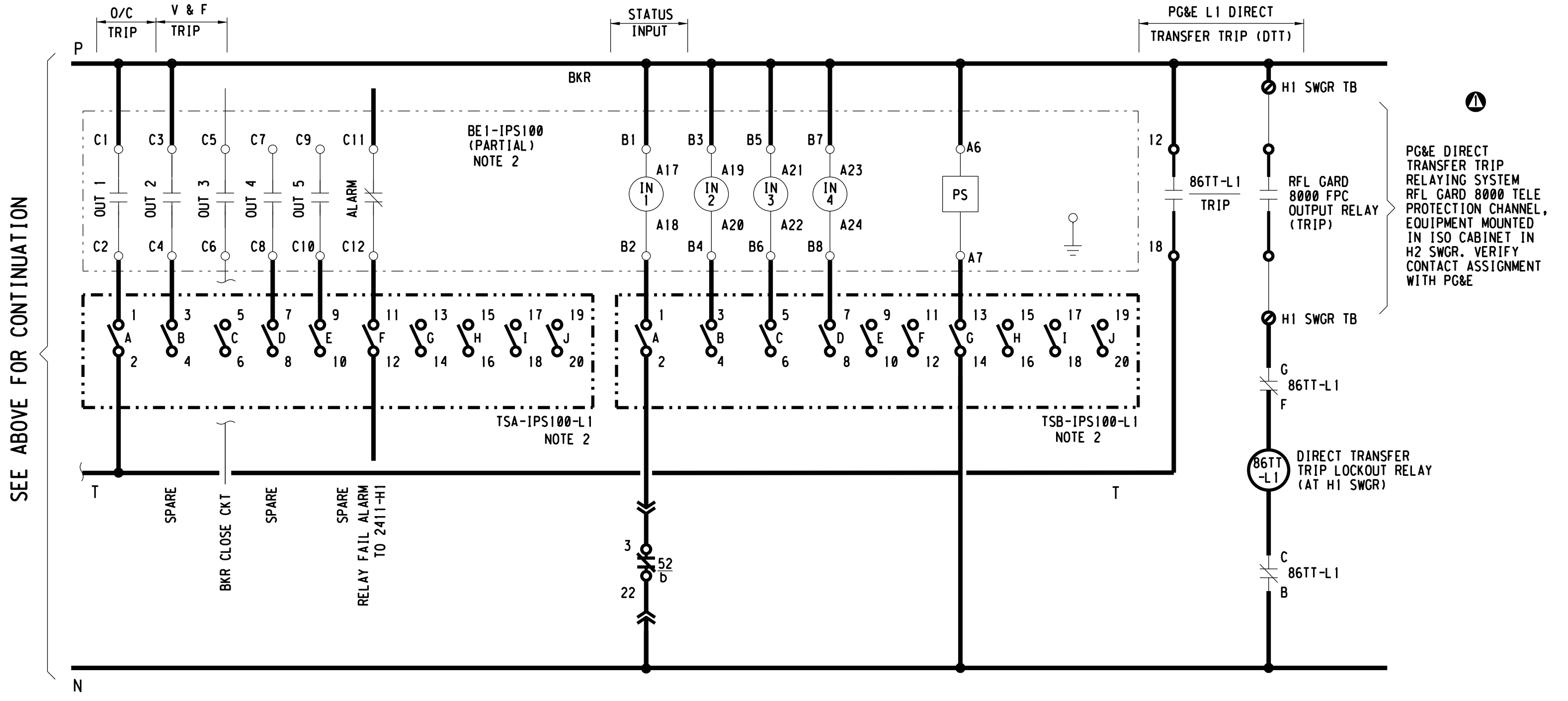
STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 INCOMING PG&E LINE 1, CKT. L1107 MAIN CIRCUIT BREAKER CONTROL SCHEMATIC

- NONE

NOTES:

1. CONTACT DEVELOPMENT OF DEVICES "CS" AND "86" ARE TYPICAL OF ELECTROSWITCH SERIES 24 AND LOR, RESPECTIVELY.
2. PROVIDE NEW TEST SWITCHES AND REWIRE EXISTING BASLER IPS100 RELAY INPUTS AND OUTPUTS AS INDICATED.
3. RECONNECT EXISITNG WIRES TO NEW 2411-H1 IN H1 SWGR FOR ALARM ANNUNCIATION.


O/C TRIP
V & F TRIP
STATUS INPUT
PG&E L1 DIRECT TRANSFER TRIP (DTT)
P
BKR
BE1-IPS100 (PARTIAL) NOTE 2
OUT 1
OUT 2
OUT 3
OUT 4
OUT 5
ALARM
IN 1
IN 2
IN 3
IN 4
PS
86TT-L1 TRIP
H1 SWGR TB
RFL GARD 8000 FPC OUTPUT RELAY (TRIP)
PG&E DIRECT TRANSFER TRIP RELAYING SYSTEM RFL GARD 8000 TELE PROTECTION CHANNEL, EQUIPMENT MOUNTED IN ISO CABINET IN H2 SWGR. VERIFY CONTACT ASSIGNMENT WITH PG&E
TSA-IPS100-L1 NOTE 2
TSB-IPS100-L1 NOTE 2
86TT-L1
DIRECT TRANSFER TRIP LOCKOUT RELAY (AT H1 SWGR)
SEE ABOVE FOR CONTINUATION
SPARE
BKR CLOSE CKT
SPARE
SPARE RELAY FAIL ALARM TO 2411-H1
52 b
T
N

DECK	SEE CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION	DWG. NO.
1	11 ⊸⊣ ⊢⊸ 13		X	PERMITS CLOSING MAIN BKR (I1107)	THIS SHEET
	12 ⊸⊣ ⊢⊸ 18	X		TRIPS MAIN BREAKER (L1107)	THIS SHEET
	15 ⊸⊣ ⊢⊸ 17		X	PERMITS CLOSING H1A-H2A LINE BKR	W17.10-E-311
	14 ⊸⊣ ⊢⊸ 16	X		TRIPS H1A-H2A BKR	W17.10-E-311
2	21 ⊸⊣ ⊢⊸ 23		X	PERMITS CLOSING TIE BKR	W17.10-E-311
	22 ⊸⊣ ⊢⊸ 28	X		TRIPS TIE BKR	W17.10-E-311
	25 ⊸⊣ ⊢⊸ 27		X		
	24 ⊸⊣ ⊢⊸ 26	X		ANNUNCIATOR (NOTE 3)	W17.10-E-540
3	31 ⊸⊣ ⊢⊸ 33		X		
	32 ⊸⊣ ⊢⊸ 38	X			
	35 ⊸⊣ ⊢⊸ 37		X		
	34 ⊸⊣ ⊢⊸ 36	X			

CONTACT DEVELOPMENT

"X" INDICATES CONTACT CLOSED

3 H1 BUS A DIFFERENTIAL LOCKOUT RELAY

- NONE

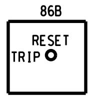
DECK	SEE CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION	DWG. NO.
1	11 ⊸⊣ ⊢⊸ 13		X	PERMITS CLOSING MAIN BKR (I1107)	THIS SHEET
	12 ⊸⊣ ⊢⊸ 18	X		TRIPS MAIN BREAKER (L1107)	THIS SHEET
	15 ⊸⊣ ⊢⊸ 17		X		
	14 ⊸⊣ ⊢⊸ 16	X			
2	21 ⊸⊣ ⊢⊸ 23		X		
	22 ⊸⊣ ⊢⊸ 28	X			
	25 ⊸⊣ ⊢⊸ 27		X		
	24 ⊸⊣ ⊢⊸ 26	X		INPUT TO SEL 351S-7	THIS SHEET
3	31 ⊸⊣ ⊢⊸ 33		X		
	32 ⊸⊣ ⊢⊸ 38	X			
	35 ⊸⊣ ⊢⊸ 37		X		
	34 ⊸⊣ ⊢⊸ 36	X			

CONTACT DEVELOPMENT

"X" INDICATES CONTACT CLOSED

4 PG&E L1107 DTT LOCKOUT RELAY DEVICE 86TT-L1

- NONE



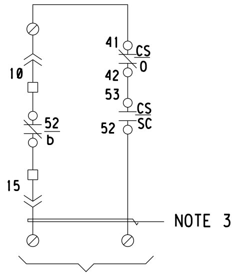
ESCUTCHEON

NOTES:

FIXED OVAL HANDLE, MAINTAINED, CONTACT, AUTO TRIP, MANUALLY RESET LOCKOUT

SYMBOL LIST

88	SPRING CHARGING MOTOR
52SRC	SPRING RELEASE COIL (CLOSE)
52Y	CLOSING COIL (ANTI-PUMP)
52T	SHUNT TRIP COIL
LS	SPRING CHARGED LIMIT SWITCH
52a	AUX. SW. CONTACTS - OPEN WHEN BKR IS OPEN
52b	AUX. SW. CONTACTS - CLOSE WHEN BKR IS OPEN
G	GREEN INDICATING LIGHT - (BREAKER TRIP)
R	RED INDICATING LIGHT - (BREAKER CLOSED)
W	WHITE INDICATING LIGHT - (SPRINGS CHARGED)
CS / C	BREAKER CONTROL SWITCH. (CLOSE POSITION)
CS / T	BREAKER CONTROL SWITCH (TRIP POSITION)
LLDB	LIVE LINE - DEAD BUS CONTACT



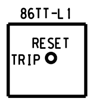
H1 SWGR PG&E LINE 1
BKR TRIP ALARM TO 2411-H1

DECK	CONTACTS		POSITION PULL TRIP	TRIP	OFF AFTER TRIP	OFF AFTER CLOSE	CLOSE
1	12 ⊸⊣ ⊢⊸ 13	C					X
	16 ⊸⊣ ⊢⊸ 17	C					X
2	21 ⊸⊣ ⊢⊸ 28	T		X			
	24 ⊸⊣ ⊢⊸ 25	T		X			
3	33 ⊸⊣ ⊢⊸ 34	PT	X				
	37 ⊸⊣ ⊢⊸ 38	PT	X				
4	41 ⊸⊣ ⊢⊸ 42	O			X	X	
	45 ⊸⊣ ⊢⊸ 46	O			X	X	
5	52 ⊸⊣ ⊢⊸ 53	SC				X	X
	56 ⊸⊣ ⊢⊸ 57	SC				X	X
6	61 ⊸⊣ ⊢⊸ 62	ST		X	X		
	65 ⊸⊣ ⊢⊸ 66	ST		X	X		

CONTACT DEVELOPMENT

"O" CONTACTS (DECK 4)
SLIP CONTACTS (DECK 5)

"X" INDICATED CONTACT CLOSED



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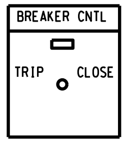
NOTES:

FIXED OVAL HANDLE, MAINTAINED, CONTACT, AUTO TRIP, MANUALLY RESET LOCKOUT RELAY ELECTROSWITCH SERIES 24 LOR

2 BREAKER CONTROL SWITCH (CS)

- NONE



ESCUTCHEON

FIXED PISTOL GRIP HANDLE, MANUALLY OPERATED, MOMENTARY CONTACT, SPRING RETURN TO VERTICAL POSITION

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	03/16/10	ADD PG&E DIRECT TRANSFER TRIP	ASC		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1
CONTROL SCHEMATICS

SCALE NONE
DATE MAR2010

W17.10-E-309
DRAWING NUMBER

2
REV.

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
NEW DRAWING NAME_9-4-14\W1710E309.r02
REF 1: REF1$FILENAME
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USER: vuong
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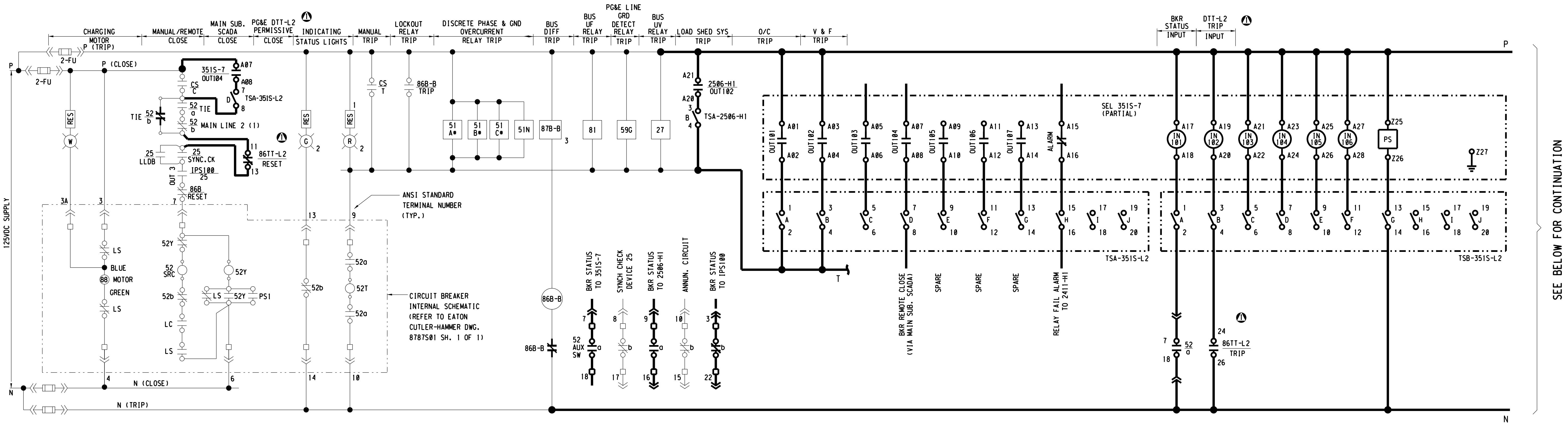
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 INCOMING PG&E LINE 2, CKT. C1151 MAIN CIRCUIT BREAKER CONTROL SCHEMATIC

- NONE

NOTES:

1. CONTACT DEVELOPMENT OF DEVICES "CS" AND "86" ARE TYPICAL OF ELECTROSWITCH SERIES 24 AND LOR, RESPECTIVELY.
2. PROVIDE NEW TEST SWITCHES AND REWIRE EXISTING BASLER IPS100 RELAY INPUTS AND OUTPUTS AS INDICATED.
3. RECONNECT EXISITNG WIRES TO NEW 2411-H1 IN H1 SWGR FOR ALARM ANNUNCIATION.

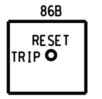
CONTACT DEVELOPMENT

DECK	SEE CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION	DWG. NO.
1	11 ⊸┤├┤├⊷ 13		X	PERMITS CLOSING MAIN BKR (PG&E LINE 2)	THIS SHEET
	12 ⊸┤├┤├⊷ 18	X		TRIPS MAIN BREAKER (PG&E LINE 2)	THIS SHEET
	15 ⊸┤├┤├⊷ 17		X	PERMITS CLOSING H1A-H2B LINE BKR	W17.10-E-311
	14 ⊸┤├┤├⊷ 16	X		TRIPS H1A-H2B BKR	W17.10-E-311
2	21 ⊸┤├┤├⊷ 23		X	PERMITS CLOSING TIE BKR	W17.10-E-311
	22 ⊸┤├┤├⊷ 28	X		TRIPS TIE BKR	W17.10-E-311
	25 ⊸┤├┤├⊷ 27		X		
	24 ⊸┤├┤├⊷ 26	X		ANNUNCIATOR (NOTE 3)	SD317A-W17-E-540
3	31 ⊸┤├┤├⊷ 33		X		
	32 ⊸┤├┤├⊷ 38	X			
	35 ⊸┤├┤├⊷ 37		X		
	34 ⊸┤├┤├⊷ 36	X			

"X" INDICATES CONTACT CLOSED

3 H1 BUS B DIFFERENTIAL LOCKOUT RELAY

- NONE



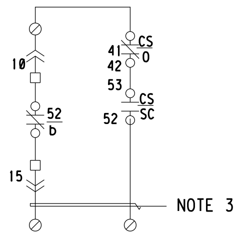
ESCUTCHEON

NOTES:

FIXED OVAL HANDLE, MAINTAINED, CONTACT, AUTO TRIP, MANUALLY RESET LOCKOUT

SYMBOL LIST

88	SPRING CHARGING MOTOR
52SRC	SPRING RELEASE COIL (CLOSE)
52Y	CLOSING COIL (ANTI-PUMP)
52T	SHUNT TRIP COIL
LS	SPRING CHARGED LIMIT SWITCH
52a	AUX. SW. CONTACTS - OPEN WHEN BKR IS OPEN
52b	AUX. SW. CONTACTS - CLOSE WHEN BKR IS OPEN
G	GREEN INDICATING LIGHT - (BREAKER TRIP)
R	RED INDICATING LIGHT - (BREAKER CLOSED)
W	WHITE INDICATING LIGHT - (SPRINGS CHARGED)
$\frac{CS}{C}$	BREAKER CONTROL SWITCH. (CLOSE POSITION)
$\frac{CS}{T}$	BREAKER CONTROL SWITCH (TRIP POSITION)
LLDB	LIVE LINE - DEAD BUS CONTACT



H1 SWGR PG&E LINE 2
BKR TRIP ALARM TO 2411-H1

CONTACT DEVELOPMENT

DECK	CONTACTS		POSITION PULL TRIP	POSITION TRIP	POSITION OFF AFTER TRIP	POSITION OFF AFTER CLOSE	POSITION CLOSE
1	12 ⊸┤├┤├⊷ 13	C					X
	16 ⊸┤├┤├⊷ 17	C					X
2	21 ⊸┤├┤├⊷ 28	T		X			
	24 ⊸┤├┤├⊷ 25	T		X			
3	33 ⊸┤├┤├⊷ 34	PT	X				
	37 ⊸┤├┤├⊷ 38	PT	X				
4	41 ⊸┤├┤├⊷ 42	O			X	X	
	45 ⊸┤├┤├⊷ 46	O			X	X	
5	52 ⊸┤├┤├⊷ 53	SC				X	X
	56 ⊸┤├┤├⊷ 57	SC				X	X
6	61 ⊸┤├┤├⊷ 62	ST		X	X		
	65 ⊸┤├┤├⊷ 66	ST		X	X		

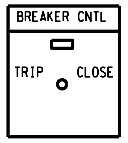
"O" CONTACTS

SLIP CONTACTS

"X" INDICATED CONTACT CLOSED

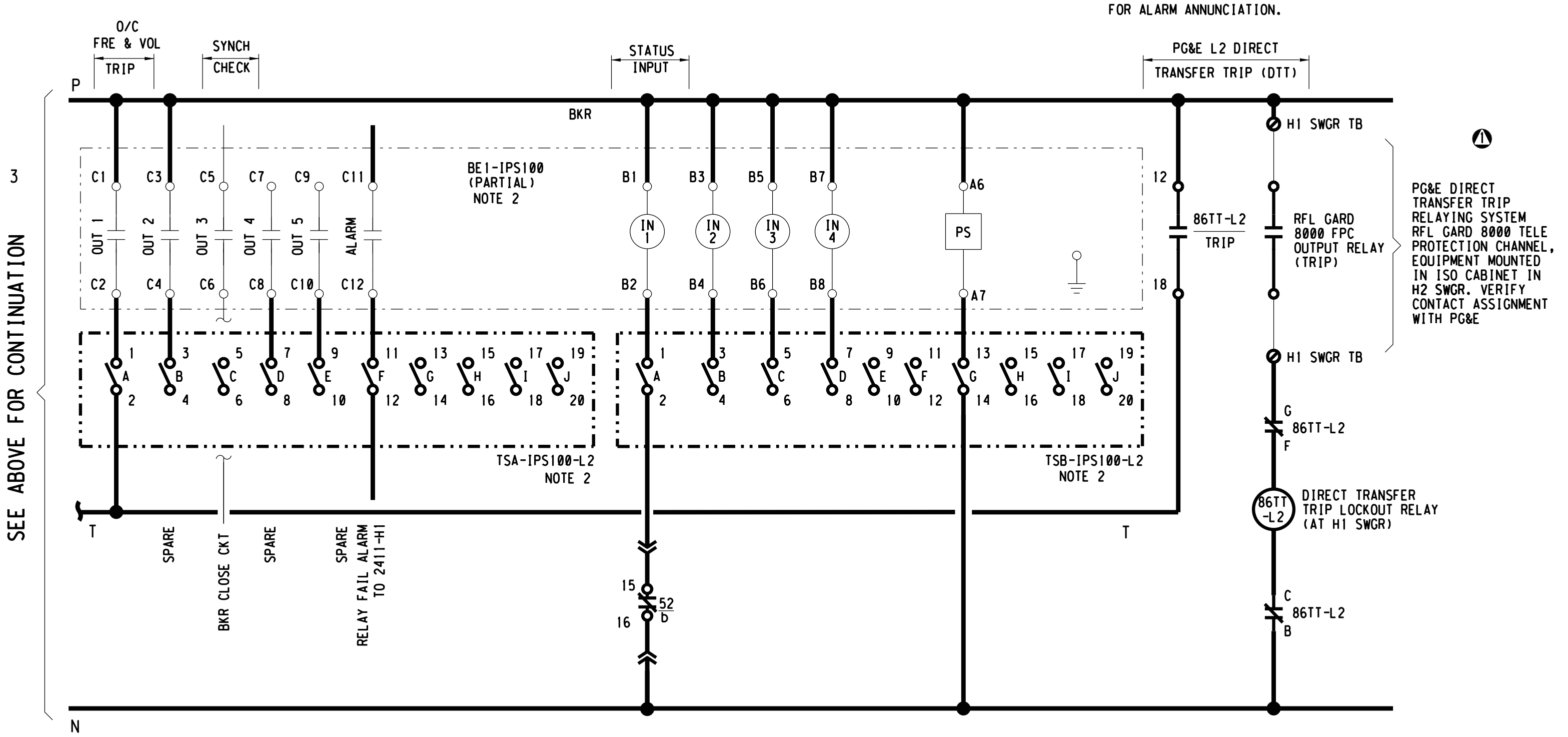
2 BREAKER CONTROL SWITCH (CS)

- NONE



ESCUTCHEON

FIXED PISTOL GRIP HANDLE, MANUALLY OPERATED, MOMENTARY CONTACT, SPRING RETURN TO VERTICAL POSITION


SEE ABOVE FOR CONTINUATION
O/C FRE & VOL TRIP
SYNCH CHECK
STATUS INPUT
PG&E L2 DIRECT TRANSFER TRIP (DTT)
P
BKR
BE1-IPS100 (PARTIAL) NOTE 2
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
OUT 1
OUT 2
OUT 3
OUT 4
OUT 5
ALARM
B1
B2
B3
B4
B5
B6
B7
B8
IN 1
IN 2
IN 3
IN 4
PS
A6
A7
12
18
86TT-L2 TRIP
H1 SWGR TB
RFL GARD 8000 FPC OUTPUT RELAY (TRIP)
PG&E DIRECT TRANSFER TRIP RELAYING SYSTEM RFL GARD 8000 TELE PROTECTION CHANNEL, EQUIPMENT MOUNTED IN ISO CABINET IN H2 SWGR. VERIFY CONTACT ASSIGNMENT WITH PG&E
H1 SWGR TB
86TT-L2
86TT -L2
DIRECT TRANSFER TRIP LOCKOUT RELAY (AT H1 SWGR)
86TT-L2
TSA-IPS100-L2 NOTE 2
TSB-IPS100-L2 NOTE 2
T
SPARE
BKR CLOSE CKT
SPARE
SPARE
RELAY FAIL ALARM TO 2411-H1
15
16
52 b
T
N

CONTACT DEVELOPMENT

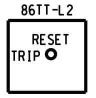
DECK	SEE CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION	DWG. NO.
1	11 ⊸┤├┤├⊷ 13		X	PERMITS CLOSING MAIN BKR (C1151)	THIS SHEET
	12 ⊸┤├┤├⊷ 18	X		TRIPS MAIN BREAKER (C1151)	THIS SHEET
	15 ⊸┤├┤├⊷ 17		X		
	14 ⊸┤├┤├⊷ 16	X			
2	21 ⊸┤├┤├⊷ 23		X		
	22 ⊸┤├┤├⊷ 28	X			
	25 ⊸┤├┤├⊷ 27		X		
	24 ⊸┤├┤├⊷ 26	X		INPUT TO SEL 351S-7	THIS SHEET
3	31 ⊸┤├┤├⊷ 33		X		
	32 ⊸┤├┤├⊷ 38	X			
	35 ⊸┤├┤├⊷ 37		X		
	34 ⊸┤├┤├⊷ 36	X			

"X" INDICATES CONTACT CLOSED

4 PG&E C1151 DTT LOCKOUT RELAY

DEVICE 86TT-L2

- NONE



ESCUTCHEON

NOTES:

FIXED OVAL HANDLE, MAINTAINED, CONTACT, AUTO TRIP, MANUALLY RESET LOCKOUT RELAY ELECTROSWITCH SERIES 24 LOR

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
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PROJECT NO. 07688-01-03

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	03/16/10	ADD PG&E DIRECT TRANSFER TRIP		ASC		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1
CONTROL SCHEMATICS

SCALE NONE
DATE MAR2010
W17.10-E-310
DRAWING NUMBER
2
REV.

USER: vuong
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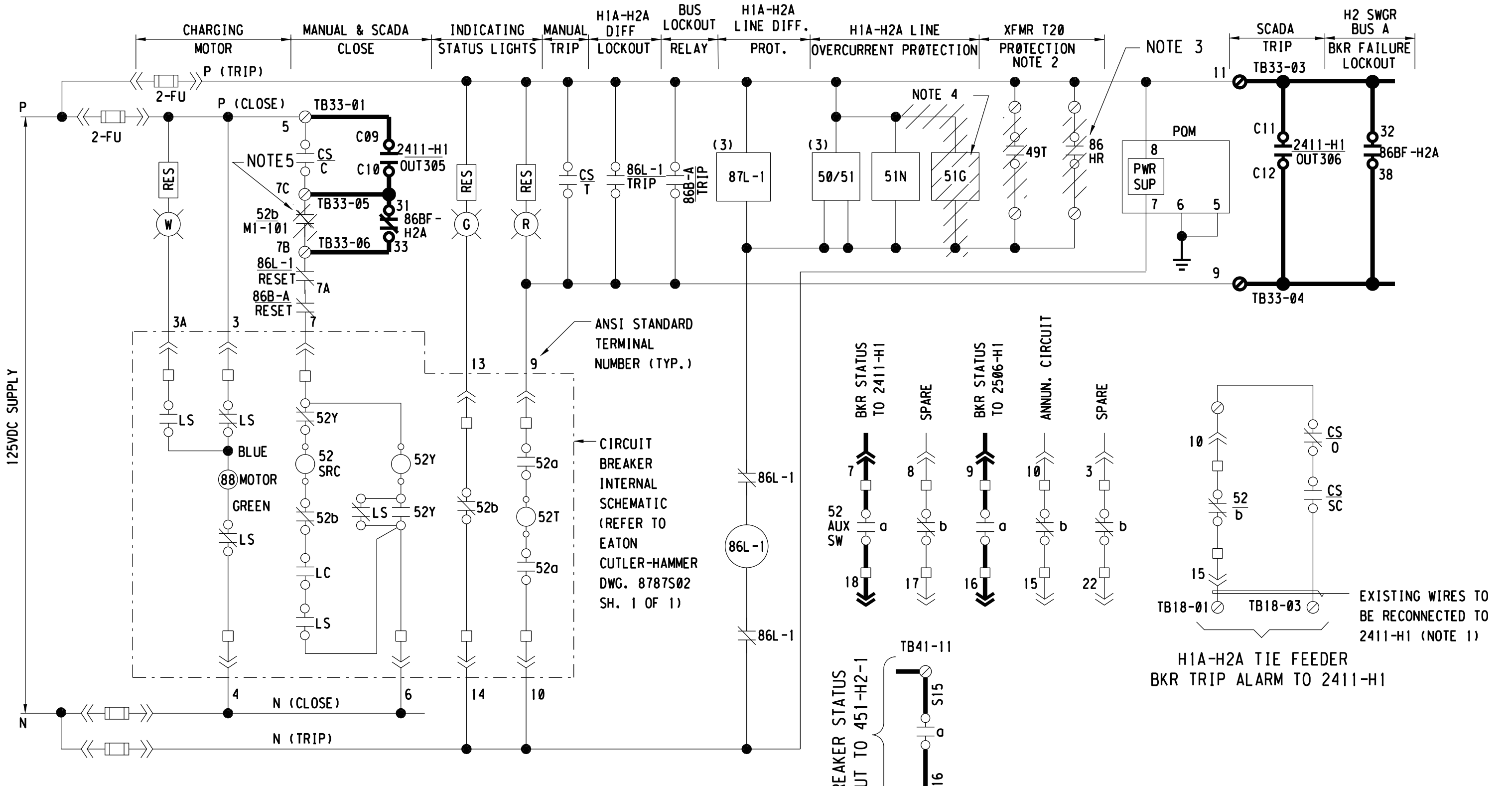
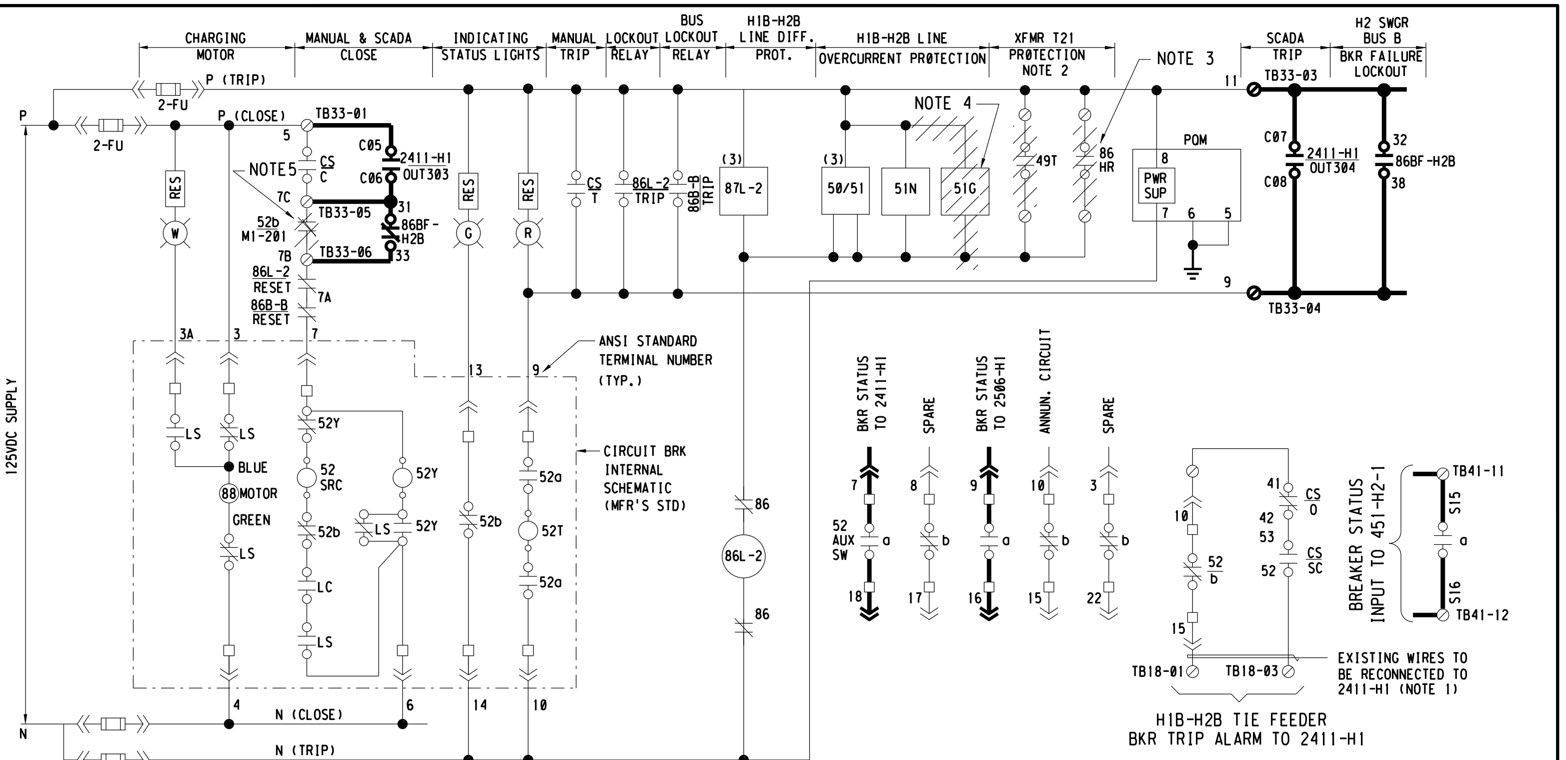


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 H1A TO H2A LINE BREAKER CONTROL SCHEMATIC

- NONE



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

2 H1B TO H2B LINE BREAKER CONTROL SCHEMATIC

- NONE

DECK	SEE CONTACTS	POSITION		FUNCTION	SEE DWG. NO.
		TRIP	RESET		
1	11 ⊸⊣⊢⊸ 13		X	PERMITS CLOSING H1A-H2A BKR	THIS SHEET
	12 ⊸⊣⊢⊸ 18	X		TRIPS H1A-H2A BKR	THIS SHEET
	15 ⊸⊣⊢⊸ 17		X	**PERMITS CLOSING BKR H2-100**	**W17.10-E-305**
	14 ⊸⊣⊢⊸ 16	X		**TRIPS BKR H2-100**	**W17.10-E-305**
2	21 ⊸⊣⊢⊸ 23		X		
	22 ⊸⊣⊢⊸ 28	X		**ANNUNCIATOR (NOTE 1)**	**W17.10-E-540**
	25 ⊸⊣⊢⊸ 27		X		
	24 ⊸⊣⊢⊸ 26	X			
3	31 ⊸⊣⊢⊸ 33		X		
	32 ⊸⊣⊢⊸ 38	X			
	35 ⊸⊣⊢⊸ 37		X		
	34 ⊸⊣⊢⊸ 36	X			

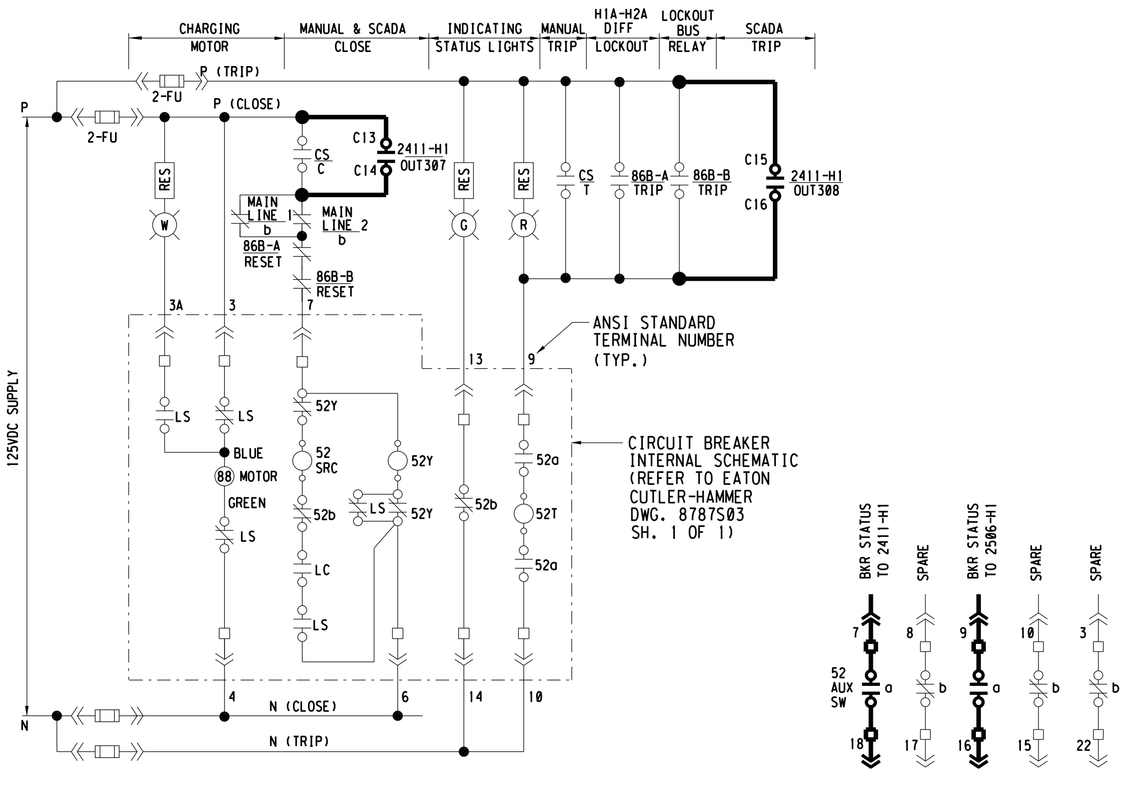
"X" INDICATES CONTACT CLOSED

5 H1A-H2A FEEDER LOCKOUT RELAY

- NONE

NOTES:

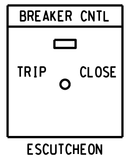
FIXED OVAL HANDLE, MAINTAINED CONTACT, AUTO TRIP, MANUALLY RESET LOCKOUT



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

3 H1A TO H1B TIE BREAKER CONTROL SCHEMATIC

- NONE



FIXED PISTOL GRIP HANDLE, MANUALLY OPERATED, MOMENTARY CONTACT, SPRING RETURN TO VERTICAL POSITION

CONTACT DEVELOPMENT

DECK	CONTACTS		POSITION					
			PULL TRIP	TRIP	OFF AFTER TRIP	OFF AFTER CLOSE	CLOSE	
1	12 ⊸⊣⊢⊸ 13	C					X	
	16 ⊸⊣⊢⊸ 17	C					X	
2	21 ⊸⊣⊢⊸ 28	T		X				
	24 ⊸⊣⊢⊸ 25	T		X				
3	33 ⊸⊣⊢⊸ 34	PT	X					
	37 ⊸⊣⊢⊸ 38	PT	X					
4	41 ⊸⊣⊢⊸ 42	O			X	X		"O" CONTACTS
	45 ⊸⊣⊢⊸ 46	O			X	X		
5	52 ⊸⊣⊢⊸ 53	SC				X	X	SLIP CONTACTS
	56 ⊸⊣⊢⊸ 57	SC				X	X	
6	61 ⊸⊣⊢⊸ 62	ST		X	X			
	65 ⊸⊣⊢⊸ 66	ST		X	X			

"X" INDICATES CONTACT CLOSED

4 BREAKER CONTROL SWITCH (CS)

- NONE

TYPICAL FOR ALL BREAKERS

NOTES:

FIXED OVAL HANDLE, MAINTAINED CONTACT, AUTO TRIP, MANUALLY RESET LOCKOUT

CONTACT DEVELOPMENT

DECK	SEE CONTACTS	POSITION		FUNCTION	SEE DWG. NO.
		TRIP	RESET		
1	11 ⊸⊣⊢⊸ 13		X	PERMITS CLOSING H1B-H2B BKR	THIS SHEET
	12 ⊸⊣⊢⊸ 18	X		TRIPS H1B-H2B BKR	THIS SHEET
	15 ⊸⊣⊢⊸ 17		X	**PERMITS CLOSING BKR H2-200**	**W17.10-E-306**
	14 ⊸⊣⊢⊸ 16	X		**TRIPS BKR H2-200**	**W17.10-E-306**
2	21 ⊸⊣⊢⊸ 23		X		
	22 ⊸⊣⊢⊸ 28	X		**ANNUNCIATOR (NOTE 1)**	**W17.10-E-540**
	25 ⊸⊣⊢⊸ 27		X		
	24 ⊸⊣⊢⊸ 26	X			
3	31 ⊸⊣⊢⊸ 33		X		
	32 ⊸⊣⊢⊸ 38	X			
	35 ⊸⊣⊢⊸ 37		X		
	34 ⊸⊣⊢⊸ 36	X			

"X" INDICATES CONTACT CLOSED

6 H1B-H2B FEEDER LOCKOUT RELAY

- NONE

NOTES:

1. RECONNECT EXISTING WIRES TO NEW 2411-H1 IN H1 SWGR FOR ALARM ANNUNCIATION
2. REMOVE TRANSFORMER PROTECTION TRIP INFLUENCE FROM BREAKER TRIP CONTROL CIRCUIT AND REWIRE THESE CONTACTS TO NEW T20 AND T21 DIFFERENTIAL PROTECTION CIRCUITS LOCATED IN THE H2 SWGR AS SHOWN ON DWGS W17.10-E-302A AND W17.10-E-303A.
3. LOCKOUT RELAY LOCATED ON TRANSFORMER SUDDEN PRESSURE SEAL-IN PANEL.
4. REMOVE DEVICE 51G (TRANSFORMER NEUTRAL OVERCURRENT RELAY). PROTECTIVE FUNCTION WILL BE VIA SEL-387A DEVICES LOCATED IN THE NEW H2 SWITCHGEAR.
5. LIFT WIRES FOR AUX. CONTACT INTERLOCKS WITH M1 SWGR BREAKERS M1-101 AND M1-201 AND LABEL WIRES AS "SPARE".

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
REF 1: REF1#FILENAME
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REF 3: REF3#FILENAME

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USER: vuong
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3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

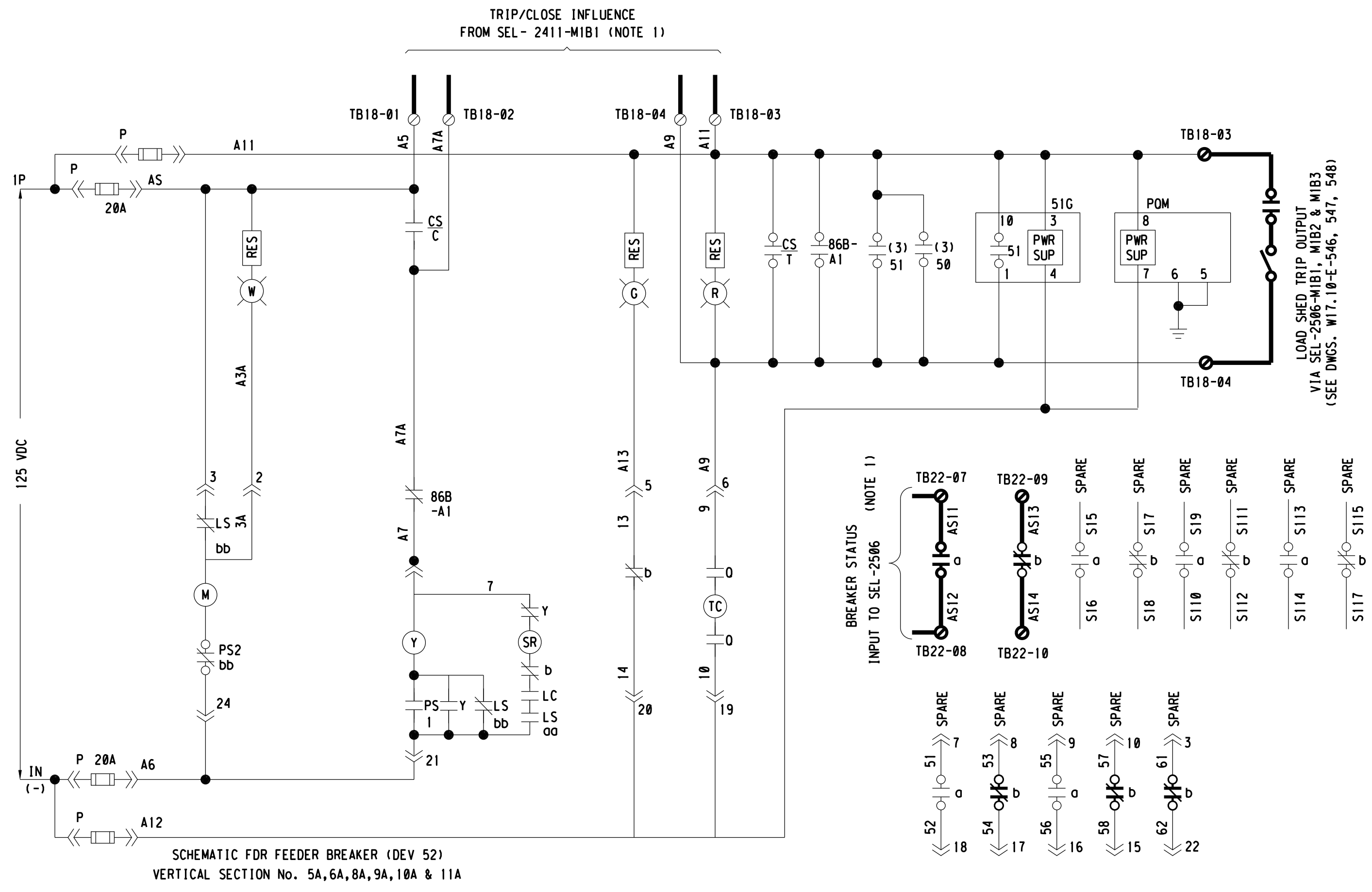
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

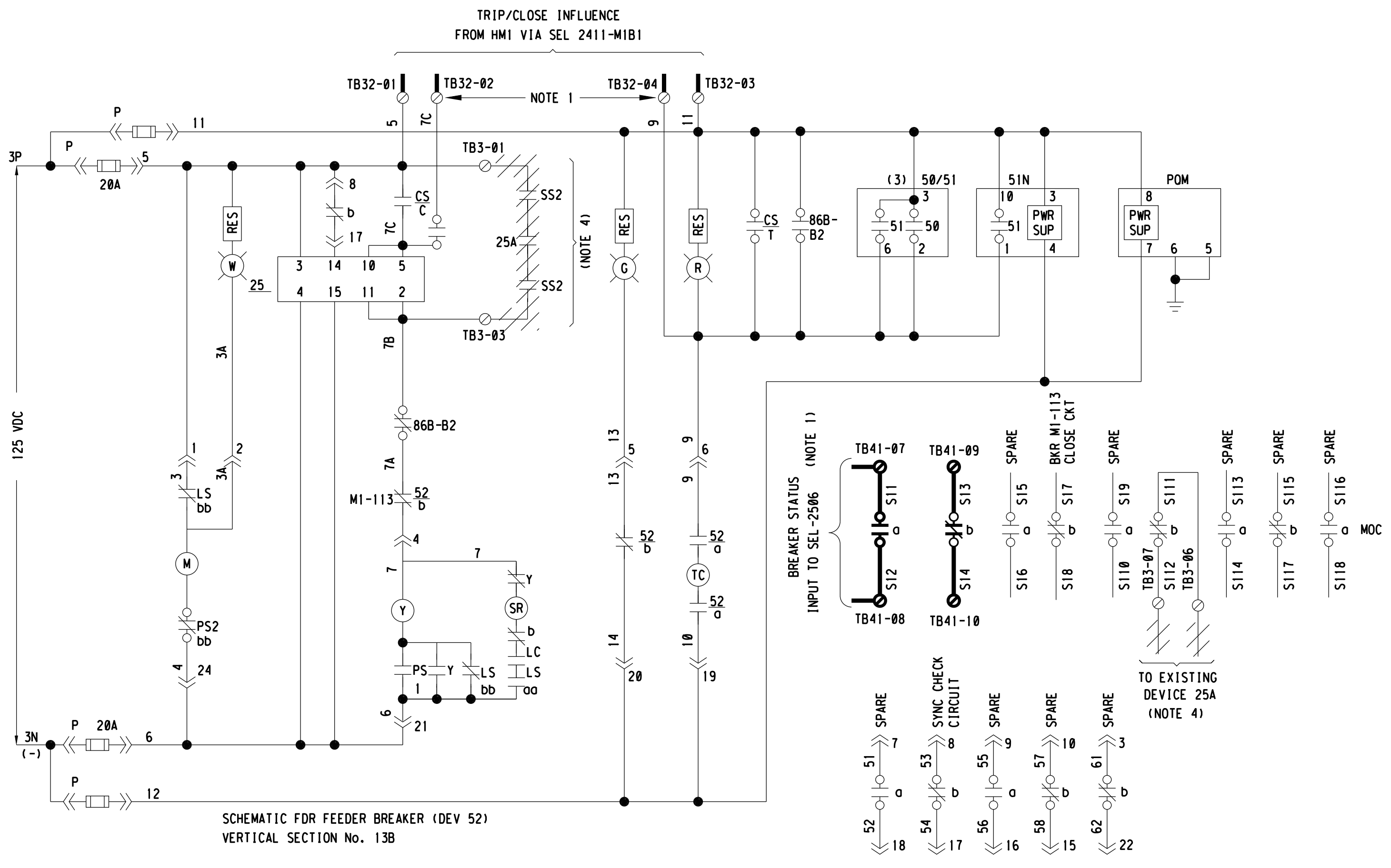
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1
CONTROL SCHEMATICS

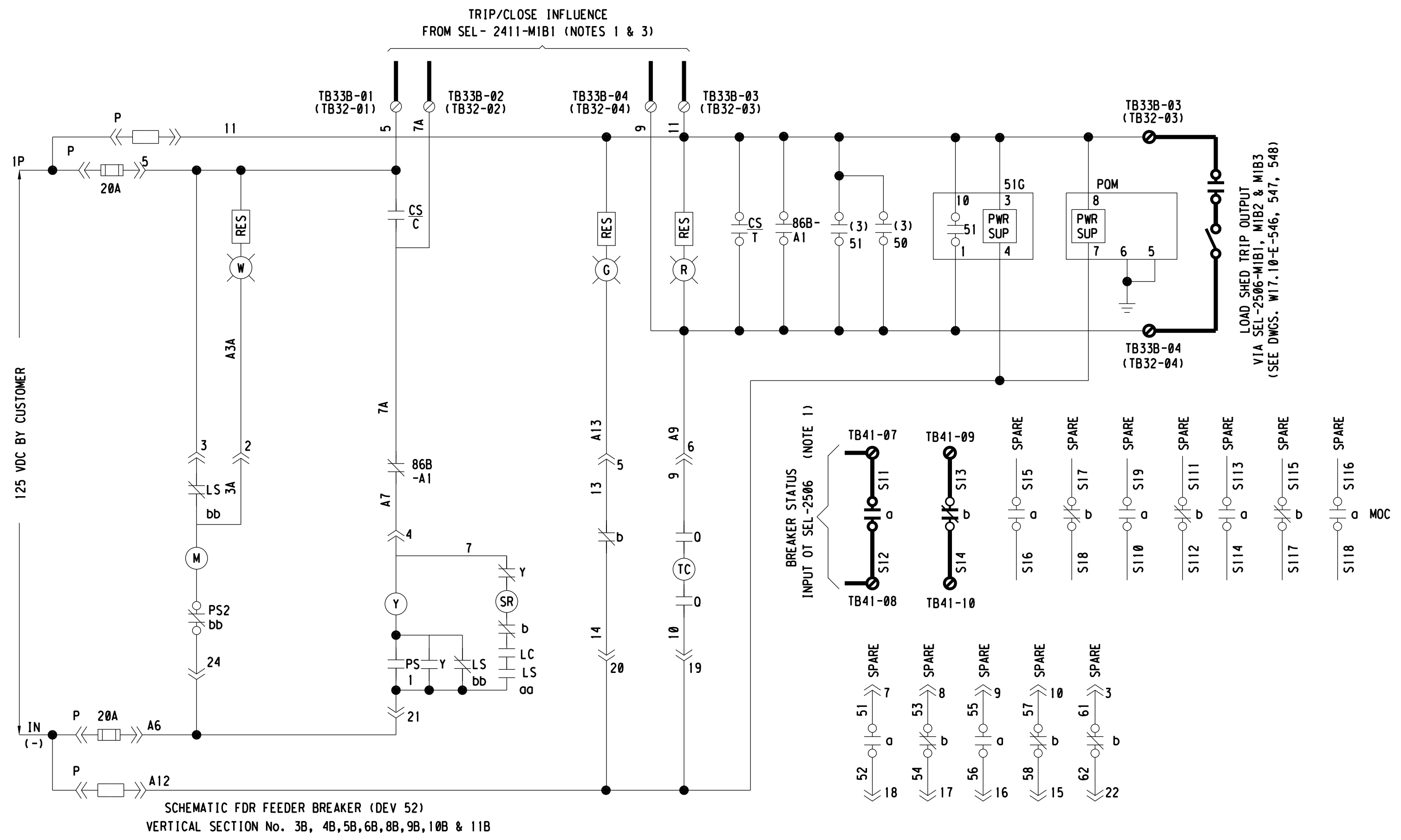
SCALE NONE
DATE JAN2009
W17.10-E-311
DRAWING NUMBER
1
REV.



SCHEMATIC FDR FEEDER BREAKER (DEV 52)
VERTICAL SECTION No. 5A,6A,8A,9A,10A & 11A



SCHEMATIC FDR FEEDER BREAKER (DEV 52)
VERTICAL SECTION No. 13B


TRIP/CLOSE INFLUENCE FROM SEL- 2411-M1B1 (NOTES 1 & 3)
TB33B-01 (TB32-01)
TB33B-02 (TB32-02)
TB33B-04 (TB32-04)
TB33B-03 (TB32-03)
TB33B-04 (TB32-04)
1P
1N (-)
125 VDC BY CUSTOMER
LOAD SHED TRIP OUTPUT VIA SEL-2506-M1B1, M1B2 & M1B3 (SEE DWGS. W17.10-E-546, 547, 548)
BREAKER STATUS INPUT OT SEL-2506 (NOTE 1)
TB41-07
TB41-08
TB41-09
TB41-10
SPARE
MOC

SCHEMATIC FDR FEEDER BREAKER (DEV 52)
VERTICAL SECTION No. 3B, 4B,5B,6B,8B,9B,10B & 11B

REFERENCE TABLE

	SWGR. SECTION No.	ONE-LINE FEEDER I.D.	LOAD SERVED	LOAD SHED TRIP VIA
SWGR. UPPER SECTION	5A	205A	U1	2506-M1B1
	6A	206A	S3	2506-M1B1
	8A	208A	U6/U7	2506-M1B2
	9A	209A	U14/U15	2506-M1B2
	10A	210A	U22/ MAINT. BLDG	2506-M1B2
	11A	211A	SPARE	2506-M1B3
SWGR. LOWER SECTION	3B	203B	S1	2506-M1B1
	4B	204B	S2	2506-M1B1
	5B	205B	U3	2506-M1B1
	6B	206B	U8/U9	2506-M1B1
	8B	208B	U4/U5/U12	2506-M1B2
	9B	209B	U10/U11	2506-M1B2
	10B	210B	U13	2506-M1B2
	11B	211B	SPARE	2506-M1B3
	13B	213	PGS1 EMERG TIE	---

NOTES:

1. REMOVE PLC WIRING TO THESE TERMINAL BLOCKS AND PROVIDE NEW WIRING AS SHOWN. REMOVE ALL WIRING ASSOCIATED WITH PLC CONTROL AND BREAKER STATUS INDICATION BETWEEN THE PLC ENCLOSURE IN THE M1-EAST SWGR AND RESPECTIVE BREAKER SECTION TERMINAL BLOCKS.
2. REFERENCE DRAWING: CUTLER-HAMMER SWITCHGEAR SCHEMATIC DRAWING NOs. 8789S01, SHEET 1 OF 1 AND 8789S02, SHEET 1 OF 1.
3. TERMINAL BLOCK NOS. IN ( ) ARE FOR VERTICAL SECTIONS 3B AND 4B.
4. REMOVE WIRING ASSOCIATED WITH EXISTING BASLER AUTOSYNCHRONIZER.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR M1-EAST TYPICAL FEEDER
BREAKER DC CONTROL SCHEMATIC MODIFICATIONS

SCALE NONE
DATE JAN2009
W17.10-E-312
DRAWING NUMBER
1
REV.

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DATE: 09-SEP-2014 15:31
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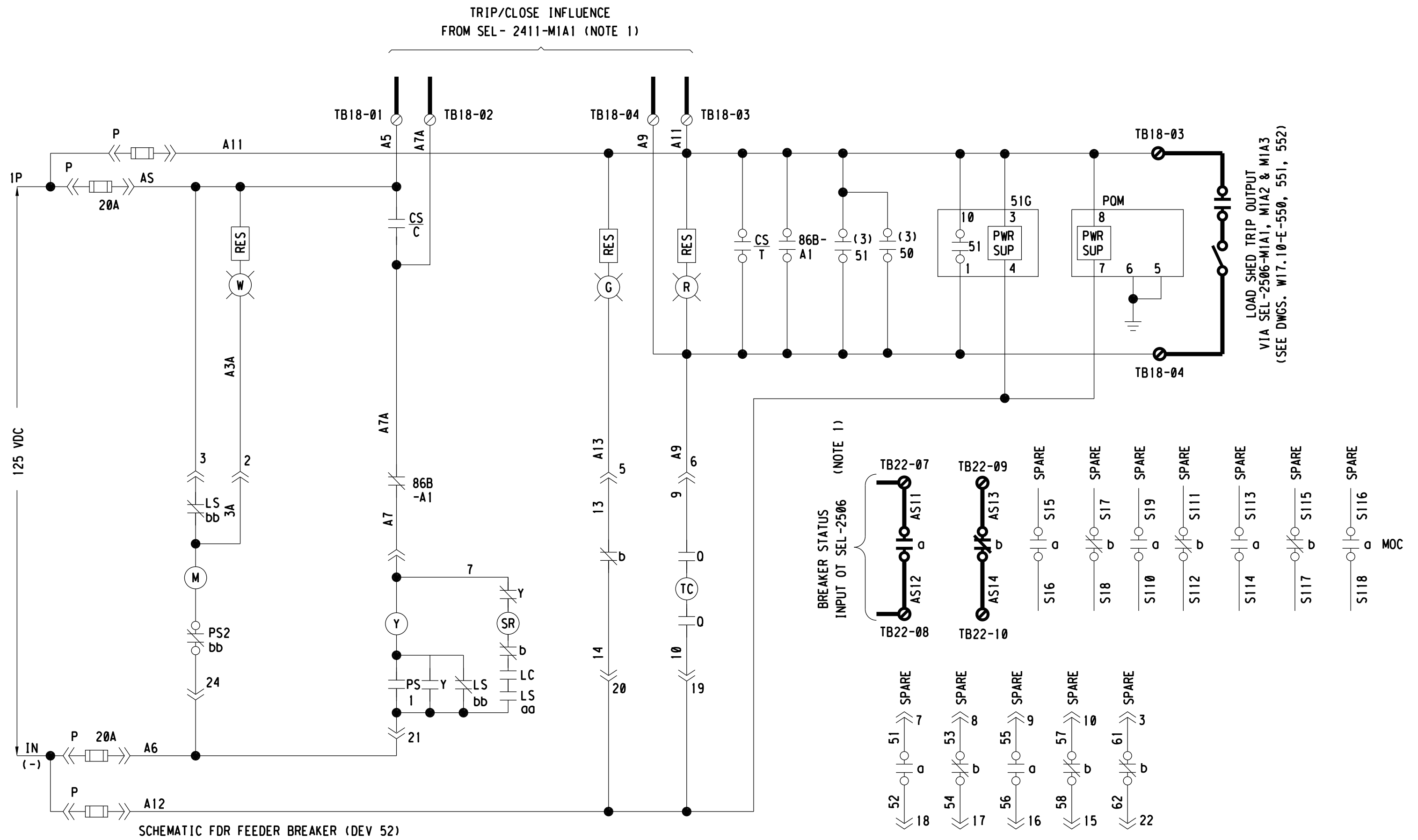
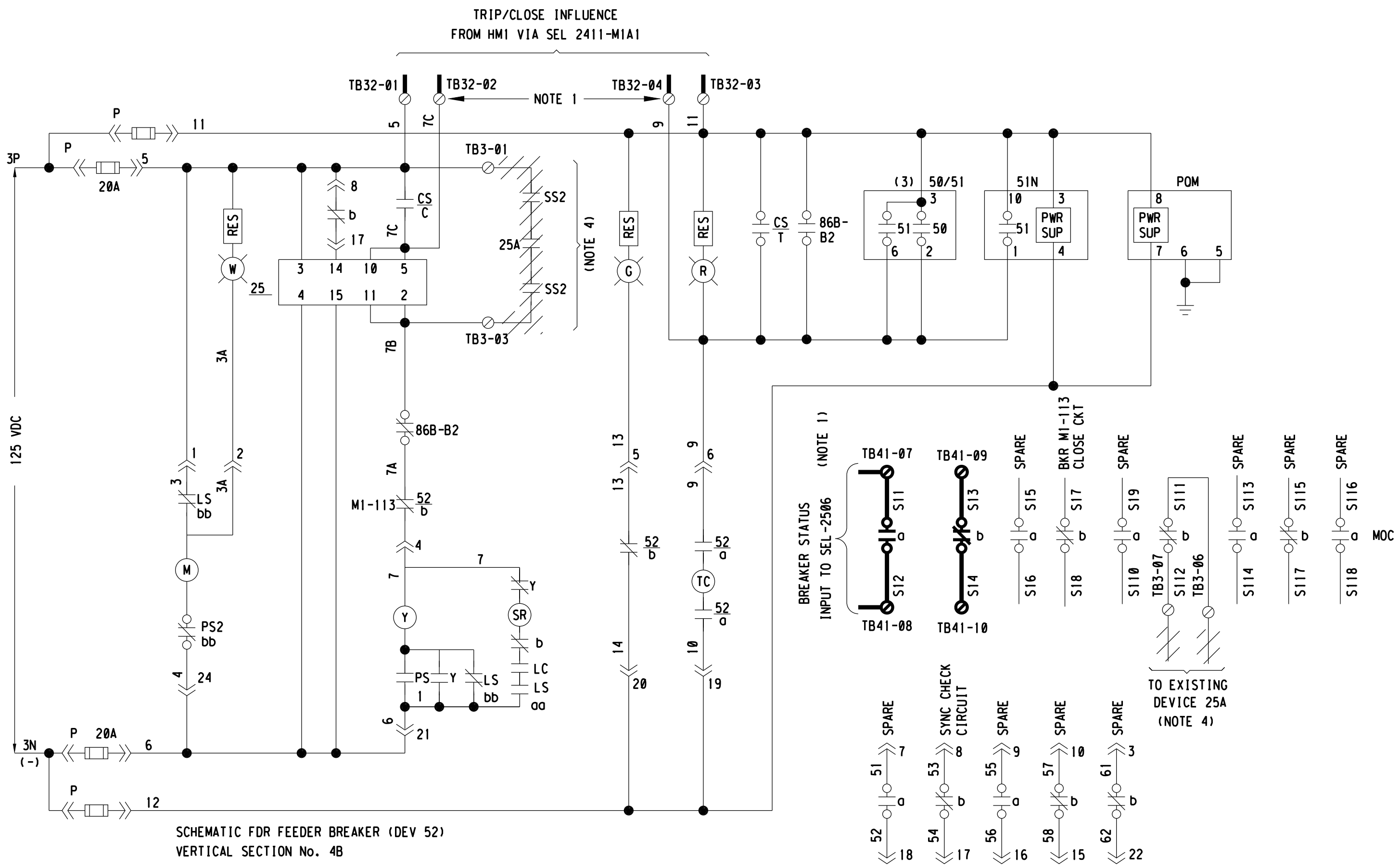
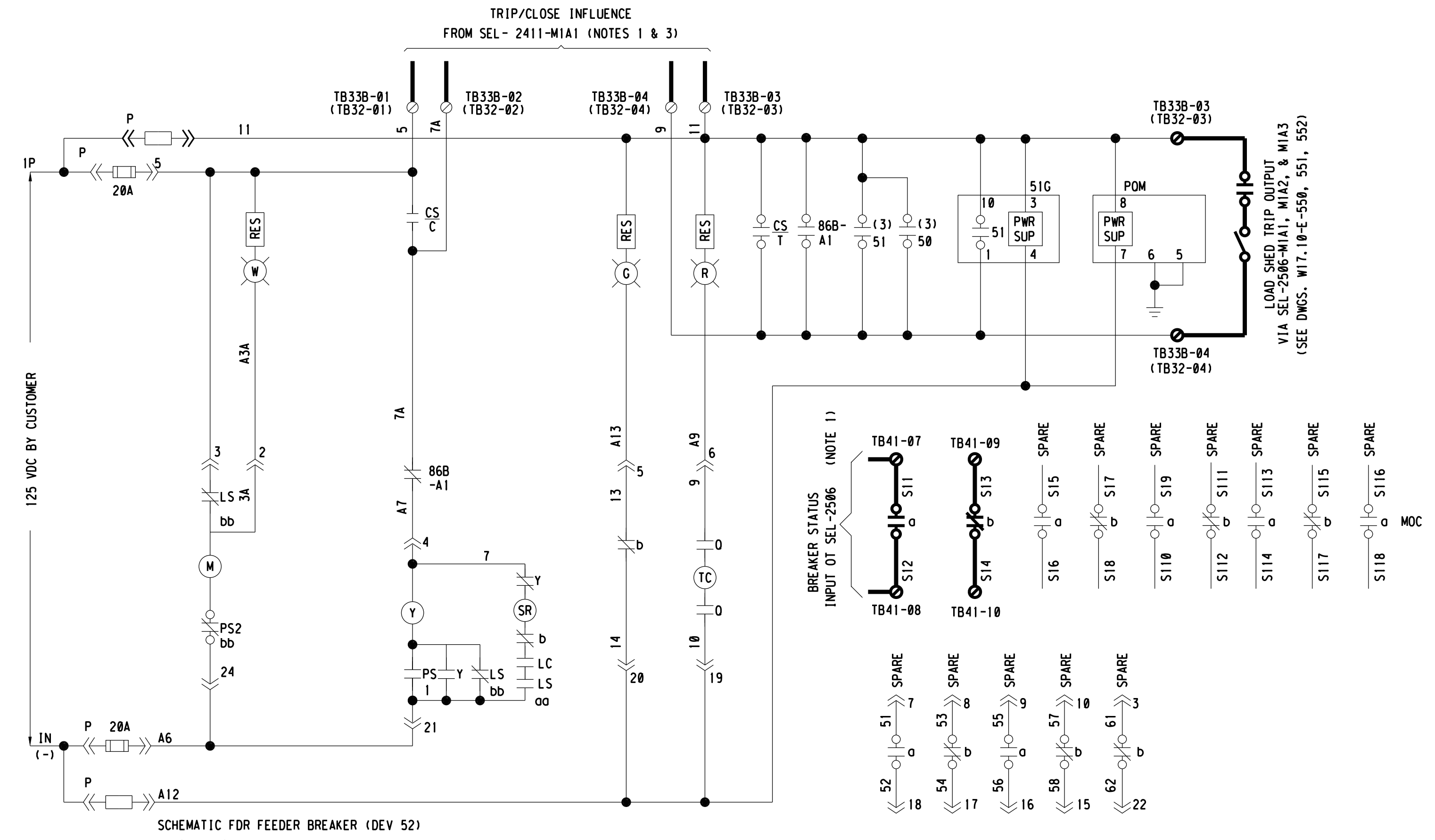


SCHEMATIC FDR FEEDER BREAKER (DEV 52)
VERTICAL SECTION No. 6A,7A,8A,9A,11A & 12A



SCHEMATIC FDR FEEDER BREAKER (DEV 52)
VERTICAL SECTION No. 4B



SCHEMATIC FDR FEEDER BREAKER (DEV 52)
VERTICAL SECTION No. 6B,7B,8B,9B,11B,12B,13B,14B

REFERENCE TABLE

	SWGR. SECTION No.	ONE-LINE FEEDER I.D.	LOAD SERVED	LOAD SHED TRIP VIA
SWGR. UPPER SECTION	6A	111A	SP	2506-M1A3
	7A	110A	U22	2506-M1A2
	8A	109A	U14/U15	2506-M1A2
	9A	108A	U6/U7	2506-M1A2
	11A	106A	S3	2506-M1A1
	12A	105A	U1	2506-M1A1
SWGR. LOWER SECTION	4B	113	PGS1 EMERG TIE	---
	6B	111B	SP	2506-M1A3
	7B	110B	U13	2506-M1A2
	8B	109B	U10/U11	2506-M1A2
	9B	108B	U4/U5/U12	2506-M1A2
	11B	106B	U8/U9	2506-M1A1
	12B	105B	U3	2506-M1A1
	13B	104B	S2	2506-M1A1
	14B	103B	S1	2506-M1A1

NOTES:

1. REMOVE PLC WIRING TO THESE TERMINAL BLOCKS AND PROVIDE NEW WIRING AS SHOWN. PLC CONTROL AND BREAKER STATUS INDICATION WIRING BETWEEN THE PLC ENCLOSURE IN THE M1-EAST SWITCHGEAR AND RESPECTIVE BREAKER SECTIONS IN THE M1-WEST SWITCHGEAR SHALL BE LIFTED AND TAGGED AS "SPARE".
2. REFERENCE DRAWING: CUTLER-HAMMER SWITCHGEAR SCHEMATIC DRAWING NO. 8788S01, SHEET 1 OF 1.
3. TERMINAL BLOCK NOS. IN ( ) ARE FOR VERTICAL SECTIONS 13B AND 14B.
4. REMOVE WIRING ASSOCIATED WITH EXISTING BASLER AUTOSYNCHRONIZER.

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR M1-WEST TYPICAL FEEDER
BREAKER DC CONTROL SCHEMATIC MODIFICATIONS

SCALE NONE
DATE JAN2009
W17.10-E-313
DRAWING NUMBER
1
REV.

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME

USER: vuong
DATE: 22-SEP-2014 15:11
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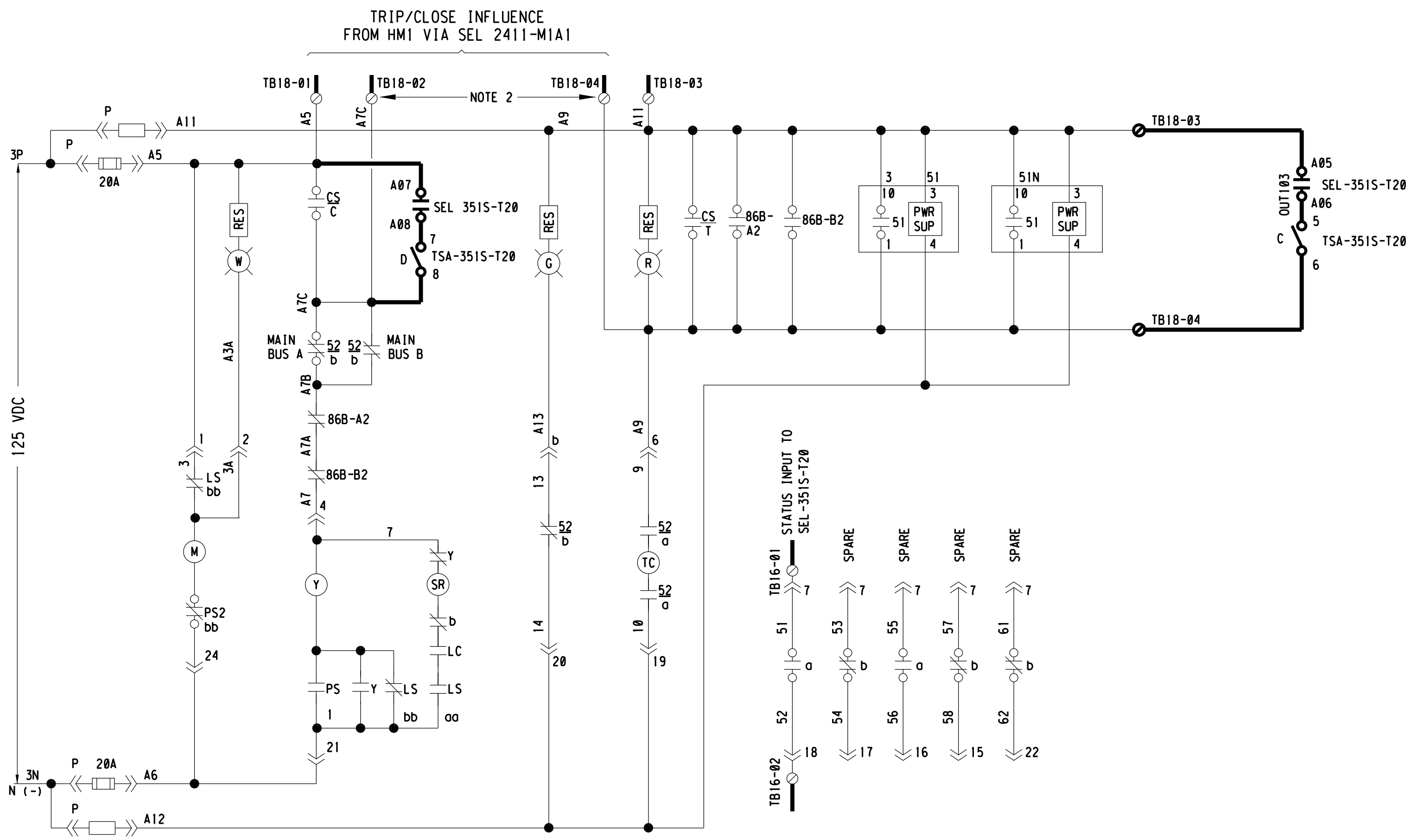
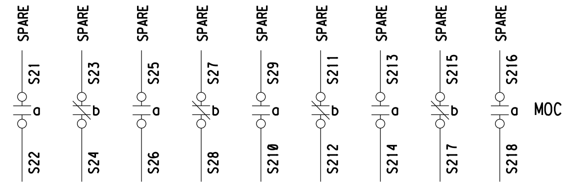
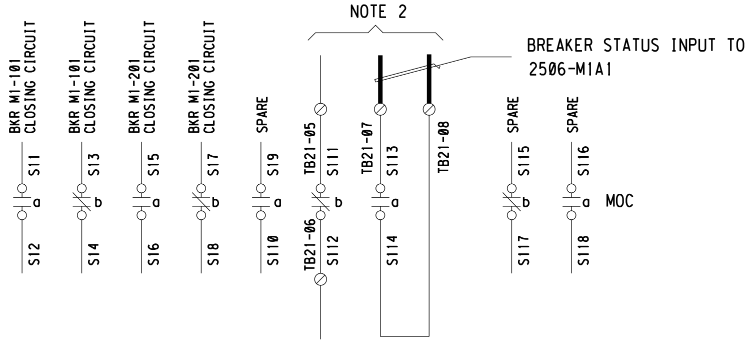
PLOT SCALE: 0.167614:1



1 - M1-WEST TIE BREAKER (UNIT 102) CONTROL SCHEMATIC

NONE





NOTES:

1. SWITCHGEARS M1-WEST TO M1-EAST MAIN-TIE-MAIN AUTO-SWITCHING SCHEME SHALL BE INITIATED VIA PROGRAMMED LOGIC OF THE NEW SEL-351S PROTECTION AND BREAKER CONTROL RELAY. REFER TO DWG. W17.10-E-210 FOR A DESCRIPTION OF OPERATION.
2. REMOVE ALL PLC WIRING TO THESE TERMINAL BLOCKS AND PROVIDE NEW WIRING SHOWN. PLC CONTROL AND BREAKER STATUS INDICATION WIRING BETWEEN THE PLC ENCLOSURE IN THE M1-EAST SWITCHGEAR AND TERMINAL BLOCKS IN THIS SWITCHGEAR SECTION SHALL BE LIFTED AND TAGGED AS "SPARE".
3. REFERENCE DRAWING: CUTLER-HAMMER SWITCHGEAR SCHEMATIC DRAWING NO. 8788S03, SHEET 1 OF 1.

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
TIE BREAKER (UNIT 102) DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-314
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 09-SEP-2014 15:35
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\[illegible] with NEW DRAWING NAME_9-4-14\W1710E314.r01
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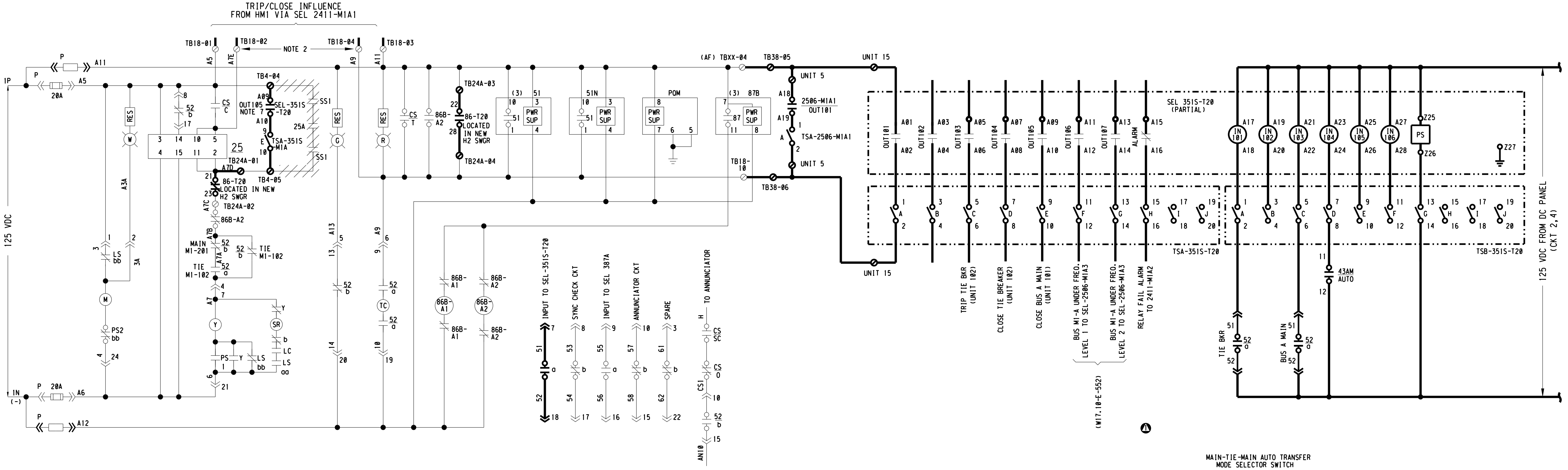


LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT

DECK	CONTACTS		POSITION		FUNCTION
			TRIP	RESET	
1	11	13		X	PERMITS CLOSING BKR S-1
	12	18	X		TRIPS BKR S-1
	15	17		X	PERMITS CLOSING BKR S-2
	14	16	X		TRIPS BKR S-2
2	21	23		X	PERMITS CLOSING BKR U-1
	22	28	X		TRIPS BKR U-1
	25	27		X	PERMITS CLOSING BKR U-3
	24	26	X		TRIPS BKR U-3
3	31	33		X	PERMITS CLOSING BKR S-3
	32	38	X		TRIPS BKR S-3
	35	37		X	PERMITS CLOSING BKR U8/U9
	34	36	X		TRIPS BKR U8/U9
4	41	43		X	PERMITS CLOSING BKR U6/U7
	42	48	X		TRIPS BKR U6/U7
	45	47		X	PERMITS CLOSING BKR U10/U11
	44	46	X		TRIPS BKR U4/U5/U12
5	51	53		X	PERMITS CLOSING BKR U22
	52	58	X		TRIPS BKR U14/U15
	55	57		X	PERMITS CLOSING BKR U-13
	54	56	X		TRIPS BKR U10/U11
6	61	63		X	PERMITS CLOSING BKR FUTURE
	62	68	X		TRIPS BKR U22
	65	67		X	PERMITS CLOSING BKR FUTURE
	64	66	X		TRIPS BKR U-13
7	71	73		X	PERMITS CLOSING BKR U4/U5/U12
	72	78	X		TRIPS BKR FUTURE
	75	77		X	PERMITS CLOSING BKR U14/U15
	74	76	X		TRIPS BKR FUTURE
8	81	83		X	SPARE
	82	88	X		SPARE
	85	87		X	SPARE
	84	86	X		SPARE

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

BUS DIFFERENTIAL LOCKOUT RELAY 86B-A1

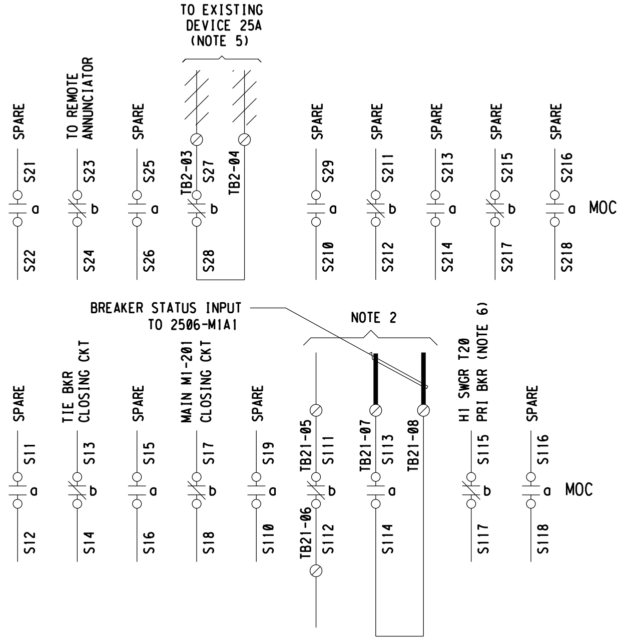
LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT

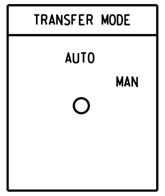
DECK	CONTACTS		POSITION		FUNCTION
			TRIP	RESET	
1	11	13		X	PERMITS CLOSING MAIN BKR
	12	18	X		TRIPS MAIN BKR
	15	17		X	PERMITS CLOSING PGS TIE BKR (M1-113)
	14	16	X		TRIPS PGS TIE BKR (M1-113)
2	21	23		X	PERMITS CLOSING TIE BKR
	22	28	X		TRIPS TIE BKR
	25	27		X	SPARE
	24	26	X		ANNUNCIATOR
3	31	33		X	SPARE
	32	38	X		ALARM
	35	37		X	SPARE
	34	36	X		SEE 3-LINE
4	41	43		X	SPARE
	42	48	X		SEE 3-LINE
	45	47		X	SPARE
	44	46	X		SEE 3-LINE
5	51	53		X	SPARE
	52	58	X		SPARE
	55	57		X	SPARE
	54	56	X		SPARE
6	61	63		X	SPARE
	62	68	X		SPARE
	65	67		X	SPARE
	64	66	X		SPARE
7	71	73		X	SPARE
	72	78	X		SPARE
	75	77		X	SPARE
	74	76	X		SPARE
8	81	83		X	SPARE
	82	88	X		SPARE
	85	87		X	SPARE
	84	86	X		SPARE

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

BUS DIFFERENTIAL LOCKOUT RELAY 86B-A2



MAIN-TIE-MAIN AUTO TRANSFER
MODE SELECTOR SWITCH



ESCUTCHEON PLATE

ENGRAVING CODE SIMILAR TO
ELECTROSWITCH #10D-2T19L

DECK	CONTACTS		POSITION	
			AUTO	MAN
1	11	12	X	
	15	16	X	
2	22	23		X
	26	27		X

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

DEVICE 43AM CONTACT CHART

NOTES:

1. SEE DRAWING W17.10-E-202 FOR MAIN-TIE-MAIN AUTO-SWITCHING SCHEME.
2. LIFT PLC WIRING OFF OF TERMINAL BLOCKS AND LABEL WIRES AS "SPARE".
3. REFERENCE DRAWING: CUTLER-HAMMER SWITCHGEAR SCHEMATIC DRAWING NO. 8788503, SHEET 1 OF 1.
4. REWIRE BREAKER CLOSING CONTROL AS SHOWN.
5. REMOVE EXISTING WIRING.
6. LIFT WIRES IN M1-101 CUBICLE (SECTION 16) AND ABANDON WIRES IN PLACE.
7. REMOVE EXISTING AUTOSYNCHRONIZER AND SYNC SWITCH WIRING AND WIRE NEW DEVICES AS SHOWN.

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NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	08/18/10	ADDED UNDER- AND OVER-FREQ. I/O's.		SEL		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
MAIN (UNIT 101) BREAKER DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-315
DRAWING NUMBER
2
REV.

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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PLOT SCALE: 0.1676141
USER: vvong
DATE: 08-OCT-2014 14:02
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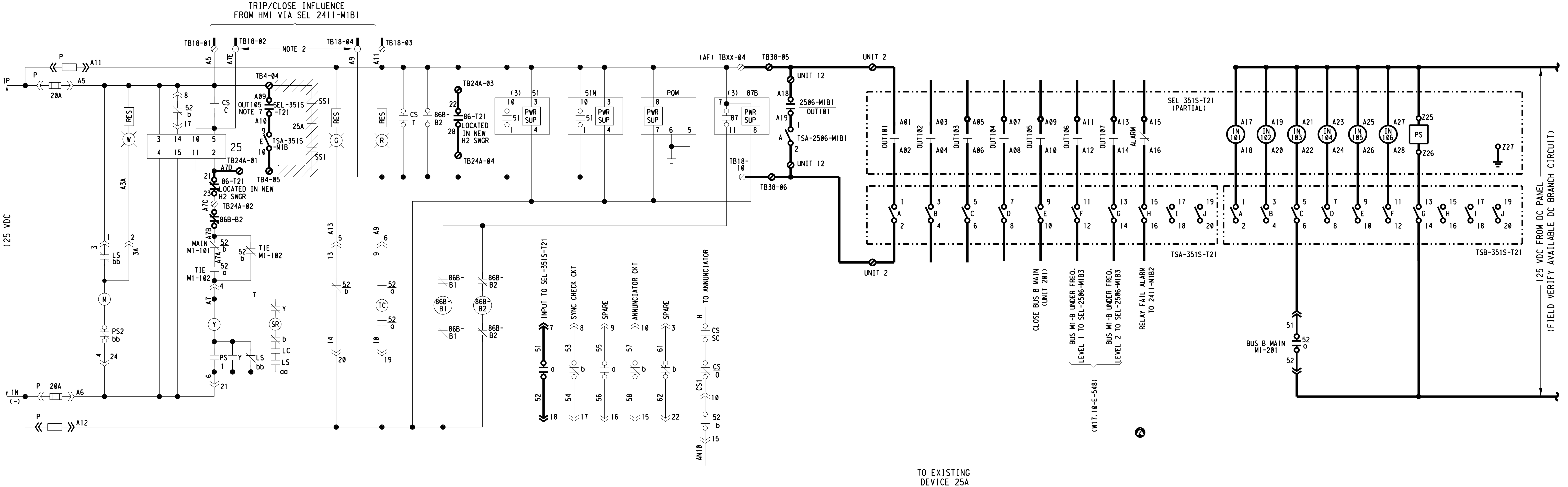

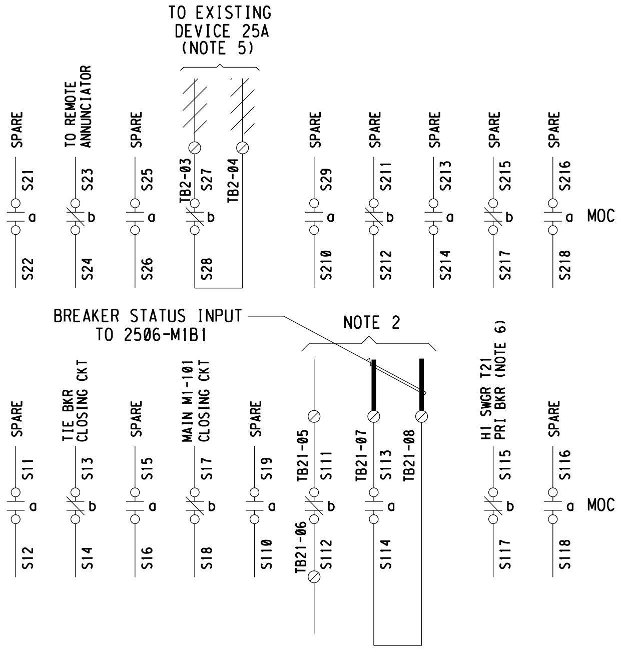

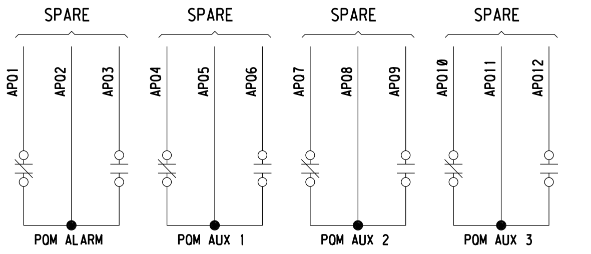

LOCK-OUT RELAY
RESET
TRIP ○

DECK	CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION
1	11 —— 13		X	PERMITS CLOSING BKR S-1
	12 —— 18	X		TRIPS BKR S-1
	15 —— 17		X	PERMITS CLOSING BKR S-2
	14 —— 16	X		TRIPS BKR S-2
2	21 —— 23		X	PERMITS CLOSING BKR U-1
	22 —— 28	X		TRIPS BKR U-1
	25 —— 27		X	PERMITS CLOSING BKR U-3
	24 —— 26	X		TRIPS BKR U-3
3	31 —— 33		X	PERMITS CLOSING BKR S-3
	32 —— 38	X		TRIPS BKR S-3
	35 —— 37		X	PERMITS CLOSING BKR U8/U9
	34 —— 36	X		TRIPS BKR U8/U9
4	41 —— 43		X	PERMITS CLOSING BKR U6/U7
	42 —— 48	X		TRIPS BKR U6/U7
	45 —— 47		X	PERMITS CLOSING BKR U4/U5/U12
	44 —— 46	X		TRIPS BKR U4/U5/U12
5	51 —— 53		X	PERMITS CLOSING BKR U14/U15
	52 —— 58	X		TRIPS BKR U14/U15
	55 —— 57		X	PERMITS CLOSING BKR U10/U11
	54 —— 56	X		TRIPS BKR U10/U11
6	61 —— 63		X	PERMITS CLOSING BKR U22
	62 —— 68	X		TRIPS BKR U22
	65 —— 67		X	PERMITS CLOSING BKR U-13
	64 —— 66	X		TRIPS BKR U-13
7	71 —— 73		X	PERMITS CLOSING BKR FUTURE
	72 —— 78	X		TRIPS BKR FUTURE
	75 —— 77		X	PERMITS CLOSING BKR FUTURE
	74 —— 76	X		TRIPS BKR FUTURE
8	81 —— 83		X	SPARE
	82 —— 88	X		SPARE
	85 —— 87		X	SPARE
	84 —— 86	X		SPARE

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

BUS DIFFERENTIAL LOCKOUT RELAY 86B-B1

LOCK-OUT RELAY
RESET
TRIP ○

DECK	CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION
1	11 —— 13		X	PERMITS CLOSING MAIN BKR
	12 —— 18	X		TRIPS MAIN BKR
	15 —— 17		X	PERMITS CLOSING PGS BKR (M1-213)
	14 —— 16	X		TRIPS PGS BKR (M1-213)
2	21 —— 23		X	PERMITS CLOSING TIE BKR
	22 —— 28	X		TRIPS TIE BKR
	25 —— 27		X	SPARE
	24 —— 26	X		ANNUNCIATOR
3	31 —— 33		X	SPARE
	32 —— 38	X		ALARM
	35 —— 37		X	SPARE
	34 —— 36	X		SEE 3-LINE
4	41 —— 43		X	SPARE
	42 —— 48	X		SEE 3-LINE
	45 —— 47		X	SPARE
	44 —— 46	X		SEE 3-LINE
5	51 —— 53		X	SPARE
	52 —— 58	X		SPARE
	55 —— 57		X	SPARE
	54 —— 56	X		SPARE
6	61 —— 63		X	SPARE
	62 —— 68	X		SPARE
	65 —— 67		X	SPARE
	64 —— 66	X		SPARE
7	71 —— 73		X	SPARE
	72 —— 78	X		SPARE
	75 —— 77		X	SPARE
	74 —— 76	X		SPARE
8	81 —— 83		X	SPARE
	82 —— 88	X		SPARE
	85 —— 87		X	SPARE
	84 —— 86	X		SPARE

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

BUS DIFFERENTIAL LOCKOUT RELAY 86B-B2

NOTES:

1. SEE DRAWING W17.10-E-203 FOR MAIN-TIE-MAIN AUTO-SWITCHING SCHEME.
2. REMOVE PLC WIRING BETWEEN SWITCHGEAR SECTION 1 AND THE PLC ENCLOSURE.
3. REFERENCE DRAWING: CUTLER-HAMMER SWITCHGEAR SCHEMATIC DRAWING NO. 8789502, SHEET 1 OF 1.
4. REWIRE BREAKER CLOSING CONTROL AS SHOWN.
5. REMOVE EXISTING WIRING.
6. LIFT WIRES IN M1-201 CUBICLE (SECTION 1) AND ABANDON WIRES IN PLACE.
7. REMOVE EXISTING AUTOSYNCHRONIZER AND SYNC SWITCH WIRING AND WIRE NEW DEVICES AS SHOWN.

USER: vuong PLOT SCALE: 0.167614:1
DATE: 09-SEP-2014 15:39
FILE: M:\08688-01-05.PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet\SD317A-Rec\W17.10E316.dgn with NEW DRAWING NAME_9-4-14\W1710E316.r03

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REF 7: REF7$FILENAME
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REF 9: REF9$FILENAME

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NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	08/18/10	ADDED UNDER- AND OVER-FREQ. I/O's	SEL		
1	05/22/10	REVISED PER M-T-M AS-BUILTS	MTH		

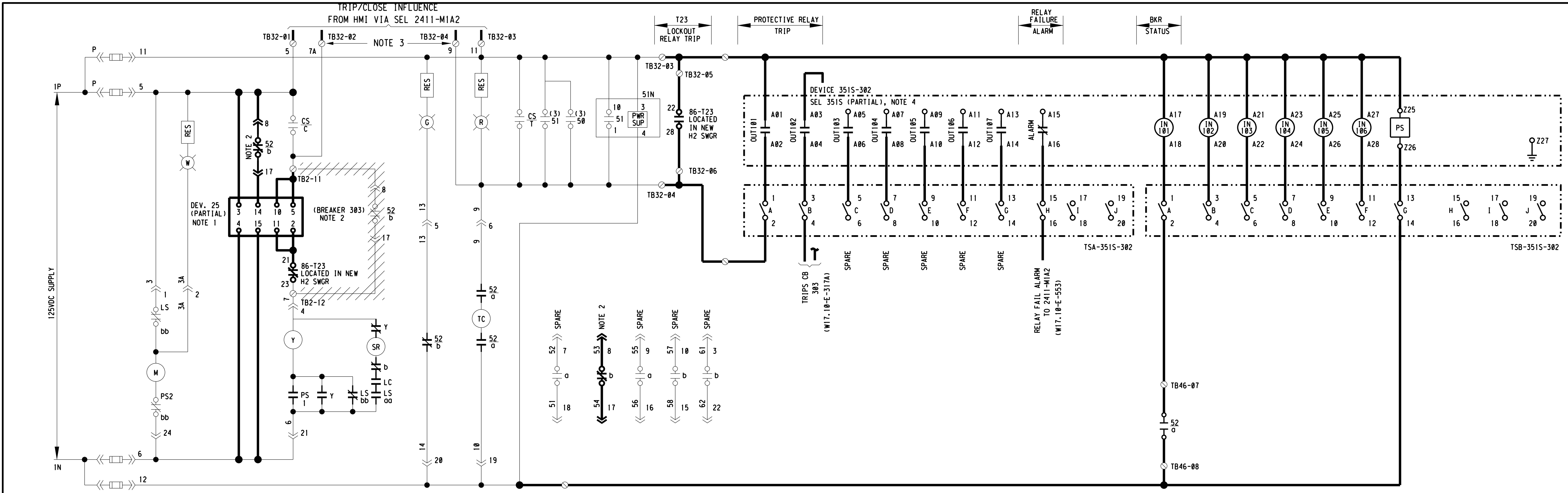
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA
EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

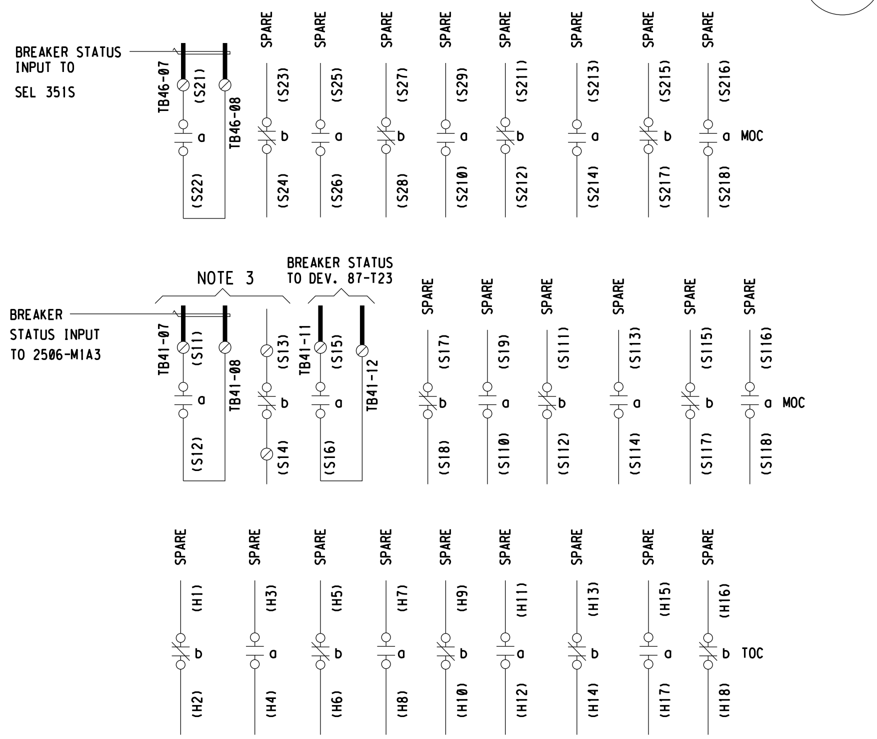
MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST,
MAIN (UNIT 201) BREAKER DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-316
DRAWING NUMBER
3
REV.



1 BREAKER UNIT 302 (TRANSFORMER T23 FEEDER BREAKER)

NONE



NOTES:

1. PROVIDE NEW SYNC. CHECK RELAY (DEV. 25) TO MATCH THE (E) BASLER BE1-25 AS INSTALLED IN UNIT 113. WIRE THE RELAY AS SHOWN.

2. REMOVE WIRING FOR BREAKER UNITS 303 & 302 INTERLOCKING, AND WIRE THE AUX. SWITCHES TO (N) DEV. 25 AS SHOWN.

3. LIFT PLC WIRING OFF OF TERMINAL BLOCKS AND LABEL WIRES AS "SPARE". PROVIDE NEW WIRING TO 2411-M1A2 AND 2506-M1A3 AS SHOWN.

4. PROVIDE NEW SEL 351S RELAY AND TEST SWITCHES, WIRED AS SHOWN.

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR M1-WEST MODIF. PGS 1 INCOMING
BKR UNITS 303 & 302 DC CONTROL SCHEM. - SHEET 1

SCALE NONE
DATE JAN2009

W17.10-E-317
DRAWING NUMBER

1
REV.

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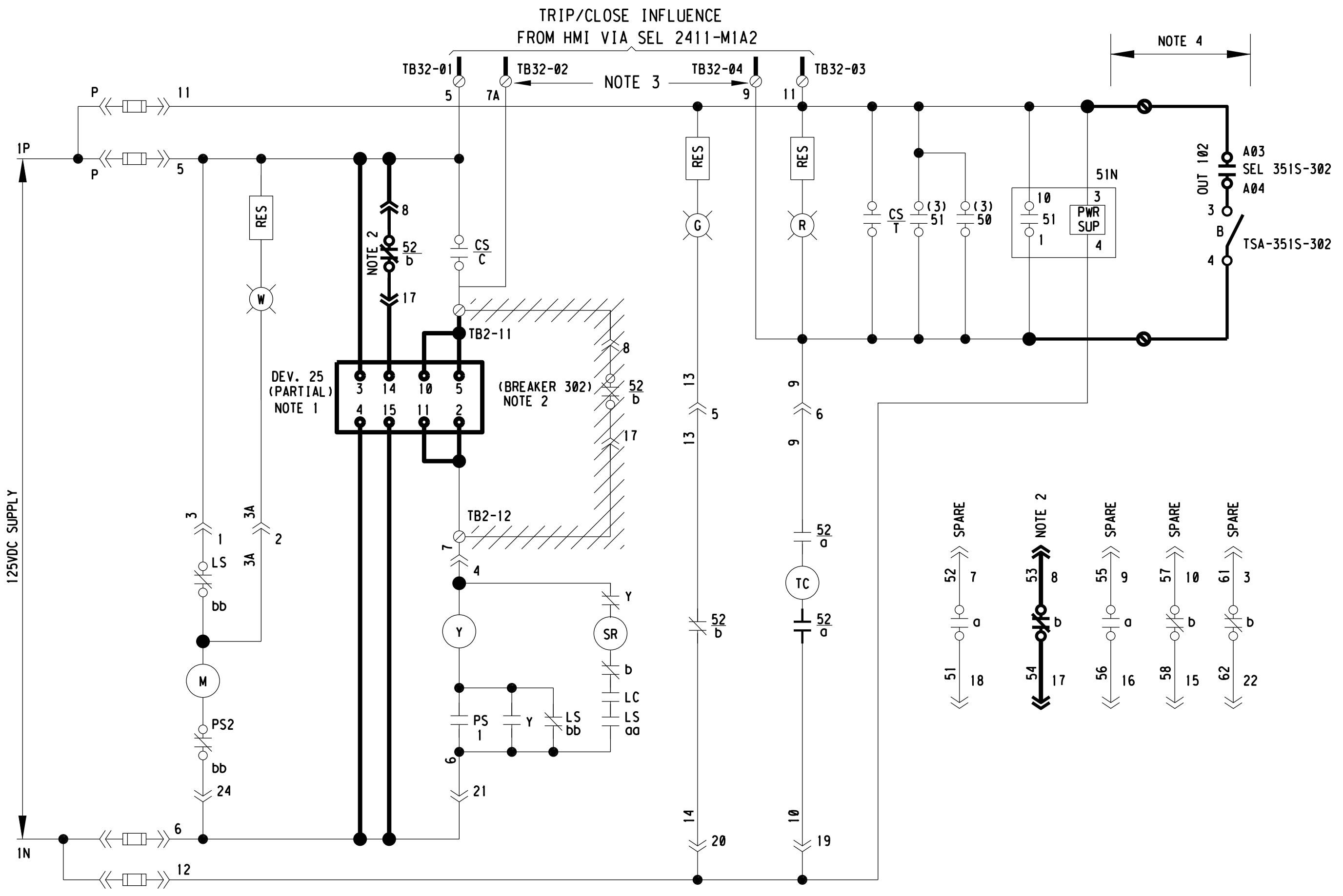
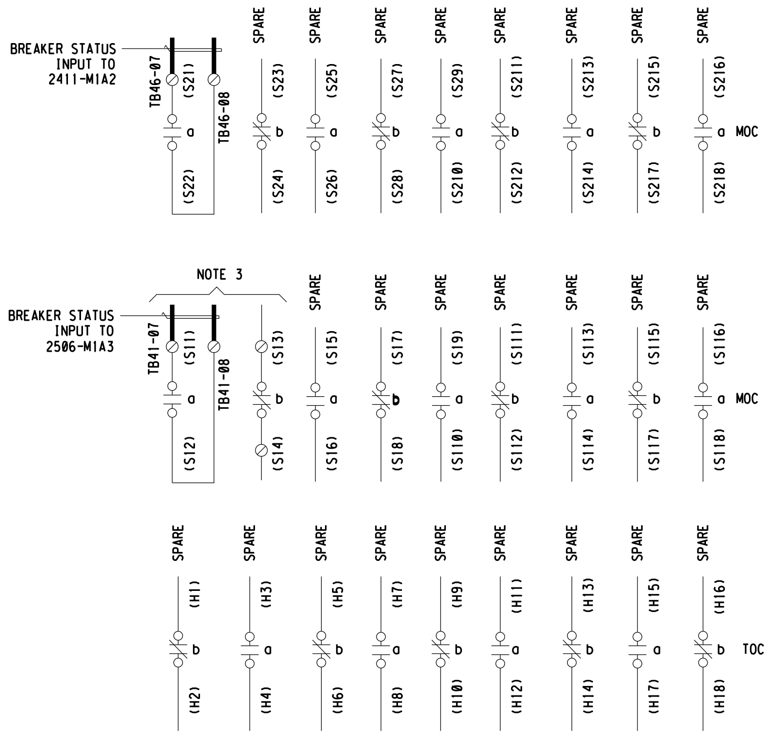


1 BREAKER UNIT 303 (PGS1 INCOMING BREAKER)

- NONE


BREAKER STATUS INPUT TO 2411-M1A2
TB46-07
TB46-08
BREAKER STATUS INPUT TO 2506-M1A3
TB41-07
TB41-08
NOTE 3
SPARE
MOC
TOC

NOTES:

1. PROVIDE NEW SYNC. CHECK RELAY (DEV. 25) TO MATCH THE (E) BASLER BE1-25 AS INSTALLED IN UNIT 113. WIRE THE RELAY AS SHOWN.
2. REMOVE WIRING FOR BREAKER UNITS 303 & 302 INTERLOCKING, AND WIRE THE AUX. SWITCHES TO (N) DEV. 25 AS SHOWN.
3. LIFT PLC WIRING OFF OF TERMINAL BLOCKS AND LABEL WIRES AS "SPARE". PROVIDE NEW WIRING TO 2411-M1A2 AND 2506-M1A3 AS SHOWN.
4. ADD PROTECTIVE RELAY SEL 351S-302 TRIP FOR PGS 1 LINE FAULT.

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

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PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

CONSULTANT
EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR M1-WEST MODIF. PGS 1 INCOMING
BKR UNITS 303 & 302 DC CONTROL SCHEM. - SHEET 2

SCALE NONE
DATE JAN2009
W17.10-E-317A
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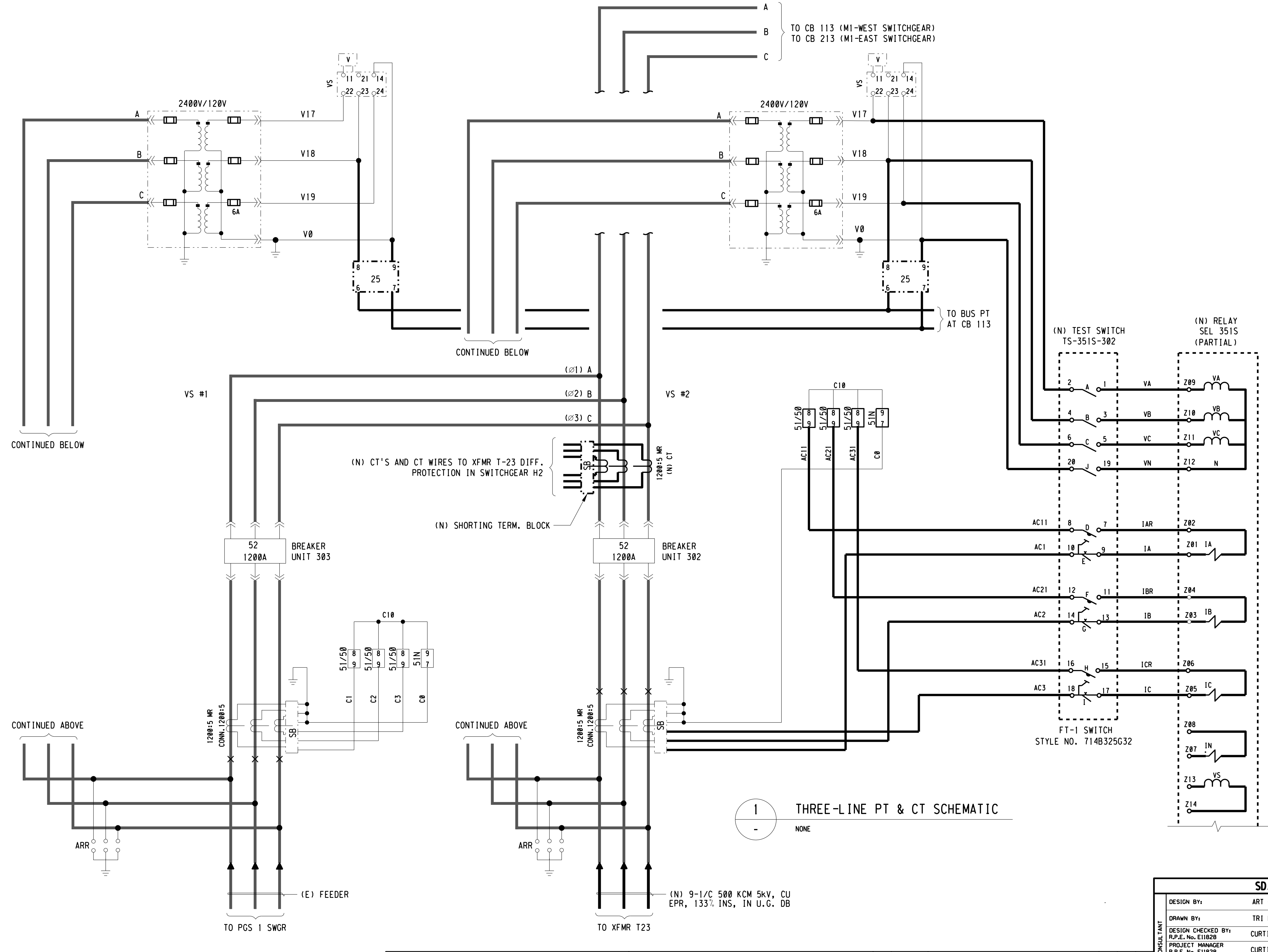

1
-

THREE-LINE PT & CT SCHEMATIC

NONE

BREAKER M1-WEST CB 302
(TRANSFORMER T23 FEEDER TIE TO PGS 1)

OVERCURRENT RELAY SEL 351S CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 IN 101 A18	BREAKER STATUS	W17.10-E-317
A19 IN 102 A20		
A21 IN 103 A22		
A23 IN 104 A24		
A25 IN 105 A26		
A27 IN 106 A28		
Z01 IA Z02 Z03 IB Z04 Z05 IC Z06 Z07 IN Z08	CURRENT INPUTS	W17.10-E-317B
Z09 VA Z10 VB Z11 VC Z12 Z13 VS Z14	VOLTAGE INPUTS	W17.10-E-317B
OUT101 A01 A02	TRIPS CB 302	W17.10-E-317
OUT102 A03 A04	TRIPS CB 303	W17.10-E-317A
OUT103 A05 A06		
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14		
ALARM A15 A16	RELAY FAILURE ALARM	W17.10-E-553
Z25 + POWER SUPPLY - Z26 BATT.MONITOR	125V DC SUPPLY	W17.10-E-317
Z27	CHASSIS GROUND	W17.10-E-317
(REAR) PORT 1 RS485 (REAR) IRIG-B 7 8 (REAR) PORT 2 EIA-232 (REAR) PORT 3 EIA-232 (FRONT) PORT F EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W17.10-E-563

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engineers, inc.
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	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
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EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR M1-WEST MODIF. PGS 1 INCOMING BREAKER UNITS 303 & 302 THREE LINE SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-317B
DRAWING NUMBER
1
REV.

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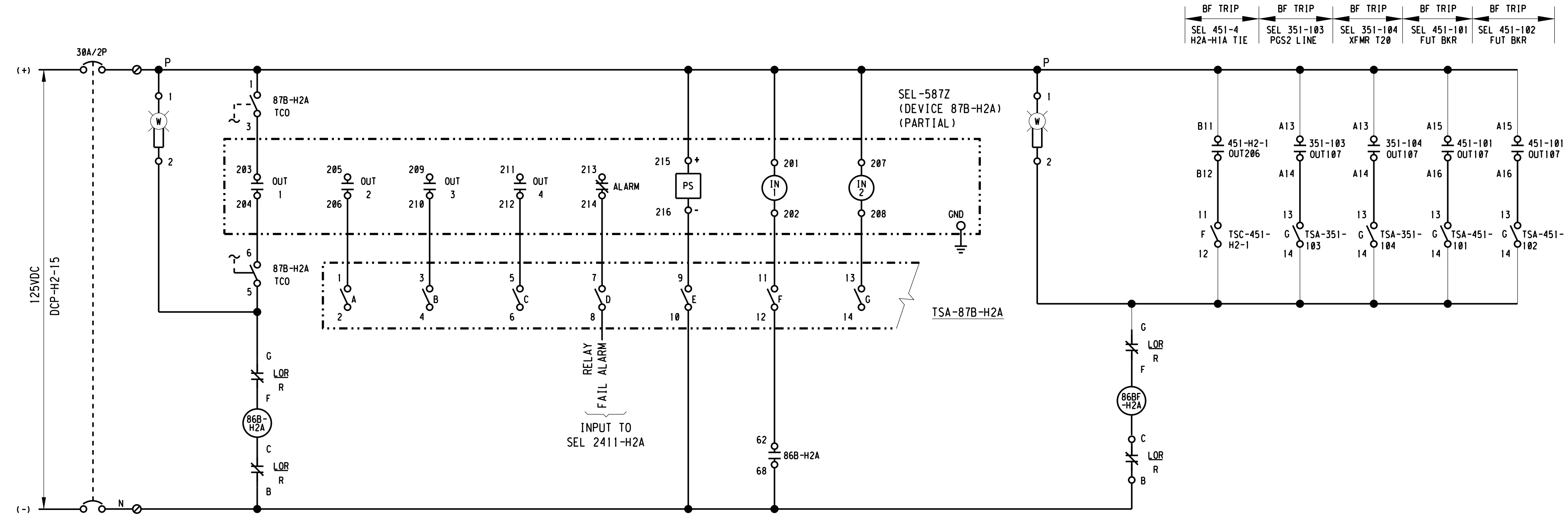


LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT

DECK	CONTACTS	POSITION		FUNCTION	SHT NO.
		TRIP	RESET		
1	11 —‖— 13		X	PERMISSIVE CLOSE CB H2-100	W17.10-E-305
	12 —‖— 18	X		TRIP CB H2-100	W17.10-E-305
	15 —‖— 17		X	PERMISSIVE CLOSE H2-150	W17.10-E-320
	14 —‖— 16	X		TRIP CB H2-150	W17.10-E-320
2	21 —‖— 23		X	PERMISSIVE CLOSE CB H2-103	W17.10-E-301
	22 —‖— 28	X		TRIP CB H2-103	W17.10-E-301
	25 —‖— 27		X	PERMISSIVE CLOSE CB H2-104	W17.10-E-302
	24 —‖— 26	X		TRIP CB H2-104	W17.10-E-302
3	31 —‖— 33		X	SPARE	
	32 —‖— 38	X		SPARE	
	35 —‖— 37		X	PERMISSIVE CLOSE CB H2-101	W17.10-E-321
	34 —‖— 36	X		TRIP CB H2-101	W17.10-E-321
4	41 —‖— 43		X	PERMISSIVE CLOSE CB H2-102	W17.10-E-322
	42 —‖— 48	X		TRIP CB H2-102	W17.10-E-322
	45 —‖— 47		X	SPARE	
	44 —‖— 46	X		SHORTED A ∅ CT, 587Z-H2A	THIS SHEET
5	51 —‖— 53		X	SPARE	
	52 —‖— 58	X		SHORTED B ∅ CT, 587Z-H2A	THIS SHEET
	55 —‖— 57		X	SPARE	
	54 —‖— 56	X		SHORTED C ∅ CT, 587Z-H2A	THIS SHEET
6	61 —‖— 63		X	SPARE	
	62 —‖— 68	X		INPUT TO SEL 587Z-H2A	THIS SHEET
	65 —‖— 67		X	SPARE	
	64 —‖— 66	X		INPUT TO SEL 2411-H2A	W17.10-E-542

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

BUS DIFFERENTIAL LOCKOUT RELAY 86B-H2A

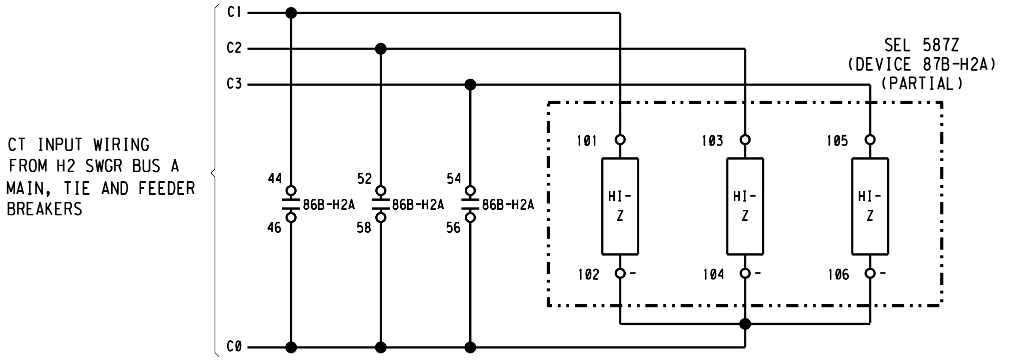
LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT

DECK	CONTACTS	POSITION		FUNCTION	SHT NO.
		TRIP	RESET		
1	11 —‖— 13		X	PERMISSIVE CLOSE CB H2-100	W17.10-E-305
	12 —‖— 18	X		TRIP CB H2-100	W17.10-E-305
	15 —‖— 17		X	PERMISSIVE CLOSE H2-150	W17.10-E-320
	14 —‖— 16	X		TRIP CB H2-150	W17.10-E-320
2	21 —‖— 23		X	PERMISSIVE CLOSE CB H2-103	W17.10-E-301
	22 —‖— 28	X		TRIP CB H2-103	W17.10-E-301
	25 —‖— 27		X	PERMISSIVE CLOSE CB H2-104	W17.10-E-302
	24 —‖— 26	X		TRIP CB H2-104	W17.10-E-302
3	31 —‖— 33		X	PERMISSIVE CLOSE CB H1A-H2A	W17.10-E-311
	32 —‖— 38	X		TRIP CB H1A-H2A	W17.10-E-311
	35 —‖— 37		X	PERMISSIVE CLOSE CB H2-101	W17.10-E-321
	34 —‖— 36	X		TRIP CB H2-101	W17.10-E-321
4	41 —‖— 43		X	PERMISSIVE CLOSE CB H2-102	W17.10-E-322
	42 —‖— 48	X		TRIP CB H2-102	W17.10-E-322
	45 —‖— 47		X	SPARE	
	44 —‖— 46	X		SPARE	
5	51 —‖— 53		X	SPARE	
	52 —‖— 58	X		SPARE	
	55 —‖— 57		X	SPARE	
	54 —‖— 56	X		SPARE	
6	61 —‖— 63		X	SPARE	
	62 —‖— 68	X		SPARE	
	65 —‖— 67		X	SPARE	
	64 —‖— 66	X		INPUT TO 2411-H2A	W17.10-E-542

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

BREAKER FAILURE (BF) LOCKOUT RELAY 86BF-H2A



BUS DIFFERENTIAL 87B-H2A AC SCHEMATIC

3" ON ORIGINAL DOCUMENT
0 1 2 3

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EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2, H2A BUS DIFF.
AND BREAKER FAILURE LOCKOUT RELAYS SCHEM.

SCALE NONE
DATE JAN2009
W17.10-E-318
DRAWING NUMBER
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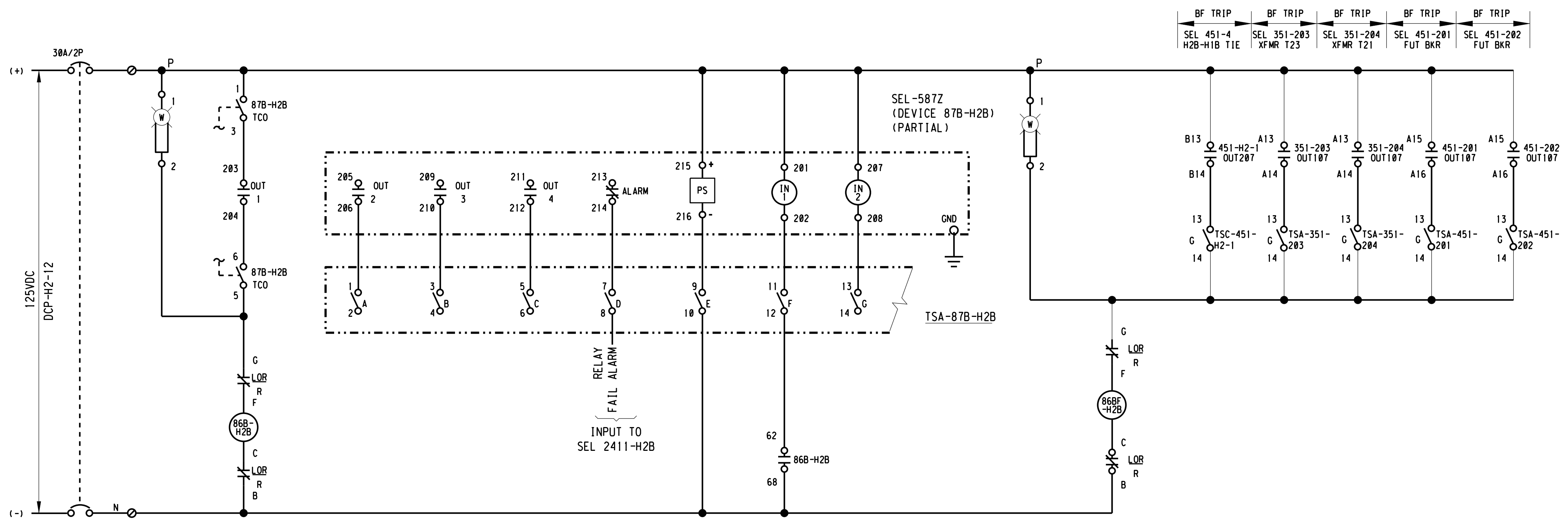


LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT					
DECK	CONTACTS	POSITION		FUNCTION	SHT NO.
		TRIP	RESET		
1	11 ○┤├┤├○ 13		X	PERMISSIVE CLOSE CB H2-200	W17.10-E-306
	12 ○┤├┤├○ 18	X		TRIP CB H2-200	W17.10-E-306
	15 ○┤├┤├○ 17		X	PERMISSIVE CLOSE H2-150	W17.10-E-320
	14 ○┤├┤├○ 16	X		TRIP CB H2-150	W17.10-E-320
2	21 ○┤├┤├○ 23		X	PERMISSIVE CLOSE CB H2-203	W17.10-E-304
	22 ○┤├┤├○ 28	X		TRIP CB H2-203	W17.10-E-304
	25 ○┤├┤├○ 27		X	PERMISSIVE CLOSE CB H2-204	W17.10-E-303
	24 ○┤├┤├○ 26	X		TRIP CB H2-204	W17.10-E-303
3	31 ○┤├┤├○ 33		X	SPARE	
	32 ○┤├┤├○ 38	X		SPARE	
	35 ○┤├┤├○ 37		X	PERMISSIVE CLOSE CB H2-201	W17.10-E-323
	34 ○┤├┤├○ 36	X		TRIP CB H2-201	W17.10-E-323
4	41 ○┤├┤├○ 43		X	PERMISSIVE CLOSE CB H2-202	W17.10-E-324
	42 ○┤├┤├○ 48	X		TRIP CB H2-202	W17.10-E-324
	45 ○┤├┤├○ 47		X	SPARE	
	44 ○┤├┤├○ 46	X		SHORTED A ∅ CT, 587Z-H2B	THIS SHEET
5	51 ○┤├┤├○ 53		X	SPARE	
	52 ○┤├┤├○ 58	X		SHORTED B ∅ CT, 587Z-H2B	THIS SHEET
	55 ○┤├┤├○ 57		X	SPARE	
	54 ○┤├┤├○ 56	X		SHORTED C ∅ CT, 587Z-H2B	THIS SHEET
6	61 ○┤├┤├○ 63		X	SPARE	
	62 ○┤├┤├○ 68	X		INPUT TO SEL 587Z-H2B	THIS SHEET
	65 ○┤├┤├○ 67		X	SPARE	
	64 ○┤├┤├○ 66	X		INPUT TO SEL 2411-H2B	W17.10-E-554

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

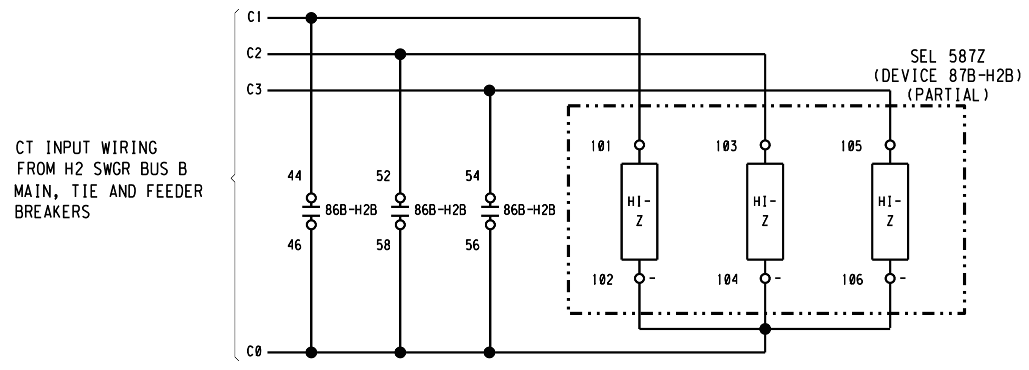
BUS DIFFERENTIAL LOCKOUT RELAY 86B-H2B

LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT					
DECK	CONTACTS	POSITION		FUNCTION	SHT NO.
		TRIP	RESET		
1	11○┤├┤├○13		X	PERMISSIVE CLOSE CB H2-200	W17.10-E-306
	12○┤├┤├○18	X		TRIP CB H2-200	W17.10-E-306
	15○┤├┤├○17		X	PERMISSIVE CLOSE H2-150	W17.10-E-320
	14○┤├┤├○16	X		TRIP CB H2-150	W17.10-E-320
2	21○┤├┤├○23		X	PERMISSIVE CLOSE CB H2-203	W17.10-E-304
	22○┤├┤├○28	X		TRIP CB H2-203	W17.0-E-304
	25○┤├┤├○27		X	PERMISSIVE CLOSE CB H2-204	W17.10-E-303
	24○┤├┤├○26	X		TRIP CB H2-204	W17.10-E-303
3	31○┤├┤├○33		X	PERMISSIVE CLOSE CB H1-B	W17.10-E-311
	32○┤├┤├○38	X		TRIP CB H1-B	W17.10-E-311
	35○┤├┤├○37		X	PERMISSIVE CLOSE CB H2-201	W17.10-E-323
	34○┤├┤├○36	X		TRIP CB H2-201	W17.10-E-323
4	41○┤├┤├○43		X	PERMISSIVE CLOSE CB H2-202	W17.10-E-324
	42○┤├┤├○48	X		TRIP CB H2-202	W17.10-E-324
	45○┤├┤├○47		X	SPARE	
	44○┤├┤├○46	X		SPARE	
5	51○┤├┤├○53		X	SPARE	
	52○┤├┤├○58	X		SPARE	
	55○┤├┤├○57		X	SPARE	
	54○┤├┤├○56	X		SPARE	
6	61○┤├┤├○63		X	SPARE	
	62○┤├┤├○68	X		SPARE	
	65○┤├┤├○67		X	SPARE	
	64○┤├┤├○66	X		INPUT TO SEL 2411-H2B	W17.10-E-554

"X" INDICATES CONTACT CLOSED IN POSITION SHOW

BREAKER FAILURE (BF) LOCKOUT RELAY 86BF-H2B



BUS DIFFERENTIAL 87B-H2B AC SCHEMATIC

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
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MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2, H2B BUS DIFF.
AND BREAKER FAILURE LOCKOUT RELAYS SCHEM.

SCALE NONE
DATE JAN2009
W17.10-E-319
DRAWING NUMBER
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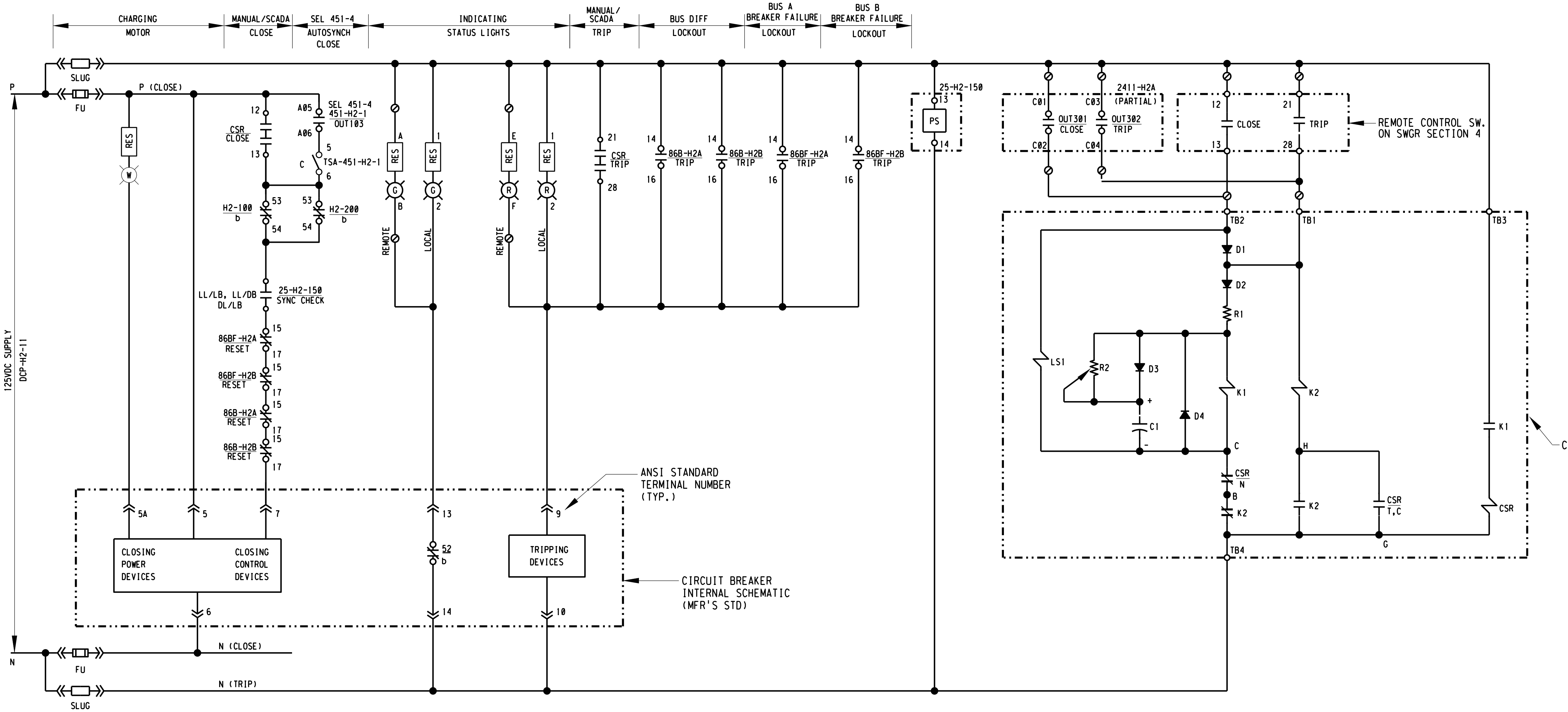


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

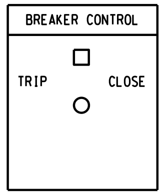
1 TIE BREAKER H2-150 CONTROL SCHEMATIC

-

NONE

CIRCUIT BREAKER
CONTROL SWITCH

UNIVERSAL
CIRCUIT 57



(TYPICAL PLATE)

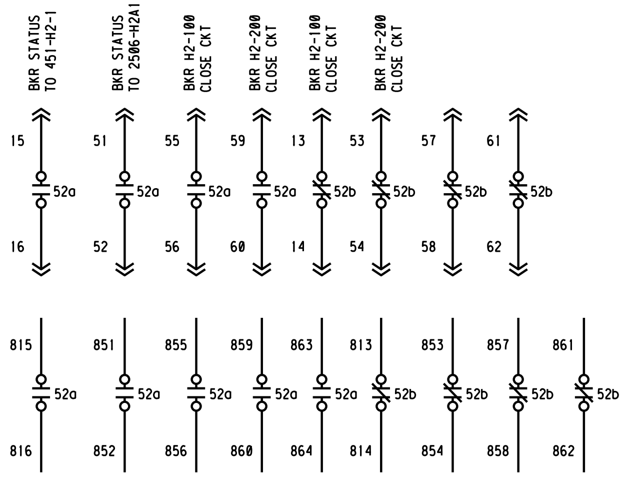
DECK	CONTACTS			POSITION			
				TRIP	nat	nac	CLOSE
1	12	o┤├─┤├o	13				╳
	16	o┤├─┤├o	17				╳
2	21	o┤├─┤├o	28	╳			
	24	o┤├─┤├o	25	╳			
3	31	o┤├─┤├o	32		╳	╳	
	35	o┤├─┤├o	36		╳	╳	
4	42	o┤├─┤├o	43			╳	╳
	46	o┤├─┤├o	47			╳	╳
5	51	o┤├─┤├o	52	╳	╳		
	55	o┤├─┤├o	56	╳	╳		

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

-

NONE



3 BREAKER AUX. CONTACTS

-

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
⚠	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
TIE BREAKER H2-150 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-320
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 10-SEP-2014 11:10
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REF 4: REF4$FILENAME
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REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
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REF 7: REF7#FILENAME
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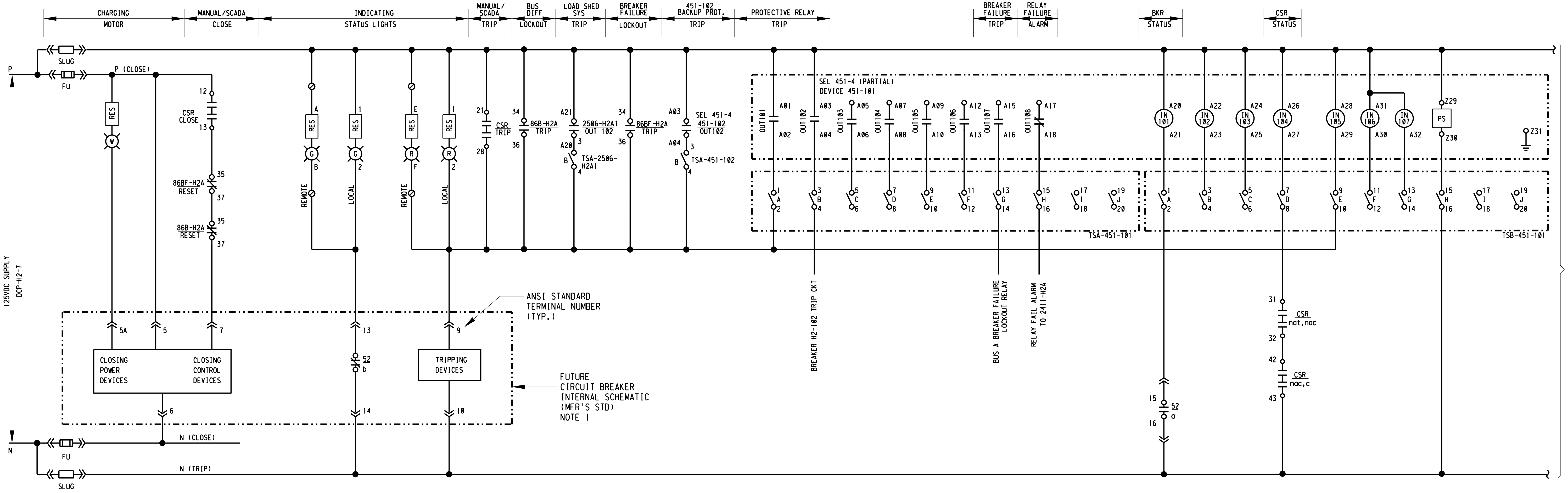
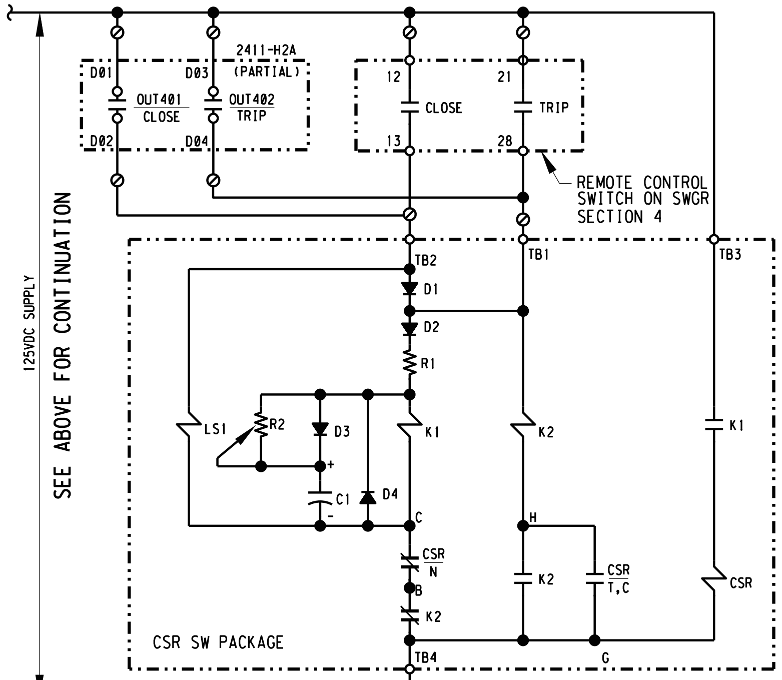
REF 2: REF2#FILENAME
PLOT SCALE: 0.167614:1
USER: vuong
DATE: 06-OCT-2014 13:50
FILE: M:\08688-01-05.PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet



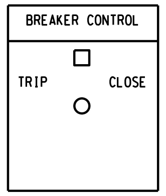
STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 FUTURE FEEDER BREAKER H2-101 CONTROL SCHEMATIC

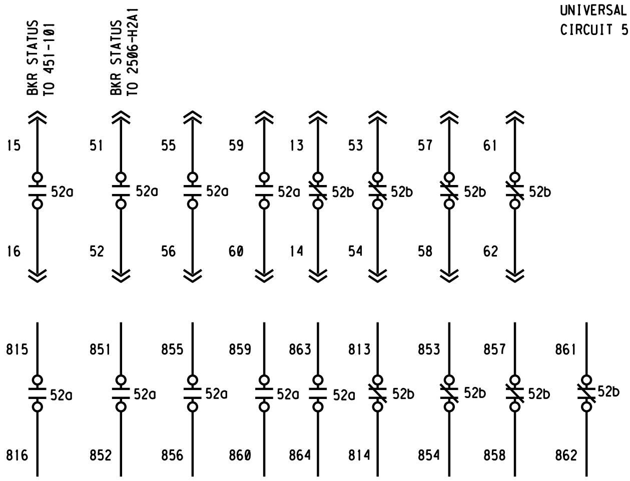
NONE



CIRCUIT BREAKER CONTROL SWITCH UNIVERSAL CIRCUIT 57



(TYPICAL PLATE)



3 FUTURE BREAKER AUX. CONTACTS

NONE

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 ⊸⊣⊢⊸ 13				☒
	16 ⊸⊣⊢⊸ 17				☒
2	21 ⊸⊣⊢⊸ 28	☒			
	24 ⊸⊣⊢⊸ 25	☒			
3	31 ⊸⊣⊢⊸ 32		☒	☒	
	35 ⊸⊣⊢⊸ 36		☒	☒	
4	42 ⊸⊣⊢⊸ 43			☒	☒
	46 ⊸⊣⊢⊸ 47			☒	☒
5	51 ⊸⊣⊢⊸ 52	☒	☒		
	55 ⊸⊣⊢⊸ 56	☒	☒		

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

NONE

NOTE:

1. PROVIDE FULLY EQUIPPED BREAKER CUBICLE, WITH ALL DEVICES AND WIRING, BUT FURNISHED WITHOUT CIRCUIT BREAKER.

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING	INSP: MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

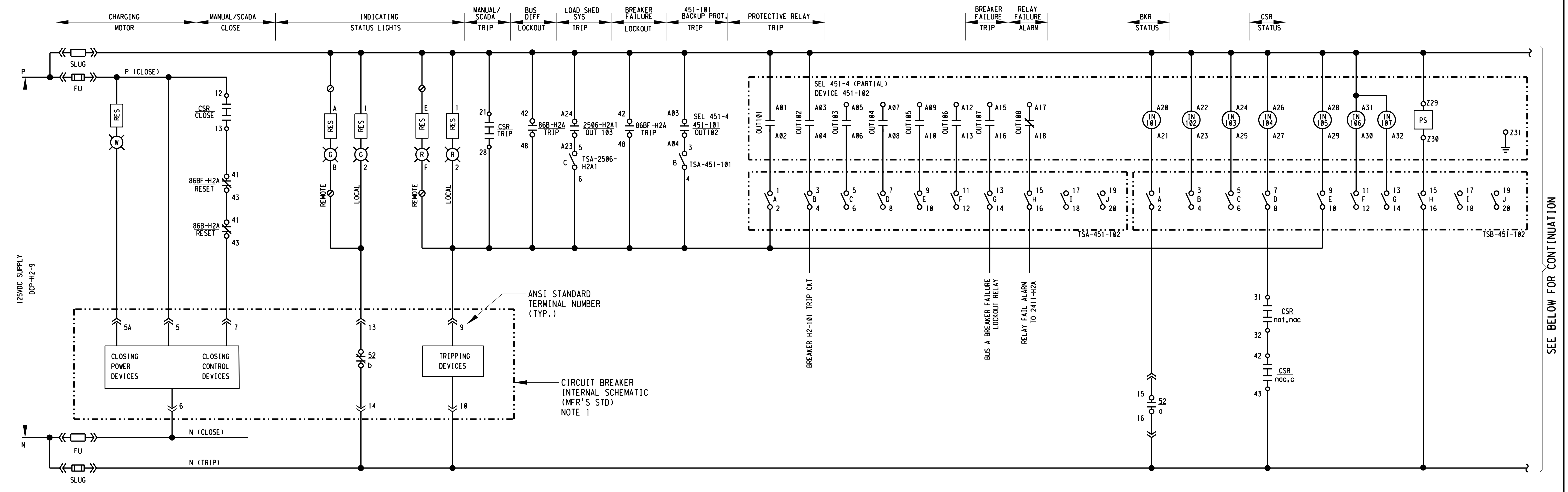
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
FEEDER BREAKER H2-101 DC CONTROL SCHEMATIC

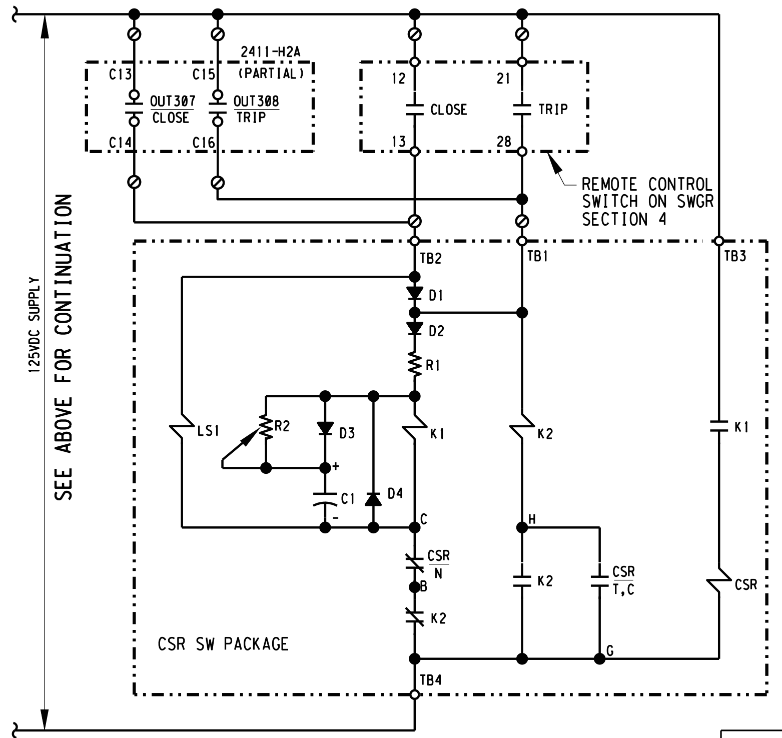
SCALE NONE
DATE JAN2009
W17.10-E-321
DRAWING NUMBER
1
REV.

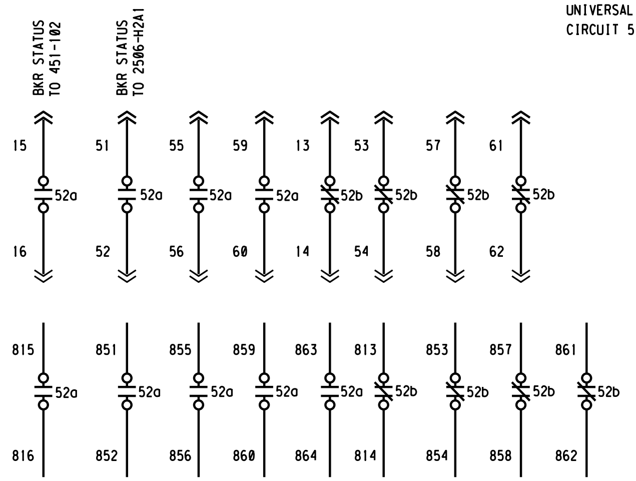


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 FUTURE FEEDER BREAKER H2-102 CONTROL SCHEMATIC

- NONE

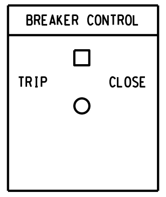




3 FUTURE BREAKER AUX. CONTACTS

- NONE

CIRCUIT BREAKER
CONTROL SWITCH
UNIVERSAL
CIRCUIT 57



(TYPICAL PLATE)

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 —| |— 13				X
	16 —| |— 17				X
2	21 —| |— 28	X			
	24 —| |— 25	X			
3	31 —| |— 32		X	X	
	35 —| |— 36		X	X	
4	42 —| |— 43			X	X
	46 —| |— 47			X	X
5	51 —| |— 52	X	X		
	55 —| |— 56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

- NONE

NOTE:

1. PROVIDE FULLY EQUIPPED BREAKER CUBICLE, WITH ALL DEVICES AND WIRING, BUT FURNISHED WITHOUT CIRCUIT BREAKER.

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
FEEDER BREAKER H2-102 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-322
DRAWING NUMBER
1
REV.

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REF 8: REF8$FILENAME
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REF 6: REF6$FILENAME

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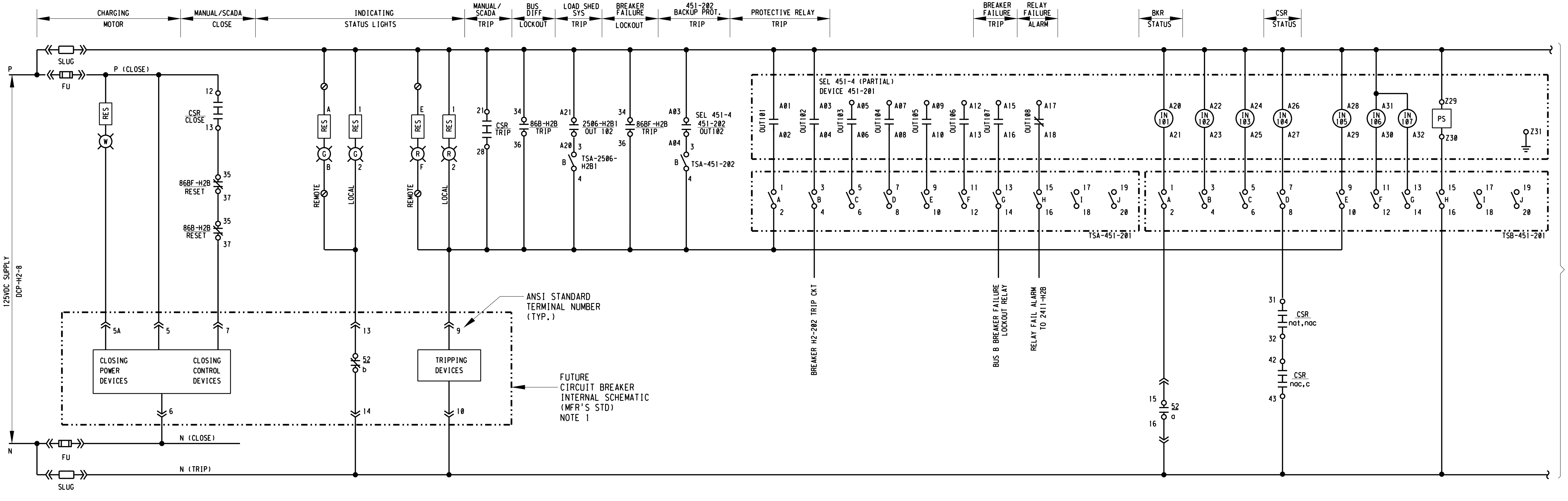
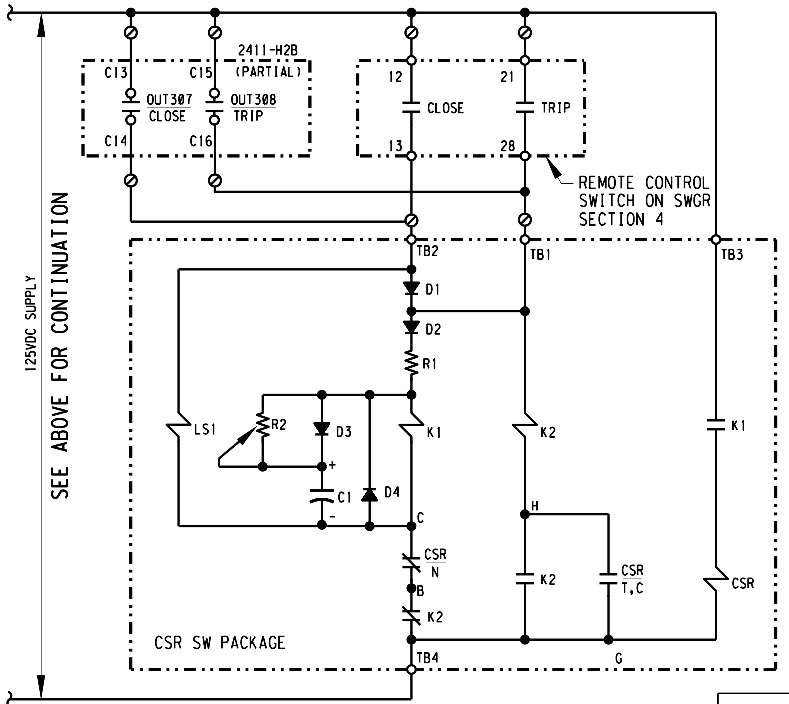
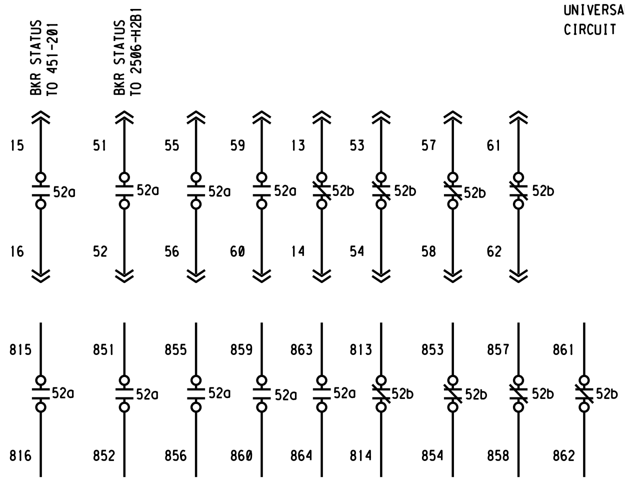


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 FUTURE FEEDER BREAKER H2-201 CONTROL SCHEMATIC

NONE

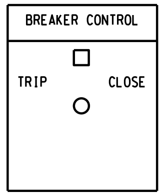




3 FUTURE BREAKER AUX. CONTACTS

NONE

CIRCUIT BREAKER
CONTROL SWITCH
UNIVERSAL
CIRCUIT 57



(TYPICAL PLATE)

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 ○┤├──┤├○ 13				╳
	16 ○┤├──┤├○ 17				╳
2	21 ○┤├──┤├○ 28	╳			
	24 ○┤├──┤├○ 25	╳			
3	31 ○┤├──┤├○ 32		╳	╳	
	35 ○┤├──┤├○ 36		╳	╳	
4	42 ○┤├──┤├○ 43			╳	╳
	46 ○┤├──┤├○ 47			╳	╳
5	51 ○┤├──┤├○ 52	╳	╳		
	55 ○┤├──┤├○ 56	╳	╳		

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

NONE

NOTE:

1. PROVIDE FULLY EQUIPPED BREAKER CUBICLE, WITH ALL DEVICES AND WIRING, BUT FURNISHED WITHOUT CIRCUIT BREAKER.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

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REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

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REF 2: REF2$FILENAME
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USER: vuong
DATE: 06-OCT-2014 14:12
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3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

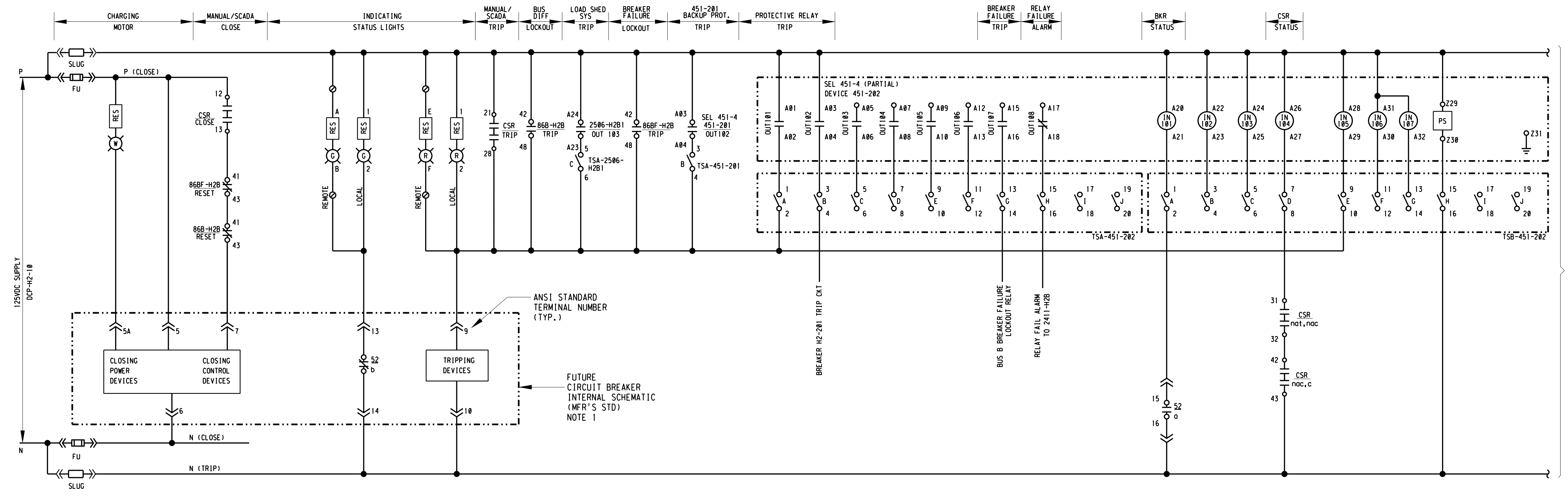
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
FUTURE FEEDER BREAKER H2-201 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-323
DRAWING NUMBER
1
REV.



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

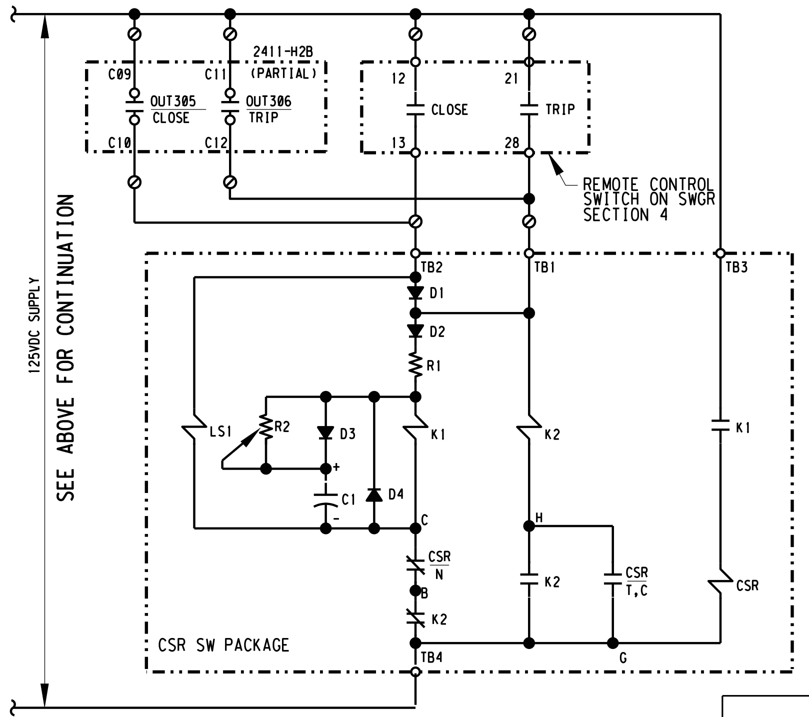
1 FUTURE FEEDER BREAKER H2-202 CONTROL SCHEMATIC

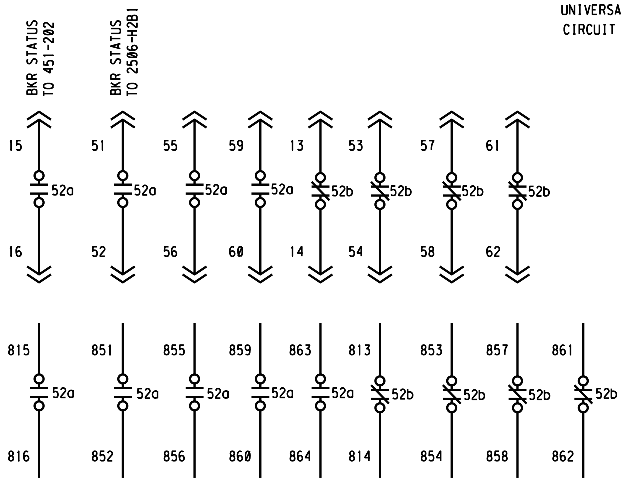
-

NONE

NOTE:

1. PROVIDE FULLY EQUIPPED BREAKER CUBICLE, WITH ALL DEVICES AND WIRING, BUT FURNISHED WITHOUT CIRCUIT BREAKER.

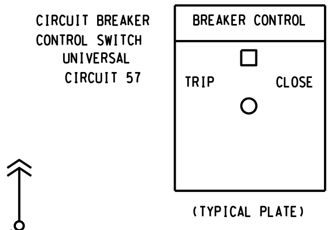




3 FUTURE BREAKER AUX. CONTACTS

-

NONE



(TYPICAL PLATE)

DECK	CONTACTS		POSITION			
			TRIP	nat	nac	CLOSE
1	12	13				X
	16	17				X
2	21	28	X			
	24	25	X			
3	31	32		X	X	
	35	36		X	X	
4	42	43			X	X
	46	47			X	X
5	51	52	X	X		
	55	56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

-

NONE

REF 7: REF7@FILENAME
REF 8: REF8@FILENAME
REF 9: REF9@FILENAME

REF 4: REF4@FILENAME
REF 5: REF5@FILENAME
REF 6: REF6@FILENAME

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REF 2: REF2@FILENAME
REF 3: REF3@FILENAME

PLOT SCALE: 0.1671694

USER: vuong
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3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
FUTURE FEEDER BREAKER H2-202 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-324
DRAWING NUMBER

1
REV.

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DATE: 10-SEP-2014 11:18
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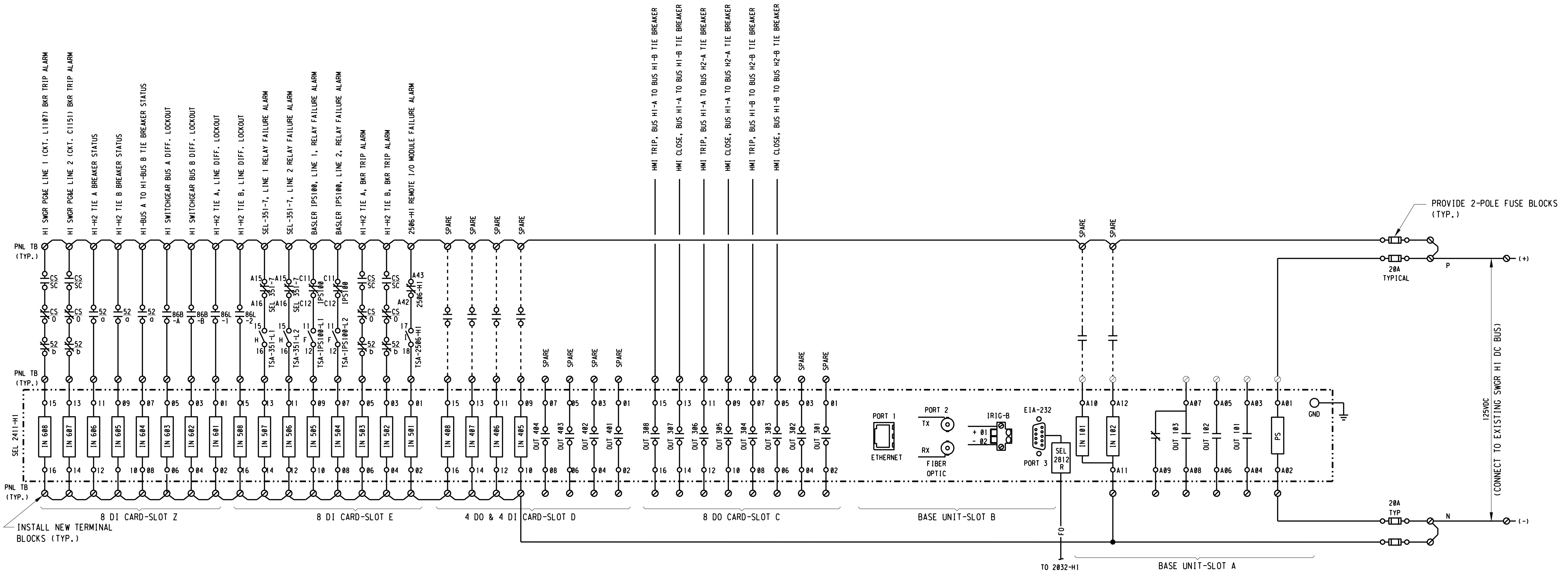
REF 9: REF9$FILENAME


H1 SWGR PG&E LINE 1 (CKT. L1107) BKR TRIP ALARM
H1 SWGR PG&E LINE 2 (CKT. C1151) BKR TRIP ALARM
H1-H2 TIE A BREAKER STATUS
H1-H2 TIE B BREAKER STATUS
H1-BUS A TO H1-BUS B TIE BREAKER STATUS
H1 SWITCHGEAR BUS A DIFF. LOCKOUT
H1 SWITCHGEAR BUS B DIFF. LOCKOUT
H1-H2 TIE A, LINE DIFF. LOCKOUT
H1-H2 TIE B, LINE DIFF. LOCKOUT
SEL-351-7, LINE 1 RELAY FAILURE ALARM
SEL-351-7, LINE 2 RELAY FAILURE ALARM
BASLER IPS100, LINE 1, RELAY FAILURE ALARM
BASLER IPS100, LINE 2, RELAY FAILURE ALARM
H1-H2 TIE A, BKR TRIP ALARM
H1-H2 TIE B, BKR TRIP ALARM
2506-H1 REMOTE I/O MODULE FAILURE ALARM
SPARE
HMI TRIP, BUS H1-A TO BUS H1-B TIE BREAKER
HMI CLOSE, BUS H1-A TO BUS H1-B TIE BREAKER
HMI TRIP, BUS H1-A TO BUS H2-A TIE BREAKER
HMI CLOSE, BUS H1-A TO BUS H2-A TIE BREAKER
HMI TRIP, BUS H1-B TO BUS H2-B TIE BREAKER
HMI CLOSE, BUS H1-B TO BUS H2-B TIE BREAKER
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYPICAL
20A TYP
P
N
(+)
(-)
125VDC (CONNECT TO EXISTING SWGR H1 DC BUS)
PNL TB (TYP.)
SEL 2411-H1
CS SC
CS O
52 b
52 a
86B -A
86B -B
86L -1
86L -2
SEL 351-7
TSA-351-L1
TSA-351-L2
IPS100
TSA-IPS100-L1
TSA-IPS100-L2
2506-H1
TSA-2506-H1
IN 608
IN 607
IN 606
IN 605
IN 604
IN 603
IN 602
IN 601
IN 508
IN 507
IN 506
IN 505
IN 504
IN 503
IN 502
IN 501
IN 408
IN 407
IN 406
IN 405
OUT 404
OUT 403
OUT 402
OUT 401
OUT 308
OUT 307
OUT 306
OUT 305
OUT 304
OUT 303
OUT 302
OUT 301
PORT 1
ETHERNET
PORT 2
TX
RX
FIBER OPTIC
IRIG-B
+ 01
- 02
EIA-232
PORT 3
SEL 2812 R
FO
TO 2032-H1
IN 101
IN 102
OUT 103
OUT 102
OUT 101
PS
GND
A10
A12
A11
A07
A05
A03
A01
A09
A08
A06
A04
A02
8 DI CARD-SLOT Z
8 DI CARD-SLOT E
4 DO & 4 DI CARD-SLOT D
8 DO CARD-SLOT C
BASE UNIT-SLOT B
BASE UNIT-SLOT A
INSTALL NEW TERMINAL BLOCKS (TYP.)

3" ON ORIGINAL DOCUMENT
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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD
PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1,
I/O PROCESSOR SEL-2411-H1 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-540
DRAWING NUMBER
1
REV.

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REF 8: REF8$FILENAME
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REF 6: REF6$FILENAME
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DATE: 10-SEP-2014 11:20
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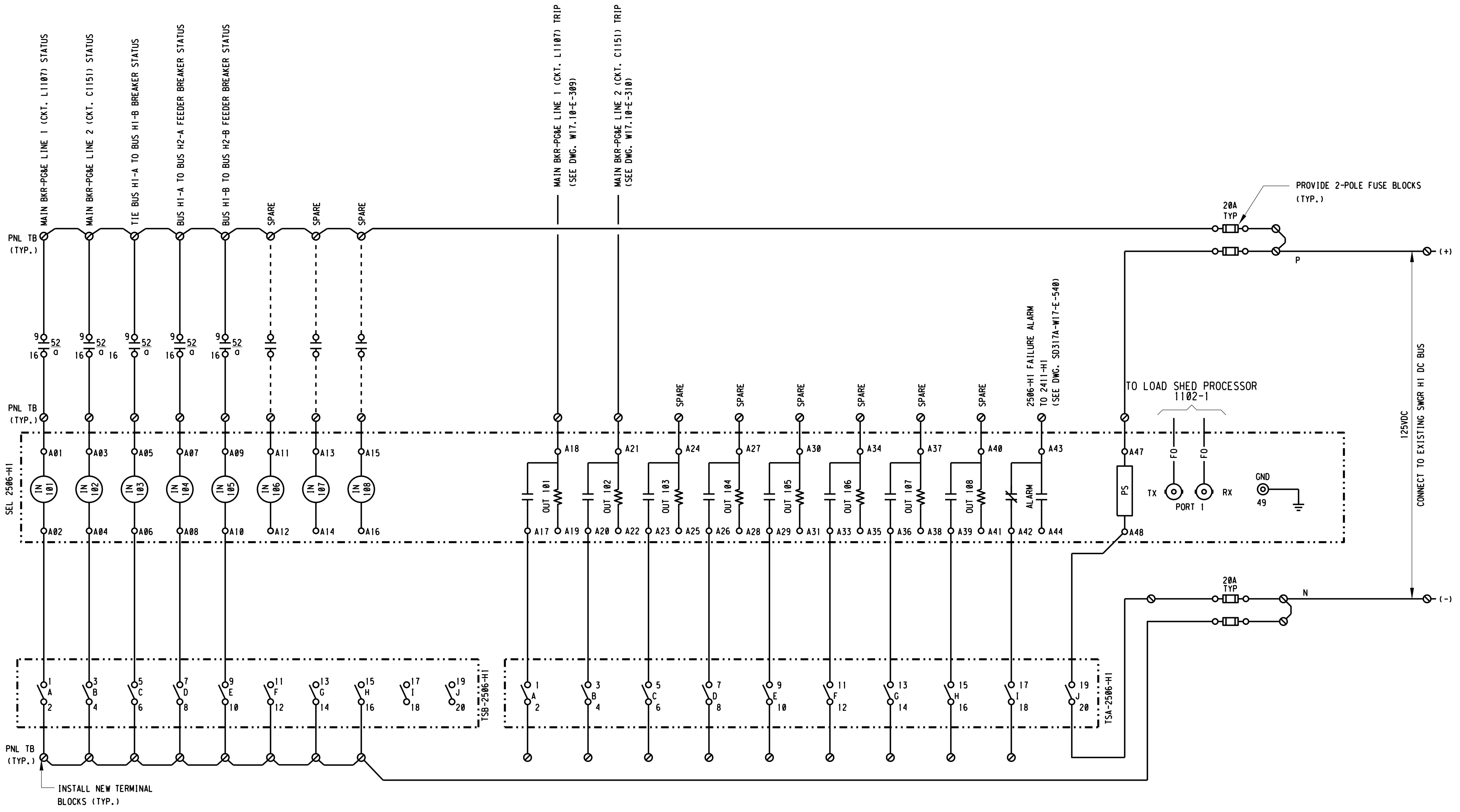
MAIN BKR-PG&E LINE 1 (CKT. L1107) STATUS
MAIN BKR-PG&E LINE 2 (CKT. C1151) STATUS
TIE BUS H1-A TO BUS H1-B BREAKER STATUS
BUS H1-A TO BUS H2-A FEEDER BREAKER STATUS
BUS H1-B TO BUS H2-B FEEDER BREAKER STATUS
SPARE
SPARE
SPARE
MAIN BKR-PG&E LINE 1 (CKT. L1107) TRIP (SEE DWG. W17.10-E-309)
MAIN BKR-PG&E LINE 2 (CKT. C1151) TRIP (SEE DWG. W17.10-E-310)
PNL TB (TYP.)
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
P
(+)
9 52 16 a
SPARE
2506-H1 FAILURE ALARM TO 2411-H1 (SEE DWG. SD317A-W17-E-540)
TO LOAD SHED PROCESSOR 1102-1
125VDC
CONNECT TO EXISTING SWGR H1 DC BUS
SEL 2506-H1
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
A18 A21 A24 A27 A30 A34 A37 A40 A43 A47
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108 ALARM
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44 A48
PS
FO FO
TX RX
PORT 1
GND 49
20A TYP
N
(-)
TSB-2506-H1
TSA-2506-H1
1 A 2 3 B 4 5 C 6 7 D 8 9 E 10 11 F 12 13 G 14 15 H 16 17 I 18 19 J 20
INSTALL NEW TERMINAL BLOCKS (TYP.)

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN, REMOTE I/O MODULE (2506-H1) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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santa clara, ca 95054
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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H1,
REMOTE I/O MODULE SEL-2506-H1 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-541
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 10-SEP-2014 11:21
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REF 2: REF2$FILENAME
REF 4: REF4$FILENAME
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REF 7: REF7$FILENAME
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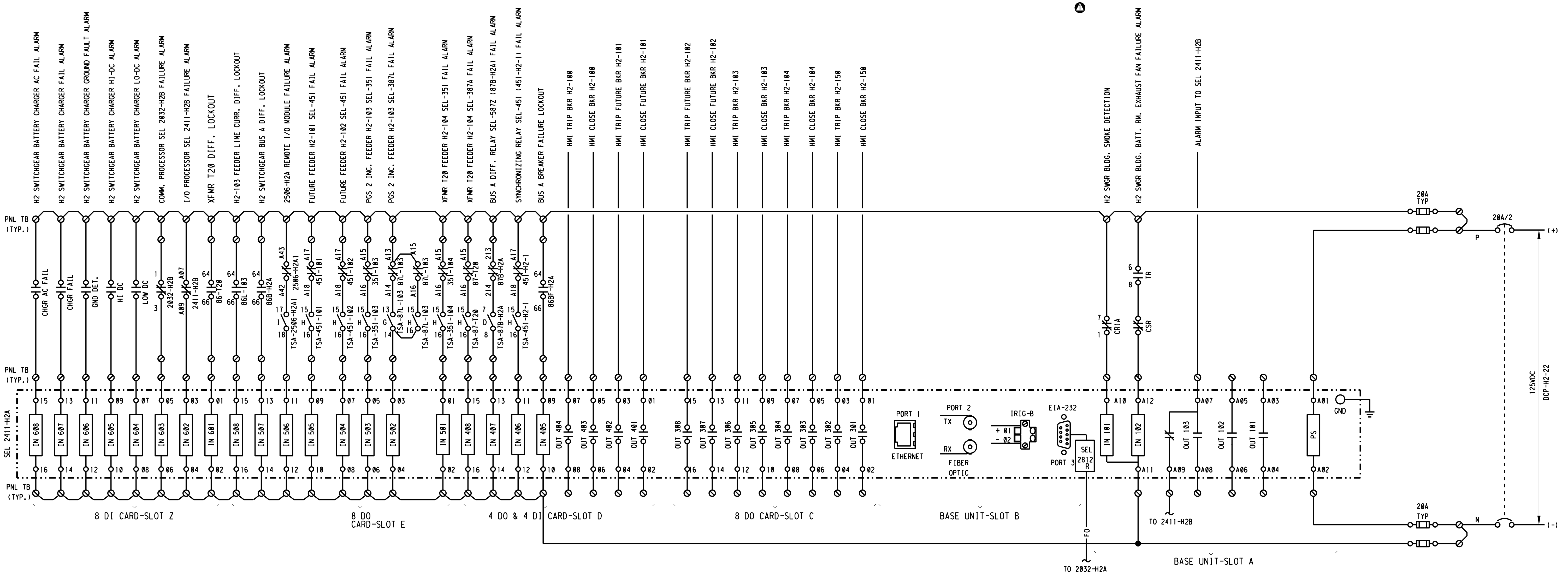

H2 SWITCHGEAR BATTERY CHARGER AC FAIL ALARM
H2 SWITCHGEAR BATTERY CHARGER FAIL ALARM
H2 SWITCHGEAR BATTERY CHARGER GROUND FAULT ALARM
H2 SWITCHGEAR BATTERY CHARGER HI-DC ALARM
H2 SWITCHGEAR BATTERY CHARGER LO-DC ALARM
COMM. PROCESSOR SEL 2032-H2B FAILURE ALARM
I/O PROCESSOR SEL 2411-H2B FAILURE ALARM
XFMR T20 DIFF. LOCKOUT
H2-103 FEEDER LINE CURR. DIFF. LOCKOUT
H2 SWITCHGEAR BUS A DIFF. LOCKOUT
2506-H2A REMOTE I/O MODULE FAILURE ALARM
FUTURE FEEDER H2-101 SEL-451 FAIL ALARM
FUTURE FEEDER H2-102 SEL-451 FAIL ALARM
PGS 2 INC. FEEDER H2-103 SEL-351 FAIL ALARM
PGS 2 INC. FEEDER H2-103 SEL-387L FAIL ALARM
XFMR T20 FEEDER H2-104 SEL-351 FAIL ALARM
XFMR T20 FEEDER H2-104 SEL-387A FAIL ALARM
BUS A DIFF. RELAY SEL-587Z (87B-H2A) FAIL ALARM
SYNCHRONIZING RELAY SEL-451 (451-H2-1) FAIL ALARM
BUS A BREAKER FAILURE LOCKOUT
HMI TRIP BKR H2-100
HMI CLOSE BKR H2-100
HMI TRIP FUTURE BKR H2-101
HMI CLOSE FUTURE BKR H2-101
HMI TRIP FUTURE BKR H2-102
HMI CLOSE FUTURE BKR H2-102
HMI TRIP BKR H2-103
HMI CLOSE BKR H2-103
HMI TRIP BKR H2-104
HMI CLOSE BKR H2-104
HMI TRIP BKR H2-150
HMI CLOSE BKR H2-150
H2 SWGR BLDG. SMOKE DETECTION
H2 SWGR BLDG. BATT. RM. EXHAUST FAN FAILURE ALARM
ALARM INPUT TO SEL 2411-H2B
PNL TB (TYP.)
CHGR AC FAIL
CHGR FAIL
GND DET.
HI DC
LOW DC
2032-H2B
2411-H2B
86-T20
86L-103
86B-H2A
2506-H2A1
TSA-2506-H2A1
451-101
TSA-451-101
451-102
TSA-451-102
351-103
TSA-351-103
87L-103
TSA-87L-103
351-104
TSA-351-104
87-T20
TSA-87-T20
87B-H2A
TSA-87B-H2A
451-H2-1
TSA-451-H2-1
86BF-H2A
CR1A
CSR
TR
SEL 2411-H2A
IN 608
IN 607
IN 606
IN 605
IN 604
IN 603
IN 602
IN 601
IN 508
IN 507
IN 506
IN 505
IN 504
IN 503
IN 502
IN 501
IN 408
IN 407
IN 406
IN 405
OUT 404
OUT 403
OUT 402
OUT 401
OUT 308
OUT 307
OUT 306
OUT 305
OUT 304
OUT 303
OUT 302
OUT 301
PORT 1
ETHERNET
PORT 2
TX
RX
FIBER OPTIC
IRIG-B
+ 01
- 02
EIA-232
PORT 3
SEL 2812 R
IN 101
IN 102
OUT 103
OUT 102
OUT 101
PS
GND
A10
A12
A11
A07
A05
A03
A01
A09
A08
A06
A04
A02
8 DI CARD-SLOT Z
8 DO CARD-SLOT E
4 DO & 4 DI CARD-SLOT D
8 DO CARD-SLOT C
BASE UNIT-SLOT B
BASE UNIT-SLOT A
TO 2411-H2B
FO
TO 2032-H2A
20A TYP
20A/2
P
N
(+)
(-)
125VDC
DCP-H2-22

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0 1 2 3

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PROJECT NO. 07688-01-03

NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
⚠1	01/24/11	REVISED PER KBL INTERCONNECT WIRING	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

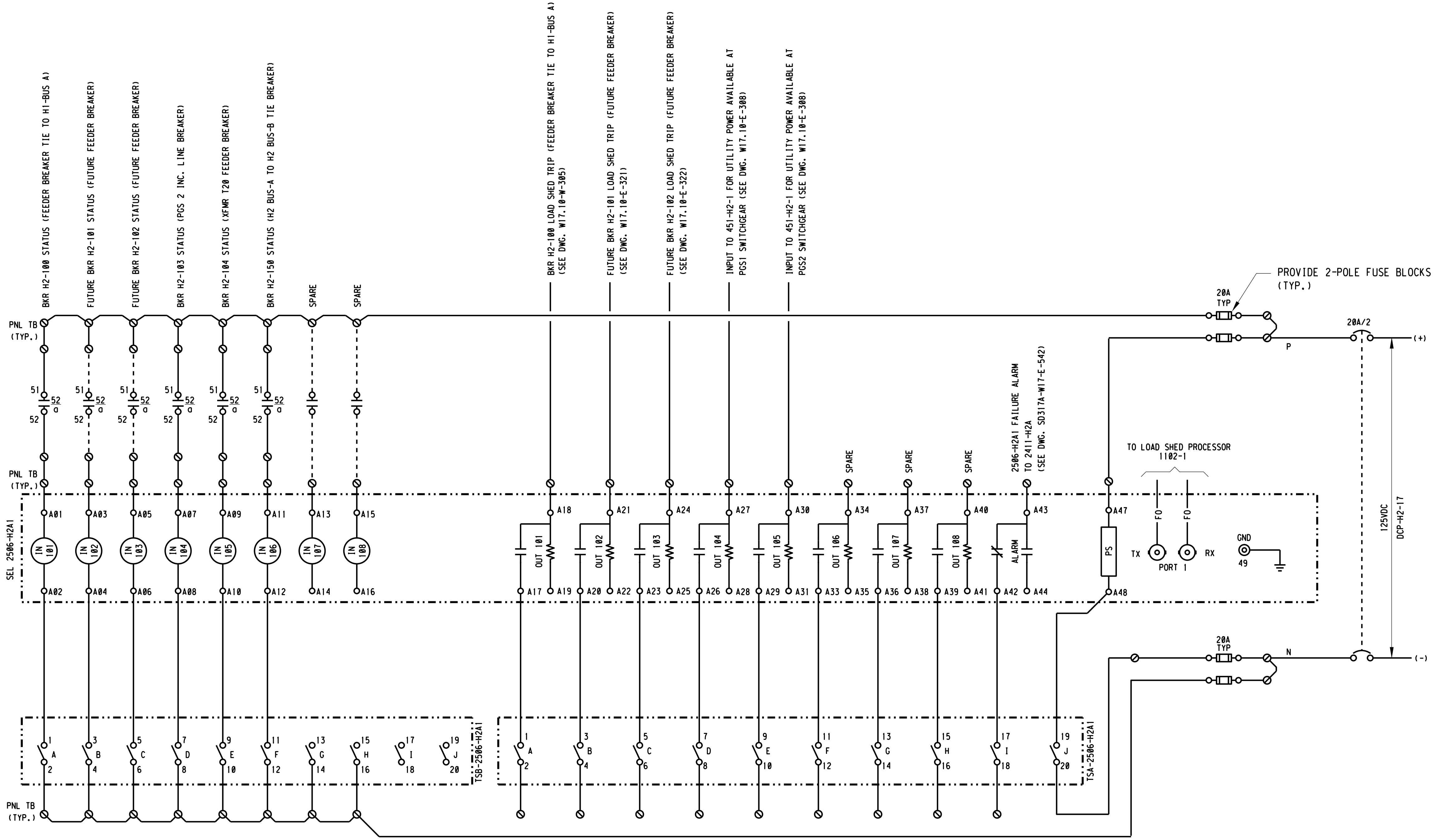
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
I/O PROCESSOR SEL-2411-H2A SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-542
DRAWING NUMBER
2
REV.


BKR H2-100 STATUS (FEEDER BREAKER TIE TO H1-BUS A)
FUTURE BKR H2-101 STATUS (FUTURE FEEDER BREAKER)
FUTURE BKR H2-102 STATUS (FUTURE FEEDER BREAKER)
BKR H2-103 STATUS (PGS 2 INC. LINE BREAKER)
BKR H2-104 STATUS (XFMR T20 FEEDER BREAKER)
BKR H2-150 STATUS (H2 BUS-A TO H2 BUS-B TIE BREAKER)
SPARE
SPARE
BKR H2-100 LOAD SHED TRIP (FEEDER BREAKER TIE TO H1-BUS A) (SEE DWG. W17.10-W-305)
FUTURE BKR H2-101 LOAD SHED TRIP (FUTURE FEEDER BREAKER) (SEE DWG. W17.10-E-321)
FUTURE BKR H2-102 LOAD SHED TRIP (FUTURE FEEDER BREAKER) (SEE DWG. W17.10-E-322)
INPUT TO 451-H2-1 FOR UTILITY POWER AVAILABLE AT PGS1 SWITCHGEAR (SEE DWG. W17.10-E-308)
INPUT TO 451-H2-1 FOR UTILITY POWER AVAILABLE AT PGS2 SWITCHGEAR (SEE DWG. W17.10-E-308)
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
20A/2
P
(+)
N
(-)
125VDC
DCP-H2-17
PNL TB (TYP.)
51
52
52 a
SPARE
SPARE
SPARE
2506-H2A1 FAILURE ALARM TO 2411-H2A (SEE DWG. SD317A-W17-E-542)
TO LOAD SHED PROCESSOR 1102-1
SEL 2506-H2A1
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
A18 A21 A24 A27 A30 A34 A37 A40 A43 A47
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108 ALARM
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44 A48
PS
FO FO
TX RX
PORT 1
GND 49
1 A 2
3 B 4
5 C 6
7 D 8
9 E 10
11 F 12
13 G 14
15 H 16
17 I 18
19 J 20
TSB-2506-H2A1
TSA-2506-H2A1

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carollo

NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
REMOTE I/O MODULE SEL-2506-H2A1 SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-543
DRAWING NUMBER

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REV.

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PLOT SCALE: 0.167614:1

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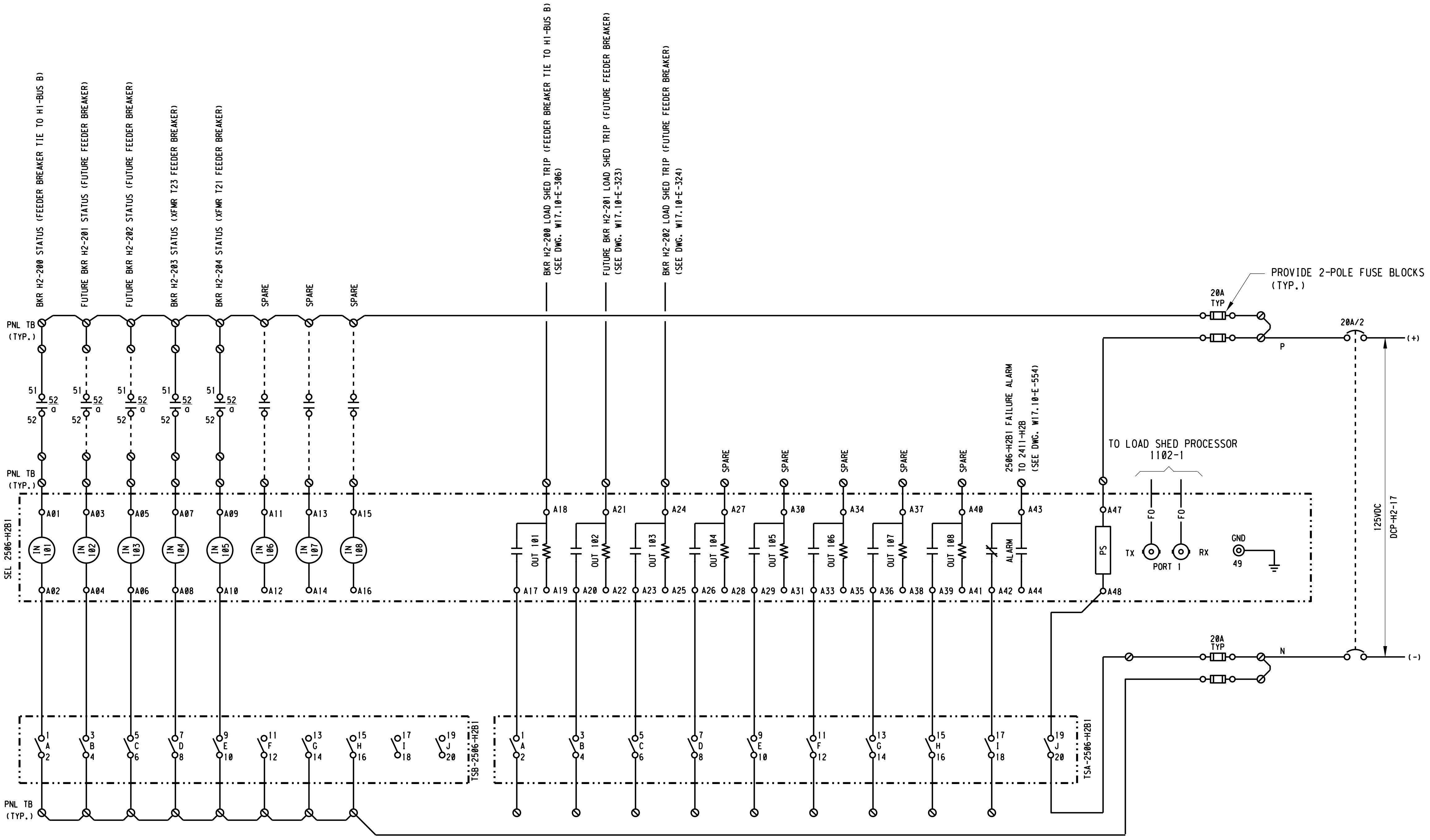
BKR H2-200 STATUS (FEEDER BREAKER TIE TO H1-BUS B)
FUTURE BKR H2-201 STATUS (FUTURE FEEDER BREAKER)
FUTURE BKR H2-202 STATUS (FUTURE FEEDER BREAKER)
BKR H2-203 STATUS (XFMR T23 FEEDER BREAKER)
BKR H2-204 STATUS (XFMR T21 FEEDER BREAKER)
SPARE
SPARE
SPARE
BKR H2-200 LOAD SHED TRIP (FEEDER BREAKER TIE TO H1-BUS B) (SEE DWG. W17.10-E-306)
FUTURE BKR H2-201 LOAD SHED TRIP (FUTURE FEEDER BREAKER) (SEE DWG. W17.10-E-323)
BKR H2-202 LOAD SHED TRIP (FUTURE FEEDER BREAKER) (SEE DWG. W17.10-E-324)
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
20A/2
(+)
P
PNL TB (TYP.)
51
52
52 a
SPARE
SPARE
SPARE
SPARE
SPARE
2506-H2B1 FAILURE ALARM TO 2411-H2B (SEE DWG. W17.10-E-554)
TO LOAD SHED PROCESSOR 1102-1
SEL 2506-H2B1
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
A18 A21 A24 A27 A30 A34 A37 A40 A43 A47
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108
ALARM
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44 A48
PS
FO
FO
TX
RX
PORT 1
GND
49
125VDC
DCP-H2-17
20A TYP
N
(-)
TSB-2506-H2B1
TSA-2506-H2B1
1 A 2
3 B 4
5 C 6
7 D 8
9 E 10
11 F 12
13 G 14
15 H 16
17 I 18
19 J 20
PNL TB (TYP.)

USER: vuong
DATE: 09-OCT-2014 11:07
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REF 7: REF7$FILENAME
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REF 9: REF9$FILENAME

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
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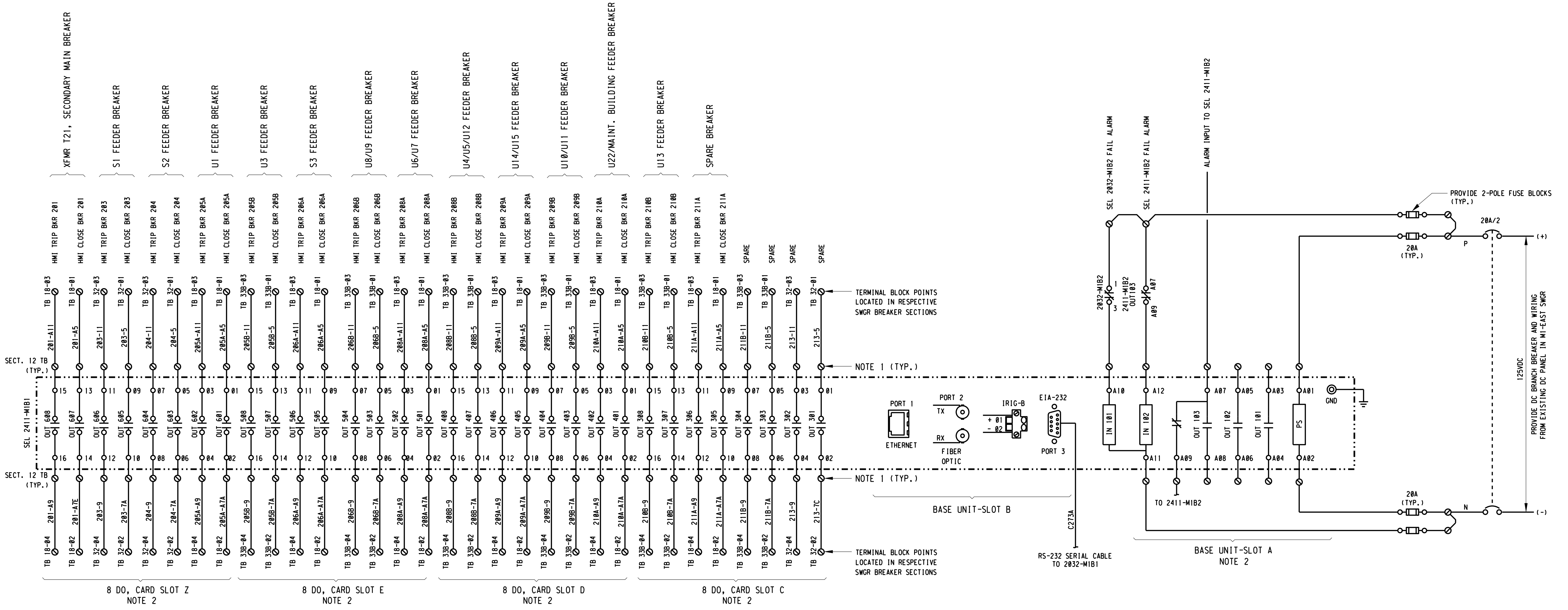
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
REMOTE I/O MODULE SEL-2506-H2B1 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-544
DRAWING NUMBER
1
REV.



NOTES:

1. PROVIDE NEW 600V, 30A RATED TERMINAL BLOCKS IN M1-EAST SWITCHGEAR SECTION 12 FOR TERMINATING NEW DEVICE 2411-M1B1 I/O WIRING.
2. PROVIDE NEW CONTROL, INDICATION AND ALARM WIRING AS SHOWN. CIRCUIT BREAKER TRIP AND CLOSE CONTROL WIRING SHALL BE INSTALLED FROM I/O PROCESSOR IN SWITCHGEAR SECTION 12 TO EACH RESPECTIVE BREAKER SECTION.

3" ON ORIGINAL DOCUMENT
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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST,
I/O PROCESSOR SEL-2411-M1B1 SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-545
DRAWING NUMBER

1
REV.

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DATE: 10-SEP-2014 11:34
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PLOT SCALE: 0.167614:1

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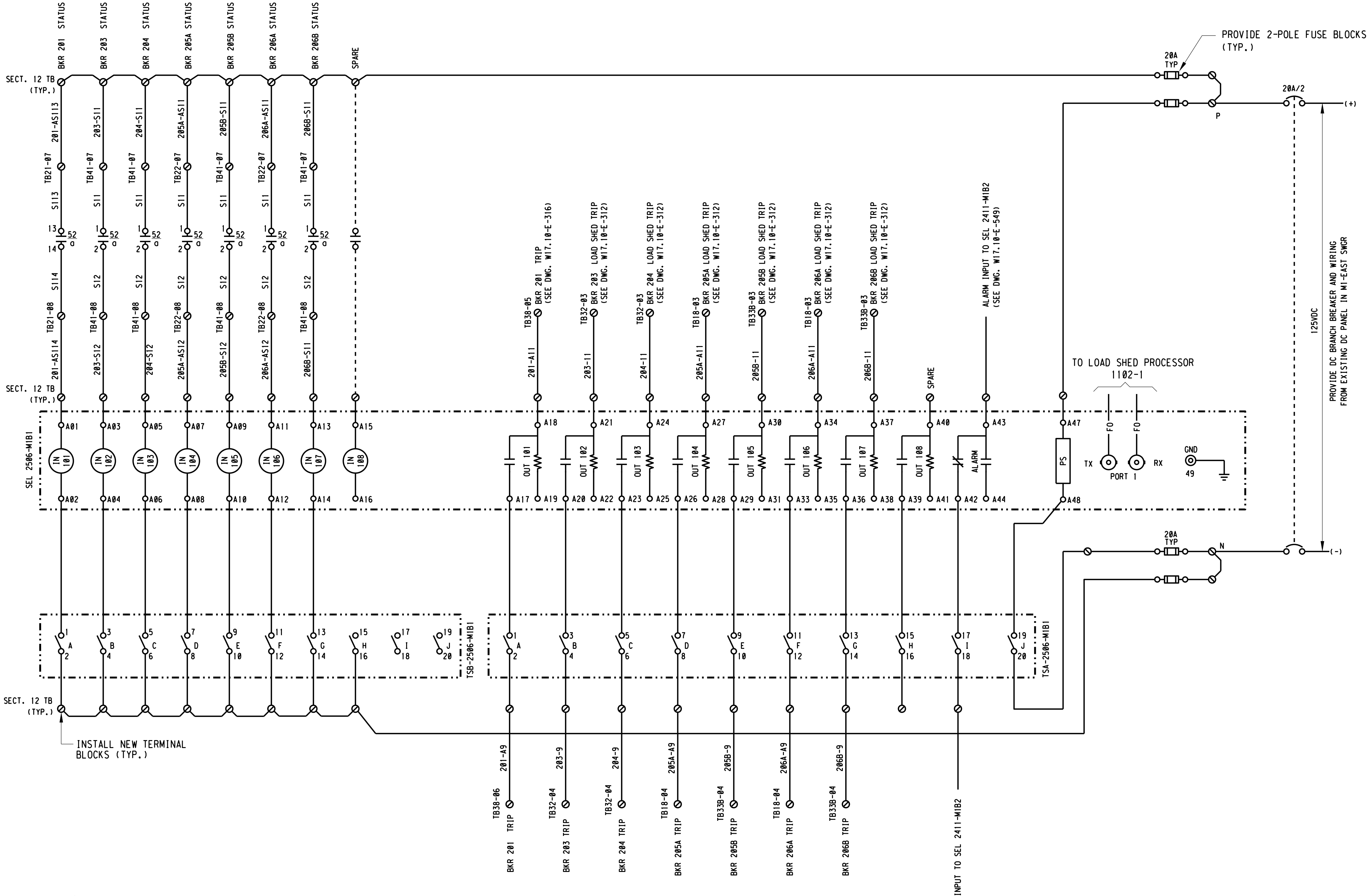

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN REMOTE I/O MODULE (2506-M1B1) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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carollo

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SD317A - PGS RENEWABLE ENERGY EXPANSION

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	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST,
REMOTE I/O MODULE SEL-2506-M1B1 SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-546
DRAWING NUMBER

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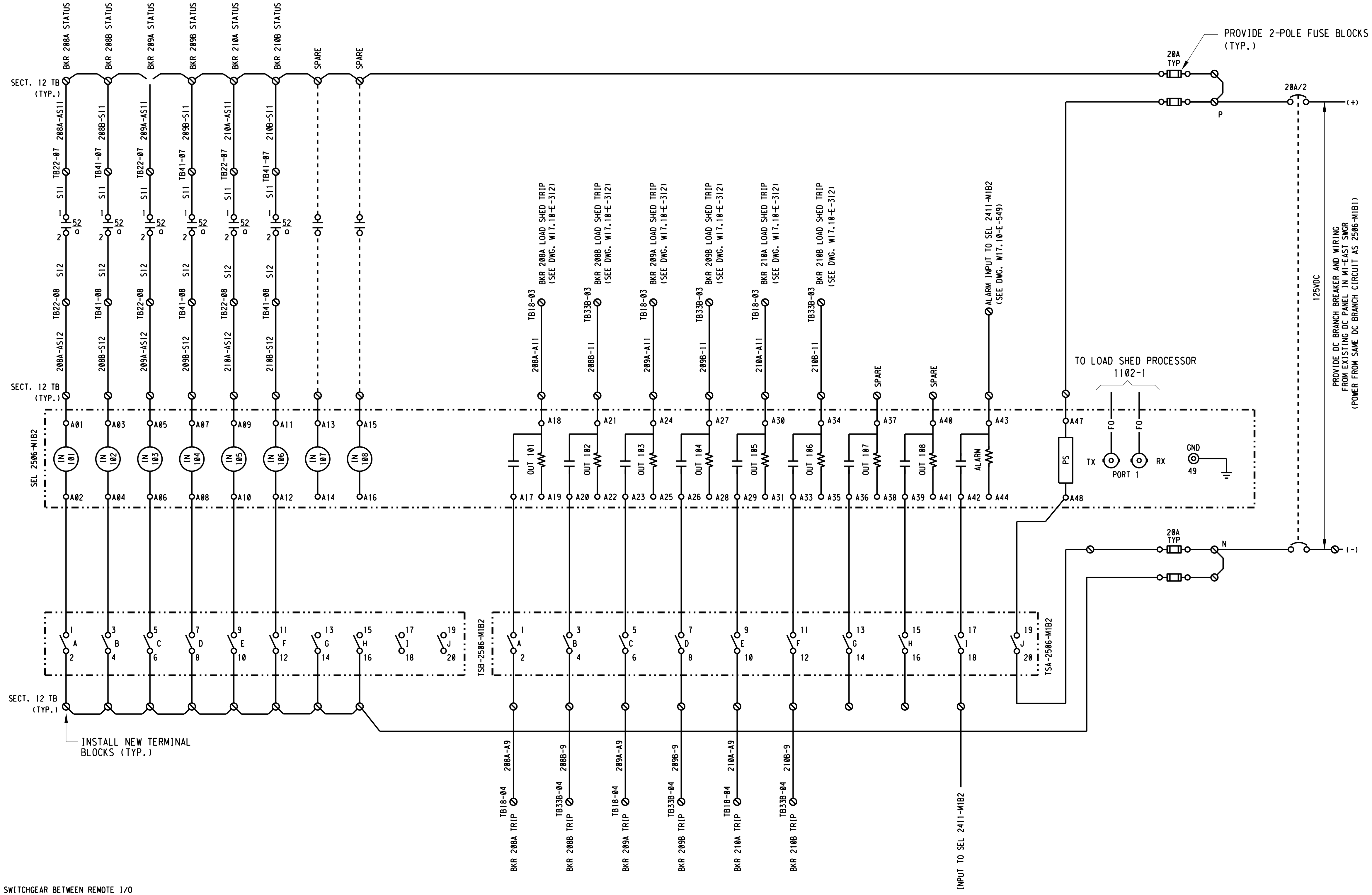
BKR 208A STATUS
BKR 208B STATUS
BKR 209A STATUS
BKR 209B STATUS
BKR 210A STATUS
BKR 210B STATUS
SPARE
SPARE
SECT. 12 TB (TYP.)
208A-AS11
208B-S11
209A-AS11
209B-S11
210A-AS11
210B-S11
TB22-07
TB41-07
S11
52 a
S12
TB22-08
TB41-08
208A-AS12
208B-S12
209A-AS12
209B-S12
210A-AS12
210B-S12
SEL 2506-M1B2
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
BKR 208A LOAD SHED TRIP (SEE DWG. W17.10-E-312)
BKR 208B LOAD SHED TRIP (SEE DWG. W17.10-E-312)
BKR 209A LOAD SHED TRIP (SEE DWG. W17.10-E-312)
BKR 209B LOAD SHED TRIP (SEE DWG. W17.10-E-312)
BKR 210A LOAD SHED TRIP (SEE DWG. W17.10-E-312)
BKR 210B LOAD SHED TRIP (SEE DWG. W17.10-E-312)
ALARM INPUT TO SEL 2411-M1B2 (SEE DWG. W17.10-E-549)
TB18-03
TB33B-03
208A-A11
208B-11
209A-A11
209B-11
210A-A11
210B-11
SPARE
SPARE
A18 A21 A24 A27 A30 A34 A37 A40 A43
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108 ALARM
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44
TO LOAD SHED PROCESSOR 1102-1
FO
FO
A47
PS
A48
TX
RX
PORT 1
GND
49
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
P
N
20A/2
(+)
(-)
125VDC
PROVIDE DC BRANCH BREAKER AND WIRING FROM EXISTING DC PANEL IN M1-EAST SWGR (POWER FROM SAME DC BRANCH CIRCUIT AS 2506-M1B1)
1 A 2
3 B 4
5 C 6
7 D 8
9 E 10
11 F 12
13 G 14
15 H 16
17 I 18
19 J 20
TSB-2506-M1B2
TSA-2506-M1B2
SECT. 12 TB (TYP.)
INSTALL NEW TERMINAL BLOCKS (TYP.)
208A-A9
208B-9
209A-A9
209B-9
210A-A9
210B-9
TB18-04
TB33B-04
BKR 208A TRIP
BKR 208B TRIP
BKR 209A TRIP
BKR 209B TRIP
BKR 210A TRIP
BKR 210B TRIP
INPUT TO SEL 2411-M1B2

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN REMOTE I/O MODULE (2506-M1B2) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

M&H engineers, inc.
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(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST,
REMOTE I/O MODULE SEL-2506-M1B2 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-547
DRAWING NUMBER
1
REV.

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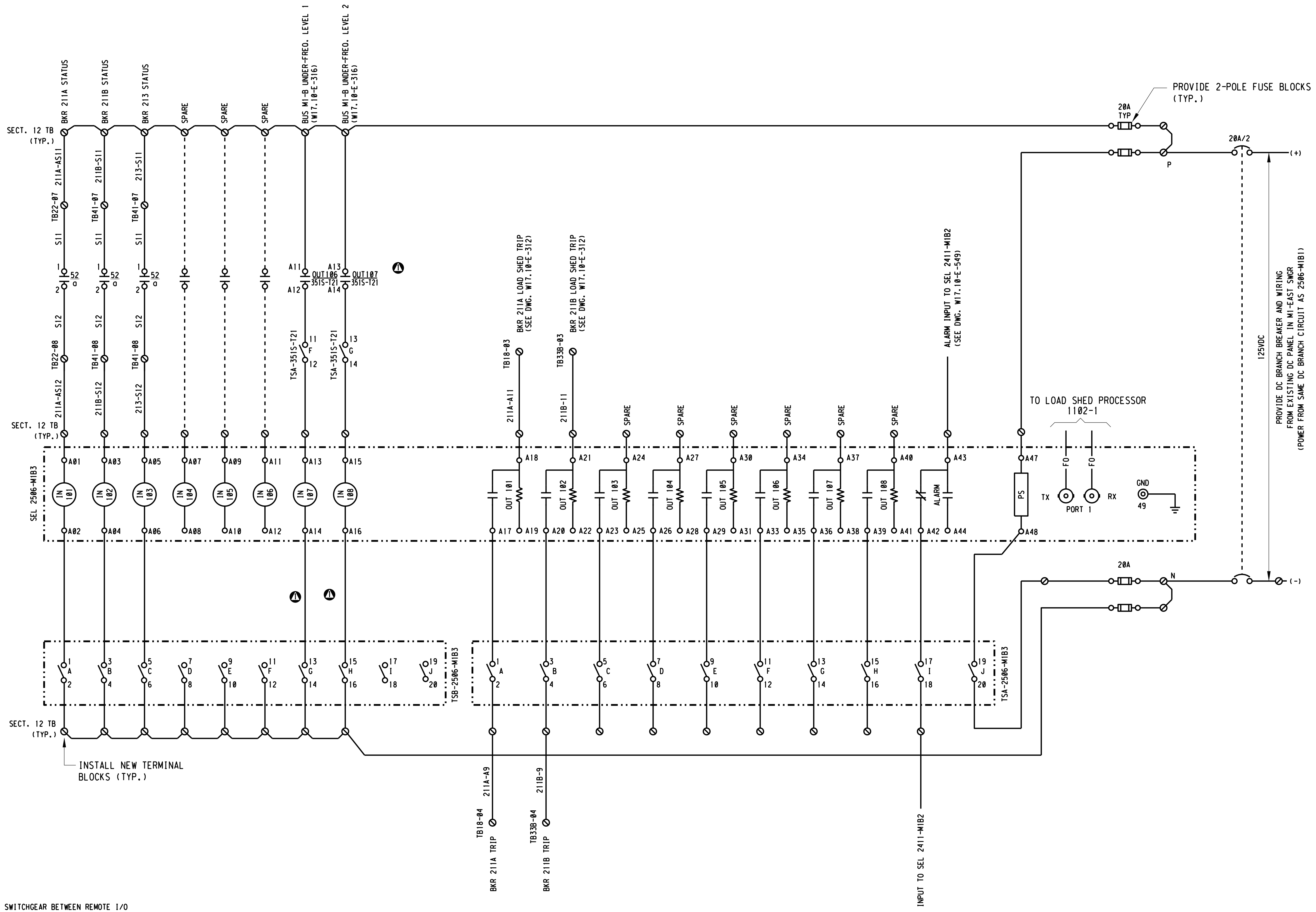
BKR 211A STATUS
BKR 211B STATUS
BKR 213 STATUS
SPARE
BUS M1-B UNDER-FREQ. LEVEL 1 (W17.10-E-316)
BUS M1-B UNDER-FREQ. LEVEL 2 (W17.10-E-316)
SECT. 12 TB (TYP.)
211A-AS11
211B-S11
213-S11
TB22-07
TB41-07
S11
52 a
OUT106 351S-T21
OUT107 351S-T21
A11 A12 A13 A14
S12
TB22-08
TB41-08
TSA-351S-T21
11 F 12
13 G 14
211A-AS12
211B-S12
213-S12
BKR 211A LOAD SHED TRIP (SEE DWG. W17.10-E-312)
BKR 211B LOAD SHED TRIP (SEE DWG. W17.10-E-312)
TB18-03
TB33B-03
211A-A11
211B-11
ALARM INPUT TO SEL 2411-M1B2 (SEE DWG. W17.10-E-549)
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
20A/2
P
N
(+)
(-)
125VDC
PROVIDE DC BRANCH BREAKER AND WIRING FROM EXISTING DC PANEL IN M1-EAST SWGR (POWER FROM SAME DC BRANCH CIRCUIT AS 2506-M1B1)
TO LOAD SHED PROCESSOR 1102-1
FO
TX PORT 1 RX
GND 49
SEL 2506-M1B3
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A01 A02 A03 A04 A05 A06 A07 A08 A09 A10 A11 A12 A13 A14 A15 A16
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108 ALARM PS
A17 A18 A19 A20 A21 A22 A23 A24 A25 A26 A27 A28 A29 A30 A31 A33 A34 A35 A36 A37 A38 A39 A40 A41 A42 A43 A44 A47 A48
TSB-2506-M1B3
TSA-2506-M1B3
1 A 2
3 B 4
5 C 6
7 D 8
9 E 10
11 F 12
13 G 14
15 H 16
17 I 18
19 J 20
INSTALL NEW TERMINAL BLOCKS (TYP.)
211A-A9
211B-9
TB18-04
TB33B-04
BKR 211A TRIP
BKR 211B TRIP
2411-M1B2
INPUT TO SEL 2411-M1B2

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN REMOTE I/O MODULE (2506-M1B3) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	08/18/10	ADDED UNDER- AND OVER-FREQ. I/O's	SEL		

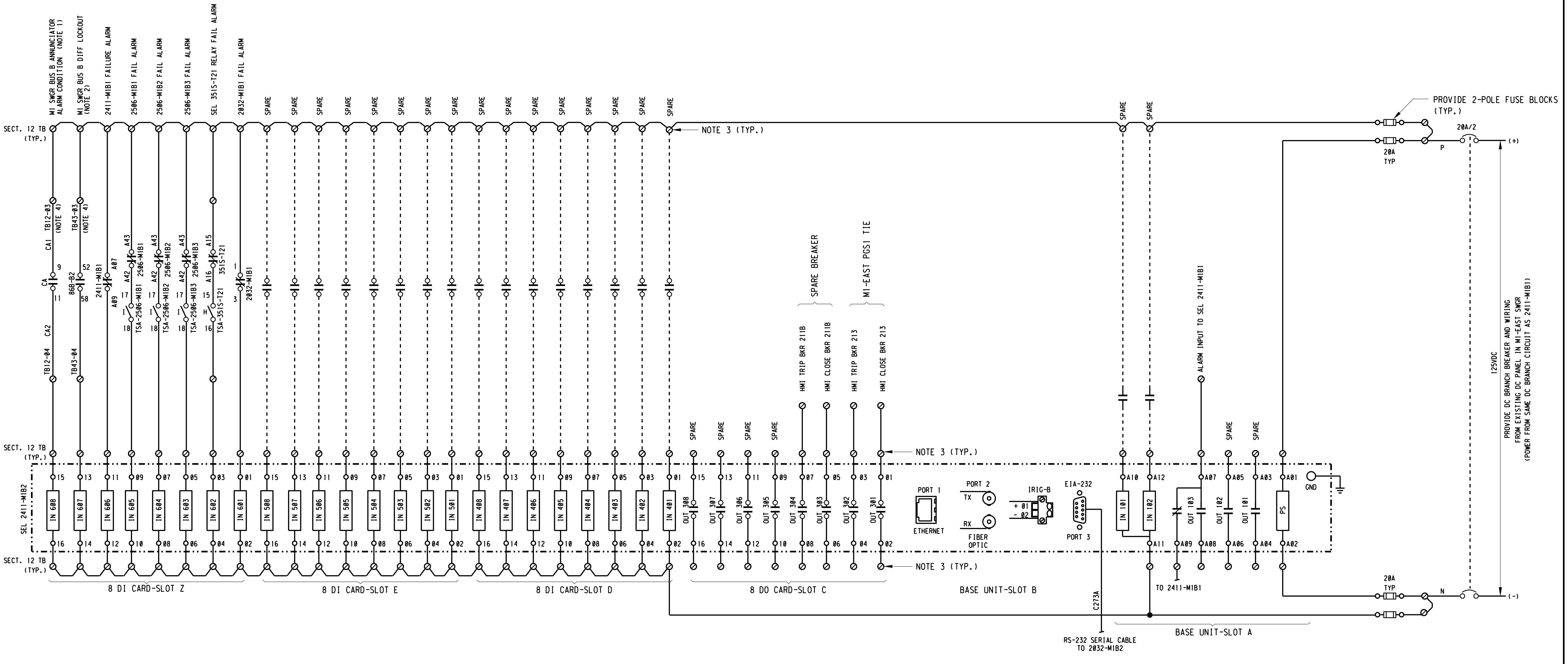
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST,
REMOTE I/O MODULE SEL-2506-M1B3 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-548
DRAWING NUMBER
2
REV.



NOTES:

1. PROVIDE NEW WIRING TO CONNECT EXISTING DEVICE CA CONTACTS TO NEW 2411-M1B2. REUSE EXISTING NORMALLY OPEN CONTACTS FROM ANNUNCIATOR AUXILIARY RELAY "CA" CURRENTLY WIRED TO THE GE 90-30 PLC.
2. PROVIDE NEW WIRING TO CONNECT EXISTING SPARE CONTACT OF LOCKOUT RELAY 86B-B2 TO NEW 2411-M1B2.
3. PROVIDE NEW 600V, 30A RATED TERMINAL BLOCKS IN M1-EAST SWITCHGEAR SECTION 12 FOR TERMINATING NEW DEVICE 2411-M1B2 I/O WIRING.
4. PROVIDE NEW ALARM WIRING AS SHOWN. ALARM WIRING SHALL BE INSTALLED FROM I/O PROCESSOR IN SWITCHGEAR SECTION 12 TO RESPECTIVE SWITCHGEAR SECTIONS AS APPLICABLE.

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-EAST,
I/O PROCESSOR SEL-2411-M1B2 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-549
DRAWING NUMBER
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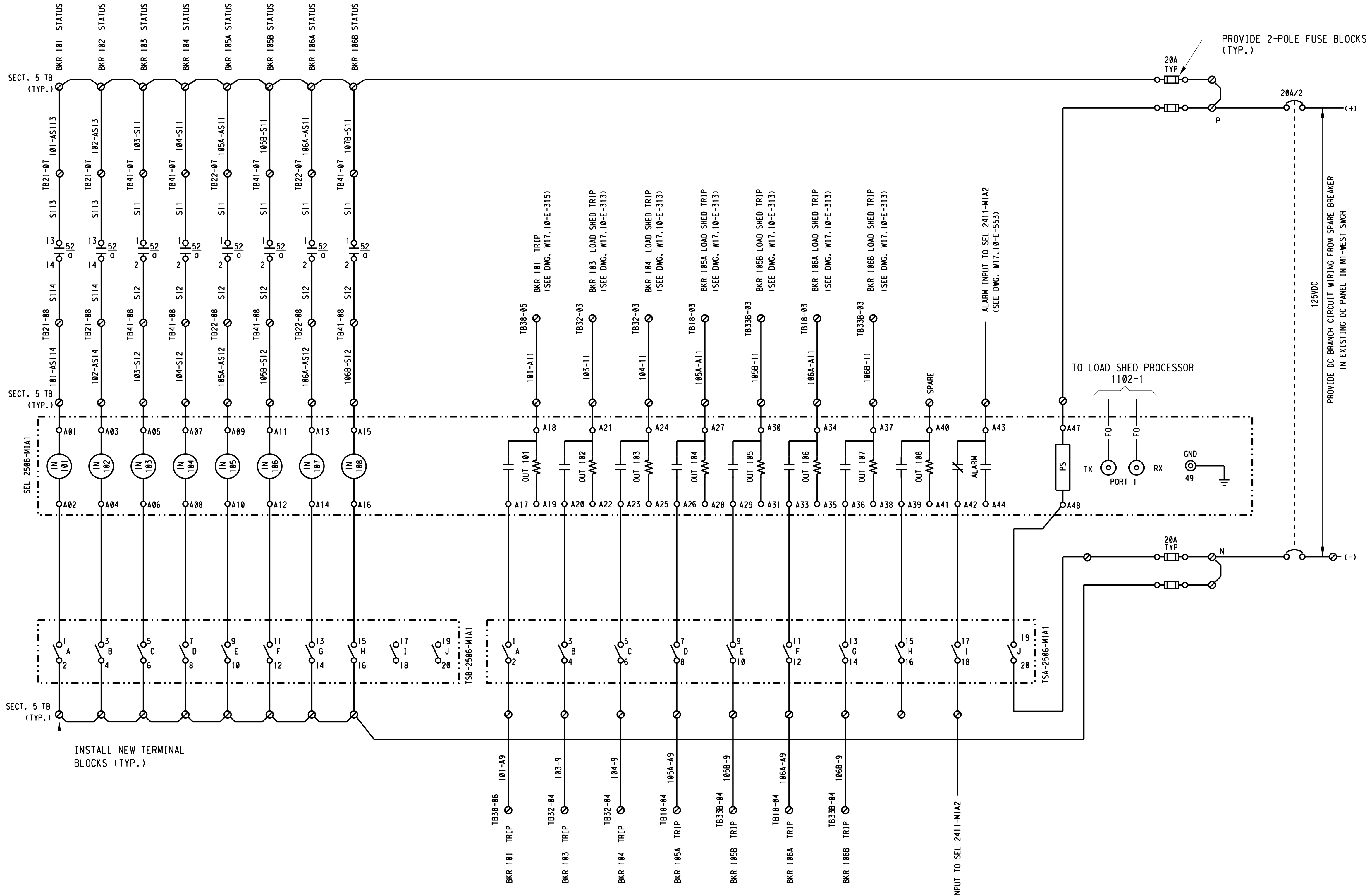
BKR 101 STATUS
BKR 102 STATUS
BKR 103 STATUS
BKR 104 STATUS
BKR 105A STATUS
BKR 105B STATUS
BKR 106A STATUS
BKR 106B STATUS
SECT. 5 TB (TYP.)
101-AS113
102-AS113
103-S11
104-S11
105A-AS11
105B-S11
106A-AS11
107B-S11
TB21-07
TB41-07
TB22-07
S113
S11
52 a
13
14
1
2
S114
S12
TB21-08
TB41-08
TB22-08
101-AS114
102-AS14
103-S12
104-S12
105A-AS12
105B-S12
106A-AS12
106B-S12
SEL 2506-M1A1
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
BKR 101 TRIP (SEE DWG. W17.10-E-315)
BKR 103 LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 104 LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 105A LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 105B LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 106A LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 106B LOAD SHED TRIP (SEE DWG. W17.10-E-313)
ALARM INPUT TO SEL 2411-M1A2 (SEE DWG. W17.10-E-553)
TB38-05
TB32-03
TB18-03
TB33B-03
101-A11
103-11
104-11
105A-A11
105B-11
106A-A11
106B-11
SPARE
A18 A21 A24 A27 A30 A34 A37 A40 A43 A47
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108
ALARM
PS
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44 A48
TO LOAD SHED PROCESSOR 1102-1
FO
TX RX
PORT 1
GND 49
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
20A/2
P
N
(+)
(-)
125VDC
PROVIDE DC BRANCH CIRCUIT WIRING FROM SPARE BREAKER IN EXISTING DC PANEL IN M1-WEST SWGR
TSB-2506-M1A1
TSA-2506-M1A1
A B C D E F G H I J
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
INSTALL NEW TERMINAL BLOCKS (TYP.)
101-A9
103-9
104-9
105A-A9
105B-9
106A-A9
106B-9
TB38-06
TB32-04
TB18-04
TB33B-04
TRIP
BKR 101
BKR 103
BKR 104
BKR 105A
BKR 105B
BKR 106A
BKR 106B
INPUT TO SEL 2411-M1A2

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN REMOTE I/O MODULE (2506-M1A1) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
REMOTE I/O MODULE SEL-2506-M1A1 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-550
DRAWING NUMBER
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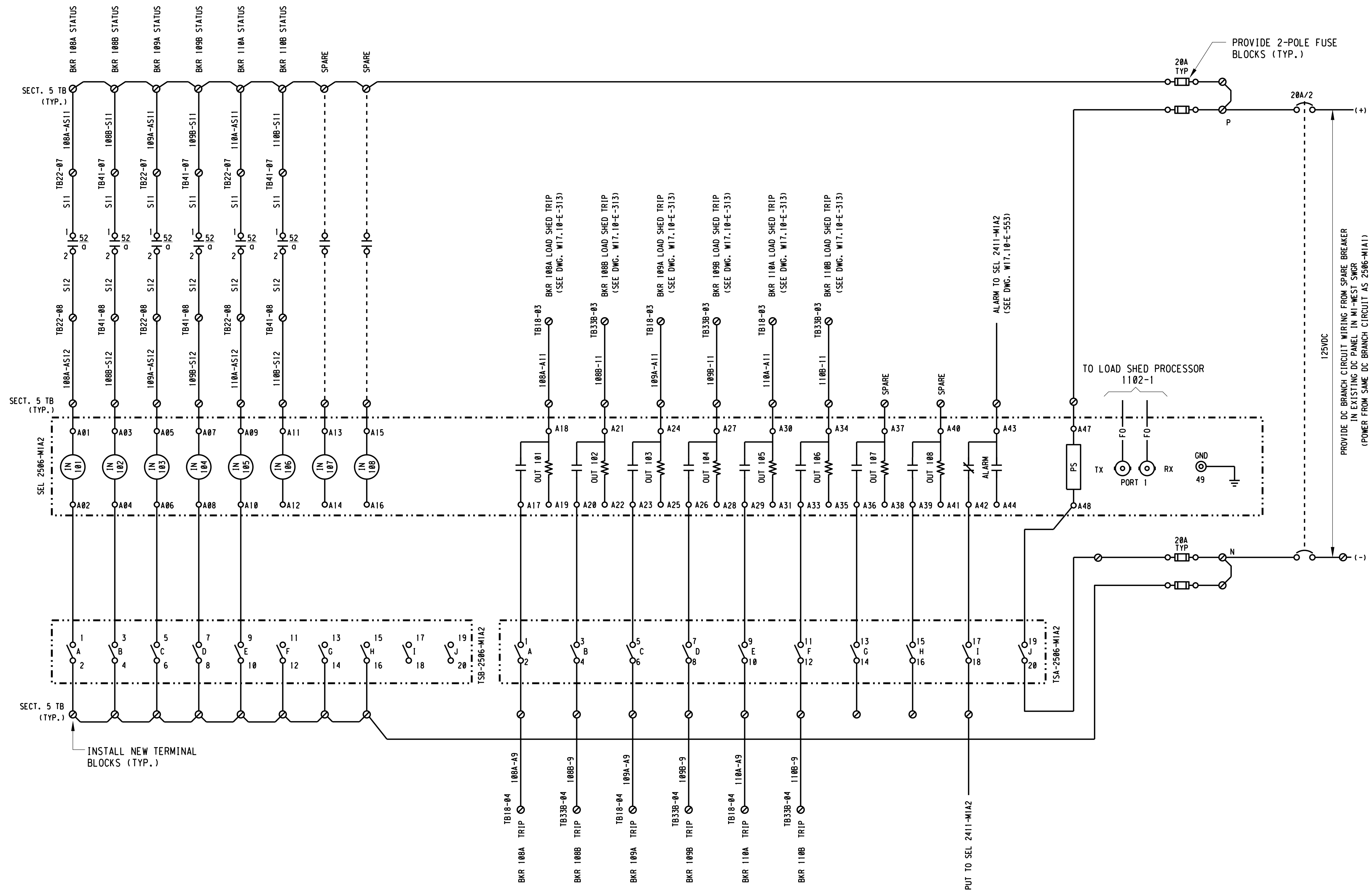
BKR 108A STATUS
BKR 108B STATUS
BKR 109A STATUS
BKR 109B STATUS
BKR 110A STATUS
BKR 110B STATUS
SPARE
SPARE
SECT. 5 TB
(TYP.)
108A-AS11
108B-S11
109A-AS11
109B-S11
110A-AS11
110B-S11
TB22-07
TB41-07
S11
52
a
S12
TB22-08
TB41-08
108A-AS12
108B-S12
109A-AS12
109B-S12
110A-AS12
110B-S12
BKR 108A LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 108B LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 109A LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 109B LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 110A LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 110B LOAD SHED TRIP (SEE DWG. W17.10-E-313)
ALARM TO SEL 2411-M1A2 (SEE DWG. W17.10-E-553)
TB18-03
TB33B-03
108A-A11
108B-11
109A-A11
109B-11
110A-A11
110B-11
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
20A/2
P
N
(+)
(-)
125VDC
PROVIDE DC BRANCH CIRCUIT WIRING FROM SPARE BREAKER IN EXISTING DC PANEL IN M1-WEST SWGR (POWER FROM SAME DC BRANCH CIRCUIT AS 2506-M1A1)
TO LOAD SHED PROCESSOR 1102-1
SEL 2506-M1A2
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
A18 A21 A24 A27 A30 A34 A37 A40 A43 A47
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108
ALARM
PS
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44 A48
FO
TX
RX
PORT 1
GND
49
TSB-2506-M1A2
TSA-2506-M1A2
1 A 2
3 B 4
5 C 6
7 D 8
9 E 10
11 F 12
13 G 14
15 H 16
17 I 18
19 J 20
INSTALL NEW TERMINAL BLOCKS (TYP.)
108A-A9
108B-9
109A-A9
109B-9
110A-A9
110B-9
TB18-04
TB33B-04
TRIP
BKR 108A
BKR 108B
BKR 109A
BKR 109B
BKR 110A
BKR 110B
INPUT TO SEL 2411-M1A2

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN REMOTE I/O MODULE (2506-M1A2) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
▲	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
REMOTE I/O MODULE SEL-2506-M1A2 SCHEMATIC

SCALE NONE
DATE JAN2009

W17.10-E-551
DRAWING NUMBER

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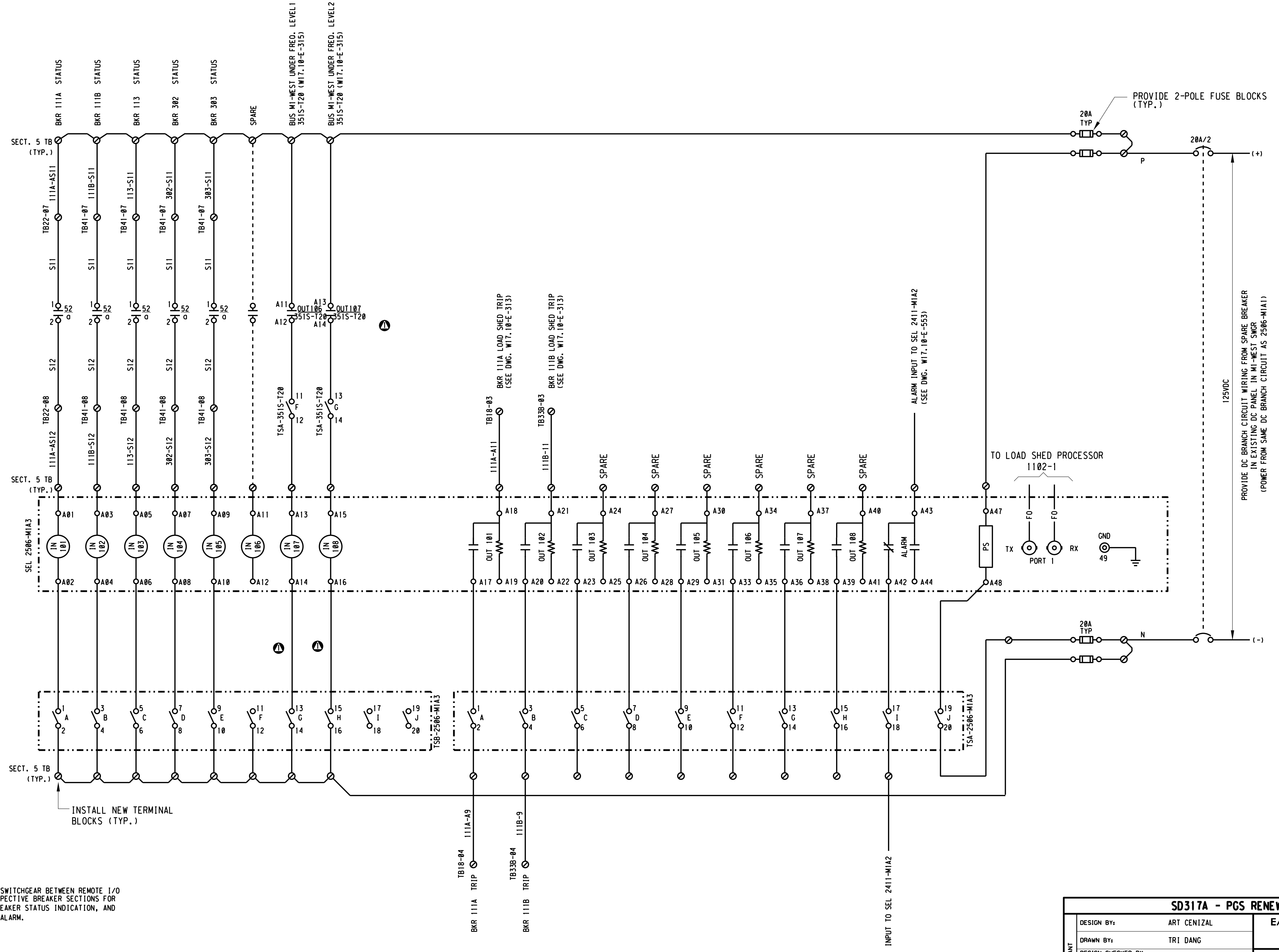
BKR 111A STATUS
BKR 111B STATUS
BKR 113 STATUS
BKR 302 STATUS
BKR 303 STATUS
SPARE
BUS M1-WEST UNDER FREQ. LEVEL1 351S-T20 (W17.10-E-315)
BUS M1-WEST UNDER FREQ. LEVEL2 351S-T20 (W17.10-E-315)
SECT. 5 TB (TYP.)
111A-AS11
111B-S11
113-S11
302-S11
303-S11
TB22-07
TB41-07
S11
52 a
A11 OUT106 351S-T20 A12
A13 OUT107 351S-T20 A14
S12
TB22-08
TB41-08
TSA-351S-T20 11 F 12
TSA-351S-T20 13 G 14
111A-AS12
111B-S12
113-S12
302-S12
303-S12
BKR 111A LOAD SHED TRIP (SEE DWG. W17.10-E-313)
BKR 111B LOAD SHED TRIP (SEE DWG. W17.10-E-313)
TB18-03
TB33B-03
111A-A11
111B-11
SPARE
ALARM INPUT TO SEL 2411-M1A2 (SEE DWG. W17.10-E-553)
TO LOAD SHED PROCESSOR 1102-1
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
20A/2
P
(+)
125VDC
PROVIDE DC BRANCH CIRCUIT WIRING FROM SPARE BREAKER IN EXISTING DC PANEL IN M1-WEST SWGR (POWER FROM SAME DC BRANCH CIRCUIT AS 2506-M1A1)
SEL 2506-M1A3
A01 A03 A05 A07 A09 A11 A13 A15
IN 101 IN 102 IN 103 IN 104 IN 105 IN 106 IN 107 IN 108
A02 A04 A06 A08 A10 A12 A14 A16
A18 A21 A24 A27 A30 A34 A37 A40 A43
OUT 101 OUT 102 OUT 103 OUT 104 OUT 105 OUT 106 OUT 107 OUT 108 ALARM
A17 A19 A20 A22 A23 A25 A26 A28 A29 A31 A33 A35 A36 A38 A39 A41 A42 A44
A47 PS A48
FO FO
TX PORT 1 RX
GND 49
20A TYP
N
(-)
TSB-2506-M1A3
TSA-2506-M1A3
1 A 2, 3 B 4, 5 C 6, 7 D 8, 9 E 10, 11 F 12, 13 G 14, 15 H 16, 17 I 18, 19 J 20
INSTALL NEW TERMINAL BLOCKS (TYP.)
111A-A9
111B-9
TB18-04
TB33B-04
BKR 111A TRIP
BKR 111B TRIP
INPUT TO SEL 2411-M1A2

NOTES:

1. PROVIDE NEW WIRING WITHIN SWITCHGEAR BETWEEN REMOTE I/O MODULE (2506-M1A3) AND RESPECTIVE BREAKER SECTIONS FOR LOAD SHED TRIP CONTROL, BREAKER STATUS INDICATION, AND REMOTE I/O MODULE FAILURE ALARM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

MTH engineers, inc.
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(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	08/18/10	ADDED UNDER- AND OVER-FREQ. I/O's	SEL		

SD317A - PGS RENEWABLE ENERGY EXPANSION

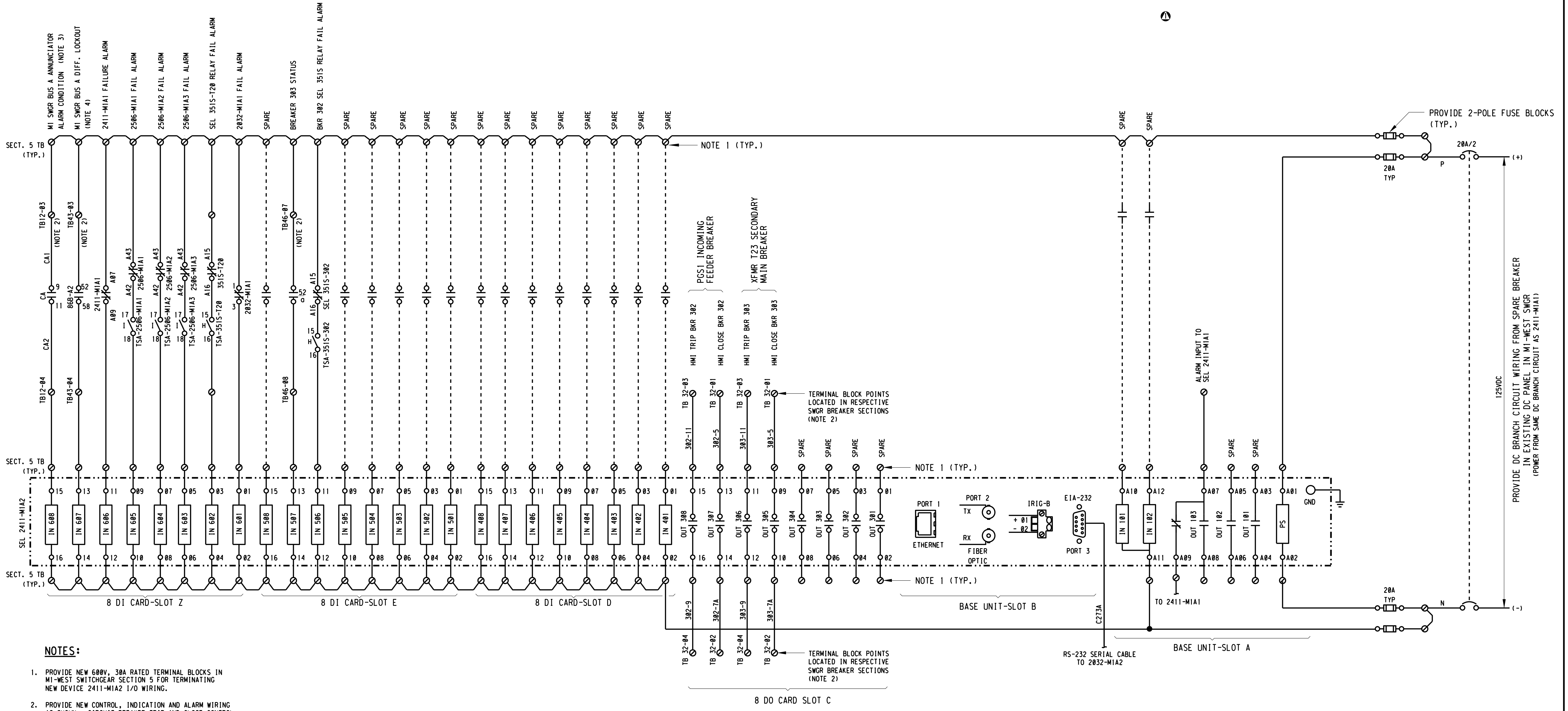
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
REMOTE I/O MODULE SEL-2506-M1A3 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-552
DRAWING NUMBER
2
REV.



NOTES:

1. PROVIDE NEW 600V, 30A RATED TERMINAL BLOCKS IN M1-WEST SWITCHGEAR SECTION 5 FOR TERMINATING NEW DEVICE 2411-M1A2 I/O WIRING.
2. PROVIDE NEW CONTROL, INDICATION AND ALARM WIRING AS SHOWN. CIRCUIT BREAKER TRIP AND CLOSE CONTROL WIRING AND SWITCHGEAR ALARM WIRING SHALL BE INSTALLED FROM I/0 PROCESSOR IN SWITCHGEAR SECTION 5 TO RESPECTIVE BREAKER AND SWITCHGEAR SECTIONS AS APPLICABLE.
3. PROVIDE NEW WIRING TO CONNECT EXISTING DEVICE CA CONTACTS TO NEW 2411-M1A2. REUSE EXISTING NORMALLY OPEN CONTACTS FROM ANNUNCIATOR AUXILIARY RELAY "CA" CURRENTLY WIRED TO THE GE 90-30 PLC.
4. PROVIDE NEW WIRING TO CONNECT EXISTING SPARE CONTACT OF LOCKOUT RELAY 86B-A2 TO NEW 2411-M1A2.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	08/25/10	REVISED INPUT 102	MTH		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
I/O PROCESSOR SEL-2411-M1A2 SCHEMATIC

SCALE NONE
DATE AUG2010

W17.10-E-553
DRAWING NUMBER

2
REV.

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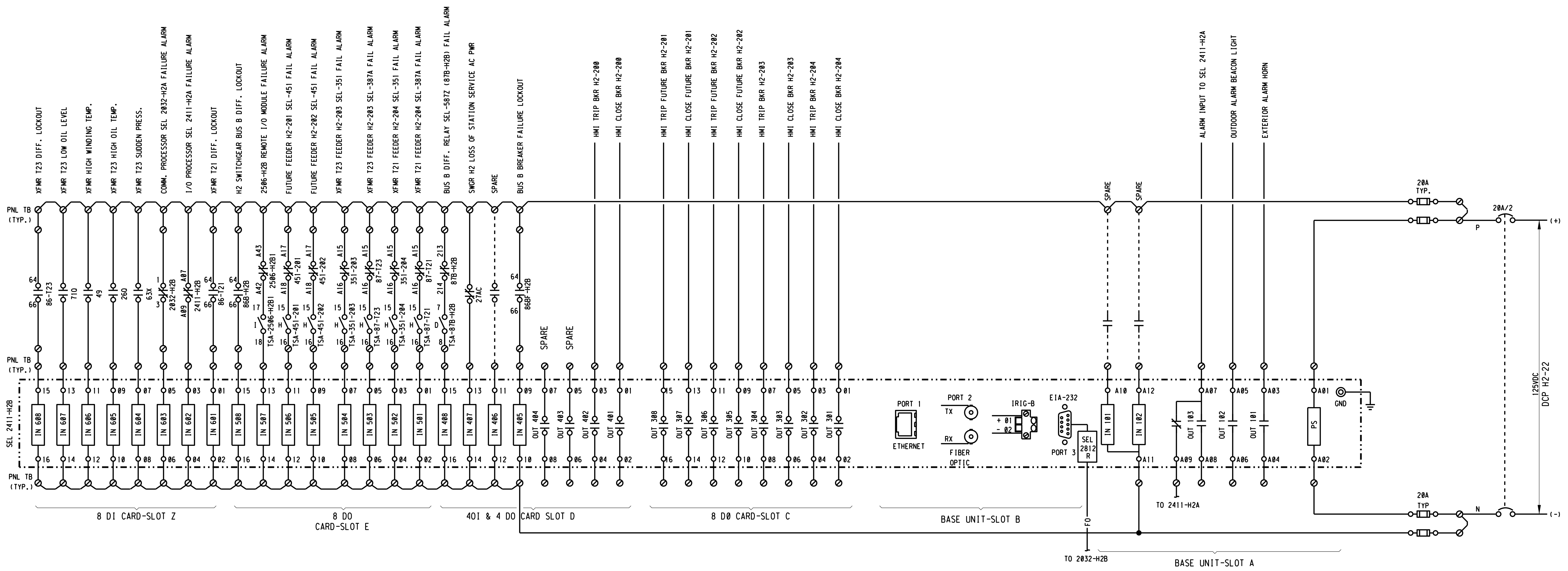
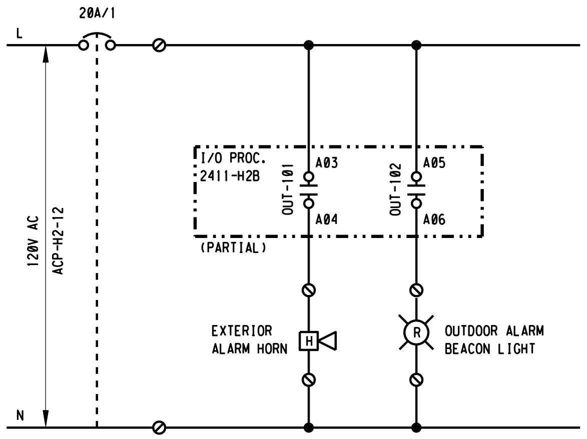


1 I/O PROCESSOR 2411-H2B SCHEMATIC

- NONE



2 H2 SWITCHGEAR OUTDOOR ALARM HORN & BEACON SCHEMATIC

- NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

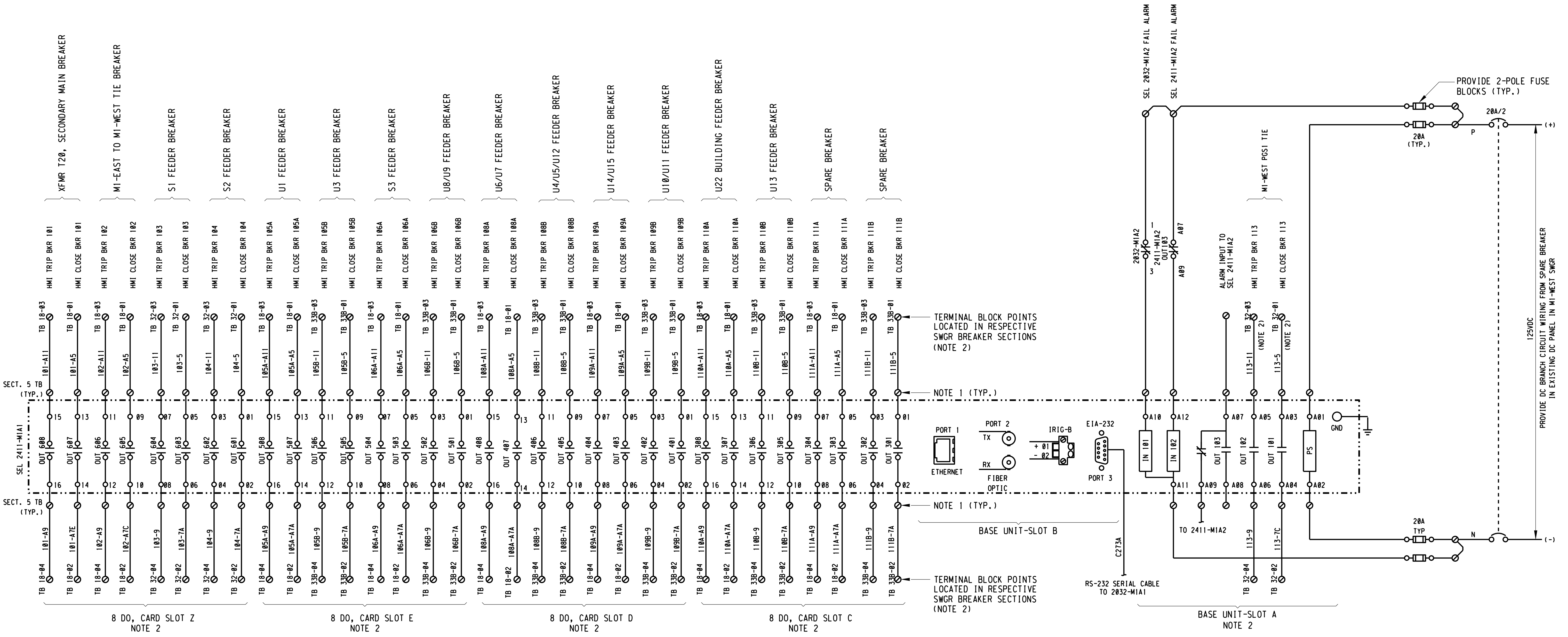
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR H2,
I/O PROCESSOR SEL-2411-H2B SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-554
DRAWING NUMBER
1
REV.

NOTES:

1. PROVIDE NEW 600V, 30A RATED TERMINAL BLOCKS IN M1-WEST SWITCHGEAR SECTION 5 FOR TERMINATING NEW DEVICE 2411-M1A1 I/O WIRING.
2. PROVIDE NEW CONTROL, INDICATION AND ALARM WIRING AS SHOWN. CIRCUIT BREAKER TRIP AND CLOSE CONTROL WIRING AND SWITCHGEAR ALARM WIRING SHALL BE INSTALLED FROM I/0 PROCESSOR IN SWITCHGEAR SECTION 5 TO RESPECTIVE BREAKER AND SWITCHGEAR SECTIONS AS APPLICABLE.



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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST,
I/O PROCESSOR SEL-2411-M1A1 SCHEMATIC

SCALE NONE
DATE JAN2009
W17.10-E-555
DRAWING NUMBER
1
REV.

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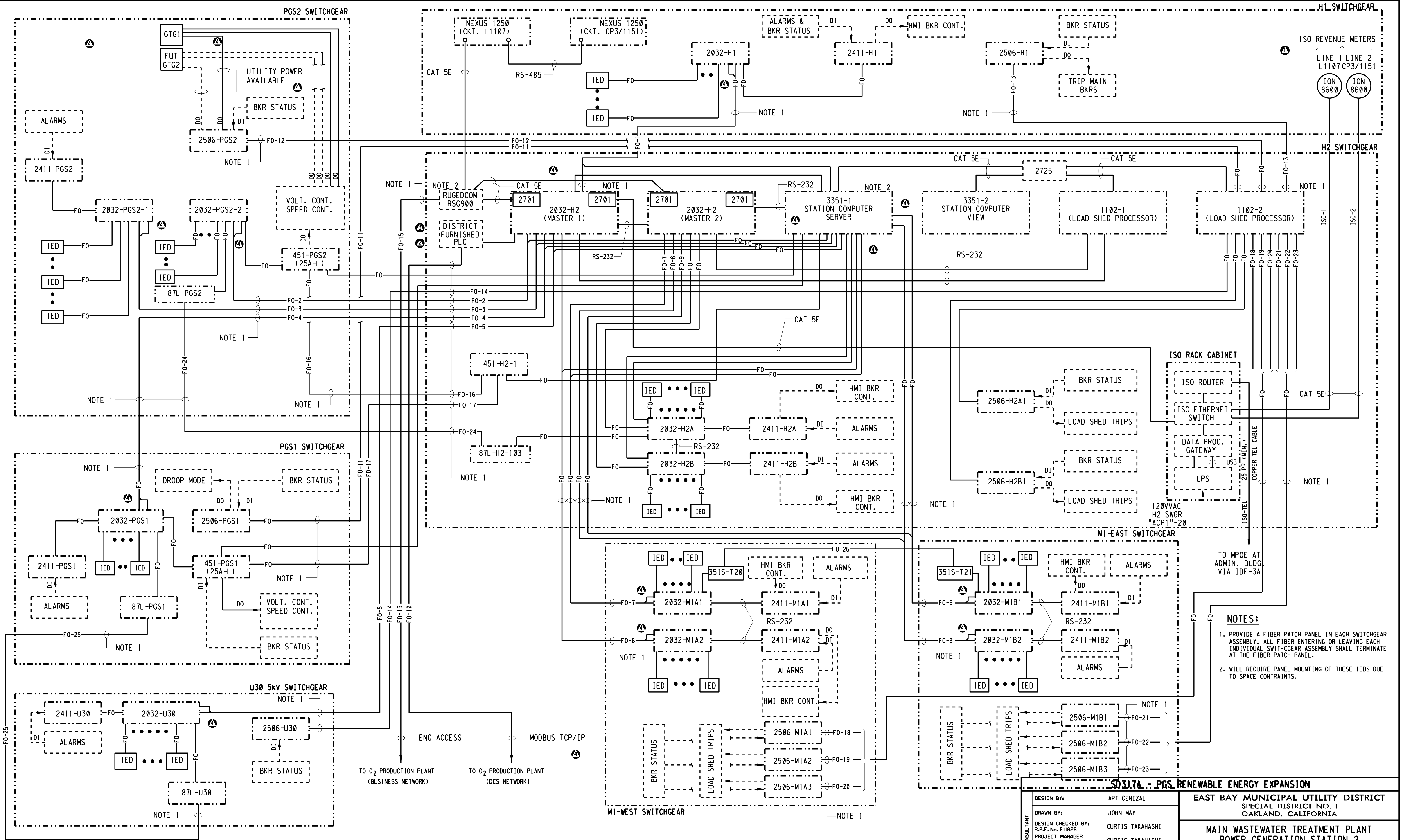
REF 9: REF9$FILENAME



NOTES:

1. PROVIDE A FIBER PATCH PANEL IN EACH SWITCHGEAR ASSEMBLY. ALL FIBER ENTERING OR LEAVING EACH INDIVIDUAL SWITHCGEAR ASSEMBLY SHALL TERMINATE AT THE FIBER PATCH PANEL.
2. WILL REQUIRE PANEL MOUNTING OF THESE IEDS DUE TO SPACE CONTRAINTS.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
⑤	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
④	01/24/11	REVISED PER 01/14/11 SEL FAT & COORD. W/SOLAR TURB.	CGT		
③	02/16/10	REVISED COMM WIRING (SEL)	SMN	SMM	
②	09/22/09	ADDED ADDITIONAL EQUIPMENT (SEL)	SMN	SMM	
①	07/23/09	REVISED FOR ISO METERING - COR#15	CGT		

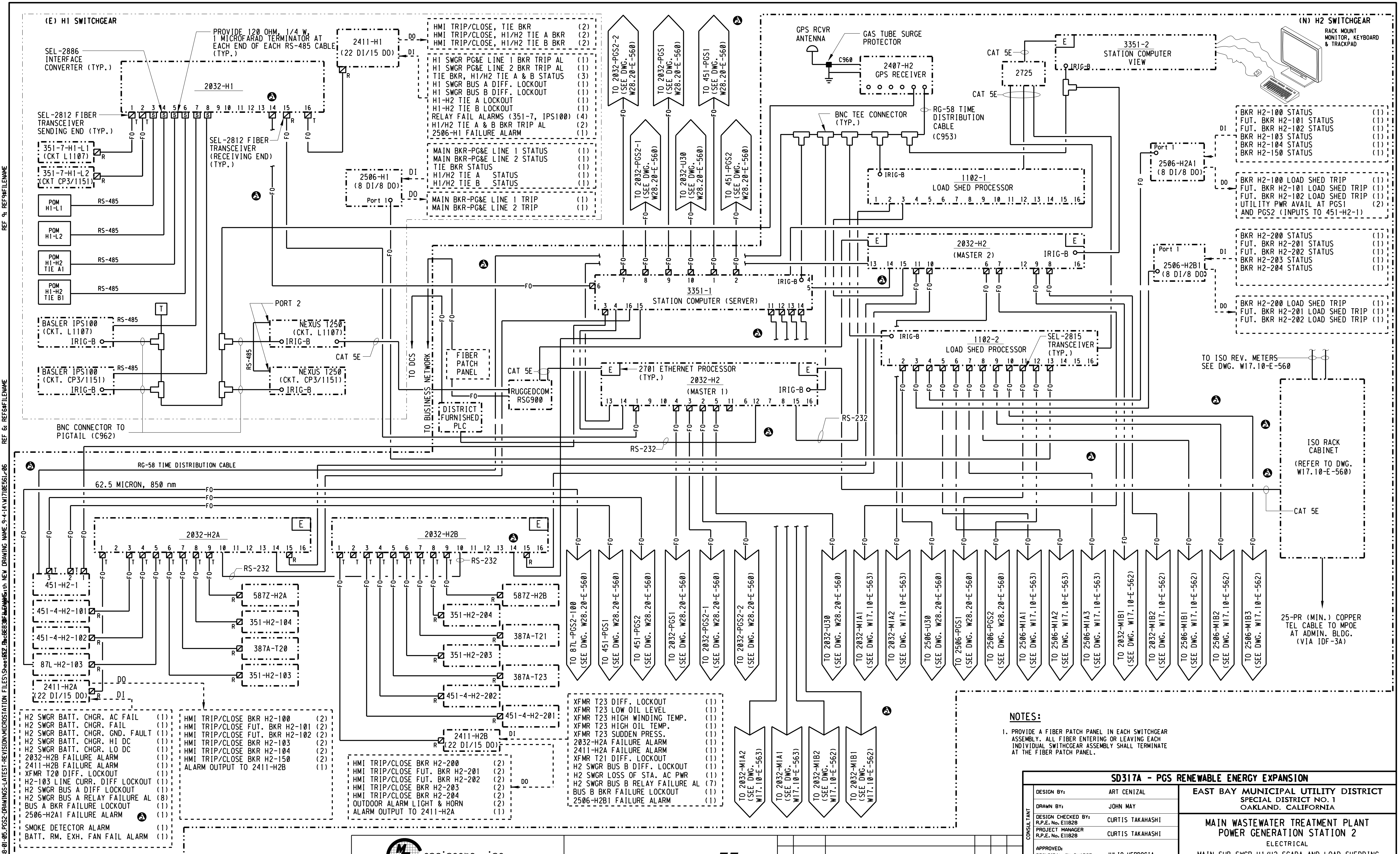
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SCADA AND LOAD SHEDDING SYSTEM
NETWORK TOPOLOGY

SCALE NONE
DATE JUL2010
W17.10-E-560
DRAWING NUMBER
5
REV.


(E) H1 SWITCHGEAR
(N) H2 SWITCHGEAR
SEL-2886 INTERFACE CONVERTER (TYP.)
PROVIDE 120 OHM, 1/4 W, 1 MICROFARAD TERMINATOR AT EACH END OF EACH RS-485 CABLE (TYP.)
2032-H1
SEL-2812 FIBER TRANSCEIVER SENDING END (TYP.)
SEL-2812 FIBER TRANSCEIVER (RECEIVING END) (TYP.)
351-7-H1-L1 (CKT L1107)
351-7-H1-L2 (CKT CP3/1151)
POM H1-L1
POM H1-L2
POM H1-H2 TIE A1
POM H1-H2 TIE B1
RS-485
BASLER IPS100 (CKT. L1107) IRIG-B
BASLER IPS100 (CKT. CP3/1151) IRIG-B
NEXUS 1250 (CKT. L1107) IRIG-B
NEXUS 1250 (CKT. CP3/1151) IRIG-B
PORT 2
CAT 5E
BNC CONNECTOR TO PIGTAIL (C962)
2411-H1 (22 DI/15 DO)
DO
DI
HMI TRIP/CLOSE, TIE BKR (2)
HMI TRIP/CLOSE, H1/H2 TIE A BKR (2)
HMI TRIP/CLOSE, H1/H2 TIE B BKR (2)
H1 SWGR PG&E LINE 1 BKR TRIP AL (1)
H1 SWGR PG&E LINE 2 BKR TRIP AL (1)
TIE BKR, H1/H2 TIE A & B STATUS (3)
H1 SWGR BUS A DIFF. LOCKOUT (1)
H1 SWGR BUS B DIFF. LOCKOUT (1)
H1-H2 TIE A LOCKOUT (1)
H1-H2 TIE B LOCKOUT (1)
RELAY FAIL ALARMS (351-7, IPS100) (4)
H1/H2 TIE A & B BKR TRIP AL (2)
2506-H1 FAILURE ALARM (1)
2506-H1 (8 DI/8 DO) Port 1
MAIN BKR-PG&E LINE 1 STATUS (1)
MAIN BKR-PG&E LINE 2 STATUS (1)
TIE BKR STATUS (1)
H1/H2 TIE A STATUS (1)
H1/H2 TIE B STATUS (1)
MAIN BKR-PG&E LINE 1 TRIP (1)
MAIN BKR-PG&E LINE 2 TRIP (1)
TO 2032-PGS2-2 (SEE DWG. W28.20-E-560)
TO 2032-PGS1 (SEE DWG. W28.20-E-560)
TO 451-PGS1 (SEE DWG. W28.20-E-560)
TO 2032-PGS2-1 (SEE DWG. W28.20-E-560)
TO 2032-U30 (SEE DWG. W28.20-E-560)
TO 451-PGS2 (SEE DWG. W28.20-E-560)
FO
GPS RCVR ANTENNA
GAS TUBE SURGE PROTECTOR
C960
2407-H2 GPS RECEIVER
BNC TEE CONNECTOR (TYP.)
RG-58 TIME DISTRIBUTION CABLE (C953)
CAT 5E
2725
3351-2 STATION COMPUTER VIEW
IRIG-B
RACK MOUNT MONITOR, KEYBOARD & TRACKPAD
1102-1 LOAD SHED PROCESSOR
3351-1 STATION COMPUTER (SERVER)
2032-H2 (MASTER 2)
E
1102-2 LOAD SHED PROCESSOR
SEL-2815 TRANSCEIVER (TYP.)
TO DCS
TO BUSINESS NETWORK
FIBER PATCH PANEL
DISTRICT FURNISHED PLC
RUGGEDCOM RSG900
2701 ETHERNET PROCESSOR (TYP.)
2032-H2 (MASTER 1)
RS-232
2506-H2A1 (8 DI/8 DO) Port 1
BKR H2-100 STATUS (1)
FUT. BKR H2-101 STATUS (1)
FUT. BKR H2-102 STATUS (1)
BKR H2-103 STATUS (1)
BKR H2-104 STATUS (1)
BKR H2-150 STATUS (1)
BKR H2-100 LOAD SHED TRIP (1)
FUT. BKR H2-101 LOAD SHED TRIP (1)
FUT. BKR H2-102 LOAD SHED TRIP (1)
UTILITY PWR AVAIL AT PGS1 AND PGS2 (INPUTS TO 451-H2-1) (2)
2506-H2B1 (8 DI/8 DO) Port 1
BKR H2-200 STATUS (1)
FUT. BKR H2-201 STATUS (1)
FUT. BKR H2-202 STATUS (1)
BKR H2-203 STATUS (1)
BKR H2-204 STATUS (1)
BKR H2-200 LOAD SHED TRIP (1)
FUT. BKR H2-201 LOAD SHED TRIP (1)
FUT. BKR H2-202 LOAD SHED TRIP (1)
TO ISO REV. METERS SEE DWG. W17.10-E-560
ISO RACK CABINET (REFER TO DWG. W17.10-E-560)
CAT 5E
25-PR (MIN.) COPPER TEL CABLE TO MPOE AT ADMIN. BLDG. (VIA IDF-3A)
RG-58 TIME DISTRIBUTION CABLE
62.5 MICRON, 850 nm
2032-H2A
2032-H2B
451-H2-1
451-4-H2-101
451-4-H2-102
87L-H2-103
2411-H2A (22 DI/15 DO)
587Z-H2A
351-H2-104
387A-T20
351-H2-103
587Z-H2B
351-H2-204
387A-T21
351-H2-203
387A-T23
451-4-H2-202
451-4-H2-201
2411-H2B (22 DI/15 DO)
T
R
TO 87L-PGS2-100 (SEE DWG. W28.20-E-560)
TO 451-PGS1 (SEE DWG. W28.20-E-560)
TO 451-PGS2 (SEE DWG. W28.20-E-560)
TO 2032-PGS1 (SEE DWG. W28.20-E-560)
TO 2032-PGS2-1 (SEE DWG. W28.20-E-560)
TO 2032-PGS2-2 (SEE DWG. W28.20-E-560)
TO 2032-U30 (SEE DWG. W28.20-E-560)
TO 2032-M1A1 (SEE DWG. W17.10-E-563)
TO 2032-M1A2 (SEE DWG. W17.10-E-563)
TO 2506-U30 (SEE DWG. W28.20-E-560)
TO 2506-PGS1 (SEE DWG. W28.20-E-560)
TO 2506-PGS2 (SEE DWG. W28.20-E-560)
TO 2506-M1A1 (SEE DWG. W17.10-E-563)
TO 2506-M1A2 (SEE DWG. W17.10-E-563)
TO 2506-M1A3 (SEE DWG. W17.10-E-563)
TO 2032-M1B1 (SEE DWG. W17.10-E-562)
TO 2032-M1B2 (SEE DWG. W17.10-E-562)
TO 2506-M1B1 (SEE DWG. W17.10-E-562)
TO 2506-M1B2 (SEE DWG. W17.10-E-562)
TO 2506-M1B3 (SEE DWG. W17.10-E-562)
TO 2032-M1A2 (SEE DWG. W17.10-E-563)
TO 2032-M1A1 (SEE DWG. W17.10-E-563)
TO 2032-M1B2 (SEE DWG. W17.10-E-562)
TO 2032-M1B1 (SEE DWG. W17.10-E-562)
H2 SWGR BATT. CHGR. AC FAIL (1)
H2 SWGR BATT. CHGR. FAIL (1)
H2 SWGR BATT. CHGR. GND. FAULT (1)
H2 SWGR BATT. CHGR. HI DC (1)
H2 SWGR BATT. CHGR. LO DC (1)
2032-H2B FAILURE ALARM (1)
2411-H2B FAILURE ALARM (1)
XFMR T20 DIFF. LOCKOUT (1)
H2-103 LINE CURR. DIFF LOCKOUT (1)
H2 SWGR BUS A DIFF LOCKOUT (1)
H2 SWGR BUS A RELAY FAILURE AL (8)
BUS A BKR FAILURE LOCKOUT (1)
2506-H2A1 FAILURE ALARM (1)
SMOKE DETECTOR ALARM (1)
BATT. RM. EXH. FAN FAIL ALARM (1)
HMI TRIP/CLOSE BKR H2-100 (2)
HMI TRIP/CLOSE FUT. BKR H2-101 (2)
HMI TRIP/CLOSE FUT. BKR H2-102 (2)
HMI TRIP/CLOSE BKR H2-103 (2)
HMI TRIP/CLOSE BKR H2-104 (2)
HMI TRIP/CLOSE BKR H2-150 (2)
ALARM OUTPUT TO 2411-H2B (1)
HMI TRIP/CLOSE BKR H2-200 (2)
HMI TRIP/CLOSE FUT. BKR H2-201 (2)
HMI TRIP/CLOSE FUT. BKR H2-202 (2)
HMI TRIP/CLOSE BKR H2-203 (2)
HMI TRIP/CLOSE BKR H2-204 (2)
OUTDOOR ALARM LIGHT & HORN (2)
ALARM OUTPUT TO 2411-H2A (1)
XFMR T23 DIFF. LOCKOUT (1)
XFMR T23 LOW OIL LEVEL (1)
XFMR T23 HIGH WINDING TEMP. (1)
XFMR T23 HIGH OIL TEMP. (1)
XFMR T23 SUDDEN PRESS. (1)
2032-H2A FAILURE ALARM (1)
2411-H2A FAILURE ALARM (1)
XFMR T21 DIFF. LOCKOUT (1)
H2 SWGR BUS B DIFF. LOCKOUT (1)
H2 SWGR LOSS OF STA. AC PWR (1)
H2 SWGR BUS B RELAY FAILURE AL (7)
BUS B BKR FAILURE LOCKOUT (1)
2506-H2B1 FAILURE ALARM (1)
5

NOTES:

1. PROVIDE A FIBER PATCH PANEL IN EACH SWITCHGEAR ASSEMBLY. ALL FIBER ENTERING OR LEAVING EACH INDIVIDUAL SWITHCGEAR ASSEMBLY SHALL TERMINATE AT THE FIBER PATCH PANEL.

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
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(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
6	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
5	01/24/11	REVISED PER SEL 01/14/11 FAT MARK-UP	CGT		
1	07/23/09	REVISED FOR ISO METERING - COR#15	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUB SWGR H1/H2 SCADA AND LOAD SHEDDING
SYSTEM COMMUNICATION BLOCK DIAGRAM

SCALE NONE
DATE JUL2010
W17.10-E-561
DRAWING NUMBER
6
REV.

USER: vuong
DATE: 10-SEP-2014 13:36
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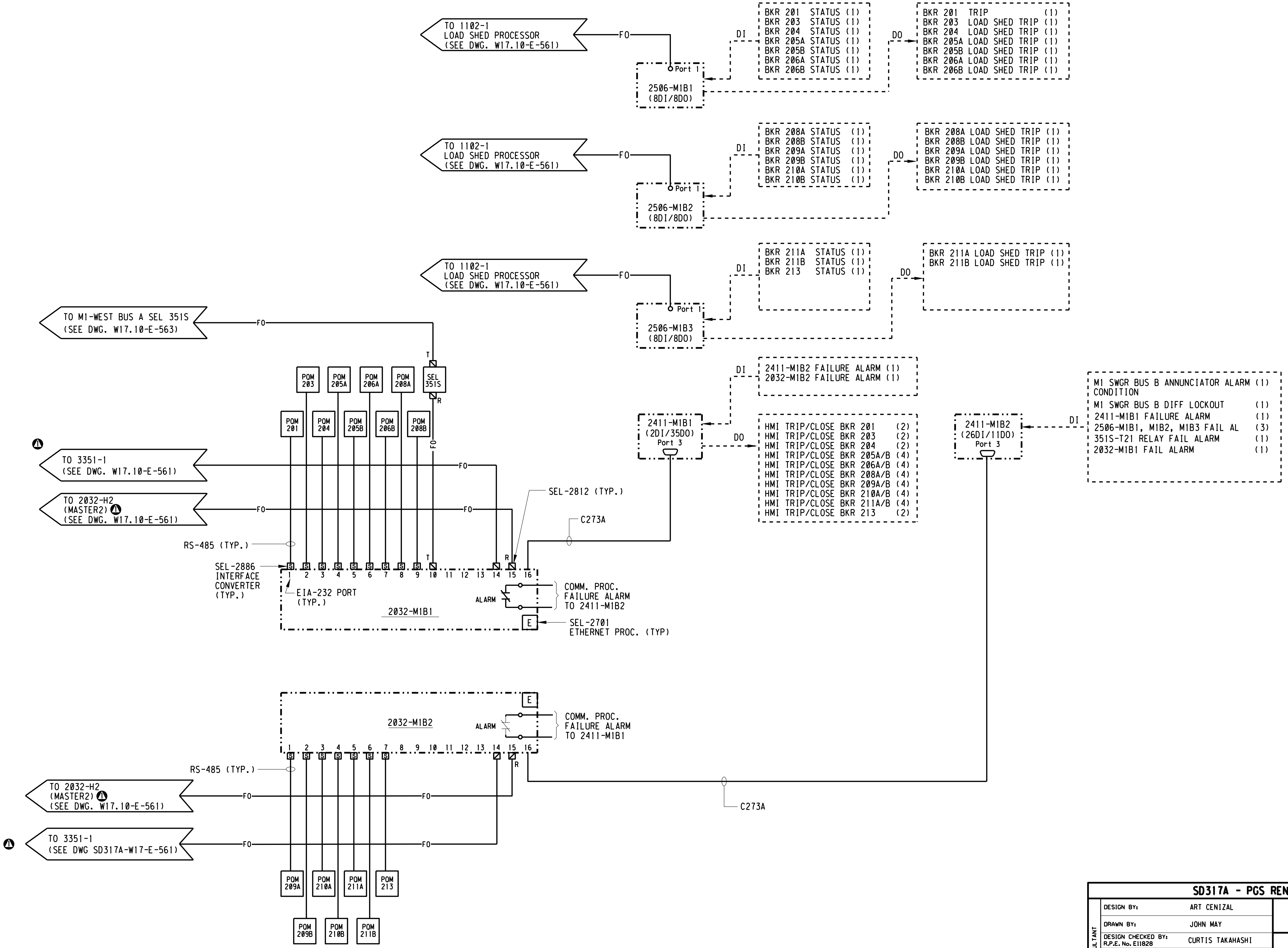
REF 3: REF3$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME



3" ON ORIGINAL DOCUMENT
0 1 2 3

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	01/24/11	REVISED PER SEL 01/14/11 FAT MARK-UP		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
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DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWGR M1-EAST SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM

SCALE NONE
DATE JAN2009
W17.10-E-562
DRAWING NUMBER
2
REV.

USER: vuong
DATE: 10-SEP-2014 13:39
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REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
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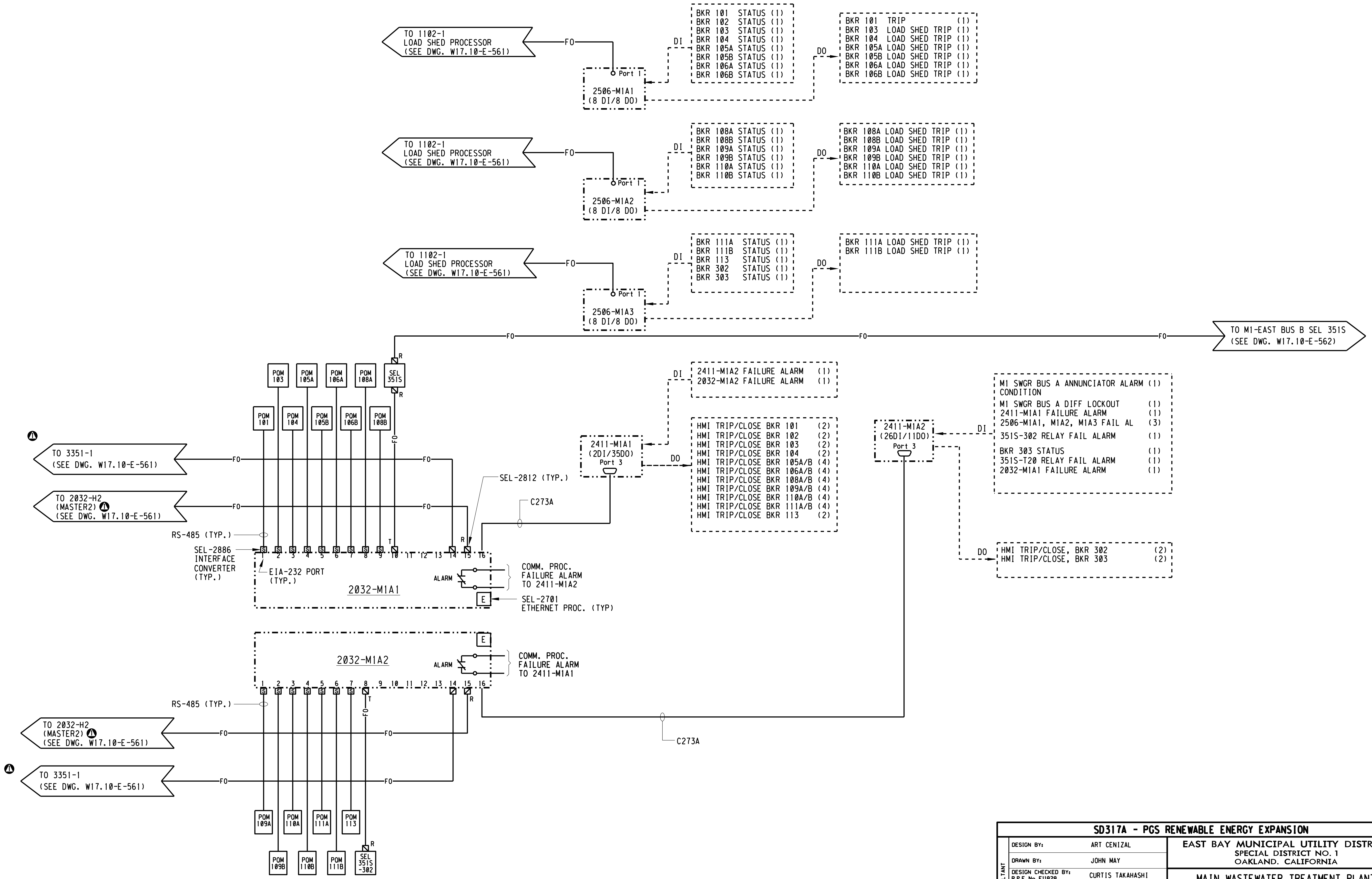
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME



3" ON ORIGINAL DOCUMENT
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SD317A - PGS RENEWABLE ENERGY EXPANSION

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DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
MAIN SUBSTATION SWITCHGEAR M1-WEST SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM

SCALE NONE
DATE JAN2009
W17.10-E-563
DRAWING NUMBER
2
REV.

USER: vuong
DATE: 10-SEP-2014 13:43
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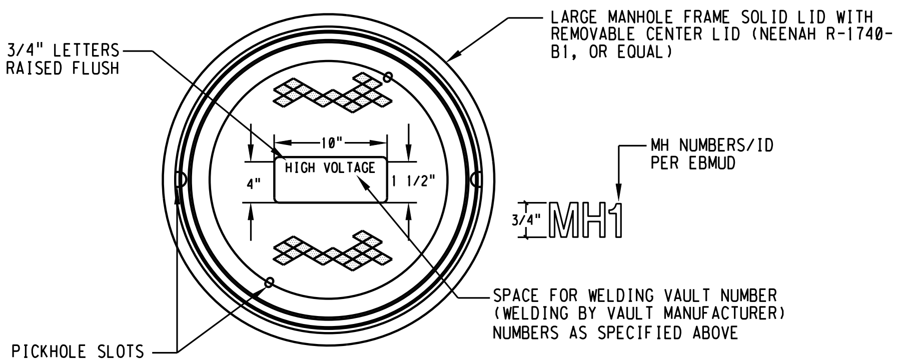
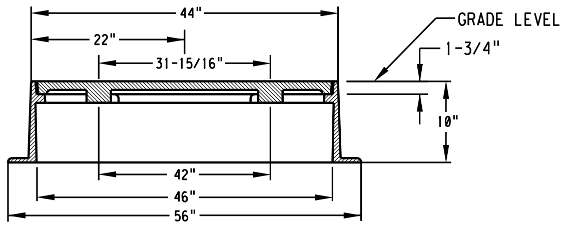
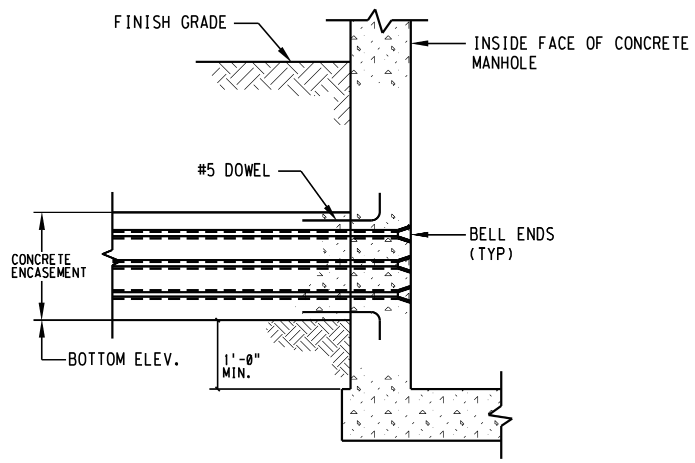

3/4" LETTERS RAISED FLUSH
LARGE MANHOLE FRAME SOLID LID WITH REMOVABLE CENTER LID (NEENAH R-1740-B1, OR EQUAL)
10"
4"
HIGH VOLTAGE
1 1/2"
MH NUMBERS/ID PER EBMUD
3/4"
MH1
SPACE FOR WELDING VAULT NUMBER (WELDING BY VAULT MANUFACTURER) NUMBERS AS SPECIFIED ABOVE
PICKHOLE SLOTS

NOTES:

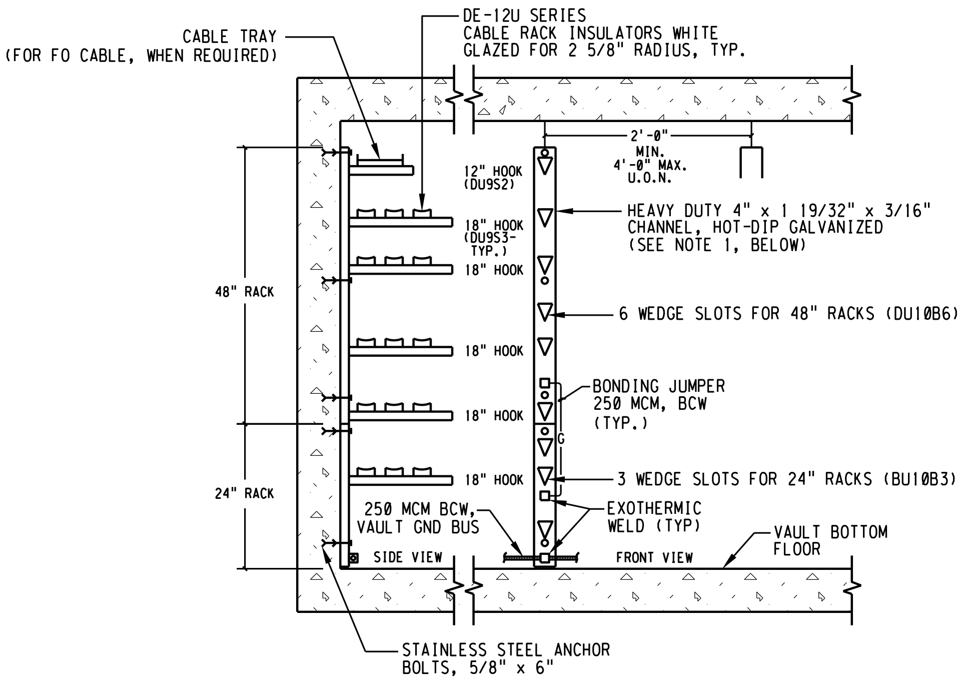
1. ARC WELD THE EBMUD ASSIGNED NUMBERS AND LETTERS ON FRAME AS SHOWN. BUILD BEAD TO 1/16" HIGH.



1 HV MANHOLE COVER DETAIL
-
NONE



2 TYPICAL CONCRETE ENCASED DUCTBANK ENTRY AT MANHOLE
-
NONE


CABLE TRAY (FOR FO CABLE, WHEN REQUIRED)
DE-12U SERIES CABLE RACK INSULATORS WHITE GLAZED FOR 2 5/8" RADIUS, TYP.
2'-0" MIN. 4'-0" MAX. U.O.N.
12" HOOK (DU9S2)
18" HOOK (DU9S3-TYP.)
18" HOOK
18" HOOK
18" HOOK
18" HOOK
HEAVY DUTY 4" x 1 19/32" x 3/16" CHANNEL, HOT-DIP GALVANIZED (SEE NOTE 1, BELOW)
48" RACK
6 WEDGE SLOTS FOR 48" RACKS (DU10B6)
BONDING JUMPER 250 MCM, BCW (TYP.)
G
3 WEDGE SLOTS FOR 24" RACKS (BU10B3)
24" RACK
250 MCM BCW, VAULT GND BUS
EXOTHERMIC WELD (TYP)
VAULT BOTTOM FLOOR
SIDE VIEW
FRONT VIEW
STAINLESS STEEL ANCHOR BOLTS, 5/8" x 6"

NOTES:

1. HEAVY-DUTY NON-METALLIC CABLE RACKS (UNDERGROUND DEVICES, INC., OR APPROVED EQUAL) MAY BE USED IN LIEU OF HEAVY-DUTY GALVANIZED CABLE RACKS.

3 CABLE RACK DETAIL
-
NONE

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

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REF 2: REF2$FILENAME
REF 3: [illegible]

USER: vuong
DATE: 10-SEP-2014 13:44
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3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
ELECTRICAL DETAILS
MAIN SUBSTATION

SCALE NONE
DATE JAN2009

DRAWING NUMBER W17.10-E-901

REV. 1

USER: vuong PLOT SCALE: 0.16727:1
DATE: 10-SEP-2014 13:45
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REF 8: REF8$FILENAME
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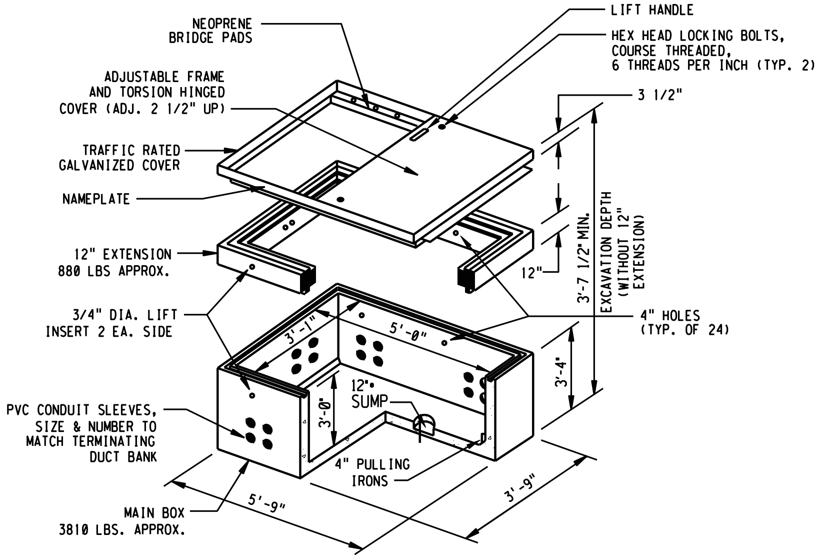
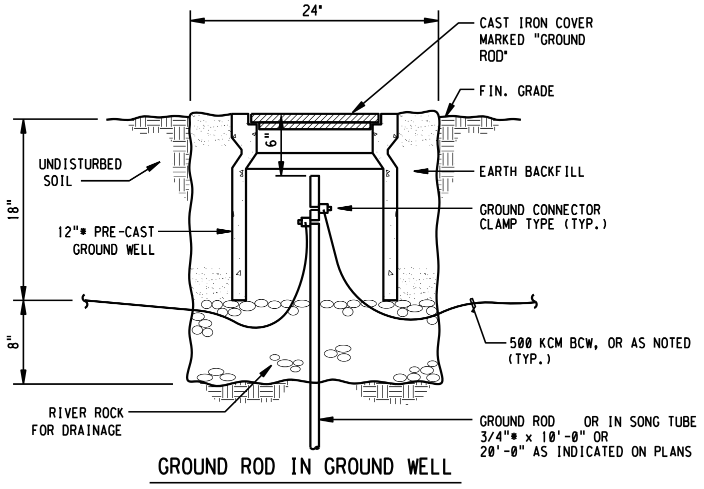
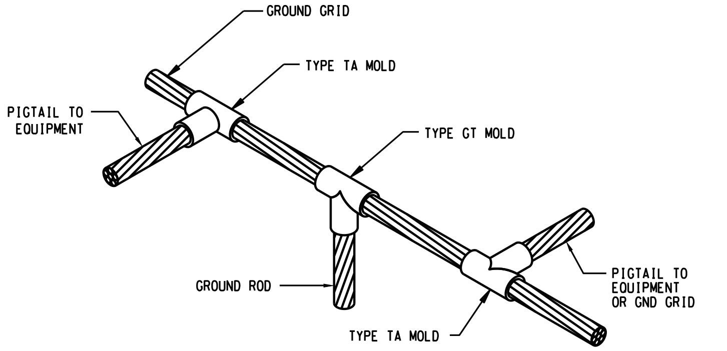

NEOPRENE BRIDGE PADS
ADJUSTABLE FRAME AND TORSION HINGED COVER (ADJ. 2 1/2" UP)
TRAFFIC RATED GALVANIZED COVER
NAMEPLATE
12" EXTENSION 880 LBS APPROX.
3/4" DIA. LIFT INSERT 2 EA. SIDE
PVC CONDUIT SLEEVES, SIZE & NUMBER TO MATCH TERMINATING DUCT BANK
MAIN BOX 3810 LBS. APPROX.
LIFT HANDLE
HEX HEAD LOCKING BOLTS, COURSE THREADED, 6 THREADS PER INCH (TYP. 2)
3 1/2"
12"
3'-7 1/2" MIN. EXCAVATION DEPTH (WITHOUT 12" EXTENSION)
4" HOLES (TYP. OF 24)
3'-4"
3'-1"
5'-0"
3'-0"
12"ø SUMP
4" PULLING IRONS
5'-9"
3'-9"

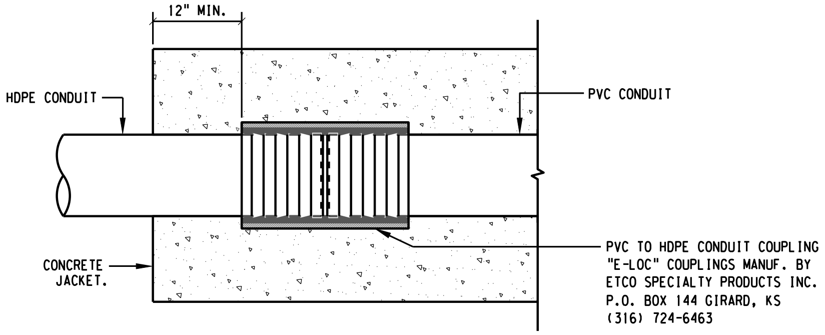
1 / -
DETAIL - COMMUNICATION HANDHOLE
NONE


24"
CAST IRON COVER MARKED "GROUND ROD"
FIN. GRADE
UNDISTURBED SOIL
EARTH BACKFILL
6"
18"
12"ø PRE-CAST GROUND WELL
GROUND CONNECTOR CLAMP TYPE (TYP.)
8"
500 KCM BCW, OR AS NOTED (TYP.)
RIVER ROCK FOR DRAINAGE
GROUND ROD OR IN SONG TUBE 3/4"ø x 10'-0" OR 20'-0" AS INDICATED ON PLANS
GROUND ROD IN GROUND WELL

2 / E-102
GROUNDING DETAIL
NONE

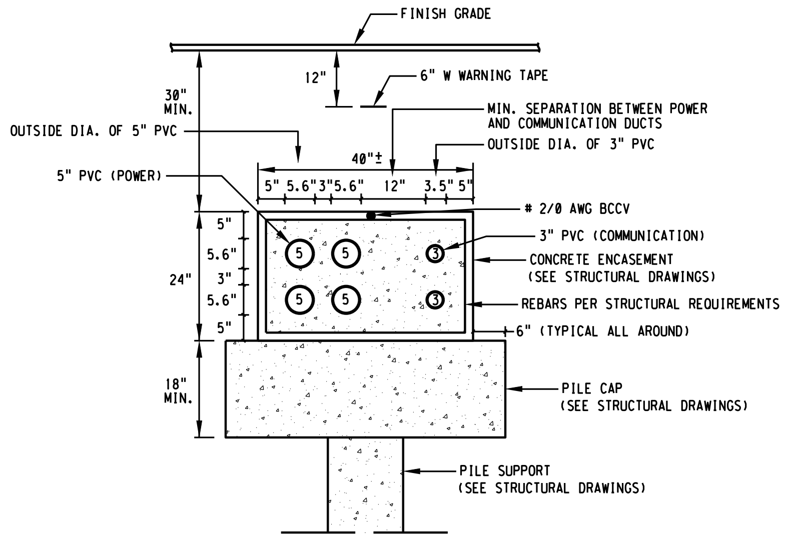


3 / E-102
THERMITE CONNECTIONS
NONE (USING CADWELD CONNECTIONS)

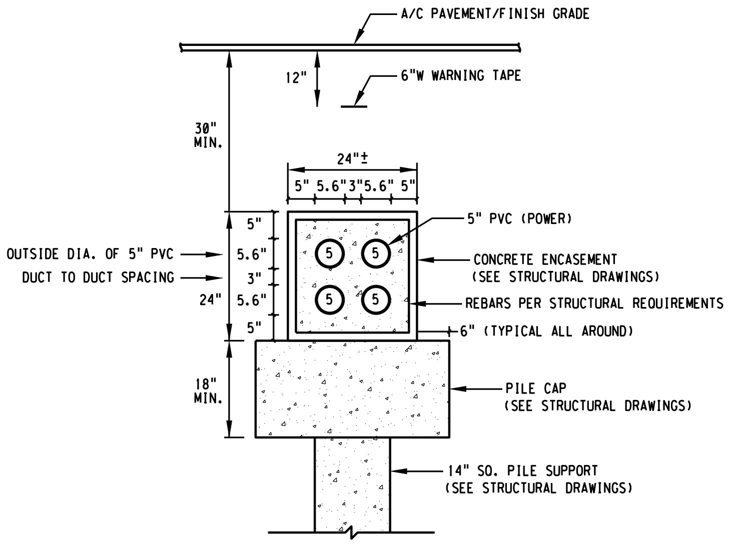

12" MIN.
HDPE CONDUIT
PVC CONDUIT
CONCRETE JACKET.
PVC TO HDPE CONDUIT COUPLING "E-LOC" COUPLINGS MANUF. BY ETCO SPECIALTY PRODUCTS INC. P.O. BOX 144 GIRARD, KS (316) 724-6463

NOTES: REFER TO PLANS FOR ACTUAL CONDUIT QUANTITY AND SIZES

4 / -
TYPICAL PVC TO HDPE CONDUIT COUPLING DETAIL
NONE



5 / -
POWER & COMMUNICATION DUCTBANK
NONE


A/C PAVEMENT/FINISH GRADE
12"
6"W WARNING TAPE
30" MIN.
24"±
5" 5.6" 3" 5.6" 5"
5" PVC (POWER)
OUTSIDE DIA. OF 5" PVC
DUCT TO DUCT SPACING
5"
5.6"
3"
24"
5.6"
5"
CONCRETE ENCASEMENT (SEE STRUCTURAL DRAWINGS)
REBARS PER STRUCTURAL REQUIREMENTS
6" (TYPICAL ALL AROUND)
18" MIN.
PILE CAP (SEE STRUCTURAL DRAWINGS)
14" SQ. PILE SUPPORT (SEE STRUCTURAL DRAWINGS)

6 / -
POWER DUCTBANK
NONE

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0 1 2 3

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

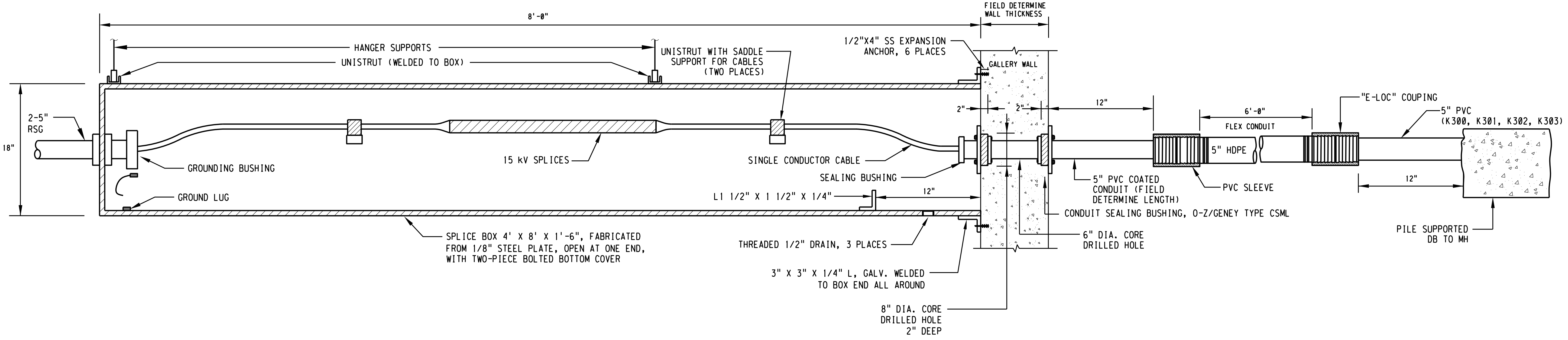
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
ELECTRICAL DETAILS
MAIN SUBSTATION

SCALE NONE
DATE JAN2009
W17.10-E-902
DRAWING NUMBER
1
REV.

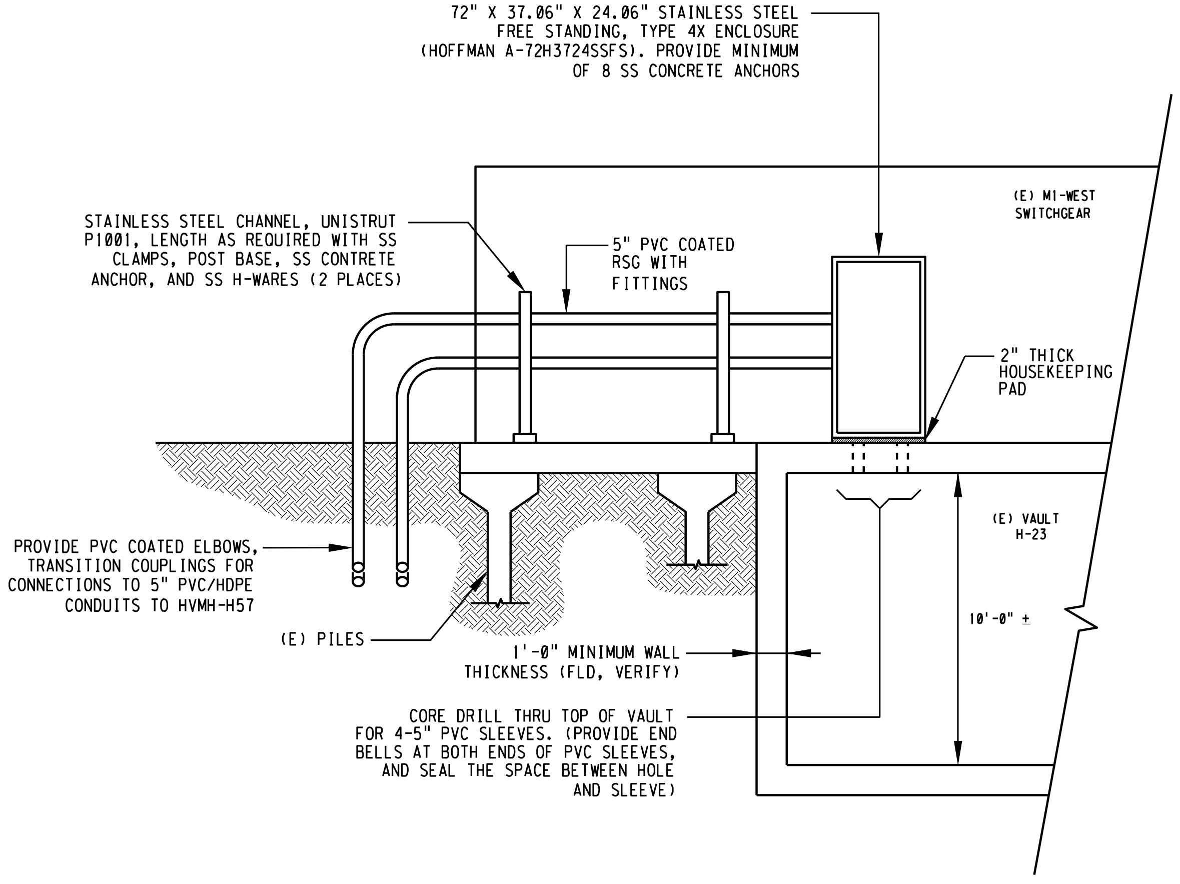

8'-0"
FIELD DETERMINE WALL THICKNESS
HANGER SUPPORTS
UNISTRUT (WELDED TO BOX)
UNISTRUT WITH SADDLE SUPPORT FOR CABLES (TWO PLACES)
1/2"X4" SS EXPANSION ANCHOR, 6 PLACES
GALLERY WALL
2-5" RSG
18"
GROUNDING BUSHING
GROUND LUG
15 kV SPLICES
SINGLE CONDUCTOR CABLE
SEALING BUSHING
L1 1/2" X 1 1/2" X 1/4"
12"
2"
2"
12"
6'-0"
FLEX CONDUIT
5" HDPE
"E-LOC" COUPING
5" PVC (K300, K301, K302, K303)
5" PVC COATED CONDUIT (FIELD DETERMINE LENGTH)
PVC SLEEVE
12"
CONDUIT SEALING BUSHING, O-Z/GENEY TYPE CSML
6" DIA. CORE DRILLED HOLE
PILE SUPPORTED DB TO MH
SPLICE BOX 4' X 8' X 1'-6", FABRICATED FROM 1/8" STEEL PLATE, OPEN AT ONE END, WITH TWO-PIECE BOLTED BOTTOM COVER
THREADED 1/2" DRAIN, 3 PLACES
3" X 3" X 1/4" L, GALV. WELDED TO BOX END ALL AROUND
8" DIA. CORE DRILLED HOLE 2" DEEP

1 - SEALED CONDUIT/CABLE EXIT THRU GALLERY WALL

NONE

NOTES:

1. ONE OF FOUR MV CONDUITS SHOWN.
2. 2-3" COMMUNICATION CONDUITS NOT SHOWN CLARITY. BOX FOR 3" COMMUNICATION CONDUITS SHALL BE SIZED 24" X 48" X 18".


72" X 37.06" X 24.06" STAINLESS STEEL FREE STANDING, TYPE 4X ENCLOSURE (HOFFMAN A-72H3724SSFS). PROVIDE MINIMUM OF 8 SS CONCRETE ANCHORS
(E) MI-WEST SWITCHGEAR
STAINLESS STEEL CHANNEL, UNISTRUT P1001, LENGTH AS REQUIRED WITH SS CLAMPS, POST BASE, SS CONTRETE ANCHOR, AND SS H-WARES (2 PLACES)
5" PVC COATED RSG WITH FITTINGS
2" THICK HOUSEKEEPING PAD
(E) VAULT H-23
PROVIDE PVC COATED ELBOWS, TRANSITION COUPLINGS FOR CONNECTIONS TO 5" PVC/HDPE CONDUITS TO HVMH-H57
10'-0" ±
(E) PILES
1'-0" MINIMUM WALL THICKNESS (FLD, VERIFY)
CORE DRILL THRU TOP OF VAULT FOR 4-5" PVC SLEEVES. (PROVIDE END BELLS AT BOTH ENDS OF PVC SLEEVES, AND SEAL THE SPACE BETWEEN HOLE AND SLEEVE)

2 - CABLE ENTRY THRU TO (E) VAULT H-23

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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SD317A - PGS RENEWABLE ENERGY EXPANSION

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

ELECTRICAL DETAILS

SCALE NONE
DATE JAN2009
W17.10-E-903
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 10-SEP-2014 13:47
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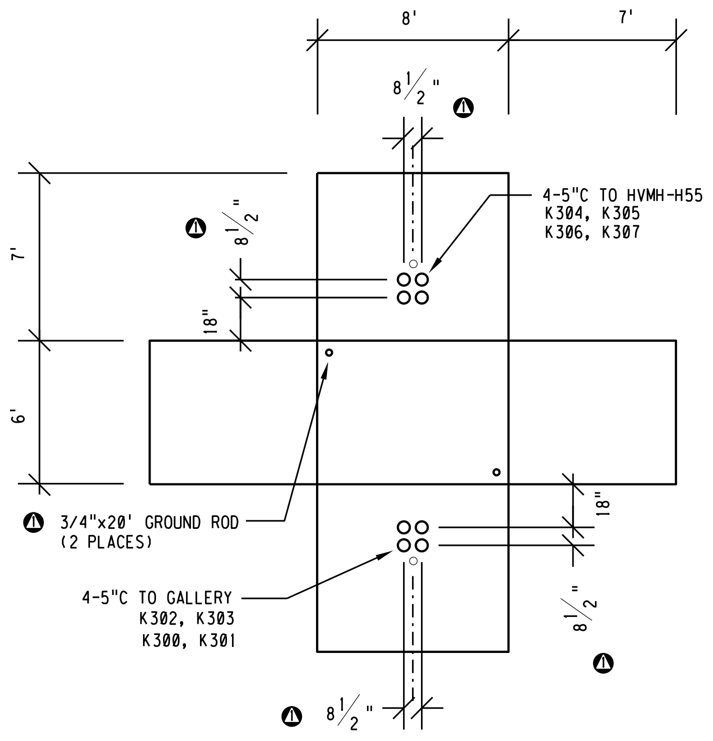
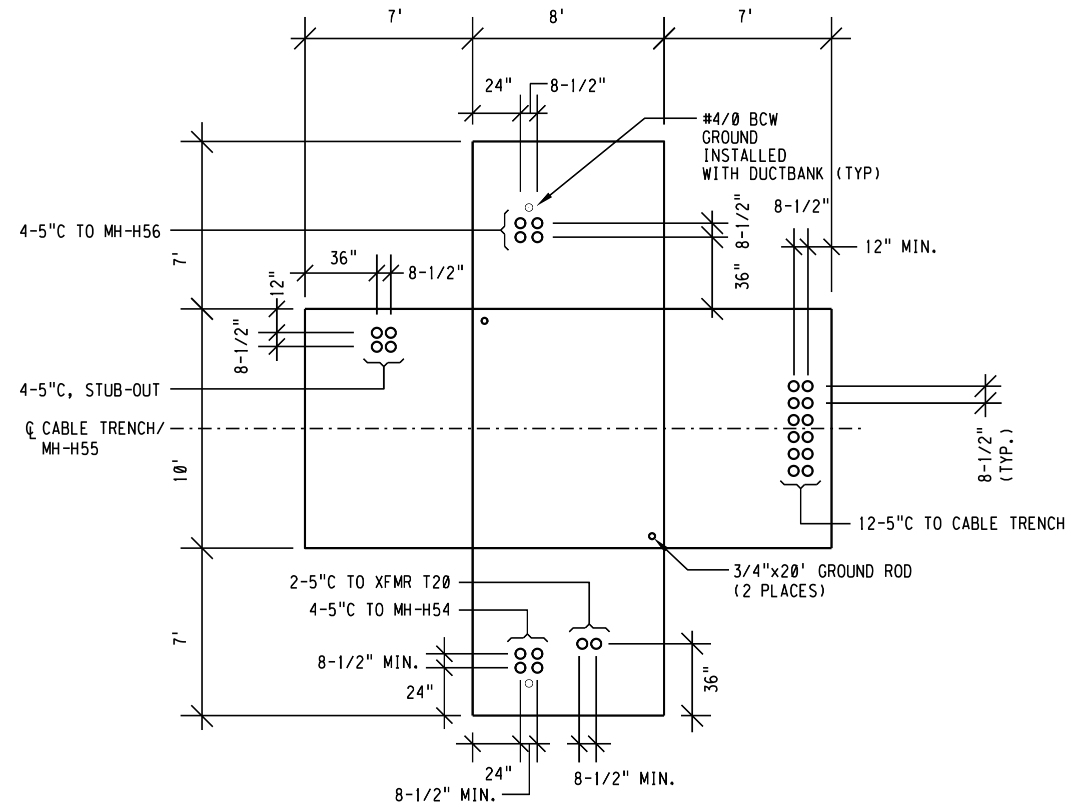


HVMH-H54



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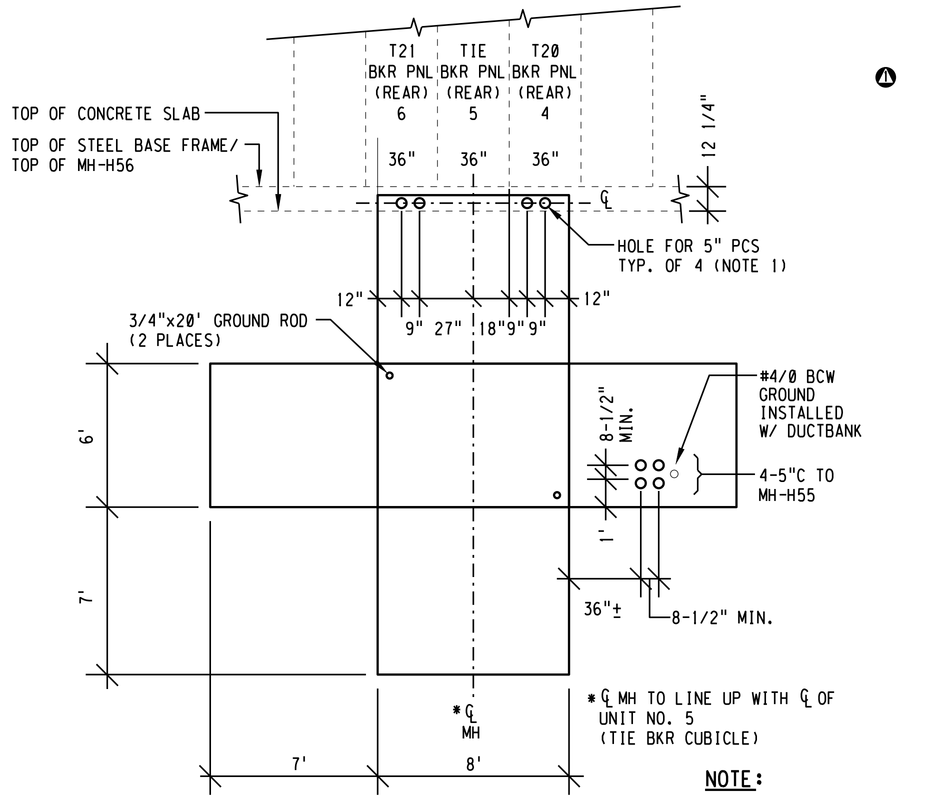


HVMH-H56

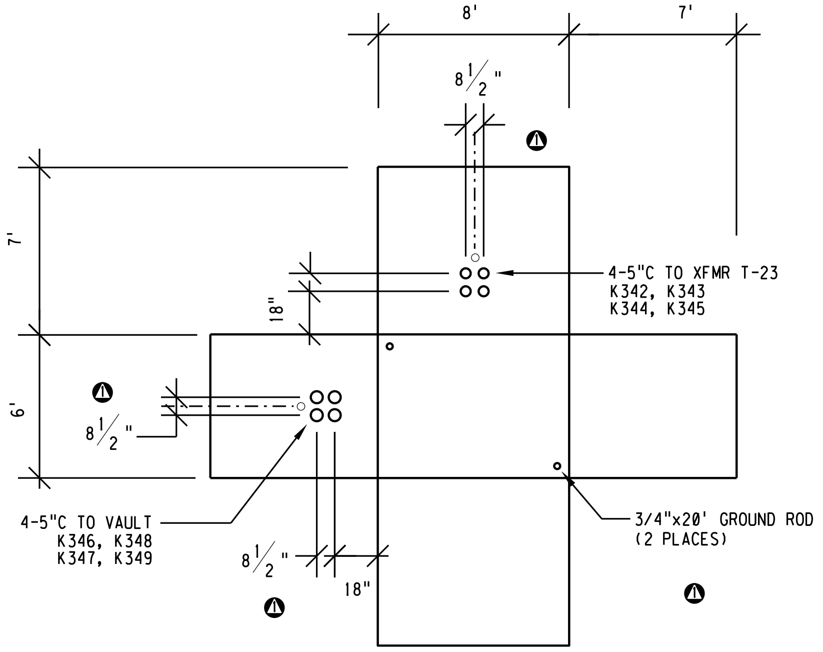
NOTE:

1. DRILL/CUT MATCHING HOLES THRU SWGR STEEL BASE FOR INSTALLATION OF 5" PCS NIPPLES.

C
-

SECTION THRU HVMH-56

NONE



HVMH-H57

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NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	08/14/09	REVISED AS SHOWN			

SD317A - PGS RENEWABLE ENERGY EXPANSION

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
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PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

CONSULTANT
EBMUD

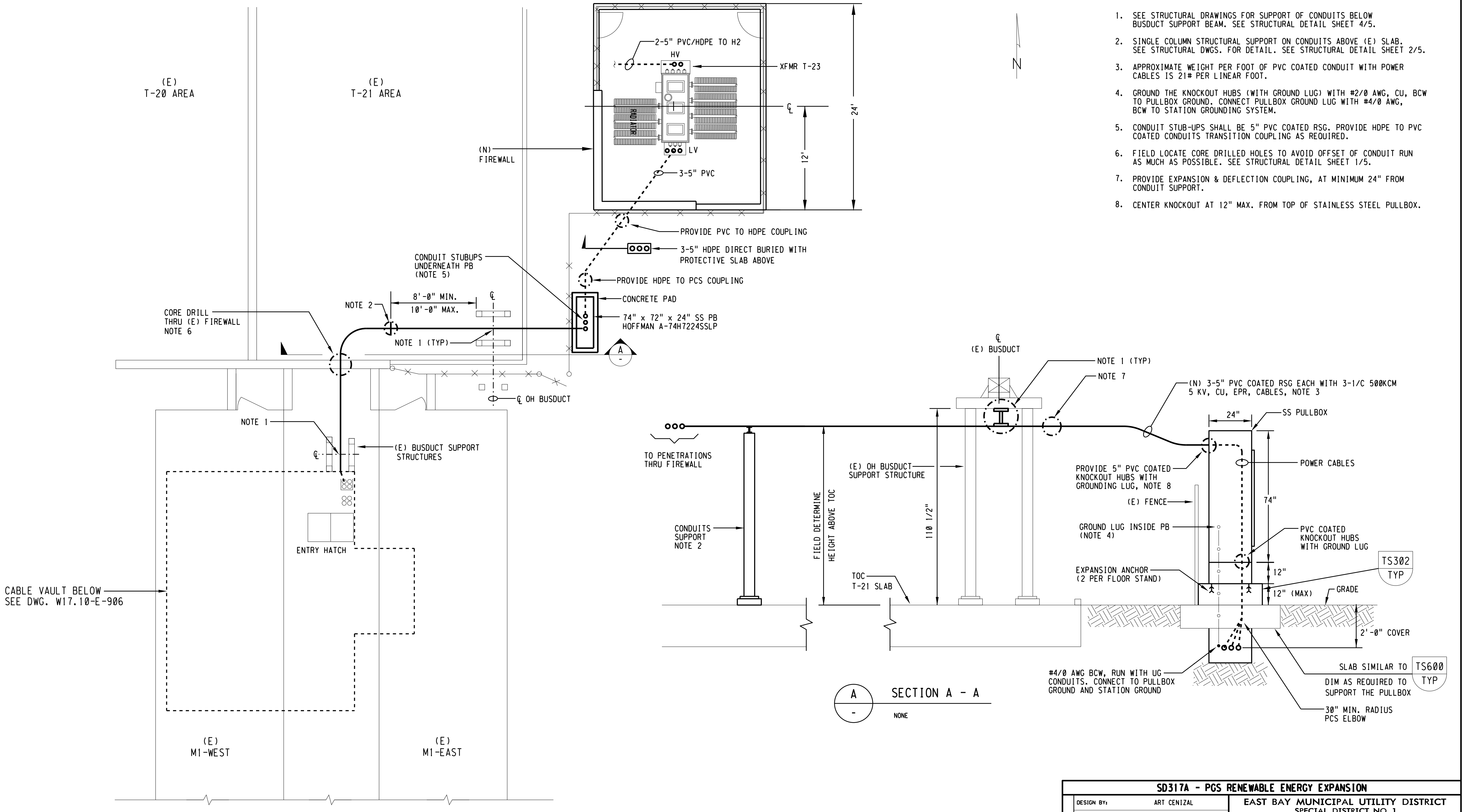
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
ELECTRICAL DETAILS
MAIN SUBSTATION MANHOLE DEVELOPMENTS

SCALE NONE
DATE JAN2009
W17.10-E-904
DRAWING NUMBER
2
REV.

GENERAL NOTES:

1. SEE STRUCTURAL DRAWINGS FOR SUPPORT OF CONDUITS BELOW BUSDUCT SUPPORT BEAM. SEE STRUCTURAL DETAIL SHEET 4/5.
2. SINGLE COLUMN STRUCTURAL SUPPORT ON CONDUITS ABOVE (E) SLAB. SEE STRUCTURAL DWGS. FOR DETAIL. SEE STRUCTURAL DETAIL SHEET 2/5.
3. APPROXIMATE WEIGHT PER FOOT OF PVC COATED CONDUIT WITH POWER CABLES IS 21# PER LINEAR FOOT.
4. GROUND THE KNOCKOUT HUBS (WITH GROUND LUG) WITH #2/0 AWG, CU, BCW TO PULLBOX GROUND. CONNECT PULLBOX GROUND LUG WITH #4/0 AWG, BCW TO STATION GROUNDING SYSTEM.
5. CONDUIT STUB-UPS SHALL BE 5" PVC COATED RSG. PROVIDE HDPE TO PVC COATED CONDUITS TRANSITION COUPLING AS REQUIRED.
6. FIELD LOCATE CORE DRILLED HOLES TO AVOID OFFSET OF CONDUIT RUN AS MUCH AS POSSIBLE. SEE STRUCTURAL DETAIL SHEET 1/5.
7. PROVIDE EXPANSION & DEFLECTION COUPLING, AT MINIMUM 24" FROM CONDUIT SUPPORT.
8. CENTER KNOCKOUT AT 12" MAX. FROM TOP OF STAINLESS STEEL PULLBOX.



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REF 7: REF7$FILENAME
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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
ELECTRICAL DETAILS
MAIN SUBSTATION - T-23 ON CONDUITS

SCALE 3/16'=1'
DATE JAN2009
W17.10-E-905
DRAWING NUMBER
1
REV.

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REF 2: REF2$FILENAME
REF 4: REF4$FILENAME
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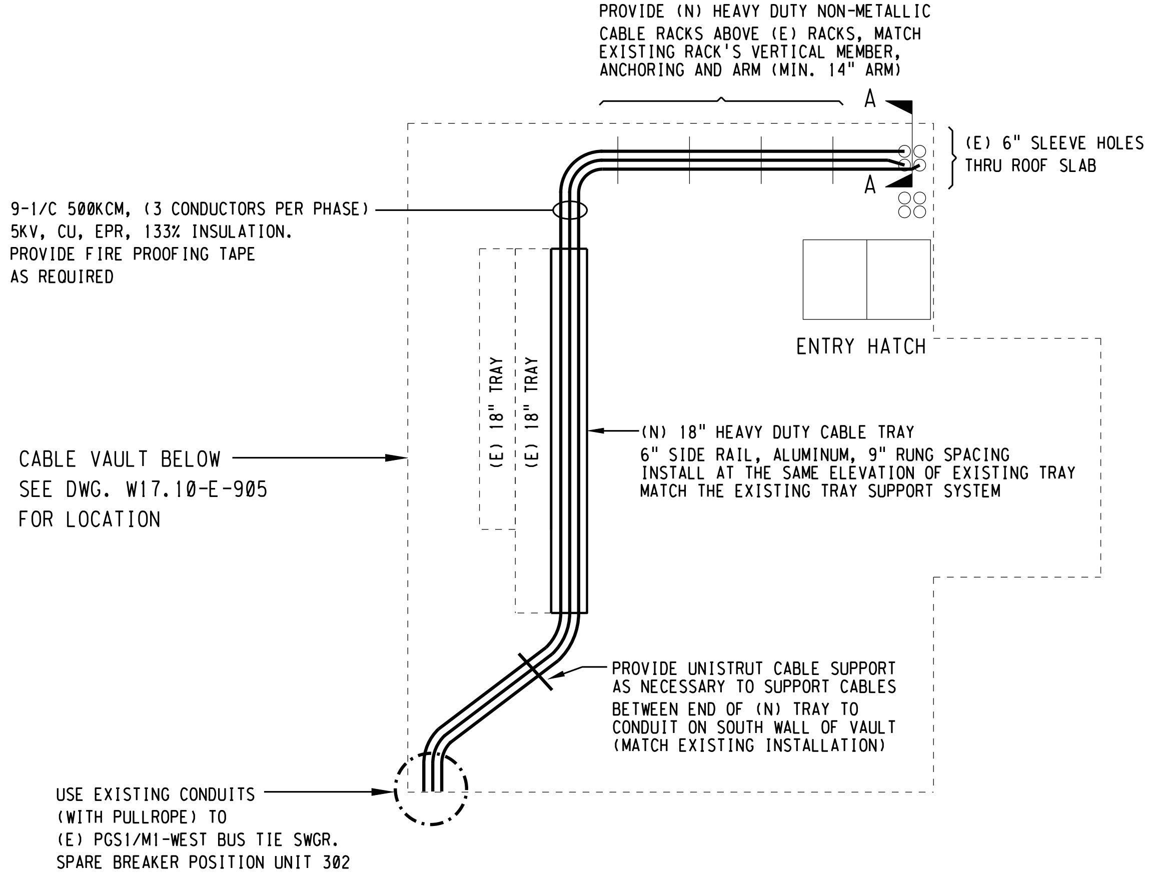
REF 9: REF9$FILENAME

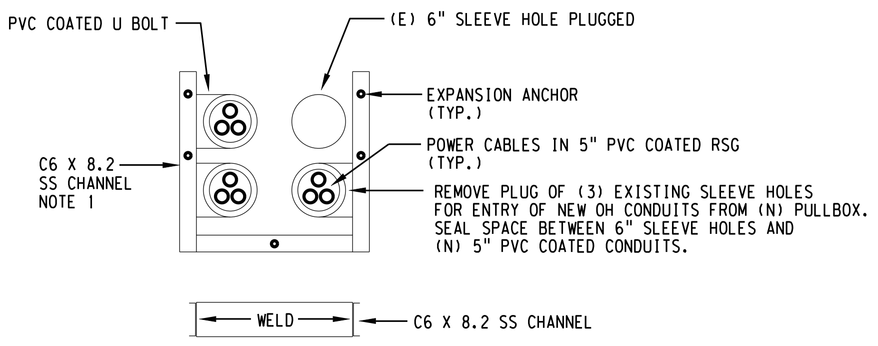

PROVIDE (N) HEAVY DUTY NON-METALLIC CABLE RACKS ABOVE (E) RACKS, MATCH EXISTING RACK'S VERTICAL MEMBER, ANCHORING AND ARM (MIN. 14" ARM)
A
A
(E) 6" SLEEVE HOLES THRU ROOF SLAB
9-1/C 500KCM, (3 CONDUCTORS PER PHASE) 5KV, CU, EPR, 133% INSULATION. PROVIDE FIRE PROOFING TAPE AS REQUIRED
ENTRY HATCH
(E) 18" TRAY
(E) 18" TRAY
CABLE VAULT BELOW SEE DWG. W17.10-E-905 FOR LOCATION
(N) 18" HEAVY DUTY CABLE TRAY 6" SIDE RAIL, ALUMINUM, 9" RUNG SPACING INSTALL AT THE SAME ELEVATION OF EXISTING TRAY MATCH THE EXISTING TRAY SUPPORT SYSTEM
PROVIDE UNISTRUT CABLE SUPPORT AS NECESSARY TO SUPPORT CABLES BETWEEN END OF (N) TRAY TO CONDUIT ON SOUTH WALL OF VAULT (MATCH EXISTING INSTALLATION)
USE EXISTING CONDUITS (WITH PULLROPE) TO (E) PGS1/M1-WEST BUS TIE SWGR. SPARE BREAKER POSITION UNIT 302

1 / -

CABLE VAULT PLAN - INSTALLATION UNDER ROOF SLAB

NONE

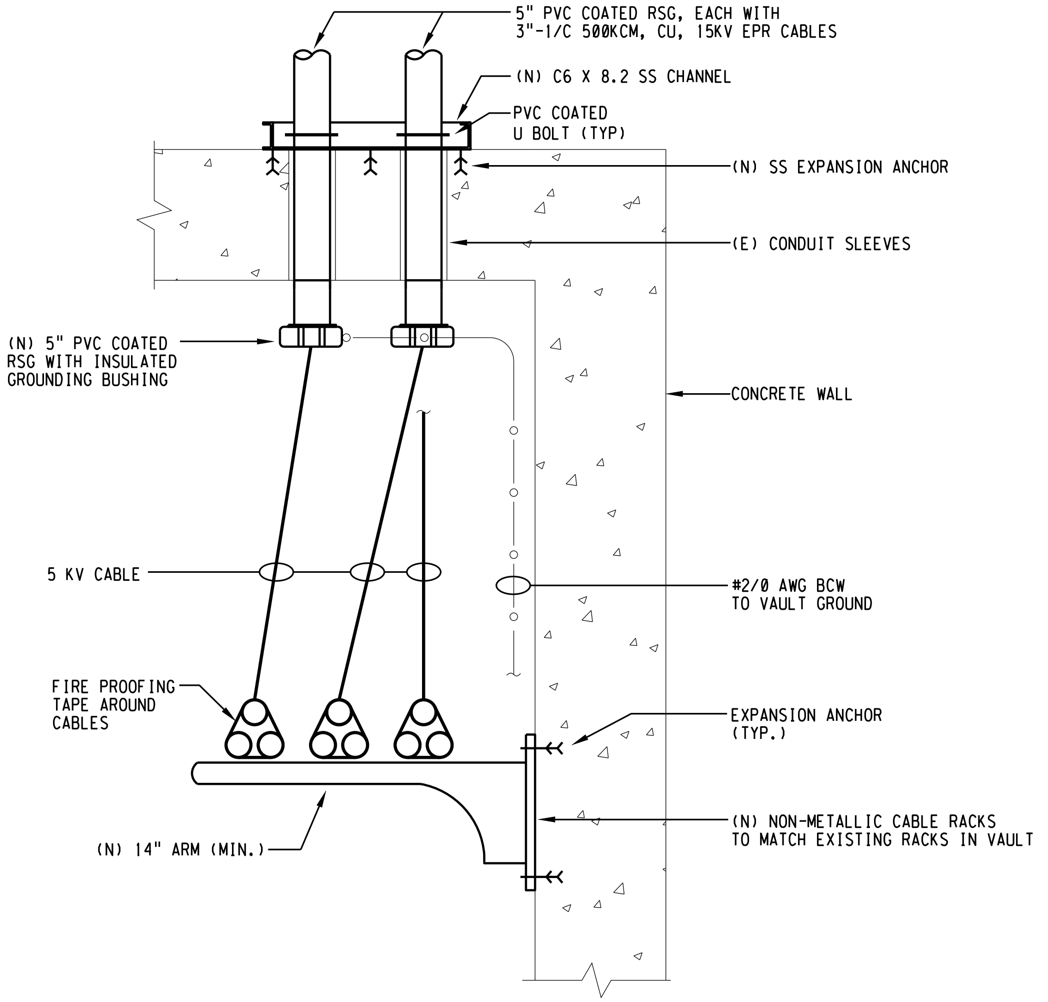
N


PVC COATED U BOLT
(E) 6" SLEEVE HOLE PLUGGED
EXPANSION ANCHOR (TYP.)
C6 X 8.2 SS CHANNEL NOTE 1
POWER CABLES IN 5" PVC COATED RSG (TYP.)
REMOVE PLUG OF (3) EXISTING SLEEVE HOLES FOR ENTRY OF NEW OH CONDUITS FROM (N) PULLBOX. SEAL SPACE BETWEEN 6" SLEEVE HOLES AND (N) 5" PVC COATED CONDUITS.
WELD
C6 X 8.2 SS CHANNEL

1 / -

DETAIL - TOP OF VAULT CONDUIT PENETRATION

NONE


5" PVC COATED RSG, EACH WITH 3"-1/C 500KCM, CU, 15KV EPR CABLES
(N) C6 X 8.2 SS CHANNEL
PVC COATED U BOLT (TYP)
(N) SS EXPANSION ANCHOR
(E) CONDUIT SLEEVES
(N) 5" PVC COATED RSG WITH INSULATED GROUNDING BUSHING
CONCRETE WALL
5 KV CABLE
#2/0 AWG BCW TO VAULT GROUND
FIRE PROOFING TAPE AROUND CABLES
EXPANSION ANCHOR (TYP.)
(N) NON-METALLIC CABLE RACKS TO MATCH EXISTING RACKS IN VAULT
(N) 14" ARM (MIN.)

A / -

DETAIL - SECTION A - A

NONE

GENERAL NOTES:

1. PROVDE STAINLESS STEEL CHANNEL (C6 X 8.2), LENGTH AS REQUIRED ON THREE SIDES AS SHOWN. SECURE CHANNEL ON TOP OF VAULT WITH EXPANSION ANCHOR, AND PROVIDE PVC COATED U-BOLTS FOR SUPPORTING VERTICAL PVC COATED RSG.

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0 1 2 3

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SD317A - PGS RENEWABLE ENERGY EXPANSION

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DRAWN BY: TRI DANG
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PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
ELECTRICAL DETAILS
MAIN SUBSTATION CABLE VAULT

SCALE 1/4"=1'
DATE JAN2009
W17.10-E-906
DRAWING NUMBER
1
REV.

LEGEND FOR PLANS

———	EXPOSED CONDUIT(S)
- - - -	CONCEALED CONDUIT RUN(S) (FLOOR, WALL, CEILING & UNDERGROUND)
	CONDUIT(S) TURN UPWARD
	CONDUIT(S) TURN DOWNWARD
	HOME RUN TO PANEL
	CONDUIT RUN IN GALLERY
G L-5, 7	CROSSHATCHES INDICATE NUMBER OF CONDUCTORS (TWO HOT, NEUTRAL, & GROUND). NO DESIGNATION OR CROSSHATCH INDICATES 2 #12 & #12 GND IN ¾" CONDUIT, APPLICABLE ONLY TO LIGHTING & RECEPTACLE CIRCUITS. L-5, 7 INDICATES LIGHTING PANEL CIRCUIT NUMBERS
(E) (E)	EXISTING CONDUIT(S)
	EXISTING CONDUIT & CONDUCTORS WHICH SHALL BE REMOVED
////	EXISTING ELECTRICAL EQUIPMENT WHICH SHALL BE DISCONNECTED AND REMOVED
	CONDUIT SEAL FITTING FOR CLASS 1, DIVISION 1, GROUPS C & D HAZARDOUS (CLASSIFIED) LOCATIONS
	STUB UP OR CAP
	UNDERGROUND DUCT LINE (CONCRETE ENCASEMENT) - NUMBER OF CIRCLES DOES NOT REPRESENT THE NUMBER OF CONDUITS IN THE ENCASEMENT
■	TERMINAL BLOCK
▲	TERMINAL BLOCK IN DCS EQUIPMENT
Ⓙ	JUNCTION BOX
J	JUNCTION BOX - CEILING MOUNTED
⊗	FIELD INSTRUMENTATION
A 1a NL J	2x4 PENDANT MOUNTED FLUORESCENT LIGHT FIXTURE. LETTER INDICATES FIXTURE TYPE AS SHOWN IN THE FIXTURE SCHEDULE. NUMBER INDICATES CIRCUIT NUMBER. LOWER CASE INDICATES THE SWITCH LEG. (SHADED INDICATES EMERGENCY BALLAST REQUIREMENTS) NL IF PRESENT INDICATES NIGHT LIGHT OPERATION.
B 1a NL	2x2 RECESSED FLUORESCENT LIGHT FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
C 1a NL J	1x4 FLUORESCENT LIGHT FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
F 1a ○ ; ●	CEILING COMPACT FLUORESCENT LIGHT FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
X 1 ⊗	EXIT OR DIRECTIONAL SIGN (SAME AS ABOVE FOR DESIGNATION)
	EXTERIOR HID LIGHT FIXTURE (SAME AS ABOVE FOR DESIGNATION)
◁	EXTERIOR FLOODLIGHT FIXTURE (SAME AS ABOVE FOR DESIGNATION)
\$ \$ᴹ	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD AND LOCK-OFF FEATURE IN AN ENCLOSURE.
\$ᵃ	SINGLE POLE TOGGLE SWITCH (LETTER INDICATES SWITCH LEG)
\$3 , \$4	TOGGLE SWITCH, "3" INDICATES 3-WAY, "4" INDICATES 4-WAY
WM	WIREMOLD, ALUMINUM SURFACE RACEWAY WITH DEVICES AS SHOWN AT +36" AFF.
A	WALL MOUNTED DUAL TECHNOLOGY SWITCH SENSOR. "WATTSTOPPER" #DW-200-I.
B	WALL MOUNTED DUAL TECHNOLOGY SWITCH SENSOR. "WATTSTOPPER" #DW-100-I.
D	WALL MOUNTED DIMMER CONTROL-SLIDE BAR WORK WITH 3 WAY SWITCH "LEVITON RENOIR" #26666-37.
OS	CEILING MOUNTED UTRASONIC OCCUPANCY SENSOR WITH ISOLATED RELAY AND 360 DEGREE COVERAGE. "WATTSTOPPER" #WT-600 (COVER UP TO 600 SQUARE FEET).
PP	OCCUPANCY POWER PACK, LOCATED IN ACCESSIBLE SPACE. "WATTSTOPPER" #B277E-P.
WP GFCI	DUPLEX CONVENIENCE OUTLET, NEMA 5-20R IF PRESENT WP INDICATES WATER PROOF. IF PRESENT GFCI INDICATES GROUND FAULT INTERRUPTER WHERE SHOWN ON PLAN
WP GFCI	FOURLEX CONVENIENCE OUTLET, NEMA 5-20R IF PRESENT WP INDICATES WATER PROOF. IF PRESENT GFCI INDICATES GROUND FAULT INTERRUPTER WHERE SHOWN ON PLAN
●● , CS	UNLESS OTHERWISE INDICATED, CONTROL STATION AS REQUIRED BY THE SCHEMATIC DIAGRAM IN NEMA 4X ENCLOSURE
FU	DISCONNECT SWITCH, HEAVY DUTY 600 VAC 3 POLE, NON-FUSIBLE; UNLESS OTHERWISE INDICATED, IN NEMA 4X ENCLOSURE "FU" WHERE PRESENT INDICATES FUSED DISCONNECT SWITCH.
⧄	CIRCUIT BREAKER IN NEMA 4X ENCLOSURE UNLESS OTHERWISE INDICATED
⊠	COMBINATION 480 VAC, 3 POLE CIRCUIT BREAKER OR MCP-MAGNETIC STARTER WITH CONTROL TRANSFORMER, RELAYS, DEVICES AS REQUIRED BY THE SCHEMATIC DIAGRAM IN NEMA 4X ENCLOSURE
Ⓢ	SOLENOID VALVE
	ALARM BELL
SP D	FIRE DETECTION DEVICE: SI - SMOKE DETECTOR, IONIZATION TYPE SP - SMOKE DETECTOR, PHOTOELECTRIC TYPE HF - HEAT DETECTOR, FIXED TEMP. HR - HEAT DETECTOR, RATE OF RISE SH - SMOKE/HEAT DETECTOR D - DUCT DETECTOR (TEXT OUTSIDE OF SYMBOL)
IM	INTERFACE MONITORING MODULE
◀	TELEPHONE OUTLET
◁ D	DATA OUTLET
◀ F	FAX OUTLET
PA	PA SYSTEM SPEAKER

HS	HORN H - HORN HS - HORN/STROBE
S	STROBE
T	TELEPHONE TONE/RINGER SPEAKER
M	MANUAL FIRE ALARM BOX
TH	THERMOSTAT

3" ON ORIGINAL DOCUMENT
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LEGEND FOR SINGLE LINE DIAGRAMS

(E)	EXISTING
———	NEW
///	EXISTING TO BE REMOVED.
	HEATER
MH	MH - MANHOLE, HH - HANDHOLE, PB - PULL BOX
ST	SHUNT TRIP
25	SYNCHRONISM CHECK RELAY
25A	AUTOMATIC SYNCHRONIZING RELAY
27	UNDERVOLTAGE RELAY
49	THERMAL RELAY
59	OVERVOLTAGE RELAY
63	SUDDEN PRESSURE RELAY
50/51	TIME OVERCURRENT RELAY WITH INSTANTANEOUS ELEMENT
51	TIME OVERCURRENT RELAY
50/GS	INSTANTANEOUS GROUND OVERCURRENT SENSING RELAY
51N	RESIDUAL GROUND OVERCURRENT RELAY
51G	NEUTRAL GROUND OVERCURRENT RELAY
87	DIFFERENTIAL RELAY
86	LOCKOUT RELAY
81	FREQUENCY RELAY PROTECTIVE RELAY SUFFIXES: B INDICATES BUS X INDICATES AUXILIARY RELAY T INDICATES TRANSFORMER L INDICATES LINE
K	KEY INTERLOCK
CS	CONTROL SWITCH
VS	VOLTMETER SELECTOR SWITCH: OFF-A0, B0, C0, AG, BG, CG
AS	AMMETER SELECTOR SWITCH: OFF-A0, B0, C0
V	VOLTMETER
A	AMMETER
PF	POWER FACTOR METER
F	FREQUENCY METER
SY	SYNCHROSCOPE
WH	WATT-HOUR METER
WM D	WATT METER D-DEMAND
2	ELECTRIC MOTOR. NUMBER INDICATES HORSEPOWER
VAR	VARMETER
WHD	WATTHOUR METER WITH DEMAND REGISTER
PFM	POWER FACTOR METER
RTM	RUNNING TIME METER
EDM	ELECTRONIC DISPLAY METER
A	ANNUNCIATOR
INLK	INTERLOCK

LEGEND FOR SINGLE LINE DIAGRAMS (CON'T)

XX AT / YY AF	MOLDED CASE CIRCUIT BREAKER, SOLID-STATE OR THERMAL MAGNETIC, 600 V, XX LETTERING FOR AMP TRIP, YY LETTERING FOR AMP FRAME
MCP 1	UNLESS OTHERWISE NOTED, COMBINATION MOTOR CIRCUIT PROTECTOR, FUSELESS CURRENT LIMITING TYPE AND FULL VOLTAGE NON-REVERSING MAGNETIC STARTER WITH OVERLOAD PROTECTION AND 480-120 VOLT CONTROL TRANSFORMER. NUMBER INDICATES NEMA STARTER SIZE
SS	SAME AS ABOVE, EXCEPT SOLID-STATE STARTER AND THERMAL MAGNETIC CIRCUIT BREAKER
VFD	VARIABLE FREQUENCY DRIVE UNIT
(E)	HEAVY DUTY, FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V
	HEAVY DUTY, NON-FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V
	FUSES
R	RESISTOR
	REACTOR
	CAPACITORS
X KVA 480- 208V/120	POWER TRANSFORMER - X LETTERING FOR SIZE OF TRANSFORMER △ -DELTA -DELTA WITH MIDPOINT GROUNDED -GROUNDED WYE
	CURRENT TRANSFORMERS (CT), THREE CT'S
	POTENTIAL TRANSFORMERS (PT), THREE PT'S
GS	GROUND FAULT SENSOR. WHEN SHOWN WITH BREAKER, SENSOR IS AN INTEGRAL PART OF THE BREAKER
	SURGE OR LIGHTNING ARRESTORS
	METAL OXIDE VARISTORS(MOV)
	FUSES WITH BLOWN FUSE NEON LIGHT INDICATORS, PUSH-TO-TEST TYPE,600V
▲	SPECIAL RECEPTACLE AND PLUG, 600V
700	MOTOR CONTROLLER, 700 DESIGNATES HP OF MOTOR
XDCR A	TRANSDUCER A AMPERE KVAR KILOVOLT AMPERE REACTIVE V VOLTAGE PF POWER FACTOR KW KILOWATT F FREQUENCY

UNDERGROUND DISTRIBUTION AND GROUNDING

- - - -	UNDERGROUND CONDUITS
—G—G—	GROUND GRID, BURIED OR IN MH/VAULT
	UNDERGROUND THERMO-WELD CONNECTIONS
	GROUND ROD, WHERE INDICATED PROVIDE PRECAST GROUND ROD BOX WITH CAST IRON TRAFFIC COVER.
ooo	CONDUIT STUB-UPS
	EXISTING CABLE SPLICE
	NEW CABLE SPLICE
	CABLE SPLICE IN MANHOLE
	EXISTING POTHEAD OR STRESS CONE TERMINATION
	NEW POTHEAD OR STRESS CONE TERMINATION
H-1	PADMOUNTED TRANSFORMER MANHOLE, H-1 INDICATES ID

LEGEND FOR SCHEMATIC DIAGRAMS

—≫—	PULLOUT, DRAWOUT OR CONNECTOR
	ATS, AUTOMATIC TRANSFER SWITCH
	THERMAL OVERLOAD
SS	SOLID STATE STARTER WITH BYPASS CONTACTOR
ETM	ELAPSED TIME METER
TR #	TIME DELAY RELAY COIL
CR #	CONTROL RELAY COIL.
CR#	NORMALLY OPEN CONTACT
CR#	NORMALLY CLOSED CONTACT
PB#	NORMALLY OPEN MOMENTARY PUSH-BUTTON
PB#	NORMALLY CLOSED MOMENTARY PUSH-BUTTON
	MAINTAINED PUSH BUTTONS
H O A XOO OXO OOX OOX	SELECTOR SWITCH
	TOGGLE SWITCH
	TRANSFORMER
CB# 50A	CIRCUIT BREAKER
FU# 5AMP	FUSE
	GROUND
GEN	GENERATOR
R	INDICATING LIGHT. LETTER INDICATES LENS COLOR.
R	PUSH-TO-TEST INDICATING LIGHT. LETTER INDICATES LENS COLOR.
S	SOLENOID
	HORN
FS#	FLOW SWITCH, NORMALLY OPEN-CLOSES ON INCREASE (TYP.)
FS#	FLOW SWITCH, NORMALLY CLOSED-CLOSES ON DECREASE (TYP.)
LS#	LEVEL SWITCH, NORMALLY OPEN
LS#	LEVEL SWITCH, NORMALLY CLOSED
PS#	PRESSURE OR VACUUM SWITCH, NORMALLY OPEN
PS#	PRESSURE OR VACUUM SWITCH, NORMALLY CLOSED
TS#	TEMPERATURE SWITCH, NORMALLY OPEN
TS#	TEMPERATURE SWITCH, NORMALLY CLOSED
LM#	LIMIT OR TORQUE SWITCH, NORMALLY OPEN
LM#	LIMIT OR TORQUE SWITCH, NORMALLY CLOSED
TR#	NORMALLY OPEN, TIME DELAY CLOSE CONTACT
TR#	NORMALLY CLOSED, TIME DELAY OPEN CONTACT
	FUSE HOLDER ASSEMBLY WITH BLOWN FUSE NEON INDICATOR

GENERAL SYMBOLS AND LEGEND

———	LIGHT LINE INDICATES EXISTING WORK
———	HEAVY LINE INDICATES NEW WORK OR NEW EQUIPMENT
/////	HATCH MARKS INDICATE EXISTING EQUIPMENT OR MATERIAL TO BE REMOVED
·····T····	INDICATES PROTECTIVE RELAY TRIPPING INFLUENCE
△	DELTA CONNECTION OR DELTA CONNECTED WINDINGS
∠	OPEN DELTA CONNECTION
	BROKEN DELTA CONNECTION
Y	WYE CONNECTION OR WYE CONNECTED WINDINGS
⏚	GROUND, GROUND CONNECTION
②	SHEET NOTE IDENTIFICATION, REFER TO SHEET NOTE NUMBER 2
K	KEY INTERLOCK
M	MECHANICAL INTERLOCK
	DISCONNECTING MEANS
-X-X-X-	FENCE
☐	LIGHTS
℄	CENTERLINE, STRUCTURE OR EQUIPMENT
—NG—	NATURAL GAS LINE
—HPA—	HIGH PRESSURE AIR LINE
1 E-102	NUMBERS FOR PLAN AND SECTION, DETAIL DRAWING SHEET WHERE PLAN, SECTION OR DETAIL IS DRAWN

ELECTRICAL SYMBOLS

	POWER TRANSFORMER
100	COMBINATION MOTOR STARTER, 100 DESIGNATES HP OF MOTOR
CL	CURRENT LIMITING POWER REACTOR
	NEUTRAL GROUNDING RESISTOR
3-PT 100:1	POTENTIAL TRANSFORMER, "3-PT" INDICATES NUMBER OF TRANSFORMERS, "100:1" INDICATES RATIO
1200:5 MR 3	CURRENT TRANSFORMER WITH RATIO AND NUMBER OF UNITS INDICATED, "MR" INDICATES MULTI-RATIO
50:5	ZERO SEQUENCE OR GROUND SENSING CURRENT TRANSFORMER, WITH RATIO INDICATED
1200:5 MR 3	CURRENT TRANSFORMER, BUSHING TYPE
	CIRCUIT BREAKER, DRAWOUT IN METALCLAD SWITCHGEAR
	SWITCH, SINGLE POLE
	BUS DUCT
	SWITCH, GROUP OPERATED, LOAD BREAK, FUSED, IN METALCLAD SWITCHGEAR
	FUSE CUT OUT
	LOW VOLTAGE MOLDED CASE CIRCUIT BREAKER
	CIRCUIT BREAKER, DRAWOUT TYPE
	POWER CAPACITOR BANK, 3-PHASE
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
RES	RESISTOR, IN CONTROL CIRCUIT
	DEVICE OPERATING COIL

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SD317A - PGS RENEWABLE ENERGY EXPANSION

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DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES
SHEET 1

SCALE NONE
DATE JAN2009
W28.20-E-001
DRAWING NUMBER
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REV.

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ABBREVIATIONS

A

A	AMMETER, AMPERES
A/C	ASPHALT CONCRETE
AC	ALTERNATING CURRENT
ACU	AIR CONDITIONING UNIT
ACB	AIR CIRCUIT BREAKER
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFR	ARC FLASH REDUCTION
AI	ANALOG INPUT
AIC	AMPERES INTERRUPTING CAPACITY
APPROX	APPROXIMATE
ARR	ARRESTER
AS	AMMETER SWITCH
AT	AMPERE TRIP
AT&T	AMERICAN TELEPHONE AND TELEGRAPH
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX.	AUXILIARY
AWG	AMERICAN WIRE GAUGE

B

BATT.	BATTERY
B.C.	BARE COPPER
BCW	BARE COPPER WIRE
BET.	BETWEEN
BKR	BREAKER
BLDG.	BUILDING
BLU	BLUE
BLK	BLACK
BD	BUS DUCT
BOM	BILL OF MATERIALS
BRG	BEARING

C

C	CONDUIT
CAB	CABINET
CAP	CAPACITOR
CB	CATCH BASIN
CHGR.	CHARGER
CKT	CIRCUIT
CL,CLE	CURRENT LIMITING, CURRENT LIMITING "E" FUSE
CMP	COMPRESSOR
COMM	COMMUNICATION
COMP	COMPARTMENT
CONT.	CONTROL
CNTL	CONTROL
CON'T	CONTINUE, CONTINOUS
CONC	CONCRETE
COND.	CONDUCTOR
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY, CORROSION-RESISTANT
C.S.	CONTROL SWITCH
CSR	CONTROL SWITCH REALY
CSCP	CHEMICAL STORAGE CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
CUB	CUBICLE

D

D	DEEP
DB	DUCT BANK
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
D.E.	DEAD END
DET	DETECTOR
DEV	DEVICE
D.I.	DIGITAL INPUT
DIA	DIAMETER
DIAG	DIAGRAM
DIFF.	DIFFERENTIAL
DIM	DIMENSION
DISC	DISCONNECT
DISP	DISPLAY
DIST.	DISTRIBUTION
DLDB	DEAD LINE DEAD BUS
DN	DOWN
DP	DISTRIBUTION PANEL
DPU	DISTRIBUTED PROCESSING UNIT
DSLC	DIGITAL SYNCHRONIZER AND LOAD CONTROL
D.O.	DIGITAL OUTPUT
DWG	DRAWING

E

(E)	EXISTING
EA	EACH
EDM	ELECTRONIC DISPLAY METER
ELEC	ELECTRIC, ELECTRICAL
EMERG	EMERGENCY
EL.	ELEVATION
ENCL.	ENCLOSURE
EO	ELECTRICALLY OPERATED
EPR	ETHYLENE PROPYLENE RUBBER
EQUIP	EQUIPMENT
ETM	ELAPSED TIME METER
EYS	ELECTRICAL WYE SEAL

F

F, FREQ	FREQUENCY
FA	FORCED AIR (TRANSFORMER RATING)
FACP	FIRE ALARM CONTROL PANEL
FB	FIRE ALARM BELL
FDSCP	FIRE DETECTION SYSTEM CONTROL PANEL
FDR	FEEDER
FLUOR	FLUORESCENT
FO	FIBER OPTIC
FS	FLOW SWITCH
FT	FOOT, FEET
FUT.	FUTURE
F,FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
FWD	FORWARD

G

GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GCB	GENERATOR CONTROL BOX
GCS	GAS CONDITIONING SYSTEM
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
G,GND,GRD	GROUND
G.L.	GRADE LEVEL
G	GREEN

H

HDPE	HIGH DENSITY POLYETHYLENE CONDUIT
HT	HEIGHT
HH	HANDHOLE
HMI	HUMAN MACHINE INTERFACE
HN	HALF NEUTRAL
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HTR	HEATER
HR	HAND RESET
HV	HIGH VOLTAGE
HVMH	HIGH VOLTAGE MANHOLE
HZ	HERTZ

I

IC	INTERRUPTING CAPACITY
ID	IDENTIFICATION
I.D.	INSIDE DIMENSION
IN	INCH
IND	INDICATION
INST	INSTANTANEOUS
INS	INSULATOR, INSULATION
INSTR	INSTRUMENT, INSTRUMENTATION
I/O	INPUT/OUTPUT
IRIG	INTERNATIONAL RANGE INSTRUMENTATION GUIDE
ISO	INDEPENDENT SYSTEM OPERATOR

J

J, JB	JUNCTION BOX

K

KCM	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOURS

L

L	LONG, LENGTH
LA	LIGHTNING ARRESTER
LBS	POUNDS
LCP	LIGHTING CONTROL PANEL
LED	LIGHT EMITTING DIODE
L-L	LINE TO LINE
L-N	LINE TO NEUTRAL
LIS	LOAD INTERRUPTER SWITCH/SWGR
LOS	LOCK-OUT-STOP
LP	LIGHTING PANEL
LPDG	LOW PRESSURE DIGESTER GAS
LPGH	LOW PRESSURE GAS HOLDER
LTG	LIGHTING
LxWxH	LENGTH, WIDTH AND HEIGHT
LLDB	LIVE LINE - DEAD BUS
LOR	LOCKOUT RELAY
LSIG	LONG TIME DELAY, SHORT TIME DELAY, INSTANTANEOUS, AND GROUND FAULT PROTECTION
LVMH	LOW VOLTAGE MANHOLE

M

M	MOTOR
MA	MILLIAMPERES
MAINT.	MAINTENANCE
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MCR	MASTER CONTROL RELAY
MECH.	MECHANICAL
MFR.	MANUFACTURER
MG/KG	MILLIGRAM PER KILOGRAM
MH	MANHOLE
MHTR	MOTOR SPACE HEATER
MI	MECHANICAL INTERLOCK
MIN	MINIMUM
MIP	MASTER INSTRUMENTATION PANEL
MISC	MISCELLANEOUS
MMR	MOTOR MANAGEMENT RELAY
MO	MANUALLY OPERATED
MOV	MOTOR OPERATED VALVE, METAL OXIDE VARISTORS
MR	MULTI-RATIO
MS	MANUAL PULL STATION
MSLC	MASTER SYNCHRONIZER AND LOAD CONTROL
MTD	MOUNTED
MTG	MOUNTING
MTRS	METERS
MV	MEDIUM VOLTAGE
MVA	MEGA-VOLT AMPERE
MW	MEGAWATT
MWWTP	MAIN WASTEWATER TREATMENT PLANT

N

(N)	NEW
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGR	NEUTRAL GROUNDING RESISTOR
NGT	NEUTRAL GROUNDING TRANSFORMER
N.I.C.	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
NP	NAMEPLATE
NPT	NATIONAL PIPE THREAD

O

OA	AIR COOLED (TRANSFORMER RATING)
O.C.	ON CENTER
O/C	OVER CURRENT
O.D.	OUTSIDE DIMENSION
OH	OVERHEAD
OL	OVERLOAD
OPER.	OPERATING, OPERATOR

P

PA	PAGING
PB	PULL BOX
PBC	PUSH-BUTTON - CLOSE
PBO	PUSH-BUTTON - OPEN
PBS	PUSH-BUTTON - STOP
PC	PERSONAL COMPUTER
PCB	POLYCHLORINATED BIPHENYLS
PCR	POWER CONTROL ROOM
PCS	PVC COATED RIGID STEEL CONDUIT
PE	PHOTOELECTRIC
PEC	PHOTOELECTRIC CELL
PF	POWER FACTOR
PH	PHASE
PIT	PRESSURE INDICATOR TRANSMITTER
PL	PILOT LIGHT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL.	PANEL
PQM	POWER QUALITY METER
PRI	PRIMARY
PROC.	PROCESSOR
PROT	PROTECTION
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PWR	POWER
PWRS	POWER SUPPLY
PG&E	PACIFIC GAS & ELECTRIC
PGS	POWER GENERATING STATION

R

RED	RED
RCPT	RECEPTACLE
REG	REGULAR
REQ'D	REQUIRED
REM	REMOTE
RES	RESISTOR, RESISTANCE
REV	REVERSE
RIO	REMOTE INPUT/OUTPUT
RM	ROOM
RMS	ROOT MEAN SQUARE
RSG	RIGID STEEL GALVANIZED
RTD	RESISTANCE TEMPERATURE DETECTOR

S

S.A.	SURGE ARRESTERS
S.C	SURGE CAPACITOR
SD	STORM DRAIN, SMOKE (FIRE) DETECTION DEVICE
SEC	SECONDARY
SECT	SECTION
SHLD.	SHIELDED
SHT	SHEET
SLT	SEALTIGHT-LIQUID-TIGHT FLEXIBLE CONDUIT
SN	SOLID NEUTRAL
SOL	SOLENOID
SPDT	SINGLE POLE, DOUBLE THROW
SPEC	SPECIFICATION
SP	SPARE
SQ. FT.	SQUARE FEET
SS	STAINLESS STEEL
SST	SOLID STATE TRIP
SSW	SELECTOR SWITCH
STA.	STATION
SUB	SUBSTATION
SVCE	SERVICE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
SYNC	SYNCHRONIZING, SYNCHRONISM

T

TB	TERMINAL BLOCK
TBL	TROUBLE
TC	TELEPHONE CABINET, TELEPHONE CABLE
TCB	TURBINE CONTROL BOX
TCO	TRIP CUTOUT
TD	TIME DELAY RELAY
TEL	TELEPHONE
TELEM	TELEMETERING
TEMP	TEMPORARY, TEMPERATURE
TERM.	TERMINAL
T/G	TURBINE/GENERATOR
TRANSF.	TRANSFORMER
TS	TEST SWITCH
TSP	TWISTED SHIELDED PAIR
TYP.	TYPICAL

U

UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
U.O.N.	UNLESS OTHERWISE NOTED
UV	UNDER VOLTAGE

V

V	VOLTS, VOLMETER
VA	VOLT-AMPERES, VALVE
VAR	VOLT-AMPERES REACTIVE
VCB	VACUUM CIRCUIT BREAKER
VERT	VERTICAL
VFD/AFD	VARIABLE FREQUENCY DRIVE
VS	VOLTMETER SWITCH
V.T.	VOLTAGE TRANSFORMER

W

W/	WITH
W	WIRE, WATTS, WIDE
WHM	WATTHOUR METER
WHRS	WASTE HEAT RECOVERY SYSTEM
WM	WATT-METER
WT	WEIGHT
WP	WEATHERPROOF
WWHT	WATTT/WATTHOUR TRANSDUCER

X

X	REACTOR, REACTANCE
XDCR	TRANSDUCER
XFMR	TRANSFORMER
XFR	TRANSFER
XMTR	TRANSMITTER

Z

Z	IMPEDANCE

GENERAL NOTES:

G1. THESE DRAWINGS ARE DIAGRAMMATIC ONLY; EXACT LOCATIONS OF ELECTRICAL EQUIPMENT SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE INSTALLATION OF ALL EQUIPMENT SHOWN ON THESE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE LATEST EDITIONS OF ALL APPLICABLE CODES AND UTILITY COMPANY STANDARDS. CONTACT THE UTILITY COMPANY REPRESENTATIVES AND VERIFY THEIR REQUIREMENTS.

G2. THIS IS A GENERALIZED LEGEND SHEET. THIS CONTRACT MAY NOT USE ALL INFORMATION SHOWN.

G3. NOTIFY THE ENGINEER IMMEDIATELY IF CONFLICTS IN THE EQUIPMENT LOCATIONS ARE DISCOVERED OR IF PROBLEMS ARISE DUE TO FIELD CONDITIONS, LACK OF INFORMATION OR ANY OTHER REASON. NO PAYMENT WILL BE MADE FOR CHANGES WHICH HAVE NOT BEEN FAVORABLY REVIEWED BY THE ENGINEER.

G4. INFORMATION SHOWN MAY NOT BE ALL INCLUSIVE. SEE ALSO ANSI C37.2, Y1.1, Y32.2, AND Y32.9.

G5. VERIFY ALL REQUIREMENTS BEFORE ORDERING MATERIALS.

G6. REFER TO THE MECHANICAL DRAWINGS FOR CERTAIN CONTROL DIAGRAMS AND EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND FOR CERTAIN CONNECTIONS TO BE MADE TO ELECTRICAL CIRCUITS.

G7. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL CONDUIT SUPPORTS PER SPECIFICATION 16070.

G8. CONTRACTOR SHALL X-RAY ALL EXISTING CONCRETE WALLS, SLABS AND STRUCTURES FOR REBAR LOCATIONS TO AVOID, PRIOR TO CORE DRILLING FOR CONDUIT PENETRATIONS.

PLAN NOTES:

P1. CONDUIT SIZE AND FILL SHALL BE AS INDICATED. WHERE NO SIZE IS SHOWN, THE CONDUIT SHALL BE SIZED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE ADOPTED BY THE AUTHORITY HAVING CODE ENFORCEMENT JURISDICTION. PROVIDE 3/16 INCH NYLON PULL ROPE IN EACH EMPTY CONDUIT, UNLESS OTHERWISE SPECIFIED.

P2. LOWER CASE LETTERS ADJACENT TO A SWITCH OR LIGHT FIXTURE INDICATE A SWITCHED CIRCUIT. FOR FOUR LAMP FLUORESCENT FIXTURES WIRED IN PAIRS WITHIN EACH FIXTURE, THE "a" SWITCH CONTROLS THE OUTER LAMPS AND THE "b" SWITCH CONTROLS THE INNER LAMPS; WIRE 3 LAMP FIXTURES SIMILARLY.

P3. CONDUIT AND WIRE LAYOUT FOR WIRING AND RECEPTACLES, NOT SHOWN. PROVIDE PER NEC.

P4. ALL WIRING AND CONDUITS NOT SHOWN BUT NECESSARY TO MAKE A FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
LEGENDS, SYMBOLS, ABBREVIATIONS AND NOTES
SHEET 2

SCALE NONE
DATE JAN2009

W28.20-E-002
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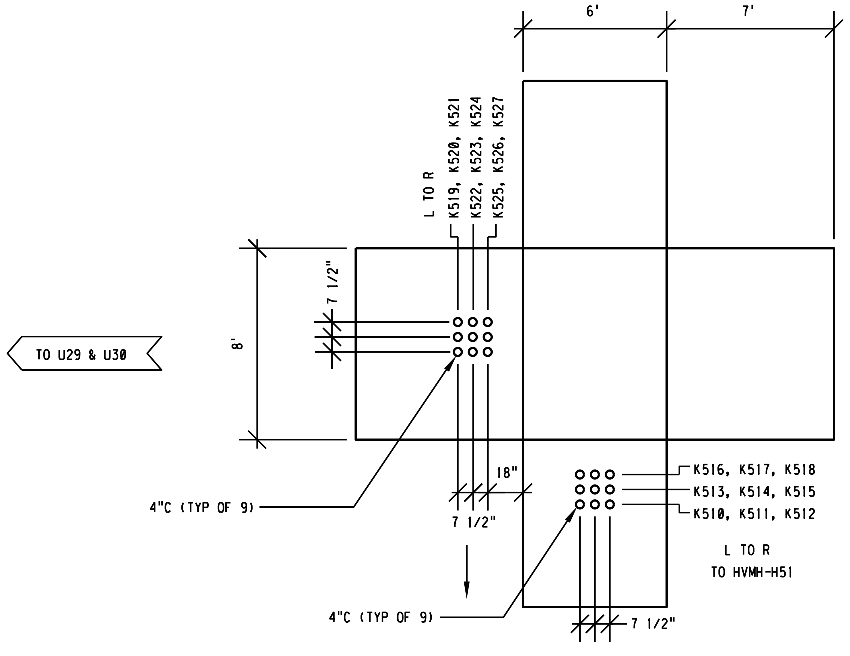

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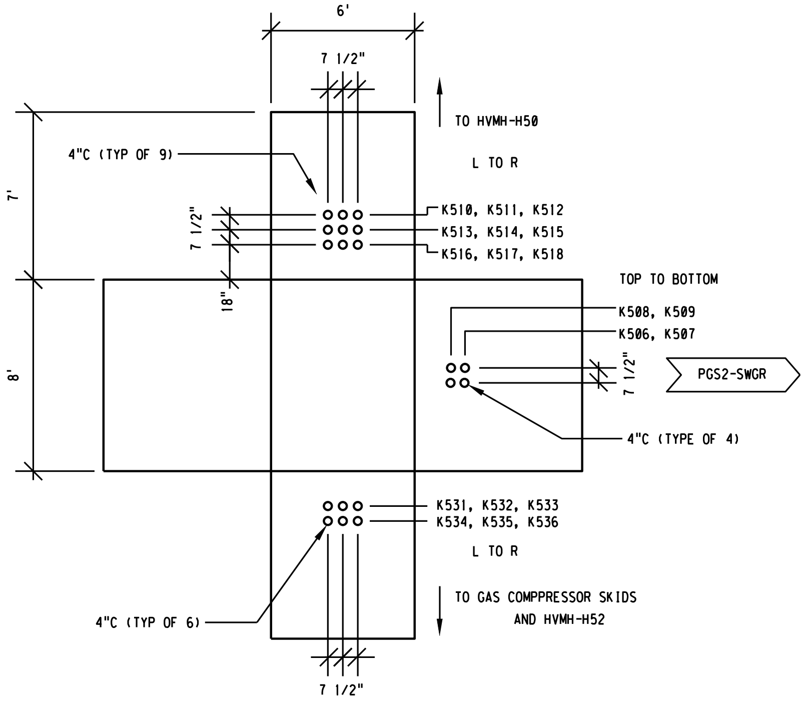

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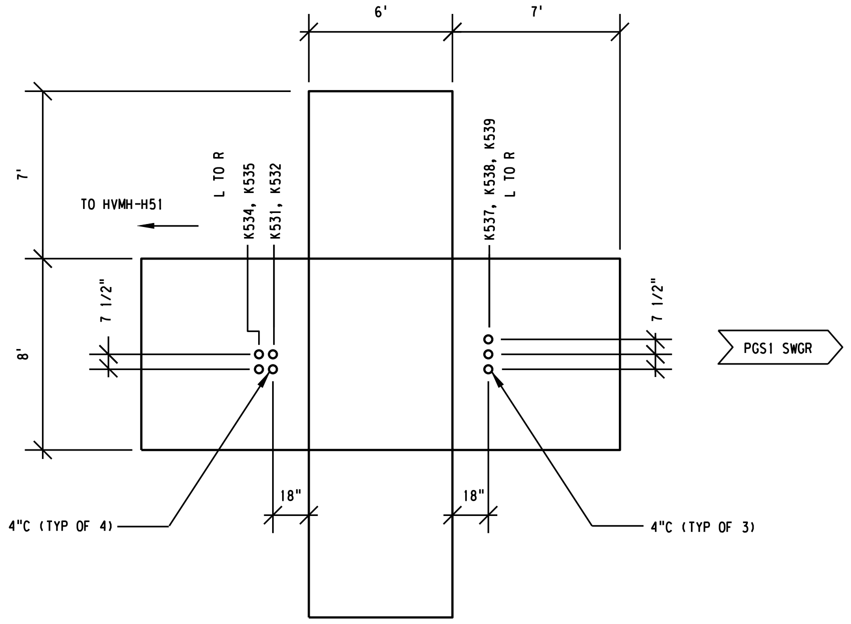

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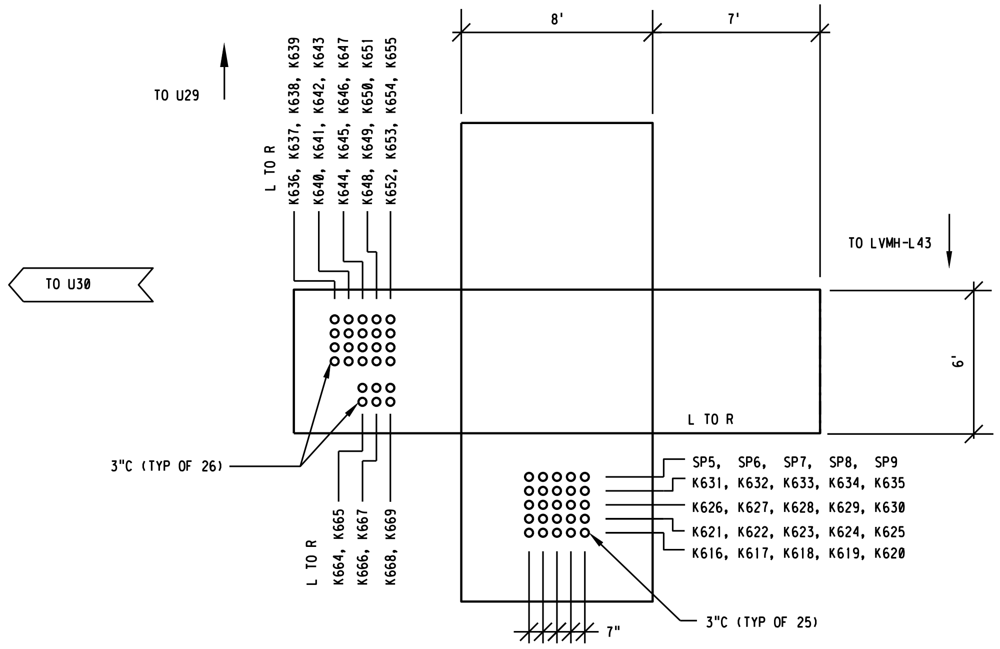

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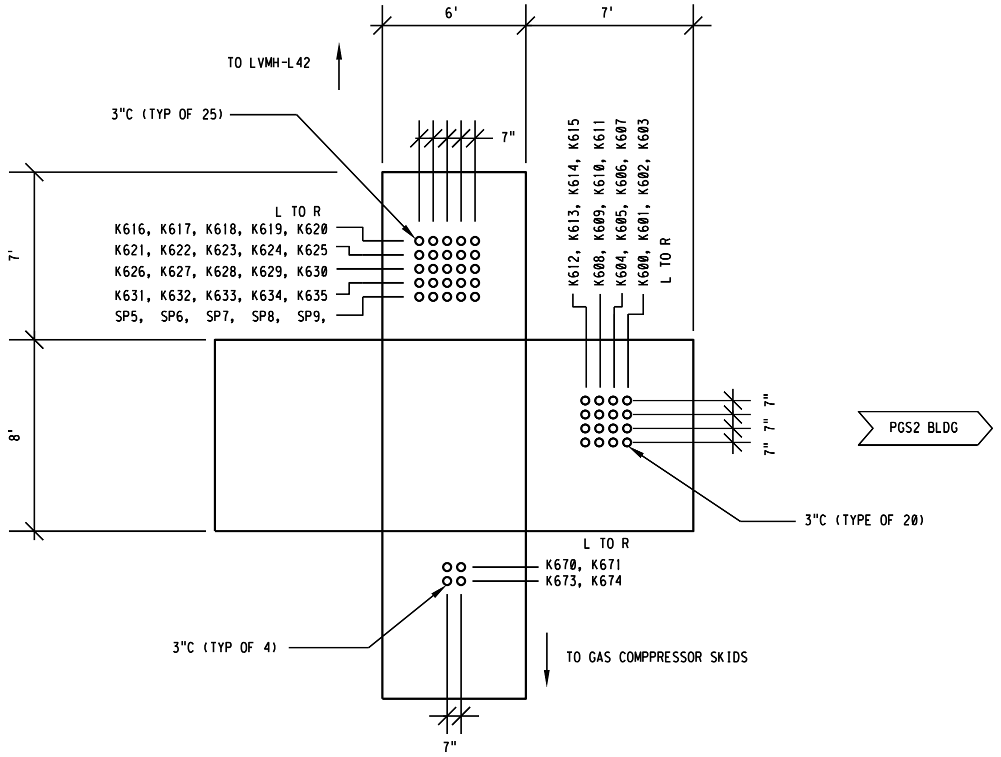

LVMH-L43

3" ON ORIGINAL DOCUMENT
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

CONSULTANT
EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

PGS 2 MANHOLE DEVELOPMENTS

SCALE 1/4"=1'
DATE JAN2009
W28.20-E-004
DRAWING NUMBER
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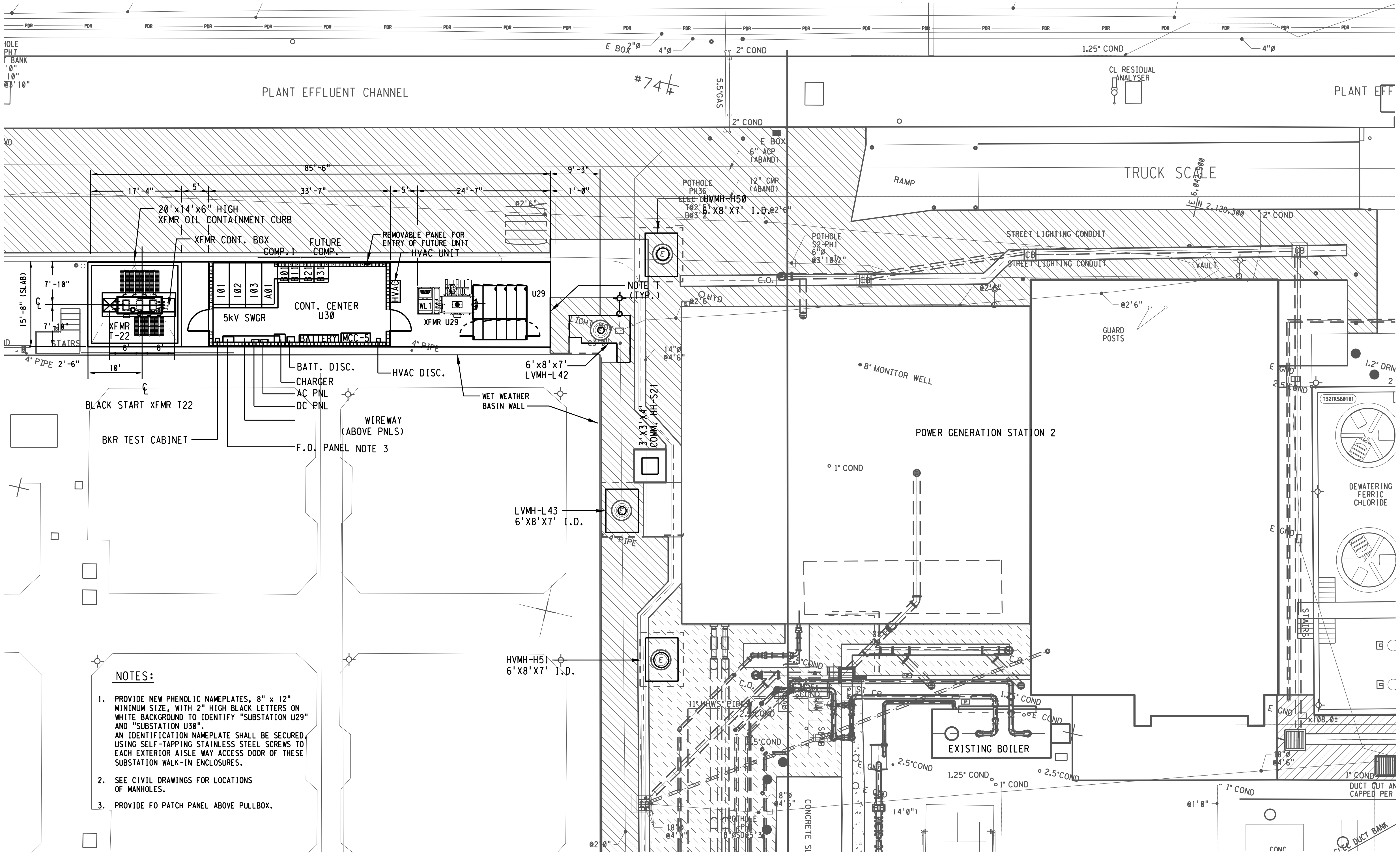
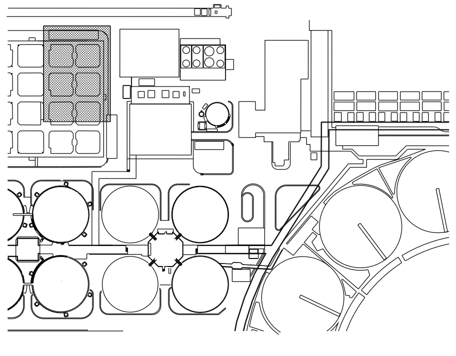


NOTES:

1. PROVIDE NEW PHENOLIC NAMEPLATES, 8" x 12" MINIMUM SIZE, WITH 2" HIGH BLACK LETTERS ON WHITE BACKGROUND TO IDENTIFY "SUBSTATION U29" AND "SUBSTATION U30". AN IDENTIFICATION NAMEPLATE SHALL BE SECURED, USING SELF-TAPPING STAINLESS STEEL SCREWS TO EACH EXTERIOR AISLE WAY ACCESS DOOR OF THESE SUBSTATION WALK-IN ENCLOSURES.
2. SEE CIVIL DRAWINGS FOR LOCATIONS OF MANHOLES.
3. PROVIDE FO PATCH PANEL ABOVE PULLBOX.



KEY MAP

3" ON ORIGINAL DOCUMENT
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SD317A - PGS RENEWABLE ENERGY EXPANSION

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EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SUBSTATION U29/U30
ARRANGEMENT PLAN

SCALE 1:=10'
DATE JAN2009
W28.20-E-040
DRAWING NUMBER
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REV.

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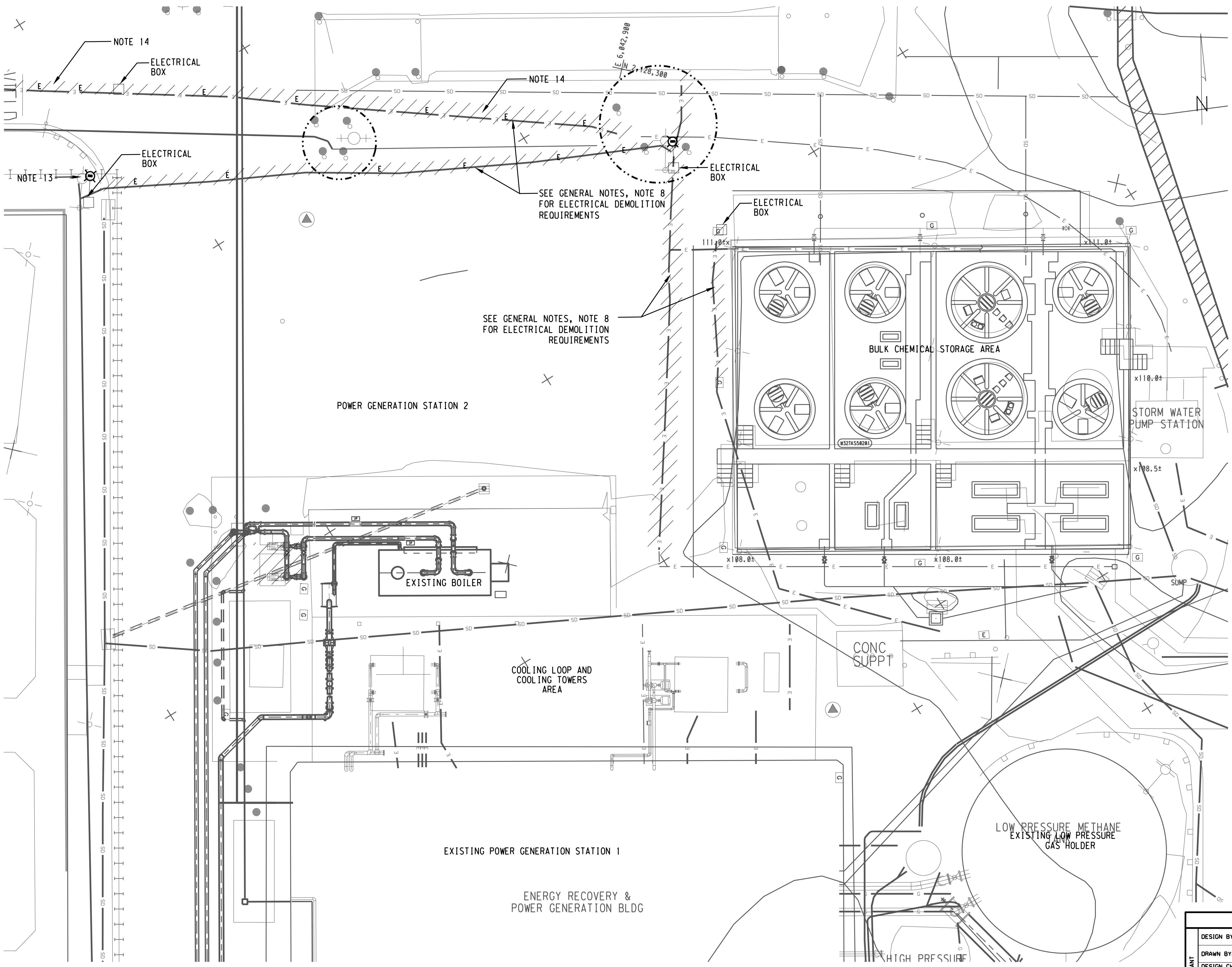
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NOTE 14
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SEE GENERAL NOTES, NOTE 8 FOR ELECTRICAL DEMOLITION REQUIREMENTS
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SEE GENERAL NOTES, NOTE 8 FOR ELECTRICAL DEMOLITION REQUIREMENTS
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BULK CHEMICAL STORAGE AREA
111.0±
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108.5±
108.0±
108.0±
STORM WATER PUMP STATION
POWER GENERATION STATION 2
EXISTING BOILER
SUMP
CONC SUPPT
COOLING LOOP AND COOLING TOWERS AREA
LOW PRESSURE METHANE
EXISTING LOW PRESSURE GAS HOLDER
EXISTING POWER GENERATION STATION 1
ENERGY RECOVERY & POWER GENERATION BLDG
HIGH PRESSURE

GENERAL NOTES:

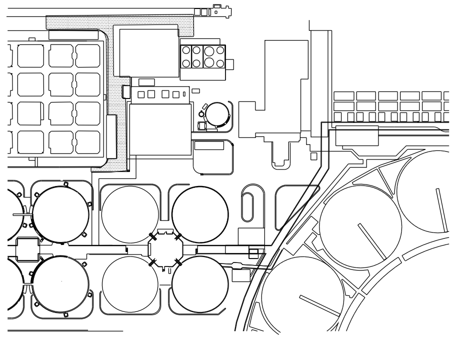
1. NOT ALL PIPING AND CONDUITS ARE SHOWN FOR CLARITY. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATIONS FOR ALL EXISTING PIPES AND CONDUITS WITHIN THE AREA AFFECTED BY THE CONSTRUCTION. ALL EXISTING PIPES AND CONDUITS SHALL BE FULLY SUPPORTED AND PROTECTED DURING DEMOLITION AND NEW INSTALLATION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING STRUCTURES, EQUIPMENT, PULL BOXES, VALVES, AND OPERATOR DURING CONSTRUCTION.
2. CONTRACTOR SHALL POTHOLE ALL EXISTING PIPE LINES CONDUITS AND DUCTBANKS PRIOR TO SITE EXCAVATION WORK TO VERIFY THEIR ACTUAL LOCATIONS AND ELEVATIONS.
3. NO LIVE PIPING OR CONDUITS SHALL BE DISCONNECTED WITHOUT PIROR APPROVAL OF THE DISTRICT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXISTING GRADING, PAVING, AND CONTOUR LINES ADJACENT TO THE CONSTRUCTION AREA.
5. CONTRACTOR SHALL FIELD VERIFY EXISTING UNDERGROUND PIPES LOCATION AND ELEVATION. RELOCATE EXISTING PIPES AS SHOWN ON PLANS.
6. FIELD VERIFY THE PULL BOX LOCATION AND RELOCATED IT AS NEED TO FACILITATE THE WORK EFFECTED.
7. FOR CONSTRUCTION SEQUENCING SEE SPECIFICATION.
8. CONTRACTOR SHALL VERIFY AND TRACE ALL STREET LIGHTING CIRCUITS AND OTHER ELECTRICAL CIRCUITS BEFORE REMOVING CONDUITS, BOXES, LIGHT FIXTURES, ETC. AFFECTED CABLES SHALL BE DISCONNECTED FROM NEAREST PULL BOX OR ELECTRICAL PANEL, AND REMOVED FROM CONDUITS TO BE DEMOLISHED.

   FOR MECHANICAL PIPING CONTINUATION SEE MECHANICAL DRAWINGS.

   FOR YARD PIPING CONTINUATION SEE CIVIL DRAWINGS.

   FOR POTHOLE INFORMATION SEE SHEET W28.20-C-301.

12. SEE CIVIL DRAWING W28.20-C-047.D FOR OTHER DEMOLITION REQUIREMENTS.
13. EXISTING ELECTROILER TO BE RELOCATED. SEE DWG. W28.20-E-101 FOR NEW WORK.
14. EXISTING ELECTRICAL CONDUIT AND WIRES TO BE REMOVED AND RELOCATED TO AVOID NEW CONSTRUCTION AND RE-ESTABLISH CIRCUIT CONTINUITY.



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3" ON ORIGINAL DOCUMENT
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MH engineers, inc.
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

ELECTRICAL DEMOLITION PLAN

SCALE 1"=10'
DATE JAN2009

W28.20-E-040.D
DRAWING NUMBER

1
REV.

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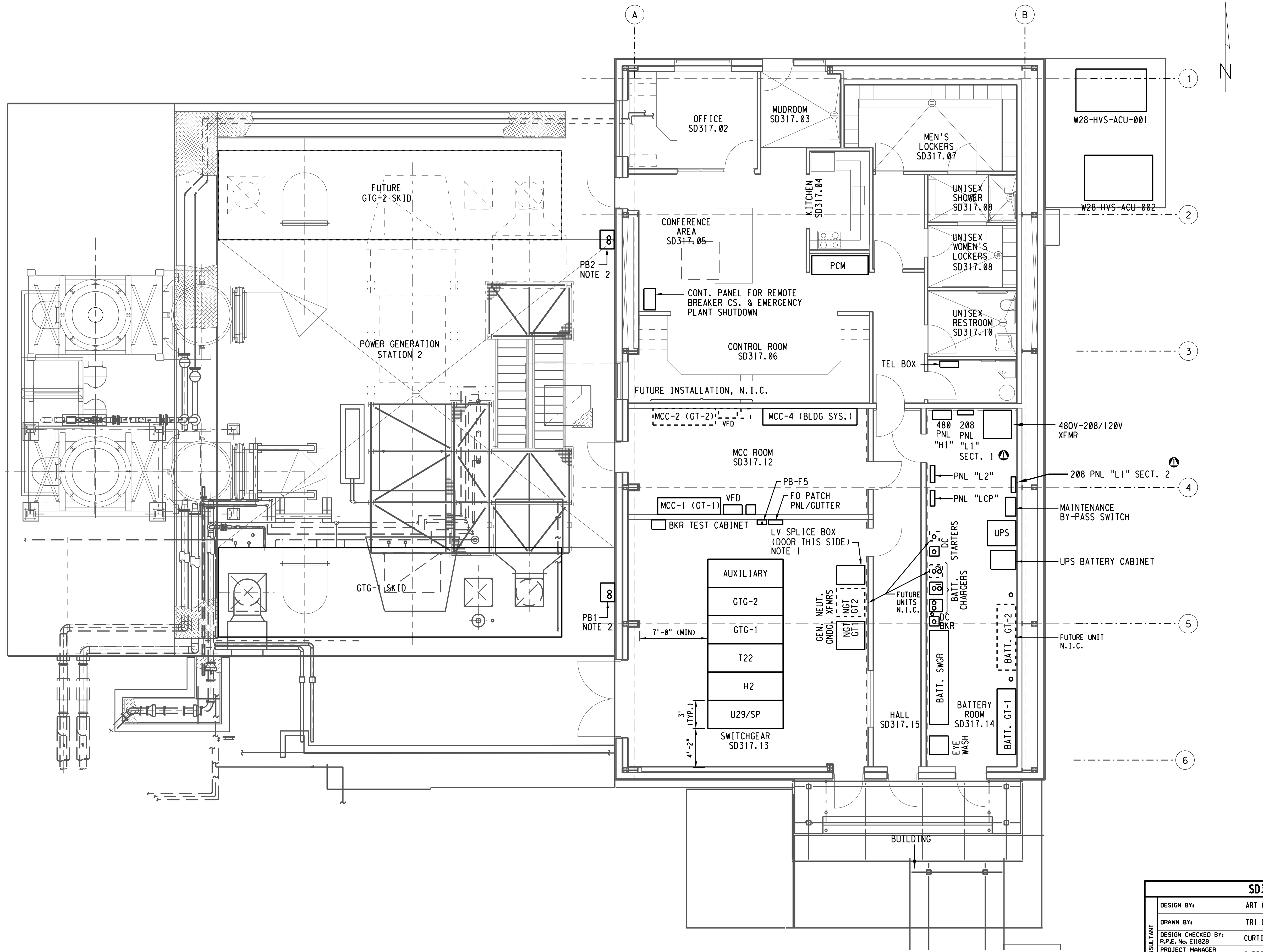
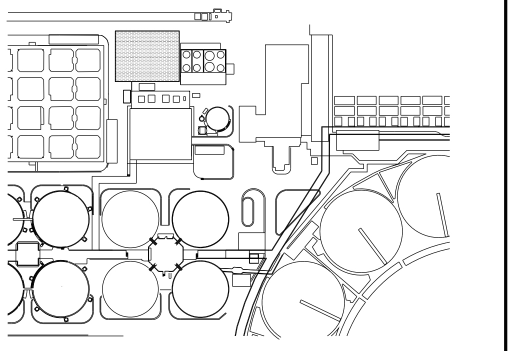


SHEET NOTES:

1. LV CABLE SPLICE BOX, NEMA TYPE 12, 12 GA, 72" H x 36" W x 24" D, SINGLE DOOR, SINGLE ACCESS, (HOFFMAN A-723636FS). PROVIDE FIBERGLASS CHANNEL SUPPORT (NEAR TOP AND BOTTOM) TO SECURE CABLES WITH HEAVY DUTY PLASTIC TIE-WRAPS.

2. MV CABLE PULLBOX, NEMA TYPE 4X, SS, 12 GA, 72" H x 25" W x 18" D, SINGLE DOOR, SINGLE ACCESS, (HOFFMAN A-72H2518SSFS), ON 2" HOUSEKEEPING PAD. PROVIDE FIBERGLASS CHANNEL SUPPORT (NEAR TOP AND BOTTOM) TO SECURE CABLES WITH HEAVY DUTY PLASTIC TIE-WRAPS.



KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	03/07/11	ADDED PANEL "L1" SECTION 2		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
EQUIPMENT ARRANGEMENT

SCALE 3/16'=1'
DATE MAR2011
W28.20-E-043
DRAWING NUMBER
2
REV.

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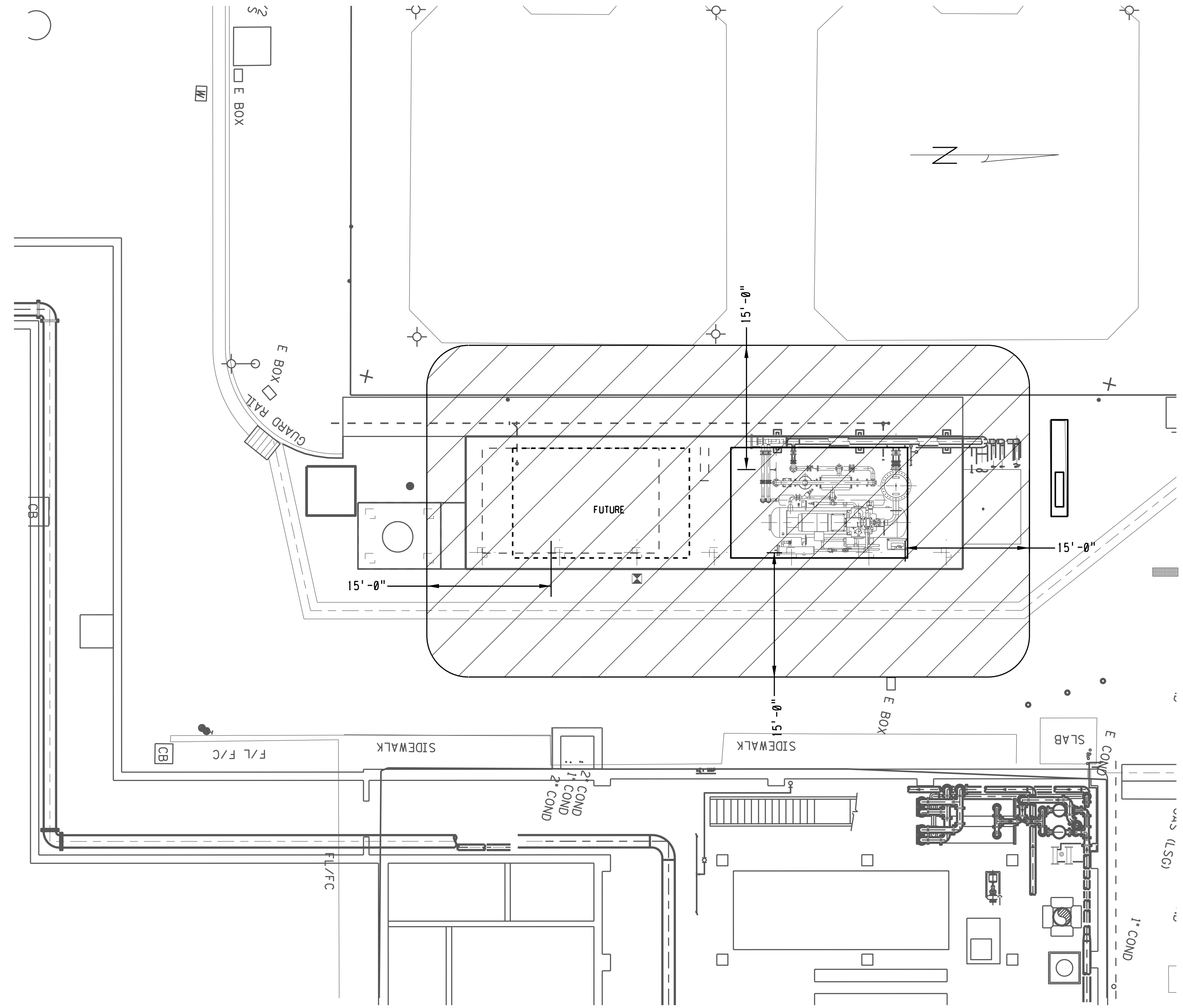


SHEET NOTES:

1. HAZARDOUS AREA CLASSIFICATION FOR GAS COMPRESSOR AREA:

   CLASS 1, DIVISION 1:

   a. WITHIN 5' IN ALL DIRECTIONS FROM RELIEF VALVES OR VENT DISCHARGE OPENINGS.

   b. DISCHARGE FROM RELIEF VALVES WITHIN 15 DEGREES OF LINE OF DISCHARGE.

   CLASS 1, DIVISION 2:

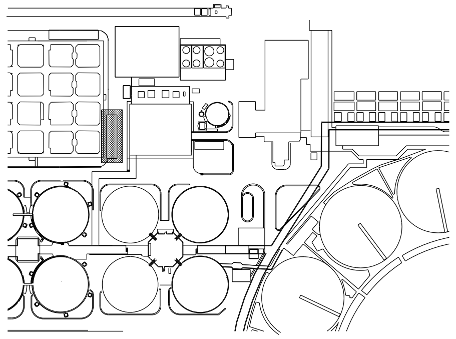
   a. WITHIN 15' FROM COMPRESSOR EQUIPMENT.

   b. BEYOND 5', BUT WITHIN 15' IN ALL DIRECTIONS FROM POINT OF DISCHARGE FROM RELIEF VALVES AND VENTS.

2. LOCATION OF RELIEF VALVES AND VENT DISCHARGE OPENINGS WILL BE DEPENDENT UPON EQUIPMENT FURNISHED.

LEGEND:

▩	CLASS 1, DIVISION 1 HAZARDOUS LOCATION
▨	CLASS 1, DIVISION 2 HAZARDOUS LOCATION



KEY MAP

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0 1 2 3

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
HAZARDOUS AREA CLASSIFICATION SITE PLAN
GAS COMPRESSOR LOCATION

SCALE 1/8"=1'
DATE JAN2009

W28.40-E-080
DRAWING NUMBER

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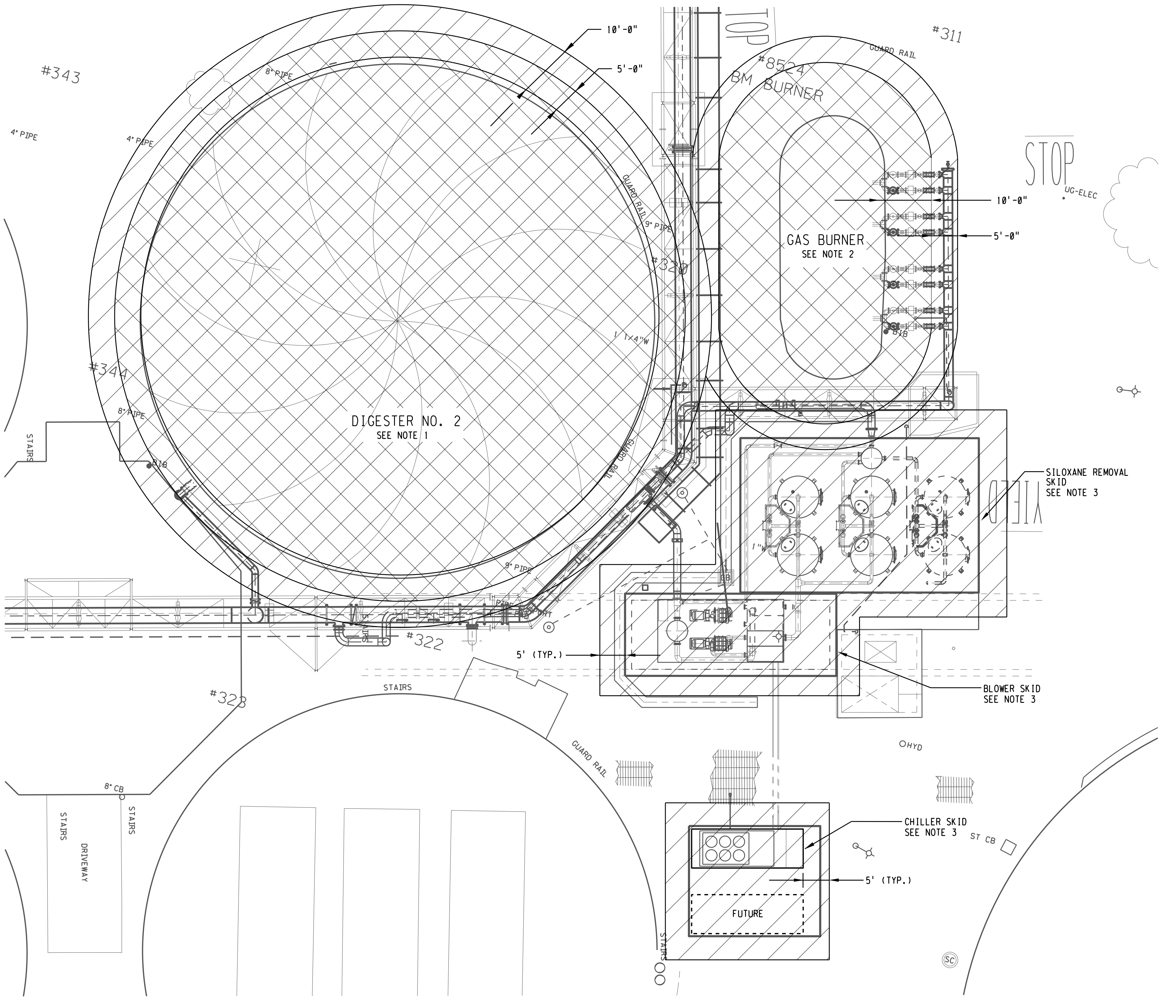


GENERAL NOTES:

1. HAZARDOUS AREA CLASSIFICATIONS AND BOUDARITIES SHALL BE IN ACCORDANCE WITH NFPA 820.

SHEET NOTES:

1. HAZARDOUS AREA CLASSIFICATIONS IN THE VICINITY OF DIGESTER NO.2

   CLASS 1, DIV.1: WITHIN TANK AND TO A HEIGHT OF 10' ABOVE MAXIMUM ELEVATION OF COVER AND TO A DISTANCE OF 5' BEYOND TANK WALLS.

   CLASS 1, DIV.2: 15' ABOVE DIVISION 1 AREA AND 5' BEYOND DIVISION 1 AREA AROUND TANK WALLS.

2. HAZARDOUS AREA CLASSIFICATIONS IN THE VICINITY OF THE GAS BURNER:

   CLASS 1, DIV.1: WITHIN 10' OF ALL FIXTURES, APPURTENANCES AND HOUSING.

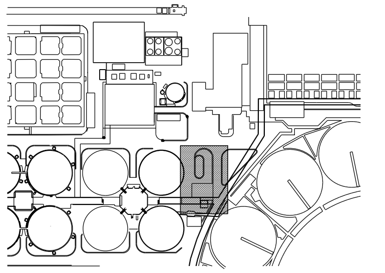
   CLASS 1, DIV.2: 19' ABOVE DIVISION 1 AREA AND 5' ON ALL SIDES.

3. HAZARDOUS AREA CLASSIFICATIONS FOR GAS CONDITIONING SKID EQUIPMENT:

   CLASS 1, DIV.2: 5' AROUND EQUIPMENT SKID.

LEGEND:

▦	CLASS 1, DIVISION 1 AREA
▨	CLASS 1, DIVISION 2 AREA



KEY MAP

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engineers, inc.
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carollo

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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
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	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
HAZARDOUS AREA CLASSIFICATION SITE PLAN
GAS CONDITIONING LOCATION

SCALE 1"=10'
DATE JAN2009
W28.40-E-081
DRAWING NUMBER
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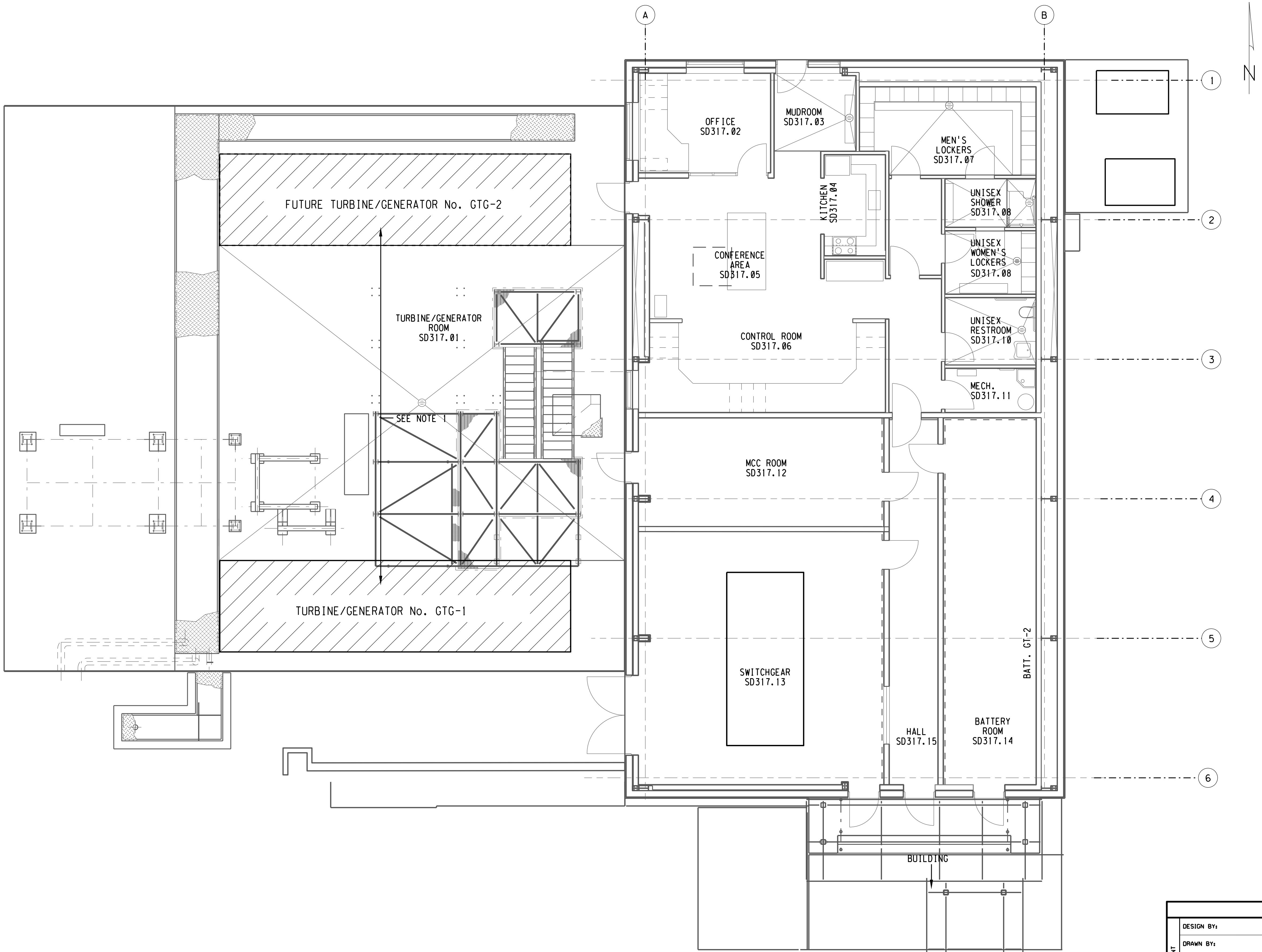


SHEET NOTES:

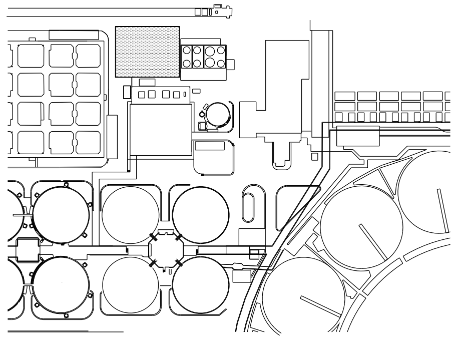
HAZARDOUS AREA CLASSIFICATION FOR TURBINE/GENERATOR AREA:

CLASS 1, DIVISION 2:

a. WITHIN TURBINE/GENERATOR ENCLOSURE.

LEGEND:

▨ CLASS 1, DIVISION 2 HAZARDOUS LOCATION



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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
⚠	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
HAZARDOUS AREA CLASSIFICATION SITE PLAN
TURNBINE/GENERATOR LOCATION

SCALE 3/16"=1'
DATE JAN2009

W28.20-E-082
DRAWING NUMBER

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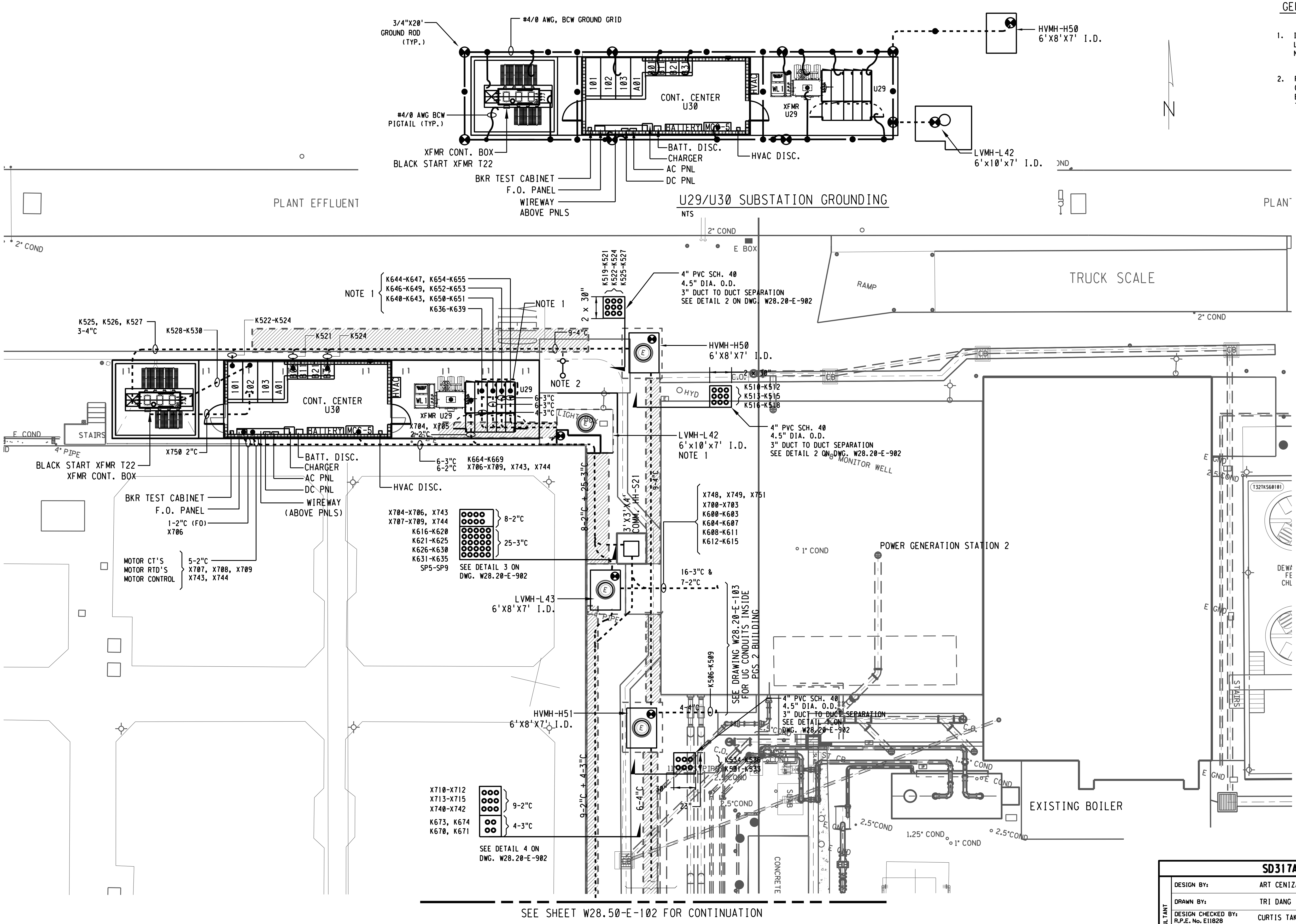


3/4"X20' GROUND ROD (TYP.)
#4/0 AWG, BCW GROUND GRID
#4/0 AWG BCW PIGTAIL (TYP.)
CONT. CENTER U30
101
102
103
A01
HVAC
BATTERY
MCC-5
WL1
XFMR U29
U29
HVMH-H50 6'X8'X7' I.D.
LVMH-L42 6'x10'x7' I.D.
XFMR CONT. BOX
BLACK START XFMR T22
BKR TEST CABINET
F.O. PANEL
WIREWAY ABOVE PNLS
BATT. DISC.
CHARGER
AC PNL
DC PNL
HVAC DISC.
U29/U30 SUBSTATION GROUNDING
NTS
N
PLANT EFFLUENT
PLAN
2" COND
E BOX
TRUCK SCALE
RAMP
4" PVC SCH. 40 4.5" DIA. O.D. 3" DUCT TO DUCT SEPARATION SEE DETAIL 2 ON DWG. W28.20-E-902
K519-K521 K522-K524 K525-K527
2 x 30"
NOTE 1
K644-K647, K654-K655 K646-K649, K652-K653 K640-K643, K650-K651 K636-K639
NOTE 1
K525, K526, K527 3-4"C
K528-K530
K522-K524
K521
K524
9-4"C
HVMH-H50 6'X8'X7' I.D.
NOTE 2
2 x 30"
HYD
K510-K512 K513-K515 K516-K518
4" PVC SCH. 40 4.5" DIA. O.D. 3" DUCT TO DUCT SEPARATION SEE DETAIL 2 ON DWG. W28.20-E-902
MONITOR WELL
6-3"C 6-3"C 4-3"C
X704, X705 2-2"C
LIGHT POLE
LVMH-L42 6'x10'x7' I.D. NOTE 1
6-3"C 6-2"C
K664-K669 X706-X709, X743, X744
E COND
STAIRS
4" PIPE
X750 2"C
BLACK START XFMR T22
XFMR CONT. BOX
BATT. DISC.
CHARGER
AC PNL
DC PNL
WIREWAY (ABOVE PNLS)
HVAC DISC.
BKR TEST CABINET
F.O. PANEL
1-2"C (FO) X706
MOTOR CT'S MOTOR RTD'S MOTOR CONTROL
5-2"C X707, X708, X709 X743, X744
X704-X706, X743 X707-X709, X744 K616-K620 K621-K625 K626-K630 K631-K635 SP5-SP9
8-2"C
25-3"C
SEE DETAIL 3 ON DWG. W28.20-E-902
8-2"C + 25-3"C
3'X3'X4' COMM. HH-S21
9-4"C
X748, X749, X751 X700-X703 K600-K603 K604-K607 K608-K611 K612-K615
1" COND
POWER GENERATION STATION 2
LVMH-L43 6'X8'X7' I.D.
16-3"C & 7-2"C
PIPE
SEE DRAWING W28.20-E-103 FOR UG CONDUITS INSIDE PGS 2 BUILDING
K506-K509
4" PVC SCH. 40 4.5" DIA. O.D. 3" DUCT TO DUCT SEPARATION SEE DETAIL 4 ON DWG. W28.20-E-902
HVMH-H51 6'X8'X7' I.D.
4-4"C
K534-K536 K531-K533
2.5"COND
1.5"COND
X710-X712 X713-X715 X740-X742
9-2"C
K673, K674 K670, K671
4-3"C
SEE DETAIL 4 ON DWG. W28.20-E-902
9-2"C + 4-3"C
6-4"C
30"
23"
SUMP
CONCRETE
C.O.
1" COND
E GND
2.5"COND
1.25" COND
1" COND
EXISTING BOILER
DEWA FE CHL
STAIRS
CB
2" COND
T32TK560101

SEE SHEET W28.50-E-102 FOR CONTINUATION

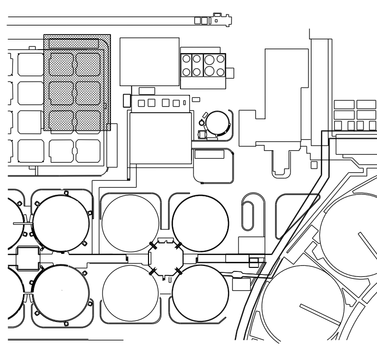
GENERAL NOTES:

1. INSTALLATION OF LVMH-L42 WILL REQUIRE RELOCATION OF (E) STREET LIGHT. FIELD DETERMINE THE NEW LOCATION AS CLOSE AS POSSIBLE TO THE NEW MANHOLE.

2. RELOCATED (E) ELECTROLIER. PROVIDE NEW CONCRETE FOUNDATION AND EXTEND CONDUIT AND CIRCUIT TO NEW ELECTROLIER LOCATION. CONTRACTOR TO ASSUME, FOR BID PURPOSES, THAT 200 LF OF 1 1/2"C PVC AND #6 AWG WIRE WILL BE REQUIRED TO RE-ESTABLISH LIGHTING CIRCUIT.

SHEET NOTES:

1. CONDUIT STUB-UP LOCATIONS NOT FIELD VERIFIED FOR RECORD DRAWINGS PREPARATION.



KEY MAP

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carollo

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2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	01/26/13	REVISED AS SHOWN & ADDED SHEET NOTE No. 1	CGT		

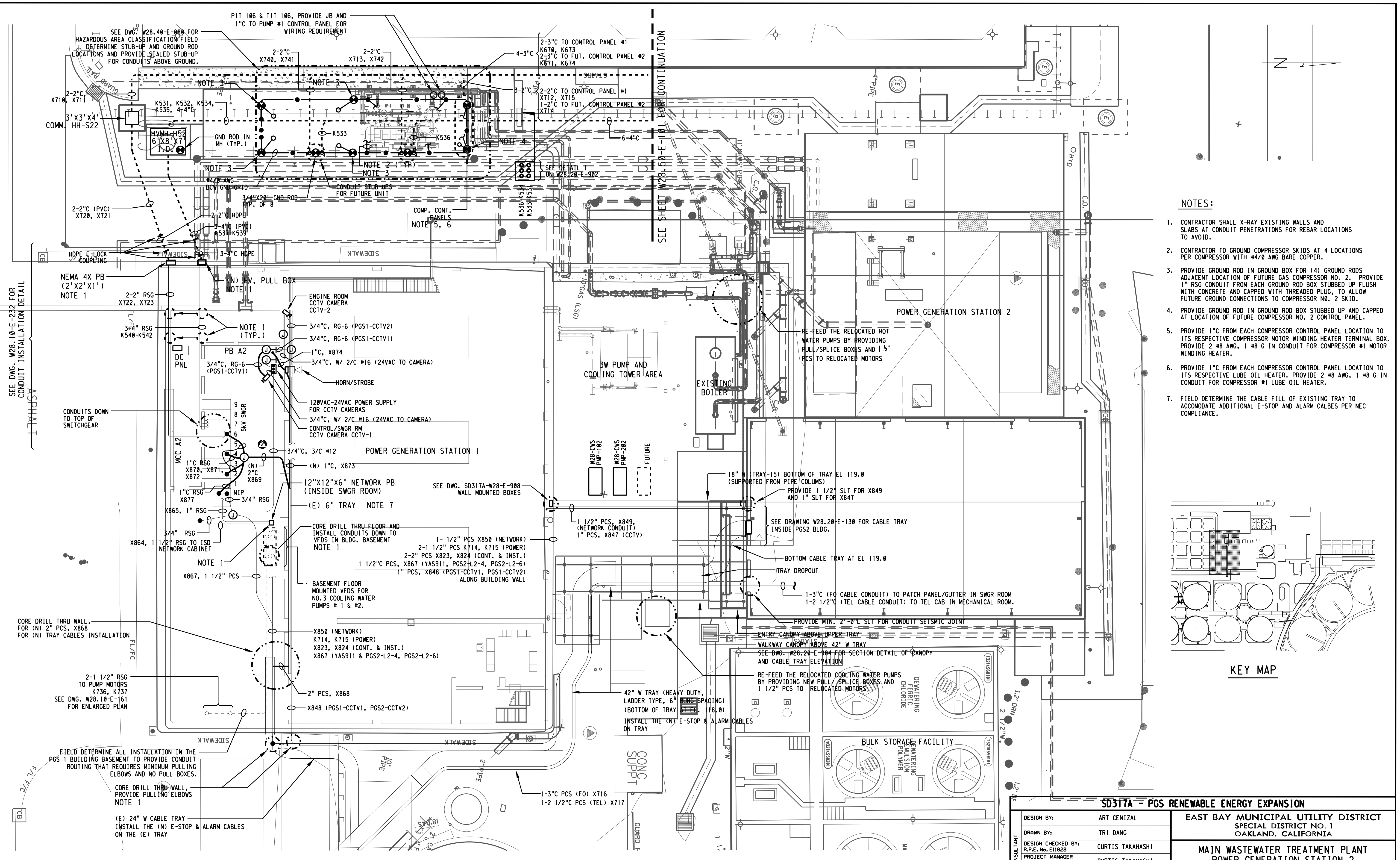
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
U29/U30 CONDUITS, MANHOLES AND GROUNDING
PGS 2 BUILDING AREA

SCALE 1"=10'
DATE JAN2009
W28.50-E-101
DRAWING NUMBER
2
REV.


SEE DWG. W28.40-E-080 FOR HAZARDOUS AREA CLASSIFICATION FIELD DETERMINE STUB-UP AND GROUND ROD LOCATIONS AND PROVIDE SEALED STUB-UP FOR CONDUITS ABOVE GROUND.
PIT 106 & TIT 106, PROVIDE JB AND 1"C TO PUMP #1 CONTROL PANEL FOR WIRING REQUIREMENT
2-2"C X740, X741
2-2"C X713, X742
4-3"C
2-3"C TO CONTROL PANEL #1 K670, K673
2-3"C TO FUT. CONTROL PANEL #2 K671, K674
3-2"C
2-2"C TO CONTROL PANEL #1 X712, X715
1-2"C TO FUT. CONTROL PANEL #2 X714
SEE SHEET W28.50-E-101 FOR CONTINUATION
6-4"C
2-2"C, X710, X711
GUARD RAIL
3'X3'X4' COMM. HH-S22
K531, K532, K534, K535, 4-4"C
HVMH-H52 6'X8'X7' I.D.
GND ROD IN MH (TYP.)
NOTE 3
K533
K536
NOTE 4
NOTE 2 (TYP)
#4/0 AWG BCW GND GRID
CONDUIT STUB UPS FOR FUTURE UNIT
3/4"X20' GND ROD TYP. OF 8
SEE DETAIL 1 ON W28.20-E-902
K536-K534
K533-K531
COMP. CONT. PANELS NOTE 5, 6
2-2"C (PVC) X720, X721
2-2"C HDPE
3-4"C (PVC) K537-K539
3-4"C HDPE
HDPE E-LOCK COUPLING
SIDEWALK
CB
NEMA 4X PB (2'X2'X1') NOTE 1
(N) HV, PULL BOX NOTE 1
2-2" RSG X722, X723
3-4" RSG K540-K542
NOTE 1 (TYP.)
SEE DWG. W28.10-E-232 FOR CONDUIT INSTALLATION DETAIL
ASPHALT
DC PNL
PB A2
ENGINE ROOM CCTV CAMERA CCTV-2
3/4"C, RG-6 (PGS1-CCTV2)
3/4"C, RG-6 (PGS1-CCTV1)
1"C, X874
3/4"C, W/ 2/C #16 (24VAC TO CAMERA)
3/4"C, RG-6 (PGS1-CCTV1)
HORN/STROBE
120VAC-24VAC POWER SUPPLY FOR CCTV CAMERAS
3/4"C, W/ 2/C #16 (24VAC TO CAMERA)
CONTROL/SWGR RM CCTV CAMERA CCTV-1
CONDUITS DOWN TO TOP OF SWITCHGEAR
5KV SWGR
MCC A2
3/4"C, 3/C #12
(N) 1"C, X873
POWER GENERATION STATION 1
1"C RSG X870, X871, X872
(N) 2"C X869
1"C RSG X877
MIP
3/4" RSG
12"X12"X6" NETWORK PB (INSIDE SWGR ROOM)
(E) 6" TRAY NOTE 7
X865, 1" RSG
3/4" RSG
X864, 1 1/2" RSG TO ISD NETWORK CABINET
CORE DRILL THRU FLOOR AND INSTALL CONDUITS DOWN TO VFDS IN BLDG. BASEMENT NOTE 1
NOTE 1
X867, 1 1/2" PCS
BASEMENT FLOOR MOUNTED VFDS FOR NO.3 COOLING WATER PUMPS # 1 & #2.
SEE DWG. SD317A-W28-E-908 WALL MOUNTED BOXES
1 1/2" PCS, X849, (NETWORK CONDUIT) 1" PCS, X847 (CCTV)
1- 1/2" PCS X850 (NETWORK)
2-1 1/2" PCS K714, K715 (POWER)
2-2" PCS X823, X824 (CONT. & INST.)
1 1/2"C PCS, X867 (YAS911, PGS2-L2-4, PGS2-L2-6)
1" PCS, X848 (PGS1-CCTV1, PGS1-CCTV2) ALONG BUILDING WALL
CORE DRILL THRU WALL, FOR (N) 2" PCS, X868 FOR (N) TRAY CABLES INSTALLATION
X850 (NETWORK)
K714, K715 (POWER)
X823, X824 (CONT. & INST.)
X867 (YAS911 & PGS2-L2-4, PGS2-L2-6)
2-1 1/2" RSG TO PUMP MOTORS K736, K737 SEE DWG. W28.10-E-161 FOR ENLARGED PLAN
2" PCS, X868
X848 (PGS1-CCTV1, PGS2-CCTV2)
FL/FC
FIELD DETERMINE ALL INSTALLATION IN THE PGS 1 BUILDING BASEMENT TO PROVIDE CONDUIT ROUTING THAT REQUIRES MINIMUM PULLING ELBOWS AND NO PULL BOXES.
CORE DRILL THRU WALL, PROVIDE PULLING ELBOWS NOTE 1
(E) 24" W CABLE TRAY INSTALL THE (N) E-STOP & ALARM CABLES ON THE (E) TRAY
10" PIPE
2" PIPE
1-3"C PCS (FO) X716
1-2 1/2"C PCS (TEL) X717
CONC SUPPT
GUARD RAIL
10"GAS (LSG)
3W PUMP AND COOLING TOWER AREA
EXISTING BOILER
W28-CWS PMP-102
W28-CWS PMP-202
FUTURE
RE-FEED THE RELOCATED HOT WATER PUMPS BY PROVIDING PULL/SPLICE BOXES AND 1½" PCS TO RELOCATED MOTORS
POWER GENERATION STATION 2
18" W (TRAY-15) BOTTOM OF TRAY EL 119.0 (SUPPORTED FROM PIPE COLUMS)
PROVIDE 1 1/2" SLT FOR X849 AND 1" SLT FOR X847
SEE DRAWING W28.20-E-130 FOR CABLE TRAY INSIDE PGS2 BLDG.
BOTTOM CABLE TRAY AT EL 119.0
TRAY DROPOUT
1-3"C (FO CABLE CONDUIT) TO PATCH PANEL/GUTTER IN SWGR ROOM
1-2 1/2"C (TEL CABLE CONDUIT) TO TEL CAB IN MECHANICAL ROOM.
PROVIDE MIN. 2'-0"L SLT FOR CONDUIT SEISMIC JOINT
ENTRY CANOPY ABOVE UPPER TRAY
WALKWAY CANOPY ABOVE 42" W TRAY
SEE DWG. W28.20-E-904 FOR SECTION DETAIL OF CANOPY AND CABLE TRAY ELEVATION
RE-FEED THE RELOCATED COOLING WATER PUMPS BY PROVIDING NEW PULL/ SPLICE BOXES AND 1 1/2" PCS TO RELOCATED MOTORS
42" W TRAY (HEAVY DUTY, LADDER TYPE, 6" RUNG SPACING) (BOTTOM OF TRAY AT EL. 118.0)
INSTALL THE (N) E-STOP & ALARM CABLES ON TRAY
DEWATERING FERRIC CHLORIDE
BULK STORAGE FACILITY
DEWATERING EMULSION POLYMER
1.2' DRN
2 1/2"W
4"PIPE
C.O.
HYD
CB
KEY MAP

NOTES:

1. CONTRACTOR SHALL X-RAY EXISTING WALLS AND SLABS AT CONDUIT PENETRATIONS FOR REBAR LOCATIONS TO AVOID.
2. CONTRACTOR TO GROUND COMPRESSOR SKIDS AT 4 LOCATIONS PER COMPRESSOR WITH #4/0 AWG BARE COPPER.
3. PROVIDE GROUND ROD IN GROUND BOX FOR (4) GROUND RODS ADJACENT LOCATION OF FUTURE GAS COMPRESSOR NO. 2. PROVIDE 1" RSG CONDUIT FROM EACH GROUND ROD BOX STUBBED UP FLUSH WITH CONCRETE AND CAPPED WITH THREADED PLUG, TO ALLOW FUTURE GROUND CONNECTIONS TO COMPRESSOR NO. 2 SKID.
4. PROVIDE GROUND ROD IN GROUND ROD BOX STUBBED UP AND CAPPED AT LOCATION OF FUTURE COMPRESSOR NO. 2 CONTROL PANEL.
5. PROVIDE 1"C FROM EACH COMPRESSOR CONTROL PANEL LOCATION TO ITS RESPECTIVE COMPRESSOR MOTOR WINDING HEATER TERMINAL BOX. PROVIDE 2 #8 AWG, 1 #8 G IN CONDUIT FOR COMPRESSOR #1 MOTOR WINDING HEATER.
6. PROVIDE 1"C FROM EACH COMPRESSOR CONTROL PANEL LOCATION TO ITS RESPECTIVE LUBE OIL HEATER. PROVIDE 2 #8 AWG, 1 #8 G IN CONDUIT FOR COMPRESSOR #1 LUBE OIL HEATER.
7. FIELD DETERMINE THE CABLE FILL OF EXISTING TRAY TO ACCOMODATE ADDITIONAL E-STOP AND ALARM CALBES PER NEC COMPLIANCE.

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3" ON ORIGINAL DOCUMENT
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
②	08/30/11	ADDED PGS1 REMOTE ALARM RESET PUSH BUTTON AT PGS2	CGT		
①	08/30/11	ADDED CONDUITS, BOXES, PGS1 E-STOP & PGS2 ALARM CKT	ASC		

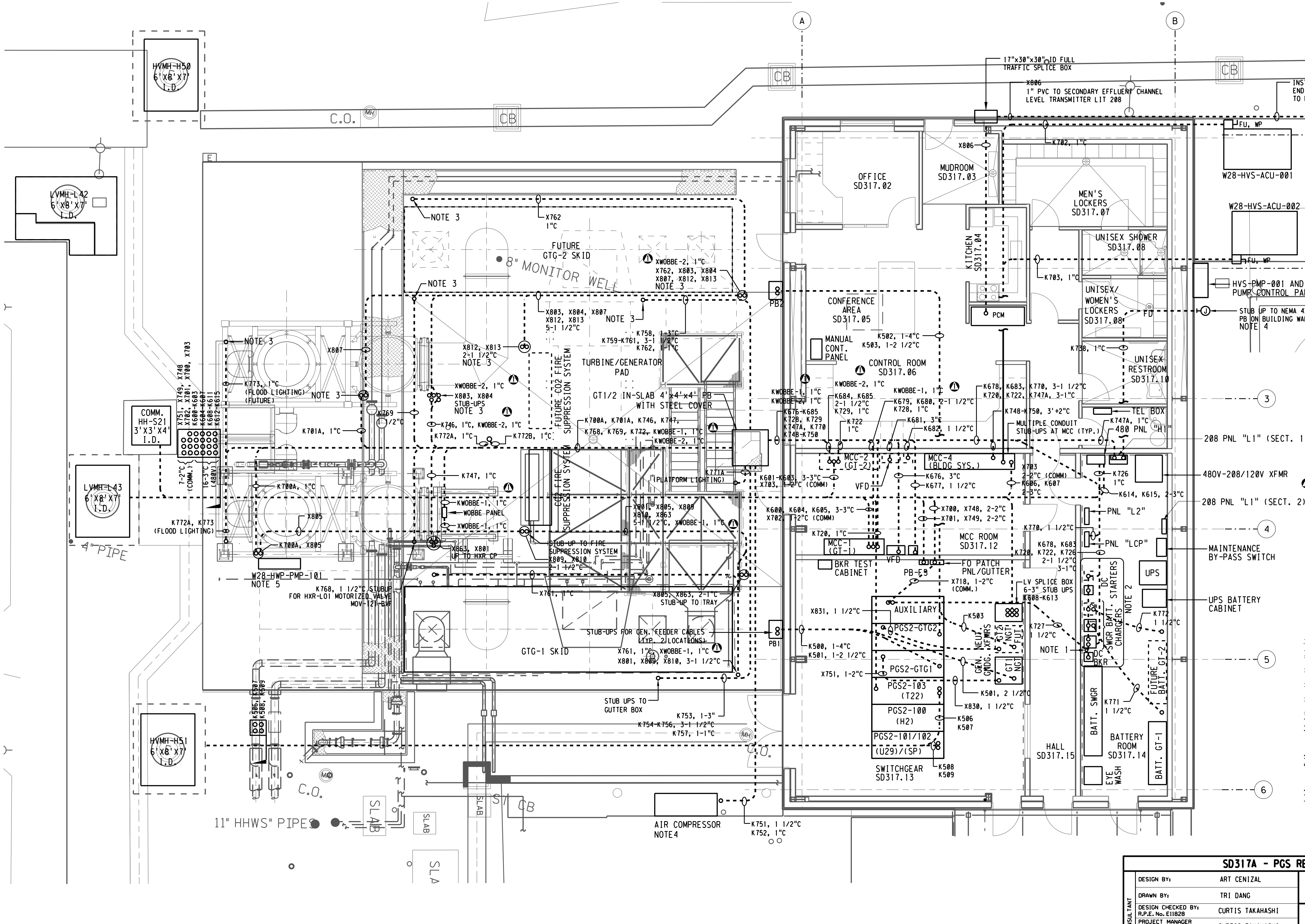
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 / PGS 2 AREA CONDUITS, TRAY AND GAS COMPRESSOR SKID GROUNDING PLAN

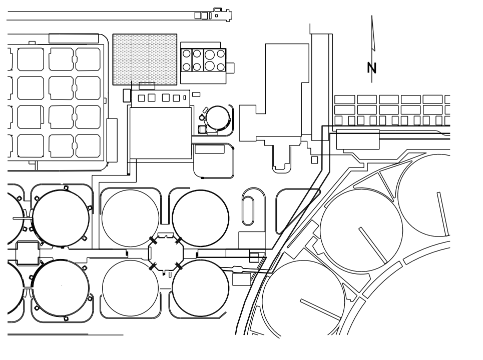
SCALE 1"=10'
DATE SEP2011
W28.50-E-102
DRAWING NUMBER
3
REV.



A
B
N
1
2
3
4
5
6
HVMH-H50 6'X8'X7' I.D.
LVMH-L42 6'X8'X7' I.D.
LVMH-L43 6'X8'X7' I.D.
HVMH-H51 6'X8'X7' I.D.
COMM. HH-S21 3'X3'X4' I.D.
C.O.
CB
MH
17"x30"x30" ID FULL TRAFFIC SPLICE BOX
X806 1" PVC TO SECONDARY EFFLUENT CHANNEL LEVEL TRANSMITTER LIT 208
INSTALL THE UNDERGROUND CONDUIT TO END OF TRUCK SCALE AND RUN PARALLEL TO NEW CW PIPE TO EFFLUENT CHANNEL
FU, WP
W28-HVS-ACU-001
W28-HVS-ACU-002
HVS-PMP-001 AND HOT WATER PUMP CONTROL PANEL
STUB UP TO NEMA 4X PB ON BUILDING WALL NOTE 4
OFFICE SD317.02
MUDROOM SD317.03
MEN'S LOCKERS SD317.07
KITCHEN SD317.04
UNISEX SHOWER SD317.08
UNISEX/ WOMEN'S LOCKERS SD317.08
UNISEX RESTROOM SD317.10
CONFERENCE AREA SD317.05
CONTROL ROOM SD317.06
MANUAL CONT. PANEL
MCC ROOM SD317.12
SWITCHGEAR SD317.13
HALL SD317.15
BATTERY ROOM SD317.14
PCM
TEL BOX
480 PNL "H1"
208 PNL "L1" (SECT. 1)
208 PNL "L1" (SECT. 2)
480V-208/120V XFMR
PNL "L2"
PNL "LCP"
MAINTENANCE BY-PASS SWITCH
UPS
UPS BATTERY CABINET
MCC-2 (GT-2)
MCC-4 (BLDG SYS.)
MCC-1 (GT-1)
VFD
BKR TEST CABINET
FO PATCH PNL/GUTTER
PB-E9
LV SPLICE BOX 6-3" STUB UPS K608-K613
AUXILIARY
PGS2-GTG2
PGS2-GTG1
PGS2-103 (T22)
PGS2-100 (H2)
PGS2-101/102 (U29)/(SP)
GEN. NEUT. GNDG. XFMRS
DC SWGR BATT. STARTERS CHARGERS NOTE 2
DC BKR
BATT. SWGR
FUTURE BATT. GT-2
BATT. GT-1
EYE WASH
NOTE 1
FUTURE GTG-2 SKID
8" MONITOR WELL
TURBINE/GENERATOR PAD
GT1/2 IN-SLAB 4'x4'x4' PB WITH STEEL COVER
FUTURE CO2 FIRE SUPPRESSION SYSTEM
CO2 FIRE SUPPRESSION SYSTEM
GTG-1 SKID
W28-HWP-PMP-101 NOTE 5
4" PIPE
11" HHWS" PIPES
AIR COMPRESSOR NOTE4
STUB UPS TO GUTTER BOX
STUB-UPS FOR GEN. FEEDER CABLES (TYP. 2 LOCATIONS)
STUB UP TO FIRE SUPPRESSION SYSTEM
X863, X801 UP TO HXR CP
K768, 1 1/2"C STUBUP FOR HXR-L01 MOTORIZED VALVE MOV-121-BVF
XWOBBE-2, 1"C X762, X803, X804 X807, X812, X813 NOTE 3
X803, X804, X807 X812, X813 5-1 1/2"C
X812, X813 2-1 1/2"C NOTE 3
XWOBBE-2, 1"C
X803, X804 STUB-UPS NOTE 3
K758, 1-3"C K759-K761, 3-1 1/2"C K762, 1-1"C
X762 1"C
NOTE 3
X807
K773, 1"C (FLOOD LIGHTING) (FUTURE)
K701A, 1"C
K769 1 1/2"C
K746, 1"C, KWOBBE-2, 1"C
K772A, 1"C
K772B, 1"C
K700A, K701A, K746, K747, K768, K769, K772, KWOBBE-1, 1"C KWOBBE-2, 1"C
K771A
(PLATFORM LIGHTING)
K747, 1"C
KWOBBE-1, 1"C
WOBBE PANEL
XWOBBE-1, 1"C
X801, X805, X809 X810, X863 5-1 1/2"C, XWOBBE-1, 1"C
K700A, 1"C
X805
K772A, K773 (FLOOD LIGHTING)
K700A, X805
X809, X810 3-1 1/2"C
X761, 1"C
X805, X863, 2-1"C STUB-UP TO TRAY
X761, 1"C, XWOBBE-1, 1"C X801, X809, X810, 3-1 1/2"C
K753, 1-3"
K754-K756, 3-1 1/2"C
K757, 1-1"C
K751, 1 1/2"C K752, 1"C
PB1
PB2
X751, X749, X748 X702, X701, X700, X703
K604-K603 K608-K611 K612-K615
7-2"C (COMM.)
6-3"C (480V)
K506, K507 K508, K509
X806
K702, 1"C
K703, 1"C
K738, 1"C
K502, 1-4"C K503, 1-2 1/2"C
KWOBBE-1, 1"C KWOBBE-2, 1"C
KWOBBE-2, 1"C
KWOBBE-1, 1"C
K676-K685 K728, K729 K747A, K770 K748-K750
K684, K685 2-1 1/2"C K729, 1"C
K722 1"C
K679, K680, 2-1 1/2"C K728, 1"C
K681, 3"C
K682, 1 1/2"C
K678, K683, K770, 3-1 1/2"C K720, K722, K747A, 3-1"C
K748-K750, 3'+2"C
MULTIPLE CONDUIT STUB-UPS AT MCC (TYP.)
K747A, 1"C
K601-K603, 3-3"C X703, 1-2"C (COMM)
K676, 3"C
K677, 1 1/2"C
X703 2-2"C (COMM) K606, K607 2-3"C
K726 1"C
K614, K615, 2-3"C
K600, K604, K605, 3-3"C X702, 1-2"C (COMM)
X700, X748, 2-2"C
X701, X749, 2-2"C
K720, 1"C
K770, 1 1/2"C
K678, K683 K720, K722, K726 2-1 1/2"C 3-1"C
X718, 1-2"C (COMM.)
X831, 1 1/2"C
K503
K727 1 1/2"C
K772 1 1/2"C
K500, 1-4"C K501, 1-2 1/2"C
X751, 1-2"C
K501, 2 1/2"C
X830, 1 1/2"C
K506 K507
K508 K509
K771 1 1/2"C
SLAB

NOTES:

1. POWER DISTRIBUTION BLOCK BOX BELOW CHARGER.
2. SEE DRAWING W28.20-E-906 FOR BATTERY CHARGER AND DC STARTER MOUNTING DETAIL.
3. TERMINATE CONDUIT IN A COUPLING FLUSHED WITH CONCRETE FLOOR. PROVIDE THREADED CONDUIT PLUG.
4. WHEN NOT PROVIDED WITH THE PACKAGE UNIT, PROVIDE OUTDOOR, HEAVY DUTY SAFETY SWITCHES IN SS NEMA 4X ENCLOSURE.
5. PROVIDE OUTDOOR PUSHBUTTON STATION, WITH LOCKOUT PROVISION FOR PUMP MAINTENANCE.
6. SEE MECHANICAL DWG. & VENDORS DWG. FOR WOBBE INDEX PANEL LOCATIONS AND CONDUIT STUB-UPS LOCATION, REFER ALSO WOBBE INDEX METER SUPPLIER AND SOLAR DRAWINGS FOR REQUIRED INSTRUMENTATION AND CONTROL CABLES BETWEEN WOBBE METER PANEL AND TURBINE CONTROL PANEL.



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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
①	08/14/09	ADD WOBBE CONDUITS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

PGS 2 BUILDING UG CONDUIT

SCALE 3/16'=1'
DATE JAN2009

W28.20-E-103
DRAWING NUMBER

2
REV.

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DATE: 06-OCT-2014 16:02
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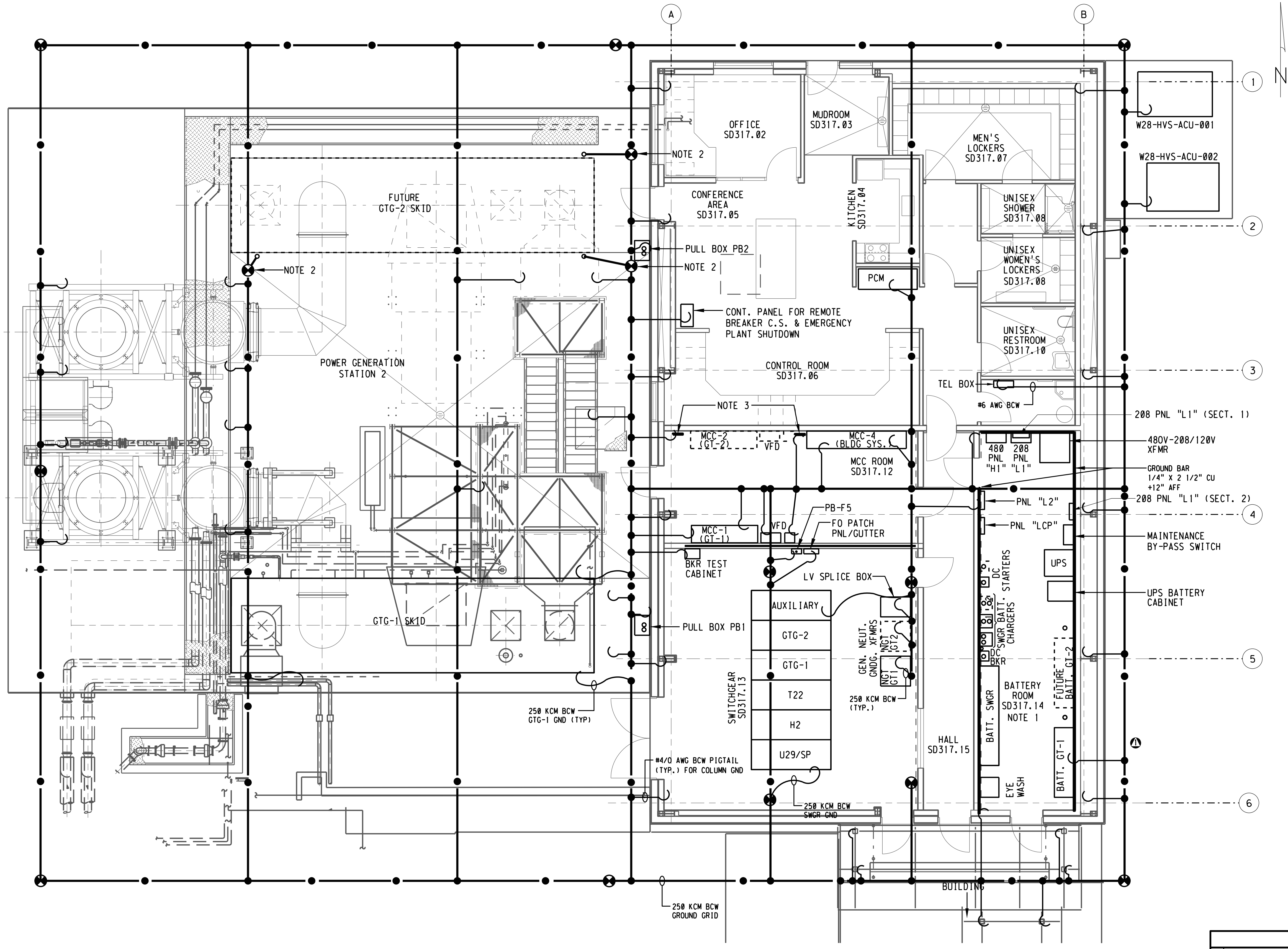
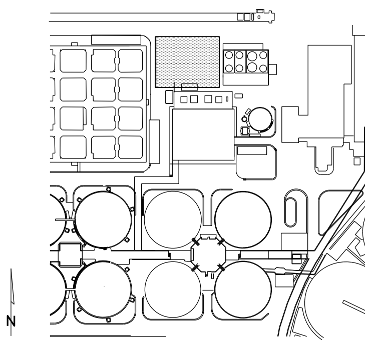


SHEET NOTES:

1. BOND ALL EQUIPMENT IN THIS ROOM TO THE GROUND BAR UTILIZING #2/0 AWG BCW. PROVIDE 2-HOLE CABLE LUGS.
2. PROVIDE GROUND ROD IN GROUND ROD BOX FOR GROUND CONNECTIONS TO FUTURE GTG2 SKID. PROVIDE 1" RSG CONDUIT FROM EACH GROUND ROD BOX STUBBED UP FLUSH WITH CONCRETE, WITH THREADED PLUG, FOR FUTURE GROUND CONNECTION.
3. PROVIDE 1/4" x 2 1/2" x 12" LONG CU GROUND BAR. SECURED WITH STAINLES STEEL "L" SUPPORT BAR 8" AFF, 6" FROM WALL, FOR GROUNDING OF FUTURE MCC AND VFD'S.



KEY MAP

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NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	09/01/09	ADDED PIGTAIL AT BATT. RM GND BAR	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

PGS 2 BUILDING GROUNDING SYSTEM

SCALE 3/16'=1'
DATE JAN2009
W28.20-E-104
DRAWING NUMBER
2
REV.

CONDUIT No.	CONDUIT SIZE	CONDUCTORS		FROM	TO	REMARKS	CIRCUIT I.D.
		CABLE I.D.	CABLE SIZE				
K500	4" PVC	GT1-A∅, GT1-B∅, GT1-C∅	3-350 KCM, 15 KV, CU	PB1	15KV SWGR GT1 CUBICLE	GT1 PHASE COND.	GT1-12KV-PH
K501	2 1/2" PVC	GT1-NEUT	1-350 KCM, 15 KV, CU	PB1	GT1 NEUT GROUNDING XFMR	GT1 NEUT COND.	GT1-12KV-NEUT
K502	4" PVC			PB2	15KV SWGR GT2 CUBICLE	FUTURE GT2 PHASE COND.	
K503	2 1/2" PVC			PB2	FUT GT2 NEUT GROUNDING XFMR	FUTURE GT2 NEUT COND.	
K506	4" PVC	T22-A∅, T22-B∅, T22-C∅	3-350 KCM, 15 KV, CU, 1-1/0 G	HVMH-H51	15 KV SWGR T22 CUBICLE	XFMR T22 PRIMARY FEEDER	T22-12KV-FEEDER NO. 1
K507	4" PVC	T22-A∅, T22-B∅, T22-C∅	3-350 KCM, 15 KV, CU, 1-1/0 G	HVMH-H51	15 KV SWGR T22 CUBICLE	XFMR T22 PRIMARY FEEDER	T22-12KV-FEEDER NO. 1
K508	4" PVC	U29-A∅, U29-B∅, U29-C∅	3-#2 AWG, 15 KV, CU, 1-#2 G	HVMH-H51	15 KV SWGR U29 CUBICLE	XFMR U29 PRIMARY FEEDER	TU29-12KV FEEDER
K509	4" PVC			HVMH-H51	15 KV SWGR U29 CUBICLE	SPARE	
K510	4" PVC	U29-A∅, U29-B∅, U29-C∅	3-#2 AWG, 15 KV, CU, 1-#2 G	HVMH-H51	HVMH-H50	XFMR U29 PRIMARY FEEDER	TU29-12KV FEEDER
K511	4" PVC			HVMH-H51	HVMH-H50	FUTURE COMP. MOTOR #2, 5 KV FEEDER	CMP-201MTR-5KV FEEDER
K512	4" PVC	CMP1-A∅, CMP1-B∅, CMP1-C∅	3-#2/O AWG, 5 KV, CU, 1-1/0 G	HVMH-H51	HVMH-H50	COMP. MOTOR #1, 5 KV FEEDER	CMP-101MTR-5KV FEEDER
K513	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	HVMH-H50	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 1
K514	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	HVMH-H50	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 2
K515	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	HVMH-H50	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 3
K516	4" PVC	T22-A∅, T22-B∅, T22-C∅	3-350 KCM, 15 KV, CU, 1-1/0 G	HVMH-H51	HVMH-H50	XFMR T22 PRIMARY FEEDER	T22-12KV-FEEDER NO. 1
K517	4" PVC	T22-A∅, T22-B∅, T22-C∅	3-350 KCM, 15 KV, CU, 1-1/0 G	HVMH-H51	HVMH-H50	XFMR T22 PRIMARY FEEDER	T22-12KV-FEEDER NO. 2
K518	4" PVC			HVMH-H51	HVMH-H50	SPARE	
K519	4" PVC	U29-A∅, U29-B∅, U29-C∅	3-#2 AWG, 15 KV, CU, 1-#2 G	HVMH-H50	U29 XFMR PRIM. TERM. CAB	U29 XFMR PRIMARY FEEDER	TU29-12KV FEEDER
K520	4" PVC			HVMH-H50	5 KV MCC UNIT 2	FUTURE COMP. MOTOR FEEDER	
K521	4" PVC	CMP1-A∅, CMP1-B∅, CMP1-C∅	3-#2/O AWG, 5 KV, CU, 1-1/0 G	HVMH-H50	5 KV MCC UNIT 1	COMP. MOTOR #1, 5 KV FEEDER	CMP-101MTR-5KV FEEDER
K522	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H50	5 KV SWGR UNIT #1	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 1
K523	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H50	5 KV SWGR UNIT #1	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 2
K524	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H50	5 KV SWGR UNIT #1	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 3
K525	4" PVC	T22-A∅, T22-B∅, T22-C∅	3-350 KCM, 15 KV, CU, 1-1/0 G	HVMH-H50	T22 PRIM. TERM. CAB	XFMR T22 PRIMARY FEEDER	T22-12KV-FEEDER NO. 1
K526	4" PVC	T22-A∅, T22-B∅, T22-C∅	3-350 KCM, 15 KV, CU, 1-1/0 G	HVMH-H50	T22 PRIM. TERM. CAB	XFMR T22 PRIMARY FEEDER	T22-12KV-FEEDER NO. 2
K527	4" PVC			HVMH-H50	T22 PRIM. TERM. CAB	SPARE	
K528	4" PVC	U30-A∅, U30-B∅, U30-C∅	3-500 KCM, 5 KV, CU	T22 SEC. TERM. CAB	U30 SWGR, UNIT #2	5 KV FEEDER, T22 TO U30	T22-5KV-FEEDER NO. 1
K529	4" PVC	U30-A∅, U30-B∅, U30-C∅	3-500 KCM, 5 KV, CU	T22 SEC. TERM. CAB	U30 SWGR, UNIT #2	5 KV FEEDER, T22 TO U30	T22-5KV-FEEDER NO. 2
K530	4" PVC	U30-A∅, U30-B∅, U30-C∅	3-500 KCM, 5 KV, CU	T22 SEC. TERM. CAB	U30 SWGR, UNIT #2	5 KV FEEDER, T22 TO U30	T22-5KV-FEEDER NO. 3
K531	4" PVC			HVMH-H51	HVMH-H52	SPARE	
K532	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	HVMH-H52	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 1
K533	4" PVC			HVMH-H51	CMP-2 STUB UP	FUTURE COMP. MOTOR FEEDER	
K534	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	HVMH-H52	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 2
K535	4" PVC	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	HVMH-H52	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 3
K536	4" PVC	CMP1-A∅, CMP1-B∅, CMP1-C∅	3-#2/O AWG, 5 KV, CU, 1-1/0 G	HVMH-H51	CMP-1 TERMINAL BOX	COMP. MOTOR #1, 5 KV FEEDER	CMP-101MTR-5KV FEEDER
K537	4" PVC/HDPE/PCS	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	NEMA 4X CAB	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 1
K538	4" PVC/HDPE/PCS	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	NEMA 4X CAB	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 2
K539	4" PVC/HDPE/PCS	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	HVMH-H51	NEMA 4X CAB	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 3
K540	4" RSG	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	NEMA 4X CAB	5 KV SWITCHGEAR UNIT 7	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 1
K541	4" RSG	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	NEMA 4X CAB	5 KV SWITCHGEAR UNIT 7	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 2
K542	4" RSG	PGS1-A∅, PGS1-B∅, PGS1-C∅	3-500 KCM, 5 KV, CU, 1-3/0 G	NEMA 4X CAB	5 KV SWITCHGEAR UNIT 7	PGS 1 FEEDER, 5 KV	PGS1-5KV-FEEDER NO. 3
K543	4" RSG	GT1-A∅, GT1-B∅, GT1-C∅	3-350 KCM, 15 KV, CU	GT1 SKID	PB1	GT1 PHASE COND.	GT1-12KV-PH
K544	2 1/2" RSG	GT1 NEUT	1-350 KCM, 15 KV, CU	GT1 SKID	PB1	GT1 NEUT COND.	GT1-12KV-NEUT
K549	5" PVC/RSG	PGS2 FDR 1B, A∅, B∅, C∅	3-500 KCM, 15 KV, CU, 1-2/0 G	ENCLOSURE CABINET AT DIGESTER 2	PB IN GALLERY AT EQUIPT HATCH	MAIN FEEDER PGS2-H2A SWGR	PGS2-H2A MAIN FEEDER
K550	5" PVC/RSG	PGS2 FDR 1B, A∅, B∅, C∅	3-500 KCM, 15 KV, CU, 1-2/0 G	ENCLOSURE CABINET AT DIGESTER 2	PB IN GALLERY AT EQUIPT HATCH	MAIN FEEDER PGS2-H2A SWGR	PGS2-H2A MAIN FEEDER
K551	5" RSG	PGS2 FDR 1B, A∅, B∅, C∅	3-500 KCM, 15 KV, CU, 1-2/0 G	PB IN GALLERY AT EQUIPT HATCH	PB'S IN GALLERY	MAIN FEEDER PGS2-H2A SWGR	PGS2-H2A MAIN FEEDER
K552	4" PVC	PGS2 FDR 1B, A∅, B∅, C∅	3-500 KCM, 15 KV, CU, 1-2/0 G	PB IN GALLERY AT EQUIPT HATCH	PB'S IN GALLERY	MAIN FEEDER PGS2-H2A SWGR	PGS2-H2A MAIN FEEDER

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME

PLOT SCALE: 0.1676631

USER: vuong
DATE: 10-SEP-2014 14:46
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\[illegible] with NEW DRAWING NAME.9-4-14\W2820E120.01

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NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012	RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
MEDIUM VOLTAGE POWER

SCALE NONE
DATE JAN2009

W28.20-E-120
DRAWING NUMBER

1
REV.

CONDUIT No.	CONDUIT SIZE	CONDUCTORS		FROM	TO	REMARKS	CIRCUIT I.D.
		CABLE I.D.	CABLE SIZE				
K600	3" PVC			LVMH-L43	MCC-1	SPARE	
K601	3" PVC			LVMH-L43	MCC-2	SPARE	
K602	3" PVC			LVMH-L43	MCC-2	480V FEEDER MAIN, MCC-2 (GT2) MOTOR CONTROL CENTER (FUTURE)	
K603	3" PVC			LVMH-L43	MCC-2	480V FEEDER MAIN, MCC-2 (GT2) MOTOR CONTROL CENTER (FUTURE)	
K604	3" PVC	MCC1-AØ, MCC1-BØ, MCC1-CØ, GND	3-350 KCM, + 1#2 G, 600V, CU	LVMH-L43	MCC-1	480V FEEDER MAIN, MCC-1 (GT1) MOTOR CONTROL CENTER	MCC-1 FEEDER MAIN NO. 1
K605	3" PVC	MCC1-AØ, MCC1-BØ, MCC1-CØ, GND	3-350 KCM, + 1#2 G, 600V, CU	LVMH-L43	MCC-1	480V FEEDER MAIN, MCC-1 (GT1) MOTOR CONTROL CENTER	MCC-1 FEEDER MAIN NO. 2
K606	3" PVC	MCC4-AØ, MCC4-BØ, MCC4-CØ, GND	3-350 KCM, + #2 G, 600V, CU	LVMH-L43	MCC-4	480V FEEDER MAIN, AUXILIARIES MOTOR CONTROL CENTER	MCC-4 FEEDER MAIN NO. 1
K607	3" PVC	MCC4-AØ, MCC4-BØ, MCC4-CØ, GND	3-350 KCM, + #2 G, 600V, CU	LVMH-L43	MCC-4	480V FEEDER MAIN, AUXILIARIES MOTOR CONTROL CENTER	MCC-4 FEEDER MAIN NO. 2
K608	3" PVC	BLW-AØ, BLW-BØ, BLW-CØ	3-500 KCM, + #1/0 G, 600V, CU	LVMH-L43	SPLICE BOX, TRAY-14	480V FEEDER, GAS CONDITIONING SKID, BLOWERS	DG-BLOWERS-FEEDER NO. 1
K609	3" PVC	BLW-AØ, BLW-BØ, BLW-CØ	3-500 KCM, + #1/0 G, 600V, CU	LVMH-L43	SPLICE BOX, TRAY-14	480V FEEDER, GAS CONDITIONING SKID, BLOWERS	DG-BLOWERS-FEEDER NO. 2
K610	3" PVC			LVMH-L43	SPLICE BOX, TRAY-14	SPARE	
K611	3" PVC	CHU-AØ, CHU-BØ, CHU-CØ	3-500 KCM, + #1/0 G, 600V, CU	LVMH-L43	SPLICE BOX, TRAY-14	480V FEEDER, GAS CONDITIONING SKID, CHILLERS	DG-CHU-001 FEEDER NO. 1
K612	3" PVC	CHU-AØ, CHU-BØ, CHU-CØ	3-500 KCM, + #1/0 G, 600V, CU	LVMH-L43	SPLICE BOX, TRAY-14	480V FEEDER, GAS CONDITIONING SKID, CHILLERS	DG-CHU-001 FEEDER NO. 2
K613	3" PVC			LVMH-L43	SPLICE BOX, TRAY-14	SPARE	
K614	3" PVC	X, Y, Z, N, GRND	4-250 KCM, + #2 G, 600V, CU	LVMH-L43	480V PANEL "H1"	480V FEEDER - 480/277V PANEL "H1"	480V PANEL MAIN FEEDER NO. 1
K615	3" PVC	X, Y, Z, N, GRND	4-250 KCM, + #2 G, 600V, CU	LVMH-L43	480V PANEL "H1"	480V FEEDER - 480/277V PANEL "H1"	480V PANEL MAIN FEEDER NO. 2
K616	3" PVC			LVMH-L43	LVMH-L42	SPARE	
K617	3" PVC			LVMH-L43	LVMH-L42	SPARE	
K618	3" PVC			LVMH-L43	LVMH-L42	SPARE	
K619	3" PVC	MCC1-AØ, MCC1-BØ, MCC1-CØ, GND	3-350 KCM, + 1#2 G, 600V, CU	LVMH-L43	LVMH-L42	MCC-1 FEEDER	MCC-1 FEEDER MAIN NO. 1
K620	3" PVC	MCC1-AØ, MCC1-BØ, MCC1-CØ, GND	3-350 KCM, + 1#2 G, 600V, CU	LVMH-L43	LVMH-L42	MCC-1 FEEDER	MCC-1 FEEDER MAIN NO. 2
K621	3" PVC			LVMH-L43	LVMH-L42	SPARE	
K622	3" PVC			LVMH-L43	LVMH-L42	FUTURE MCC-2 FEEDER	
K623	3" PVC			LVMH-L43	LVMH-L42	FUTURE MCC-2 FEEDER	
K624	3" PVC	MCC4-AØ, MCC4-BØ, MCC4-CØ, GND	3-350 KCM, + 1#2 G, 600V, CU	LVMH-L43	LVMH-L42	MCC-4 FEEDER	MCC-4 FEEDER MAIN NO. 1
K625	3" PVC	MCC4-AØ, MCC4-BØ, MCC4-CØ, GND	3-350 KCM, + 1#2 G, 600V, CU	LVMH-L43	LVMH-L42	MCC-4 FEEDER	MCC-4 FEEDER MAIN NO. 2
K626	3" PVC	PMP-101-AØ , PMP-101-BØ , PMP-101-CØ	3-1/C #8 AWG + 1 #8 G	LVMH-L43	LVMH-L42	LUBE OIL PUMP FEEDER FOR DIGESTER GAS COMPRESSOR NO.1	DG-PMP-101 FEEDER
K627	3" PVC	BLW-AØ, BLW-BØ, BLW-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L43	LVMH-L42	GAS CONDITIONING BLOWERS	DG-BLOWERS- FEEDER NO. 1
K628	3" PVC	BLW-AØ, BLW-BØ, BLW-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L43	LVMH-L42	GAS CONDITIONING BLOWERS	DG-BLOWERS- FEEDER NO. 2
K629	3" PVC	CHU-AØ, CHU-BØ, CHU-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L43	LVMH-L42	GAS CONDITIONING CHILLERS	DG-CHU-001 FEEDER NO. 1
K630	3" PVC	CHU-AØ, CHU-BØ, CHU-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L43	LVMH-L42	GAS CONDITIONING CHILLERS	DG-CHU-001 FEEDER NO. 2
K631	3" PVC			LVMH-L43	LVMH-L42	FUT LUBE OIL PUMP FEEDER FOR DIGESTER GAS COMPRESSOR NO.2	DG-PMP-201 FEEDER
K632	3" PVC	DG-CMP-101 AUXILIARIES	6-1/C #8 AWG + 1 #8 G	LVMH-L43	LVMH-L42	120 VAC CONTROL POWER, LUBE OIL HTR, SPACE HTR CMP #1	GAS COMPRESSOR #1 AUXILIARIES
K633	3" PVC			LVMH-L43	LVMH-L42	120 VAC CONTROL POWER, LUBE OIL HTR, SPACE HTR CMP #2	
K634	3" PVC	X, Y, Z, N, GND	4-250 KCM + #2 G, 600V, CU	LVMH-L43	LVMH-L42	480V FEEDER - 480/277V PANEL "H1"	480V PANEL MAIN FEEDER NO. 1
K635	3" PVC	X, Y, Z, N, GND	4-250 KCM + #2 G, 600V, CU	LVMH-L43	LVMH-L42	480V FEEDER - 480/277V PANEL "H1"	480V PANEL MAIN FEEDER NO. 2
SP5	3"			LVMH-L43	LVMH-L42	SPARE	
SP6	3"			LVMH-L43	LVMH-L42	SPARE	
SP7	3"			LVMH-L43	LVMH-L42	SPARE	
SP8	3"			LVMH-L43	LVMH-L42	SPARE	
SP9	3"			LVMH-L43	LVMH-L42	SPARE	
K636	3" PVC			LVMH-L42	U29	SPARE	
K637	3" PVC			LVMH-L42	U29	SPARE	
K638	3" PVC			LVMH-L42	U29	SPARE	
K639	3" PVC			LVMH-L42	U29	SPARE	
K640	3" PVC	MCC1-AØ, MCC1-BØ, MCC1-CØ, GND	3-350 KCM + 1#2 G, 600V, CU	LVMH-L42	U29	MCC-1 FEEDER	MCC-1 FEEDER MAIN NO. 1
K641	3" PVC	MCC1-AØ, MCC1-BØ, MCC1-CØ, GND	3-350 KCM + 1#2 G, 600V, CU	LVMH-L42	U29	MCC-1 FEEDER	MCC-1 FEEDER MAIN NO. 2
K642	3" PVC	MCC4-AØ, MCC4-BØ, MCC4-CØ, GND	3-350 KCM + 1#2 G, 600V, CU	LVMH-L42	U29	MCC-4 FEEDER	MCC-4 FEEDER MAIN NO. 1
K643	3" PVC	MCC4-AØ, MCC4-BØ, MCC4-CØ, GND	3-350 KCM + 1#2 G, 600V, CU	LVMH-L42	U29	MCC-4 FEEDER	MCC-4 FEEDER MAIN NO. 2
K644	3" PVC	BLW-AØ, BLW-BØ, BLW-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L42	U29	GAS CONDITIONING BLOWERS	DG-BLOWERS-FEEDER NO. 1
K645	3" PVC	BLW-AØ, BLW-BØ, BLW-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L42	U29	GAS CONDITIONING BLOWERS	DG-BLOWERS-FEEDER NO. 2
K646	3" PVC			LVMH-L42	U29	SPARE	
K647	3" PVC			LVMH-L42	U29	SPARE	
K648	3" PVC			LVMH-L42	U29	FUTURE MCC-2	
K649	3" PVC			LVMH-L42	U29	FUTURE MCC-2	
K650	3" PVC	MCC5-AØ, MCC5-BØ, MCC5-CØ, GND	3-350 KCM + 1#2 G, 600V, CU	LVMH-L42	U29	MCC-5	MCC-5 MAIN
K651	3" PVC			LVMH-L42	U29	SPARE	
K652	3" PVC	CHU-AØ, CHU-BØ, CHU-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L42	U29	GAS CONDITIONING CHILLERS	DG-CHU-001 FEEDER NO.1
K653	3" PVC	CHU-AØ, CHU-BØ, CHU-CØ, GND	3-500 KCM + 1#1/0 G, 600V, CU	LVMH-L42	U29	GAS CONDITIONING CHILLERS	DG-CHU-001 FEEDER NO.2
K654	3" PVC	X, Y, Z, N, GND	4-250 KCM + #2 G, 600V, CU	LVMH-L42	U29	480V FEEDER - 480/277V PANEL "H1"	
K655	3" PVC	X, Y, Z, N, GND	4-250 KCM + #2 G, 600V, CU	LVMH-L42	U29	480V FEEDER - 480/277V PANEL "H1"	
K656	3" PVC			LVMH-L42	U29	SPARE	
K657	3" PVC			LVMH-L42	U29	SPARE	

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PROJECT NO. 07688-01-03

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
LOW VOLTAGE POWER AND CONTROL - SHEET 1

SCALE NONE
DATE JAN2009

W28.20-E-121
DRAWING NUMBER

1
REV.

USER: vuong
DATE: 10-SEP-2014 14:47
FILE: M:\08688-01-05_PCS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\W2820E121-01
PLOT SCALE: 0.16727941
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REF 2: REF2@FILENAME
REF 4: REF4@FILENAME
REF 5: REF5@FILENAME
REF 6: REF6@FILENAME
REF 7: REF7@FILENAME
REF 8: REF8@FILENAME
REF 9: REF9@FILENAME

CONDUIT No.	CONDUIT SIZE	CONDUCTORS (NOTE 2)		FROM	TO	REMARKS	CIRCUIT I.D.
		CABLE I.D.	CABLE SIZE				
K664	3" PVC	MCC5-A∅, MCC5-B∅, MCC5-C∅	3-350 KCM + 1 #2 G	LVMH-L42	MCC 5 IN U30	MAIN FEED TO MCC-5 FROM U29	MCC-5 MAIN
K665	3" PVC	PMP-101-A∅, PMP-101-B∅, PMP-101-C∅	3-1/C #8 AWG + 1 #8 G	LVMH-L42	MCC 5 IN U30	LUBE OIL PUMP FEEDER FOR DIGESTER GAS COMPRESSOR NO.1	DG-PMP-101 FEEDER
K666	3" PVC	LVMH-L43		LVMH-L42	MCC 5 IN U30	FUT LUBE OIL PUMP FEEDER FOR DIGESTER GAS COMPRESSOR NO.2	DG-PMP-201 FEEDER
K667	3" PVC	DG-CMP-101 AUXILIARIES	6-1/C #8 AWG + 1 #8 G	LVMH-L42	MCC 5 IN U30	120 VAC CONTROL POWER, LUBE OIL HTR, SPACE HTR COMP #1	COMPRESSOR #1 AUXILIARIES
K668	3" PVC			LVMH-L42	MCC 5 IN U30	FUT 120 VAC CONTROL POWER, LUBE OIL HTR, SPACE HTR COMP #2	
K669	3" PVC			LVMH-L42	MCC 5 IN U30	SPARE	
K670	3" PVC	PMP-101-A∅, PMP-101-B∅, PMP-101-C∅	3-1/C #8 AWG + 1 #8 G	LVMH-L43	GAS COMPR. #1 CONTROL PANEL	LUBE OIL PUMP FEEDER FOR DIGESTER GAS COMPRESSOR NO.1	DG-PMP-101 FEEDER
K671	3" PVC			LVMH-L43	GAS COMPR. #2 CONTROL PANEL	FUT LUBE OIL PUMP FEEDER FOR DIGESTER GAS COMPRESSOR NO.2	
K673	3" PVC	DG-CMP-101 AUXILIARIES	6-1/C #8 AWG + 1 #8 G	LVMH-L43	GAS COMPR. #1 CONTROL PANEL	120 VAC CONTROL POWER, LUBE OIL HTR, SPACE HTR COMP #1	COMPRESSOR #1 AUXILIARIES
K674	3" PVC			LVMH-L43	FUT GAS COMPR. #2 CONTROL PANEL	FUT 120 VAC CONTROL POWER, LUBE OIL HTR, SPACE HTR COMP #2	
K676	3" PVC	NOTE 1, TRB-STRT101-P, TRB-STRT101-HTR, TRB-STRT101-TS	3/C 250 KCM W/ 1 #4 G + 2/C #14, 2 /C #16	VFD-GT1-START MOTOR	GT1/2-PB	AC START MOTOR FEEDER, HEATER, THERMOSTAT SW	GT1-START MOTOR
K677	1 1/2" PVC	NOTE 1, TRB-P101-P, TRB-P101-HTR, TRB-P101-TS	4/C #8 AWG, 2/C #14, 2/C #16	VFD-GT1-LO MOTOR	GT1/2-PB	AC LUBE OIL MOTOR FEEDER, HEATER, THERMOSTAT SW	GT1-LO MOTOR
K678	1 1/2" PVC	NOTE 1, TRB-P103-P	4/C #6 AWG	GT1-DC STARTER	GT1/2-PB	DC BACKUP LUBE OIL MOTOR	GT1-DC START MOTOR
K679	1 1/2" PVC	NOTE 1, TRB-LOH101-P, TRB-LOH101-TS, NOTE 3 △1	4/C #8 AWG, 2/C #14, NOTE 3 △1	MCC-1 (GT1)	GT1/2-PB	GT1-TANK LUBE OIL HEATER	GT1-LO HEATER
K680	1 1/2" PVC	CWS-MOV-121-P, CWS-MOV-121-C, CWS-MOV-121-S	4/C #10 AWG, 4/C #14, 7/C #16	MCC-1 (GT1)	GT1/2-PB	GT1-MOTORIZED VALVE MOV 121 POWER, CONTROL, STATUS	GT1-MOV 121
K681	3" PVC			FUT-VFD-GT2-START MOTOR	GT1/2-PB	FUTURE AC START MOTOR FEEDER, HEATER, THERMOSTAT SW	
K682	1 1/2" PVC			FUT-VFD-GT2-LO MOTOR	GT1/2-PB	FUTURE AC LUBE OIL MOTOR FEEDER, HEATER, THERMOSTAT SW	
K683	1 1/2" PVC			GUTTER IN BATTERY ROOM	GT1/2-PB	FUTURE DC BACKUP LUBE OIL MOTOR	
K684	1 1/2" PVC			FUT-MCC-2 (GT2)	GT1/2-PB	FUTURE GT2-TANK LUBE OIL HEATER	
K685	1 1/2" PVC			FUT-MCC-2 (GT2)	GT1/2-PB	FUTURE GT2-MOTORIZED VALVE MOV 221, POWER, CONTROL, STATUS	
K700A	1" RSG/PVC	HWP-P101-P, HWP-P101-C, HWP-P101-HTR	3-1/C #8 AWG + 1 #8 G, 6-1/C #14	HWP-PMP-101 GT 1/2-PB	GT1/2-PB	HWP-PMP-101 FEEDER, CONTROL, HEATER	
K701A	1" RSG/PVC			FUT-HWP-PMP-201 GT 1/2-PB	GT1/2-PB	FUT-HWP-PMP-201 FEEDER, CONTROL, HEATER	
K702	1" PCS	HVS-ACV-001-P	3-1/C #6 AWG + 1 #8 G	HVS-AHU-001	MCC-4	HVS-ACV-001 FEEDER	
K703	1" RSG	HVS-ACV-002-P	3-1/C #4 AWG + 1 #8 G	HVS-AHU-002	MCC-4	HVS-ACV-002 FEEDER	
K704	1" RSG	EE-SF-101-P, EE-SF-101-HTR	3-/C #6 AWG W/+ 1 #8 G, 2-/C #14	GT1 ENCL. INTAKE	TRAY 1	EE-SF-101 POWER, HEATER	
K705	1" RSG	EE-EF-101-P, EE-EF-101-HTR	△1 4/C #8 AWG 2-/C #14	GT1 ENCL. EXHAUST	TRAY 1	EE-EF-101 POWER, HEATER	
K712	1 1/2" RSG	CWS-P101-P	3/C #4 AWG W/ #8 G	SS PB ON PGS1 WALL	TRAY-15	CWS-PMP-101 FEEDER	
K713	1 1/2" PCS	CWS-P201-P	3/C #4 AWG W/ #8 G	SS PB ON PGS1 WALL	TRAY-15	CWS-PMP-201 FEEDER	
K714	1 1/2" PCS	CWS-P101-P	3/C #4 AWG W/ #8 G	SS PB ON PGS1 WALL	VFD CWS-PMP-101 IN PGS1	CWS-PMP-101 FEEDER	
K715	1 1/2" PCS	CWS-P201-P	3/C #4 AWG W/ #8 G	SS PB ON PGS1 WALL	VFD CWS-PMP-201 IN PGS1	CWS-PMP-201 FEEDER	
K716	3" PVC/PCS	BLW A∅, B∅, C∅, GND	3-500 KCM + 1/0 AWG, CU.	LV SPLICE BOX IN GAS CONDITIONING AREA	GAS CONDITIONING CONTROL PANEL	DG-BLOWERS-FEEDER NO. 1	
K717	3" PVC/PCS	BLW A∅, B∅, C∅, GND	3-500 KCM + 1/0 AWG, CU.	LV SPLICE BOX IN GAS CONDITIONING AREA	GAS CONDITIONING CONTROL PANEL	DG-BLOWERS-FEEDER NO. 2	
K718	3" PVC/PCS	CHU A∅, B∅, C∅, GND	3-500 KCM + 1#1/0 AWG, CU.	LV SPLICE BOX IN GAS CONDITIONING AREA	GAS CHILLER CONTROL PANEL	DG-CHU-001-FEEDER NO. 1	
K719	3" PVC/PCS	CHU A∅, B∅, C∅, GND	3-500 KCM + 1#1/0 AWG, CU.	LV SPLICE BOX IN GAS CONDITIONING AREA	GAS CHILLER CONTROL PANEL	DG-CHU-001-FEEDER NO. 2	
K720	1" PVC/RSG	GT1 BATT CHGR-P	2-1/C #8 AWG + 1 #8 G	MCC-1 (GT1)	GT1 BATT CHGR	GT1 BATT CHGR INPUT POWER	
K722	1" PVC/RSG			FUTURE MCC-2 (GT2)	GUTTER IN BATTERY ROOM		
	8 x 8 GUTTER		3-1/C #6 AWG + 1 #6 G	GT1 BATT CHGR	GT1 DC STARTER	FEEDER TO GT1 DC STARTER	
K726	1 1/2" PVC/RSG		3-1/C #10 + 1 # 10G	480V PNC "H1"	PGS2 SWGR BATT CHGR	SWGR BATT CHGR INPUT POWER	
K727	1 1/2" PVC/RSG	PGS2-SWGR-DCPS	2-1/C #2/0 AWG	BOX BELOW SWGR BATT CHGR	15KV SWGR AUX CUBICLE	FEEDER TO DC PANEL DCPS	
K728	1" PVC	GT1-ENCL-LTG	3/C #10 AWG	MCC-1 (GT1)	GT1/2 PB	GT1 ENCLOSURE LIGHTING	
K729	1" PVC			FUTURE MCC-2 (GT2)	GT1/2 PB	FUTURE GT2 ENCLOSURE LIGHTING	

NOTES:

1. REFER TO DRAWING NO. W28.20-E-316 FOR WIRE NOS.
2. SEE DRAWING W28.20-E-208 (MCC-4 SCHEMATICS) FOR CONDUCTORS WHICH ARE NOT SCHEDULED.
3. △1 CONFIRM WITH T/G MFR THAT INTERCONNECTION FOR LUBE OIL TANK HEATER TEMPERATURE SWITCH TO MCC-1 STARTER (CIRCUIT TRB-LOH101-TS) HAS BEEN DELETED.

USER: vuong
DATE: 10-SEP-2014 14:50
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\PGS2 Rec[illegible] with NEW DRAWING NAME_9-4-14\W2820E122.r02
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REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

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carollo

NO.	DATE	REVISION	BY	REC.	APP.
△2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△1	03/25/11	REV. PER T/G MFR SHOP DWGS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	
DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
LOW VOLTAGE POWER AND CONTROL - SHEET 2

SCALE NONE
DATE MAR2011
W28.20-E-122
DRAWING NUMBER
2
REV.

CONDUIT No.	CONDUIT SIZE	CONDUCTORS (NOTE 2)		FROM	TO	REMARKS	CIRCUIT I.D.
		CABLE I.D.	CABLE SIZE				
K734	2" PCS	CWS-P102-PWR, CWS-P102-C, CWS-P102-HTR, TSH222-1-S	4/C #6 AWG, 4/C #14 AWG, 2/C #14 AWG, 2/C #16	TRAY-15	CWS-PMP-102	CWS-PMP-102 FEEDER, CONTROL, HEATER, TEMPERATURE SWITCH	
K735	2" PCS	CWS-P202-PWR, CWS-P202-C, CWS-P202-HTR, TSH222-2-S	4/C #6 AWG, 4/C #14 AWG, 2/C #14 AWG, 2/C #16	TRAY-15	CWS-PMP-202	CWS-PMP-202 FEEDER, CONTROL, HEATER, TEMPERATURE SWITCH	
K736	1 1/2" RSG	CWS-P101-PWR, CWS-P101-HTR, TSH211-1-S	3/C #6 2KV + 3 #12 G, 2 1/C #14, 2C/#16	VFD CWS-PMP-101	CWS-PMP-101	CWS-PMP-101 FEEDER, HEATER, TEMPERATURE SWITCH	
K737	1 1/2" RSG	CWS-P201-PWR, CWS-P201-HTR, TSH211-2-S	3/C #6 2KV + 3 #12 G, 2 1/C #14, 2C/#16	VFD CWS-PMP-201	CWS-PMP-201	CWS-PMP-201 FEEDER, HEATER, TEMPERATURE SWITCH	
K738	1" RSG/PVC	HVS-PMP-001-P, HVS-VCP-003-P	3-1/C #10 AWG + 1 #10 G	AC PANEL "L1"	HVS-PMP-001 & HVS-VCP-003	120VAC POWER TO HVS-PMP-001 & HVS-VCP-003	
K746	1" PVC/GRS			FUT-EXH-VCP-HXR201	GT1/2-PB	FUT WHRS CONTROL PANEL 120V AC POWER	
K747	1" PVC/GRS	EXH-VCP-HXR101-P	3/C #10	EXH-VCP-HXR101	GT1/2-PB	WHRS CONTROL PANEL 120V AC POWER	
K747A	1" PVC/GRS	EXH-VCP-HXR101-P	3/C #10	GT1/2-PB	PANEL "H1"	WHRS CONTROL PANEL 120V AC POWER	
K748	2" PVC	CAS-ACP-001-P, CAS-DRY-001-P	4/C #8 AWG, 4/C #10	MCC-4	GT1/2-PB	CAS-ACP-001 FEEDER, CAS-DRY-001 FEEDER	
K749	2" PVC			MCC-4	GT1/2-PB	FUT HWP-PMP-201 FEEDER, CONTROL, HEATER	
K750	2" PVC	HWP-P101, HWP-P101-C, HWP-P101-HTR	3-VC #8 + 1-VC #8(6), 6 VC #14	MCC-4	GT1/2-PB	HWP-PMP-101 FEEDER, CONTROL, HEATER	
K751	1 1/2" PVC	CAS-ACP-001-P	4/C #8 AWG	GT1/2-PB	CAS-ACP-001 CONTROLLER	CAS-ACP-001 FEEDER	
K752	1" PVC	CAS-DRY-001-P	4/C #10 AWG	GT1/2-PB	CAS-DRY-001 CONTROLLER	CAS-DRY-001 FEEDER	
K753	3" PVC	NOTE 1, TRB-STRT101-P, TRB-STRT101-HTR, TRB-STRT101-TS	3/C 250 KCM W/ #4 G, 2/C #14, 2/C #16	GT1/2-PB	GTG-1 SKID	AC START MOTOR FEEDER, HEATER, THERMOSTAT SW	
K754	1 1/2" RSG/PVC	NOTE 1, TRB-LOH101-P, TRB-LOH101-TS ②③	4/C #8 AWG, 2/C #14	GT1/2-PB	GTG-1 SKID	GT1-TANK LUBE OIL HEATER	
K755	1 1/2" RSG/PVC	NOTE 1, TRB-P101-P, TRB-P101-HTR, TRB-P101-TS	4/C #8 AWG, 2/C #14, 2/C #16	GT1/2-PB	GTG-1 SKID	AC LUBE OIL MOTOR FEEDER, HEATER, THERMOSTAT SW	
K756	1 1/2" RSG/PVC	NOTE 1, TRB-P103-P	4/C #6 AWG	GT1/2-PB	GTG-1 SKID	DC BACKUP LUBE OIL MOTOR	
K757	1" RSG/PVC	GT1-ENCL-LTG	3/C #10 AWG	GT1/2-PB	GTG-1 SKID	GT1 ENCLOSURE LIGHTING	
K758	3" RSG/PVC			GT1/2-PB	FUT GTG-2 SKID	FUT AC START MOTOR FEEDER, HEATER, THERMOSTAT SW	
K759	1 1/2" RSG/PVC			GT1/2-PB	FUT GTG-2 SKID	FUT GT2-TANK LUBE OIL HEATER	
K760	1 1/2" RSG/PVC			GT1/2-PB	FUT GTG-2 SKID	FUT AC LUBE OIL MOTOR FEEDER, HEATER, THERMOSTAT SW	
K761	1 1/2" RSG/PVC			GT1/2-PB	FUT GTG-2 SKID	FUT DC BACKUP LUBE OIL MOTOR	
K762	1" RSG/PVC			GT1/2-PB	FUT GTG-2 SKID	FUT GT2 ENCLOSURE LIGHTING	
K768	1 1/2" PVC/RSG	CWS-MOV-121-P, CWS-MOV-121-C, CWS-MOV-121-S	4/C #10 AWG, 4/C #14, 7/C #16	GT1/2-PB	CWS-MOV-121-BFV	GT1-MOTORIZED VALVE MOV-121 POWER, CONTROL, STATUS	
K769	1 1/2" PVC/RSG			GT1/2-PB	FUT CWS-MOV-221-BFV	FUT GT2-MOTORIZED VALVE MOV-221 POWER, CONTROL, STATUS	
K770	1 1/2" PVC/RSG	PNLH1-6	3/C #10 AWG	PNL "LCP"	GT1/2-PB	PLATFORM LIGHTING/FLOOD LIGHTING	
K771	1 1/2" PVC/RSG	GT1-BATT-120VDC	2-1/C #2 AWG, 2-1/C #10 AWG	GT1 BATT CHGR	GT1 BATT	GT1 BATT FEEDER	
K771A	1" RSG	PNLH1-6	3/C #10 AWG	GTG-1/2-PB	PLATFORM	PLATFORM LIGHTING	
K772	1 1/2" PVC/RSG			FUT GT2 BATT CHGR	FUT GT2 BATT		
K772A	1" PVC/RSG	PNLH1-6	3/C #10 AWG	POLE	HEAT RECOVERY UNIT 1	FLOOD LIGHTING	
K772B	1" PVC/RSG		3/C #10 AWG	GTG-1/2-PB	POLE	FLOOD LIGHTING	
K773	1" PVC/RSG			HEAT RECOVERY UNIT 1	FUT HEAR RECOVERY UNIT 2	FUT FLOOD LIGHTING	
K774	1" RSG	DCPS-16	2-1/C #10	BKR TEST CABINET	TRAY-9	DC SUPPLY TO BKR TEST CABINET	
K775	1" RSG	PGS2-UPS-BYP	4-1/C #8 AWG, 1 #10 G	208V PNL "L1"	UPS MAINT./BYPASS	UPS BYPASS TO PNL "L2"	
K775A	1" CRS	PGS2-UPS-IN	3-1/C #6, 1 #10 GND	208V PNL "L1"	UPS CABINET	INPUT POWER TO UPS	
K776	1" RSG	PGS2-UPS-OUT	4-1/C #8 AWG, 1 #10 G	208V PNL "L2"	UPS CABINET	OUTPUT POWER TO PNL "L2"	
K777	1 1/2" RSG	PGS2-L2-4, PGS2-L2-6	(2) 3/C #12	TRAY-13	PANEL L2	120VAC PWR TO PGS1 ISD CAB. & PGS1 CCTV CAMERAS	
K778	2" IMC	PGS2-SWGR-LT, PGS2-SWGR-REC	(2) 3/C #12	PANEL "L1" SECT. 2	TRAY-1	120VAC PWR TO SWGR LTS & RECEPTACLES ①	

NOTES:

1. REFER TO DRAWING NO. W28.20-E-316 FOR WIRE NOS.
2. SEE DRAWING W28.20-E-208 (MCC-4 SCHEMATICS) FOR CONDUCTORS WHICH ARE NOT SCHEDULED.

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3" ON ORIGINAL DOCUMENT
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
④	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
③	06/09/11	REV. PER T/G MFR SHOP DWGS				
②	03/25/11	REV. PER T/G MFR SHOP DWGS		CGT		
①	03/07/11	ADDED CONDUIT K778		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
LOW VOLTAGE POWER AND CONTROL - SHEET 3

SCALE NONE
DATE MAR2011
W28.20-E-123
DRAWING NUMBER
4
REV.

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

CONDUIT No.	CONDUIT SIZE	CONDUCTORS		FROM	TO	REMARKS	CIRCUIT I.D.
		CABLE I.D.	CABLE SIZE				
X700	2" PVC	CONTROLNET DG-CMP101-CNA, DG-CMP101-CNB	(2) COAX CABLES	COMM. BOX-S21	PGS2 SWGR RM/GUTTER/PATCH PANEL	REDUNDANT CONTROLNET	
X701	2" PVC	GCMP1-I1, PIT-106-S, TIT-106-S	7/C #16 AWG, (2) 2TSP #16	COMM. BOX-S21	PGS2 SWGR PB-F5	INDICATIONS (READY/AUTO/RUNNING), FUEL PRESSURE & TEMP XMTRS	
X702	2" PVC	MCC-1 AFR	(1) 4/C #12 AWG	COMM. BOX-S21	MCC-1	ARC FLASH REDUCTION MCC-1, MCC-5	
X703	2" PVC	MCC-2 AFR, MCC-4 AFR	(2) 4/C #12 AWG	COMM. BOX-S21	MCC-4	ARC FLASH REDUCTION FUT MCC-2, MCC-4	
X704	2" PVC	MCC-1 AFR, MCC-5 AFR	(2) 4/C #12 AWG	COMM. BOX-S21	U29	ARC FLASH REDUCTION MCC-1, MCC-5	
X705	2" PVC	MCC-2 AFR, MCC-4 AFR, U29 DC PWR	(2) 4/C #12 AWG, 2-1/C #8	COMM. BOX-S21	U29	ARC FLASH REDUCTION FUT MCC-2, MCC-4, DC PWR U29 BUS DIFF.	
X706	2" PVC	FO-5, FO-14, FO-25	(3) 6PR FO	COMM. BOX-S21	U30	RELAY COMMUNICATIONS CABLES	
X707	2" PVC	DIFF CT-T22, T22 PROT, T22 CONT, MCC-5 AFR, U29 DC PWR	4/C #10 AWG, (2) 7/C #10, 4/C #12, 2-1/C #8	COMM. BOX-S21	U30	XFMR T22 RELAYING, PROT AND CONT, ARC FLASH REDUCTION MCC-5	
X708	2" PVC	DG-CMP101-CTD, U30-PGS1-PT	(2) 4/C #10 AWG	COMM. BOX-S21	U30	DIFF. CT WIRES, PGS1 PT WIRES	
X709	2" PVC	GCMP1-I1, GCMP1-I2, GCMP1-C1	(2) 7/C #16 AWG, (1) 7/C #14	COMM. BOX-S21	U30	INDICATIONS (READY/AUTO/RUNNING) & CONTROLS	
X710	2" PVC	FO-4, FO-11, FO-17, FO-25	(4) 6PR FO	COMM. BOX-S21	COMM. BOX-S22	LOAD SHED, PTN & CONT, COMMUNICATION	
X711	2" PVC	U30-PGS1 PT	4/C #10 AWG	COMM. BOX-S21	COMM. BOX-S22	SYNC. CHECK POTENTIAL	
X712	2" PVC	CONTROLNET DG-CMP101-CNA, DG-CMP101-CNB	(2) COAX CABLES	COMM. BOX-S21	CMP-101 CONTROL PANEL	REDUNDANT CONTROLNET CABLE	
X713	2" PVC/PCS	DG-CMP101-CTD	4/C #10 AWG	COMM. BOX-S21	GAS COMPRESSOR MOTOR #1 CT BOX	DIFF. CT WIRES	
X714	2" PVC			COMM. BOX-S21	GAS COMPRESSOR CONT CABINET #2	SPARE FOR FUT GAS COMPRESSOR	
X715	2" PVC	GCMP1-I2, GCMP1-C1, PIT-106-S, TIT-106-S	7/C #16 AWG, 7/C #14 (2) 2 TSP #16 AWG	COMM. BOX-S21	CMP-101 CONTROL PANEL	INDICATIONS (READY/RUNNING/ALARM) AND CONTROLS (START/STOP & SAFETY PERMISSIVES), FUEL PRESSURE & TEMP. XMTRS	
X716	3" RSG	FO-2, FO-3, FO-4, FO-5, FO-11, FO-12, FO-14, FO-16, FO-17, FO-24, FO-27	(11) 6PR FO	SPLICE BOX AT TRAY	PGS2 SWGR RM GUTTER/PATCH PNL	LOAD SHED, PROT & CONT, COMMUNICATION (SEE DETAILS 1 & 2 ON SD317A-W28-E-903) REDUNDANT CONTROLNET	
X716A	3" RSG	FO-2, FO-3, FO-4, FO-5, FO-11, FO-12, FO-14, FO-16, FO-17, FO-24	(10) 6PR FO	EAST END OF GALLERY	SPLICE BOX AT TRAY	LOAD SHED, PROT & CONT, COMMUNICATION (SEE DETAILS 1 & 2 ON SD317A-W28-E-903) REDUNDANT CONTROLNET	
X717	2 1/2" RSG	PGS2-TEL	25 PR TEL CABLE	IDF-3A	PGS2 TEL CAB IN MECH. RM.	TELEPHONE AND PUBLIC ADDRESS	
X718	2" PVC	FO-2, FO-3, FO-12, FO-16, FO-24	(5) 6PR FO	PGS2 SWGR RM GUTTER/PATCH PNL	PGS2 SWGR AUX SECTION	LOAD SHED, PROT & CONT, COMMUNICATION	
X719	2 1/2" RSG	FO-27, DG-CMP101-CNA, DG-CMP101-CNB	6PR FO, (2) COAX CABLES	PGS2 SWGR RM GUTTER/PATCH PNL	PCM-PGS2	REDUNDANT CONTROLNET	
X720	2" PVC/HDPE, PCS3	FO-4, FO-11, FO-17, FO-25	(4) 6PR FO	COMM. BOX-S22	PB	LOAD SHED, PROT & CONT, COMMUNICATION	
X721	2" PVC/HDPE	U30-PGS1 PT	4/C #10 AWG	COMM. BOX-S22	PB	SYNC. CHECK POTENTIAL	
X722	2" RSG	FO-4, FO-11, FO-17, FO-25	(4) 6PR FO	PB	5KV SWGR UNIT 6	LOAD SHED, PROT & CONT, COMMUNICATION	
X723	2" RSG	U30-PGS1 PT	4/C #10 AWG	PB	5KV SWGR UNIT 6	SYNC. CHECK POTENTIAL	
X724	2 1/2" RSG	IY201-1-5, TSH-203-1-5	2/C #16, 2 TSP #16	PCM-PGS2	TRAY-1	FCV-101 CONTROL PANEL & HWP-PMP-101 TSH 203-1	
X725	2 1/2" RSG	GT1-BKR-S, GT2-BKR-S, SWGR-LOR-S	(2) 12/C #16, 7/C #16	PCM-PGS2	TRAY-1	SWGR BUS DIFF, BKR FAIL, GEN BKR & AUX CONTACT STATUS	
X726	2 1/2" RSG	CWS-P101-S, TSH211-1-S CWS-P101-C, FIT-215-P, FIT-215-S, FSL-921-S	12/C #16 AWG, 2/C #16, 3TSP #16, 3/C #14, 2 TSP #16, 4/C #14 ②	PCM-PGS2	TRAY-13	CWS-PMP-101 STATUS, TEMP SW, SPEED CONTROL & FEEDBACK AC PWR TO FIT-215, FIT-215 4-20MA, BATT RM EXH FLOW SW	
X727	2 1/2" RSG	CWS-P201-S, TSH211-2-S CWS-P201-C	12/C #16 AWG, 2/C #16, 3TSP #16,	PCM-PGS2	TRAY-13	CWS-PMP-201 STATUS, TEMP SW, SPEED CONTROL & FEEDBACK	
X728	2 1/2" RSG	TIT220-S, TIT231-S, TSH222-1-S, TSH222-2-S, FSL222-1-P, FSL222-2-P	(2) 2TSP #16, (2 2/C #16, (2) 4/C #14	PCM-PGS2	TRAY-13		
X729	2 1/2" RSG	YAS-911-PGS1	4/C #14	PCM-PGS2	TRAY-13		
X730	1 1/2" RSG	EE-EF101-S, EE-SF101-S, CWS-MOV-121-S, CWS-MOV-121-C	(3) 7/C #16 AWG, 4/C #14	PCM-PGS2	MCC-1	GT1 ENCL. FANS & MOV 121 STATUS/CONTROLS	
X732	1 1/2" RSG			PCM-PGS2	UPS	SPARE	
X735	1 1/2" PCS	PIT-010-S	2 TSP #16 AWG	PIT-010	TRAY 16	SIGNAL, 4-20MA	
X736	1 1/2" PCS	IY-1222-S, PIT-010-S	(2) 2 TSP #16 AWG	(E) 24" TRAY (ON PGS1 ROOF)	(E) 6" TRAY (ON PGS1 ROOF)	LPGH LEVEL XMTR IY-1222, PIT-010 SIGNAL, 4-20MA	
X737	1 1/2" PCS	IY-1222-S, PIT-010-S	(2) 2 TSP #16 AWG	(E) 6" TRAY (ON PGS1 ROOF)	MIP PGS1 CONTROL RM	LPGH LEVEL XMTR IY-1222, PIT-010 SIGNAL, 4-20MA	
X738	1 1/2" PVC	IY-1222-S	2 TSP #16 AWG	LV SPLICE BOX IN GCS AREA	GCS CONTROL PANEL	LPGH LEVEL XMTR IY-1222	
X739	2 1/2" RSG	GCMP1-I1, PIT-106-S, TIT-106-S	7/C #16 AWG, (2) 2 TSP #16	PGS2 SWGR RM, PB-F5	PCM-PGS2	INDICATIONS (READY/AUTO/RUNNING), FUEL PRESSURE & TEMP. XMTRS	
X740	2" PVC/PCS			COMM. BOX-S21	FUT GAS COMPRESSOR MOTOR #2 CT BOX	SPARE FOR FUTURE GAS CMP	
X741	2" PVC			COMM. BOX-S21	FUT GAS COMPRESSOR MOTOR #2 RTD BOX	FUT MOTOR WINDING RTD'S	
X742	2" PVC	RTD-M1-1 THRU RTD-M1-6	(6) TRIADS #16 AWG	COMM. BOX-S21	CMP-101 CONDUIT	MOTOR WINDING RTD'S	
X743	2" PVC	RTD-M1-1 THRU RTD-M1-6	(6) TRIADS #16 AWG	COMM. BOX-S21	U30	MOTOR WINDING RTD'S	
X744	2" PVC	MCC-5 AFR	4/C #12 AWG	COMM. BOX-S21	U30	ARC FLASH REDUCTION MCC-5	
X748	2" PVC	FO-4, FO-5, FO-11, FO-14, FO-17	(5) 6PR FO	COMM. BOX-S21	PGS2 SWGR RM GUTTER/PATCH PANEL	LOAD SHED, PROT & CONT, COMMUNICATION	
X749	2" PVC			COMM. BOX-S21	PGS2 SWGR RM PB-F5	SPARE	
X750	2" PVC	T22 NEUT CT, T22 AC, T22 DC, T22 ALARMS, T22-63X1	(2) 4/C #10 AWG, 7/C #12, 5-1/C #10	T22 CONTROL BOX	U30 T22 5KV MAIN	XFMR T22 AUX PWR, NEUT CT & ALARM & CONTROL	
X751	2" PVC	DIFF. CT T22, T22 PROT., T22 CONT	4/C #10 AWG, (2) 7/C #10	COMM. BOX-S21	PGS2 SWGR T22 CUBICLE	XFMR T22 RELAYING PROT AND CONT	
X752	1" RSG	GC1033, GC1034	(2) 2/C #12 AWG	GT1 BATT CHGR	TRAY-1	BATT CHGR ALARM & GT1 24VDC PS	
X753	1" RSG			FUT GT2 BATT CHGR	TRAY-1	FUTURE BATT CHGR ALARM & GT2 24VDC PS	
X755	1 1/2" RSG	GC1035, GC1036	2/C #6 AWG, 2/C #10	GT1 BATT CHGR	TRAY-1	GT1 TURBINE FUEL & AIR DIVERTER VALVE ACTUATORS	
X758	1" RSG	SWGR-BATT-AL	7/C #14 AWG	SWGR BATT CHGR	TRAY-1	BATTERY CHAGER ALARM	
X759	1" RSG	TC1029	2/C #16 AWG	GT1 DC STARTER	TRAY-1	BACKUP LUBE OIL PUMP STARTER START/STOP	
X761	1" RSG/PVC	TC1028, TC1025	(2) 2/C #16 AWG, 2TSP #16	GT1 TCB	GT1 FIT120-1	GT1 MASS FLOW DENSITY XMTR	
X762	1" RSG/PVC			FUT GT2 TCB	FUT GT1 FIT120-2	FUT GT2 MASS FLOW DENSITY XMTR	
X764	3" RSG	ISO-TEL	24-PR/48 FIBER, 50 MICRON FO CABLE	NPB-3	GALLERY EXIT BOX AT EAST END OF GALLERY	ISO COMM. CABLE	

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NOTES:

1. REFER TO DRAWING NO. W28.20-E-316 FOR WIRE NOS.

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REF 2: REF2$FILENAME
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
②	03/25/11	CHANGED FIT-215-S TO 2 TSP #16 IN X726		CGT		
①	02/10/10	REVISED FOR ISO METERING - COR#15.1		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
LOW VOLTAGE POWER AND CONTROL - SHEET 4

SCALE NONE
DATE MAR2011
W28.20-E-124
DRAWING NUMBER
3
REV.

CONDUIT No.	CONDUIT SIZE	CONDUCTORS		FROM	TO	REMARKS	CIRCUIT I.D.
		CABLE I.D.	CABLE SIZE				
X800	1" RSG	TC1009, TC1010, NOTE 1 ①	(2) 2 TSP #16 AWG, NOTE 1 ①	GT1 COMBUSTION AIR INLET FILTER DP SW	TRAY-1	DIFF PRESSURE SW AT COMBUSTION AIR INLET FILTER	
X801	1 1/2" RSG/PVC	TC1005 THRU TC1008, TC1011 THRU TC1013	(7) 2/C #16 AWG	VCP-HXR-101 CONTROL PANEL	TRAY-1	WASTE HEAT RECOVERY SYSTEM INTERLOCKS	
X803	1 1/2" RSG/PVC			FUT-HXR-102 CONTROL PANEL	FUT TRAY	FUT WASTE HEAT RECOVERY SYSTEM INTERLOCKS	
X804	1 1/2" RSG/PVC			FUT-HXR-102 CONTROL PANEL	FUT TRAY	FUT CONTROL NET	
X805	1" RSG/PVC	IY201-1-S, TSH203-1-S	2/C#16 , 2TSP#16	TRAY 3	IY201-1 & HWP-PMP-101	FCV-101 CONTROL & HWP-PMP-101 TSH203-1	
X806	1" PVC/PCS	LIT208-S	2TSP#16	PCM-PGS2	LIT-208	SECONDARY EFFLUENT CHANNEL LEVEL XMTR	
X807	1 1/2" RSG/PVC			FUT TRAY	FUT IY201-2 & HWP-PMP-102	FUT FCV-602 CONTROL & HWP-PMP-102 HH203-2	
X808	1 1/2" RSG	PGS2-HXR1-CNA, PGS2-HXR1-CNB, SOLAR VDU-CNA, SOLAR VDU-CNB	(4) COAX CABLES	PCM-PGS2	TRAY-1	REDUNDANT CONTROLNET	
X809	1 1/2" RSG/PVC	TC1014, TC1015, TC1018, TC1019	(4) 2/C #16 AWG	GT1 CO2/FIRE SUPPRESSION SYS CAB	TRAY-2	GT1 CO2 FIRE SUPPRESION	
X810	1 1/2" RSG/PVC	TC1020 THRU TC1023	(4) 2/C #16 AWG	GT1 CO2/FIRE SUPPRESSION SYS CAB	TRAY-2	GT1 CO2 FIRE SUPPRESION	
X812	1 1/2" RSG/PVC			FUT GT2 CO2/FIRE SUPPRESSION SYS CAB	FUT TRAY	FUT GT2 CO2 FIRE SUPPRESION	
X813	1 1/2" RSG/PVC			FUT GT2 CO2/FIRE SUPPRESSION SYS CAB	FUT TRAY	FUT GT2 CO2 FIRE SUPPRESION	
X815	1" RSG	FSL-S/P	4/C #14, 2/C #16	TRAY-13	FSL-921	BATTERY ROOM EXH FAN FLOW SW	
X817	1 1/2" RSG	TIT-201-S	2TSP#16 AWG	JB-G6 AT TRAY-16	PCM-PGS2	TEMP XMTR HOT WATER LOOP SIGNAL 4-20MA	
X818	1" RSG	FACP-PGS2-AL	4/C #14	PGS2 FIRE ALARM PANEL	PCM-PGS2	FIRE ALARM AMD TROUBLE ALARM	
				①			
X820	1 1/2" RSG/PVC/PCS	TIT-201-S	2TSP#16 AWG	LV SPLICE BOXES IN GCS AREA	TIT 201 IN DIGESTER GALLERY	TEMP XMTR HOT WATER LOOP SIGNAL 4-20MA	
X821	2" PVC/PCS	FO-27	6 PR FO	CGS CONTROL PANEL	PB ON SIDE OF LV SPLICE BOX IN GCS AREA	REDUNDANT FIBER CONTROLNET	
X822	1 1/2" PVC/PCS	HEAT EXCH/GCS	GAS CONDITIONING SYSTEM PACKAGE	GCS CONTROL PANEL	CHILLER CONTROL PANEL		
X823	2" PCS	CWS-P101-S, TSH211-1-S, CWS-P101-C, FIT-215-P, FIT-215-S	12/C#16 AWG, 2/C#16, 3TSP#16, 3/C#14, 2TSP#16	VFD CWS-PMP-101	SS PB ON PGS1 WALL	CWS-PMP-101 CONTROL STATUS, TEMP SW, SPEED CONTROL AND FEEDBACK, AC POWER TO FIT-215, FIT-215, 4-20MA	
X824	2" PCS	CWS-P201-S, TSH211-2-S, CWS-P201-C	12/C#16 AWG, 2/C#16, 3TSP#16	VFD CWS-PMP-201	SS PB ON PGS1 WALL	CWS-PMP-201 CONTROL STATUS, TEMP SW, SPEED CONTROL AND FEEDBACK	
X825	2" PCS	CWS-P101-S, TSH211-1-S, CWS-P101-C, FIT-215-P, FIT-215-S	12/C#16 AWG, 2/C#16, 3TSP#16 3/C#14, 2TSP#16	TRAY-15	SS PB ON PGS1 WALL	CWS-PMP-101 CONTROL STATUS, TEMP SW, SPEED CONTROL AND FEEDBACK, AC POWER TO FIT-215, FIT-215, 4-20MA	
X826	2" PCS	CWS-P201-S, TSH211-2-S, CWS-P201-C	12/C#16 AWG, 2/C#16, 3TSP#16	TRAY-15	SS PB ON PGS1 WALL	CWS-PMP-201 CONTROL STATUS, TEMP SW, SPEED CONTROL AND FEEDBACK	
X830	1 1/2" PVC	GT1NT-CT, GT1NT-PT	(2) 4/C #10	PGS2 SWGR GT1 CUBICLE	GT1NGT	GT1 NEUTRAL GROUNDING XFMR PT/CT	
X831	1 1/2" PVC			PGS2 SWGR GT2 CUBICLE	FUT. GT2NGT	FUT GT2	
				①	①		
X847	1" PCS	PGS1-CCTV1, PGS1-CCTV2	(2) COAX CABLES	SS PB ON PGS1 WALL	PGS2 CONTROL ROOM	PGS1 CCTV CAMERAS FEED	
X848	1" PCS	PGS1-CCTV1, PGS1-CCTV2	(2) COAX CABLES	SS PB ON PGS1 WALL	JB PGS1 ENGINE ROOM	PGS1 CCTV CAMERAS FEED	
X849	1 1/2" PCS	PGS1-WKSTN-COM1, PGS1-WKSTN-COM2, PGS2-ISD-ETH1 THRU ETH6	(7) CAT5E, 2TSP #16	PCM-PGS2	SS PB ON PGS1 WALL	ISD ETHERNET, DCS & PGS1 WORKSTATION RELOCATION CABLES	
X850	1 1/2" PCS	PGS1-WKSTN-COM1, PGS1-WKSTN-COM2, PGS2-ISD-ETH1 THRU ETH6	(7) CAT5E, 2TSP #16	SS PB ON PGS1 WALL	12 X 12 X 6 PB IN PGS1 CONTROL RM	ISD ETHERNET, DCS & PGS1 WORKSTATION RELOCATION CABLES	
X851	1" RSG	FIT-215-P, FIT-215-S	3/C #14 AWG, 2TSP #16	FIT-215 IN PGS1 BLDG	VFD CWS-PMP-101	AC PWR TO FIT-215, FIT-215, 4-20MA	
X854	1" PCS	TIT231-S, TIT220-S	(2) 2TSP #16	TRAY-15	PBAT TIT-220/TIT-231	TEMPERATURE XMTR TIT-220 & TIT-231	
X855	3/4" SLT	TIT220-S	2TSP #16	PB AT TIT-220/231	TIT-220	TEMPERATURE XMTR TIT-220	
X856	3/4" SLT	TIT231-S	2TSP #16	PB AT TIT-220/231	TIT-231	TEMPERATURE XMTR TIT-231	
X857	2" RSG	HWP-P101-S, HWP-P101-C	7/C #16, 4/C #14	MCC-4	PCM-PGS2	HWP-PMP-101 CONTROL & INDICATION	
X858	2" RSG	CWS-PMP-102-S, CWS-PMP-102-C, CWS-PMP-202-S, CWS-PMP-202-C	(2) 7/C #16, (2) 4/C #14	MCC-4	PCM-PGS2	CWS-PMP-102/202 CONTROL AND INDICATION	
X859	1" PCS	FSL222-1-P/	4/C #14 AWG/	TRAY-15	FSL222-1	AC PWR & STATUS THERMAL FLOW SW FSL222-1	
X860	1" PCS	FSL222-2-P/	4/C #14 AWG/	TRAY-15	FSL222-2	AC PWR & STATUS THERMAL FLOW SW FSL222-2	
X861	1" RSG	TC1004	2/C #16 AWG	GT1 ENCLOSURE INTAKE, FAN FILTER, DP SW	TRAY-1	ENCLOSURE INTAKE AIR FILTER DIFF PRESSURE	
X863	1" RSG/PVC	PGS2-GT1-CNA, PGS2-GT1-CNB, PGS2-HXR1-CNA, PGS2-HXR-CNB	(4) COAX CABLES	VCP-HXR-101 CONTROL PANEL	TRAY-3	REDUNDANT CONTROLNET	
X864	1 1/2" RSG	PGS2-ISD-ETH1 THRU ETH6	② (6) CAT5E	PGS1 12 X 12 X 6 PB	IDS NETWORK CAB.	ISD AND DCS ETHERNET	
X865	1" RSG	PGS1-WKSTN-COM1/COM2	CAT5E, 2TSP #16	PGS1 12 X 12 X 6 PB	MIP PANEL	PGS1 WORKSTATION RELOCATION CABLES	
X866	1 1/2" PCS	YAS-911-PGS1, PGS2-L2-4, PGS2-L2-6	4/C #14 AWG, (2) 3/C #12	TRAY-15	SS PB ON PGS1 WALL	MIP HORN RELAY, ISD CAB. 120VAC, PGS1 CCTV CAMERA 120VAC	
X867	1 1/2" PCS	YAS-911-PGS1, PGS2-L2-4, PGS2-L2-6	4/C #14 AWG, (2) 3/C #12	SS PB ON PGS1 WALL	PGS1 CONTROL ROOM	MIP HORN RELAY, ISD CAB. 120VAC, PGS1 CCTV CAMERA 120VAC	
③							
X868	2" PCS	RESTP-PGS1-G1, RESTP-PGS1-G2, RESTP-PGS1-G3, PGS2-RTAL, AL-RST-PGS1	(4) 4/C #10	PGS1 OUTDOOR TRAY	PGS1 INDOOR TRAY	EMERGENCY STOP CIRCUITS-PGS1 GEN 1, 2, 3, PGS2-RTAL	
X869	2" RSG ④	RESTP-PGS1-G1, RESTP-PGS1-G2, RESTP-PGS1-G3, AL-RST-PGS1	④ (3) 4/C #10	PGS1 INDOOR TRAY	PULL BOX ABOVE PGS1 SWGR	EMERGENCY STOP CIRCUITS-PGS1 GEN 1, 2, 3	
X870	1" RSG	RESTP-PGS1-G1	4/C #10	PULL BOX ABOVE PGS1 SWGR	AUX. CUBICLE G-1	EMERGENCY STOP CABLE-PGS1 GEN 1	
X871	1" RSG	RESTP-PGS1-G2	4/C #10	PULL BOX ABOVE PGS1 SWGR	AUX. CUBICLE G-2	EMERGENCY STOP CABLE-PGS1 GEN 2	
X872	1" RSG	RESTP-PGS1-G3	4/C #10	PULL BOX ABOVE PGS1 SWGR	AUX. CUBICLE G-3	EMERGENCY STOP CABLE-PGS1 GEN 3	
X873	1" RSG	PGS2-RTAL	4/C #10	PGS1 INDOOR TRAY	HORN/STROBE SPLICE BOX	PGS2 REMOTE ALARM BEACON/HORN AT PGS1	
X874	1" RSG	RTAL-PGS2-P	4/C #10	HORN/STROBE SPLICE BOX	AC PANEL H2A, WEST WALL PGS1 SWGR RM	HORN/STROBE POWER SUPPLY	
X875	2" RSG	RESTP-PGS1-G1, RESTP-PGS1-G2, RESTP-PGS1-G3, PGS2-RTAL, AL-RST-PGS1	④ (4) 4/C #10	PGS2 TRAY-1	PGS2 TRAY-14	EMERGENCY STOP CIRCUITS-PGS1 GEN 1, 2, 3, PGS2-RTAL	
X876	1 1/2" RSG ④	PGS2-RTAL, AL-RST-PGS1 ④	4/C #10	PGS2 TRAY-1	PCM/PLC PGS2 CAB.	PGS2 REMOTE ALARM BEACON/HORN AT PGS1	
X877 ④	1" RSG	AL-RST-PGS1	4/C #10 ④	PULL BOX ABOVE PGS1 SWGR ④	PGS1 MIP ④	PGS1 REMOTE ALARM RESET ④	

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NOTES:

1. CONFIRM CIRCUIT TC1010P (DC POWER TO COMBUSTION AIR INLET FILTER DELTA-P SWITCH) IS NO LONGER REQUIRED BY T/G HEATER.

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DATE: 10-SEP-2014 14:57
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
⑤	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
④	09/29/11	ADDED PGS1 REMOTE ALARM RESET PUSH BUTTON AT PGS2		CGT		
③	08/30/11	ADDED E-STOP & ALARM CKTS		ASC		
②	04/13/11	REVISED CONTROLNET CONNECTIONS		CGT		
①	03/25/11	REV. PER T/G MFR SHOP DWGS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CONDUIT AND CABLE SCHEDULE
LOW VOLTAGE POWER AND CONTROL - SHEET 5

SCALE NONE
DATE SEP2011
W28.20-E-125
DRAWING NUMBER
5
REV.

P&ID EQUIPMENT DESIGNATION	P&ID DWG. NO.	CONDUCTORS		FROM	TO	ROUTE	REMARKS
		CABLE I.D.	CABLE SIZE				
GAS CONDITIONING & STORAGE	W28.20-I-101	FO-27	6-PR FO CABLE	GCS CONTROL PANEL	PGS2-PCM	GCS CONTROL PNL., X821, PB, X716, FO PATCH PNL/GUTTER, X719,PCM-PGS2	REDUNDANT CONTROLNET CABLE
		PIT-001	GAS CONDITIONING PACKAGE	PIT-001	GCS CONTROL PANEL	GAS CONDITIONING PACKAGE	NOTE 1
		BLW-101	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	BLW-101	GAS CONDITIONING PACKAGE	
		BLW-201	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	BLW-201	GAS CONDITIONING PACKAGE	
		BLW-301	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	BLW-301	GAS CONDITIONING PACKAGE	
		FCV-101	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	FCV-101	GAS CONDITIONING PACKAGE	
		HEAT EXCH/GCS	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	GCS CHILLER SKID	X822	
		SILOX	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	SILOXANE UNITS	GAS CONDITIONING PACKAGE	
		FIT-004	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	FIT-004	GAS CONDITIONING PACKAGE	
		PIT-005	GAS CONDITIONING PACKAGE	GCS CONTROL PANEL	PIT-005	GAS CONDITIONING PACKAGE	
		PIT-010-S	2 PR SHLD #16	PIT-010	PGS1-PLC IN MIP	PIT-010, X735, TRAY-16, (E) PGS1 TRAY ON ROOF, X736, (E) PGS1 6" TRAY, X737, MIP	LOW PRESSURE GAS PRESSURE XMTR SIGNAL V-001-BB, 4-20 MA LOOP
		IY-1222-S	2 PR SHLD #16	GCS CONTROL PANEL	PGS1 MIP	GCS CONTROL PNL,X738,LV SPLICE BOX,TRAY-16, (E) PGS1 TRAY ON ROOF, X736, (E) PGS1 6" TRAY, X737, MIP	LOW PRESSURE GAS HOLDER LEVEL XMTR SIGNAL
GAS COMPRESSOR NO. 1	W28.20-I-102	DG-CMP101-CNA, DG-CMP101-CNB	CONTROLNET, 2-COAX CABLES	CMP-101 CONTROL PNL	PCM- PGS2	X712, S21, X700, FO PATCH PNL GUTTER, X719, PCM-PGS2	REDUNDANT CONTROLNET CABLE NOTE 2
		GCMP1-C1	7/C #14	CMP-101 CONTROL PNL	U30 MV MCC	X715, S21, X709,	START/STOP CONTROL & SAFETY PERMISSIVES
		GCMP1-I2	7/C #16	CMP-101 CONTROL PNL	U30 MV MCC	X715, S21, X709	INDICATION (READY/RUNNING/ALARM STATUS)
		GCMP1-I1	7/C #16	U30 MV MCC	PCM-PGS2	X709, S21, X701, PB-F5, X739, PCM-PGS2	INDICATION (READY/AUTO/RUNNING)
		RTD-M1-1 THRU RTD-M1-6	6 TRIAD #16	CMP-101 RTD CONDUIT BOX	U30 MV MCC	X742, S21, X743	MOTOR WINDING RTD'S
GAS TURBINE GENERATOR GT-1 (NOTE 3)	W28.20-I-103	PIT-106-S	2 PR SHLD #16	PIT-106	PGS2-PCM	X715, S21, X701, PB-F5, X739. PCM-PGS2	HPDG PRESS. XMTR SIGNAL, 4-20 MA LOOP
		TIT-106-S	2 PR SHLD #16	TIT-106	PGS2-PCM	X715, S21, X701, PB-F5, X739. PCM-PGS2	HPDG TEMP. XMTR SIGNAL, 4-20 MA LOOP
		GT1-BKR-S	12/C #16	GT1 BREAKER, MV SWITCHGEAR	PGS2-PCM	MV SWITCHGEAR-GT1 CUBICLE, TRAY-12, TRAY-1, X725, PCM-PGS2	86B, 86BF, 86GT-1, BKR AUX CONTACT AND CSR STATUS.
		EE-EF101-S	7/C #16	MCC-1	PGS2-PCM	MCC-1, X730, PCM-PGS2	ENCL EXHAUST FAN READY, AUTO, RUN
		EE-SF101-S	7/C #16	MCC-1	PGS2-PCM	MCC-1, X730, PCM-PGS2	ENCL SUPPLY FAN READY, AUTO, RUN
FUTURE GAS TURBINE GENERATOR GT-2		GT2-BKR-S	12/C #16	GT2-BREAKER, MV SWITCHGEAR	PGS2-PCM	MV SWGR GT2 CUBICLE, TRAY-11, TRAY-1, X725, PCM-PGS2	86GT-2 , BKR AUX CONTACT, AND CSR STATUS
HEAT RECOVERY UNIT #1	W28.20-I-201	PGS2-HXR1-CNA	CONTROLNET, COAX 18 GA	VCP-HXR-101 CONTROL PNL	PGS2-PCM	VCP-HXR-101, X863, TRAY-3, TRAY-1, X808	CONTROLNET CABLE
		PGS2-HXR1-CNB	CONTROLNET, COAX 18 GA	VCP-HXR-101 CONTROL PNL	PGS2-PCM	VCP-HXR-101, X863, TRAY-3, TRAY-1, X808	CONTROLNET CABLE
		HWP-P101-S	7/C #16	MCC-4	PGS2-PCM	MCC-4, X857, PCM-PGS2	HWP-PMP-101 READY, AUTO, RUNNING STATUS
		HWP-P101-C	4/C #14 AWG	MCC-4	PGS2-PCM	MCC-4, X857, PCM-PGS2 ①	HWP-PMP-101 START/STOP CONTROL
		TSH203-1-S	2/C #16	TSH203-1	PGS2-PCM	MOTOR, PB, X805, TRAY-3, TRAY-1, X724, PCM-PGS2	MOTOR WINDING TEMP. SENSOR
		IY201-1-S	2 PR SHLD #16	IY201-1	PGS2-PCM	1Y201-1, PB, X805, TRAY-3,TRAY-1, X724, PCM-PGS2	CONTROL
		TIT201-S	2 PR SHLD #16	TIT201	PGS2-PCM	TIT201, X820, LOW VOLTAGE SPLICE BOX, TRAY-16, JB-G6, X817,PCM-PGS2	SIGNAL, 4-20 MA LOOP

NOTES:

1. GAS CONDITIONING SYSTEM INTER-SKID AND INTRA-SKID CONDUIT AND WIRING REQUIREMENTS ARE SPECIFIC EQUIPMENT FURNISHED AND SHALL BE PROVIDED AS PART OF THE DIGESTER GAS FUEL CONDITIONING SYSTEM PACKAGE IN ACCORDANCE WITH SECTION 11002 OF THE SPECIFICATIONS.
2. CONDUIT AND WIRING FOR THE DIGESTER GAS COMPRESSOR SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 11011 OF THE SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL CONDUIT AND WIRING NECESSARY TO SATISFY BOTH SYSTEM OPERATIONAL REQUIREMENTS AND INTERCONNECTION AND INTERFACE REQUIREMENTS WITH REMOTE EQUIPMENT, INCLUDING THE 5KV MOTOR CONTROL SWITCHGEAR AND THE PGS2 PLC.
3. REFER TO DRAWINGS W28.20-E-319 THROUGH W28.20-E-320A FOR CABLES AND WIRES TERMINATING WITHIN THE GENERATOR AND TURBINE CONTROL BOXES.

USER: vuong
DATE: 10-SEP-2014 15:03
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NO.	DATE	REVISION		BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
①	03/25/11	CORRECTED ROUTING OF TSH203-1-S & IY201-1-S		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
INSTRUMENTATION AND CONTROL CABLE SCHEDULE
SHEET 1

SCALE NONE
DATE MAR2011
W28.20-E-126
DRAWING NUMBER
2
REV.

P&ID EQUIPMENT DESIGNATION	P&ID DWG. NO.	CONDUCTORS		FROM	TO	ROUTE	REMARKS
		CABLE I.D.	CABLE SIZE				
COOLING SYSTEM PUMPS NO. 3	W28.20-I-203	LIT208-S	2 TSP #16	LIT208/LE208	PCM-PGS2 CALL	LIT-208, X806 VIA TRAFFIC SPLICE BOX, PCM-PGS2	XMTR SIGNAL, 4-20MA LOOP, SEC. EFFL. CHANNEL
(PGS1-BASEMENT)		TSH211-1-S	2/C #16	TSH211-1	PCM-PGS2 CALL	TSH211-1, K736, VFD-101, X823, SS PB, X825, TRAY-15, TRAY-13, X726, PCM-PGS2	MOTOR WINDING SENSOR, HIGH INDICATION
		CWS-P101-S	12/C #16	VFD-PMP-101	PCM-PGS2 CALL	VFD-101, X823, SSPB, X825, TRAY-15, TRAY-13, X726, PCM-PGS2	CONTROL AND INDICATION
		CWS-P101-C	3 TSP #16	VFD-PMP-101	PCM-PGS2 CALL	VFD-101, X823, SSPB, X825, TRAY-15, TRAY-13, X726, PCM-PGS2	SPEED CONTROL AND FEEDBACK
		FIT215-P	3/C #14	FIT215/FE215	PCM-PGS2 CALL	FIT215, X851, VFD-101, X823, SSPB, X825, TRAY-15, TRAY-13, X726, PCM-PGS2	120VAC, XMTR POWER
		FIT215-S	2 PR SHLD #16	FIT215/FE215	PCM-PGS2 CALL	FIT215, X851, VFD-101, X823, SSPB, X825, TRAY-15, TRAY-13, X726, PCM-PGS2	FLOW XMTR SIGNAL
		TSH211-2-S	2/C #16	TSH 211-2	PCM-PGS2 CALL	TSH211-2, K737, VFD-201, X824, SSPB, X826, TRAY-15, TRAY-13, X727, PCM-PGS2	MOTOR WINDING SENSOR, HIGH INDICATION
		CWS-P201-S	12/C #16	VFD-PMP-201	PCM-PGS2 CALL	VFD-201, X824, SSPB, X826, TRAY-15, TRAY-13, X727, PCM-PGS2	CONTROL AND INDICATION
		CWS-P201-C	3 TSP #16	VFD-PMP-201	PCM-PGS2 CALL	VFD-201, X824, SSPB, X826, TRAY-15, TRAY-13, X727, PCM-PGS2	SPEED CONTROL AND FEEDBACK
COOLING SYSTEM WATER PUMPS	W28.20-I-204						
		TIT220-S	2 PR SHLD #16	TIT220	PCM-PGS2 CALL	TIT220, SLT, JB, X855, TRAY-15, TRAY-13, X728, PCM-PGS2	TEMPERATURE XMTR SIGNAL
		CWS-PMP-102-S	7/C #16	MCC-4	PCM-PGS2 CALL	MCC-4, X858, PCM-PGS2	READY, AUTO, RUN
		CWS-PMP-102-C	4/C #14 AWG	MCC-4	PCM-PGS2 CALL	MCC-4, X858, PCM-PGS2	CWS-PMP-102 START/STOP
		TSH222-1-S	2/C #16 AWG	TSH222-1	PCM-PGS2 CALL	K734, TRAY-15, TRAY-13, X728, PCM-PGS2	TEMP. SWITCH, MOTOR WINDING
		CWS-P102-C	4/C #14	HS222-1	MCC-4	K734, TRAY-15, TRAY-13, MCC-4	LOCAL CONTROLLER/INTERLOCK
		FSL222-1-P/S	4/C #14	FSL222-1	PCM-PGS2 CALL	FSL222-1, X859, TRAY-15, TRAY-13, X728, PCM-PGS2	FLOW SWITCH POWER AND SIGNAL (120VAC)
		CWS-PMP-202-S	7/C #16	MCC-4	PCM-PGS2 CALL	MCC-4, X858, PCM-PGS2	READY, AUTO, RUN
		CWS-PMP-202-C	4/C #14 AWG	MCC-4	PCM-PGS2 CALL	MCC-4, X858, PCM-PGS2	CWS-PMP-202 START/STOP
		CWS-P202-C	4/C #14	HS222-2	MCC-4	K735, TRAY-15, TRAY-13, MCC-4	LOCAL CONTROLLER/INTERLOCK
		TSH222-2-S	2/C #16 AWG	TSH222-2	PCM-PGS2 CALL	K735, TRAY-15, TRAY-13, X728, PCM-PGS2	TEMP. SWITCH MOTOR WINDING
		FSL222-2-P	4/C #14	FSL222-2	PCM-PGS2 CALL	FSL222-2, X860, TRAY-15, TRAY-13, X728, PCM-PGS2	FLOW SWITCH ALARM AND SIGNAL (120VAC)
COOLING SYSTEM HEAT EXCHANGER	W28.20-I-205						
		TIT231-S	2 PR SHLD #16	TIT231	PCM-PGS2 CALL	TIT231, X856, JB, X854, TRAY-15, TRAY-13, X728, PCM-PGS2	TEMPERATURE XMTR SIGNAL
LUBE OIL SYSTEM GT-1	W28.20-I-206						
		CWS-MOV-121-S	7/C #16	CWS-MOV-121-BFV	PCM-PGS2 CALL	K768, GT1/GT2 PB, K680, MCC-1, X730, PCM-PGS2	POSITION AND REMOTE STATUS INDICATION
		CWS-MOV-121-C	4/C #14	CWS-MOV-121-BFV	PCM-PGS2 CALL	K768, GT1/GT2 PB, K680, MCC-1, X730, PCM-PGS2	OPEN-CLOSE CONTROL
MISC. SYSTEM	W28.20-I-301						
		FSL-921-S/P	4/C #14	FSL-921	PCM-PGS2 CALL	X815, TRAY-13, X726, PCM-PGS2	PGS2 BATTERY ROOM EXHAUST SYSTEM FLOW SWITCH
		YAS-911-PGS1	4/C #14	YAS-911	PCM-PGS2 CALL	MIP, I-BOX, X867, SS PB, X866, TRAY-15, TRAY-13, X729,PCM-PGS2	ALARM HORN RELAY IN PGS1
		FACP-PGS2-AL	4/C #14	PGS2 FIRE ALARM CONTROL PANEL	PCM-PGS2 CALL	FACP, X818, PCM-PGS2	FIRE ALARM AND TROUBLE ALARM MONITORING
CONTROL ROOM	W28.20-I-560			△1			
		SOLAR-VDU-CNA	COAX 18 GA	CONTROLNET Y-TAP FOR LUBE OIL PUMP 101 VFD	SOLAR VIDEO DISPLAY UNIT	TRAY-7, TRAY-1, X808, PCM-PGS2 CAB., 1"C TO VDU LOCATION △1	REDUNDANT CONTROLNET, NOTE 1 △1
		SOLAR-VDU-CNB	COAX 18 GA	CONTROLNET Y-TAP FOR LUBE OIL PUMP 101 VFD	SOLAR VIDEO DISPLAY UNIT	TRAY-7, TRAY-1, X808, PCM-PGS2 CAB., 1"C TO VDU LOCATION	REDUNDANT CONTROLNET, NOTE 1
		PGS1-WKSTN-COM1	CAT 5E	WORKSTATION	PGS1 MIP PANEL	WALL JACK, PCM-PGS2, X849, SS PB, X850, PB, X865, MIP	RELOCATED PGS1 AND DCS WORKSTATIONS VIA PCM PGS2 PLC CABINET
		PGS1-WKSTN-COM2	2 TSP #16	WORKSTATION	PGS1 MIP PANEL	WORKSTATION, PCM-PGS2, X849, SS PB, X850, PB, X865, MIP	
		PGS2-ISD-ETH1 THRU ETH6	(6) CAT 5E	WORKSTATION	PGS1 ISD NETWORK CABINET	WALL JACK, PCM-PGS2, X849, SS PB, X850, PB, X864, ISD CABINET	ISD ETHERNET, EXTEND TO WORKSTATIONS VIA PCM PGS2 PLC CABINET
	W28.20-E-910	RESTP-PGS1-G1	4/C #10	PGS2 PWR PLANT MAN. CONT. PNL	PGS1 SWGR AUX CUBICLE G-1	TRAY-6, TRAY-1, X875, TRAY-14, TRAY-16, (E) 24" TRAY ON PGS1 ROOF, X868, (E) PGS1 6" TRAY, X869, PULL BOX, X870	EMERGENCY STOP CIRCUIT - PGS1 GEN 1
	W28.20-E-910	RESTP-PGS1-G2	4/C #10	PGS2 PWR PLANT MAN. CONT. PNL	PGS1 SWGR AUX CUBICLE G-2	TRAY-6, TRAY-1, X875, TRAY-14, TRAY-16, (E) 24" TRAY ON PGS1 ROOF, X868, (E) PGS1 6" TRAY, X869, PULL BOX, X871	EMERGENCY STOP CIRCUIT - PGS1 GEN 2
	W28.20-E-910	RESTP-PGS1-G3	4/C #10	PGS2 PWR PLANT MAN. CONT. PNL	PGS1 SWGR AUX CUBICLE G-3	TRAY-6, TRAY-1, X875, TRAY-14, TRAY-16, (E) 24" TRAY ON PGS1 ROOF, X868, (E) PGS1 6" TRAY, X869, PULL BOX, X872	EMERGENCY STOP CIRCUIT - PGS1 GEN 3
		PGS2-RTAL	4/C #10	PCM-PGS2 PLC CAB.	HORN/STROBE SPLICE BOX, PGS1	△3 X876, TRAY-1, X875, TRAY-14, TRAY-16, (E) 24" TRAY ON PGS1 ROOF, X868, (E) PGS1 6" TRAY, X869, PULL BOX, X870	PGS2 REMOTE ALARM HORN/BEACON AT PGS1
PGS1 SWGR & ENGINE ROOM							
	W28.20-E-910	RTAL-PGS2-P	4/C #10	HORN/STROBE SPLICE BOX, PGS1	AC PANEL H2A, WEST WALL PGS1 SWGR ROOM	X874	120 VAC POWER, PGS2 REMOTE ALARM HORN/BEACON
	W28.20-E-910	AL-RST-PGS1	4/C #10	PCM-PGS2 PLC CAB.	PGS1 MIP	X876, TRAY-1, X875, TRAY-14, TRAY-16, (E) 24" TRAY ON PGS1 ROOF, X868, (E) PGS1 6" TRAY, X869, PULL BOX, X877	PGS1 REMOTE ALARM RESET △3

△1 NOTES:

1. ROUTE REDUNDANT CONTROLNET CABLING FROM PCM-PGS2 PLC CABINET TO SOLAR VIDEO DISPLAY UNIT IN 1"C PER DWG. W28.20-E-801, SHEET NOTE 9.

△2

USER: vuong
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PLOT SCALE: 0.167095:1

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION	BY	REC.	APP.
△4	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△3	09/29/11	ADDED PGS1 REMOTE ALARM RESET PUSH BUTTON AT PGS2	CGT		
△2	08/30/11	ADDED PGS1 E-STOP & PGS2 REMOTE ALARM CKTS	CGT		
△1	04/13/11	REVISED CONTROLNET CONNECTIONS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
INSTRUMENTATION AND CONTROL CABLE SCHEDULE
SHEET 2

SCALE NONE
DATE SEP2011
W28.20-E-127
DRAWING NUMBER
4
REV.

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P&ID EQUIPMENT DESIGNATION	P&ID DWG. NO.	CONDUCTORS		FROM	TO	ROUTE	REMARKS
		CABLE I.D.	CABLE SIZE				
PGS2 SWITCHGEAR		SWGR-BATT-AL	7/C #14	SWITCHGEAR BATTERY CHARGER	PGS2 SWGR UNIT 1	X758, TRAY-1, TRAY-9, PGS2 SWGR	SWITCHGEAR BATTERY CHARGER ALARMS TO SEL 2411-PGS2
		SWGR-BUS-VT	4/C #12	PGS2 SWGR UNIT 1	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-9, TRAY-1, TRAY-6, MANUAL CONTROL PNL	PGS2 SWITCHGEAR BUS POTENTIAL
		GT1-VT	4/C #12	PGS2 SWGR UNIT 3	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-12, TRAY-1, TRAY-6, MANUAL CONTROL PNL	GENERATOR GT-1 LINE POTENTIAL
		GT2-VT	4/C #12	PGS2 SWGR UNIT 2	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-11, TRAY-1, TRAY-6, MANUAL CONTROL PNL	GENERATOR GT-2 LINE POTENTIAL
		PGS2-GT1-C	7/C #10	PGS2 SWGR UNIT 3	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-12, TRAY-1, TRAY-6, MANUAL CONTROL PNL	GENERATOR GT-1 BKR TRIP/CLOSE/SYNC SWITCH CONTROL
		PGS2-GT2-C	7/C #10	PGS2 SWGR UNIT 2	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-11, TRAY-1, TRAY-6, MANUAL CONTROL PNL	GENERATOR GT-2 BKR TRIP/CLOSE/SYNC SWITCH CONTROL
		PGS2-100-C	4/C #10	PGS2 SWGR UNIT 5	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	MAIN BKR PGS2-100 TRIP/CLOSE CONTROL
		PGS2-101-C	4/C #10	PGS2 SWGR UNIT 6	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	FEEDER BKR PGS2-101 TRIP/CLOSE CONTROL
		PGS2-102-C	4/C #10	PGS2 SWGR UNIT 6	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	FEEDER BKR PGS2-102 TRIP/CLOSE CONTROL
		PGS2-103-C	4/C #10	PGS2 SWGR UNIT 4	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	FEEDER BKR PGS2-103 TRIP/CLOSE CONTROL
		25A-L-ENABLE	4/C #12	PGS2 SWGR UNIT 5	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	ENABLE SWGR AUTO-SYNCHRONIZER 451-PGS2
		PGS2-GT1-S	4/C #12	PGS2 SWGR UNIT 3	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-12, TRAY-1, TRAY-6, MANUAL CONTROL PNL	GENERATOR GT-1 BKR STATUS INDICATING LIGHTS
		PGS2-GT2-S	4/C #12	PGS2 SWGR UNIT 2	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-11, TRAY-1, TRAY-6, MANUAL CONTROL PNL	GENERATOR GT-2 BKR STATUS INDICATING LIGHTS
		PGS2-100-S	4/C #12	PGS2 SWGR UNIT 5	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	MAIN BKR PGS2-100 STATUS INDICATING LIGHTS
		PGS2-101-S	4/C #12	PGS2 SWGR UNIT 6	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	FEEDER BKR PGS2-101 STATUS INDICATING LIGHTS
		PGS2-102-S	4/C #12	PGS2 SWGR UNIT 6	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	FEEDER BKR PGS2-102 STATUS INDICATING LIGHTS
		PGS2-103-S	4/C #12	PGS2 SWGR UNIT 4	PGS2 PWR PLANT MAN. CONT. PNL	TRAY-18, TRAY-1, TRAY-6, MANUAL CONTROL PNL	FEEDER BKR PGS2-103 STATUS INDICATING LIGHTS ②
		GT1NT-CT	4/C #10	PGS2 SWGR UNIT 3	GT1 NEUTRAL GND XFMR CAB.	X830	GT1 NEUTRAL GROUNDING XFMR CT
		GT1NT-PT	4/C #10	PGS2 SWGR UNIT 3	GT1 NEUTRAL GND XFMR CAB.	X830	GT1 NEUTRAL GROUNDING XFMR SECONDARY POTENTIAL
		FO-2, 3	(2) 6-PR FIBER OPTIC	PGS2 SWGR UNIT 1	H2 SWITCHGEAR, MAIN SUBSTATION	DEVICE PORT, SWGR CUB. 1 X718, FO PATCH PNL, X716, S401, MH S23, S403, PB1, X502	COMM. FOR 2032-PGS2-1, 2032-PGS2-2
		FO-12, 16, 24	(3) 6-PR FIBER OPTIC	PGS2 SWGR UNIT 1 & 5	H2 SWITCHGEAR, MAIN SUBSTATION	DEVICE PORT, SWGR CUB. 1 X718, FO PATCH PNL, X716, S401, MH S23, S403, PB1, X501	COMM. FOR 2506-PGS2, 451-PGS2, AND LINE CURRENT DIFF. RELAY 87L-PGS2-100
		SWGR-LOR-S	7/C #16	PGS2 SWGR UNIT 1	PGS2-PCM	TRAY-9, TRAY-1, X725, PGS2-PCM	BREAKER FAILURE & BUS DIFF. LOCKOUT STATUS
		PGS2-SWGR-LT	3/C #12	PANEL "L1" SECT. 2	PGS2 SWGR UNIT 101A	K778, TRAY-1, TRAY-9	120VAC TO PGS2 SWGR CUBICLE LTS
		PGS2-SWGR-REC	3/C #12	PANEL "L1" SECT. 2	PGS2 SWGR UNIT 101A	K778, TRAY-1, TRAY-9	120VAC TO PGS2 SWGR CUBICLE RECEPTACLES ①
SUBSTATION U30		FO-5, 14	(2) 6-PR FIBER OPTIC	SWGR U30, UNIT 3	H2 SWITCHGEAR, MAIN SUBSTATION	X706, S21, X748, FO PATCH PNL/GUTTER X716, X716A,S401,MHS23,S403,PB1,X501/X502	COMM. FOR 2032-U30, 2506-U30
		FO-25	(1) 6-PR FIBER OPTIC	SWGR U30, UNIT 1	PGS1 SWGR UNIT 7	X706, S21, X710, S22, X720, PB, X722	COMM. FOR LINE CURRENT DIFF. RELAY 87L-PGS1
		DIFF-CT-T22	4/C #10	SWGR U30, UNIT 2	PGS2 SWGR UNIT 4	X707, S21, X751	CT'S FOR T-22 DIFFERENTIAL PROTECTION
		T22-63X-1	4/C #10	XFMR T-22 CONTROL CABINET	SWGR U30, UNIT 2	X750	TRANSFORMER T-22 SUDDEN PRESSURE AND WINDING TEMP.
		T22 CONT.	7/C #10	SWGR U30, UNIT 2	PGS2 SWGR UNIT 4	X707, S21, X751	TRANSFORMER T-22 LOCKOUT TRIP/BLOCK CLOSE
		T22 PROT.	7/C #10	SWGR U30, UNIT 2	PGS2 SWGR UNIT 4	X707, S21, X751	TRANSFORMER T-22 63X/49 DEVICE CONTACTS
		T22-NEUT-CT	4/C #10	XFMR T-22 CONTROL CABINET	SWGR U30, UNIT 2	X750	TRANSFORMER T-22 NEUTRAL CT
		T22-DC	2-1/C #10	XFMR T-22 CONTROL CABINET	SWGR U30, UNIT 2	X750	TRANSFORMER T-22 DC POWER
		T22-AC	3-1/C #10	XFMR T-22 CONTROL CABINET	SWGR U30, UNIT 2	X750	TRANSFORMER T-22 AC POWER
		T22-AL	7/C #12	XFMR T-22 CONTROL CABINET	SWGR U30, UNIT 2	X750	TRANSFORMER T-22 ALARMS
		DG-CMP101-CTD	4/C #10	U30 MV MCC	CMP101 CT TERMINAL BOX	X708, S21, X713	COMPRESSOR MOTOR DIFFERENTIAL CT'S
		U30-PGS1-PT	4/C #10	SWGR U30 UNIT 1	PGS1 SWGR UNIT 7	X708, S21, X711, S22, X721, PB ON PGS1 WALL, X723	U30-PGS1 SYNCHRONIZING POTENTIAL
PGS1 SWITCHGEAR							
		FO-4	(1) 6-PR FIBER OPTIC	PGS1 SWGR UNITS 7 AND 9	H2 SWITCHGEAR, MAIN SUBSTATION	DEVICE PORT, SWGR CUB. 6, X722, PB, X720, HH-S22, , X710, S21, X748 FO PATCH PNL/GUTTER, X716, X716A, S401, MHS23, S403, PB1, X502	COMM. FOR 2032-PGS1, 2506-PGS1, AND 451-PGS1
		FO-11, 17	(2) 6-PR FIBER OPTIC		H2 SWITCHGEAR, MAIN SUBSTATION	DEVICE PORT, SWGR CUB. 6, X722, PB, X720, HH-S22, , X710, S21, X748 FO PATCH PNL/GUTTER, X716, X716A, S401, MHS23, S403, PB1, X501	

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
②	03/25/11	ADDED CABLE PGS2-103-S		CGT		
①	03/07/11	ADDED CKTS PGS2-SWGR-LT & PGS2-SWGR-REC		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
INSTRUMENTATION AND CONTROL CABLE SCHEDULE
SHEET 3

SCALE NONE
DATE MAR2011

W28.20-E-128
DRAWING NUMBER

3
REV.

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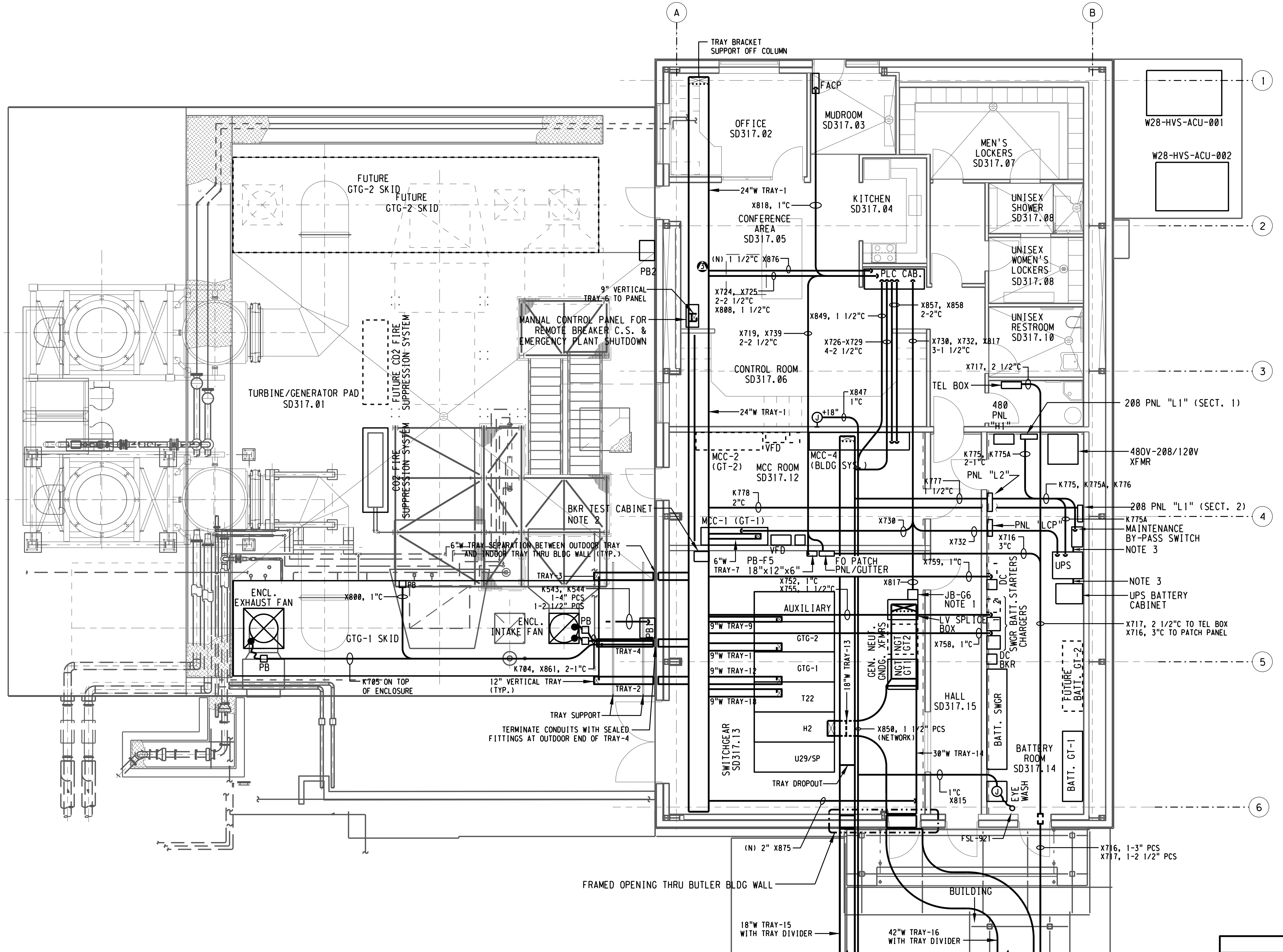
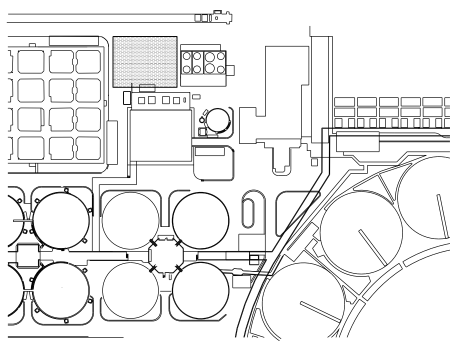


NOTES:

1. JB 12" X 12" X 4" WITH 16 CIRCUIT TERMINAL BLOCK FOR INSTRUMENTATION CIRCUITS. TRANSITION TYPE MC-HL CABLE TO NON-ARMORED INSTRUMENTATION WIRING AT THIS BOX.
2. RUN CONDUIT K774, 1"C FROM TRAY-1 TO BREAKER TEST CABINET.
3. PROVIDE 1 1/2"C CLOSE NIPPLE FROM UPS TO BOTH MAINTENANCE BY-PASS SWITCH AND BATTERY CABINET.



KEY MAP

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NO.	DATE	REVISION		BY	REC.	APP.
4	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
3	09/29/11	ADDED PGS1 REMOTE ALARM RESET PUSH BUTTON AT PGS2		CGT		
2	08/30/11	ADDED CONDUITS FOR PGS1 E-STOP & PGS2 ALARM CKT		ASC		
1	03/07/11	ADDED PANEL "L1" SECTION 2 & K778		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

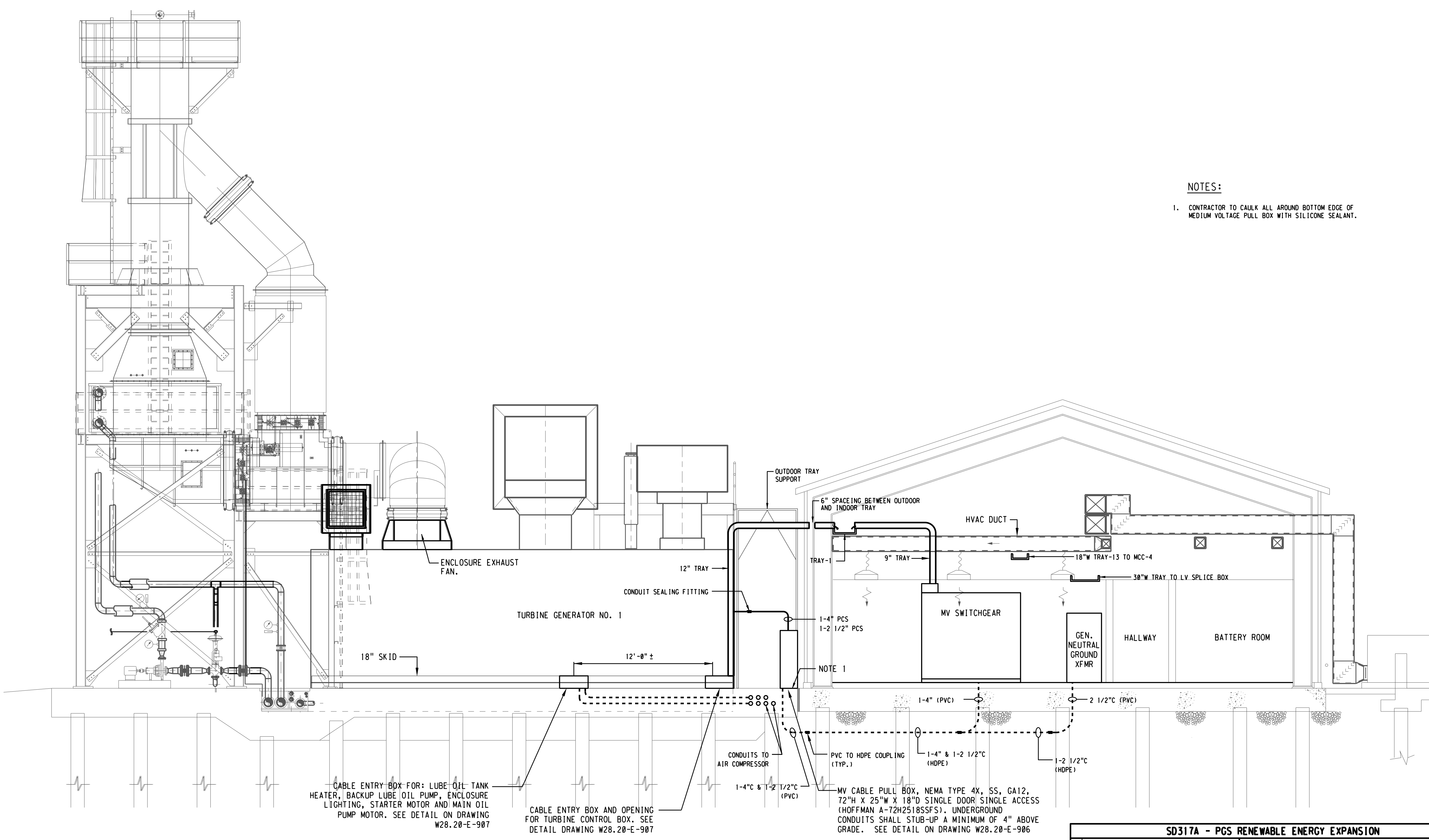
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING OVERHEAD CONDUIT
AND TRAY SYSTEM

SCALE 3/16'=1'
DATE SEP2011
W28.20-E-130
DRAWING NUMBER
4
REV.

NOTES:

1. CONTRACTOR TO CAULK ALL AROUND BOTTOM EDGE OF MEDIUM VOLTAGE PULL BOX WITH SILICONE SEALANT.



CABLE ENTRY BOX FOR: LUBE OIL TANK HEATER, BACKUP LUBE OIL PUMP, ENCLOSURE LIGHTING, STARTER MOTOR AND MAIN OIL PUMP MOTOR. SEE DETAIL ON DRAWING W28.20-E-907

CABLE ENTRY BOX AND OPENING FOR TURBINE CONTROL BOX. SEE DETAIL DRAWING W28.20-E-907

MV CABLE PULL BOX, NEMA TYPE 4X, SS, GA12, 72"H X 25"W X 18"D SINGLE DOOR SINGLE ACCESS (HOFFMAN A-72H2518SSFS). UNDERGROUND CONDUITS SHALL STUB-UP A MINIMUM OF 4" ABOVE GRADE. SEE DETAIL ON DRAWING W28.20-E-906

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NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
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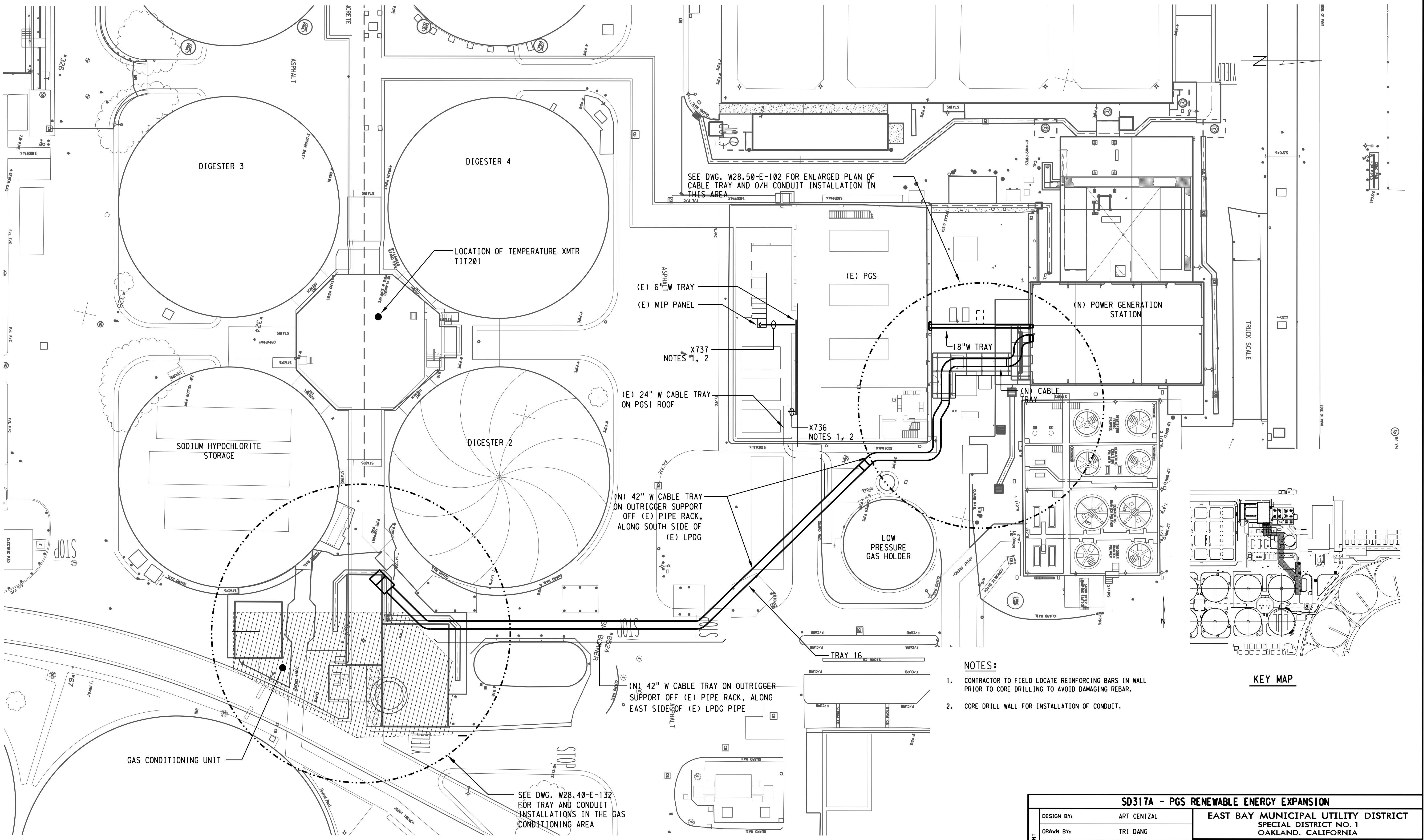
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
SECTION THROUGH COLUMN LINE 5

SCALE 1/4"=1'
DATE JAN2009
W28.20-E-130A
DRAWING NUMBER
1
REV.


DIGESTER 3
DIGESTER 4
DIGESTER 2
SODIUM HYPOCHLORITE STORAGE
(E) PGS
(N) POWER GENERATION STATION
LOW PRESSURE GAS HOLDER
TRUCK SCALE
ASPHALT
STOP
YIELD
N
LOCATION OF TEMPERATURE XMTR TIT201
SEE DWG. W28.50-E-102 FOR ENLARGED PLAN OF CABLE TRAY AND O/H CONDUIT INSTALLATION IN THIS AREA
(E) 6" W TRAY
(E) MIP PANEL
X737 NOTES 1, 2
(E) 24" W CABLE TRAY ON PGS1 ROOF
X736 NOTES 1, 2
18" W TRAY
(N) CABLE TRAY
(N) 42" W CABLE TRAY ON OUTRIGGER SUPPORT OFF (E) PIPE RACK, ALONG SOUTH SIDE OF (E) LPDG
TRAY 16
(N) 42" W CABLE TRAY ON OUTRIGGER SUPPORT OFF (E) PIPE RACK, ALONG EAST SIDE OF (E) LPDG PIPE
GAS CONDITIONING UNIT
SEE DWG. W28.40-E-132 FOR TRAY AND CONDUIT INSTALLATIONS IN THE GAS CONDITIONING AREA
KEY MAP

NOTES:

1. CONTRACTOR TO FIELD LOCATE REINFORCING BARS IN WALL PRIOR TO CORE DRILLING TO AVOID DAMAGING REBAR.
2. CORE DRILL WALL FOR INSTALLATION OF CONDUIT.

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
ELECTRICAL DISTRIBUTION SITE PLAN
OUTDOOR OVERHEAD FEEDER CABLE TRAY SYSTEM

SCALE 1"=20'
DATE JAN2009
W28.20-E-131
DRAWING NUMBER
1
REV.

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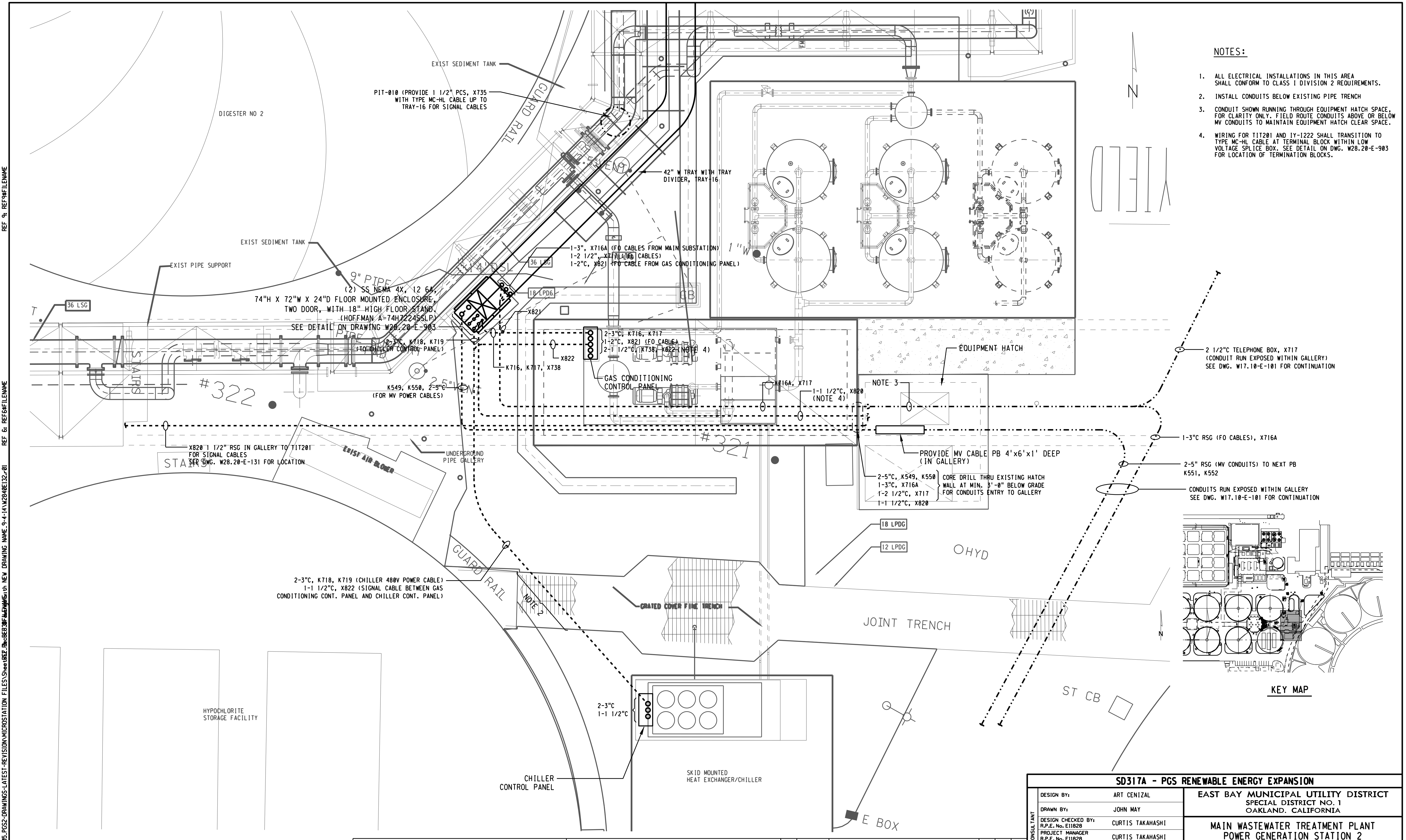
DIGESTER NO 2
EXIST SEDIMENT TANK
PIT-010 (PROVIDE 1 1/2" PCS, X735 WITH TYPE MC-HL CABLE UP TO TRAY-16 FOR SIGNAL CABLES
GUARD RAIL
42" W TRAY WITH TRAY DIVIDER, TRAY-16
EXIST SEDIMENT TANK
EXIST PIPE SUPPORT
36 LSG
9" PIPE
14"DSL
1"W
1-3", X716A (FO CABLES FROM MAIN SUBSTATION)
1-2 1/2", X717 (TEL CABLES)
1-2"C, X821 (FO CABLE FROM GAS CONDITIONING PANEL)
36 LSG
18 LPD6
CB
(2) SS NEMA 4X, 12 6A, 74"H X 72"W X 24"D FLOOR MOUNTED ENCLOSURE, TWO DOOR, WITH 18" HIGH FLOOR STAND. (HOFFMAN A-74H7224SSLP) SEE DETAIL ON DRAWING W28.20-E-903
X821
2-3"C, K716, K717
1-2"C, X821 (FO CABLE)
2-1 1/2"C, X738, X822 (NOTE 4)
X822
2-3"C, K718, K719 (TO CHILLER CONTROL PANEL)
K716, K717, X738
GAS CONDITIONING CONTROL PANEL
STAIRS
PIPE
#322
2.5"VENT
K549, K550, 2-5"C (FOR MV POWER CABLES)
X716A, X717
1-1 1/2"C, X820 (NOTE 4)
NOTE 3
EQUIPMENT HATCH
#321
PROVIDE MV CABLE PB 4'x6'x1' DEEP (IN GALLERY)
2-5"C, K549, K550
1-3"C, X716A
1-2 1/2"C, X717
1-1 1/2"C, X820
CORE DRILL THRU EXISTING HATCH WALL AT MIN. 3'-0" BELOW GRADE FOR CONDUITS ENTRY TO GALLERY
X820 1 1/2" RSG IN GALLERY TO TIT201 FOR SIGNAL CABLES SEE DWG. W28.20-E-131 FOR LOCATION
STAIRS
EXIST AIR BLOWER
UNDERGROUND PIPE GALLERY
2 1/2"C TELEPHONE BOX, X717 (CONDUIT RUN EXPOSED WITHIN GALLERY) SEE DWG. W17.10-E-101 FOR CONTINUATION
1-3"C RSG (FO CABLES), X716A
2-5" RSG (MV CONDUITS) TO NEXT PB K551, K552
CONDUITS RUN EXPOSED WITHIN GALLERY SEE DWG. W17.10-E-101 FOR CONTINUATION
N
YIELD
18 LPDG
12 LPDG
OHYD
2-3"C, K718, K719 (CHILLER 480V POWER CABLE)
1-1 1/2"C, X822 (SIGNAL CABLE BETWEEN GAS CONDITIONING CONT. PANEL AND CHILLER CONT. PANEL)
GUARD RAIL
NOTE 2
GRATED COVER FIRE TRENCH
JOINT TRENCH
HYPOCHLORITE STORAGE FACILITY
2-3"C
1-1 1/2"C
CHILLER CONTROL PANEL
SKID MOUNTED HEAT EXCHANGER/CHILLER
ST CB
E BOX
N
KEY MAP

NOTES:

1. ALL ELECTRICAL INSTALLATIONS IN THIS AREA SHALL CONFORM TO CLASS I DIVISION 2 REQUIREMENTS.
2. INSTALL CONDUITS BELOW EXISTING PIPE TRENCH
3. CONDUIT SHOWN RUNNING THROUGH EQUIPMENT HATCH SPACE, FOR CLARITY ONLY. FIELD ROUTE CONDUITS ABOVE OR BELOW MV CONDUITS TO MAINTAIN EQUIPMENT HATCH CLEAR SPACE.
4. WIRING FOR TIT201 AND IY-I222 SHALL TRANSITION TO TYPE MC-HL CABLE AT TERMINAL BLOCK WITHIN LOW VOLTAGE SPLICE BOX. SEE DETAIL ON DWG. W28.20-E-903 FOR LOCATION OF TERMINATION BLOCKS.

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

GAS CONDITIONING SYSTEM - PLAN

SCALE 3/16'=1'
DATE JAN2009
W28.40-E-132
DRAWING NUMBER
1
REV.

LIGHT FIXTURE SCHEDULE

MARK	MANUFACTURERS MODEL NO.	LAMPS		TOTAL WATTS	VOLTS	MOUNTING	DESCRIPTION AND REMARKS
		QTY.	TYPE				
A	NOT USED						
A1	NOT USED						
B	NEO-RAY #272-R-2-T5HO-ETG-2-DB	2	F24T5HO	52	277	GRID LAY-IN +10'-0" AFF	2'X2' LAY-IN FIXTURE, 20 GAUGE STEEL HOUSING, PRECISION FORMED PERFORATED METAL PANELS BACKED BY A WHITE ACRYLIC DIFFUSER. ELECTROSTATICALLY APPLIED. BAKED WHITE POWDER COAT ACRYLIC FINISH, ELECTRONIC DIMMING BALLAST.
B1	NEO-RAY #272-R-2-T5HO-ETG-2-EB-EM	2	F24T5HO	52	277	GRID LAY-IN +10'-0" AFF	SAME AS "B" BUT WITH EMERGENCY BALLAST AND WITHOUT ELECTRONIC DIMMING BALLAST.
C	METALUX #W-232-A-UNV-ER8-1	2	F32T8	54	277	SUSPENDED +10'-0" AFF	LOW PROFILE FLUORESCENT WRAPAROUND LUMINAIRE. DIE FORMED COLD ROLLED STEEL HOUSING. HINGED, ACRYLIC PRISMATIC REFRACTOR LENS. BAKED WHITE ENAMEL FINISH. UL LISTED DAMP LOCATIONS
C1	METALUX #W-232-A-UNV-EM-ER8-1	2	F32T8	54	277	SUSPENDED +10'-0" AFF	SAME AS "C" BUT WITH EMERGENCY BALLAST.
C2	NOT USED						
C3	NOT USED						
D	METALUX #WTS-232-D-W-UNV-ER8-1	2	F32T8	54	277	SURFACE +9'-2" AFF	FLUORESCENT "SOFTSIDE CLOUD" FIXTURE, DIE FORMED STEEL HOUSING. HINGED ACRYLIC PRISMATIC REFRACTOR LENS. BAKED WHITE ENAMEL FINISH. UL LISTED DAMP LOCATIONS
D1	METALUX #WTS-232-D-W-UNV-EM-ER8-1	2	F32T8	54	277	SURFACE +9'-2" AFF	SAME AS "D" BUT WITH EMERGENCY BALLAST.
E	METALUX #BA-UB-225-UNV-ER81	2	F25T8	48	277	SURFACE WALL MOUNT +8'-0" AFF	36" SURFACE MOUNTED FLUORESCENT FIXTURE. EXTRUDED ANODIZED ALUMINUM HOUSING WITH DOWNLIGHT AND UPLIGHT OPTICS. 100% VIRGIN PRISMATIC ACRYLIC DOWNLIGHT DIFFUSER AND MATTE OPAL UPLIGHT DIFFUSER. LENS HOUSING SECURED TO INTERNAL CHANNEL WITH SPRING LOADED LATCHES. BRUSHED ALUMINUM FINISH WITH CLEAR ANODIC COATING. UL LISTED DAMP LOCATIONS.
E1	METALUX #BAU-225-HTS-UNV-ER81-WH	2	F25T8	48	277	SURFACE WALL MOUNT +8'-0" AFF	SAME AS "E" BUT WITH EMERGENCY BALLAST.
F	HALO #H572ICAT-ERT552-GA-ATH5-6PK	1	26W COMPACT FLUORESCENT F26/TBX/ GX24Q	37	120	RECESSED +9'-2" AFF	5" INSULATED CEILING COMPACT FLUORESCENT SHOWER LIGHT. AIR-TITE HOUSING, FRESNEL LENS WITH REFLECTOR. WHITE TRIM RING AND TORSION SPRING. ELECTRONIC BALLAST UL LISTED WET LOCATIONS FOR USE IN SHOWER.
F1	HALO #H572ICAT-ERT552-EM-GA-ATH5-6PK	1	26W COMPACT FLUORESCENT F26/TBX/ GX24Q	37	120	RECESSED +9'-2" AFF	SAME AS "F" BUT WITH EMERGENCY BALLAST.

LIGHT FIXTURE SCHEDULE (CONTINUATION)

MARK	MANUFACTURERS MODEL NO.	LAMPS		TOTAL WATTS	VOLTS	MOUNTING	DESCRIPTION AND REMARKS
		QTY.	TYPE				
G	NEO-RAY #701IW-S/P-1-T5HO-1-C-2-SU-WA	1	F54T5HO	62	277	WALL MOUNTED +8'-0" AFF	4 FT. FLUORESCENT WALL MOUNT FIXTURE WITH ONE PIECE DIE FORMED COLD ROLLED STEEL HOUSING, PERFORATED DOWN OPTICS WITH STAGGERED HOLE. PATTERN AND OPAL DIFFUSER. DIE FORMED, SEMI SPECULAR ANODIZED ALUMINUM REFLECTOR ELECTROSTATICALLY APPLIED WHITE BAKED POWDER COAT FINISH. PROVIDE WITN END CAPS.
G1	NEO-RAY #701IW-S/P-1-T5HO-1-E-2-SU-WA	1	F54T5HO	62	277	WALL MOUNTED +8'-0" AFF	SAME AS "G" BUT WITH EMERGENCY BALLAST.
K	ALLSCAPE #BL-44-50HPS-E17-277V-OP-GY	1	50W HPS	55	277	SECURED TO BOTTOM OF CABLE TRAY AT APPROX. 9'-0" AFF	CAST ALUMINUM WITH A MINIMUM THICKNESS OF 1/8", OPAL POLYCARBONATE LENS WITH ONE PIECE EXTRUDED SILICONE GASKET GRAY FINISH, ETL LISTED FOR WET LOCATION. SUBMIT DRAWINGS FOR CONDUIT MOUNTING OPTION PRIOR TO ORDERING.
L	NOT USED						

M	LUMARK
	#HPIP-T-70-MT-F1-XX
	XX = CUSTOM PAINT FINISH
		1	70W HPS	91	277	WALL MOUNTED, SEE PLAN FOR MOUNTING HEIGHT	TRAPEZOIDAL HPS FIXTURE WITH DIE CAST ALUMINUM HOUSING AND DOOR WITH HEAT AND IMPACT RESISTANT TEMPERED GLASS LENS AND HIGH POWER FACTOR BALLAST. U.L. LISTED FOR WET LOCATIONS. PROVIDE CUSTOM COLOR PAINT FINISH; COLOR TO BE DETERMINED AT TIME OF SUBMITTALS.

M1	LUMARK
	#HPIP-T-150-MT-F1-XX
	XX = CUSTOM PAINT FINISH
		1	150W HPS	190	277	WALL MOUNTED, +14'-0" AFF	SAME AS "M" BUT WITH 150W LAMP TYPE.

N	MCGRAW-EDISON #AMF-F-250-MH-MT-76-BZ-F MCGRAW-EDISON POLE: #RSS4A10SF2XXG	1	250W MH PULSE START	295W	277	POLE MOUNTED +10'-0" ABOVE PLATFORM, ON POLE	METAL HALIDE FLOODLIGHT, DIECAST ALUMINUM HOUSING AND DOOR WITH INTEGRAL CAST HINGES, HEAT AND IMPACT RESISTANT TEMPERED GLASS LENS MOUNTED FLUSH WITH DOOR SURFACE, REFLECTOR SYSTEM WITH 7X6 BEAM SPREAD OPTICS, DARK BRONZE FINISH. PROVIDE WITH SLIPFITTER FOR POLE TOP MOUNT. PROVIDE WITH POLE HAVING 2 3/8" FIXED TENDON MOUNTING OPTION.
N1	MCGRAW-EDISON #AMF-F-250-MH-MT-76-BZ-F MOUNTING BRACKET: #RAB	1	250W MH PULSE START	295W	277	BRACKET MOUNTED OFF WHRS SUPPORT AT 20'-0" AFG	SAME AS "N" BUT WITH SLIPFITTER AND RIGHT ANGLE PIPE BRACKET.
N2	MCGRAW-EDISON #AMF-F-250-MH-MT-76-BZ-F MCGRAW-EDISON POLE: #RSS4A10SF2XXGC MOUNTING BRACKET: #101-J32	1	250W MH PULSE START	295W	277	POLE MOUNTED +10'-0" ABOVE CONCRETE PEDESTAL	SAME AS "N" BUT WITH TRIPLE LUMINAIRE BRACKET MOUNT. PROVIDE PROVISIONS FOR GFCI RECEPTACLE AT 24" ABOVE BASE.
X	COOPER LIGHTING-SURE-LITES #VRX71-70-00-G-W OR APPROVED EQUAL	1	LED	3.5	277	UNIVERSAL	DIE CAST ALUMINUM LED EXIT SIGN WITH GREEN LETTERS ON WHITE BACKGROUND, SEALED NICKEL CADMIUM BATTERY.

USER: vuong
DATE: 11-SEP-2014 09:58
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet[illegible]with NEW DRAWING NAME_9-4-14\W2820E140.r01
PLOT SCALE: 0.1666667:1
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

3" ON ORIGINAL DOCUMENT
0 1 2 3

MTH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
LIGHT FIXTURE SCHEDULE

SCALE NONE
DATE JAN2009
W28.20-E-140
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 11-SEP-2014 10:00
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet[illegible]with NEW DRAWING NAME_9-4-14\W2820E141.r01
PLOT SCALE: 0.166667:1
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

CERTIFICATE OF COMPLIANCE (Part 1 of 4) LTG-1-C

PROJECT NAME PGS RENEWABLE ENERGY EXPANSION		DATE 12/24/2008
PROJECT ADDRESS OAKLAND		Building Permit #
PRINCIPAL DESIGNER - LIGHTING CURTIS TAKAHASHI	TELEPHONE (408) 986-8558	
DOCUMENTATION AUTHOR MTH ENGINEERS, INC	TELEPHONE (408) 986-8558	Checked by/Date Enforcement Agency Use

GENERAL INFORMATION

DATE OF PLANS	BUILDING CONDITIONED FLOOR AREA	CLIMATE ZONE
12/24/2008	2,874 Sq.Ft.	3

BUILDING TYPE ☒ NONRESIDENTIAL ☐ HIGH RISE RESIDENTIAL ☐ HOTEL/MOTEL GUEST ROOM
☒ CONDITIONED SPACES ☒ UNCONDITIONED SPACES ☐ INDOOR & OUTDOOR SIGNS

PHASE OF CONSTRUCTION ☒ NEW CONSTRUCTION ☐ ADDITION ☐ ALTERATION

METHOD OF LIGHTING COMPLIANCE ☐ COMPLETE BUILDING ☒ AREA CATEGORY ☐ TAILORED ☐ PERFORMANCE
☐ COMMON LIGHTING

STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building lighting requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
VUONG DANG MAI		12/24/2008

The Principal Lighting Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the lighting requirements contained in Sections 110, 119, 130 through 132, and 146, 148 and 149 of Title 24, Part 6.

Please Check One: (These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer or electrical engineer, or I am a licensed architect.

☐ I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.

☐ I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

PRINCIPAL LIGHTING DESIGNER - NAME	SIGNATURE	DATE	LIC. #
CURTIS TAKAHASHI		12/24/2008	11828

LIGHTING MANDATORY MEASURES

Indicate location on plans of Note Block for Mandatory Measures ☐

LIGHTING COMPLIANCE FORMS & WORKSHEETS (Check box if worksheet is included)

- ☒ LTG-1-C, Parts 1 of 4 & 2 of 4: Certificate of Compliance. Part 1 of 4 and 2 of 4 are required for all submittals
- ☒ LTG-1-C, Part 3 of 4: Certificate of Compliance. Part 3 of 4 submittal is required only if Control Credits are claimed
- ☒ LTG-1-C, Part 4 of 4: Certificate of Compliance. Part 4 of 4 submittal is required when lighting controls are installed
- ☒ LTG-2-C: Indoor Lighting Schedule
- ☐ LTG-3-C: Portable Lighting Worksheet
- ☒ LTG-4-C: Lighting Controls Credit Worksheet
- ☒ LTG-5-C: Indoor Lighting Power Allowance
- ☐ LTG-6-C: Tailored Method Worksheet
- ☐ LTG-7-C: Room Cavity Ratio Worksheet
- ☐ LTG-8-C: Common Lighting Systems Method Worksheet
- ☐ LTG-9-C: Line Voltage Track Lighting Worksheet

EnergyPro 4.0 by EnergySoft User Number:7376 Job Number: 07688-01-02 Page: 3 of 10

LIGHTING MANDATORY MEASURES LTG-MM

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

	DESCRIPTION		Designer	Enforcement
☐	131(d)1	For every floor, all interior lighting systems shall be equipped with a separate automatic control to shut off the lighting. This automatic control shall meet the requirements of Section 119 and may be an occupancy sensor, automatic time switch, or other device capable of automatically shutting off the lighting.		
☐	131(d)2	Override for Building Lighting Shut-off: The automatic building shut-off system is provided with a manual, accessible override switch in sight of the lights. The area of override is not to exceed 5,000 square feet.		
☐	119(h)	Automatic Control Devices Certified: All automatic control devices specified are certified, all alternate equipment shall be certified and installed as directed by the manufacturer.		
☑	111	Fluorescent Ballast and Luminaires Certified: All fluorescent fixtures specified for the project are certified and listed in the Directory. All installed fixtures shall be certified.		
☑	131(a)	Individual Room/Area Controls: Each room and area in this building is equipped with a separate switch or occupancy sensor device for each area with floor-to-ceiling walls.		
☑	131(b)	Uniform Reduction for Individual Rooms: All rooms and areas greater than 100 square feet and more than 0.8 watts per square foot of lighting load shall be controlled with bi-level switching for uniform reduction of lighting within the room.		
☐	131(c)	Daylight Area Control: All rooms with windows and skylights that are greater than 250 square feet and that allow for the effective use of daylight in the area shall have 50% of the lamps in each daylit area controlled by a separate switch; or the effective use of daylight cannot be accomplished because the windows are continuously shaded by a building on the adjacent lot. Diagram of shading during different times of the year is included on plans.		
☐	131(e)	Display Lighting. Display lighting shall be separately switched on circuits that are 20 amps or less.		

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CERTIFICATE OF COMPLIANCE (Part 2 of 4) LTG-1-C

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

INSTALLED INDOOR LIGHTING POWER FOR CONDITIONED AND UNCONDITIONED SPACES

	INSTALLED WATTS
INSTALLED LIGHTING, CONDITIONED SPACES (From LTG-2-C)	2,829
PORTABLE LIGHTING (From LTG-3-C)	0
LIGHTING CONTROL CREDIT, CONDITIONED SPACES (From LTG-4-C)	313
CONDITIONED SPACE ADJUSTED INSTALLED LIGHTING POWER	2,516
INSTALLED LIGHTING, UNCONDITIONED SPACES (From LTG-2-C)	0
LIGHTING CONTROL CREDIT, UNCONDITIONED SPACES (From LTG-4-C)	0
UNCONDITIONED SPACE ADJUSTED INSTALLED LIGHTING POWER	0

ALLOWED INDOOR LIGHTING POWER FOR CONDITIONED SPACES

☐ COMPLETE BUILDING METHOD (From LTG-5-C)
☒ AREA CATEGORY METHOD (From LTG-5-C)
☐ TAILORED METHOD (From LTG-5-C)

ALLOWED LIGHTING POWER — INSTALLED WATTS: 2,534

ALTERNATE COMPLIANCE

☐ PERFORMANCE METHOD
☐ COMMMON LIGHTING SYSTEM (From LTG-8-C)

ALLOWED INDOOR LIGHTING POWER FOR UNCONDITIONED SPACES (From LTG-5-C) 0

MANDATORY INDOOR AND DAYLIGHTING AUTOMATIC CONTROLS

CONTROL LOCATION (Room #)	CONTROL IDENTIFICATION	CONTROL TYPE (Auto Time Switch, Dimming, etc	SPACE CONTROLLED	Check if Daylt g.	NOTE TO FIELD

NOTES TO FIELD - For Building Department Use Only

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CERTIFICATE OF COMPLIANCE (Part 3 of 4) LTG-1-C

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

CONTROLS FOR CREDIT IN CONDITIONED AND UNCONDITIONED SPACES

CONTROL LOCATION (Room # or Dwg. #)	CONTROL IDENTIFICATION	CONTROL TYPE (Occupant,Daylgt,Dimming,etc)	LUMINAIRES CONTROLLED TYPE	LUMINAIRES CONTROLLED # OF LUMINAIRES	NOTE TO FIELD
Office		Occ Sensor - < 250 SOFT	B	4	
Conference Room		Dimming W/Occ Sensor	B	12	
Kitchen Room		Occ Sensor - < 250 SOFT	B	1	
Corridor-1		Occ Sensor - < 250 SOFT	B	1	
Corridor-2		Occ Sensor - < 250 SOFT	G	3	
Men's Locker		Occ Sensor - < 250 SOFT	D & D1	2	
Women's Locker		Occ Sensor - < 250 SOFT	D1	1	
Unisex restroom		Occ Sensor - < 250 SOFT	E & E1	2	
Mechnical Room		Occ Sensor - < 250 SOFT	D	1	

NOTES TO FIELD - For Building Department Use Only

EnergyPro 4.0 by EnergySoft User Number: 7376 Job Number: 07688-01-02 Page: 5 of 10

CERTIFICATE OF COMPLIANCE (Part 4 of 4) LTG-1-C

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

Designer:
This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for lighting systems. The designer is required to check the boxes by all acceptance tests that apply and list all equipment that require an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems to be tested in parenthesis. The NJ number designates the Section in the Appendix of the Nonresidential ACM Manual that describes the test. Also indicate the person responsible for performing the tests (i.e.) the installing contractor, design professional or an agent selected by the owner). Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Building Departments:
Systems Acceptance. Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance. In addition a Certificate of Acceptance, LTG-1-A, Forms shall be submitted to the building department that:

A. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of § 10-103(b) and Title 24 Part 6.

Test Description	Test Performed By:
☐ LTG-2-A: Lighting Control Acceptance Document - Occupancy Sensor Acceptance - Manual Daylight Controls Acceptance - Automatic Time Switch Control Acceptance Equipment requiring acceptance testing	
☐ LTG-3-A: Automatic Daylighting Controls Document Equipment requiring acceptance testing	

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INDOOR LIGHTING SCHEDULE (Part 1 of 2) LTG-2-C

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

INSTALLED LIGHTING POWER FOR CONDITIONED SPACES

Luminaire		Lamps/Ballasts					Installed Watts			
		C	D	E	F	G	H		I	J
Name	Type Description	Lamp Type	Number of Lamps per Luminaire	Watts per Lamp	Number of Ballast per Luminaire	Watts per Luminaire	CEC Default Yes	CEC Default No	Number of Luminaires	Installed Watts (G x I)
B	(2) 24w Linear Fluorescent T5 HO Elec	F25T5HO	2	24	1.0	52.0	X		18	936
B&B1	(2) 24w Linear Fluorescent T5 HO Elec	F25T5HO	2	24	1.0	52.0	X		2	104
B1	(2) 24w Linear Fluorescent T5 HO Elec	F25T5HO	2	24	1.0	52.0	X		4	208
C&C1	(2) 4 ft. Fluorescent T8 Engergy Savings Elec	F32T8	2	30	1.0	54.0	X		18	972
D	(2) 4 ft. Fluorescent T8 Engergy Savings Elec	F32T8	1	30	1.0	29.0	X		1	29
D&D1	(2) 4 ft. Fluorescent T8 Engergy Savings Elec	F32T8	2	30	1.0	54.0	X		2	108
D1	(2) 4 ft. Fluorescent T8 Engergy Savings Elec	F32T8	2	30	1.0	54.0	X		1	54
E&E1	(2) 3 ft. Fluorescent T8 Elec	F32T8	2	25	1.0	48.0	X		2	96
F&F1	(1) 26W Compact Fluorescent Quad 2 pin	CFO26W/G24d-3	1	26	1.0	37.0	X		2	74
G	(1) 54W Linear Fluorescent T5 HO Elec	F54T5	1	54	1.0	62.0	X		3	186
G1	(1) 54W Linear Fluorescent T5 HO Elec	F54T5	1	54	1.0	62.0	X		1	62

PAGE TOTAL	2,829
BUILDING TOTAL (sum of all pages)	2,829
PORTABLE LIGHTING (From LTG-3-C)	0
CONTROL CREDIT (From LTG-4-C)	313
ADJUSTED ACTUAL WATTS	2,516

EnergyPro 4.0 by EnergySoft User Number: 7376 Job Number: 07688-01-02 Page:7 of 10

LIGHTING CONTROLS CREDIT WORKSHEET (Part 1 of 2) LTG-4-C

CONTROL CREDITS FOR CONDITIONED SPACES

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

A	B	C	D	E	F	G	H	I	J
				DAYLIGHTING					
ROOM # ZONE ID CONDITIONED AREAS	LIGHTING CONTROL DESCRIPTION	PLAN REF.	ROOM AREA (SF)	WINDOW WALL RATIO 1	GLAZING VLT	SKYLIGHT EFFECTIVE APERTURE	WATTS OF CONTROL LIGHTING	LIGHTING ADJUST. FACTOR	CONTROL CREDIT WATTS (H X I)
Office	Occ Sensor - <= 250 sqft	B	142				208	0.20	42
Conference Room	Dimming W/Occ Sensor	B	558				676	0.25	169
Kitchen Area	Occ Sensor - <= 250 sqft	B&B1	42				52	0.20	10
Corridor-1	Occ Sensor - <= 250 sqft	B&B1	131				52	0.20	10
Corridor-2	Occ Sensor - <= 250 sqft	G	209				186	0.20	37
Men Shower	Occ Sensor - <= 250 sqft	D&D1	177				108	0.20	22
Women Locker	Occ Sensor - <= 250 sqft	D1	67				54	0.20	11
Unisex Restroom	Occ Sensor - <= 250 sqft	E&E1	90				90	0.20	19
Mechanical room	Occ Sensor - <= 250 sqft	D	50				29	0.20	6

1) From Equation 146-A
2) From Table 146-A

PAGE TOTAL 313
BUILDING TOTAL 313
Enter in LTG-2-C: Lighting Control Credit

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INDOOR LIGHTING POWER ALLOWANCE LTG-5-C

PROJECT NAME POWER GENERATION STATION RENEWABLE ENERGY EXPANSION PROJECT DATE 12/24/2008

ALLOWED LIGHTING POWER (Choose One Method)

COMPLETE BUILDING METHOD - CONDITIONED SPACES

BUILDING CATEGORY (From Section 146 Table 146-B)	WATTS PER SF	COMPLETE BLDG. AREA	ALLOWED WATTS

AREA CATEGORY METHOD - CONDITIONED SPACES

AREA CATEGORY (From Section 146 Table 146-C)	WATTS PER SF	AREA (SF)	ALLOWED WATTS
Office	1.20	234	281
Conference	1.40	558	781
Kitchen	1.60	42	67
Corridor/Restroom	0.60	479	287
Locker	0.80	244	195
Electrical/Mechnical room	0.70	1,317	922
PAGE TOTAL		2,874	2,534
BUILDING TOTAL		2,874	2,534
		AREA	WATTS

TAILORED METHOD - CONDITIONED SPACES

TOTAL ALLOWED WATTS (From LTG-6-C or from computer run.) 0

UNCONDITIONED SPACES

Complete Building and Area Catagory Methods Category (From Section 146 Table 146-B&C)	WATTS PER SF	AREA (SF)	ALLOWED WATTS
-	-	-	-
PAGE TOTAL		0	0
BUILDING TOTAL		0	0
		AREA	WATTS

TAILORED METHOD - UNCONDITIONED SPACES

TOTAL UNCONDITIONED SPACES ALLOWED WATTS (From LTG-5-C and LTG-6-C) 0

EnergyPro 4.0 by EnergySoft User Number: 7376 Job Number: 07688-01 Page: 9 of 10

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MTH engineers, inc.
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
⚠	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

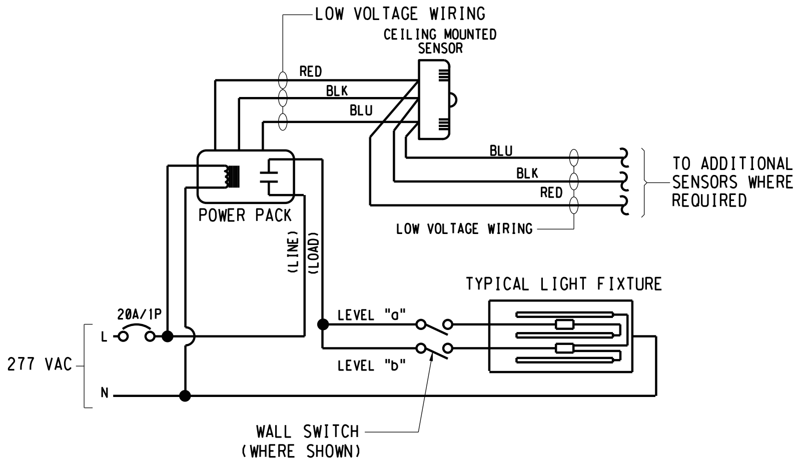
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

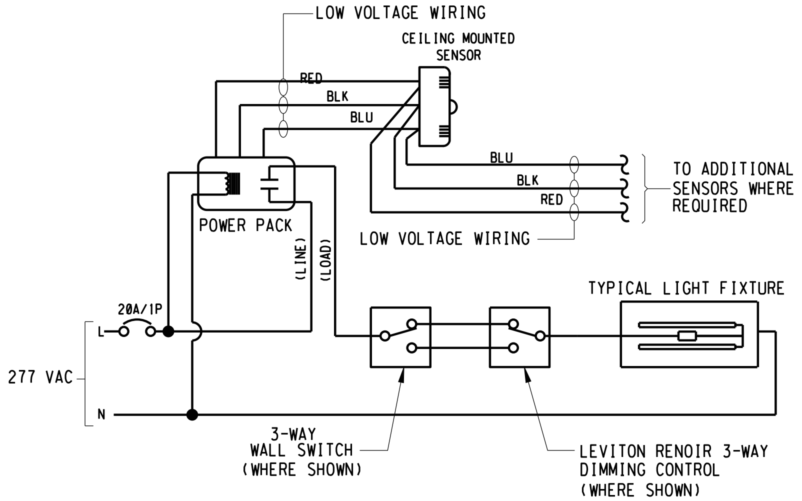
MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
TITLE 24 COMPLIANCE

SCALE NONE
DATE JAN2009
W28.20-E-141
DRAWING NUMBER
1
REV.



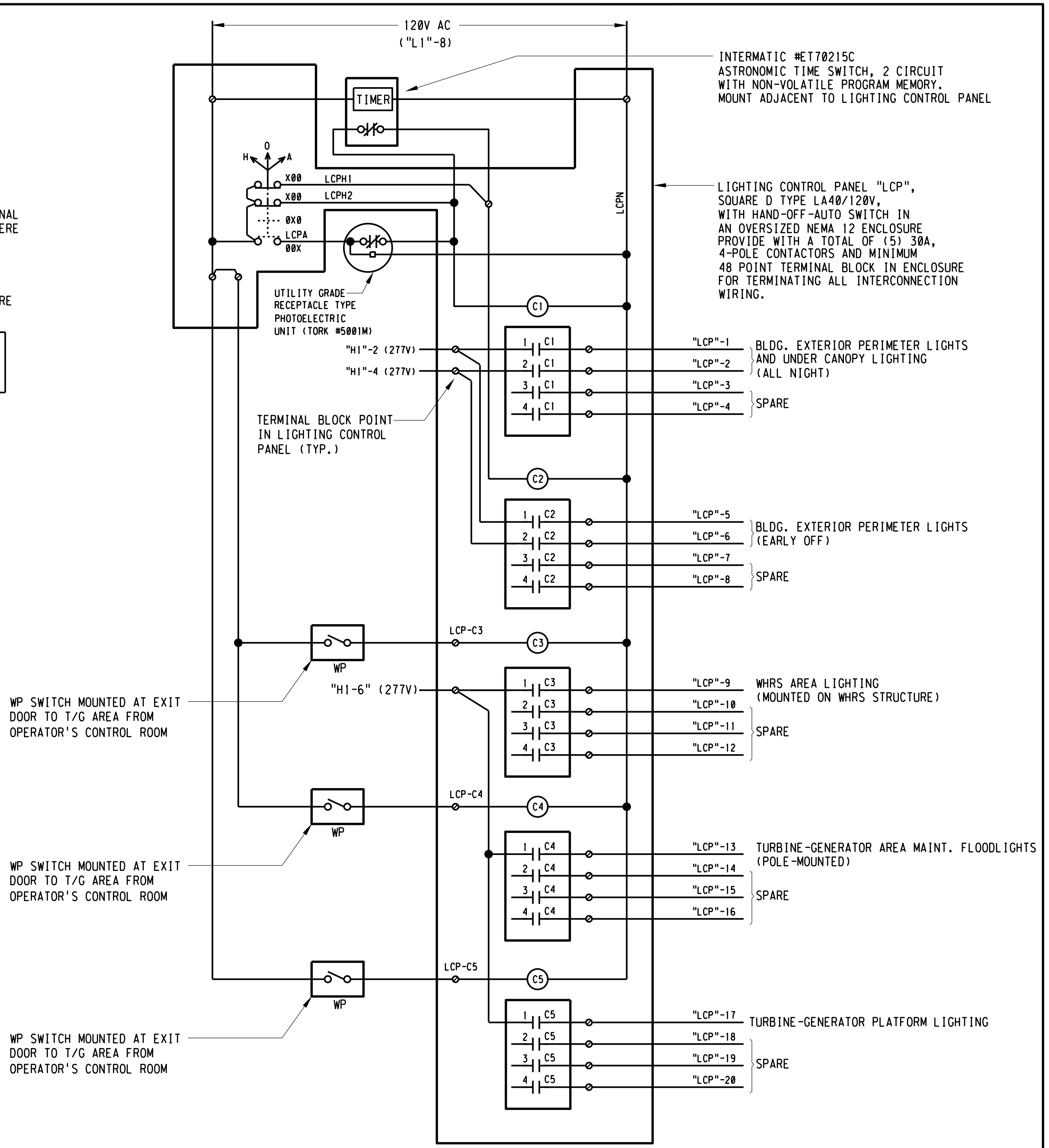
1 SENSOR WIRING DIAGRAM

NONE



2 DIMMING WIRING DIAGRAM

NONE


120V AC
("L1"-8)
TIMER
INTERMATIC #ET70215C ASTRONOMIC TIME SWITCH, 2 CIRCUIT WITH NON-VOLATILE PROGRAM MEMORY. MOUNT ADJACENT TO LIGHTING CONTROL PANEL
H
O
A
X00
X00
0X0
00X
LCPH1
LCPH2
LCPA
LCPN
LIGHTING CONTROL PANEL "LCP", SQUARE D TYPE LA40/120V, WITH HAND-OFF-AUTO SWITCH IN AN OVERSIZED NEMA 12 ENCLOSURE PROVIDE WITH A TOTAL OF (5) 30A, 4-POLE CONTACTORS AND MINIMUM 48 POINT TERMINAL BLOCK IN ENCLOSURE FOR TERMINATING ALL INTERCONNECTION WIRING.
UTILITY GRADE RECEPTACLE TYPE PHOTOELECTRIC UNIT (TORK #5001M)
"H1"-2 (277V)
"H1"-4 (277V)
TERMINAL BLOCK POINT IN LIGHTING CONTROL PANEL (TYP.)
C1
C2
C3
C4
C5
"LCP"-1
"LCP"-2
BLDG. EXTERIOR PERIMETER LIGHTS AND UNDER CANOPY LIGHTING (ALL NIGHT)
"LCP"-3
"LCP"-4
SPARE
"LCP"-5
"LCP"-6
BLDG. EXTERIOR PERIMETER LIGHTS (EARLY OFF)
"LCP"-7
"LCP"-8
SPARE
LCP-C3
WP
WP SWITCH MOUNTED AT EXIT DOOR TO T/G AREA FROM OPERATOR'S CONTROL ROOM
"H1-6" (277V)
"LCP"-9
WHRS AREA LIGHTING (MOUNTED ON WHRS STRUCTURE)
"LCP"-10
"LCP"-11
"LCP"-12
SPARE
LCP-C4
WP
WP SWITCH MOUNTED AT EXIT DOOR TO T/G AREA FROM OPERATOR'S CONTROL ROOM
"LCP"-13
TURBINE-GENERATOR AREA MAINT. FLOODLIGHTS (POLE-MOUNTED)
"LCP"-14
"LCP"-15
"LCP"-16
SPARE
LCP-C5
WP
WP SWITCH MOUNTED AT EXIT DOOR TO T/G AREA FROM OPERATOR'S CONTROL ROOM
"LCP"-17
TURBINE-GENERATOR PLATFORM LIGHTING
"LCP"-18
"LCP"-19
"LCP"-20
SPARE

3 OUTDOOR LIGHTING CONTROL SCHEMATIC

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
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(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
LIGHTING WIRING DIAGRAM AND DETAILS

SCALE NONE
DATE JAN2009
W28.20-E-142
DRAWING NUMBER
1
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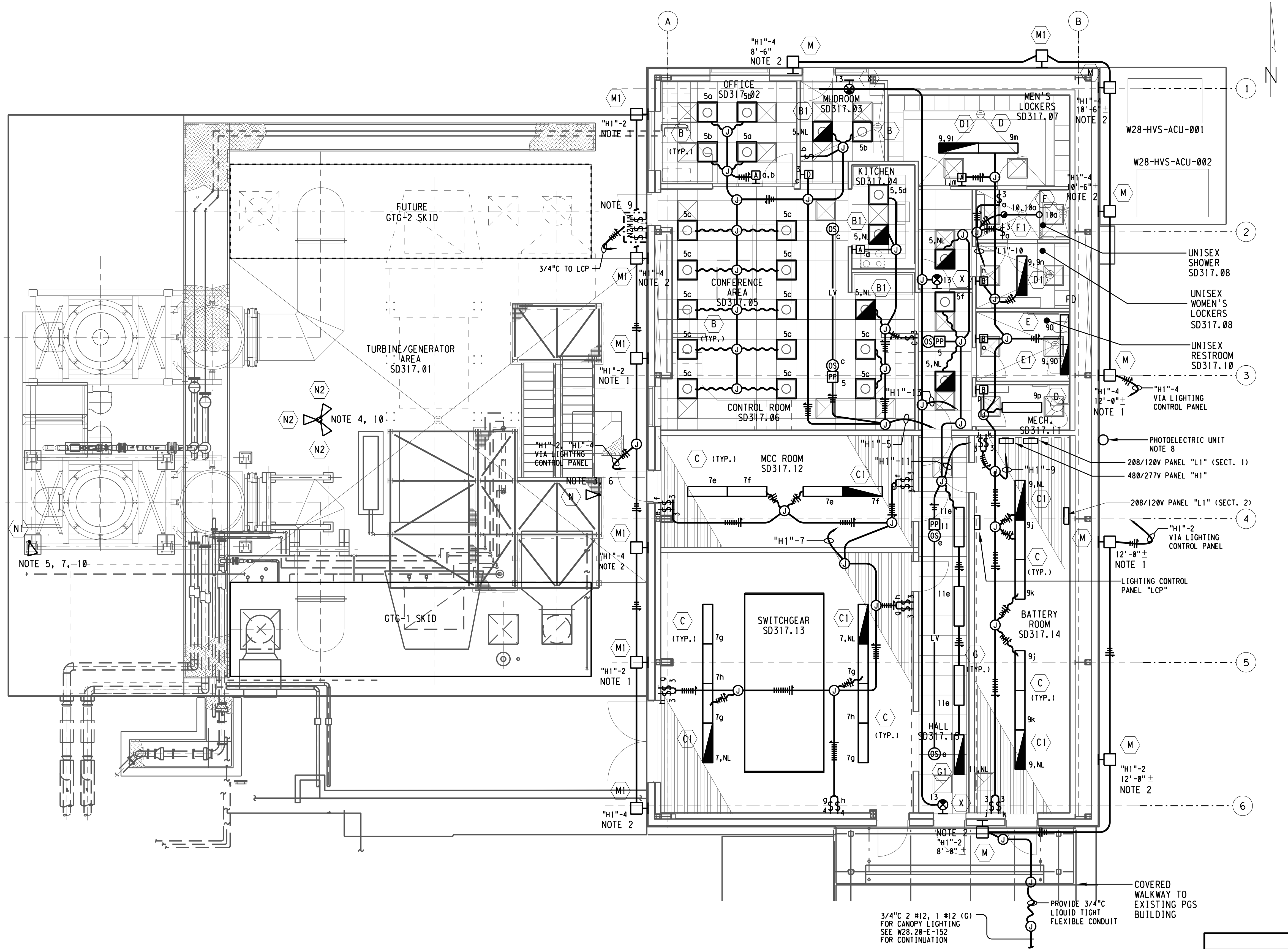
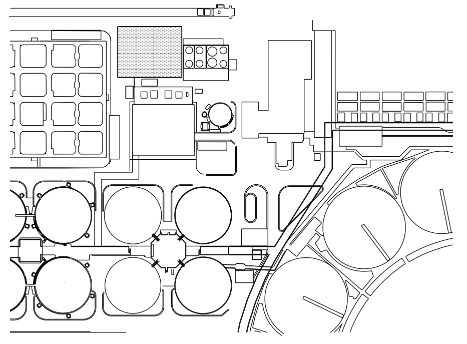


SHEET NOTES:

1. PERIMETER WALL LIGHT CONTROLLED BY BOTH PHOTOCELL AND TIMER, FOR "EARLY OFF" CONTROLS VIA LIGHTING CONTROL PANEL.
2. PERIMETER WALL LIGHT TO BE PHOTOCELL CONTROLLED VIA LIGHTING CONTROL PANEL.
3. MANUAL SWITCHED FLOODLIGHT FIXTURES FOR PLATFORM LIGHTING.
4. PROVIDE 2'-0" HIGH CONCRETE PEDESTAL FOR THE 10'-0" POLE.
5. MOUNT THIS FLOODLIGHT 20'-0" ABOVE GROUND ON WHRS STRUCTURE.
6. PROVIDE 1" THICK MOUNTING PLATE, WELDED TO PLATFORM CORNER FOR MOUNTING/BOLTING OF POLE BASE.
7. PROVISIONS FOR MOUNTING WHRS AREA LIGHTING SYSTEM FIXTURE/MOUNTING BRACKET SHALL BE BY WHRS SUPPLIER.
8. MOUNT PHOTOELECTRIC UNIT HIGH ON WALL, JUST BELOW ROOF EAVE, ORIENTED NORTH.
9. PROVIDE WP OUTDOOR SWITCHES FOR FLOODLIGHTING FIXTURES N, N1, AND N2. SWITCHES SHALL BE MOUNTED 4'-0" AFF IN THREE GANG CAST DEVICE BOX.
10. PROVIDE 2-1/C #8 AWG, PHASE AND NEUTRAL, PLUS 1/C #10 AWG GREEN GROUND WIRES FOR LIGHTING CIRCUITS TO N, N1, AND N2 LIGHTING FIXTURES.



KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

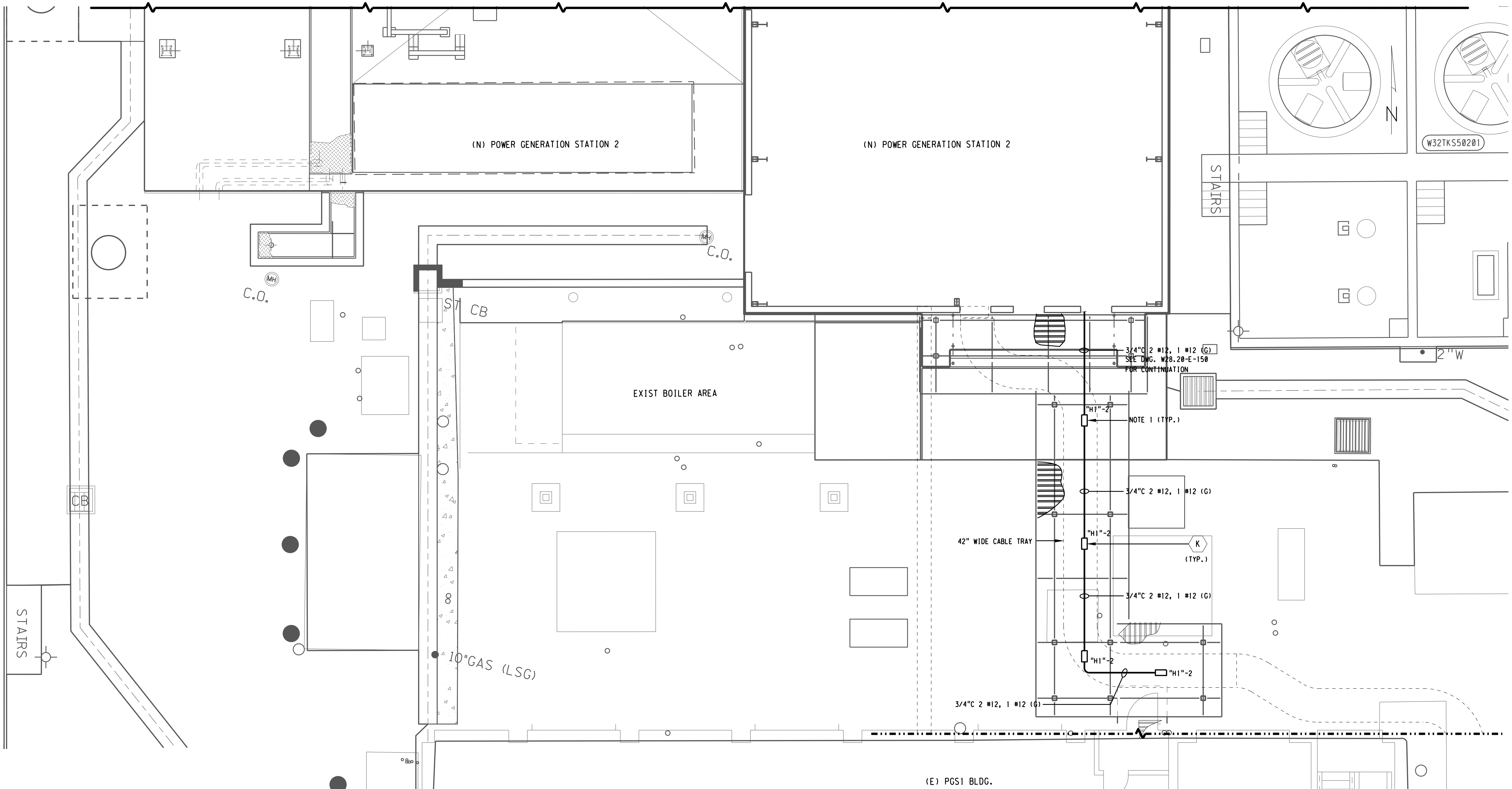
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

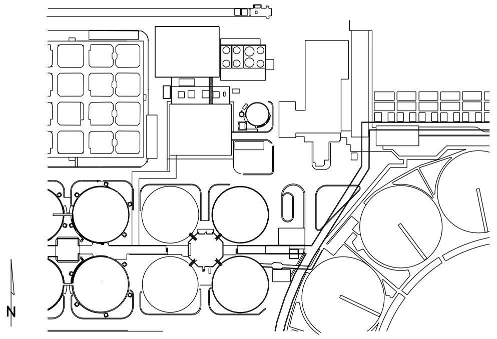
MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
LIGHTING PLAN

SCALE 3/16'=1'
DATE JAN2009

W28.20-E-150
DRAWING NUMBER

1
REV.





KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

SHEET NOTES:

1. SURFACE MOUNT CANOPY LIGHTING FIXTURE TO BOTTOM OF CABLE TRAY.

engineers, inc.
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NO.	DATE	REVISION		BY	REC.	APP.
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SD317A - PGS RENEWABLE ENERGY EXPANSION

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	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
LIGHITNG PLAN

SCALE 3/16'=1'
DATE JAN2009

W28.20-E-152
DRAWING NUMBER

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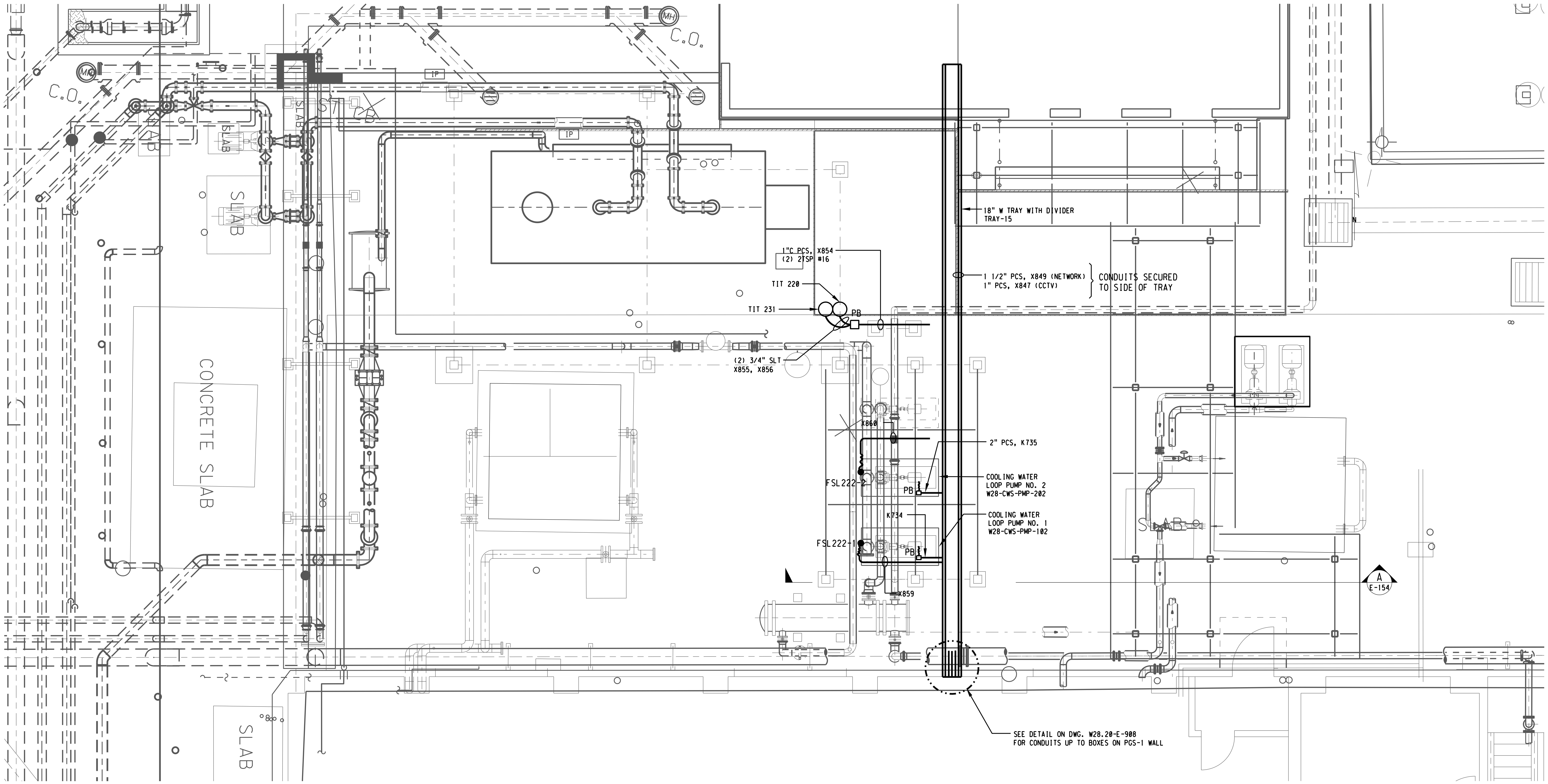
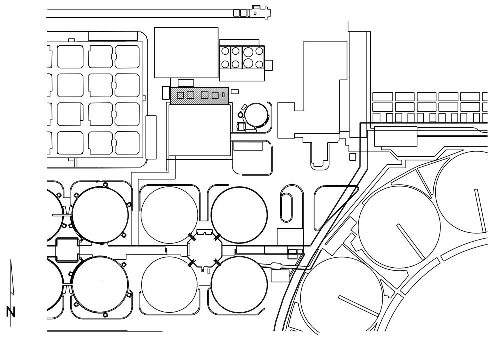


1 COOLING WATER LOOP PUMPS - POWER PLAN

1/4"=1'



KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.

RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
COOL WATER LOOP PUMPS
POWER PLAN

SCALE 1/4"=1'
DATE JAN2009

W28.20-E-153
DRAWING NUMBER

1
REV.

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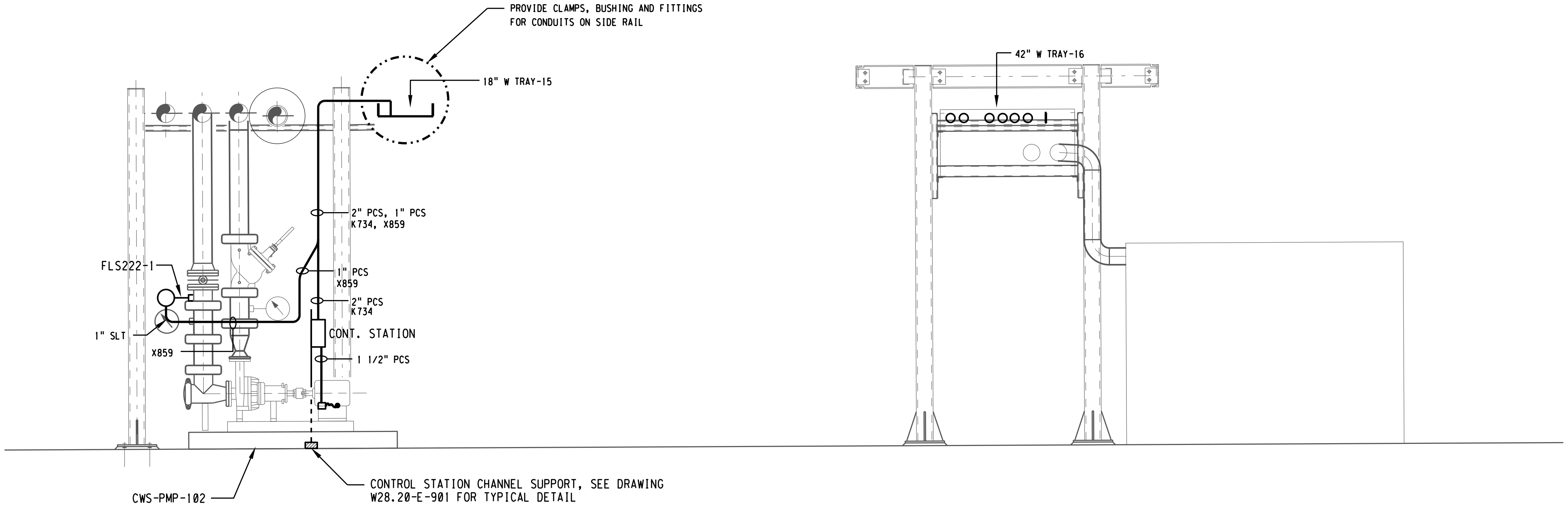
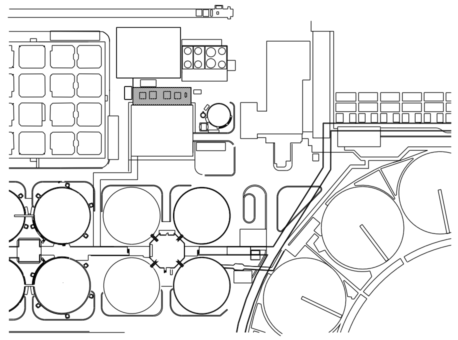

PROVIDE CLAMPS, BUSHING AND FITTINGS
FOR CONDUITS ON SIDE RAIL
18" W TRAY-15
42" W TRAY-16
2" PCS, 1" PCS
K734, X859
1" PCS
X859
2" PCS
K734
CONT. STATION
1 1/2" PCS
FLS222-1
1" SLT
X859
CWS-PMP-102
CONTROL STATION CHANNEL SUPPORT, SEE DRAWING
W28.20-E-901 FOR TYPICAL DETAIL

A SECTION
-
1/2"=1'



KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

MTH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

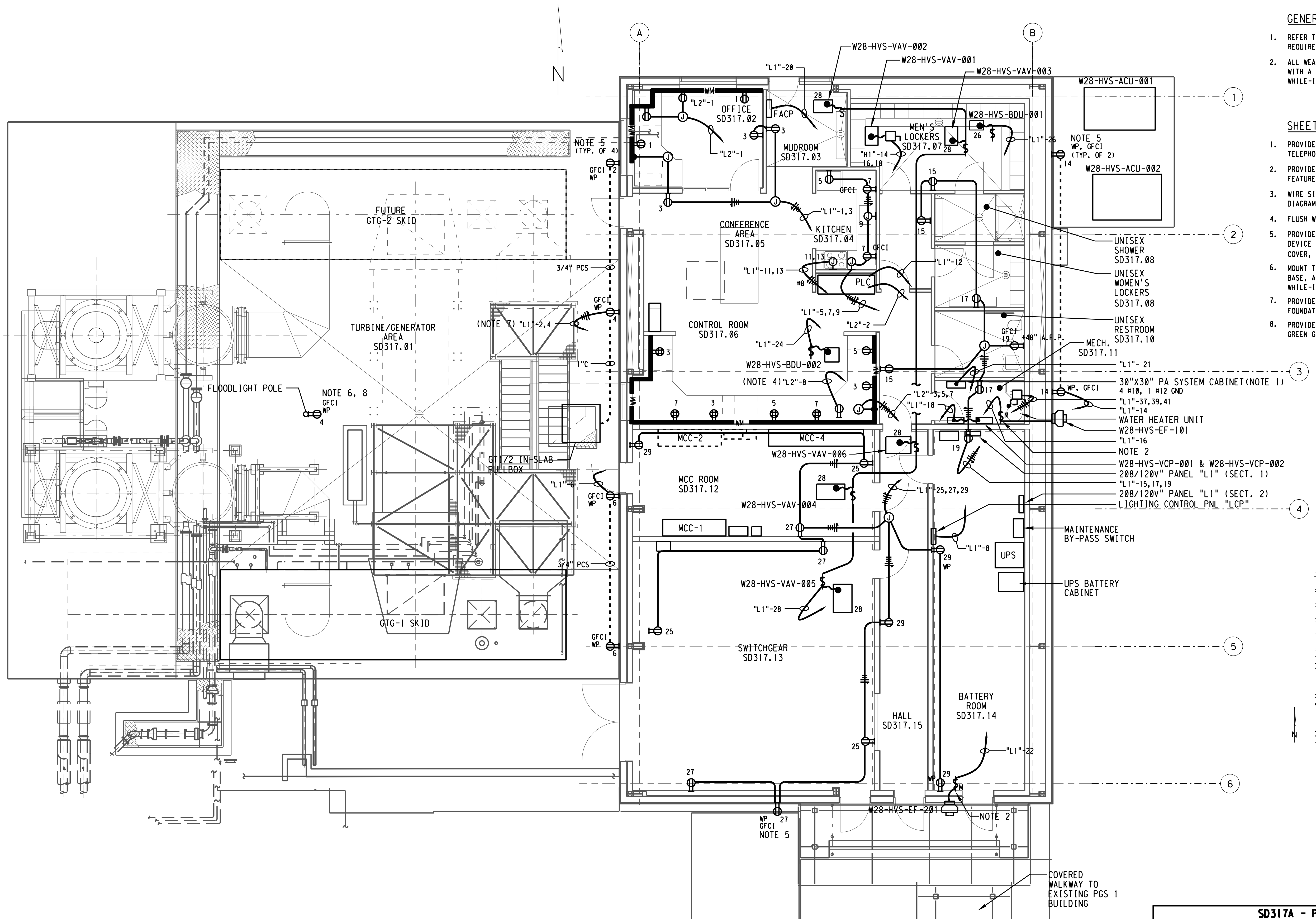
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
COOLING LOOP
SECTIONS AND DETAILS

SCALE 1/2"=1'
DATE JAN2009
W28.20-E-154
DRAWING NUMBER
1
REV.

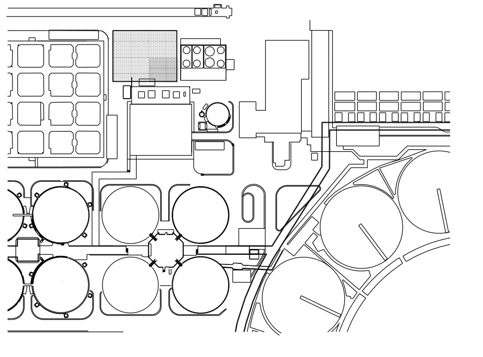


GENERAL NOTES:

1. REFER TO DWG. W28.20-E-103 FOR UNDERGROUND CONDUIT REQUIREMENTS.
2. ALL WEATHERPROOF OUTDOOR RECEPTACLES SHALL BE PROVIDED WITH A COPPER-FREE CAST ALUMINUM, LOCKABLE, WEATHERPROOF WHILE-IN-USE COVER.

SHEET NOTES:

1. PROVIDE A DUPLEX RECEPTACLE NEMA 5-20R INSIDE THE TELEPHONE CABINET.
2. PROVIDE TOGGLE TYPE MANUAL STARTER WITH LOCK-OFF FEATURE.
3. WIRE SIZE TO BE IN ACCORDANCE WITH SINGLE LINE DIAGRAM ON DWG. W28.20-E-208.
4. FLUSH WALL RECEPTACLE MOUNT AT APPROX. +8'-0" AFF.
5. PROVIDE GFCI RECEPTACLES IN PVC COATED FDD SERIES CAST DEVICE BOXES WITH ALUMINUM WEATHERPROOF WHILE-IN-USE COVER, MOUNTED 18" AFF.
6. MOUNT THIS GFCI RECEPTACLE ON LIGHT POLE, 24" ABOVE BASE, AND PROVIDE WITH ALUMINUM WEATHERPROOF WHILE-IN-USE COVER.
7. PROVIDE HDPE CONDUIT SEGMENT TO TRANSITION FROM BLDG FOUNDATION SYSTEM TO TURBINE-GENERATOR PAD.
8. PROVIDE 2-1/C #12 AWG PHASE & NEUTRAL PLUS 1/C #12 AWG GREEN GROUND WIRES BETWEEN GFCI RECEPTACLE DEVICES "4".



KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

MTH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
POWER PLAN

SCALE 3/16'=1'
DATE JAN2009
W28.20-E-160
DRAWING NUMBER
1
REV.

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DATE: 07-OCT-2014 10:59
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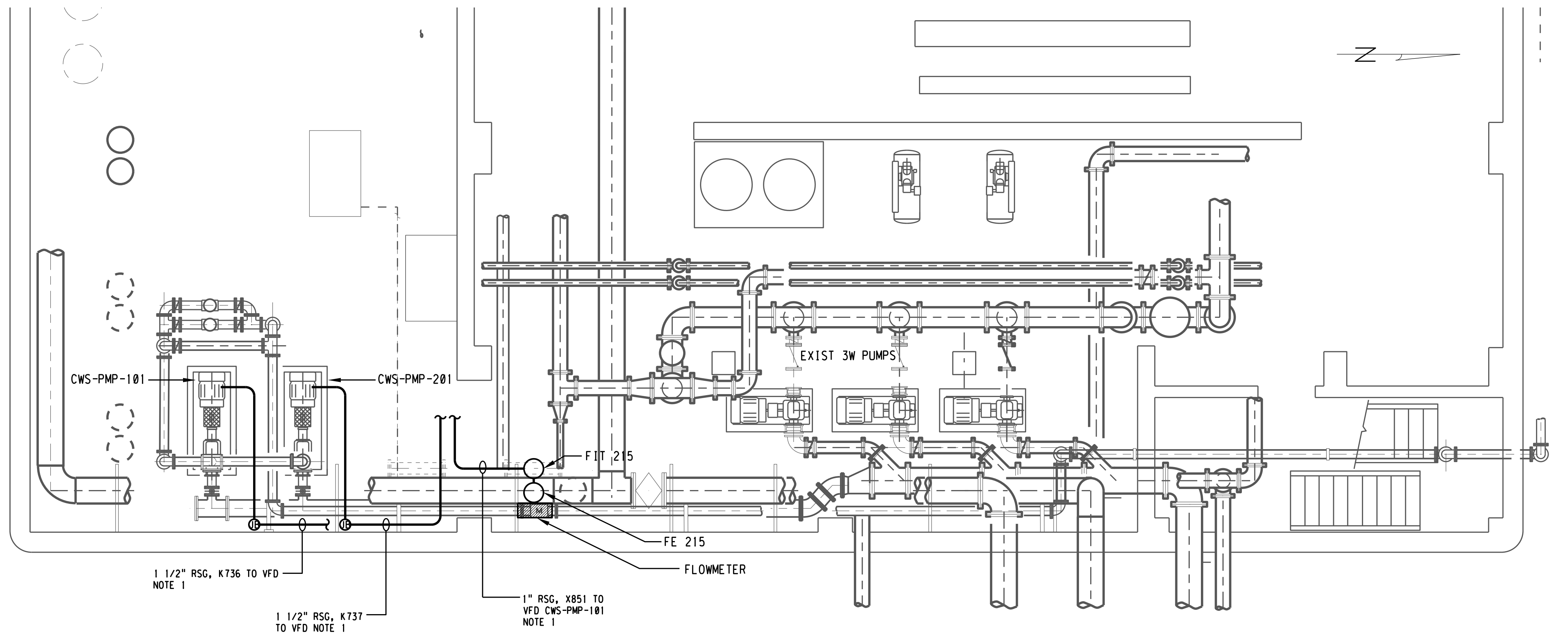
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

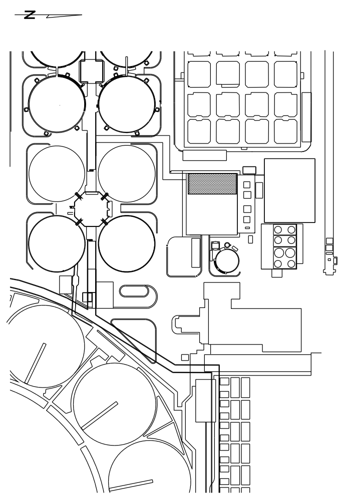
NOTES:

1. SEE DRAWING W28.50-E-102 FOR LOCATION OF VFD(S) IN PGS1 BUILDING BASEMENT.



1 PGS 1 BASEMENT POWER PLAN - NO. 3 COOLING WATER PUMPS

- 1/4"=1'



KEY MAP

3" ON ORIGINAL DOCUMENT
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santa clara, ca 95054
(408) 986-8558
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PROJECT NO. 07688-01-03

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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
NO. 3 COOLING WATER PUMPS
POWER PLAN

SCALE 1/4"=1'
DATE JAN2009

W28.10-E-161
DRAWING NUMBER

1
REV.

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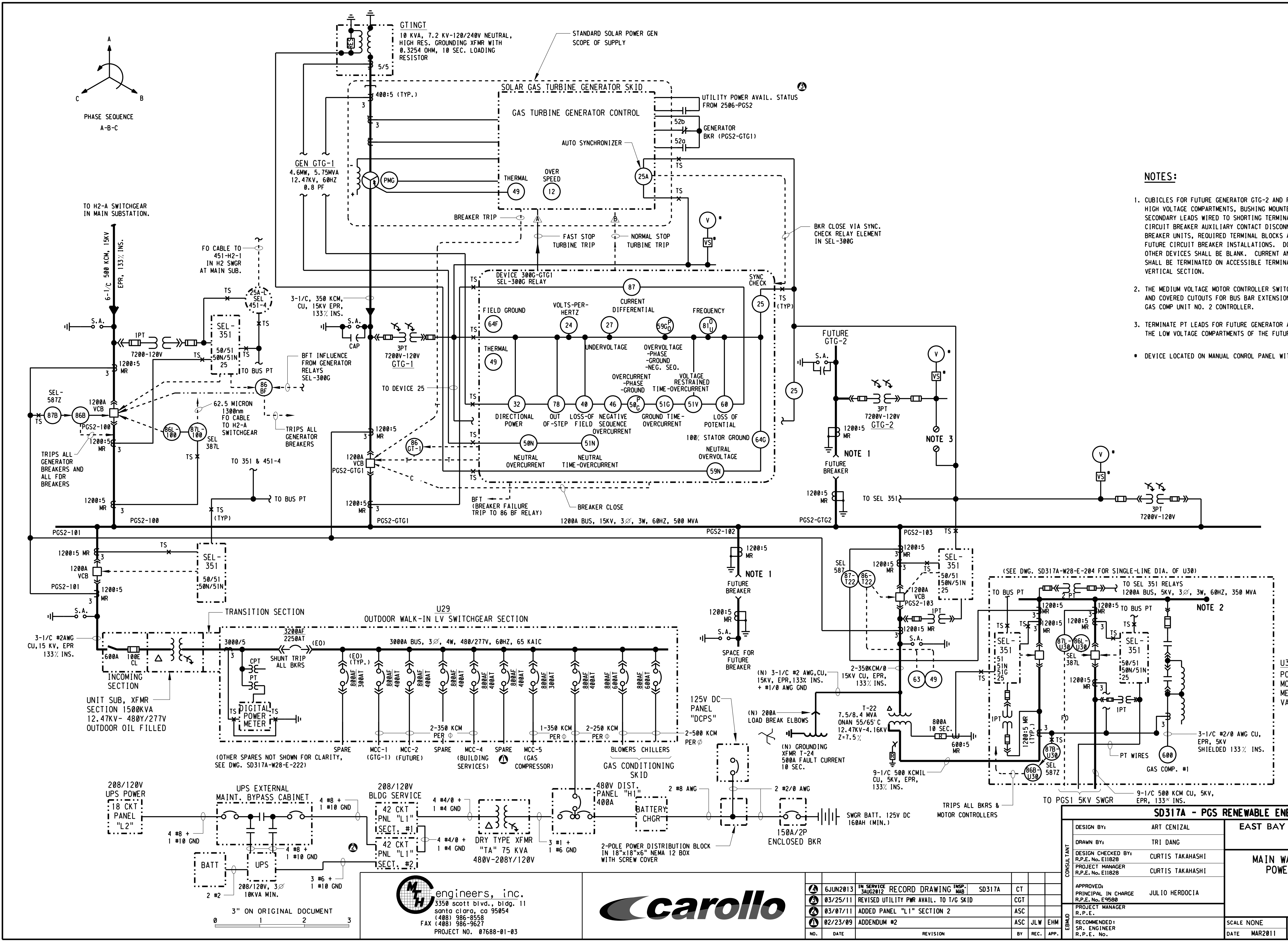

PHASE SEQUENCE
A-B-C
GTINGT
10 KVA, 7.2 KV-120/240V NEUTRAL, HIGH RES. GROUNDING XFMR WITH 0.3254 OHM, 10 SEC. LOADING RESISTOR
5/5
STANDARD SOLAR POWER GEN SCOPE OF SUPPLY
SOLAR GAS TURBINE GENERATOR SKID
400:5 (TYP.)
GAS TURBINE GENERATOR CONTROL
UTILITY POWER AVAIL. STATUS FROM 2506-PGS2
52b
52a
GENERATOR BKR (PGS2-GTG1)
AUTO SYNCHRONIZER
25A
TS
GEN GTG-1
4.6MW, 5.75MVA
12.47KV, 60HZ
0.8 PF
PMG
THERMAL
49
OVER SPEED
12
BREAKER TRIP
FAST STOP TURBINE TRIP
NORMAL STOP TURBINE TRIP
BKR CLOSE VIA SYNC. CHECK RELAY ELEMENT IN SEL-300G
V
VS
TO H2-A SWITCHGEAR IN MAIN SUBSTATION.
6-1/C 500 KCM, 15KV EPR, 133% INS.
FO CABLE TO 451-H2-1 IN H2 SWGR AT MAIN SUB.
25A-1 SEL 451-4
S.A.
1PT
7200-120V
SEL-351
50/51 50N/51N 25
TO BUS PT
1200:5 MR
SEL-587Z
87B
86B
1200A VCB
PGS2-100
BFT INFLUENCE FROM GENERATOR RELAYS SEL-300G
86 BF
62.5 MICRON 1300nm FO CABLE TO H2-A SWITCHGEAR
TRIPS ALL GENERATOR BREAKERS
86L 100
87L 100
SEL 387L
TRIPS ALL GENERATOR BREAKERS AND ALL FDR BREAKERS
TO 351 & 451-4
TO BUS PT
PGS2-100
3-1/C, 350 KCM, CU, 15KV EPR, 133% INS.
CAP
3PT
7200V-120V
GTG-1
TO DEVICE 25
DEVICE 300G-GTG1
SEL-300G RELAY
FIELD GROUND
64F
VOLTS-PER-HERTZ
24
CURRENT DIFFERENTIAL
87
27
59Q
81
FREQUENCY
SYNC CHECK
25
THERMAL
49
UNDERVOLTAGE
OVERVOLTAGE -PHASE -GROUND -NEG. SEQ.
OVERCURRENT -PHASE -GROUND
VOLTAGE RESTRAINED TIME-OVERCURRENT
32
78
40
46
50
51G
51V
60
DIRECTIONAL POWER
OUT OF-STEP
LOSS-OF FIELD
NEGATIVE SEQUENCE OVERCURRENT
GROUND TIME-OVERCURRENT
LOSS OF POTENTIAL
100% STATOR GROUND
64G
50N
51N
NEUTRAL OVERCURRENT
NEUTRAL TIME-OVERCURRENT
NEUTRAL OVERVOLTAGE
59N
86 GT-1
1200A VCB PGS2-GTG1
BFT (BREAKER FAILURE TRIP TO 86 BF RELAY)
BREAKER CLOSE
PGS2-GTG1
1200A BUS, 15KV, 3Ø, 3W, 60HZ, 500 MVA
FUTURE GTG-2
7200V-120V
GTG-2
NOTE 3
NOTE 1
FUTURE BREAKER
TO SEL 351
PGS2-GTG2
3PT 7200V-120V
PGS2-101
PGS2-102
PGS2-103
SEL-351 50/51 50N/51N
TRANSITION SECTION
U29
OUTDOOR WALK-IN LV SWITCHGEAR SECTION
3-1/C #2AWG CU,15 KV, EPR 133% INS.
600A
100E CL
INCOMING SECTION
UNIT SUB, XFMR SECTION 1500KVA 12.47KV- 480Y/277V OUTDOOR OIL FILLED
3000/5
3200AF 2250AT
SHUNT TRIP ALL BKRS
(EO)
3000A BUS, 3Ø, 4W, 480/277V, 60HZ, 65 KAIC
CPT
PT
DIGITAL POWER METER
2-350 KCM PER Ø
1-350 KCM PER Ø
2-250 KCM PER Ø
SPARE
MCC-1 (GTG-1)
MCC-2 (FUTURE)
SPARE
MCC-4 (BUILDING SERVICES)
SPARE
MCC-5 (GAS COMPRESSOR)
BLOWERS
CHILLERS
(OTHER SPARES NOT SHOWN FOR CLARITY, SEE DWG. SD317A-W28-E-222)
GAS CONDITIONING SKID
125V DC PANEL "DCPS"
2-500 KCM PER Ø
FUTURE BREAKER
SPACE FOR FUTURE BREAKER
(N) 3-1/C #2 AWG,CU, 15KV, EPR,133% INS. + #1/0 AWG GND
(N) 200A LOAD BREAK ELBOWS
2-350KCM/0 15KV CU, EPR, 133% INS.
63
49
T-22
7.5/8.4 MVA ONAN 55/65°C 12.47KV-4.16KV Z=7.5%
800A 10 SEC.
600:5 MR
(N) GROUNDING XFMR T-24 500A FAULT CURRENT 10 SEC.
9-1/C 500 KCMIL CU, 5KV, EPR, 133% INS.
SEL 587
87-T22
86-T22
1200A VCB PGS2-103
(SEE DWG. SD317A-W28-E-204 FOR SINGLE-LINE DIA. OF U30)
TO SEL 351 RELAYS
1200A BUS, 5KV, 3Ø, 3W, 60HZ, 350 MVA
TO BUS PT
NOTE 2
SEL-351 51 51N 51G 25
87L U30
86L U30
SEL 387L
SEL-351 50/51 50N/51N 25
FO
PT WIRES
87B U30
86B U30
SEL 587Z
GAS COMP. #1
600
3-1/C #2/0 AWG CU, EPR, 5KV SHIELDED 133% INS.
9-1/C 500 KCM CU, 5KV, EPR, 133% INS.
TO PGS1 5KV SWGR
TRIPS ALL BKRS & MOTOR CONTROLLERS
U30
PCR-ENCLOSED AUTO-TRANSFORMER 5KV MOTOR STARTER SWGR WITH INTEGRATED METAL-CLAD MEDIUM VOLTAGE DRAWOUT VACUUM BKRS
208/120V UPS POWER
18 CKT PANEL "L2"
UPS EXTERNAL MAINT. BYPASS CABINET
4 #8 + 1 #10 GND
BATT
UPS
208/120V, 3Ø 10KVA MIN.
2 #2
3 #6 + 1 #10 GND
208/120V BLDG SERVICE
42 CKT PNL "L1" SECT. #1
42 CKT PNL "L1" SECT. #2
4 #4/0 + 1 #4 GND
DRY TYPE XFMR "TA" 75 KVA 480V-208Y/120V
3 #1 + 1 #6 GND
480V DIST. PANEL "H1" 400A
2-POLE POWER DISTRIBUTION BLOCK IN 18"x18"x6" NEMA 12 BOX WITH SCREW COVER
2 #8 AWG
BATTERY CHGR
2 #2/0 AWG
150A/2P ENCLOSED BKR
SWGR BATT. 125V DC 160AH (MIN.)

NOTES:

1. CUBICLES FOR FUTURE GENERATOR GTG-2 AND FUTURE SPARE FEEDER SHALL BE PROVIDED WITH HIGH VOLTAGE COMPARTMENTS, BUSHING MOUNTED CURRENT TRANSFORMERS (CT'S) WITH SECONDARY LEADS WIRED TO SHORTING TERMINAL BLOCKS, DRAWOUT VOLTAGE TRANSFORMERS, CIRCUIT BREAKER AUXILIARY CONTACT DISCONNECTS, ALL HARDWARE FOR FUTURE DRAWOUT BREAKER UNITS, REQUIRED TERMINAL BLOCKS AS THE OTHER CUBICLES, AND PROVISIONS FOR FUTURE CIRCUIT BREAKER INSTALLATIONS. DOOR PANELS FOR RELAYS, CONTROLS, AND OTHER DEVICES SHALL BE BLANK. CURRENT AND VOLTAGE TRANSFORMER SECONDARY WIRES SHALL BE TERMINATED ON ACCESSIBLE TERMINAL BLOCKS WITHIN THE RESPECTIVE SWGR VERTICAL SECTION.
2. THE MEDIUM VOLTAGE MOTOR CONTROLLER SWITCHGEAR SHALL BE PROVIDED WITH END PANEL AND COVERED CUTOUTS FOR BUS BAR EXTENSIONS AND SUBSEQUENT INSTALLATION OF FUTURE GAS COMP UNIT NO. 2 CONTROLLER.
3. TERMINATE PT LEADS FOR FUTURE GENERATOR AND BUS PT. TO TERMINAL BLOCKS INSIDE THE LOW VOLTAGE COMPARTMENTS OF THE FUTURE GTG-2 CUBICLE.

* DEVICE LOCATED ON MANUAL CONROL PANEL WITHIN CONTROL ROOM

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REF 2: REF2#FILENAME
REF 3: REF3#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

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USER: vuong
DATE: 07-OCT-2014 11:29
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheet

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carollo

NO.	DATE	REVISION	BY	REC.	APP.
4	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
3	03/25/11	REVISED UTILITY PWR AVAIL. TO T/G SKID	CGT		
2	03/07/11	ADDED PANEL "L1" SECTION 2	ASC		
1	02/23/09	ADDENDUM #2	ASC	JLW	EHM

SD317A - PGS RENEWABLE ENERGY EXPANSION

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
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PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

CONSULTANT
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SINGLE LINE METER AND
RELAY DIAGRAM - PGS 2

SCALE NONE
DATE MAR2011
W28.20-E-202
DRAWING NUMBER
4
REV.

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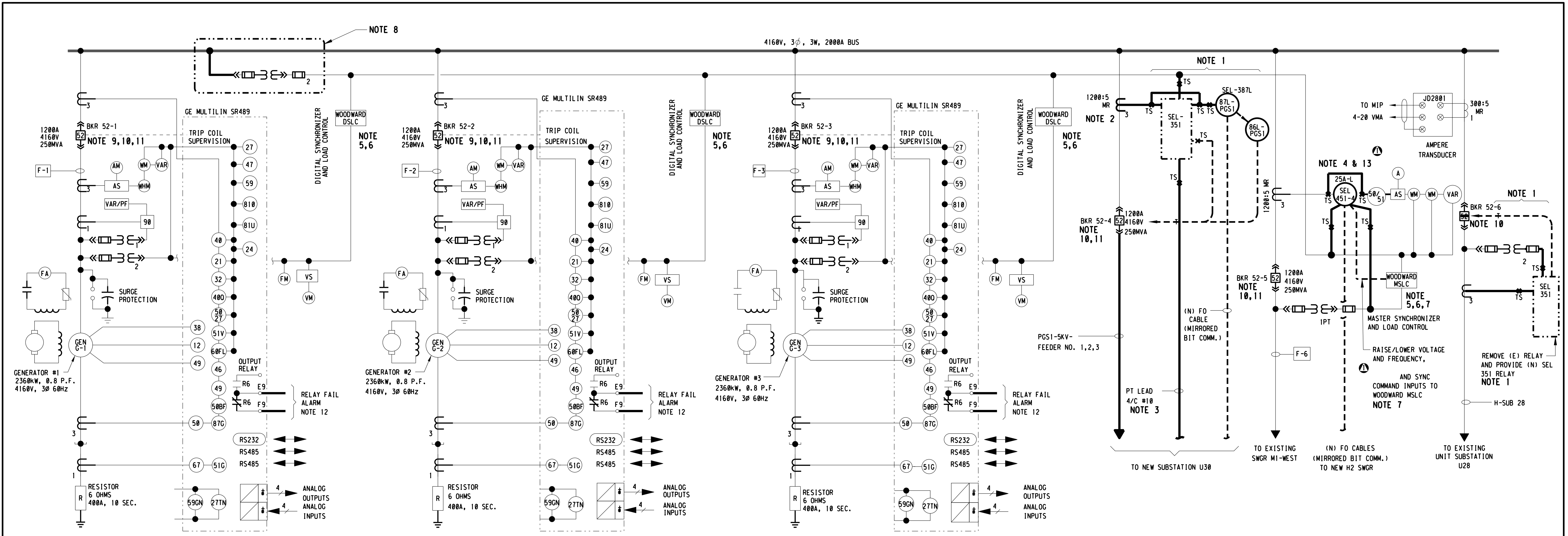


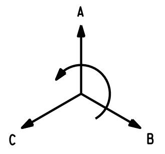
DEVICE LEGEND:

12	OVERSPEED
15	SPEED MATCHING RELAY
21	DISTANCE
24	VOLTS/ Hz
25	SYNCHRONIZING RELAY
27	UNDERVOLTAGE RELAY
32	ANTI-MOTORING RELAY
38	BEARING OVERTEMPERATURE (RTD)
39	BEARING VIBRATION (ANALOG INPUTS)
40	LOSS OF EXCITATION (IMPEDENCE)
40Q	LOSS OF FIELD (REACTIVE POWER)
46	PHASE BALANCE RELAY
47	VOLTAGE PHASE REVERSAL
49	STATOR THERMAL (RTD/ THERMAL MODEL)
50BF	BREAKER FAILURE DETECTION
50	HIGH-SET PHASE OVERCURRENT.
50/27	INADVERTANT GENERATOR ENERGIZATION
50/51	OVERCURRENT RELAY
50/51GN	GROUND OVERCURRENT
51N	RESIDUAL GROUND OVERCURRENT RELAY
51V	OVERCURRENT RELAY WITH VOLTAGE RESTRAINT
52	CURCUIT BREAKER
59	OVERVOLTAGE RELAY
59GN/27TN	100% STATOR GROUND
60	VOLTAGE MATCHING RELAY
60FL	VT FUSE FAILURE
65	GOVERNOR
67	DIRECTIONAL GROUND RELAY
81O	OVER FREQUENCY RELAY
81U	UNDER FREQUENCY RELAY
81	FREQUENCY RELAY
86	LOCKOUT RELAY
87G	DIFFERENTIAL RELAY
90	VOLTAGE REGULATOR
94	TRIPPING RELAY
79	RECLOSING RELAY
83	AUTOMATIC SELECTIVE CONTROL RELAY
47	PHASE BALANCE VOLTAGE RELAY
AM	AMMETER
AS	AMMETER SWITCH
FM	FREQUENCY METER
SS	SYNCHRONIZING SWITCH
SYN	SYNCHRONOSCOPE
VAR	VARMETER
VAR/P.F.	VAR/ POWER FACTOR CONTROLLER
VM	VOLTMETER
VS	VOLTMETER SWITCH
WHM	WATTHOUR DEMAND METER
WM	WATTMETER
K	KEY INTERLOCK
FA	FIELD AMMETER
CS	CONTROL SWITCH

PGS 1 SWGR SINGLE LINE METER AND RELAY DIAGRAM

NOTES:

1. REMOVE EXISTING RELAYS AND METERS, PROVIDE NEW RELAYS AND TEST SWITCHES (TS) AS SHOWN.
2. REMOVE (E) 300:5 CT AND PROVIDE NEW 1200:5A MULTI-RATIO, C100 (MIN.) CT'S.
3. PROVIDE NEW CABLE FROM LINE PT IN (N) U30 SWITCHGEAR FOR SYNC. CHECK INPUT TO SEL 351.
4. PROVIDE (N) AUTO-SYNC. RELAY SEL 451-4 AT FEEDER U30 CUBICLE FOR REMOTE RE-SYNCHRONIZING CONTROL OF PGS1 GENERATORS THRU EXISTING WOODWARD MSLC.
5. CURRENT TRANSFORMER CONNECTIONS TO EXISTING DSLC AND MSLC ARE NOT SHOWN FOR CLARITY.
6. COMMUNICATION NETWORKS BETWEEN EXISTING MSLC AND DSLC'S ARE NOT SHOWN FOR CLARITY.
7. THE MSLC SYNCHRONIZER MODE SELECT MUST BE IN "OFF" POSITION TO RECEIVE AND EXECUTE RAISE/LOWER VOLTAGE AND FREQUENCY COMMAND INPUT FROM THE NEW SEL 451-4.
8. THESE BUS POTENTIAL TRANSFORMERS ARE LOCATED AT THE REAR ON TOP OF THE SECTION TO BE MODIFIED FOR THE U30 FEEDER. RELOCATE THESE POTENTIAL TRANSFORMERS TO THE FRONT OF SECTION TO ACCOMMODATE NEW 5KV CABLE INSTALLATION. SEE DWG. W28.10-E-231.
9. WIRE A NORMALLY OPEN OUTPUT CONTACT FROM THE NEW LOAD SHEDDING SYSTEM REMOTE I/O MODULE INTO THE TRIP CIRCUIT OF EACH GENERATOR BREAKER. SEE DWG. W28.10-E-542.
10. WIRE A NORMALLY OPEN CIRCUIT BREAKER AUXILIARY CONTACT TO LOAD SHED SYSTEM REMOTE I/O MODULE AS SHOWN ON DWG. W28.10-E-542. FIELD VERIFY AVAILABILITY OF BREAKER AUXILIARY CONTACTS AND PROVIDE NEW AUXILIARY CONTACT SWITCH AS NECESSARY.
11. WIRE A NORMALLY OPEN CIRCUIT BREAKER AUXILIARY CONTACT TO NEW SEL 451-4 DEVICE AS SHOWN ON DWG. W28.10-E-309B. FIELD VERITY AVAILABILITY OF BREAKER AUXILIARY CONTACTS AND PROVIDE NEW AUXILIARY CONTACT SWITCH AS NECESSARY.
12. PROVIDE WIRING TO CONNECT EXISTING SR489 RELAY FAILURE OUTPUT TO NEW I/O PROCESSOR 2411-PGS1 FOR ALL THREE GENERATOR RELAYS. SEE DWG. W28.10-E-545 FOR I/O PROCESSOR SCHEMATIC DIAGRAM.
13. ⚠1 SEL 451-4 OUTPUT FOR AUTO-SYNC VOLTAGE CONTROL SHALL BE WIRED TO DIGITAL INPUT OF EACH ENGINE GENERATOR UNIT PLC.



PHASE SEQUENCE
A-B-C

FEEDER SCHEDULE

	FEEDER NUMBER	FROM	TO	CABLE	CONDUIT	REMARKS
				NUMBER & SIZE		
(E) FEEDER CABLES	F-1	GENERATOR #1	PGS1 CONTROL ROOM SWITCHGEAR	3 #500 KCM	1-6"	(E) 1 #3/0 GND RUN IN SAME CONDUIT
	F-2	GENERATOR #2	PGS1 CONTROL ROOM SWITCHGEAR	3 #500 KCM	1-6"	(E) 1 #3/0 GND RUN IN SAME CONDUIT
	F-3	GENERATOR #3	PGS1 CONTROL ROOM SWITCHGEAR	3 #500 KCM	1-6"	(E) 1 #3/0 GND RUN IN SAME CONDUIT
(N) FEEDER CABLES	PGS1-5KV-FEEDER NO. 1,2,3	PGS1 CONTROL ROOM SWITCHGEAR	PRIMARY UNIT SUB U-30	9-500 KCM, 5KV	3-4"	PROVIDE 1 #3/0 GND IN EACH CONDUIT
(E) FEEDER CABLES	H-SUB 28	PGS1 CONTROL ROOM SWITCHGEAR	UNIT SUB 28			EXISTING CABLES
	F-6	PGS1 CONTROL ROOM SWITCHGEAR	EXISTING MAIN SUBSTATION M1-WEST SWGR	9-500 KCM	3-6"	(E) 1 #3/0 GND RUN IN EACH CONDUIT

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	04/24/10	ADDED NOTE 13 & DELETED UTILITY POWER				
		AVAILABLE OUTPUT FROM SEL 451-4		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
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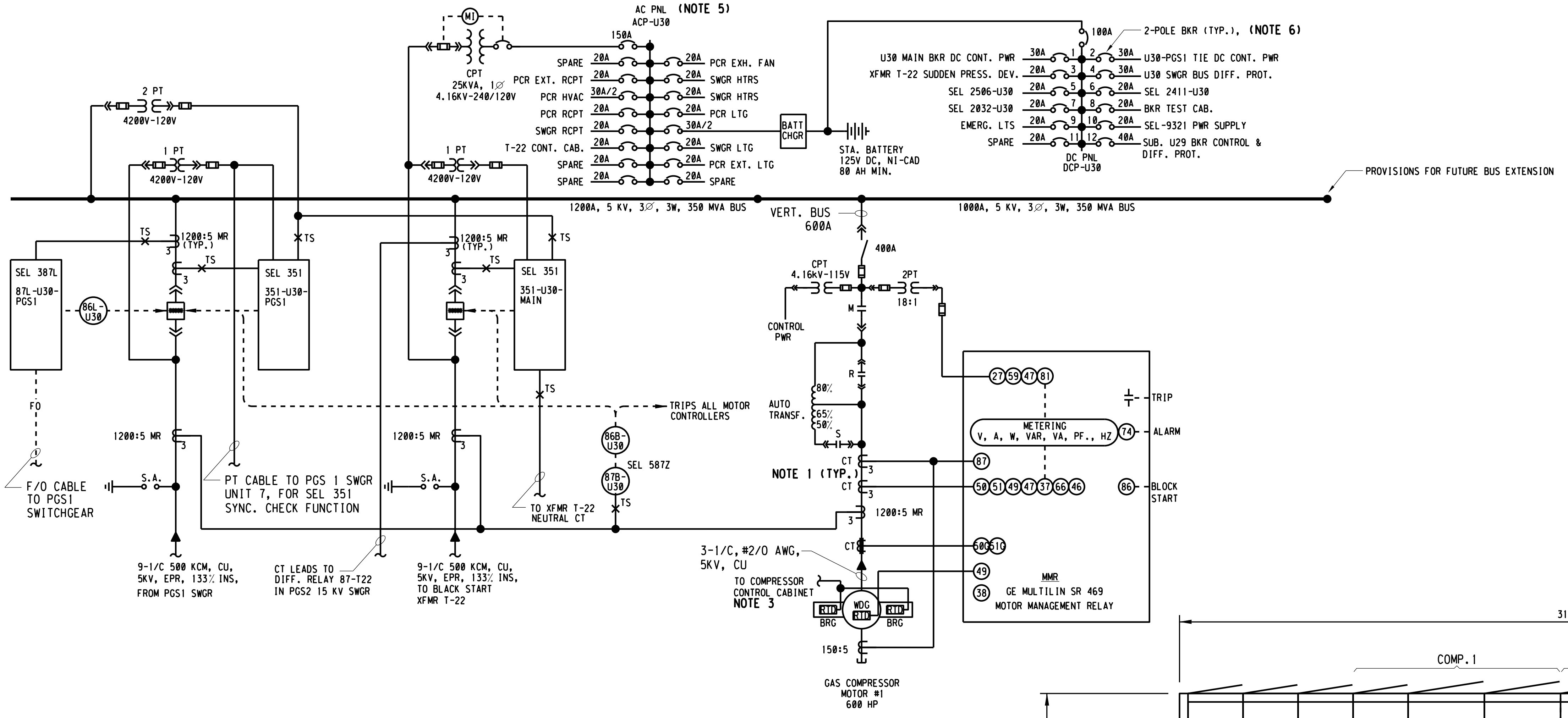
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
SINGLE LINE METER AND
RELAY DIAGRAM - PGS 1

SCALE NONE
DATE APR2010
W28.10-E-203
DRAWING NUMBER
2
REV.

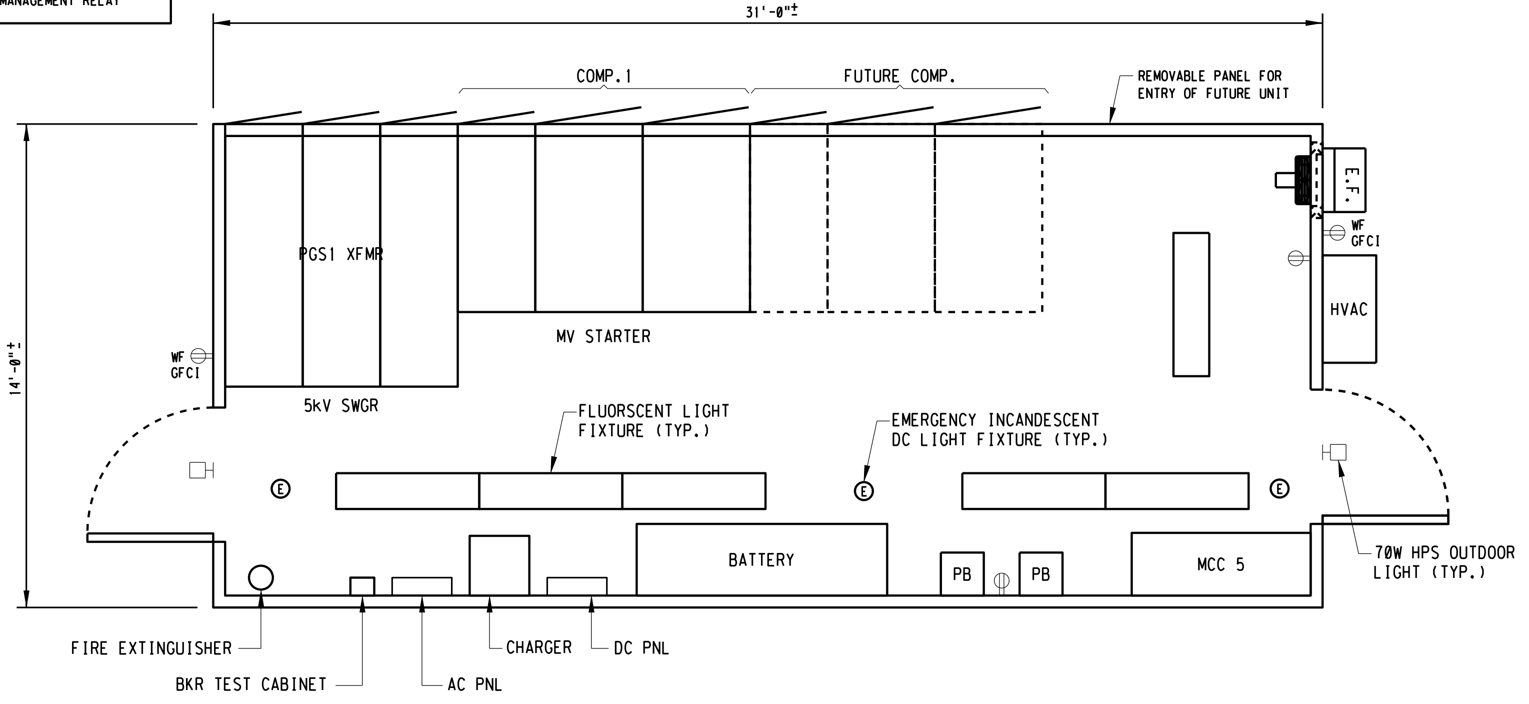

AC PNL (NOTE 5)
ACP-U30
M1
CPT 25KVA, 1Ø 4.16KV-240/120V
150A
SPARE 20A
PCR EXT. RCPT 20A
PCR HVAC 30A/2
PCR RCPT 20A
SWGR RCPT 20A
T-22 CONT. CAB. 20A
SPARE 20A
SPARE 20A
20A PCR EXH. FAN
20A SWGR HTRS
20A SWGR HTRS
20A PCR LTG
30A/2
20A SWGR LTG
20A PCR EXT. LTG
20A SPARE
BATT CHGR
STA. BATTERY 125V DC, NI-CAD 80 AH MIN.
100A
2-POLE BKR (TYP.), (NOTE 6)
U30 MAIN BKR DC CONT. PWR 30A
XFMR T-22 SUDDEN PRESS. DEV. 20A
SEL 2506-U30 20A
SEL 2032-U30 20A
EMERG. LTS 20A
SPARE 20A
30A U30-PGS1 TIE DC CONT. PWR
30A U30 SWGR BUS DIFF. PROT.
20A SEL 2411-U30
20A BKR TEST CAB.
20A SEL-9321 PWR SUPPLY
40A SUB. U29 BKR CONTROL & DIFF. PROT.
DC PNL DCP-U30
PROVISIONS FOR FUTURE BUS EXTENSION
2 PT 4200V-120V
1 PT 4200V-120V
1 PT 4200V-120V
1200A, 5 KV, 3Ø, 3W, 350 MVA BUS
VERT. BUS 600A
1000A, 5 KV, 3Ø, 3W, 350 MVA BUS
TS
1200:5 MR (TYP.)
SEL 387L 87L-U30-PGS1
86L-U30
SEL 351 351-U30-PGS1
SEL 351 351-U30-MAIN
FO
1200:5 MR
F/O CABLE TO PGS1 SWITCHGEAR
S.A.
PT CABLE TO PGS 1 SWGR UNIT 7, FOR SEL 351 SYNC. CHECK FUNCTION
9-1/C 500 KCM, CU, 5KV, EPR, 133% INS, FROM PGS1 SWGR
CT LEADS TO DIFF. RELAY 87-T22 IN PGS2 15 KV SWGR
9-1/C 500 KCM, CU, 5KV, EPR, 133% INS, TO BLACK START XFMR T-22
TRIPS ALL MOTOR CONTROLLERS
86B-U30
SEL 587Z
87B-U30
TO XFMR T-22 NEUTRAL CT
400A
CPT 4.16KV-115V
2PT 18:1
CONTROL PWR
M
R
AUTO TRANSF.
80%
65%
50%
S
NOTE 1 (TYP.)
CT
1200:5 MR
3-1/C, #2/0 AWG, 5KV, CU
TO COMPRESSOR CONTROL CABINET NOTE 3
RTD
BRG
WDG
150:5
GAS COMPRESSOR MOTOR #1 600 HP
27 59 47 81
TRIP
METERING V, A, W, VAR, VA, PF., HZ
74 ALARM
87
50 51 49 47 37 66 46
86 BLOCK START
50G 51G
49
38
MMR GE MULTILIN SR 469 MOTOR MANAGEMENT RELAY

1 PRIMARY UNIT SUBSTATION U30 SINGLE LINE METER & RELAY DIAGRAM

NONE

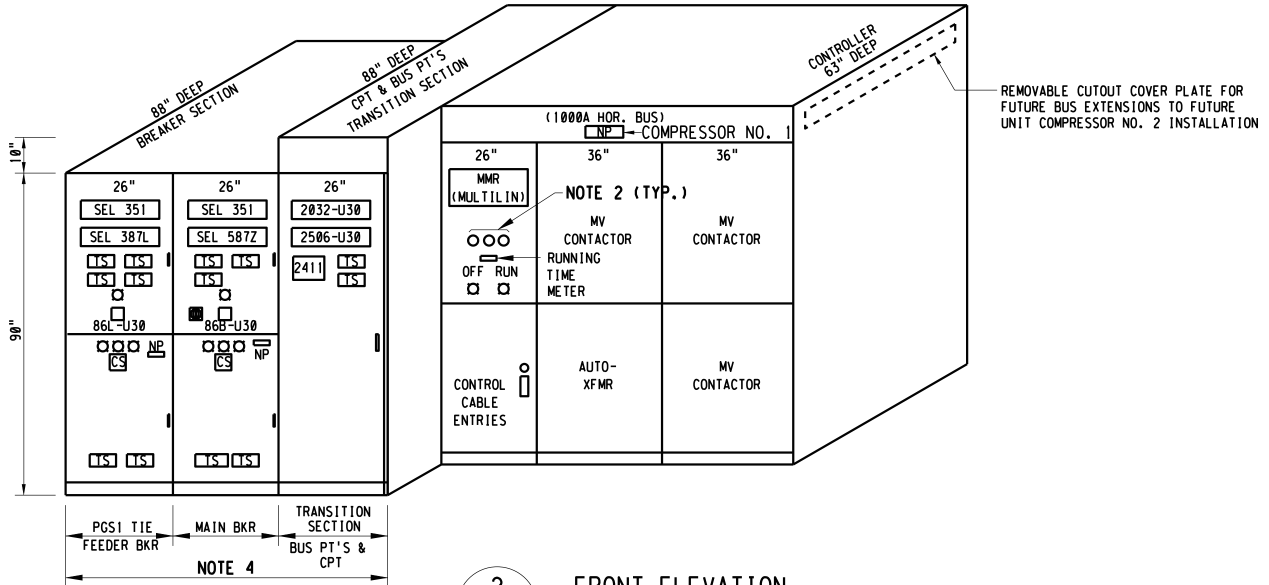
NOTES:

1. CURRENT TRANSFORMERS TO BE SIZED BY MANUFACTURER FOR PROPER PROTECTION OF MOTOR.
2. PROVIDE FRONT PANEL MOUNTED HAND/OFF/AUTO SWITCH, START, AND STOP PUSHBUTTON CONTROLS. SEE DWG. W28.50-E-212.
3. BEARING TEMPERATURE DETECTORS TO BE PROVIDED, 2 PER BEARING, AND WIRED TO A SEPARATE TERMINAL BOX WITH TERMINAL BLOCKS FOR EXTERNAL CONNECTION TO EACH COMPRESSOR'S CONTROL CABINET. PROVIDE 1 1/2"C UNDERGROUND CONDUIT BETWEEN BEARING RTD TERMINAL BOX AND RESPECTIVE COMPRESSOR CONTROL CABINET, STUBBED UP, SEALED AND CAPPED AT EACH END FOR FUTURE USE.
4. SEE DRAWING W28.50-E-224 FOR METAL-CLAD SWITCHGEAR ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST.
5. PROVIDE AC PANELBOARD IN ACCORDANCE WITH REQUIREMENTS OF SPECIFICATION SECTION 16446. PANELBOARD SHALL BE SIZED TO ACCOMMODATE A MINIMUM OF 30 1-POLE BRANCH CIRCUITS. PROVIDE A MINIMUM OF 4 SPARE 20A/1P BREAKERS.
6. PROVIDE DC PANELBOARD IN ACCORDANCE WITH REQUIREMENTS OF SPECIFICATION SECTION 16446. PANELBOARD SHALL BE SIZED TO ACCOMMODATE A MINIMUM OF 20 2-POLE BRANCH CIRCUITS. PROVIDE A MINIMUM OF 4 SPARE 20A/2P BREAKERS.
7. THE POWER CONTROL CENTER SHALL BE MODULAR, THERMALLY INSULATED, WALK-IN ENCLOSURE THAT SHALL BE ASSEMBLED AT THE SWITCHGEAR MANUFACTURER'S PLANT, ON RIGID STRUCTURAL BASE. DIMENSIONS SHOWN ARE LIMITING REQUIREMENTS OF THE AREA WHERE THE ENCLOSURE WILL BE INSTALLED.



3 PLAN - U30 POWER CONTROL CENTER

NONE



2 FRONT ELEVATION

NONE

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
5KV SWITCHGEAR AND MV MOTOR CONTROLLER

SCALE NONE
DATE JAN2009
W28.50-E-204 DRAWING NUMBER
1 REV.

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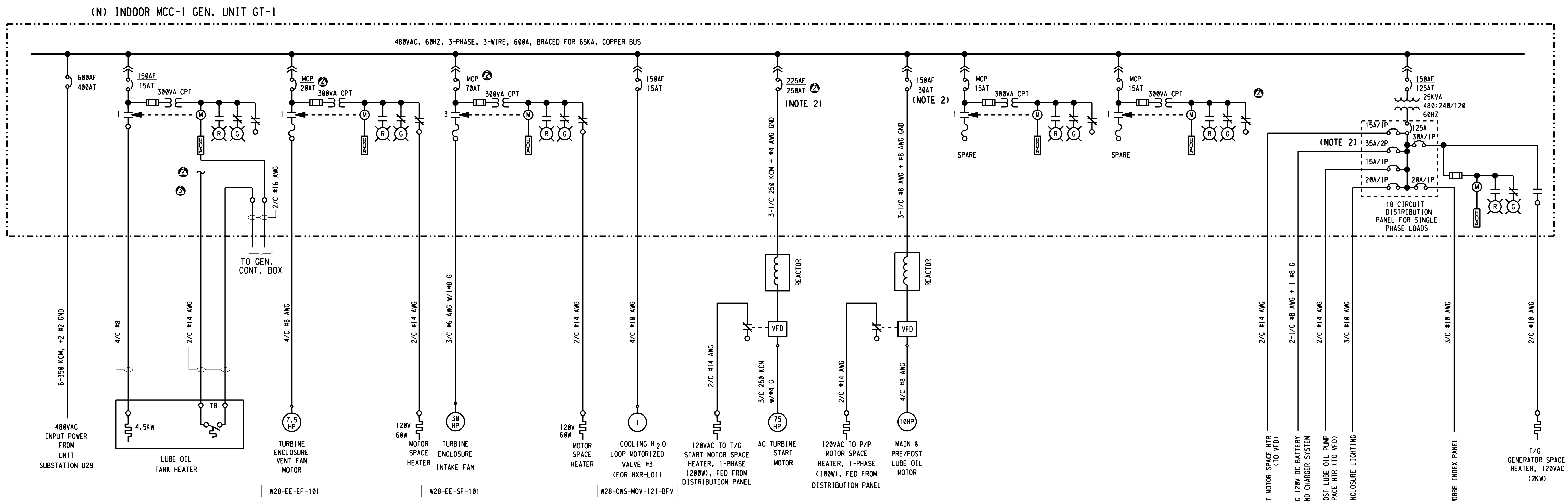
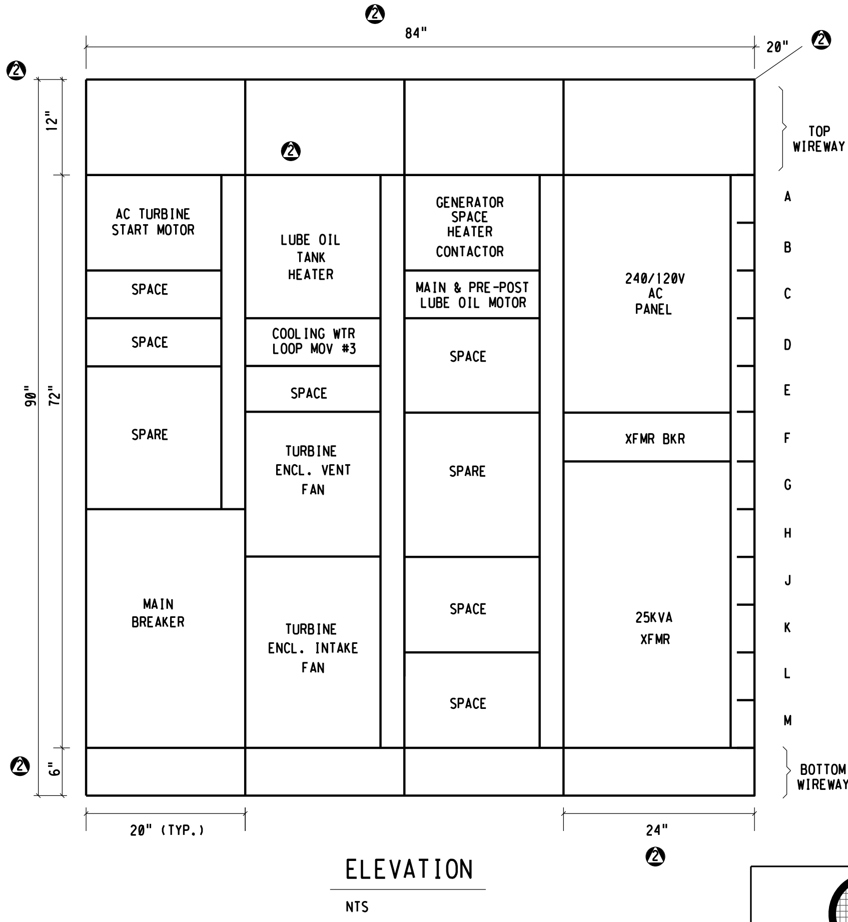

(N) INDOOR MCC-1 GEN. UNIT GT-1
480VAC, 60HZ, 3-PHASE, 3-WIRE, 600A, BRACED FOR 65KA, COPPER BUS
600AF
400AT
150AF
15AT
300VA CPT
MCP
20AT
70AT
15AT
150AF
15AT
225AF
250AT
(NOTE 2)
150AF
30AT
(NOTE 2)
150AF
125AT
25KVA
480:240/120
60HZ
15A/1P
35A/2P
15A/1P
20A/1P
125A
30A/1P
20A/1P
(NOTE 2)
18 CIRCUIT DISTRIBUTION PANEL FOR SINGLE PHASE LOADS
SPARE
SPARE
M
R
G
HOA
2/C #16 AWG
TO GEN. CONT. BOX
6-350 KCM, +2 #2 GND
4/C #8
2/C #14 AWG
4/C #8 AWG
2/C #14 AWG
3/C #6 AWG W/1#8 G
2/C #14 AWG
4/C #10 AWG
3-1/C 250 KCM + #4 AWG GND
3-1/C #8 AWG + #8 AWG GND
REACTOR
REACTOR
VFD
VFD
2/C #14 AWG
3/C 250 KCM W/#4 G
2/C #14 AWG
4/C #8 AWG
2/C #14 AWG
2-1/C #8 AWG + 1 #8 G
2/C #14 AWG
3/C #10 AWG
3/C #10 AWG
2/C #10 AWG
480VAC INPUT POWER FROM UNIT SUBSTATION U29
TB
4.5KW
LUBE OIL TANK HEATER
7.5 HP
TURBINE ENCLOSURE VENT FAN MOTOR
W28-EE-EF-101
120V 60W
MOTOR SPACE HEATER
30 HP
TURBINE ENCLOSURE INTAKE FAN
W28-EE-SF-101
120V 60W
MOTOR SPACE HEATER
1
COOLING H2O LOOP MOTORIZED VALVE #3 (FOR HXR-L01)
W28-CWS-MOV-121-BFV
120VAC TO T/G START MOTOR SPACE HEATER, 1-PHASE (200W), FED FROM DISTRIBUTION PANEL
75 HP
AC TURBINE START MOTOR
120VAC TO P/P MOTOR SPACE HEATER, 1-PHASE (100W), FED FROM DISTRIBUTION PANEL
10HP
MAIN & PRE/POST LUBE OIL MOTOR
START MOTOR SPACE HTR (TO VFD)
240VAC TO T/G 120V DC BATTERY AND CHARGER SYSTEM
MAIN & PRE-POST LUBE OIL PUMP MOTOR SPACE HTR (TO VFD)
ENCLOSURE LIGHTING
WOBBE INDEX PANEL
T/G GENERATOR SPACE HEATER, 120VAC (2KW)
1
2
3
4



ELEVATION

NTS

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0 1 2 3

NOTES:

1. THIS SCHEMATIC IS BASED SOLELY ON PRELIMINARY SCHEMATICS FURNISHED BY THE GAS TURBINE GENERATOR PACKAGE EQUIPMENT SUPPLIER. MINOR REVISIONS MAY BE REQUIRED. CONTRACTOR SHALL VERIFY SPECIFIC EQUIPMENT REQUIREMENTS WITH EQUIPMENT VENDOR SHOP DRAWINGS TO ENSURE CONDUIT, WIRING AND MCC COMPONENTS ARE PROPERLY RATED FOR THE LOADS SERVED.
2. VERIFY BREAKER SIZE REQUIREMENTS WITH TURBINE GENERATOR EQUIPMENT SUPPLIER.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
4	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
3	06/09/11	REV. PER T/G MFR SHOP DWGS			
2	03/25/11	REV. PER T/G MFR & MCC MFR SHOP DWGS			
1	08/14/09	ADD WOBBE POWER SUPPLY			

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 MOTOR CONTROL CENTER
MCC-1 (GEN. UNIT GT-1)

SCALE NONE
DATE MAR2011
W28.20-E-205
DRAWING NUMBER
4
REV.

REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
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REF 6: REF6$FILENAME
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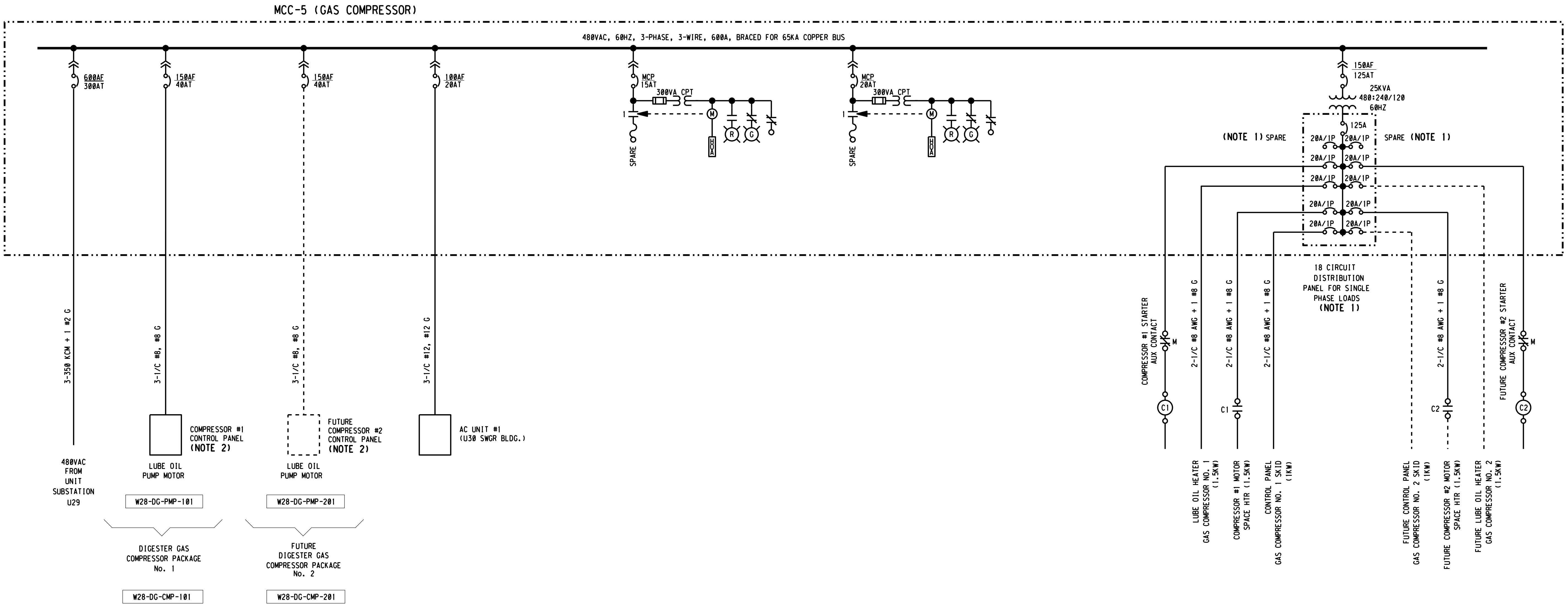
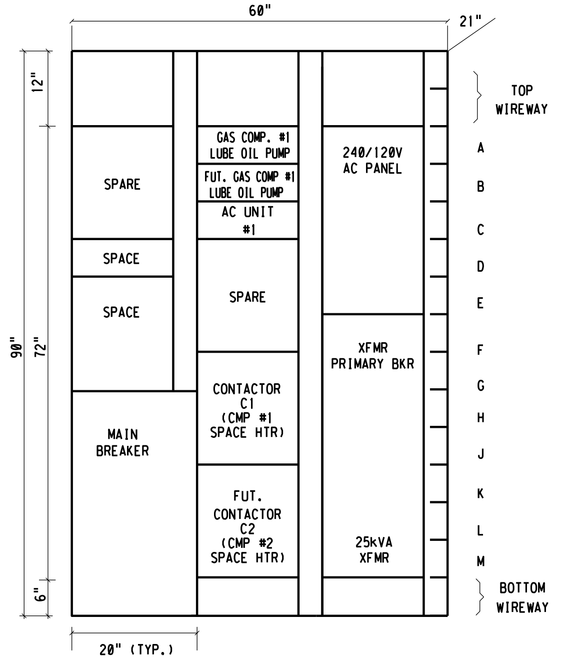

MCC-5 (GAS COMPRESSOR)
480VAC, 60HZ, 3-PHASE, 3-WIRE, 600A, BRACED FOR 65KA COPPER BUS
600AF
300AT
150AF
40AT
150AF
40AT
100AF
20AT
MCP
15AT
300VA CPT
1
SPARE
M
HOA
R
G
MCP
20AT
300VA CPT
1
SPARE
M
HOA
R
G
150AF
125AT
25KVA
480:240/120
60HZ
125A
(NOTE 1) SPARE
SPARE (NOTE 1)
20A/1P
18 CIRCUIT DISTRIBUTION PANEL FOR SINGLE PHASE LOADS (NOTE 1)
3-350 KCM + 1 #2 G
3-1/C #8, #8 G
3-1/C #8, #8 G
3-1/C #12, #12 G
480VAC FROM UNIT SUBSTATION U29
COMPRESSOR #1 CONTROL PANEL (NOTE 2)
LUBE OIL PUMP MOTOR
W28-DG-PMP-101
FUTURE COMPRESSOR #2 CONTROL PANEL (NOTE 2)
LUBE OIL PUMP MOTOR
W28-DG-PMP-201
AC UNIT #1 (U30 SWGR BLDG.)
DIGESTER GAS COMPRESSOR PACKAGE No. 1
W28-DG-CMP-101
FUTURE DIGESTER GAS COMPRESSOR PACKAGE No. 2
W28-DG-CMP-201
COMPRESSOR #1 STARTER AUX CONTACT
M
C1
2-1/C #8 AWG + 1 #8 G
2-1/C #8 AWG + 1 #8 G
C1
2-1/C #8 AWG + 1 #8 G
2-1/C #8 AWG + 1 #8 G
C2
FUTURE COMPRESSOR #2 STARTER AUX CONTACT
M
C2
LUBE OIL HEATER GAS COMPRESSOR NO. 1 (1.5KW)
COMPRESSOR #1 MOTOR SPACE HTR (1.5KW)
CONTROL PANEL GAS COMPRESSOR NO. 1 SKID (1KW)
FUTURE CONTROL PANEL GAS COMPRESSOR NO. 2 SKID (1KW)
FUTURE COMPRESSOR #2 MOTOR SPACE HTR (1.5KW)
FUTURE LUBE OIL HEATER GAS COMPRESSOR NO. 2 (1.5KW)



ELEVATION

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

NOTES:

1. PROVIDE SPARE 20A/1P BREAKERS IN ALL UNUSED BRANCH CIRCUIT SPACES OF THE PANELBOARD.
2. PROVIDE CONDUIT AND WIRING FOR POWER AND CONTROL BETWEEN CONTROL PANEL AND LUBE OIL PUMP MOTOR IN ACCORDANCE WITH SPECIFIC REQUIREMENTS OF EQUIPMENT FURNISHED.

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

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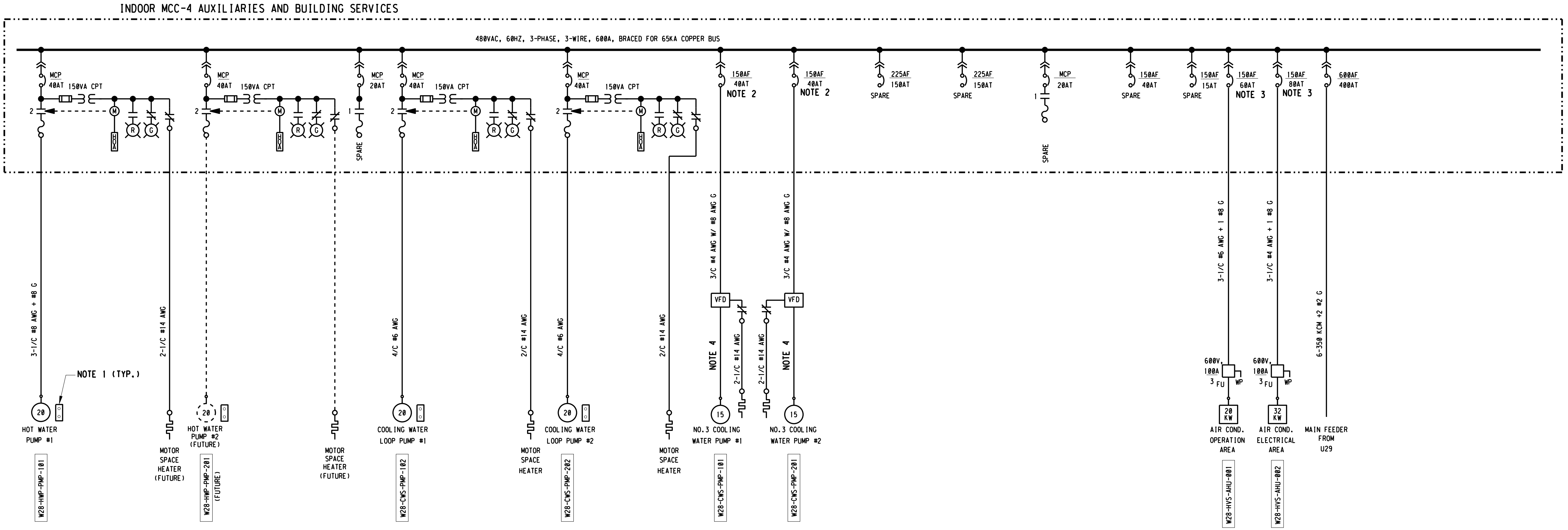
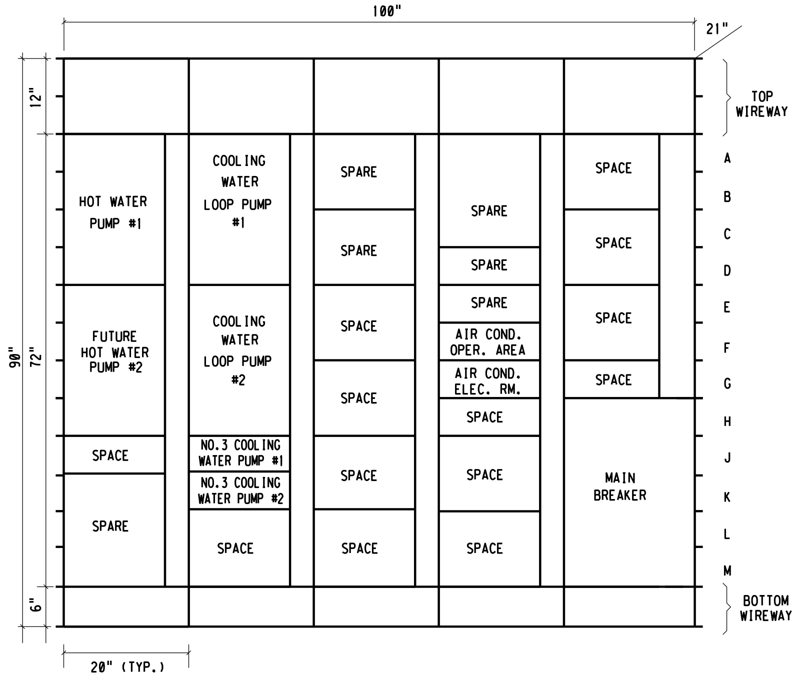
PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 MOTOR CONTROL CENTER
MCC-5 GAS COMPRESSOR

SCALE NONE
DATE JAN2009
W28.20-E-207
DRAWING NUMBER
1
REV.





ELEVATION

NONE

NOTES:

1. PROVIDE 2-POSITION, WEATHERPROOF, CONTROL STATION AT MOTOR FOR START/STOP AND STOP LOCK-OUT CONTROL.
2. CIRCUIT BREAKER TRIP RATING TO BE CONFIRMED WITH VFD MANUFACTURER.
3. CIRCUIT BREAKER TRIP RATING TO BE CONFIRMED WITH MANUFACTURER OF HVAC EQUIPMENT.
4. POWER CABLES BETWEEN THE VFD'S AND NO. 3 COOLING WATER PUMPS SHALL BE UNARMORED, 3/C #6 AWG, 2000V VFD POWER CABLE WITH 3-1/C #12 AWG INSULATED GROUNDING CONDUCTORS.

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REF 9: REF9$FILENAME

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REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

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USER: vuong
DATE: 15-OCT-2014 11:00
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3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 MOTOR CONTROL CENTER
MCC-4 AUXILIARIES AND BUILDING SERVICES

SCALE NONE
DATE JAN2009
W28.20-E-208
DRAWING NUMBER
1
REV.

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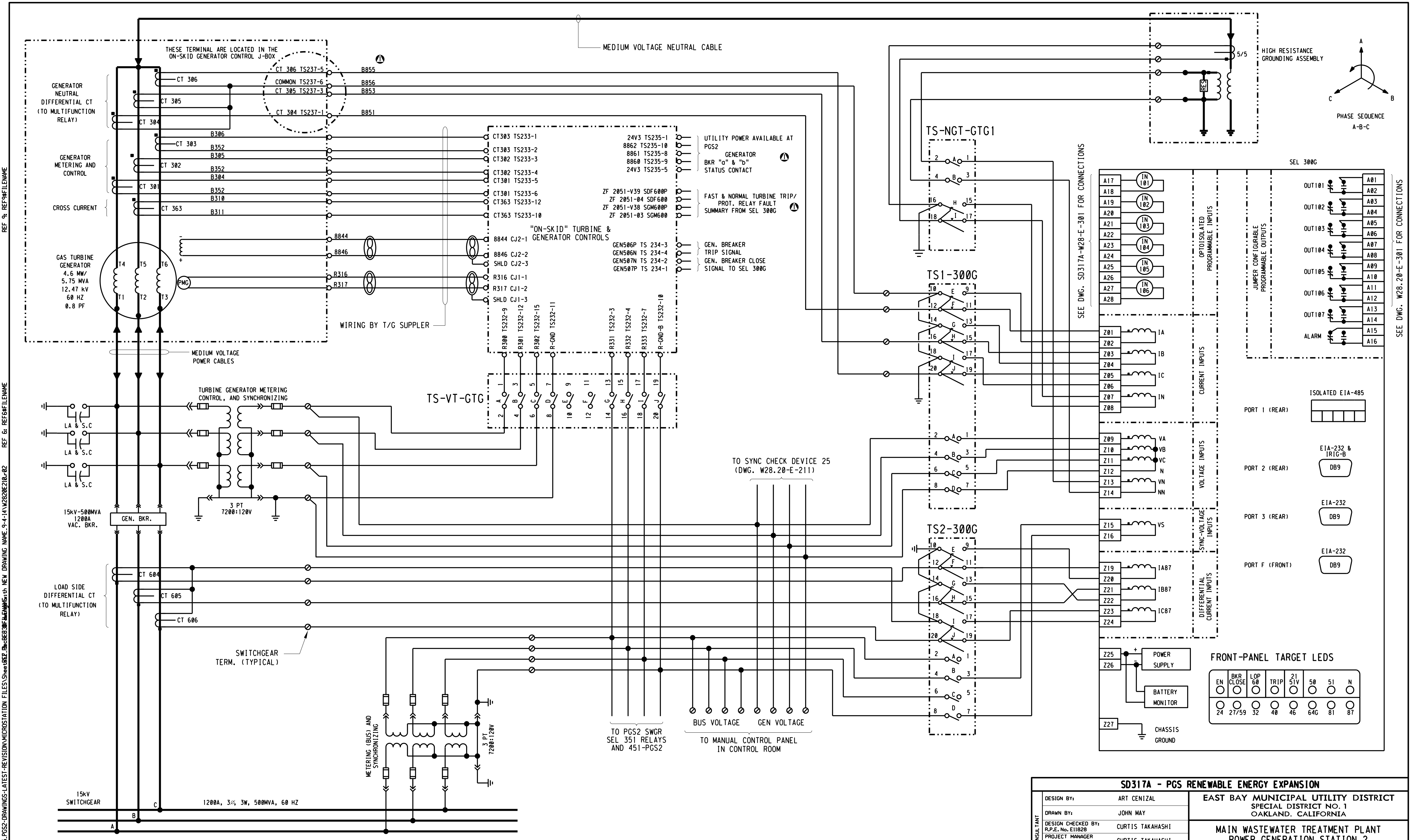

3" ON ORIGINAL DOCUMENT
0 1 2 3

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	04/24/10	REV. PER T/G MFR SHOP DWGS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

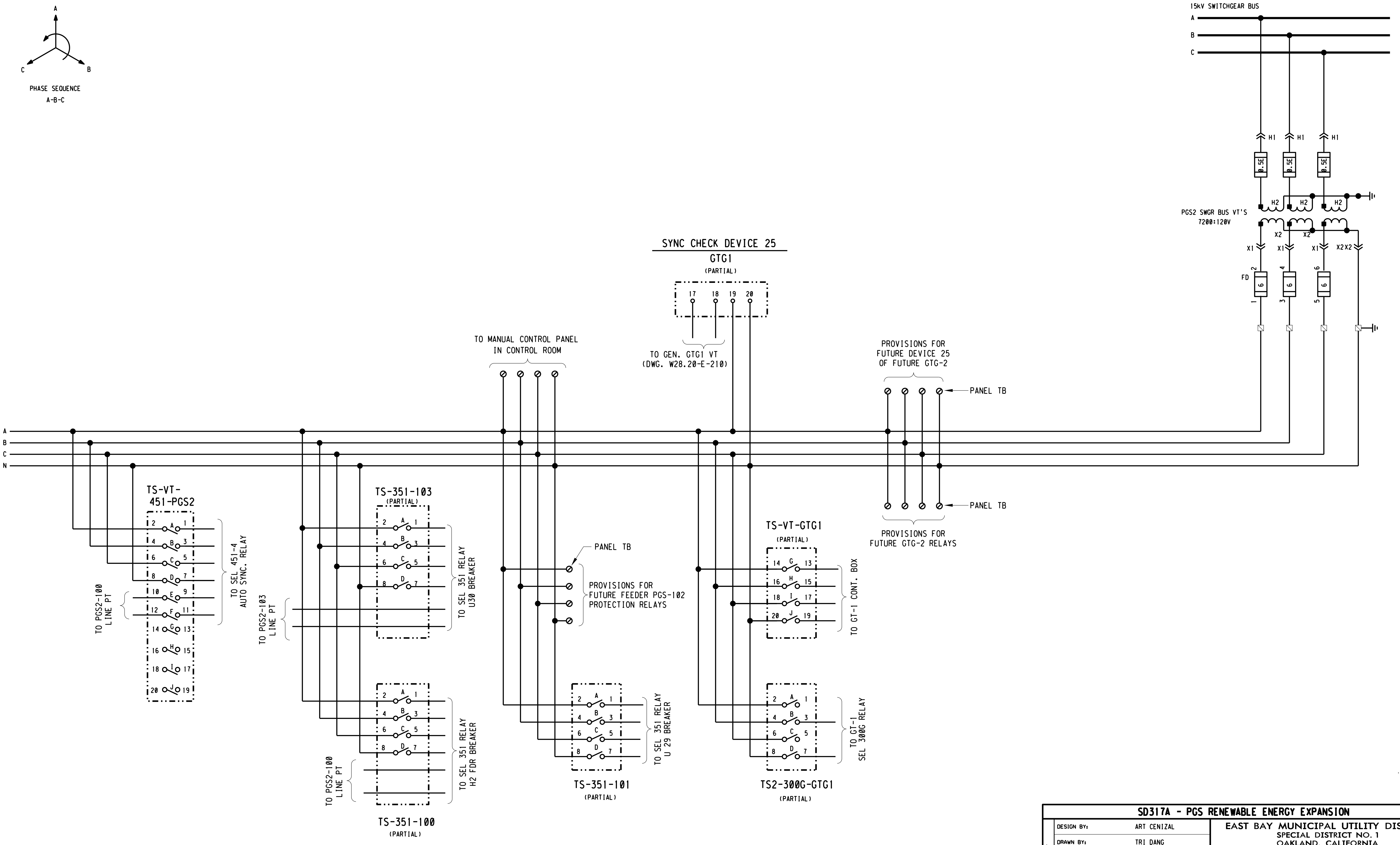
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2

ELECTRICAL

PGS 2 GENERATOR BREAKER THREE LINE AC SCHEMATIC

SCALE NONE
DATE MAR2011
W28.20-E-210
DRAWING NUMBER
2
REV.



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REF 7: REF7$FILENAME
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REF 9: REF9$FILENAME

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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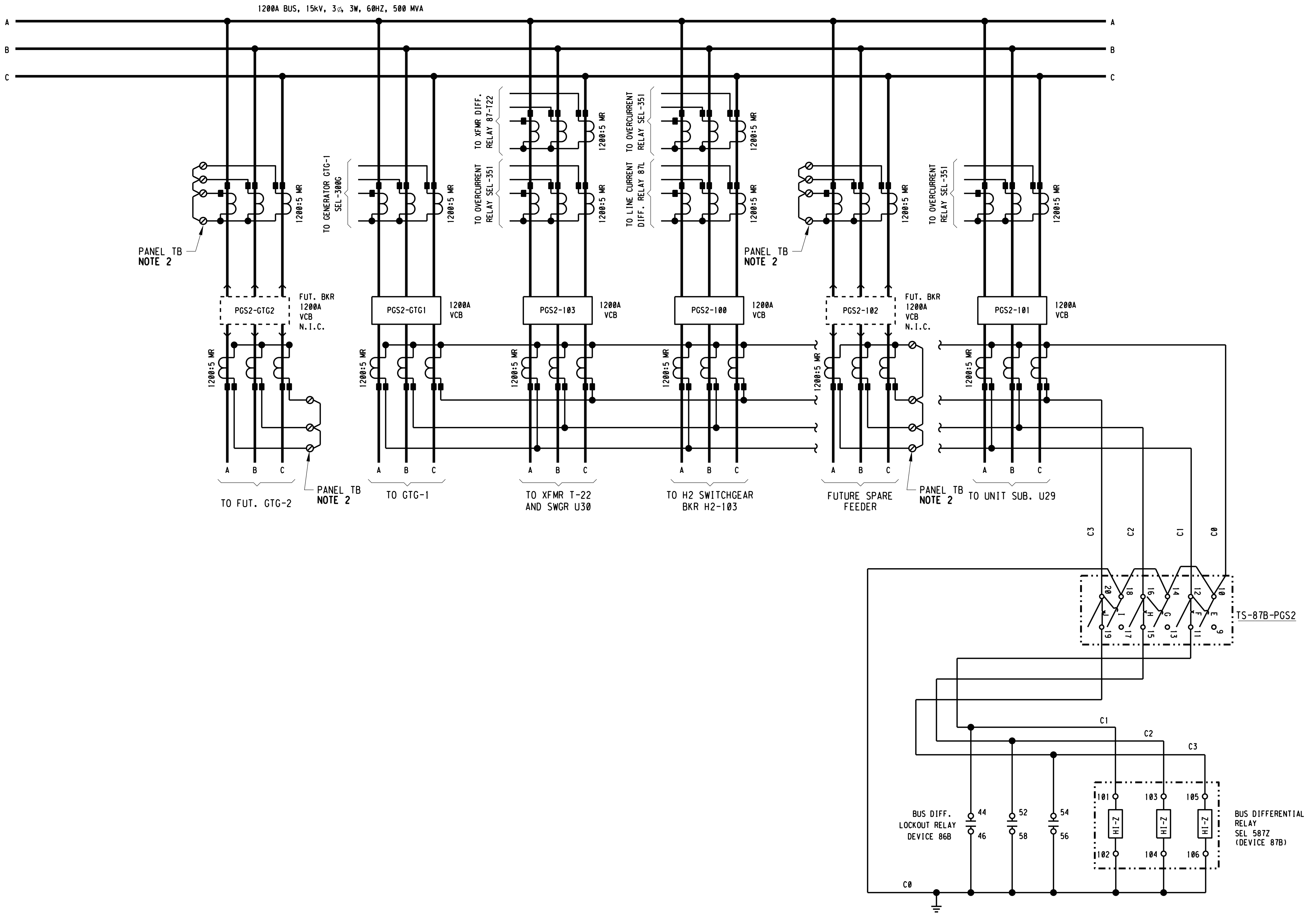
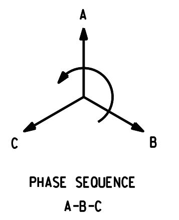
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR BUS
THREE-LINE POTENTIAL SCHEMATIC

SCALE NONE
DATE JAN2009
W28.20-E-211
DRAWING NUMBER
1
REV.


1200A BUS, 15kV, 3∅, 3W, 60HZ, 500 MVA
A
B
C
PANEL TB NOTE 2
TO GENERATOR GTG-1 SEL-300G
TO OVERCURRENT RELAY SEL-351
TO XFMR DIFF. RELAY 87-T22
TO LINE CURRENT DIFF. RELAY 87L
TO OVERCURRENT RELAY SEL-351
1200:5 MR
PGS2-GTG2
FUT. BKR 1200A VCB N.I.C.
PGS2-GTG1
1200A VCB
PGS2-103
PGS2-100
PGS2-102
PGS2-101
TO FUT. GTG-2
TO GTG-1
TO XFMR T-22 AND SWGR U30
TO H2 SWITCHGEAR BKR H2-103
FUTURE SPARE FEEDER
TO UNIT SUB. U29
C3
C2
C1
C0
TS-87B-PGS2
BUS DIFF. LOCKOUT RELAY DEVICE 86B
44
46
52
58
54
56
101
102
103
104
105
106
HI-Z
BUS DIFFERENTIAL RELAY SEL 587Z (DEVICE 87B)



NOTES:

1. REFER TO DRAWING W28.20-E-308B FOR PGS2 SWGR BUS DIFFERENTIAL PROTECTION DC CONTROL SCHEMATIC.
2. ALL CURRENT TRANSFORMERS WHICH ARE PROVIDED WITH FUTURE BREAKER CUBICLES SHALL BE TERMINATED AND SHORTED AT THE SHORTING TERMINAL BLOCKS.

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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR THREE-LINE AC CURRENT
SCHEMATIC BUS DIFFERENTIAL PROTECTION

SCALE NONE
DATE JAN2009
W28.20-E-211A
DRAWING NUMBER
1
REV.

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DATE: 11-SEP-2014 10:51
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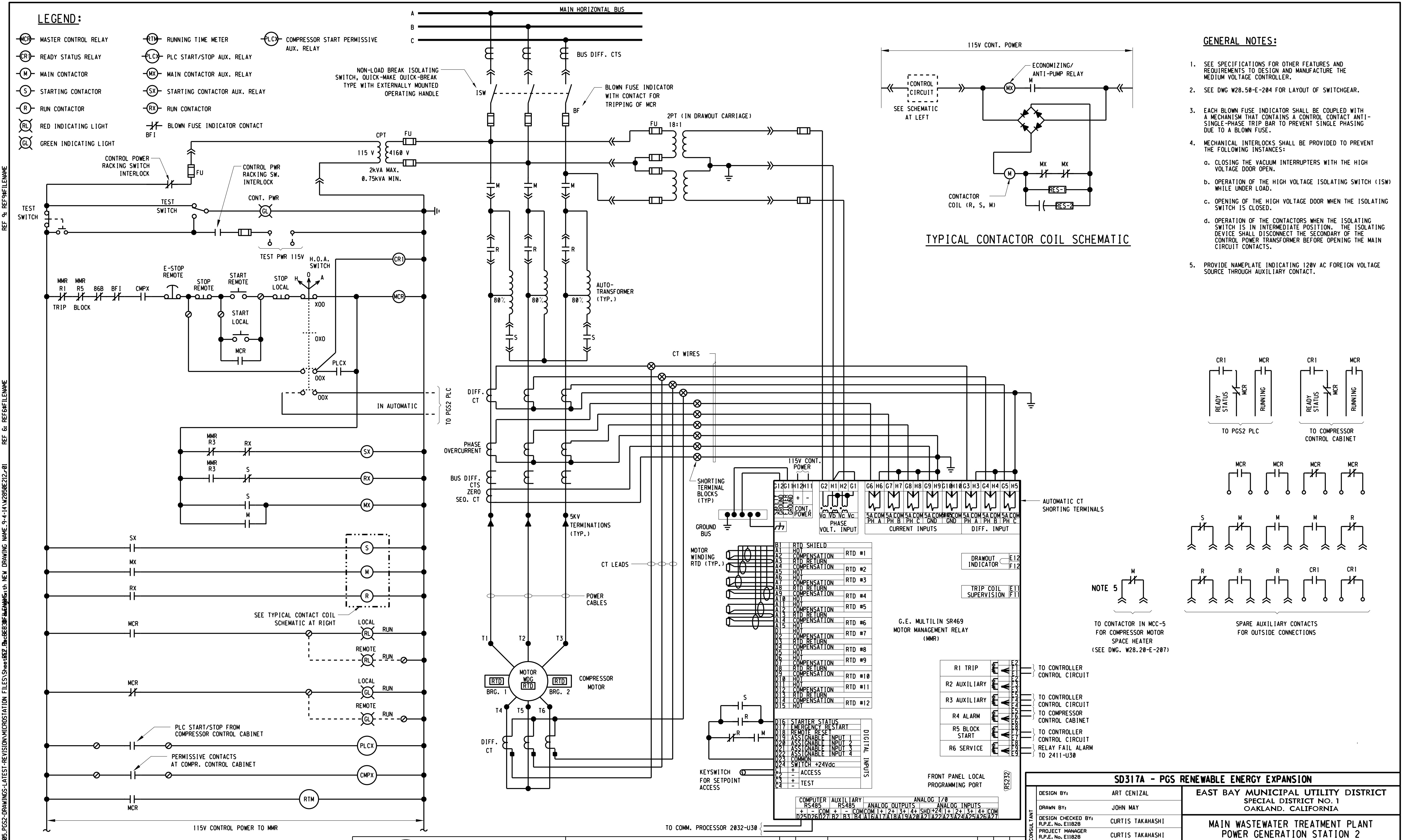

GENERAL NOTES:

1. SEE SPECIFICATIONS FOR OTHER FEATURES AND REQUIREMENTS TO DESIGN AND MANUFACTURE THE MEDIUM VOLTAGE CONTROLLER.
2. SEE DWG W28.50-E-204 FOR LAYOUT OF SWITCHGEAR.
3. EACH BLOWN FUSE INDICATOR SHALL BE COUPLED WITH A MECHANISM THAT CONTAINS A CONTROL CONTACT ANTI-SINGLE-PHASE TRIP BAR TO PREVENT SINGLE PHASING DUE TO A BLOWN FUSE.
4. MECHANICAL INTERLOCKS SHALL BE PROVIDED TO PREVENT THE FOLLOWING INSTANCES:
   a. CLOSING THE VACUUM INTERRUPTERS WITH THE HIGH VOLTAGE DOOR OPEN.
   b. OPERATION OF THE HIGH VOLTAGE ISOLATING SWITCH (ISW) WHILE UNDER LOAD.
   c. OPENING OF THE HIGH VOLTAGE DOOR WHEN THE ISOLATING SWITCH IS CLOSED.
   d. OPERATION OF THE CONTACTORS WHEN THE ISOLATING SWITCH IS IN INTERMEDIATE POSITION. THE ISOLATING DEVICE SHALL DISCONNECT THE SECONDARY OF THE CONTROL POWER TRANSFORMER BEFORE OPENING THE MAIN CIRCUIT CONTACTS.
5. PROVIDE NAMEPLATE INDICATING 120V AC FOREIGN VOLTAGE SOURCE THROUGH AUXILIARY CONTACT.

3" ON ORIGINAL DOCUMENT
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

CONSULTANT
EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
5KV MOTOR CONTROLLER AC SCHEMATIC

SCALE NONE
DATE JAN2009
W28.50-E-212
DRAWING NUMBER
1
REV.

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REF 5: REF5#FILENAME
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DATE: 11-SEP-2014 10:56
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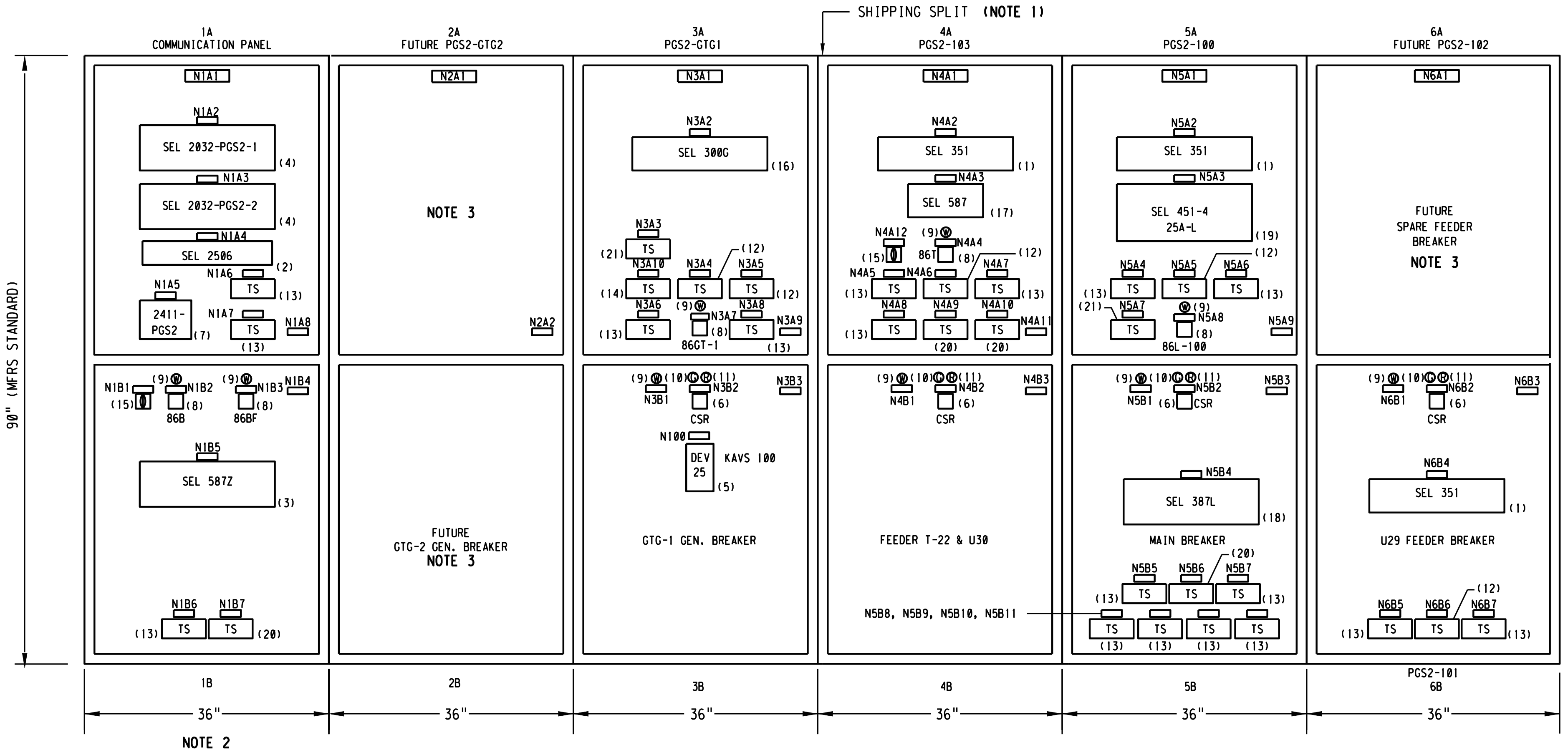

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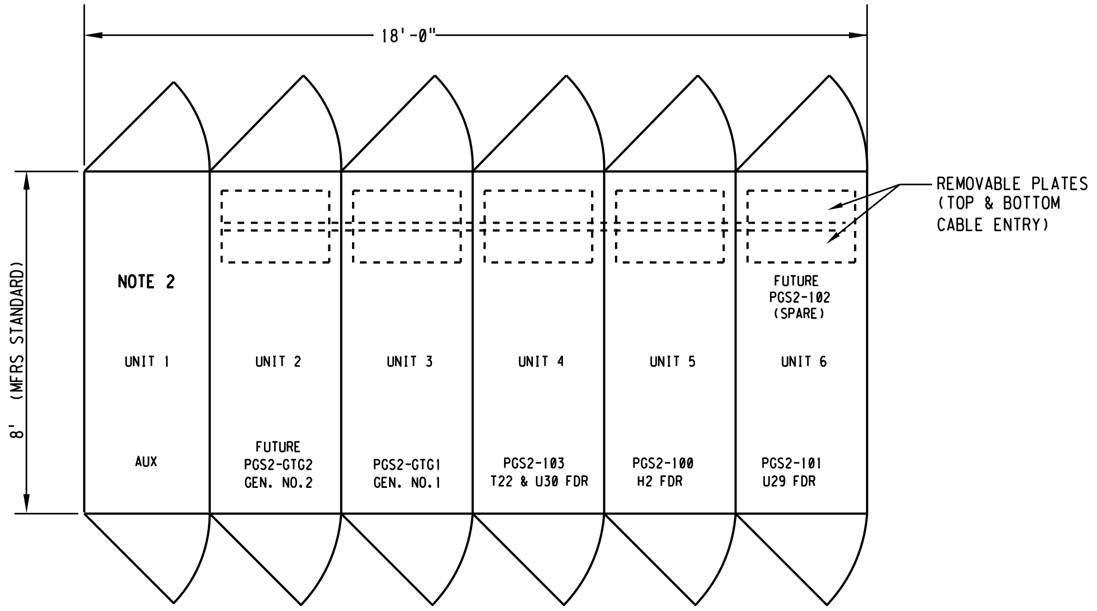
PGS2 - 15 KV INDOOR SWITCHGEAR ELEVATION
NONE



2
-
PGS2 - 15 KV INDOOR SWITCHGEAR - PLAN
NONE

NOTES:

1. INDICATED IS PREFERRED SHIPPING SPLIT LOCATION BUT NOT MANDATORY. MANUFACTURER'S SHIPPING SPLIT LOCATION(S) SHALL BE COORDINATED WITH THE DISTRICT AND SHALL BE KEPT TO A MINIMUM TO FACILITATE FIELD ASSEMBLY OF THE SWITCHGEAR.
2. PROVIDE DC PANELBOARD "DCPS" WITHIN SWITCHGEAR AUXILIARY SECTION.
3. PROVIDE BLANK PANELS.

3" ON ORIGINAL DOCUMENT
0 1 2 3

MTH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
15KV INDOOR SWITCHGEAR
PGS 2 - PLAN AND ELEVATION

SCALE NONE
DATE JAN2009
W28.20-E-220
DRAWING NUMBER
1
REV.

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NAMEPLATE SCHEDULE

NP NO.	MTG. LOCATIONS	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING		
				FIRST LINE	SECOND LINE	THIRD LINE
N1A1	AS, RD	2 x 6	3/8	UNIT 1	COMMUNICATION PANEL	AND BUS VT
N1A2	AS, BS	1 x 3	3/16	COMMUNICATION	PROCESSOR	2032-PGS2-1
N1A3	AS, BS	1 x 3	3/16	COMMUNICATION	PROCESSOR	2032-PGS2-2
N1A4	AS, BS	1 x 3	3/16	LOAD SHED SYSTEM	REMOTE I/O MODULE	2506-PGS2
N1A5	AS, BS	1 x 3	3/16	I/O PROCESSOR	2411-PGS2	
N1A6	AS, BS	1 x 3	3/16	TSA-2506-PGS2	DEVICE I/O	TEST SWITCH
N1A7	AS, BS	1 x 3	3/16	TSB-2506-PGS2	DEVICE I/O	TEST SWITCH
N1A8	AS	1 x 3	3/16	COMMUNICATION	PANEL	
N1B1	AS, BS	1 x 3	3/16	BUS DIFF. RELAY 87B	TRIP CUTOUT	
N1B2	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	LOCKOUT RELAY	DEVICE 86B
N1B3	AS, BS	1 x 3	3/16	BREAKER FAILURE	LOCKOUT RELAY	DEVICE 86BF
N1B4	AS	1 x 3	3/16	PGS2 SWGR BUS	VT COMPARTMENT	
N1B5	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	PROTECTION RELAY	DEVICE 87B
N1B6	AS, BS	1 x 3	3/16	TSA-87B-PGS2	DEVICE I/O	TEST SWITCH
N1B7	AS, BS	1 x 3	3/16	TS-87B-PGS2	CURRENT	TEST SWITCH
N2A1	AS, RD	2 x 6	3/8	UNIT 2	FUT. GENERATOR GTG2	BKR AND VT
N2A2	AS	1 x 3	3/16	FUT. GENERATOR GTG2	VT COMPARTMENT	
N3A1	AS, RD	2 x 6	3/8	UNIT 3	GENERATOR GTG1	BREAKER AND VT
N3A2	AS, BS	1 x 3	3/16	GENERATOR PROT. RELAY	DEVICE 300G-GTG1	
N3A3	AS, BS	1 x 3	3/16	TS-VT-GTG1	POTENTIAL	TEST SWITCH
N3A4	AS, BS	1 x 3	3/16	TS1-300G-GTG1	CURRENT & POT.	TEST SWITCH
N3A5	AS, BS	1 x 3	3/16	TS2-300G-GTG1	CURRENT & POT.	TEST SWITCH
N3A6	AS, BS	1 x 3	3/16	TSA-300G-GTG1	DEVICE I/O	TEST SWITCH
N3A7	AS, BS	1 x 3	3/16	GENERATOR PROT.	LOCKOUT RELAY	DEVICE 86GT-1
N3A8	AS, BS	1 x 3	3/16	TSB-300G-GTG1	DEVICE I/O	TEST SWITCH
N3A9	AS	1 x 3	3/16	GENERATOR GTG1	VT COMPARTMENT	
N3A10	AS, BS	1 x 3	3/16	TS-NGT-GTG1	CURRENT & POT.	TEST SWITCH
N3B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N3B2	AS, BS	1 x 3	3/16	BKR PGS2-GTG1	CONTROL SWITCH	
N3B3	AS	1 x 3	3/16	GEN. BREAKER	PGS2-GTG1	
N4A1	AS, RD	2 x 6	3/8	UNIT 4	FEEDER PGS2-103	(XFMR T-22 & U30)
N4A2	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-PGS2-103	
N4A3	AS, BS	1 x 3	3/16	XFMR T-22	DIFFERENTIAL PROT.	DEVICE 87-T22
N4A4	AS, BS	3 x 1	3/16	XFMR T-22 DIFF.	LOCKOUT RELAY	DEVICE 86-T22
N4A5	AS, BS	3 x 1	3/16	TSA-351-PGS2-103	DEVICE I/O	TEST SWITCH
N4A6	AS, BS	3 x 1	3/16	TS-351-PGS2-103	CURRENT & POT.	TEST SWITCH
N4A7	AS, BS	3 x 1	3/16	TSB-351-PGS2-103	DEVICE I/O	TEST SWITCH
N4A8	AS, BS	3 x 1	3/16	TSA-87-T22	DEVICE I/O	TEST SWITCH
N4A9	AS, BS	3 x 1	3/16	TS-87-T22-103	CURRENT	TEST SWITCH
N4A10	AS, BS	3 x 1	3/16	TS-87-T22-U30	CURRENT	TEST SWITCH
N4A11	AS	3 x 1	3/16	PGS2-103 LINE VT	COMPARTMENT	
N4A12	AS, BS	3 x 1	3/16	XFMR T-22	DEVICE 63/49	TRIP CUTOUT
N4B1	AS, BS	3 x 1	3/16	CLOSING SPRING	CHARGED	
N4B2	AS, BS	3 x 1	3/16	BKR PGS2-103	CONTROL SWITCH	
N4B3	AS	3 x 1	3/16	FEEDER BREAKER	PGS2-103	XFMR T-22 & U30
N5A1	AS, RD	2 x 6	3/8	UNIT 5	MAIN BREAKER PGS2-100	(TIE TO H2 SWGR)
N5A2	AS, BS	3 x 1	3/16	OVERCURRENT RELAY	DEVICE 351-PGS2-100	
N5A3	AS, BS	3 x 1	3/16	REMOTE AUTO-SYNC	DEVICE 451-PGS2	(25A-L)
N5A4	AS, BS	3 x 1	3/16	TSA-351-PGS2-100	DEVICE I/O	TEST SWITCH
N5A5	AS, BS	3 x 1	3/16	TS-351-PGS2-100	CURRENT & POT.	TEST SWITCH
N5A6	AS, BS	3 x 1	3/16	TSB-351-PGS2-100	DEVICE I/O	TEST SWITCH
N5A7	AS, BS	3 x 1	3/16	TS-VT-451-PGS2	POTENTIAL	TEST SWITCH
N5A8	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	LOCKOUT RELAY	DEVICE 86L-100
N5A9	AS	3 x 1	3/16	PGS2-100 LINE VT	COMPARTMENT	
N5B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N5B2	AS, BS	1 x 3	3/16	BKR PGS2-100	CONTROL SWITCH	
N5B3	AS	1 x 3	3/16	MAIN BREAKER	PGS2-100	TIE TO H2 SWGR
N5B4	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	PROT. RELAY	DEVICE 87L-PGS2-100
N5B5	AS, BS	1 x 3	3/16	TSA-87L-PGS2-100	DEVICE I/O	TEST SWITCH
N5B6	AS, BS	1 x 3	3/16	TS-387L-PGS2-100	CURRENT	TEST SWITCH
N5B7	AS, BS	1 x 3	3/16	TSB-87L-PGS2-100	DEVICE I/O	TEST SWITCH
N5B8	AS, BS	3 x 1	3/16	TSA-451-PGS2	DEVICE I/O	TEST SWITCH
N5B9	AS, BS	3 x 1	3/16	TSB-451-PGS2	DEVICE I/O	TEST SWITCH
N5B10	AS, BS	3 x 1	3/16	TSC-451-PGS2	DEVICE I/O	TEST SWITCH
N5B11	AS, BS	3 x 1	3/16	TSD-451-PGS2	DEVICE I/O	TEST SWITCH

* NAMEPLATE MTG LOCATION:

AS - MOUNTED ON PANEL AS SHOWN	RD - MOUNTED REAR DOOR
BS - MOUNTED ON BACK OF DEVICE PANEL	FD - MOUNTED ON FRONT DOOR

NAMEPLATE SCHEDULE (CONT.)

NP NO.	MTG. LOCATIONS	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING		
				FIRST LINE	SECOND LINE	THIRD LINE
N6A1	AS, RD	2 x 6	3/8	UNIT 6	FEEDER PGS2-101 (U29)	FUT. FDR PGS2-102
N6B1	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N6B2	AS, BS	1 x 3	3/16	BKR PGS2-101	CONTROL SWITCH	
N6B3	AS	1 x 3	3/16	FEEDER BREAKER	PGS2-101	U29
N6B4	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-PGS2-101	
N6B5	AS, BS	1 x 3	3/16	TSA-351-PGS2-101	DEVICE I/O	TEST SWITCH
N6B6	AS, BS	1 x 3	3/16	TS-351-PGS2-101	CURRENT & POT.	TEST SWITCH
N6B7	AS, BS	1 x 3	3/16	TSB-351-PGS2-101	DEVICE I/O	TEST SWITCH
N100	AS, BS	1 x 3	3/16	SYNC. CHECK RELAY	DEVICE 25	

DEVICE LIST

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 351; DIRECTIONAL OVERCURRENT AND RECLOSING RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, HORIZONTAL PANEL MOUNT.	SEL 351-7 03517033554XX1
2	DEVICE 2506; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
3	DEVICE 87B; HIGH IMPEDANCE DIFFERENTIAL RELAY FOR SWITCHGEAR BUS PROTECTION. 5A NOMINAL CURRENT INPUT, 48/125 VDC POWER SUPPLY, PANEL MOUNT.	SEL 587Z 0587Z0X325312XX
4	DEVICE 2032; COMMUNICATION PROCESSOR FOR USE WITH INTEGRATING COMMUNICATIONS AND DISTRIBUTING IRIG-B TIME SYNCHRONIZATION SIGNAL TO SWITCHGEAR DIGITAL PROTECTIVE RELAYS AND OTHER ELECTRONIC DEVICES, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL PANEL MOUNT, PROVIDE WITH ETHERNET CARD AND DNP3 PROTOCOL AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS AND SEL-2886 INTERFACE CONVERTERS SHOWN ON DWG. W28.20-E-560.	SEL 2032 203233X444G0XX PROVIDE SEL-9321 125V-5V DC POWER SUPPLY AND CABLES FOR SEL-2886 CONVERTERS
5	DEVICE 25; SYNCHRONISM CHECK RELAY, 48V-250V DC POWER SUPPLY, 57.7/120V INPUT VOLTAGE (Vn) RATING, FLUSH MOUNTED.	AREVA TYPE KAVS100 KAVS 100-01-T1-5-J-E
6	DEVICE CSR; CIRCUIT BREAKER CONTROL SWITCH, ELECTRICALLY OPERATED CONTROL SWITCH RELAY, FOR BOTH MANUAL AND REMOTE CONTROL OF POWER CIRCUIT BREAKER, 125V DC COIL VOLTAGE, 5 DECKS, STANDARD CIRCUIT B, PISTOL GRIP HANDLE, SPRING RETURN TO NORMAL POSITION, SLIP CONTACTS, WITH TARGET.	ELECTROSWITCH SERIES 24, CSR, 8857DB
7	DEVICE 2411; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 4, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS-232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 26 DIGITAL INPUTS AND 11 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X3A3A3A0100
8	DEVICE 86; HIGH-SPEED MULTI-CONTACT LOCKOUT RELAY, MANUAL RESET, 125V DC OPERATING COIL VOLTAGE, 9 DECK.	ELECTROSWITCH SERIES 24, LOR, 7809G
9	WHITE INDICATING LIGHT, 125V DC, WHITE LED LAMP WITH CLEAR TRANSPARENT CAP. PROVIDE WITH LEDTRONICS ULTRA PALE WHITE CLUSTERED REPLACEMENT LAMP OR EQUAL, FOR G.E. ET-16 LAMP ASSY.	G.E. TYPE ET-16 116B6708G43XXXC4
10	GREEN INDICATING LIGHT, 125V DC, GREEN LED LAMP WITH GREEN TRANSPARENT COLOR CAP.	G.E. TYPE ET-16 116B6708G43G73G4
11	RED INDICATING LIGHT, 125V DC, RED LED LAMP WITH RED TRANSPARENT COLOR CAP.	G.E.TYPE ET-16 116B6708G43R73R4
12	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T T C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 498A010G01
13	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES., SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01
14	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 4-POLE, 600V, 30A RATED, 1 CURRENT SHORTING ASSY, BLACK HANDLES, AND 2 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T X X X X X C-C X.	ABB FLEXI-TEST SWITCH TYPE FT-1 9676A36G01

DEVICE LIST (CONT.)

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
15	DEVICE TCO; SWITCH, ELECTROSWITCH SERIES 101, 90 DEGREES SNAP ACTION, 2-DECK, DOUBLE-POLE, DOUBLE-THROW, INTERRUPTING RATING OF 10A AT 125V DC, 15A AT 120V AC, WITH OVAL HANDLE AND BLACK COLORED NAMEPLATE, ESCUTCHEON PLATE MARKED "CUT-IN" "CUT-OUT".	ELECTROSWITCH SERIES 101 #102602LN* (* FACTORY TO CONFIRM)
16	DEVICE 300G; COMPREHENSIVE GENERATOR PROTECTION RELAY WITH 100 PERCENT STATOR GROUND FAULT PROTECTION USING BOTH FUNDAMENTAL FREQUENCY OVER-VOLTAGE AND THIRD-HARMONIC VOLTAGE DIFFERENTIAL ELEMENTS FOR HIGH-IMPEDANCE GROUNDED GENERATORS, AND WITH THE FOLLOWING ADDITIONAL FEATURES: CURRENT DIFFERENTIAL PROTECTION OVEREXCITATION DETECTION WITH VOLTS-PER-HERTZ ELEMENTS DIRECTIONAL POWER ELEMENTS, OUT OF STEP PROTECTION, AND LOSS OF FIELD NEGATIVE SEQUENCE O/C INSTANTANEOUS OVERCURRENT ELEMENT (PHASE, GROUND) UNDERVOLTAGE ELEMENT OVER-AND UNDER-FREQUENCY ELEMENT PHASE MHO OR COMPENSATOR DISTANCE, VOLTAGE RESTRAINED/CONTROLLED TIME O/C LOSS OF POTENTIAL ELEMENT GROUND TIME OVERCURRENT NEUTRAL INSTANTANEOUS AND TIME O/C ELEMENT NEUTRAL OVERVOLTAGE ELEMENT SYNCHRONISM CHECK ELEMENT BREAKER WEAR MONITOR AND STATION BATTERY MONITOR METERING AND EVENT REPORTING MODBUS RTU PROTOCOL. RELAY SHALL BE RATED FOR 80-208V AC INPUTS FROM WYE CONNECTED PTS, 5A AC CURRENT INPUTS, 48/125 VDC POWER SUPPLY, STANDARD CONFIGURATION SHALL PROVIDE 6 INPUTS AND 8 OUTPUT CONTACTS AT LESS THAN 5 MS PICKUP/DROPOUT TIMES WITH 30A MAKE, 6A CONTINUOUS DUTY. RELAY SHALL BE PANEL MOUNTED.	SEL 300G 0300G303325XX42XX
17	DEVICE 87T; PANEL MOUNT CURRENT DIFFERENTIAL RELAY FOR TWO-WINDING TRANSFORMER PROTECTION, PROGRAMMABLE SINGLE OR DUAL-SLOPE PERCENTAGE RESTRAINT, SUPERVISED BY A CHOICE OF 2ND AND 4TH-HARMONIC BLOCKING OR RESTRAINT ELEMENTS, PLUS 5TH- HARMONIC AND DC BLOCKING ELEMENTS. RELAY SHALL BE PROVIDED FOR 5A NOMINAL CURRENT INPUT, 48/125 VDC POWER SUPPLY, 125 VDC CONTROL INPUT VOLTAGE, CONVENTIONAL TERMINAL BLOCKS, MODBUS RTU PROTOCOL, EIA-232 SERIAL COMMUNICATIONS.	SEL 587-1 05871032531
18	DEVICE 387L; LINE CURRENT DIFFERENTIAL RELAY REQUIRING NO SETTINGS ON DIFFERENTIAL OPERATING SYSTEM, 5A NOMINAL AC CURRENT INPUTS. 125 VDC POWER SUPPLY, 7 STANDARD SPEED OUTPUTS, 6 HIGH-SPEED OUTPUTS, 6 OPTOISOLATED INPUTS, 1300nm 62.5 MICRON FIBER-OPTIC COMMUNICATIONS.	SEL 387L 0387L03D03X54X1
19	DEVICE 451; (25A-L), BAY CONTROL, AUTOMATION, AND PROTECTION SYSTEM RELAY TO PROVIDE AUTOMATIC SYNCHRONIZER CONTROL. RELAY SHALL BE HORIZONTAL PANEL MOUNT, (6) INDEPENDENT 300 VAC CONTINUOUS VOLTAGE INPUTS, 5A NOMINAL CURRENT INPUTS, 125 VDC POWER SUPPLY, STANDARD INPUT/OUTPUT, ADDITIONAL 8 INDEPENDENT INPUTS, 13 STANDARD FORM A AND 2 FORM C OUTPUTS, DUAL MIRRORED BIT COMMUNICATION CHANNELS, ETHERNET CARD WITH (1) 10/100BASE-T AND (1) 10BASE-FL CONNECTOR. SYSTEM SHALL INCLUDE: GENERATOR FREQUENCY AND VOLTAGE MATCHING CONTROL BREAKER CLOSE DELAY COMPENSATION ENABLE ANTI-MOTORING INPUTS WITH TWO SELECTABLE MASTER FREQUENCY TRACKING INPUTS. SOFT SYNCH-SCOPE SYSTEM CLOSE FAIL ALARM CLOSE LOCKOUT ALARM SYNCH OPERATIONAL PARAMETERS DISPLAY	SEL 451-4 045144152B3AX331XXXXX
20	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 6-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY WITH BLACK HANDLES, SWITCH ARRANGEMENT: X X X X C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 9672A72G01
21	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T T T T T T T T.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A539G01

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0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

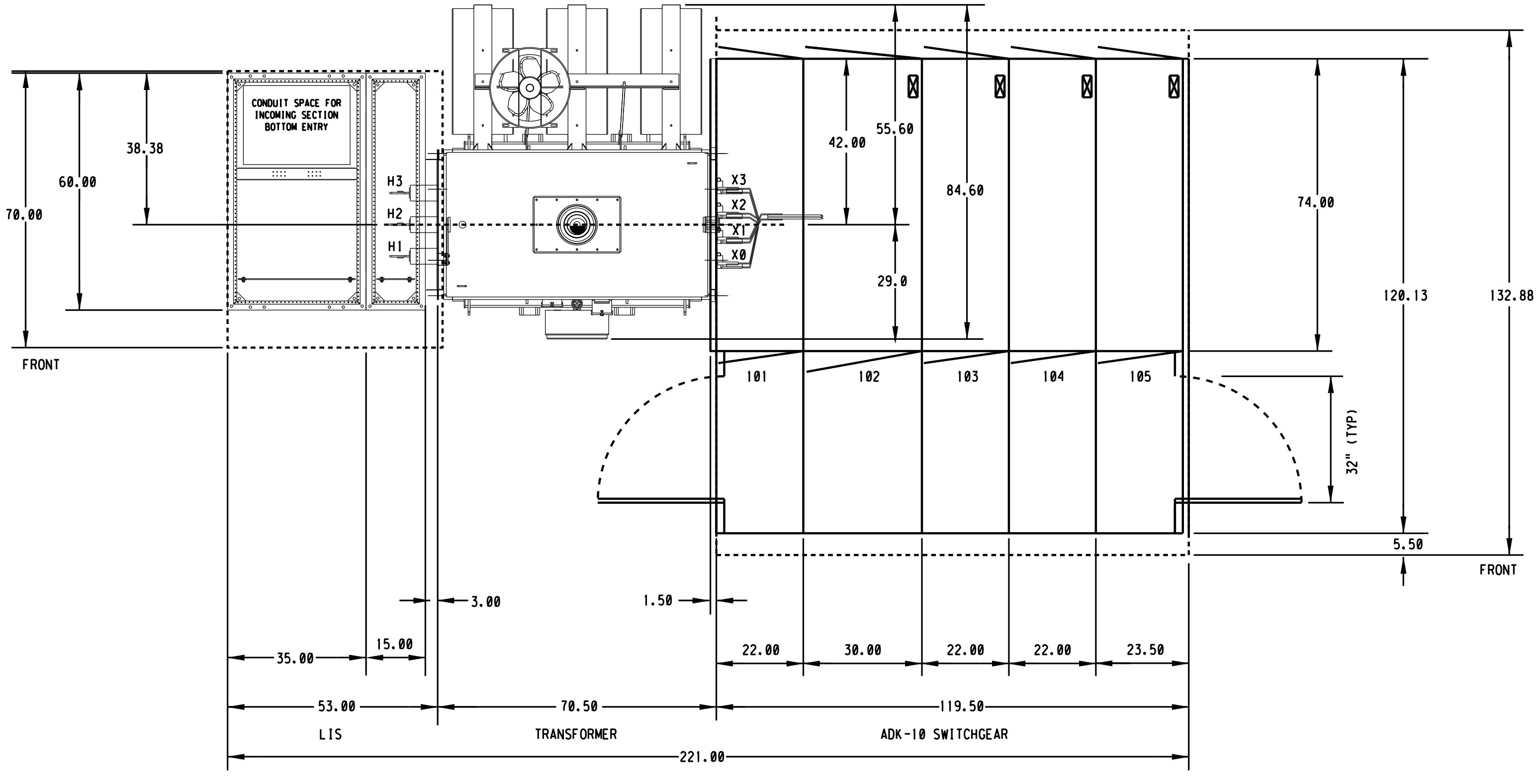
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
15KV INDOOR SWITCHGEAR PGS 2
PANEL NAMEPLATE SCHEDULE AND DEVICE LIST

SCALE NONE
DATE JAN2009
W28.20-E-221
DRAWING NUMBER
1
REV.



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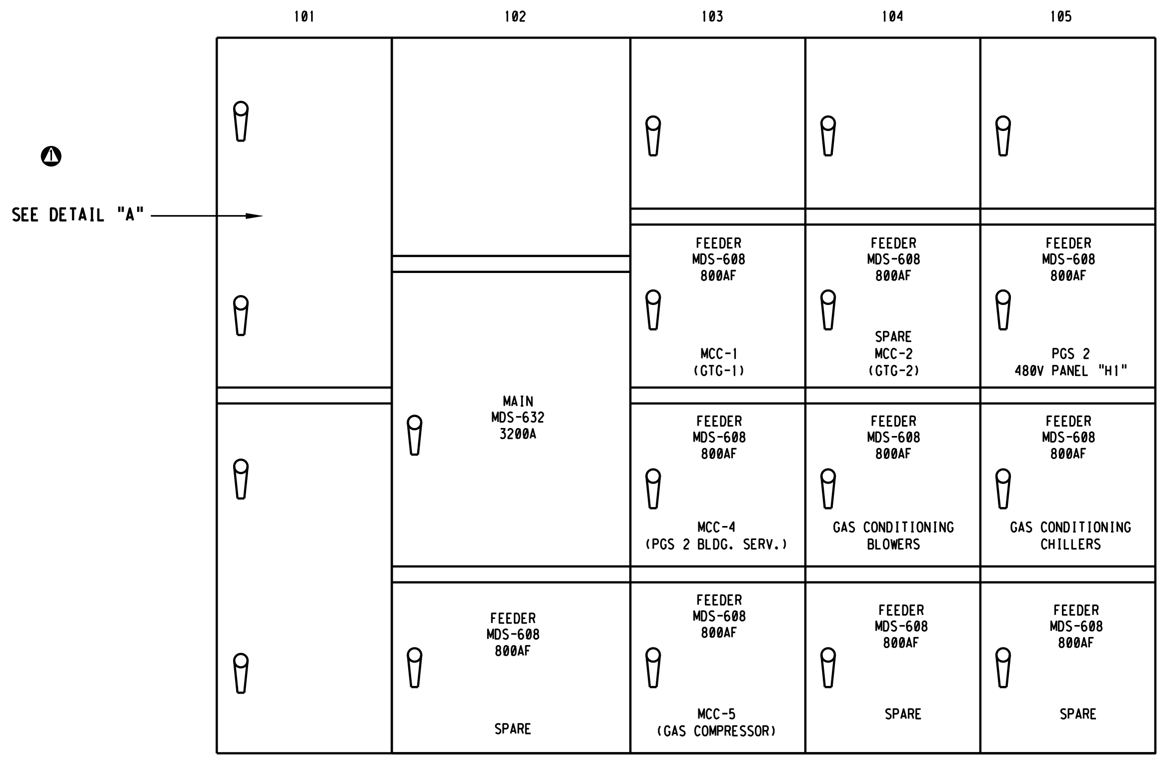
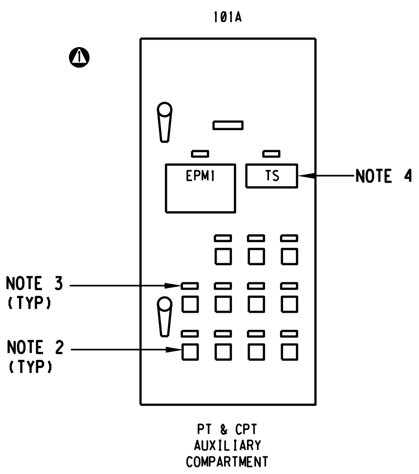


SECONDARY UNIT SUBSTATION U29
LOW VOLTAGE SWITCHGEAR ELEVATION

NONE
(NOTE 1)



DETAIL "A"

NOTES:

1. MAIN BREAKER AND ALL FEEDER BREAKERS SHALL BE FURNISHED FOR ELECTRICAL OPERATION WITH SPRING CHARGING MOTOR OPERATED OFF OF THE CONTROL POWER TRANSFORMER PROVIDED WITH THE UNIT SUBSTATION. SPRING RELEASE AND SHUNT TRIP CONTROL POWER SHALL BE RATED 125V DC AND PROVIDED BY A CONTROL POWER CIRCUIT FROM DC PANEL DCP-U30, LOCATED IN THE SUBSTATION U30 PCR.
2. PROVIDE CIRCUIT BREAKER CONTROL SWITCH, FOR EACH CIRCUIT BREAKER POSITION, ON THE SWITCHGEAR AUXILIARY COMPARTMENT SECTION. CONTROL SWITCHES SHALL BE ELECTROSWITCH, SERIES 20, WITH PISTOL GRIP HANDLE AND TARGET, OR APPROVED EQUAL.
3. PROVIDE ENGRAVED NAMEPLATE FOR EACH CONTROL SWITCH TO IDENTIFY THE CIRCUIT BREAKER CONTROLLED BY THE SWITCH.
4. PROVIDE 10-POLE CURRENT AND POTENTIAL TEST SWITCH FOR DIGITAL POWER METER. TEST SWITCH TO BE ABB FT-1, WITH BLACK OPAQUE COVER OR APPROVED EQUAL.
5. NOT USED.
6. NOT USED.

USER: vuong
DATE: 18-SEP-2014 10:12
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MTH engineers, inc.
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	01/26/12	REVISED PER SWGR MFR SHOP DWGS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

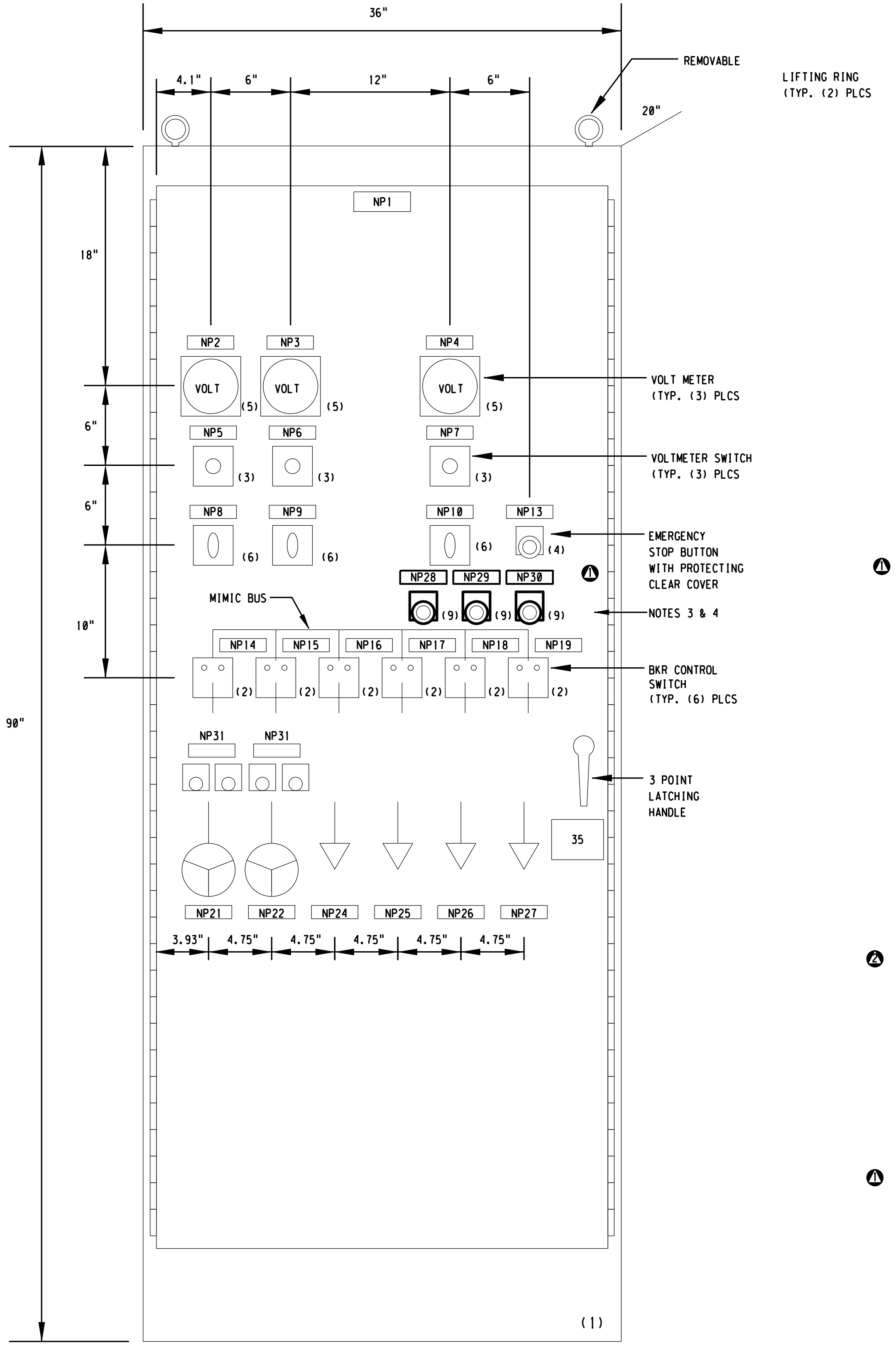
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 SECONDARY UNIT SUBSTATION U29
PLAN ELEVATION AND NAMEPLATE SCHEDULE

SHEET NO.290
SCALE NONE
DATE JAN2009
W28.50-E-222
DRAWING NUMBER
2
REV.



1 - FRONT VIEW
PGS2 MANUAL CONTROL PANEL

N.T.S.

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NAMEPLATE SCHEDULE						
NP NO.	MTG. LOCATIONS	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING		
				FIRST LINE	SECOND LINE	THIRD LINE
NP1	AS	1 1/2 x 3 1/2	5/16	POWER PLANT	MANUAL CONTROL	PANEL
NP2	AS, BS	1 x 3	3/16	GENERATOR GTG1	VOLTAGE	
NP3	AS, BS	1 x 3	3/16	GENERATOR GTG2	VOLTAGE	
NP4	AS, BS	1 x 3	3/16	PGS2 SWITCHGEAR	BUS VOLTAGE	
NP5	AS, BS	1 x 3	3/16	VOLTMETER	SWITCH	GENERATOR GTG1
NP6	AS, BS	1 x 3	3/16	VOLTMETER	SWITCH	GENERATOR GTG2
NP7	AS, BS	1 x 3	3/16	VOLTMETER	SWITCH	PGS2 SWGR BUS
NP8	AS, BS	1 x 3	3/16	AUTO SYNC.	REMOTE/INITIATE SWITCH	GTG1
NP9	AS, BS	1 x 3	3/16	AUTO SYNC.	REMOTE/INITIATE SWITCH	GTG2
NP10	AS, BS	1 x 3	3/16	AUTO SYNC.	REMOTE/INITIATE SWITCH	MAIN BKR PGS2-100
NP11	NOT USED					
NP12	NOT USED					
NP13	AS, BS	1 x 3	3/16	POWER PLANT	EMERGENCY	SHUTDOWN
NP14	AS, BS	1 x 3	3/16	GEN. BREAKER	PGS2-GTG1	CONTROL SWITCH
NP15	AS, BS	1 x 3	3/16	FUT. GEN. BREAKER	PGS2-GTG2	CONTROL SWITCH
NP16	NOT USED					
NP17	AS, BS	1 x 3	3/16	MAIN BREAKER	PGS2-100	CONTROL SWITCH
NP18	AS, BS	1 x 3	3/16	FEEDER BREAKER	PGS2-103	CONTROL SWITCH
NP19	AS, BS	1 x 3	3/16	FEEDER BREAKER	PGS2-102	CONTROL SWITCH
NP20	AS, BS	1 x 3	3/16	FEEDER BREAKER	PGS2-101	CONTROL SWITCH
NP21	AS	1 x 3	3/16	GAS TURBINE	GENERATOR	GTG1
NP22	AS	1 x 3	3/16	FUT. GAS TURBINE	GENERATOR	GTG2
NP23	NOT USED					
NP24	AS	1 x 3	3/16	TIE FEEDER	TO H2 SWGR	
NP25	AS	1 x 3	3/16	XFMR T-22/SUB. U30	FEEDER	
NP26	AS	1 x 3	3/16	SPARE	FEEDER	
NP27	AS	1 x 3	3/16	SUB. U29	FEEDER	
NP28	AS, BS	1 x 3	3/16	PGS1 UNIT NO. 1	EMERGENCY	STOP
NP29	AS, BS	1 x 3	3/16	PGS1 UNIT NO. 2	EMERGENCY	STOP
NP30	AS, BS	1 x 3	3/16	PGS1 UNIT NO. 3	EMERGENCY	STOP
NP31	AS, BS	1 x 3	3/16	GAS TURBINE	START/STOP	PUSHBUTTON

NOTE 1

MATERIAL/DEVICE LIST			
ITEM NO.	QUANTITY	DESCRIPTION	CATALOG REFERENCE
1	1	CONTROL PANEL, NEMA TYPE 12 ENCLOSURE, SINGLE FRONT DOOR, SINGLE ACCESS, FREE STANDING, 12 GAUGE WITH 10 GAUGE DOOR, HEAVY GAUGE CONTINUOUS HINGE, STAINLESS STEEL HINGE PIN, 3-POINT LATCH, WHITE FINISH INSIDE WITH WHITE FINISH BACK PANEL, ANSI GRAY 61 OUTSIDE FINISH. SIZE 90"X36"X20", HOFFMAN A-903620-FS.	HOFFMAN A-903620-FS (SEE NOTE 2)
2	6	CIRCUIT BREAKER CONTROL SWITCH, WITH INTEGRAL "SMART" LIGHTED NAMEPLATE, ELECTROSWITCH SERIES 24, PISTOL GRIP HANDLE, MOMENTARY CONTACTS, SPRING RETURN TO NORMAL POSITION, FIVE DECK FRAME, INTEGRAL AND REPLACEABLE RED AND GREEN INDICATORS, 38-140 VDC OPERATING RANGE 11-YEAR LED LIFE, WITH TARGET.	ELECTROSWITCH SERIES 24PB57D
3	3	VOLTMETER SWITCH, 3-PHASE, PHASE TO PHASE DOUBLE POLE, TRIPLE THROW, MAINTAINED CONTACT, FIXED ROUND KNURLED HANDLE	ELECTROSWITCH SERIES 24, CAT No. 2404C ESCUTCHEON MARK: OFF, 1-2, 2-3, 3-1
4	1	PUSHBUTTON, EMERGENCY SHUTDOWN SWITCH WITH FLIP-UP CLEAR COVER, RED MUSHROOM HEAD, SINGLE MOMENTARY PUSHBUTTON, NON-ILLUMINATED 3 BLOCKS, MOUNTED IN TANDEM, N.C. CONTACTS.	SQUARE D TYPE K
5	3	AC VOLTMETER, TRANSFORMER RATED, 60 HZ 250° FULL SCALE DEFLECTION, ±1%ACCURACY 250V RATING, 0-15kV SCALE, SWITCHBOARD MOUNTING.	YOKOGAWA AB-40 METAL CASE CATALOG #103D21RSWZ
6	3	AUTO SYNCHRONIZING REMOTE INITIATE SWITCH, MOMENTARY, SPRING RETURN TO CENTER OFF, SINGLE-THROW, ROTARY, 2 DECK, FIXED OVAL HANDLE.	ELECTROSWITCH SERIES 24, 74202B ESCUTCHEON MARK: SIMILAR TO #10D-2S17, EXCEPT TITLE TO BE "AUTO-SYNC INITIATE"
7	2	PUSHBUTTON, NORMAL START, 2 N.O. MOMENTARY CONTACTS, BLACK FLUSH PUSHBUTTON, WITH LEGEND PLATE MARKED "START".	SQUARE D TYPE K
8	2	PUSHBUTTON, NORMAL STOP, 2 N.C. MOMENTARY CONTACTS, RED FLUSH PUSHBUTTON, WITH LEGEND PLATE MARKED "STOP".	SQUARE D TYPE K
9	3	NON-ILLUMINATED MOMENTARY PUSHBUTTON, RED BUTTON COVER, NC CONTACT, WITH CLEAR FLIP-UP COVER, SIMILAR TO EXISTING EMERGENCY STOP SWITCH IN PGS1 SWITCHGEAR ROOM.	REFER TO EXISTING EMERGENCY STOP SWITCH ON PGS1 CONTROL ROOM WALL. SEE NOTE 4

NOTES:

1. NAMEPLATE FOR POWER PLANT EMERGENCY SHUTDOWN (NP13) SHALL BE PROVIDED WITH WHITE LETTERS ON A RED BACKGROUND.
2. ALTERNATIVELY, ENCLOSURE MAY BE HOFFMAN APX-UA MODULAR ENCLOSURES UL/NEMA TYPE 12 ASSEMBLY FOR UNIVERSAL APPLICATIONS, SOLID SIDES AND SOLID COVER ATTACHED TO RIGID FRAME ASSEMBLY ON STANDARD SOLID BASE. SINGLE SOLID DOOR FOR MOUNTING OF DEVICES SHOWN SHALL BE HINGED ON THE LEFT, AND SHALL BE PROVIDED WITH FLUSH KEYLOCKING PUSH-BUTTON AND 3-POINT LATCHES. FULL SUBPANEL SHALL BE PROVIDED FOR MOUNTING OF TERMINAL BLOCKS FOR INTERCONNECT WIRING REQUIREMENTS. OVERALL DIMENSIONS PER MANUFACTURING STANDARD.
3. FIELD LOCATE THE NEW PGS1 E-STOP PUSHBUTTON TO AVOID WIRING HARNESS AT BACK OF DOOR. LOWER THE MIMIC BUS AS REQUIRED.
4. AT PGS1 CONTROL ROOM, REMOVE MOUNTING TO EXPOSE THE EXISTING PUSHBUTTON AND FIELD DETERMINE THE MANUFACTURER AND CATALOG NUMBER OF THE EXISTING E-STOP DEVICES TO ORDER EXACT EQUIVALENT.

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carollo

NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	08/01/11	CHANGED VOLT METER AND CAT. NO.	ASC		
1	08/25/11	ADDED PGS1 E-STOP SW.	ASC		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	
DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD	
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 MANUAL CONTROL PANEL ELEVATION,
PANEL NAMEPLATE SCHEDULE & DEVICE LIST

SCALE NONE
DATE AUG2011
W28.20-E-223 DRAWING NUMBER
3 REV.

USER: vuong PLOT SCALE: 0.166667:1
DATE: 18-SEP-2014 10:13
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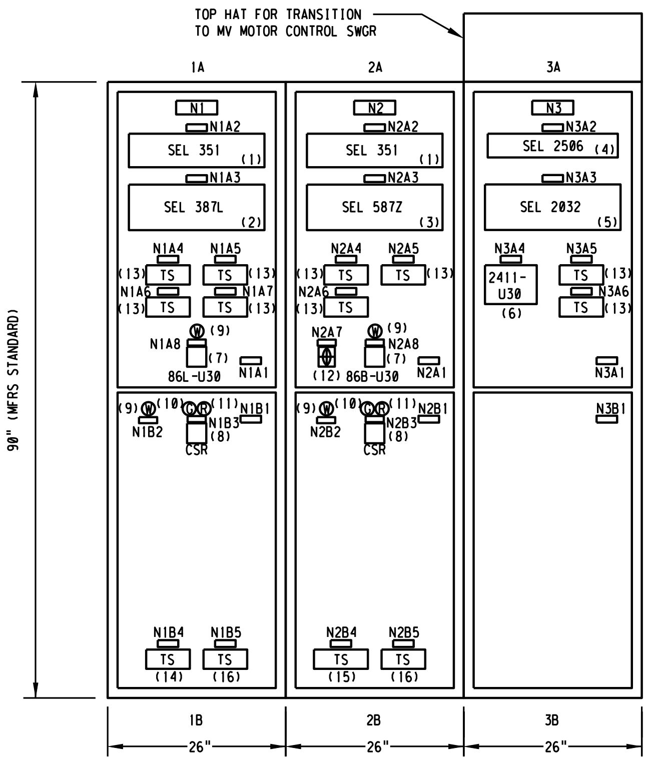

FRONT ELEVATION

1 / –

NONE

NAMEPLATE SCHEDULE

NP NO.	MTG. LOCATIONS *	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING		
				FIRST LINE	SECOND LINE	THIRD LINE
N1	AS, RD	2 x 6	3/8	UNIT 1	SUBSTATION U30	PGS1 TIE FEEDER
N1A1	AS	1 x 3	3/16	PGS1 TIE FEEDER	LINE VT COMPARTMENT	
N1A2	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-U30-PGS1	
N1A3	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	PROT. RELAY	DEVICE 87L-U30-PGS1
N1A4	AS, BS	1 x 3	3/16	TSA-351-U30-PGS1	DEVICE I/O	TEST SWITCH
N1A5	AS, BS	1 x 3	3/16	TSB-351-U30-PGS1	DEVICE I/O	TEST SWITCH
N1A6	AS, BS	1 x 3	3/16	TSA-87L-U30-PGS1	DEVICE I/O	TEST SWITCH
N1A7	AS, BS	1 x 3	3/16	TSB-87L-U30-PGS1	DEVICE I/O	TEST SWITCH
N1A8	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	LOCKOUT RELAY	DEVICE 86L-U30
N1B1	AS	1 x 3	3/16	PGS1 TIE	FEEDER BREAKER	
N1B2	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N1B3	AS, BS	1 x 3	3/16	PGS1 TIE FDR BKR	CONTROL SWITCH	
N1B4	AS, BS	1 x 3	3/16	TS-351-U30-PGS1	CURRENT & POT.	TEST SWITCH
N1B5	AS, BS	1 x 3	3/16	TS-87L-U30-PGS1	CURRENT	TEST SWITCH
.	.	.				
N2	AS, RD	2 x 6	3/8	UNIT 2	SUBSTATION U30	MAIN BREAKER
N2A1	AS	1 x 3	3/16	MAIN BREAKER	LINE VT COMPARTMENT	
N2A2	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-U30-MAIN	
N2A3	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	PROTECTION RELAY	DEVICE 87B-U30
N2A4	AS, BS	1 x 3	3/16	TSA-351-U30-MAIN	DEVICE I/O	TEST SWITCH
N2A5	AS, BS	1 x 3	3/16	TSB-351-U30-MAIN	DEVICE I/O	TEST SWITCH
N2A6	AS, BS	1 x 3	3/16	TSA-87B-U30	DEVICE I/O	TEST SWITCH
N2A7	AS, BS	1 x 3	3/16	87B-U30	TRIP CUTOUT	
N2A8	AS, BS	1 x 3	3/16	BUS DIFFERENTIAL	LOCKOUT RELAY	DEVICE 86B-U30
.	.	.				
N2B1	AS	1 x 3	3/16	SUBSTATION U30	MAIN BREAKER	
N2B2	AS, BS	1 x 3	3/16	CLOSING SPRING	CHARGED	
N2B3	AS, BS	1 x 3	3/16	MAIN BREAKER	CONTROL SWITCH	
N2B4	AS, BS	1 x 3	3/16	TS-351-U30-MAIN	CURRENT & POT.	TEST SWITCH
N2B5	AS, BS	1 x 3	3/16	TS-87B-U30	CURRENT	TEST SWITCH
.	.	.				
N3	AS, RD	2 x 6	3/8	UNIT 3	SUBSTATION U30	CPT AND BUS VT'S
N3A1	AS	1 x 3	3/16	BUS VT'S	AND CPT FUSES	
N3A2	AS, BS	1 x 3	3/16	LOAD SHED SYSTEM	REMOTE I/O MODULE	2506-U30
N3A3	AS, BS	1 x 3	3/16	COMM. PROCESSOR	2032-U30	
N3A4	AS, BS	1 x 3	3/16	I/O PROCESSOR	2411-U30	
N3A5	AS, BS	1 x 3	3/16	TSA-2506-U30	DEVICE I/O	TEST SWITCH
N3A6	AS, BS	1 x 3	3/16	TSB-2506-U30	DEVICE I/O	TEST SWITCH
.		.				
N3B1	AS	1 x 3	3/16	CPT COMPARTMENT		

* NAMEPLATE MTG LOCATION:
AS - MOUNTED ON PANEL AS SHOWN
BS - MOUNTED ON BACK OF DEVICE PANEL
RD - MOUNTED REAR DOOR

DEVICE LIST

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 351-U30-MAIN (-PGS1); DIRECTIONAL OVERCURRENT AND RECLOSING RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, HORIZONTAL PANEL MOUNT.	SEL 351-7 03517033554XX1 PROVIDE PROJECTION PANEL MOUNT IF REQUIRED FOR 26" WIDE SWGR SECTION.
2	DEVICE 87L-U30-PGS1; LINE CURRENT DIFFERENTIAL RELAY REQUIRING NO SETTINGS ON DIFFERENTIAL OPERATING SYSTEM, 5A NOMINAL AC CURRENT INPUTS. 125 VDC POWER SUPPLY, 7 STANDARD SPEED OUTPUTS, 6 HIGH-SPEED OUTPUTS, 6 6 OPTOISOLATED INPUTS, 1300nm 62.5 MICRON FIBER-OPTIC COMMUNICATIONS.	SEL 387L 0387L03D03X54X1 PROVIDE PROJECTION PANEL MOUNT IF REQUIRED FOR 26" WIDE SWGR SECTION.
3	DEVICE 87B-U30; HIGH IMPEDANCE DIFFERENTIAL RELAY FOR SWITCHGEAR BUS PROTECTION. 5A NOMINAL CURRENT INPUT, 48/125 VDC POWER SUPPLY, PANEL MOUNT.	SEL 587Z 0587Z0X325312XX PROVIDE PROJECTION PANEL MOUNT IF REQUIRED FOR 26" WIDE SWGR SECTION.
4	DEVICE 2506-U30; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
5	DEVICE 2032-U30; COMMUNICATION PROCESSOR FOR USE WITH INTEGRATING COMMUNICATIONS AND DISTRIBUTING IRIG-B TIME SYNCHRONIZATION SIGNAL TO SWITCHGEAR DIGITAL PROTECTIVE RELAYS AND OTHER ELECTRONIC DEVICES, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL PANEL MOUNT. PROVIDE WITH ONE ETHERNET CARD, DNP3 PROTOCOL, AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS AND SEL-2886 INTERFACE CONVERTERS SHOWN ON DWG. W28.20-E-560.	SEL 2032 203233X444G0XX PROVIDE SEL-9321 125V-5V DC POWER SUPPLY AND CABLES FOR SEL-2886 CONVERTERS PROVIDE PROJECTION PANEL MOUNT IF REQUIRED FOR 26" WIDE SWGR SECTION.
6	DEVICE 2411-U30; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 5, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS-232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 26 DIGITAL INPUTS AND 11 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X3A3A3A0100
7	HIGH-SPEED MULTI-CONTACT LOCKOUT RELAY, MANUAL RESET, 125V DC OPERATING COIL VOLTAGE, 9 DECK.	ELECTROSWITCH SERIES 24, LOR, 7809G
8	DEVICE CSR, CIRCUIT BREAKER CONTROL SWITCH, ELECTRICALLY OPERATED CONTROL SWITCH RELAY, FOR BOTH MANUAL AND REMOTE CONTROL OF POWER CIRCUIT BREAKER, 125V DC COIL VOLTAGE, 5 DECKS, STANDARD CIRCUIT B, PISTOL GRIP HANDLE, SPRING RETURN TO NORMAL POSITION, SLIP CONTACTS, WITH TARGET.	ELECTROSWITCH SERIES 24, CSR, 8857DB
9	WHITE INDICATING LIGHT, 125V DC, WHITE LED LAMP WITH CLEAR TRANSPARENT CAP. PROVIDE WITH LEDTRONICS ULTRA PALE WHITE CLUSTERED REPLACEMENT LAMP OR EQUAL, FOR G.E. ET-16 LAMP ASSY.	G.E. TYPE ET-16 116B6708G43XXXC4
10	GREEN INDICATING LIGHT, 125V DC, GREEN LED LAMP WITH GREEN TRANSPARENT COLOR CAP.	G.E. TYPE ET-16 116B6708G43G73G4
11	RED INDICATING LIGHT, 125V DC, RED LED LAMP WITH RED TRANSPARENT COLOR CAP.	G.E.TYPE ET-16 116B6708G43R73R4
12	DEVICE TCO; SWITCH, ELECTROSWITCH SERIES 101, 90 DEGREE SNAP ACTION, 2-DECK, DOUBLE-POLE, DOUBLE-THROW, INTERRUPTING RATING OF 10A AT 125V DC, 15A AT 120V AC, WITH OVAL HANDLE AND BLACK COLORED NAMEPLATE. ESCUTCHEON PLATE MARKED "CUT-IN" "CUT-OUT".	ELECTROSWITCH SERIES 101 #102602LN* (* FACTORY TO CONFIRM)
13	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01
14	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES, SWITCH ARRANGEMENT: T T T C-C C-C C-C T.	ABB FLEXI-TEST SWITCH TYPE FT-1 714B325G32
15	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 14-POLE, 600V, 30A RATED, 4 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES, SWITCH ARRANGEMENT: T T T X C-C C-C C-C T C-C X.	ABB FLEXI-TEST SWITCH TYPE FT-14 ORDER BY SWITCH ARRANGEMENT
16	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: X X X X C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 9672A72G01

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
ELEVATION, NAMEPLATE SCHEDULE AND DEVICE LIST

SCALE NONE
DATE JAN2009
W28.50-E-224
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 18-SEP-2014 10:19
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets [illegible] with NEW DRAWING NAME.9-4-14\W2850E224.01
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REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

ENCLOSURE NEMA 1, INTERRUPTING DUTY 480/277 VOLT, 3 PHASE, 4 WIRE
MOUNTING SURFACE, BREAKER 65,000 A, 400 A. MAIN BREAKER, 400 A. BUS

DESCRIPTION	LOADS-VA A	LOADS-VA B	LOADS-VA C	BKR./POLE	CKT. NO.	PHASE A	PHASE B	PHASE C	CKT. NO.	BKR./POLE	LOADS-VA A	LOADS-VA B	LOADS-VA C	DESCRIPTION
SPARE	-			20/1	1	●			2	20/1	1100			EXTERIOR LTS
SPARE		-		20/1	3		●		4	20/1		1000		EXTERIOR LTS
OFFICE, CORRIDOR LTG.			1300	20/1	5			●	6	20/1			1500	FLOODLIGHTS, PLATFORM LTS
MCC, SWGR RM. LTG.	648			20/1	7	●			8	20	3190			SWGR. BATT. CHARGER
BATTERY, LOCKERS RM. LTG.		748		20/1	9		●		10	2		3190		↓
CORRIDOR LTG.			248	20/1	11			●	12	20/1			-	SPARE
EXIT LTG.	15			20/1	13	●			14	15	600			CONF. AREA HVS-VAV-002
SPARE		-			15		●		16			600		
			-		17			●	18	3			600	↓
	-				19	●			20	20/1	-			SPARE
		-			21		●		22			-		
			-		23			●	24				-	
	-				25	●			26		-			
		-			27		●		28			-		
			-		29			●	30	↓			-	↓
↓	-			↓	31	●			32		-			SPACE
SPACE		-			33		●		34			-		
			-		35			●	36				-	↓
	-				37	●			38	125	10850			TRANSFORMER "TA"
		-			39		●		40			10850		
↓			-		41			●	42	3			10850	↓
	663	748	1548								15740	15640	12950	

TOTAL: 52.5 KVA. PANEL # "H1" FEEDER SIZE 8 #250 KCM + 2 #2 GND

ENCLOSURE NEMA 1, INTERRUPTING DUTY 208/120 VOLT, 3 PHASE, 4 WIRE
MOUNTING SURFACE, BREAKER 22,000 A, 225 A. MAIN BREAKER, 225 A. BUS

DESCRIPTION	LOADS-VA A	LOADS-VA B	LOADS-VA C	BKR./POLE	CKT. NO.	PHASE A	PHASE B	PHASE C	CKT. NO.	BKR./POLE	LOADS-VA A	LOADS-VA B	LOADS-VA C	DESCRIPTION
OFFICE RECEPT.	400			20/1	1	●			2	20/1	200			GENERATOR AREA GFCI WP RCPT.
MUD RM, OFFICE, CONF. RCPT		600			3		●		4			400		
REFRIGERATOR			540		5			●	6				400	↓
KITCHEN COUNTER TOP	400				7	●			8	↓	100			LIGHTING CONTROL PNL "LCP"
KITCHEN DISPOSAL		360		↓	9		●		10	15/1		74		UNISEX SHOWER LTG.
ELECTRIC RANGE			4400	40	11			●	12	20/1			250	PLC CAB. LTG. & RCPT.
↓	4400			2	13	●			14	20/1	400			EXT. RCPT., EAST WALL
MEN LOCKER & CORRIDOR		600		20/1	15		●		16	20/1		700		RESTROOM EF-001
WOMEN LOCKER & MECH. RCPT			400		17			●	18	20/1			200	VAV CONTROL PNL 1 & 2
RESTROOM RCPT.	400				19	●			20	20/1	200			FIRE ALARM CONTROL PNL
RCPT. INSIDE TEL. CAB.		100			21		●		22	20/1		700		BATT. ROOM EF-002
SPARE			-		23			●	24	20/1			200	BYPASS DAMPER 002
MCC, BATTERY RM. RCPT.	600				25	●			26	20/1	200			BYPASS DAMPER 001
		800			27		●		28	20/1		1000		VAV 2,3,4,5,6
↓			800	↓	29			●	30	20/1			600	WHRS CONT. PANEL
SPACE	-				31	●			32	20/1	700			HW PUMP HVS-PMP-001
		-			33		●		34	20/1		-		SPARE
↓			-		35			●	36	20/1			600	VAV HW CONTROL VALVES
WATER HEATER UNIT	2000			30	37	●			38		-			
		2000			39		●		40			-		
			2000	3	41			●	42				-	
	8200	4460	8140			(NOTE 2)					1800	2874	2250	

TOTAL: 30.8 KVA. PANEL # "L1" (SECTION 1) FEEDER SIZE 4 #4/0 AWG + 1 #4 GND

ENCLOSURE NEMA 1, INTERRUPTING DUTY 208/120 VOLT, 3 PHASE, 4 WIRE
MOUNTING SURFACE, BREAKER 10,000 A, 50 A. MAIN BREAKER, 100 A. BUS

DESCRIPTION	LOADS-VA A	LOADS-VA B	LOADS-VA C	BKR./POLE	CKT. NO.	PHASE A	PHASE B	PHASE C	CKT. NO.	BKR./POLE	LOADS-VA A	LOADS-VA B	LOADS-VA C	DESCRIPTION
OFFICE RCPT.	800			20/1	1	●			2	20/1	400			PLC CABINET
CONTROL ROOM RCPT.		1200			3		●		4			400		PGS1 ISD NETWORK CAB.
			1200		5			●	6				100	PGS1-CCTV CAMERAS
↓	800				7	●			8		100			CCTV MONITOR
SPARE		-			9		●		10			-		SPARE
↓			-	↓	11			●	12	↓			-	↓
SPACE	-				13	●			14		-			SPACE
		-			15		●		16			-		
↓			-		17			●	18				-	↓
	-				19	●			20		-			
		-			21		●		22			-		
			-		23			●	24				-	
	-				25	●			26		-			
		-			27		●		28			-		
			-		29			●	30				-	
	-				31	●			32		-			
		-			33		●		34			-		
			-		35			●	36				-	
	-				37	●			38		-			
		-			39		●		40			-		
			-		41			●	42				-	
	1600	1200	1200								500	400	100	

TOTAL: 6.25 KVA. PANEL # "L2" FEEDER SIZE 4 #8 + 1 #10 GND

ENCLOSURE NEMA 1, INTERRUPTING DUTY 208/120 VOLT, 3 PHASE, 4 WIRE
MOUNTING SURFACE, BREAKER 22,000 A, 225 A. MAIN LUGS ONLY 225 A. BUS

DESCRIPTION	LOADS-VA A	LOADS-VA B	LOADS-VA C	BKR./POLE	CKT. NO.	PHASE A	PHASE B	PHASE C	CKT. NO.	BKR./POLE	LOADS-VA A	LOADS-VA B	LOADS-VA C	DESCRIPTION
PGS2 SWGR CUBICLE RECPTS	1200			20/1	43	●			44	20/1	-			SPARE
PGS2 SWGR CUBICLE LTG		360			45		●		46			-		
SPARE			-		47			●	48				-	
	-				49	●			50		-			
↓		-		↓	51		●		52	↓		-		↓
SPACE					53			●	54				-	SPACE
					55	●			56		-			
		-			57		●		58			-		
			-		59			●	60				-	
	-				61	●			62		-			
		-			63		●		64			-		
			-		65			●	66				-	
	-				67	●			68		-			
		-			69		●		70			-		
			-		71			●	72				-	
	-				73	●			74		-			
		-			75		●		76			-		
↓			-		77			●	78				-	↓
UPS ENCLOSURE	-			60	79	●			80	40	1470			UPS/MAINT./
(NOTES 1 & 3)		-			81		●		82			1470		BYPASS CABINET
↓			-	3	83			●	84	3			1470	(NOTES 1 & 3)
	1200	360	-								1470	1470	1470	

TOTAL: 6.6 KVA. PANEL # "L1" (SECTION 2 FEEDER SIZE 4 #4/0 AWG + 1 #4 GND

NOTES:

1. CONFIRM BRANCH BREAKER RATING WITH UPS MANUFACTURER.
2. PROVIDE PANEL WITH FEED-THROUGH LUGS FOR FUTURE USE.
3. RELOCATE BRANCH BREAKERS FOR UPS ENCLOSURE AND UPS MAINTENANCE BYPASS CABINET FROM PANEL "L1" SECTION 1 TO PANEL "L1" SECTION 2.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	03/07/11	ADDED PANEL "L1" SECTION 2		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
480V AND 208V PANEL SCHEDULES

SHEET NO.293

SCALE NONE
DATE MAR2011
W28.20-E-230
DRAWING NUMBER
2
REV.

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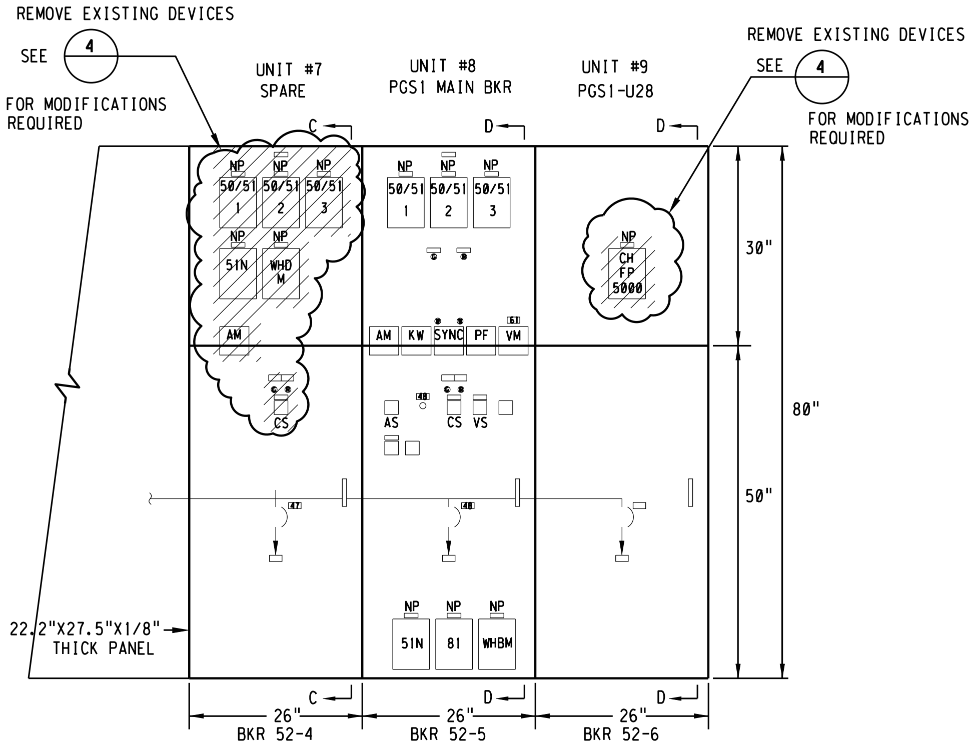
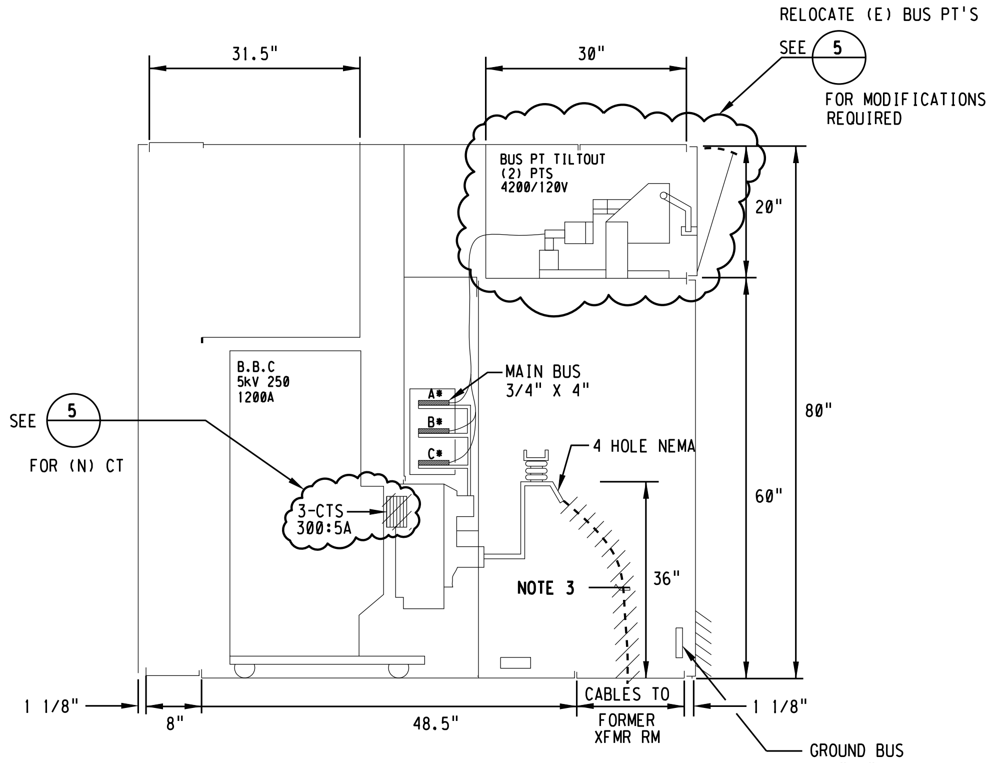
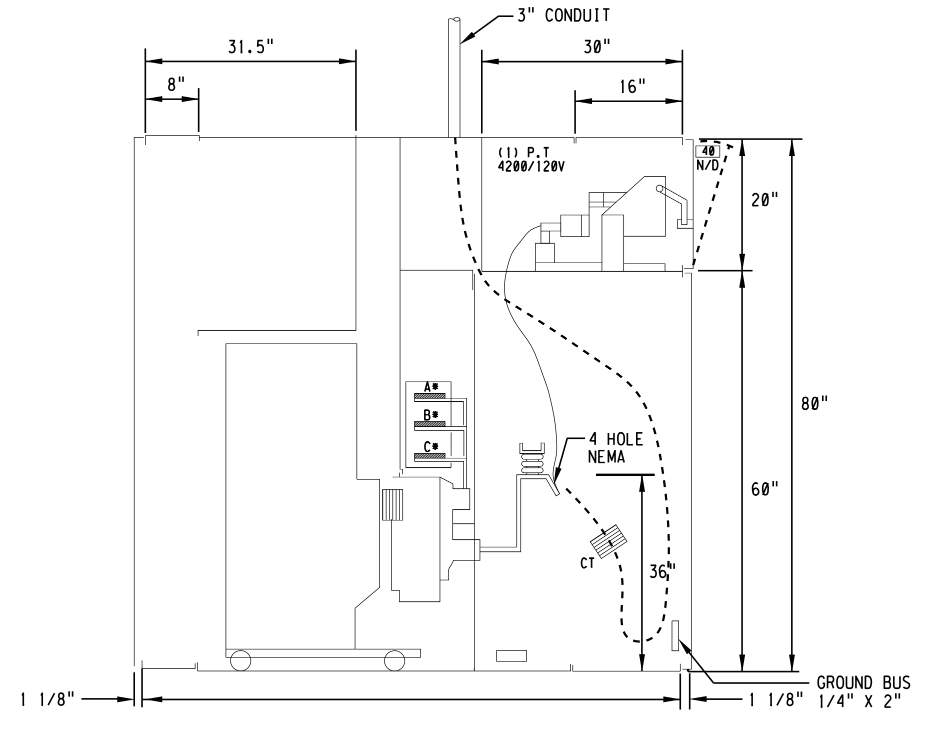
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
USER: vuong PLOT SCALE: 0.167665:1
DATE: 18-SEP-2014 10:21
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\[illegible] drawings with NEW DRAWING NAME_9-4-14\W2820E230.r02



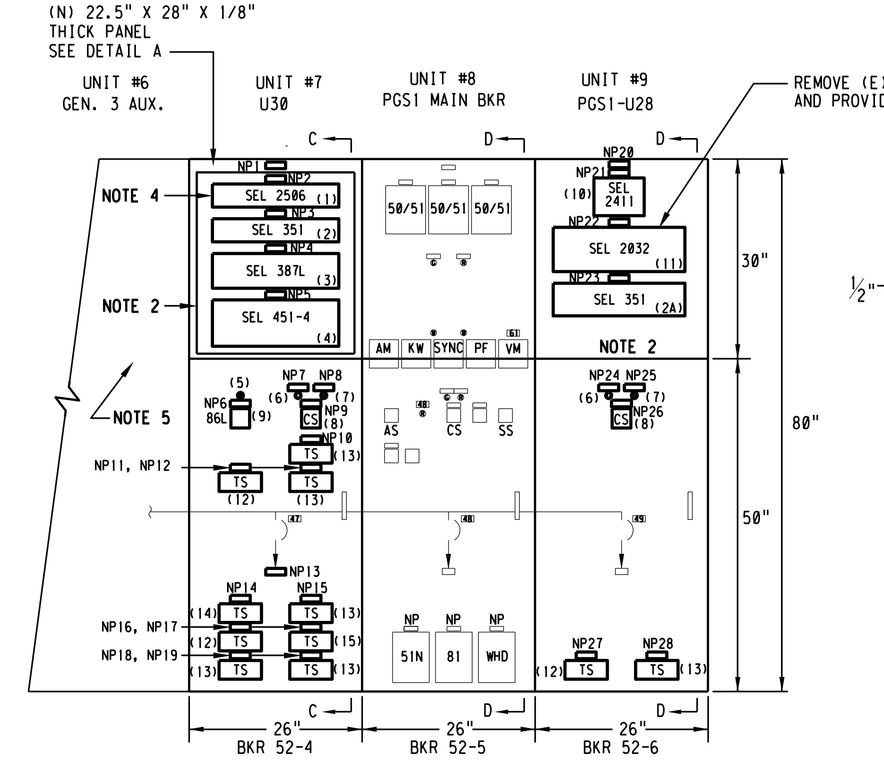
1 ELEVATION (EXISTING)
-
NONE



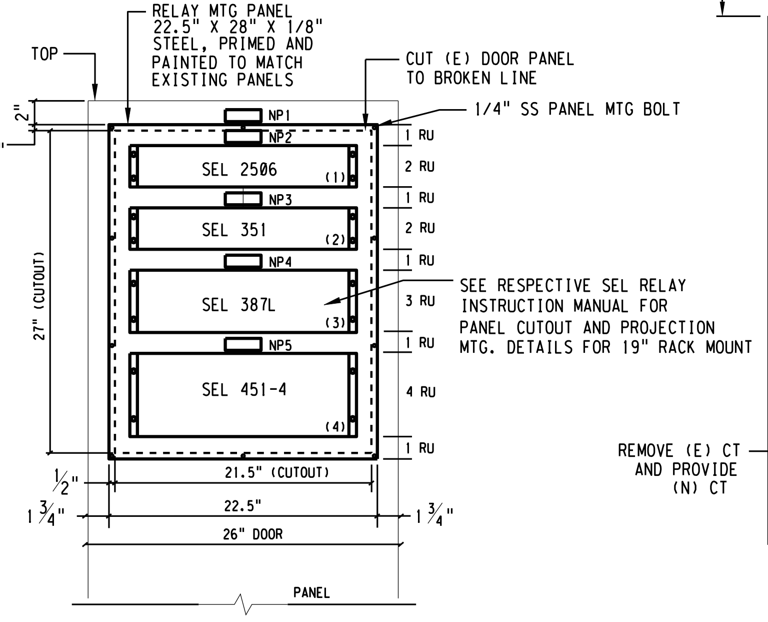
2 SECTION C-C (EXISTING)
-
NONE



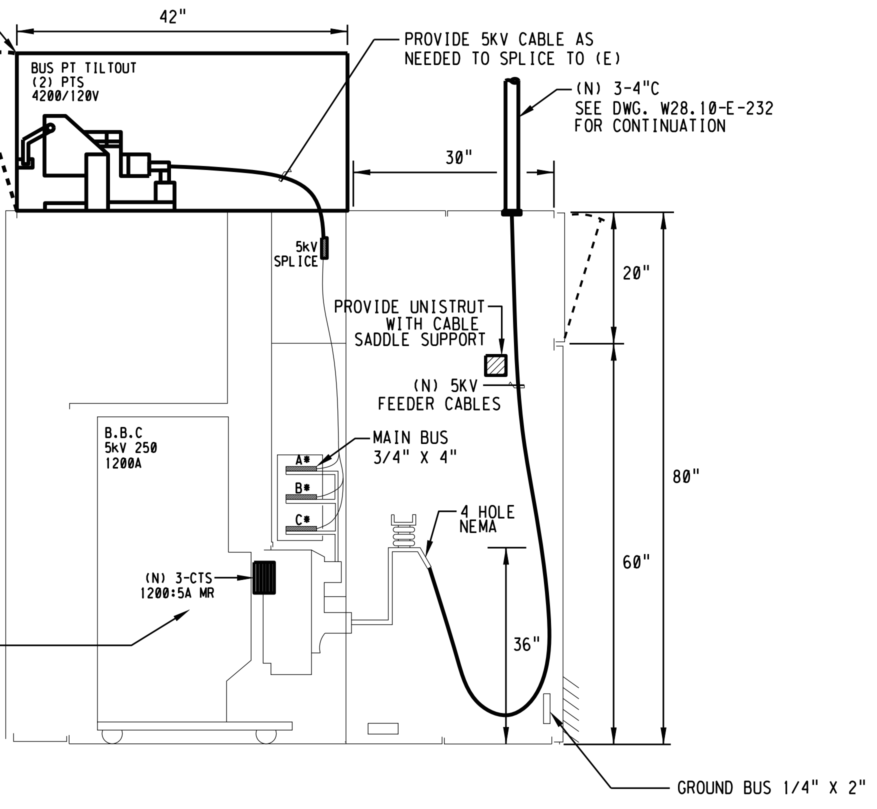
3 SECTION D-D (EXISTING)
-
NONE



4 ELEVATION (NEW INSTALLATION)
-
NONE



DETAIL A
NONE



5 SECTION C-C (NEW INSTALLATION)
-
NONE

NOTES:

1. THE MODIFICATIONS SHOWN ON THIS DRAWING REQUIRES SHUTDOWN OF THE EXISTING 5kV SWITCHGEAR. CONTRACTOR SHALL COORDINATE WITH EBMUD FOR NECESSARY TEMPORARY FEED TO PLANT AUXILIARIES MCC FOR KEEPING CRITICAL LOADS ENERGIZED DURING THE SHUTDOWN PERIOD.
2. PROVIDE NEW 30A, 600V, 12 POINT TERMINAL BLOCKS, AS REQUIRED, TO ACCOMPLISH REQUIRED WIRING MODIFICATIONS.
3. REMOVE ABANDONED CABLES BETWEEN PGS1 SWITCHGEAR SECTION 7 AND PGS1 SWITCHGEAR BUILDING TRANSFORMER ROOM.
4. WIRE A NORMALLY OPEN OUTPUT CONTACT OF DEVICE 2506-PGS1 INTO THE TRIP CIRCUIT OF EACH EXISTING PGS1 GENERTOR BREAKER.
5. PROVIDE NEW 24 PORT FIBER PATCH PANEL AND ENCLOSURE, EMERSON FIBERCONN OR APPROVED EQUAL, INSTALLED WITHIN PGS1 SWITCHGEAR SECTION 6.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	
DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATION
UNIT 7, 8 AND 9

SCALE NONE
DATE JAN2009
W28.10-E-231
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 18-SEP-2014 10:24
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\REF_Rec-REF3$FILENAME with NEW DRAWING NAME_9-4-14\W2810E231.r01
PLOT SCALE: 0.167614:1
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

NAMEPLATE SCHEDULE

NP NO.	MTG. LOCATIONS	NP SIZE (INCH)	LETTER HT. (INCH)	ENGRAVING FIRST LINE	SECOND LINE	THIRD LINE
NP1	AS	1 x 3	3/16	U30 FEEDER BREAKER	(TIE TO PGS2)	
NP2	AS, BS	1 x 3	3/16	LOAD SHED SYSTEM	REMOTE I/O MODULE	2506-PGS1
NP3	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-PGS1-U30	
NP4	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	PROT. RELAY	DEVICE 87L-PGS1-U30
NP5	AS, BS	1 x 3	3/16	REMOTE AUTO-SYNC	DEVICE 451-PGS1	(25A-L)
NP6	AS, BS	1 x 3	3/16	LINE CURRENT DIFF.	LOCKOUT RELAY	DEVICE 86L-PGS1
NP7	AS	1 x 3	3/16	OPEN		
NP8	AS	1 x 3	3/16	CLOSED		
NP9	AS, BS	1 x 3	3/16	U30 FEEDER BKR	(TIE TO PGS2)	CONTROL SWITCH
NP10	AS, BS	1 x 3	3/16	TSA-2506-PGS1	DEVICE I/O	TEST SWITCH
NP11	AS, BS	1 x 3	3/16	TS-351-PGS1-U30	CURRENT & POT.	TEST SWITCH
NP12	AS, BS	1 x 3	3/16	TSA-351-PGS1-U30	DEVICE I/O	TEST SWITCH
NP13	AS	1 x 3	3/16	SUBSTATION U30		
NP14	AS, BS	1 x 3	3/16	TS-87L-PGS1-U30	CURRENT	TEST SWITCH
NP15	AS, RD	2 x 6	3/8	TSA-87L-PGS1-U30	DEVICE I/O	TEST SWITCH
NP16	AS, BS	1 x 3	3/16	TS-451-PGS1-MAIN	CURRENT & POT.	TEST SWITCH
NP17	AS, BS	1 x 3	3/16	TS-451-PGS1-VT	PGS1 BUS POT.	TEST SWITCH
NP18	AS, BS	1 x 3	3/16	TSA-451-PGS1	DEVICE I/O	TEST SWITCH
NP19	AS, BS	1 x 3	3/16	TSB-451-PGS1	DEVICE I/O	TEST SWITCH
NP20	AS	1 x 3	3/16	U28 FEEDER BREAKER	PGS1 STATION SERVICE	
NP21	AS, BS	1 x 3	3/16	I/O PROCESSOR	2411-PGS1	
NP22	AS, BS	1 x 3	3/16	COMM. PROCESSOR	2032-PGS1	
NP23	AS, BS	1 x 3	3/16	OVERCURRENT RELAY	DEVICE 351-PGS1-U28	
NP24	AS	1 x 3	3/16	OPEN		
NP25	AS	1 x 3	3/16	CLOSED		
NP26	AS	1 x 3	3/16	U28 FEEDER BKR	CONTROL SWITCH	
NP27	AS, BS	1 x 3	3/16	TS-351-PGS1-U28	CURRENT & POT.	TEST SWITCH
NP28	AS, BS	1 x 3	3/16	TSA-351-PGS1-U28	DEVICE I/O	TEST SWITCH

* NAMEPLATE MTG LOCATION:
AS - MOUNTED ON PANEL AS SHOWN
BS - MOUNTED ON BACK OF DEVICE PANEL
RD - MOUNTED REAR DOOR
FD - MOUNTED ON FRONT DOOR

DEVICE LIST

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
1	DEVICE 2506; RACK-MOUNT REMOTE I/O MODULE FOR CONVERSION OF DEVICE INPUT/OUTPUTS DIRECTLY TO MIRRORED BITS COMMUNICATION TO LOAD SHED PROCESSOR OVER FIBER. MODULE SHALL BE RATED FOR 48/125 VDC POWER SUPPLY, WITH EIGHT INPUTS AND EIGHT HIGH SPEED OUTPUTS RATED 125 VDC. PROVIDE FIBER PORT FOR 62.5 MICRON MULTIMODE, ST CONNECTORS.	SEL 2506 250603254X
2	DEVICE 351; DIRECTIONAL OVERCURRENT AND RECLOSING RELAY, WITH PHASE, NEGATIVE-SEQUENCE, NEUTRAL AND RESIDUAL OVERCURRENT ELEMENTS WITH AVAILABLE DIRECTIONAL CONTROL, 5A NOMINAL CURRENT INPUT, 0-300V AC RATED VOLTAGE INPUT, 48-125V DC POWER SUPPLY, 125V DC CONTROL VOLTAGE, MIRRORED BITS, VOLTAGE SAG/SWELL/INTERRUPTION, WITH STANDARD INPUTS & OUTPUTS AND CONVENTIONAL TERMINAL BLOCKS, HORIZONTAL RACK MOUNT.	SEL 351-7 035170H3554XX1
2A	DEVICE 351; DIRECTIONAL OVERCURRENT AND RECLOSING RELAY, SIMILAR TO ITEM 1 ABOVE, EXCEPT PROVIDE FOR HORIZONTAL PANEL MOUNT. PRIOR TO ORDERING RELAY, CONTRACTOR SHALL FIELD VERIFY WHETHER HORIZONTAL PANEL PROJECTION MOUNT IS REQUIRED DUE TO DEPTH OF RELAY.	SEL 351-7 03517033554XX1 CONFIRM NEED FOR PROJECTION MOUNT PRIOR TO ORDERING
3	DEVICE 387L; LINE CURRENT DIFFERENTIAL RELAY REQUIRING NO SETTINGS ON DIFFERENTIAL OPERATING SYSTEM, 5A NOMINAL AC CURRENT INPUTS. 125 VDC POWER SUPPLY, 7 STANDARD SPEED OUTPUTS, 6 HIGH-SPEED OUTPUTS, 6 OPTOISOLATED INPUTS, 1300nm 62.5 MICRON FIBER-OPTIC COMMUNICATIONS. HORIZONTAL RACK MOUNT.	SEL 387L 0387L0HD03X54X1
4	DEVICE 451-PGS1; (25A-L), BAY CONTROL, AUTOMATION, AND PROTECTION SYSTEM RELAY TO PROVIDE AUTOMATIC SYNCHRONIZER CONTROL. RELAY SHALL BE HORIZONTAL RACK MOUNT, (6) INDEPENDENT 300 VAC CONTINUOUS VOLTAGE INPUTS, 5A NOMINAL CURRENT INPUTS, 125 VDC POWER SUPPLY, STANDARD INPUT/OUTPUT, ADDITIONAL 8 INDEPENDENT INPUTS, 13 STANDARD FORM A AND 2 FORM C OUTPUTS, DUAL MIRRORED BIT COMMUNICATION CHANNELS, ETHERNET CARD WITH (1) 10/100BASE-T AND (1) 10BASE-FL CONNECTOR. SYSTEM SHALL INCLUDE: GENERATOR FREQUENCY AND VOLTAGE MATCHING CONTROL BREAKER CLOSE DELAY COMPENSATION ENABLE ANTI-MOTORING INPUTS WITH TWO SELECTABLE MASTER FREQUENCY TRACKING INPUTS. SOFT SYNCH-SCOPE SYSTEM CLOSE FAIL ALARM CLOSE LOCKOUT ALARM SYNCH OPERATIONAL PARAMETERS DISPLAY 24 FRONT PANEL LED INDICATORS AND 12 MEMBRANE PUSHBUTTONS	SEL 451-4 045144152B3AXH31XXXXX
5	WHITE INDICATING LIGHT, 125V DC, WHITE LED LAMP WITH CLEAR TRANSPARENT CAP. PROVIDE WITH LEDTRONICS ULTRA PALE WHITE CLUSTERED REPLACEMENT LAMP OR EQUAL, FOR G.E. ET-16 LAMP ASSY.	G.E. TYPE ET-16 116B6708G43XXXC4
6	GREEN INDICATING LIGHT, 125V DC, GREEN LED LAMP WITH GREEN TRANSPARENT COLOR CAP.	G.E. TYPE ET-16 116B6708G43G73G4
7	RED INDICATING LIGHT, 125V DC, RED LED LAMP WITH RED TRANSPARENT COLOR CAP.	G.E.TYPE ET-16 116B6708G43R73R4
8	DEVICE CSR; CIRCUIT BREAKER CONTROL SWITCH, ELECTRICALLY OPERATED CONTROL SWITCH RELAY, FOR BOTH MANUAL AND REMOTE CONTROL OF POWER CIRCUIT BREAKER, 125V DC COIL VOLTAGE, 5 DECKS, STANDARD CIRCUIT B, PISTOL GRIP HANDLE, SPRING RETURN TO NORMAL POSITION, SLIP CONTACTS,	ELECTROSWITCH SERIES 24, CSR, 8857DB
9	DEVICE 86L; HIGH-SPEED MULTI-CONTACT LOCKOUT RELAY, MANUAL RESET, 125V DC OPERATING COIL VOLTAGE, 9 DECK.	ELECTROSWITCH SERIES 24, LOR, 7809D
10	DEVICE 2411; INPUT/OUTPUT (I/O) PROCESSOR FOR DATA ACQUISITION AND CONTROL, SUITABLE FOR OPERATING AS AN I/O NODE IN CONJUNCTION WITH ITEM 11, SIX CONFIGURABLE FRONT PANEL LEDs AND FOUR CONFIGURABLE FRONT PANEL PUSHBUTTONS AND LEDs, INDEPENDENT FRONT AND REAR PANEL SERIAL RS-232 PORTS, 110-250V DC POWER SUPPLY, PROCESSOR CONFIGURED FOR 26 DIGITAL INPUTS AND 11 DIGITAL OUTPUTS, 125V DC CONTROL VOLTAGE FOR DIGITAL INPUTS, DIGITAL OUTPUTS RATED FOR 240V AC / 250V DC APPLICATION, SEMI-FLUSH PANEL MOUNT.	SEL 2411 241101A2X3A3A3A0100
11	DEVICE 2032; COMMUNICATION PROCESSOR FOR USE WITH INTEGRATING COMMUNICATIONS AND DISTRIBUTING IRIG-B TIME SYNCHRONIZATION SIGNAL TO SWITCHGEAR DIGITAL PROTECTIVE RELAYS AND OTHER ELECTRONIC DEVICES, ONE FRONT PANEL AND SIXTEEN REAR PANEL SERIAL COMMUNICATION PORTS, I/O BOARD WITH FOUR OUTPUTS AND SIXTEEN INPUTS, 85-350V DC POWER SUPPLY, 125V DC CONTROL INPUT VOLTAGE, HORIZONTAL PANEL MOUNT, PROVIDE WITH ETHERNET CARD AND DNP3 PROTOCOL AND ALL REQUIRED SEL-2812 FIBER TRANSCEIVER PAIRS AND SEL-2886 INTERFACE CONVERTERS SHOWN ON DWG. W28.20-E-560. CONTRACTOR SHALL FIELD VERIFY WHETHER HORIZONTAL PANEL PROJECTION MOUNT IS REQUIRED DUE TO DEPTH OF RELAY.	SEL 2032 203233X444G0XX CONFIRM NEED FOR PROJECTION MOUNT PRIOR TO ORDERING PROVIDE SEL-9321 125VDC-5VDC POWER SUPPLY AND CABLES FOR SEL-2886 CONVERTERS
12	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, AND 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES., SWITCH ARRANGEMENT: T T T T C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 498A010G01

DEVICE LIST (CONT.)

ITEM NO.	DESCRIPTION	CATALOG REFERENCE
13	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 10 SINGLE POLE POTENTIAL ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: P P P P P P P P P P.	ABB FLEXI-TEST SWITCH TYPE FT-1 129A501G01
14	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 3 CURRENT SHORTING ASSY, BLACK HANDLES, SWITCH ARRANGEMENT: X X X X C-C C-C C-C.	ABB FLEXI-TEST SWITCH TYPE FT-1 9672A72G01
15	DEVICE TS; RELAY TEST SWITCH ASSEMBLY, BACK CONNECTED, BLACK OPAQUE COVER, 10-POLE, 600V, 30A RATED, 4 SINGLE POLE POTENTIAL ASSY, RED HANDLES, SWITCH ARRANGEMENT: T T T T X X X X X X.	ABB FLEXI-TEST SWITCH TYPE FT-1 9688A79G01

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS
PANEL 7 & 9 NAMEPLATE SCHEDULE AND DEVICE LIST

SCALE NONE
DATE JAN2009
W28.10-E-231A
DRAWING NUMBER
1
REV.

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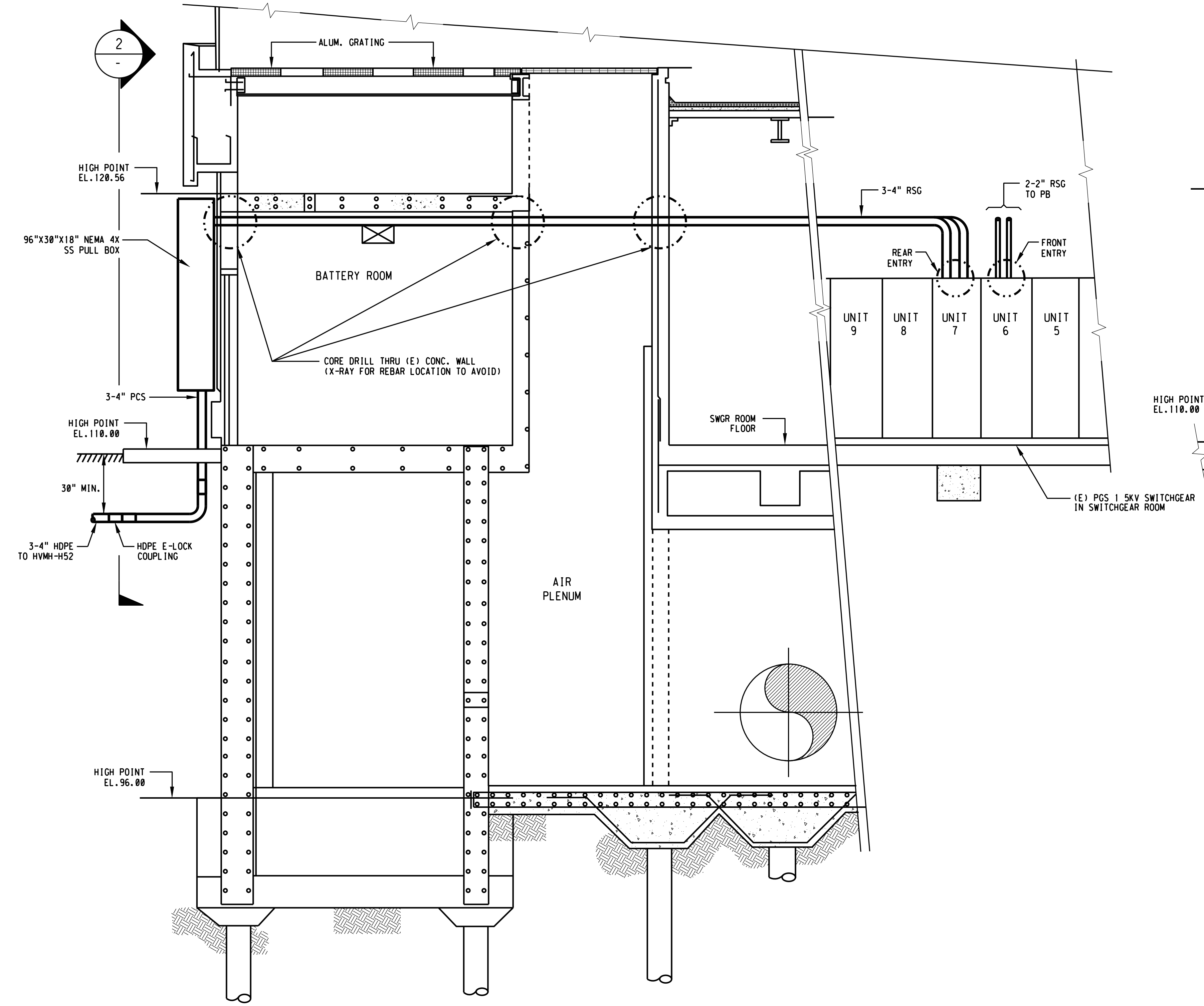
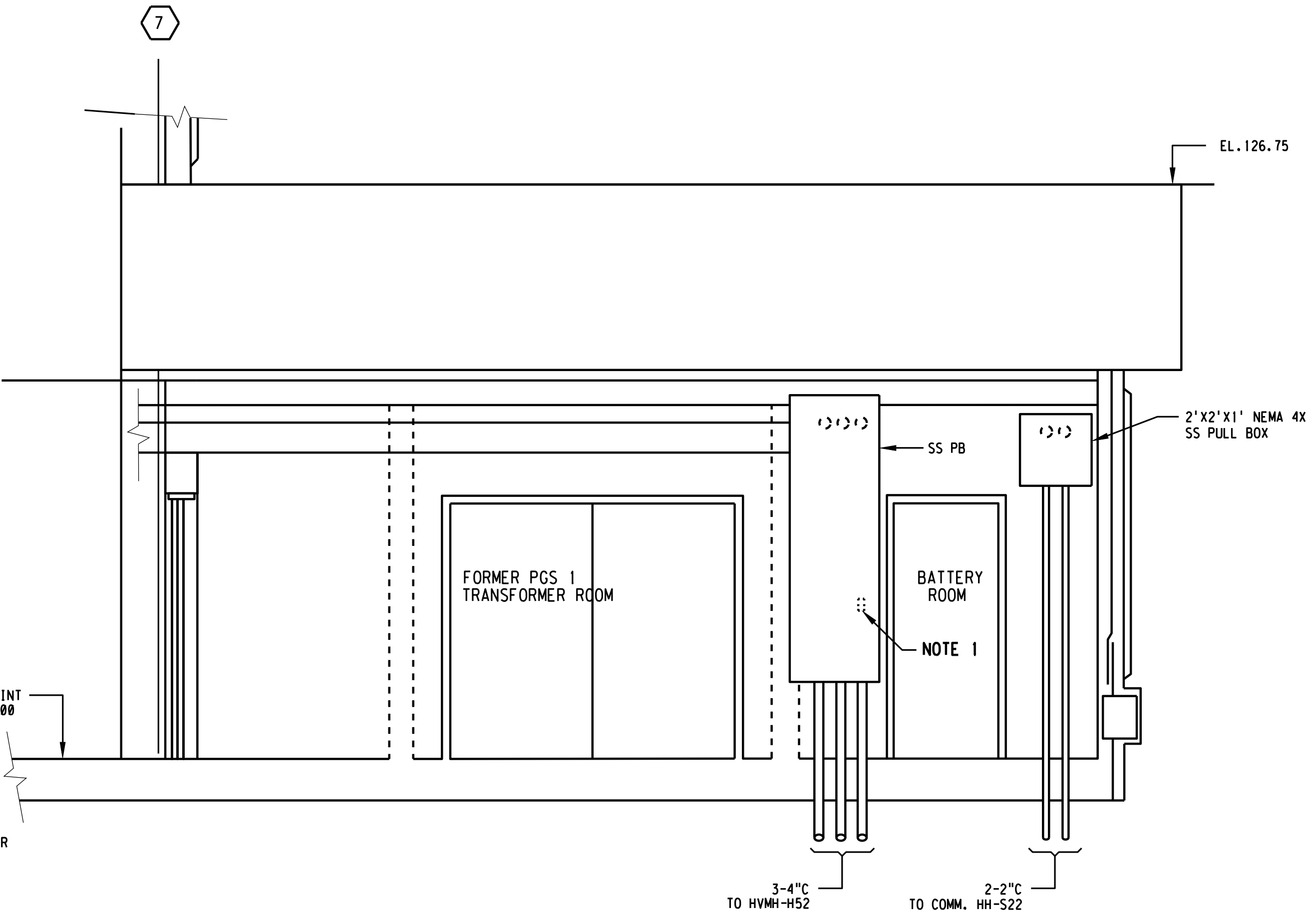


1 - SECTION

3/8"=1'



2 - SECTION

NONE

NOTES:

1. REMOVE EXISTING LIGHT SWITCH AND PROVIDE BLANK COVERPLATE FOR OUTLET BOX. PROVIDE NEW SURFACE MOUNTED LIGHT SWITCH IN FS BOX FOR BATTERY ROOM LIGHTING ON INTERIOR WALL OF BATTERY ROOM. PROVIDE NECESSARY CONDUIT AND WIRING SO NEW SWITCH IS WIRED TO CONTROL EXISTING BATTERY ROOM LIGHT.

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
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santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
△	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATION
FEEDER CONDUITS INSTALLATION

SCALE AS SHOWN
DATE JAN2009
W28.10-E-232
DRAWING NUMBER
1
REV.

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DATE: 18-SEP-2014 10:29
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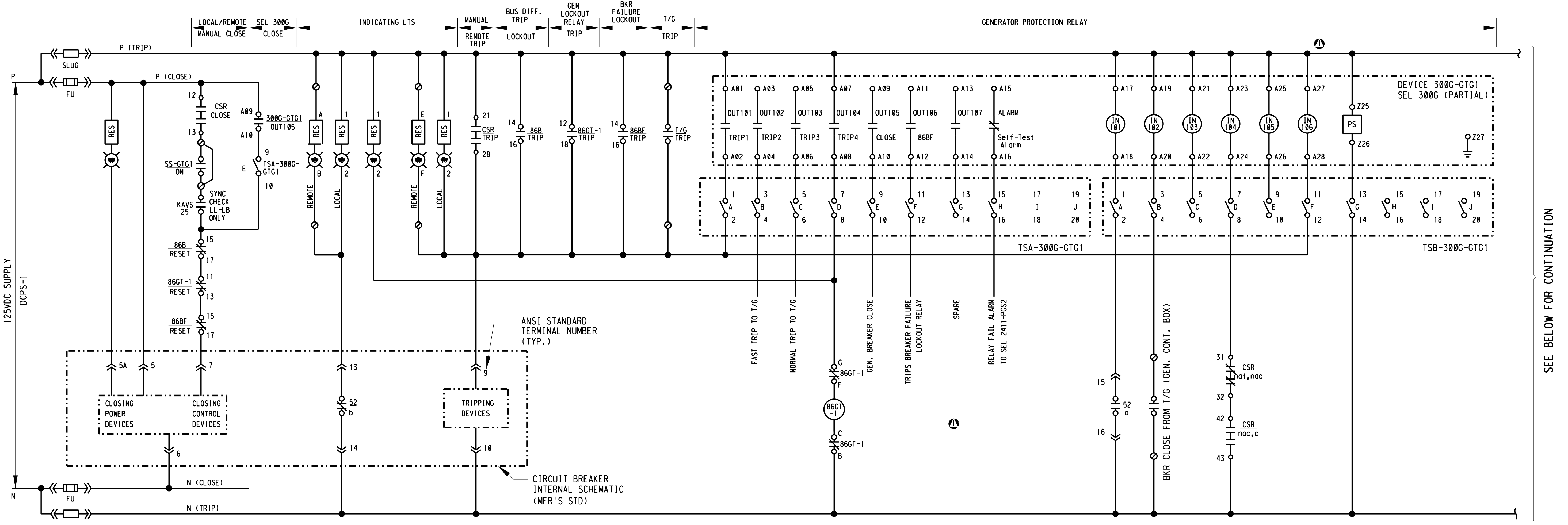
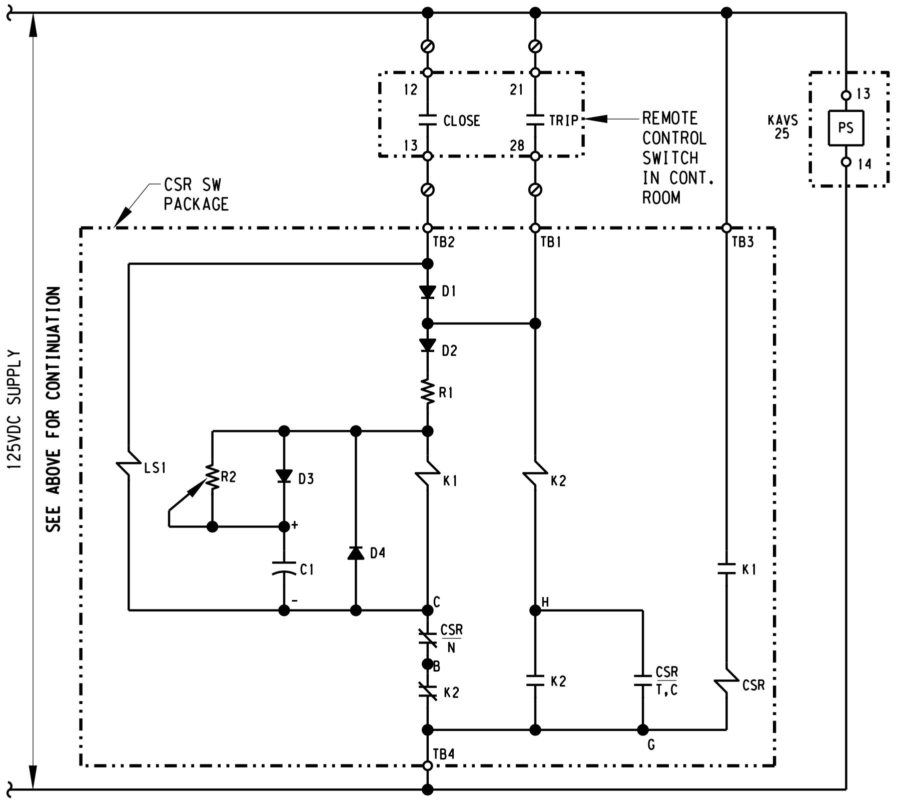


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 GENERATOR BREAKER CONTROL SCHEMATIC GTG-1

(SIMILAR FOR FUTURE GTG-2)

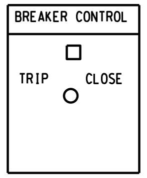


DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 ○┤├┤├○ 13				☒
	16 ○┤├┤├○ 17				☒
2	21 ○┤├┤├○ 28	☒			
	24 ○┤├┤├○ 25	☒			
3	31 ○┤├┤├○ 32		☒	☒	
	35 ○┤├┤├○ 36		☒	☒	
4	42 ○┤├┤├○ 43			☒	☒
	46 ○┤├┤├○ 47			☒	☒
5	51 ○┤├┤├○ 52	☒	☒		
	55 ○┤├┤├○ 56	☒	☒		

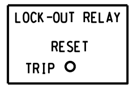
INPUT TO PGS2 PLC FOR MANUAL TRIP INDICATION

nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART



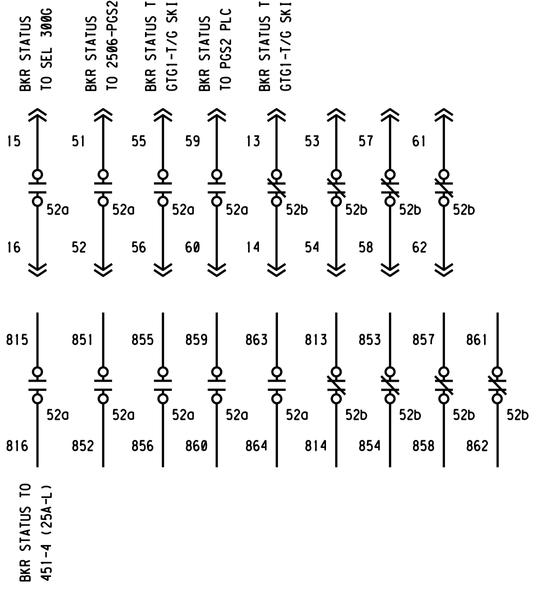
(TYPICAL PLATE)
CIRCUIT BREAKER
CONTROL SWITCH
UNIVERSAL CIRCUIT 57



DECK	CONTACTS	CONTACT DEVELOPMENT		
		POSITION		FUNCTION
		TRIP	RESET	
1	11 ○┤├┤├○ 13		X	PERMITS CLOSING GEN. BKR
	12 ○┤├┤├○ 18	X		TRIPS GEN. BKR
	15 ○┤├┤├○ 17		X	SPARE
	14 ○┤├┤├○ 16	X		SPARE
2	21 ○┤├┤├○ 23		X	SPARE
	22 ○┤├┤├○ 28	X		ALARM INPUT TO 2411-PGS2
	25 ○┤├┤├○ 27		X	SPARE
	24 ○┤├┤├○ 26	X		INPUT TO PGS2 PLC
3	31 ○┤├┤├○ 33		X	SPARE
	32 ○┤├┤├○ 38	X		SPARE
	35 ○┤├┤├○ 37		X	SPARE
	34 ○┤├┤├○ 36	X		SPARE
4	41 ○┤├┤├○ 43		X	SPARE
	42 ○┤├┤├○ 48	X		SPARE
	45 ○┤├┤├○ 47		X	SPARE
	44 ○┤├┤├○ 46	X		SPARE

3 GEN. LOCKOUT RELAY 86GT-1

(SIMILAR FOR DEVICES 86GT-2 & 86GT-3)



4 BREAKER AUX. CONTACTS

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
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(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	03/25/11	REV. PER SWGR & T/G MFR SHOP DWGS			

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 GENERATOR BREAKER
DC CONTROL SCHEMATIC

SCALE NONE
DATE MAR2011
W28.20-E-301 DRAWING NUMBER
2 REV.

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PGS2 BREAKER GTG-1

GENERATOR RELAY SEL 300G CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 — IN 101 — A18	BREAKER STATUS INPUT	W28.20-E-301
A19 — IN 102 — A20	BREAKER CLOSE INPUT FROM T/G CONTROL	W28.20-E-301
A21 — IN 103 — A22		
A23 — IN 104 — A24	CSR INPUT	W28.20-E-301
A25 — IN 105 — A26		
A27 — IN 106 — A28	TRIP COIL MONITOR (BKR CONTACT WEAR)	W28.20-E-301
Z01 — IA — Z02 Z03 — IB — Z04 Z05 — IC — Z06 Z07 — IN — Z08	CURRENT INPUTS	W28.20-E-210
Z09 — VA Z10 — VB Z11 — VC — N — Z12 Z13 — VN — NN — Z14	VOLTAGE INPUTS	W28.20-E-210
Z15 — VS — NS — Z16	SYNC. VOLTAGE INPUT	W28.20-E-210
Z19 — IA87 — Z20 Z21 — IB87 — Z22 Z23 — IC87 — Z24	CURRENT INPUTS (GEN. DIFF. PROTECTION)	W28.20-E-210
OUT101 A01 A02	TRIPS GEN. BREAKER GTG-1	W28.20-E-301
OUT102 A03 A04	DIFF. RELAY (FAST) TRIP TO TURBINE	W28.20-E-301
OUT103 A05 A06	O/C TRIP (NORMAL) TO TURBINE	W28.20-E-301
OUT104 A07 A08	TRIPS GEN. LOCKOUT RELAY	W28.20-E-301
OUT105 A09 A10	GEN. BREAKER CLOSE	W28.20-E-301
OUT106 A11 A12	TRIPS BREAKER FAILURE LOCKOUT	W28.20-E-308B
OUT107 A13 A14		
ALARM A15 A16	⚠1 RELAY FAILURE ALARM (SELF TEST)	W28.20-E-540
Z25 + POWER SUPPLY - Z26 BATT.MONITOR	125V DC SUPPLY	W28.20-E-301
Z27	CHASSIS GROUND	W28.20-E-301
(REAR) PORT 1 — RS485 (REAR) IRIG-B — 7, 8 (REAR) PORT 2 — EIA-232 (REAR) PORT 3 — EIA-232 (FRONT) PORT F — EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

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3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	03/25/11	REV. PER T/G MFR SHOP DWGS			

SD317A - PGS RENEWABLE ENERGY EXPANSION

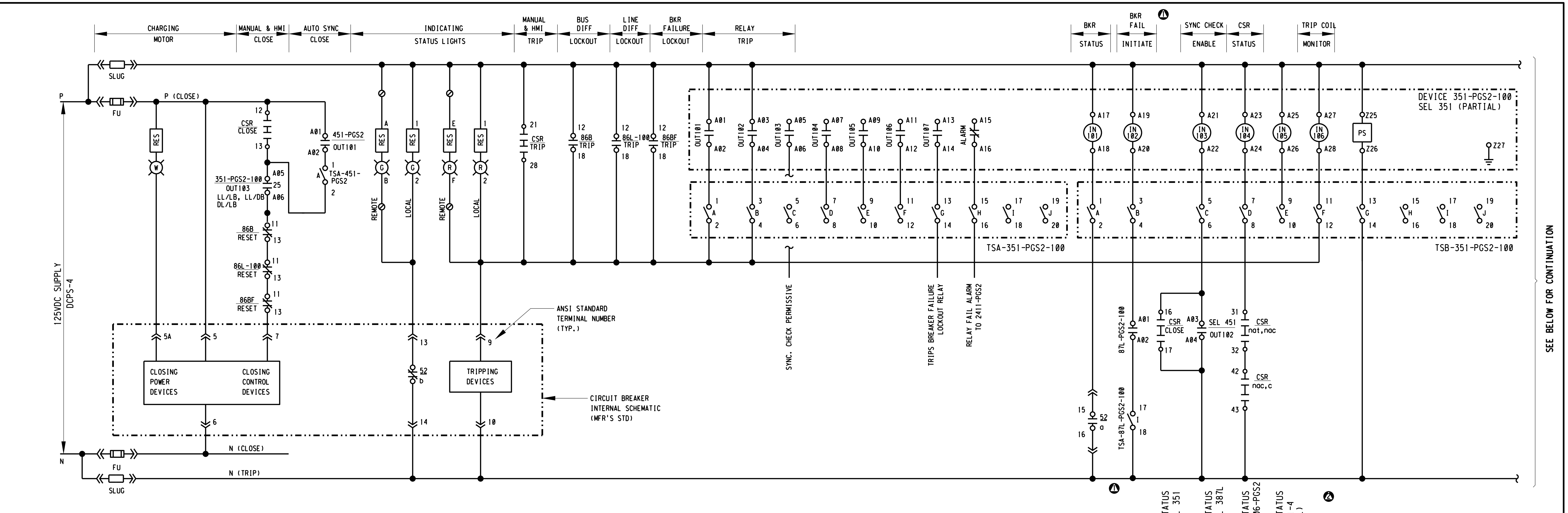
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 GENERATOR PROTECTIVE RELAY
SEL-300G CONTACT TABLE

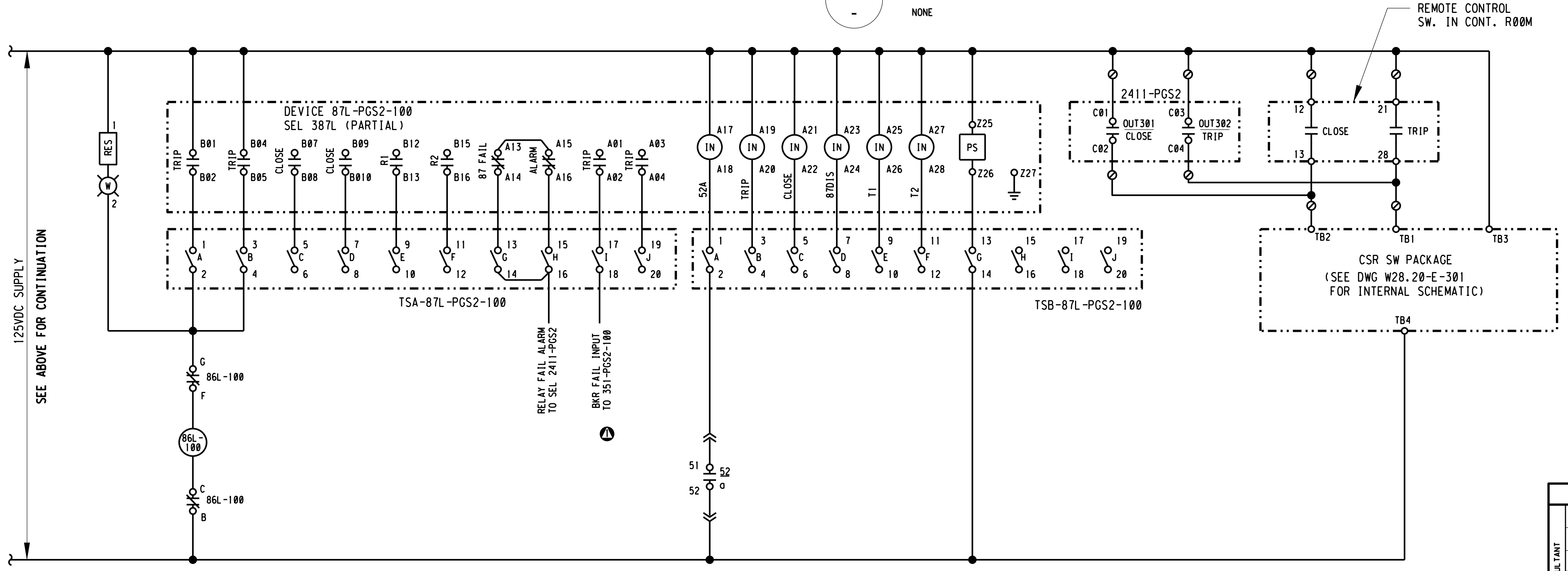
SCALE NONE
DATE MAR2011
W28.20-E-302
DRAWING NUMBER
2
REV.

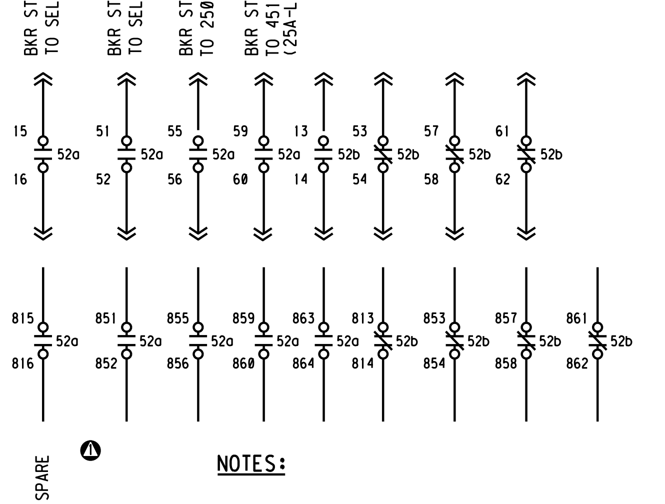


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 MAIN BREAKER PGS2-100 CONTROL SCHEMATIC

- NONE


REMOTE CONTROL SW. IN CONT. ROOM
125VDC SUPPLY
SEE ABOVE FOR CONTINUATION
RES
W
DEVICE 87L-PGS2-100 SEL 387L (PARTIAL)
TRIP TRIP CLOSE CLOSE R1 R2 87 FAIL ALARM TRIP TRIP
IN
52A TRIP CLOSE 87DIS T1 T2
PS
TSA-87L-PGS2-100
TSB-87L-PGS2-100
RELAY FAIL ALARM TO SEL 2411-PGS2
BKR FAIL INPUT TO 351-PGS2-100
86L-100
86L-100
52 a
2411-PGS2
OUT301 CLOSE
OUT302 TRIP
CLOSE
TRIP
TB1 TB2 TB3 TB4
CSR SW PACKAGE (SEE DWG W28.20-E-301 FOR INTERNAL SCHEMATIC)



NOTES:

1. REFER TO DWG. W28.20-E-304 FOR CSR CONTROL SWITCH CONTACT DEVELOPMENT CHART AND ESCUTCHEON PLATE REQUIREMENTS.

2 BREAKER AUX. CONTACTS

- NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

MH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	03/25/11	REV. PER SWGR MFR SHOP DWGS	CGT		
1	01/24/11	ADD 87L BKR FAIL INPUT TO SEL 351, DEL 52a TO GTG1	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR
MAIN BREAKER PGS2-100 DC CONTROL SCHEMATIC

SCALE NONE
DATE MAR2011
W28.20-E-303
DRAWING NUMBER
3
REV.

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REF 6: REF6$FILENAME
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87L-PGS2-100

LINE CURRENT DIFF. RELAY SEL 387L CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 – 52A – A18	BREAKER STATUS	W28.20-E-303
A19 – TRIP – A20		
A21 – CLOSE – A22		
A23 – 87 DIS – A24		
A25 – T1 – A26		
A27 – T2 – A28		
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06	CURRENT INPUTS	W28.20-E-202
TRIP A01 / A02	⚠1 BKR FAILURE INITIATE TO SEL 351-PGS2-100	W28.20-E-303
TRIP A03 / A04		
CLOSE A05 / A06		
CLOSE A07 / A08		
R1 A09 / A10		
R2 A11 / A12		
87 FAIL A13 / A14	87 FAIL ALARM	W28.20-E-540
ALARM A15 / A16	RELAY FAILURE ALARM	W28.20-E-540
B01 – TRIP – B02 B04 – TRIP – B05 B07 – CLOSE – B08 B09 – CLOSE – B10 B12 – R1 – B13 B15 – R2 – B16	BREAKER TRIP	W28.20-E-303
Z25 + POWER SUPPLY − Z26 BATT.MONITOR	125V DC SUPPLY	W28.20-E-303
Z27	CHASSIS GROUND	W28.20-E-303
(REAR) CH. X – FO	MIRRORED BIT COMM.	W28.20-E-202
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7, 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

351-PGS2-100
OVERCURRENT & SYNCHRONISM CHECK

OVERCURRENT RELAY SEL 351 CONTACT TABLE

⚠1

CONTACTS	FUNCTION	DRAWING
A17 – IN 101 – A18	BREAKER STATUS	W28.20-E-303
A19 – IN 102 – A20	BKR FAILURE INITIATE INPUT FROM 87L	W28.20-E-303
A21 – IN 103 – A22	SYNC CHECK ENABLE	W28.20-E-303
A23 – IN 104 – A24	CSR INPUT	W28.20-E-303
A25 – IN 105 – A26		
A27 – IN 106 – A28	TRIP COIL MONITOR (BKR CONTACT WEAR)	W28.20-E-303
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06 Z07 – IN – Z08	CURRENT INPUTS	W28.20-E-202
Z09 – VA Z10 – VB Z11 – VC – N – Z12 Z13 – VS – NS – Z14	VOLTAGE INPUTS	W28.20-E-202
OUT101 A01 / A02	BREAKER TRIP	W28.20-E-303
OUT102 A03 / A04		
OUT103 A05 / A06	SYNC CHECK PERMISSIVE	W28.20-E-303
OUT104 A07 / A08		
OUT105 A09 / A10		
OUT106 A11 / A12		
OUT107 A13 / A14	BREAKER FAILURE TRIP	W28.20-E-308B
ALARM A15 / A16	RELAY FAILURE ALARM	W28.20-E-540
Z25 + POWER SUPPLY − Z26 BATT.MONITOR	125V DC SUPPLY	W28.20-E-303
Z27	CHASSIS GROUND	W28.20-E-303
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7, 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 – 13				X
	16 – 17				X
2	21 – 28	X			
	24 – 25	X			
3	31 – 32		X	X	
	35 – 36		X	X	
4	42 – 43			X	X
	46 – 47			X	X
5	51 – 52	X	X		
	55 – 56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

1 / - CSR CONTACT CHART

NONE

BREAKER CONTROL
☐
TRIP CLOSE
○

(TYPICAL PLATE)

CIRCUIT BREAKER
CONTROL SWITCH
UNIVERSAL CIRCUIT 57

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION			BY	REC.	APP.
⚠2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING	INSP. MAB	SD317A	CT		
⚠1	01/24/11	ADDED 87L BKR FAIL INITIATE TO 351-PGS2-100			CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR MAIN BREAKER PGS2-100
LINE PROTECTIVE RELAYS CONTACT TABLES

SCALE NONE
DATE JAN2009
W28.20-E-304
DRAWING NUMBER
2
REV.

USER: vuong
DATE: 18-SEP-2014 10:48
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\[illegible] with NEW DRAWING NAME_9-4-14\W2820E304.r02
PLOT SCALE: 0.167279:1
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REF 6: REF6$FILENAME
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USER: vuong
DATE: 18-SEP-2014 10:53
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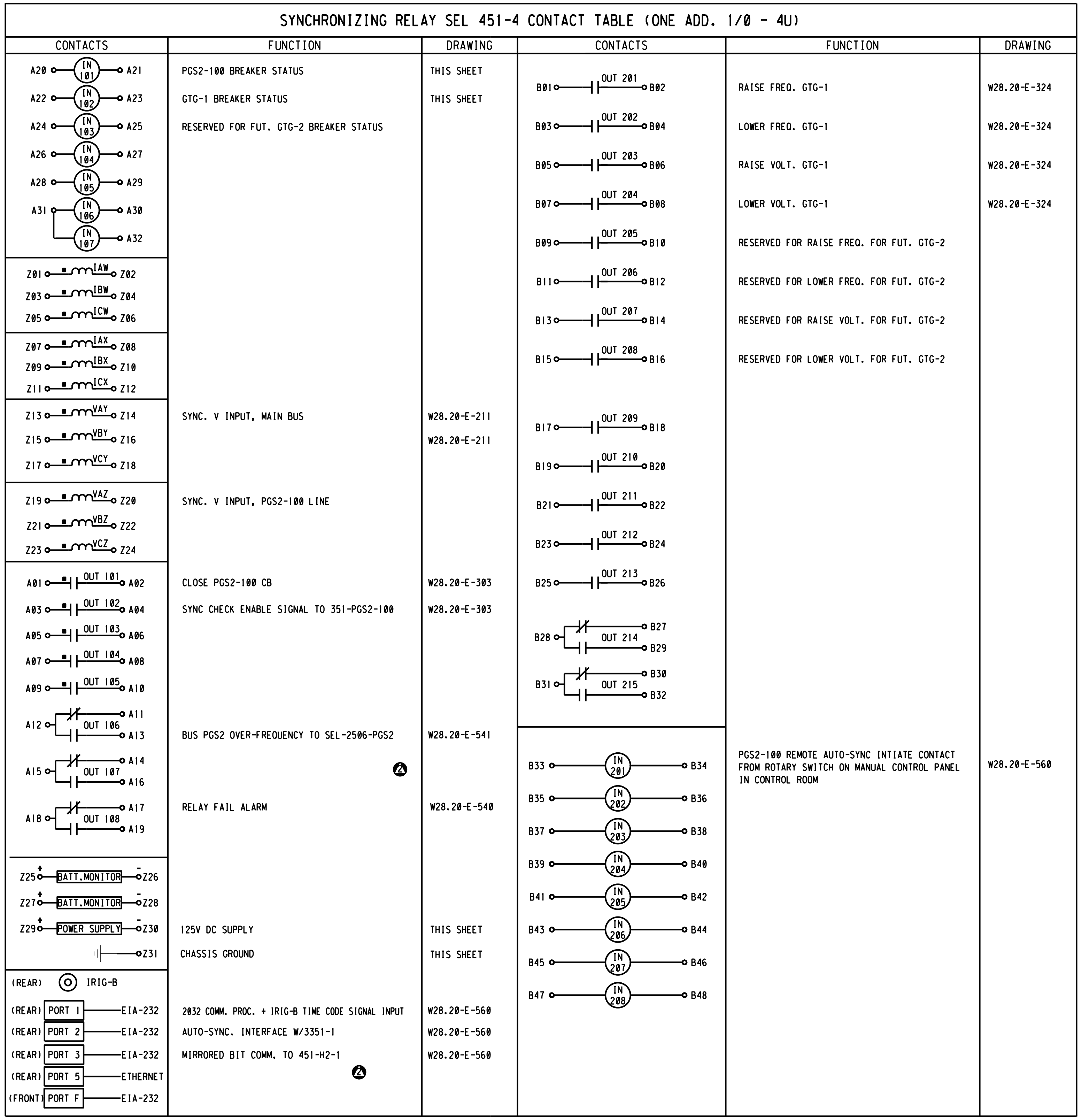
DEVICE 451-PGS2 (25A-L)

SYNCHRONIZING RELAY SEL 451-4 CONTACT TABLE (ONE ADD. I/0 - 4U)



CONTACTS	FUNCTION	DRAWING
A20 – IN 101 – A21	PGS2-100 BREAKER STATUS	THIS SHEET
A22 – IN 102 – A23	GTG-1 BREAKER STATUS	THIS SHEET
A24 – IN 103 – A25	RESERVED FOR FUT. GTG-2 BREAKER STATUS	
A26 – IN 104 – A27		
A28 – IN 105 – A29		
A31 – IN 106 – A30		
A31 – IN 107 – A32		
Z01 – IAW – Z02		
Z03 – IBW – Z04		
Z05 – ICW – Z06		
Z07 – IAX – Z08		
Z09 – IBX – Z10		
Z11 – ICX – Z12		
Z13 – VAY – Z14	SYNC. V INPUT, MAIN BUS	W28.20-E-211
Z15 – VBY – Z16		W28.20-E-211
Z17 – VCY – Z18		
Z19 – VAZ – Z20	SYNC. V INPUT, PGS2-100 LINE	
Z21 – VBZ – Z22		
Z23 – VCZ – Z24		
A01 – OUT 101 – A02	CLOSE PGS2-100 CB	W28.20-E-303
A03 – OUT 102 – A04	SYNC CHECK ENABLE SIGNAL TO 351-PGS2-100	W28.20-E-303
A05 – OUT 103 – A06		
A07 – OUT 104 – A08		
A09 – OUT 105 – A10		
A12 – OUT 106 – A11 A13	BUS PGS2 OVER-FREQUENCY TO SEL-2506-PGS2	W28.20-E-541
A15 – OUT 107 – A14 A16	②	
A18 – OUT 108 – A17 A19	RELAY FAIL ALARM	W28.20-E-540
+ Z25 – BATT.MONITOR – Z26 -		
+ Z27 – BATT.MONITOR – Z28 -		
+ Z29 – POWER SUPPLY – Z30 -	125V DC SUPPLY	THIS SHEET
Z31	CHASSIS GROUND	THIS SHEET
(REAR) IRIG-B		
(REAR) PORT 1 – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560
(REAR) PORT 2 – EIA-232	AUTO-SYNC. INTERFACE W/3351-1	W28.20-E-560
(REAR) PORT 3 – EIA-232	MIRRORED BIT COMM. TO 451-H2-1	W28.20-E-560
(REAR) PORT 5 – ETHERNET	②	
(FRONT) PORT F – EIA-232		

CONTACTS	FUNCTION	DRAWING
B01 – OUT 201 – B02	RAISE FREQ. GTG-1	W28.20-E-324
B03 – OUT 202 – B04	LOWER FREQ. GTG-1	W28.20-E-324
B05 – OUT 203 – B06	RAISE VOLT. GTG-1	W28.20-E-324
B07 – OUT 204 – B08	LOWER VOLT. GTG-1	W28.20-E-324
B09 – OUT 205 – B10	RESERVED FOR RAISE FREQ. FOR FUT. GTG-2	
B11 – OUT 206 – B12	RESERVED FOR LOWER FREQ. FOR FUT. GTG-2	
B13 – OUT 207 – B14	RESERVED FOR RAISE VOLT. FOR FUT. GTG-2	
B15 – OUT 208 – B16	RESERVED FOR LOWER VOLT. FOR FUT. GTG-2	
B17 – OUT 209 – B18		
B19 – OUT 210 – B20		
B21 – OUT 211 – B22		
B23 – OUT 212 – B24		
B25 – OUT 213 – B26		
B28 – OUT 214 – B27 B29		
B31 – OUT 215 – B30 B32		
B33 – IN 201 – B34	PGS2-100 REMOTE AUTO-SYNC INTIATE CONTACT FROM ROTARY SWITCH ON MANUAL CONTROL PANEL IN CONTROL ROOM	W28.20-E-560
B35 – IN 202 – B36		
B37 – IN 203 – B38		
B39 – IN 204 – B40		
B41 – IN 205 – B42		
B43 – IN 206 – B44		
B45 – IN 207 – B46		
B47 – IN 208 – B48		

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
②	08/18/10	ADDED UNDER- AND OVER-FREQ. I/O's	SEL		
①	04/24/10	DELETED UTILITY PWR AVAIL. STATUS OUTPUTS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

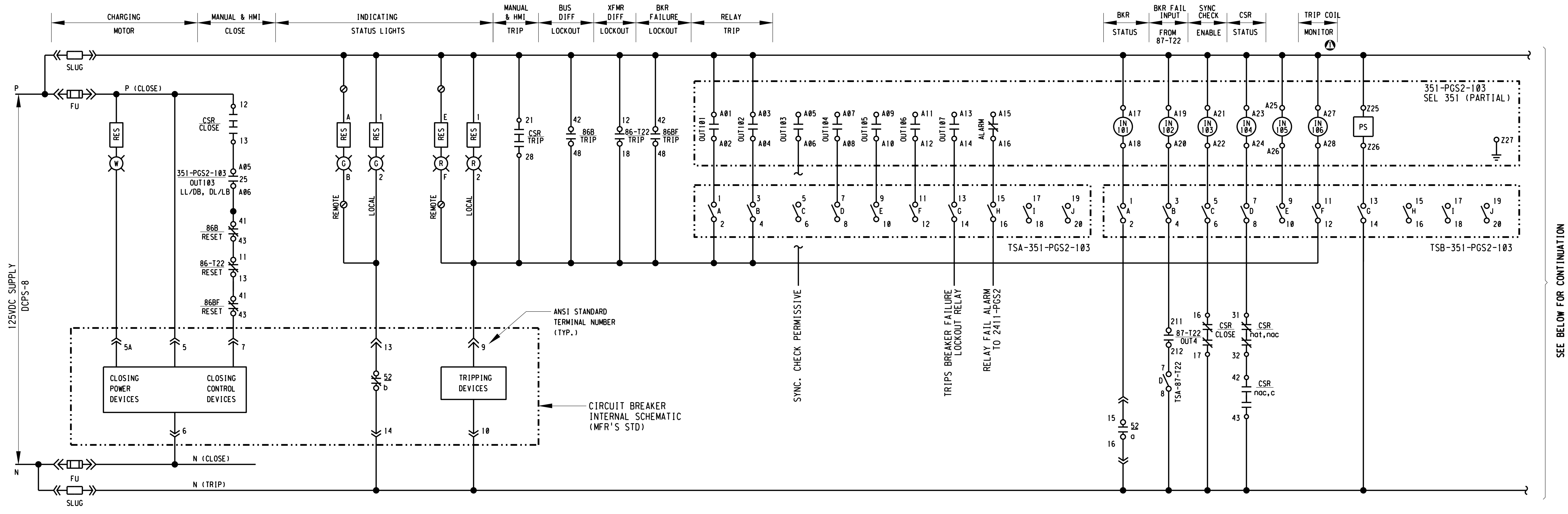
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

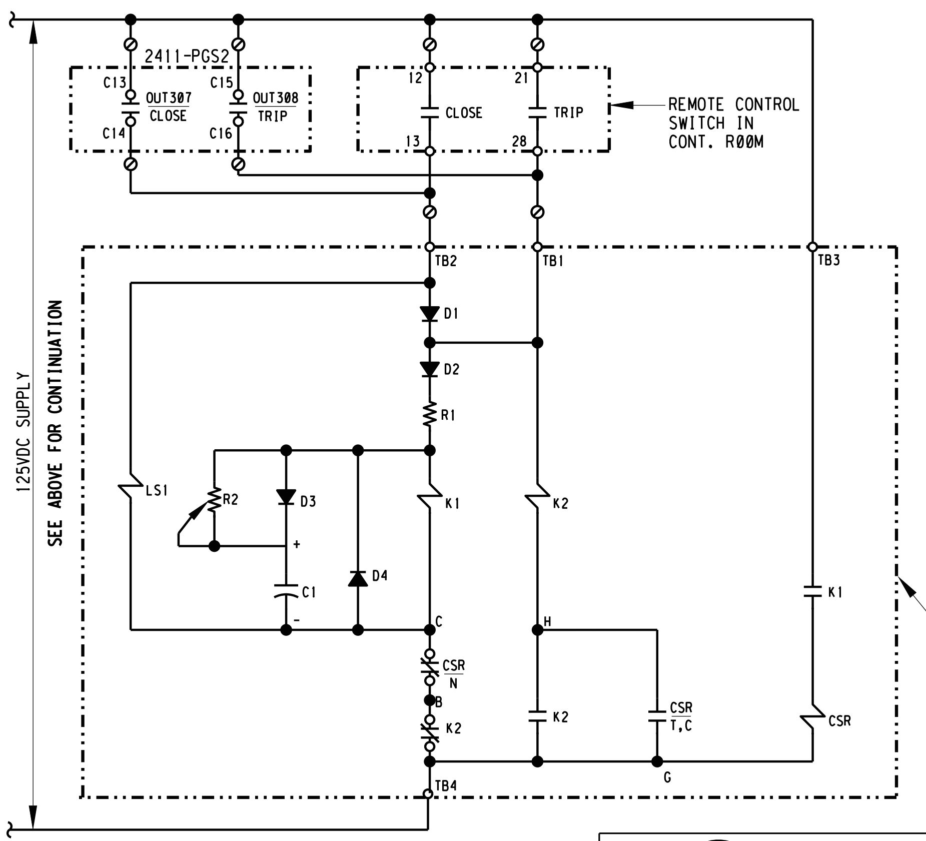
MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR MAIN BREAKER PGS2-100
PROTECTIVE RELAYS CONTACT TABLES AUTO SYNC. RELAY

SCALE NONE
DATE JAN2009
W28.20-E-305
DRAWING NUMBER
3
REV.



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 FEEDER BREAKER PGS2-103 CONTROL SCHEMATIC
NONE

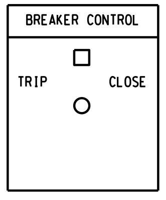


DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 o—‖—‖—o 13				╳
	16 o—‖—‖—o 17				╳
2	21 o—‖—‖—o 28	╳			
	24 o—‖—‖—o 25	╳			
3	31 o—‖—‖—o 32		╳	╳	
	35 o—‖—‖—o 36		╳	╳	
4	42 o—‖—‖—o 43			╳	╳
	46 o—‖—‖—o 47			╳	╳
5	51 o—‖—‖—o 52	╳	╳		
	55 o—‖—‖—o 56	╳	╳		

nat=normal after TRIP
nac=normal after CLOSE

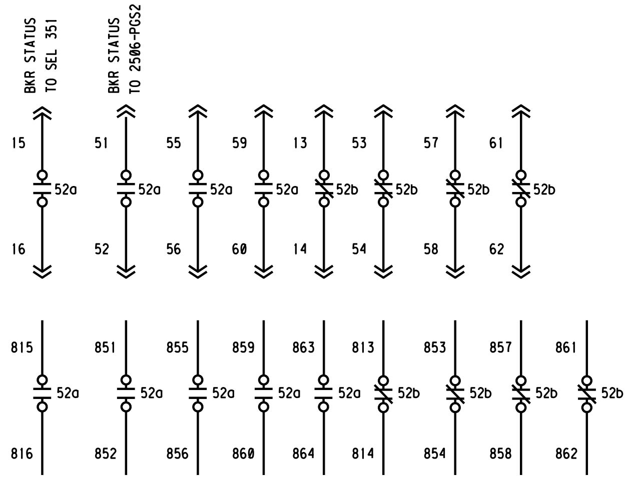
CIRCUIT BREAKER CONTROL SWITCH

UNIVERSAL CIRCUIT 57



(TYPICAL PLATE)

3 CSR CONTACT CHART
NONE



2 BREAKER AUX. CONTACTS
NONE

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FAX (408) 986-9627
PROJECT NO. 07688-01-03

NO.	DATE	REVISION		BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
①	03/25/11	REV. PER SWGR MFR SHOP DWGS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR
FEEDER BREAKER PGS2-103 DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W28.20-E-306
DRAWING NUMBER
2
REV.

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DATE: 18-SEP-2014 10:56
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FEEDER PGS2-101 (SUBSTATION U29)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 – IN 101 – A18	BREAKER STATUS	W28.20-E-308
A19 – IN 102 – A20		
A21 – IN 103 – A22		
A23 – IN 104 – A24	CSR INPUT	W28.20-E-308
A25 – IN 105 – A26		
A27 – IN 106 – A28	TRIP COIL MONITOR (BKR CONTACT WEAR)	W28.20-E-308
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06 Z07 – IN – Z08	CURRENT INPUTS	W28.20-E-202
Z09 – VA Z10 – VB Z11 – VC – N – Z12 Z13 – VS – NS – Z14	VOLTAGE INPUTS	W28.20-E-202
OUT101 A01 A02 OUT102 A03 A04	BREAKER TRIP	W28.20-E-308
OUT103 A05 A06		
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14	BREAKER FAILURE TRIP	W28.20-E-308B
ALARM A15 A16	RELAY FAILURE ALARM	W28.20-E-540
Z25 + POWER SUPPLY – Z26 BATT.MONITOR	125V DC SUPPLY	W28.20-E-308
Z27	CHASSIS GROUND	W28.20-E-308
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7, 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

FEEDER PGS2-103 (XFMR T-22 AND SUBSTATION U30)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 – IN 101 – A18	BREAKER STATUS	W28.20-E-306
A19 – IN 102 – A20	BREAKER FAILURE INPUT FROM 87-T22	W28.20-E-306
A21 – IN 103 – A22	SYNC CHECK ENABLE	W28.20-E-306
A23 – IN 104 – A24	CSR INPUT	W28.20-E-306
A25 – IN 105 – A26		
A27 – IN 106 – A28	TRIP COIL MONITOR (BKR CONTACT WEAR)	W28.20-E-306
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06 Z07 – IN – Z08	CURRENT INPUTS	W28.20-E-202
Z09 – VA Z10 – VB Z11 – VC – N – Z12 Z13 – VS – NS – Z14	VOLTAGE INPUTS	W28.20-E-202
OUT101 A01 A02 OUT102 A03 A04	BREAKER TRIP	W28.20-E-306
OUT103 A05 A06	SYNC CHECK PERMISSIVE	W28.20-E-306
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14	BREAKER FAILURE TRIP	W28.20-E-308B
ALARM A15 A16	RELAY FAILURE ALARM	W28.20-E-540
Z25 + POWER SUPPLY – Z26 BATT.MONITOR	125V DC SUPPLY	W28.20-E-306
Z27	CHASSIS GROUND	W28.20-E-306
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7, 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	SD317A-W28-E-560

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REF 9: REF9$FILENAME

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR FEEDER BREAKERS
PROTECTIVE RELAYS CONTACT TABLE

SCALE NONE
DATE JAN2009
W28.20-E-307
DRAWING NUMBER
1
REV.

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DATE: 18-SEP-2014 11:13
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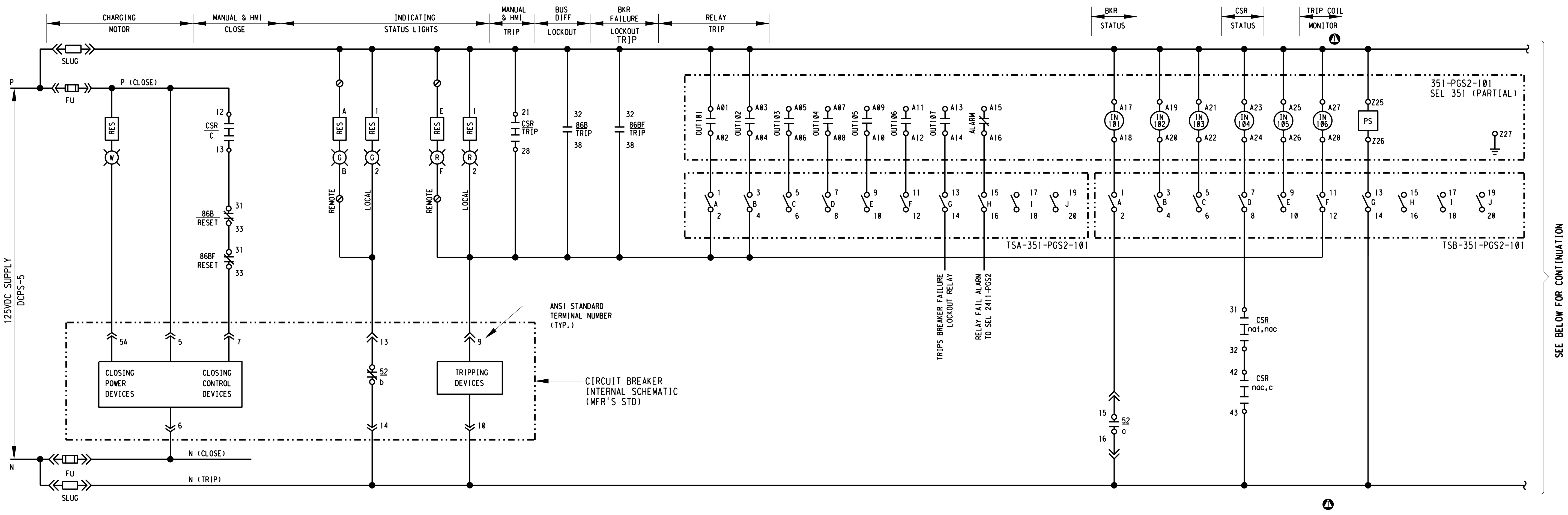
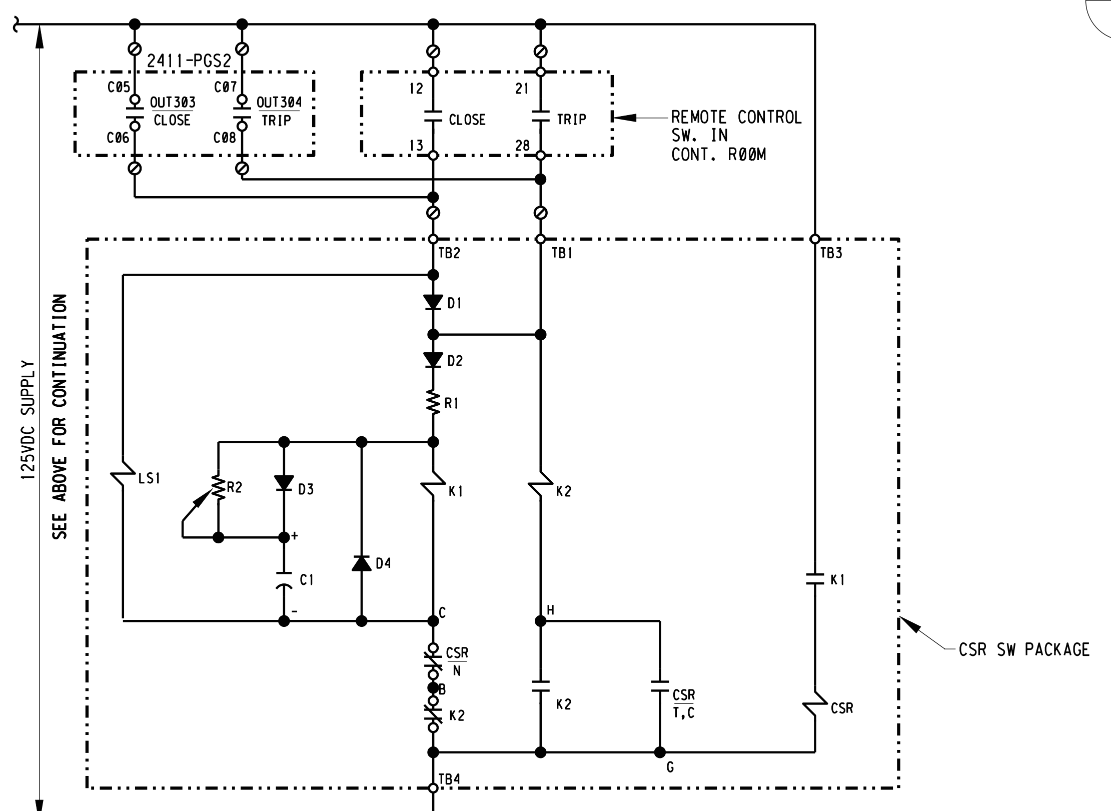
REF 2: REF2$FILENAME REF 5: REF5$FILENAME REF 8: REF8$FILENAME
REF 3: REF3$FILENAME REF 6: REF6$FILENAME REF 9: REF9$FILENAME



STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)



1 FEEDER BREAKER PGS2-101 (U29) CONTROL SCHEMATIC

- NONE

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 — 13				X
	16 — 17				X
2	21 — 28	X			
	24 — 25	X			
3	31 — 32		X	X	
	35 — 36		X	X	
4	42 — 43			X	X
	46 — 47			X	X
5	51 — 52	X	X		
	55 — 56	X	X		

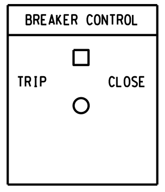
nat=normal after TRIP
nac=normal after CLOSE

2 CSR CONTACT CHART

- NONE

CIRCUIT BREAKER CONTROL SWITCH

UNIVERSAL CIRCUIT 57



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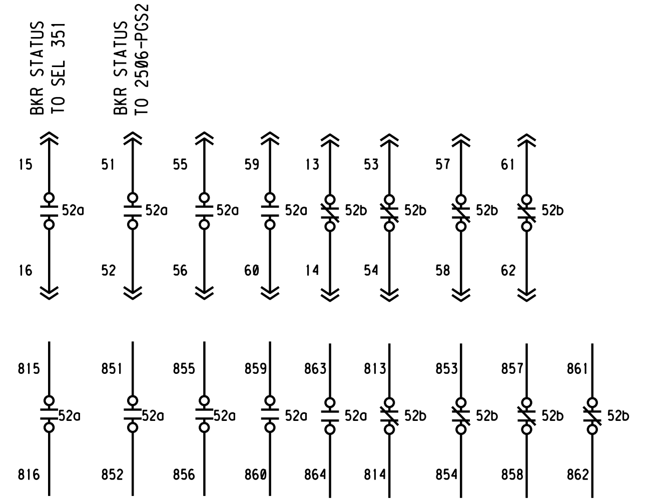

3 BREAKER AUX. CONTACTS

- NONE

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
1	03/25/11	REV. PER SWGR MFR SHOP DWGS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

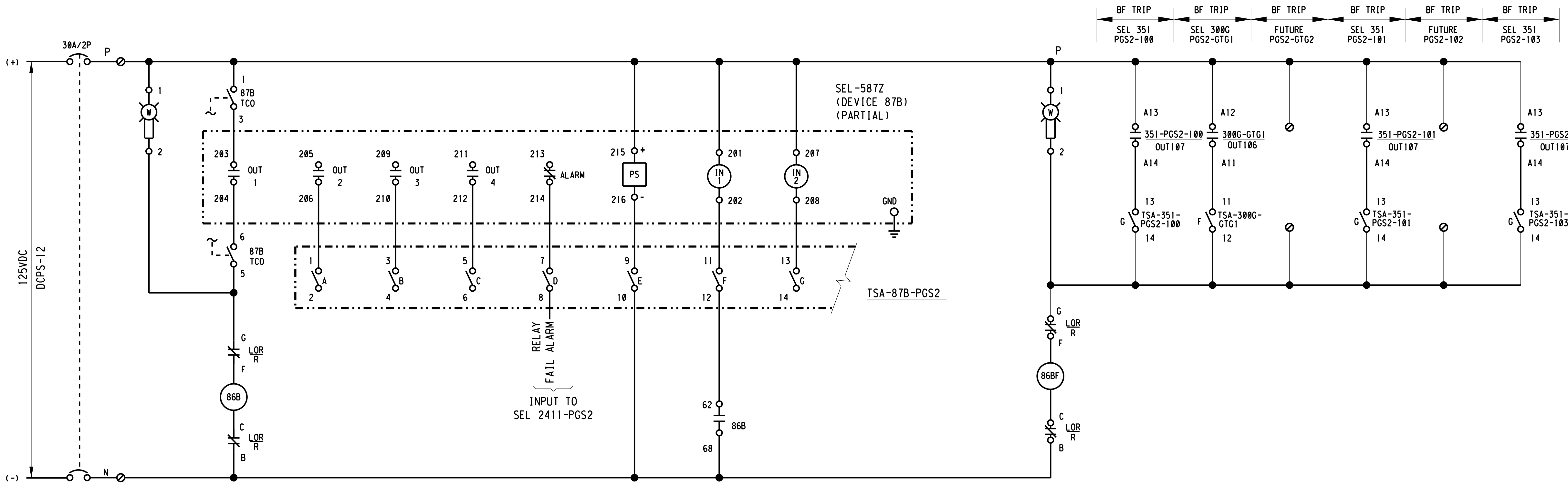
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR FEEDER BREAKER PGS2-101
(U29) DC CONTROL SCHEMATIC

SCALE NONE
DATE MAR2011

W28.20-E-308
DRAWING NUMBER

2
REV.



LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT

DECK	CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION	SHT NO.
1	11 ─┤├─┤├─ 13		X	PERMISSIVE CLOSE CB PGS2-100	W28.20-E-303
	12 ─┤├─┤├─ 18	X		TRIP CB PGS2-100	W28.20-E-303
	15 ─┤├─┤├─ 17		X	PERMISSIVE CLOSE PGS2-GTG1	W28.20-E-301
	14 ─┤├─┤├─ 16	X		TRIP CB PGS2-GTG1	W28.20-E-301
2	21 ─┤├─┤├─ 23		X	RESERVED FOR FUTURE PGS2-GTG2	
	22 ─┤├─┤├─ 28	X		RESERVED FOR FUTURE PGS2-GTG2	
	25 ─┤├─┤├─ 27		X	SPARE	
	24 ─┤├─┤├─ 26	X		SPARE	
3	31 ─┤├─┤├─ 33		X	PERMISSIVE CLOSE CB PGS2-101	W28.20-E-308
	32 ─┤├─┤├─ 38	X		TRIP CB PGS2-101	W28.20-E-308
	35 ─┤├─┤├─ 37		X	RESERVED FOR FUTURE PGS2-102	
	34 ─┤├─┤├─ 36	X		RESERVED FOR FUTURE PGS2-102	
4	41 ─┤├─┤├─ 43		X	PERMISSIVE CLOSE CB PGS2-103	W28.20-E-306
	42 ─┤├─┤├─ 48	X		TRIP CB PGS2-103	W28.20-E-306
	45 ─┤├─┤├─ 47		X	SPARE	
	44 ─┤├─┤├─ 46	X		SHORTED A ∅ CT, 587Z-PGS2	THIS SHEET
5	51 ─┤├─┤├─ 53		X	SPARE	
	52 ─┤├─┤├─ 58	X		SHORTED B ∅ CT, 587Z-PGS2	THIS SHEET
	55 ─┤├─┤├─ 57		X	SPARE	
	54 ─┤├─┤├─ 56	X		SHORTED C ∅ CT, 587Z-PGS2	THIS SHEET
6	61 ─┤├─┤├─ 63		X	SPARE	
	62 ─┤├─┤├─ 68	X		INPUT TO SEL 587Z-PGS2	THIS SHEET
	65 ─┤├─┤├─ 67		X	SPARE	
	64 ─┤├─┤├─ 66	X		INPUT TO SEL 2411-PGS2	W28.20-E-540
7	71 ─┤├─┤├─ 73		X	SPARE	
	72 ─┤├─┤├─ 78	X		INPUT TO PGS2 PLC	W28.20-I-103
	75 ─┤├─┤├─ 77		X	SPARE	
	74 ─┤├─┤├─ 76	X		SPARE	

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

BUS DIFFERENTIAL LOCKOUT RELAY 86B

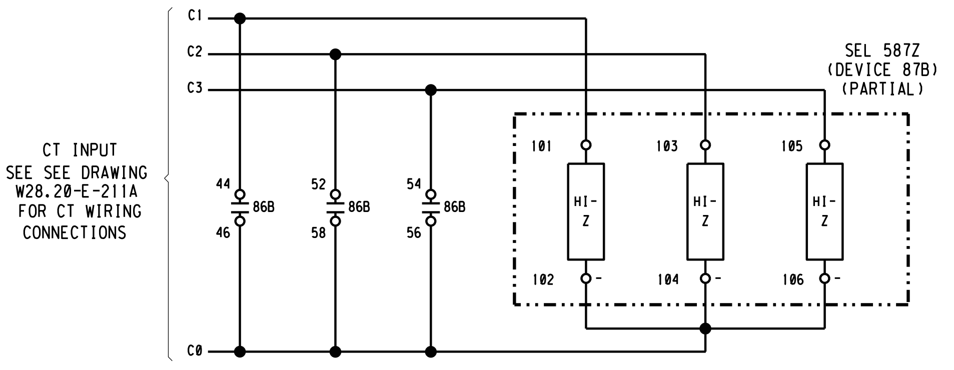
LOCK-OUT RELAY
RESET
TRIP ○

CONTACT DEVELOPMENT

DECK	CONTACTS	POSITION TRIP	POSITION RESET	FUNCTION	SHT NO.
1	11 ─┤├─┤├─ 13		X	PERMISSIVE CLOSE CB PGS2-100	W28.20-E-303
	12 ─┤├─┤├─ 18	X		TRIP CB PGS2-100	W28.20-E-303
	15 ─┤├─┤├─ 17		X	PERMISSIVE CLOSE PGS2-GTG1	W28.20-E-301
	14 ─┤├─┤├─ 16	X		TRIP CB PGS2-GTG1	W28.20-E-301
2	21 ─┤├─┤├─ 23		X	RESERVED FOR FUTURE PGS2-GTG2	
	22 ─┤├─┤├─ 28	X		RESERVED FOR FUTURE PGS2-GTG2	
	25 ─┤├─┤├─ 27		X	SPARE	
	24 ─┤├─┤├─ 26	X		SPARE	
3	31 ─┤├─┤├─ 33		X	PERMISSIVE CLOSE CB PGS2-101	W28.20-E-308
	32 ─┤├─┤├─ 38	X		TRIP CB PGS2-101	W28.20-E-308
	35 ─┤├─┤├─ 37		X	RESERVED FOR FUTURE PGS2-102	
	34 ─┤├─┤├─ 36	X		RESERVED FOR FUTURE PGS2-102	
4	41 ─┤├─┤├─ 43		X	PERMISSIVE CLOSE CB PGS2-103	W28.20-E-306
	42 ─┤├─┤├─ 48	X		TRIP CB PGS2-103	W28.20-E-306
	45 ─┤├─┤├─ 47		X	SPARE	
	44 ─┤├─┤├─ 46	X		SPARE	
5	51 ─┤├─┤├─ 53		X	SPARE	
	52 ─┤├─┤├─ 58	X		SPARE	
	55 ─┤├─┤├─ 57		X	SPARE	
	54 ─┤├─┤├─ 56	X		SPARE	
6	61 ─┤├─┤├─ 63		X	SPARE	
	62 ─┤├─┤├─ 68	X		SPARE	
	65 ─┤├─┤├─ 67		X	SPARE	
	64 ─┤├─┤├─ 66	X		INPUT TO SEL 2411-PGS2	W28.20-E-540
7	71 ─┤├─┤├─ 73		X	SPARE	
	72 ─┤├─┤├─ 78	X		INPUT TO PGS2 PLC	W28.20-I-103
	75 ─┤├─┤├─ 77		X	SPARE	
	74 ─┤├─┤├─ 76	X		SPARE	

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

BREAKER FAILURE (BF) LOCKOUT RELAY 86BF



BUS DIFFERENTIAL 87B-PGS2 AC SCHEMATIC

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 SWITCHGEAR BUS DIFFERENTIAL
AND BREAKER FAILURE LOCKOUT RELAYS SCHEMATICS

SCALE NONE
DATE JAN2009
W28.20-E-308B
DRAWING NUMBER
1
REV.

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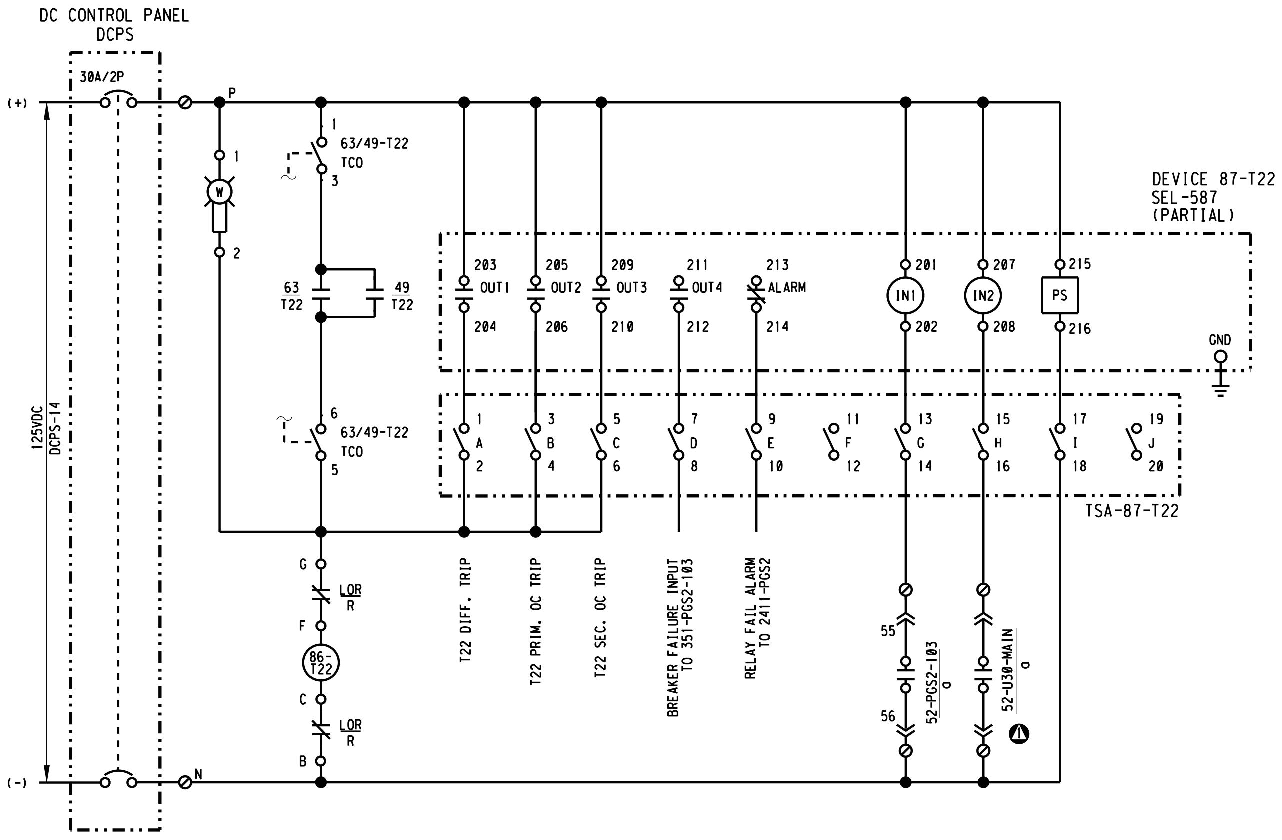
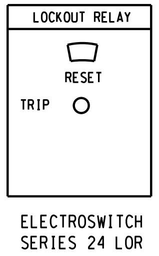


1 TRANSFORMER T-22 DIFFERENTIAL PROTECTION CONTROL SCHEMATIC

- NONE



ELECTROSWITCH
SERIES 24 LOR

DECK	CONTACTS	POSITION		FUNCTION
		TRIP	RESET	
1	11–13		X	PERMISSIVE CLOSE BREAKER PGS2-103
	12–18	X		TRIP BREAKER PGS2-103
	15–17		X	SPARE
	14–16	X		SPARE
2	21–23		X	PERMISSIVE CLOSE U30 XFMR T-22 SECONDARY MAIN BREAKER (F-T22)
	22–28	X		TRIP U30 XFMR T-22 SECONDARY MAIN BREAKER (F-T22)
	25–27		X	SPARE
	24–26	X		SPARE
3	31–33		X	SPARE
	32–38	X		SPARE
	35–37		X	SPARE
	34–36	X		SPARE
4	41–43		X	SPARE
	42–48	X		SPARE
	45–47		X	SPARE
	44–46	X		SPARE
5	51–53		X	SPARE
	52–58	X		SPARE
	55–57		X	SPARE
	54–56	X		SPARE
6	61–63		X	SPARE
	62–68	X		SPARE
	65–67		X	SPARE
	64–66	X		INPUT TO SEL 2411-PGS2

2 LOCKOUT RELAY 86-T22 CONTACT CHART

- NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
②	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
①	03/25/11	REV. NAME OF U30 MAIN 52a CONTACT	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
15KV INDOOR SWITCHGEAR PGS 2
XFMR T-22 DIFF. PROTECTION DC CONTROL SCHEMATIC

SCALE NONE
DATE MAR2011
W28.20-E-308C
DRAWING NUMBER
2
REV.

USER: vuong
DATE: 18-SEP-2014 11:26
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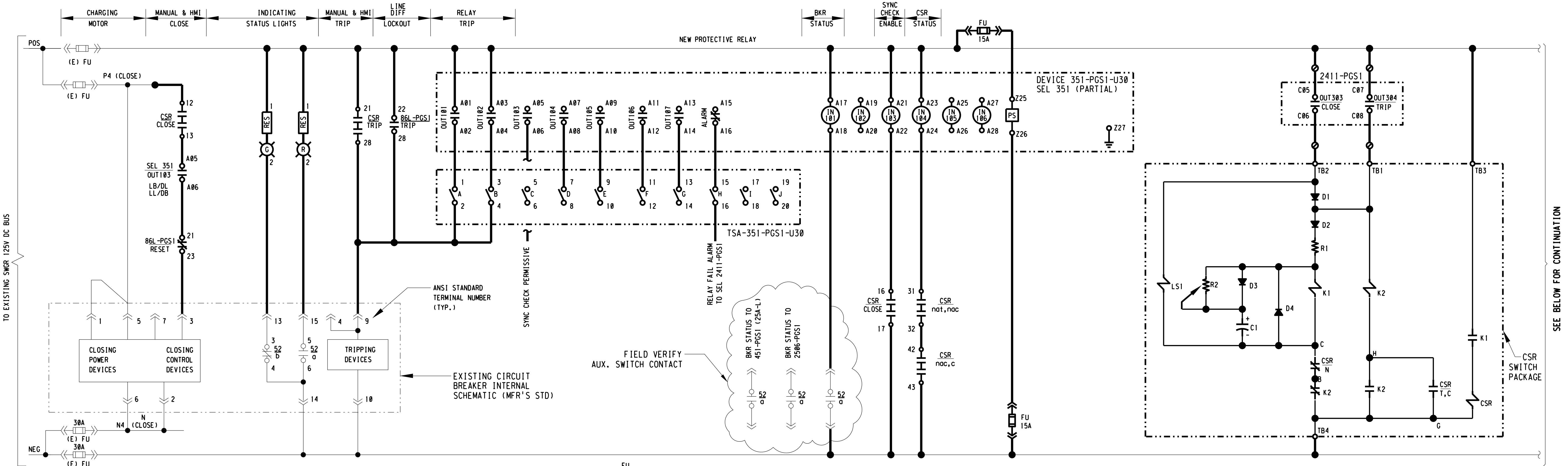


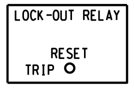
1
-
PGS1 BKR 52-4 (U30 FEEDER) BREAKER SCHEMATIC

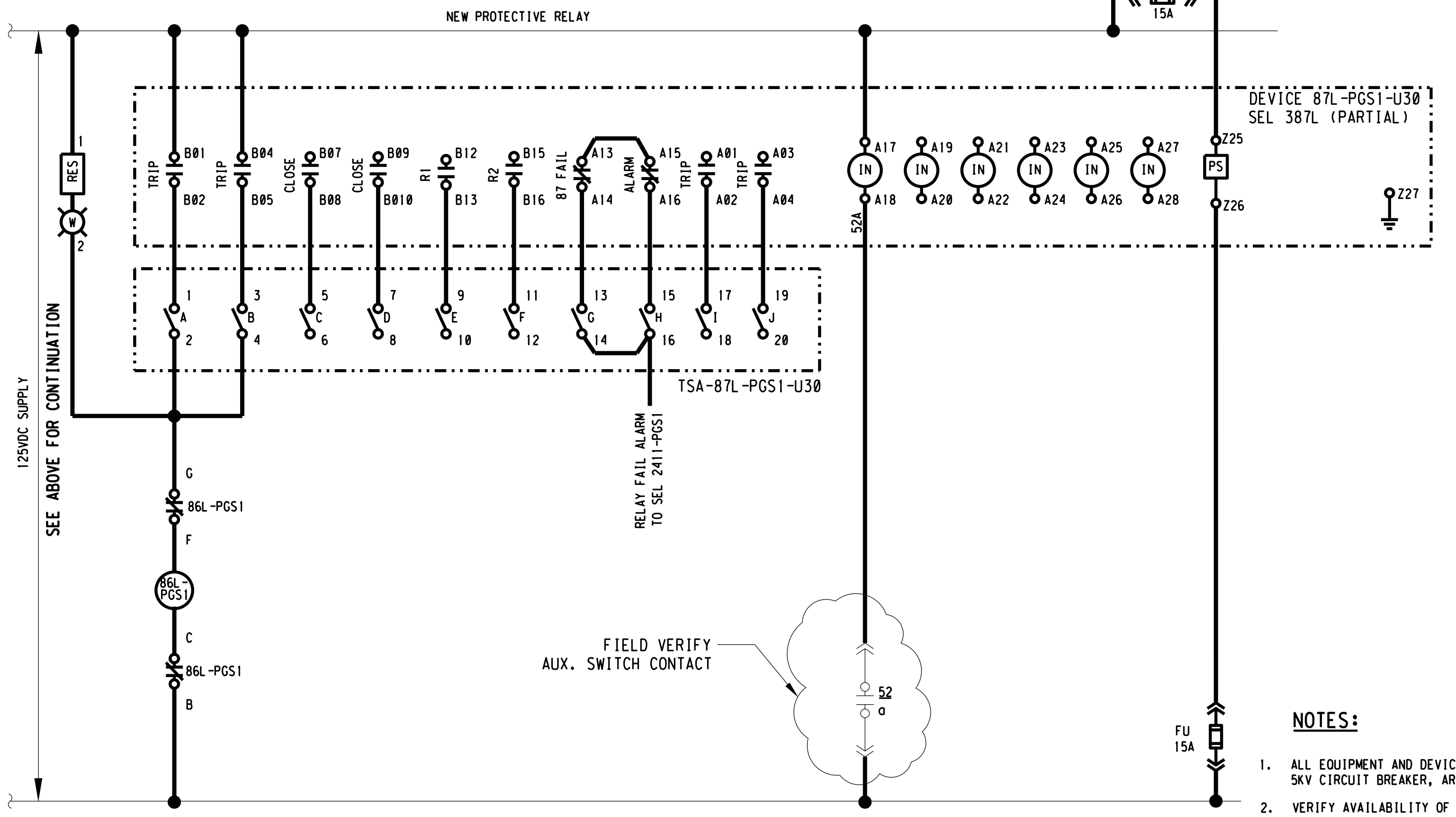
NONE

DECK	CONTACTS	POSITION		FUNCTION
		TRIP	RESET	
1	11 ○┤├┤├┤├○ 13		X	SPARE
	12 ○┤├┤├┤├○ 18	X		SPARE
	15 ○┤├┤├┤├○ 17		X	SPARE
	14 ○┤├┤├┤├○ 16	X		SPARE
2	21 ○┤├┤├┤├○ 23		X	PERMITS CLOSING BREAKER 52-4
	22 ○┤├┤├┤├○ 28	X		TRIPS BREAKER 52-4
	25 ○┤├┤├┤├○ 27		X	SPARE
	24 ○┤├┤├┤├○ 26	X		SPARE
3	31 ○┤├┤├┤├○ 33		X	SPARE
	32 ○┤├┤├┤├○ 38	X		SPARE
	35 ○┤├┤├┤├○ 37		X	SPARE
	34 ○┤├┤├┤├○ 36	X		SPARE
4	41 ○┤├┤├┤├○ 43		X	SPARE
	42 ○┤├┤├┤├○ 48	X		SPARE
	45 ○┤├┤├┤├○ 47		X	SPARE
	44 ○┤├┤├┤├○ 46	X		INPUT TO 2411-PGS1
	51 ○┤├┤├┤├○ 53		X	SPARE

CONTACT DEVELOPMENT

"X" INDICATES CONTACT CLOSED IN POSITION SHOW





2
-
LINE DIFFERENTIAL LOCKOUT RELAY 86L-PGS1-U30

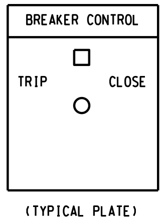
NONE

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 ○┤├──┤├○ 13				X
	16 ○┤├──┤├○ 17				X
2	21 ○┤├──┤├○ 28	X			
	24 ○┤├──┤├○ 25	X			
3	31 ○┤├──┤├○ 32		X	X	
	35 ○┤├──┤├○ 36		X	X	
4	42 ○┤├──┤├○ 43			X	X
	46 ○┤├──┤├○ 47			X	X
5	51 ○┤├──┤├○ 52	X	X		
	55 ○┤├──┤├○ 56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

CIRCUIT BREAKER
CONTROL SWITCH

UNIVERSAL
CIRCUIT 57



(TYPICAL PLATE)

3
-
CSR CONTACT CHART (REPLACMENT TO (E) CONTROL SWITCH)

NONE

NOTES:

1. ALL EQUIPMENT AND DEVICES ON THIS DWG., WITH EXCEPTION OF THE 5KV CIRCUIT BREAKER, ARE NEW AND SHALL BE WIRED AS INDICATED.
2. VERIFY AVAILABILITY OF BREAKER AUXILIARY CONTACTS AND PROVIDE NEW AUXILIARY CONTACT SWITCH FOR BREAKER AS NECESSARY.

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		

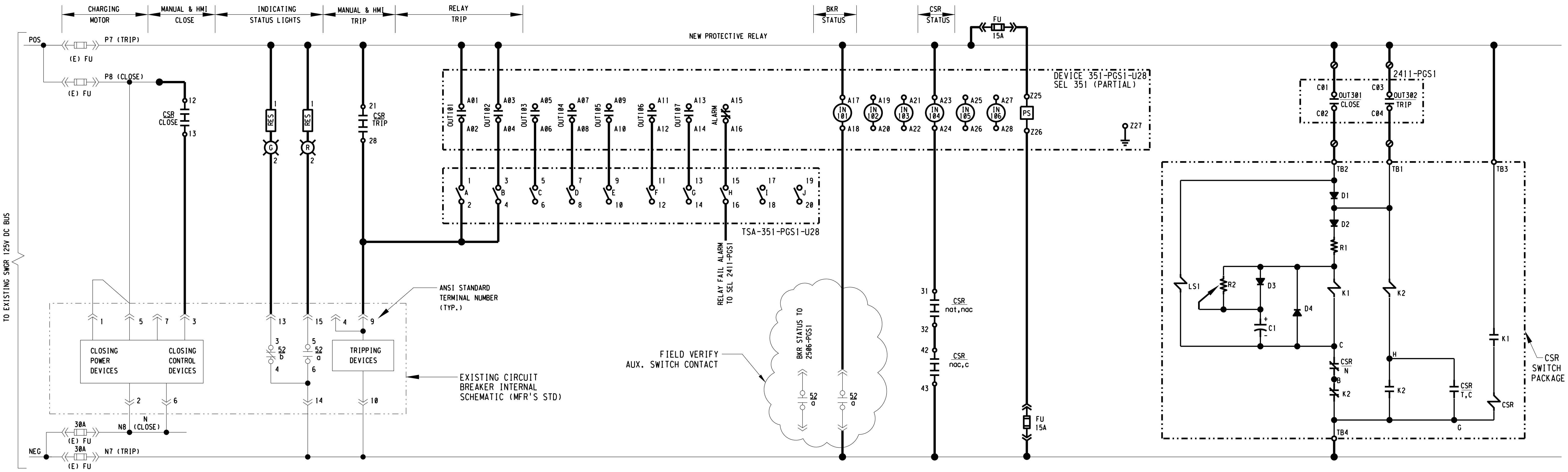
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS
U30 FEEDER BREAKER DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W28.10-E-309
DRAWING NUMBER
1
REV.



1 PGS1 BKR 52-6 (STATION SERVICE U28 FEEDER) BREAKER SCHEMATIC

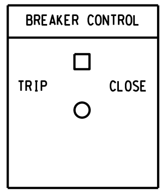
- NONE

DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12○–┤├–┤├–○13				X
	16○–┤├–┤├–○17				X
2	21○–┤├–┤├–○28	X			
	24○–┤├–┤├–○25	X			
3	31○–┤├–┤├–○32		X	X	
	35○–┤├–┤├–○36		X	X	
4	42○–┤├–┤├–○43			X	X
	46○–┤├–┤├–○47			X	X
5	51○–┤├–┤├–○52	X	X		
	55○–┤├–┤├–○56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

CIRCUIT BREAKER CONTROL SWITCH

UNIVERSAL CIRCUIT 57



(TYPICAL PLATE)

2 CSR CONTACT CHART (NEW CONTROL SWITCH)

- NONE

NOTES:

1. ALL EQUIPMENT AND DEVICES ON THIS DWG., WITH EXCEPTION OF THE 5KV CIRCUIT BREAKER, ARE NEW AND SHALL BE WIRED AS INDICATED.
2. VERIFY AVAILABILITY OF BREAKER AUXILIARY CONTACTS AND PROVIDE NEW AUXILIARY CONTACT SWITCH FOR BREAKER AS NECESSARY.

3" ON ORIGINAL DOCUMENT
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FAX (408) 986-9627
PROJECT NO. 07688-01-03

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NO.	DATE	REVISION			BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING	INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS
U28 FEEDER BREAKER DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W28.10-E-309A
DRAWING NUMBER
1
REV.

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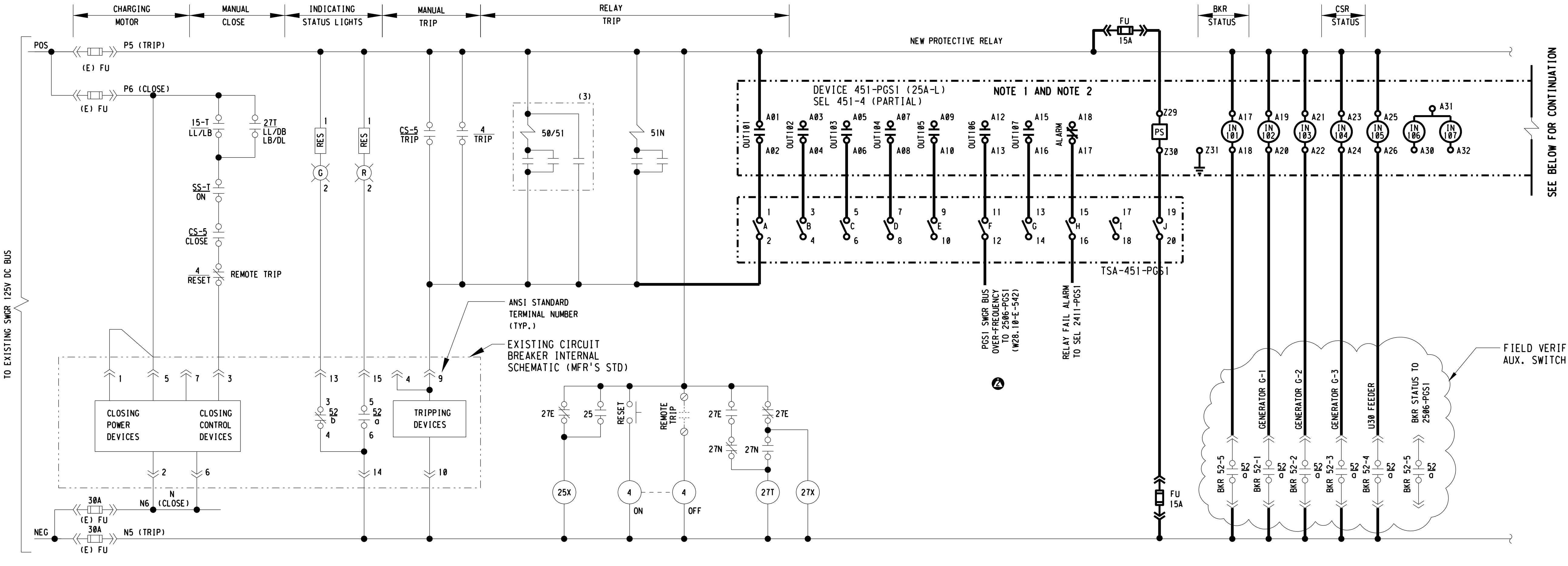
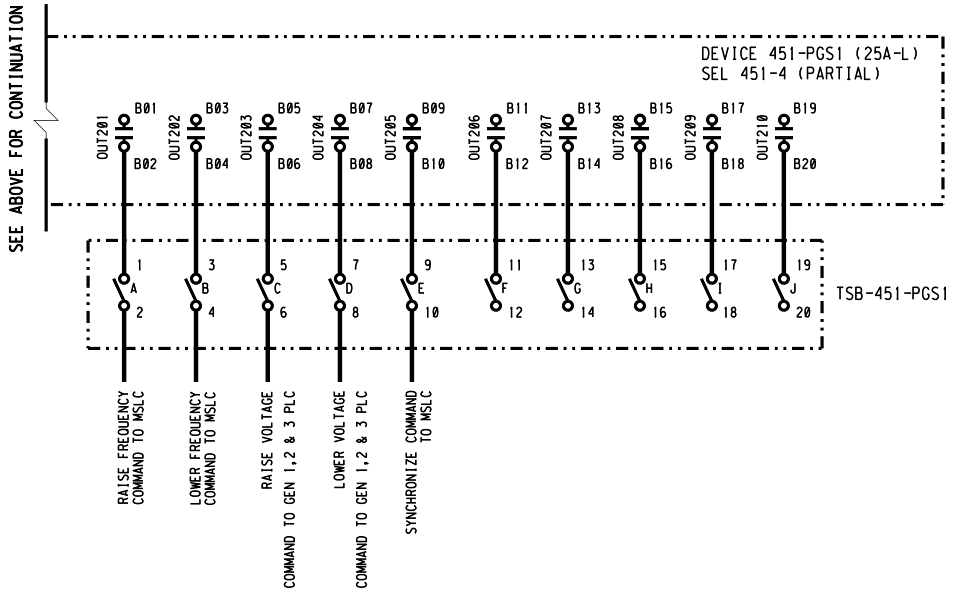


CHARGING MOTOR
MANUAL CLOSE
INDICATING STATUS LIGHTS
MANUAL TRIP
RELAY TRIP
BKR STATUS
CSR STATUS
POS
P5 (TRIP)
(E) FU
P6 (CLOSE)
NEW PROTECTIVE RELAY
FU 15A
15-T LL/LB
27T LL/DB LB/DL
SS-T ON
CS-5 CLOSE
4 RESET
REMOTE TRIP
RES
G
R
CS-5 TRIP
4 TRIP
50/51
(3)
51N
DEVICE 451-PGS1 (25A-L)
SEL 451-4 (PARTIAL)
NOTE 1 AND NOTE 2
OUT101 OUT102 OUT103 OUT104 OUT105 OUT106 OUT107 ALARM
A01 A02 A03 A04 A05 A06 A07 A08 A09 A10 A12 A13 A15 A16 A18 A17
Z29 PS Z30 Z31
IN101 IN102 IN103 IN104 IN105 IN106 IN107
A17 A18 A19 A20 A21 A22 A23 A24 A25 A26 A31 A30 A32
SEE BELOW FOR CONTINUATION
TSA-451-PGS1
PGS1 SWGR BUS OVER-FREQUENCY TO 2506-PGS1 (W28.10-E-542)
RELAY FAIL ALARM TO SEL 2411-PGS1
TO EXISTING SWGR 125V DC BUS
ANSI STANDARD TERMINAL NUMBER (TYP.)
EXISTING CIRCUIT BREAKER INTERNAL SCHEMATIC (MFR'S STD)
CLOSING POWER DEVICES
CLOSING CONTROL DEVICES
TRIPPING DEVICES
52 b
52 a
27E 25 RESET REMOTE TRIP 27E 27E
27N 27N
25X 4 4 27T 27X
ON OFF
FIELD VERIFY AUX. SWITCH CONTACT
GENERATOR G-1
GENERATOR G-2
GENERATOR G-3
U30 FEEDER
BKR STATUS TO 2506-PGS1
BKR 52-5 BKR 52-1 BKR 52-2 BKR 52-3 BKR 52-4 BKR 52-5
52 a
FU 15A
30A (E) FU
N6 N (CLOSE)
N5 (TRIP)
NEG

1 / - PGS1 BKR 52-5 (MAIN BREAKER TO M1 SWGR/T-23) DC CONTROL SCHEMATIC

NONE



SEE ABOVE FOR CONTINUATION
DEVICE 451-PGS1 (25A-L)
SEL 451-4 (PARTIAL)
OUT201 OUT202 OUT203 OUT204 OUT205 OUT206 OUT207 OUT208 OUT209 OUT210
B01 B02 B03 B04 B05 B06 B07 B08 B09 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20
TSB-451-PGS1
RAISE FREQUENCY COMMAND TO MSLC
LOWER FREQUENCY COMMAND TO MSLC
RAISE VOLTAGE COMMAND TO GEN 1,2 & 3 PLC
LOWER VOLTAGE COMMAND TO GEN 1,2 & 3 PLC
SYNCHRONIZE COMMAND TO MSLC

NOTES:

1. NEW RELAY 451-PGS1 IS TO BE USED WITH THE REMOTE AUTO-SYNCHRONIZING EQUIPMENT BEING PROVIDED AS PART OF THE NEW H2 SWITCHGEAR. DEVICE 451-PGS1 SHALL BE WIRED TO PROVIDE OUTPUT RELAY SIGNALS TO THE EXISTING WOODWARD MSLC AT PGS1 IN RESPONSE TO COMMANDS INITIATED BY THE REMOTE AUTO-SYMCHRONIZER, DEVICE 451-H2-1, LOCATED IN THE H2 SWITCHGEAR.

2. NEW DEVICE 451-PGS1 SHALL BE CONFIGURED TO PROVIDE BACK-UP OVERCURRENT PROTECTION FOR BREAKER 52-5.

3. VERIFY AVAILABILITY OF BREAKER AUXILIARY CONTACTS AND PROVIDE NEW AUXILIARY CONTACT SWITCH FOR BREAKER AS NECESSARY.

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME

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REF 2: REF2$FILENAME

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3" ON ORIGINAL DOCUMENT
0 1 2 3

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santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
②	01/24/11	REVISED PER SEL 08/23/10 LOAD SHED REVISIONS	CGT		
①	04/24/10	REVISED SEL 451-4 OUTPUTS 203, 204, & 206	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS
MAIN BREAKER DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W28.10-E-309B
DRAWING NUMBER
3
REV.

BREAKER 52-4
(U30 FEEDER)

LINE CURRENT DIFF. RELAY SEL 387L CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 — 52A — A18	BREAKER STATUS	W28.10-E-309
A19 — TRIP — A20		
A21 — CLOSE — A22		
A23 — 87 DIS — A24		
A25 — T1 — A26		
A27 — T2 — A28		
Z01 — IA — Z02 Z03 — IB — Z04 Z05 — IC — Z06	CURRENT INPUTS	W28.10-E-203
TRIP A01 A02 TRIP A03 A04 CLOSE A05 A06 CLOSE A07 A08 R1 A09 A10 R2 A11 A12		
87FAIL A13 A14	87 FAIL ALARM	W28.10-E-545
ALARM A15 A16	RELAY FAILURE ALARM	W28.10-E-545
B01 — TRIP — B02 B04 — TRIP — B05 B07 — CLOSE — B08 B09 — CLOSE — B10 B12 — R1 — B13 B15 — R2 — B16	BREAKER TRIP	W28.10-E-309
Z25 + POWER SUPPLY / BATT.MONITOR - Z26	125V DC SUPPLY	W28.10-E-309
Z27	CHASSIS GROUND	W28.10-E-309
(REAR) CH. X — FO	MIRRORED BIT COMM.	W28.20-E-560
(REAR) PORT 1 — RS485 (REAR) IRIG-B — 7, 8 (REAR) PORT 2 — EIA-232 (REAR) PORT 3 — EIA-232 (FRONT) PORT F — EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

BREAKER 52-4
(U30 FEEDER)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 — IN 101 — A18	BREAKER STATUS	W28.10-E-309
A19 — IN 102 — A20		
A21 — IN 103 — A22	SYNC CHECK ENABLE	W28.10-E-309
A23 — IN 104 — A24	CSR INPUT	W28.10-E-309
A25 — IN 105 — A26		
A27 — IN 106 — A28		
Z01 — IA — Z02 Z03 — IB — Z04 Z05 — IC — Z06 Z07 — IN — Z08	CURRENT INPUTS	W28.10-E-203
Z09 — VA Z10 — VB Z11 — VC — Z12 Z13 — VS NS — Z14	VOLTAGE INPUTS	W28.10-E-203
OUT101 A01 A02 OUT102 A03 A04	BREAKER TRIP	W28.10-E-309
OUT103 A05 A06	SYNC CHECK PERMISSIVE	W28.10-E-309
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14		
ALARM A15 A16	RELAY FAILURE ALARM	W28.10-E-545
Z25 + POWER SUPPLY / BATT.MONITOR - Z26	125V DC SUPPLY	W28.10-E-309
Z27	CHASSIS GROUND	W28.10-E-309
(REAR) PORT 1 — RS485 (REAR) IRIG-B — 7, 8 (REAR) PORT 2 — EIA-232 (REAR) PORT 3 — EIA-232 (FRONT) PORT F — EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

BREAKER 52-6
(U28 FEEDER)

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 — IN 101 — A18	BREAKER STATUS	W28.10-E-309A
A19 — IN 102 — A20		
A21 — IN 103 — A22		
A23 — IN 104 — A24	CSR INPUT	W28.10-E-309A
A25 — IN 105 — A26		
A27 — IN 106 — A28		
Z01 — IA — Z02 Z03 — IB — Z04 Z05 — IC — Z06 Z07 — IN — Z08	CURRENT INPUTS	W28.10-E-203
Z09 — VA Z10 — VB Z11 — VC — Z12 Z13 — VS NS — Z14	VOLTAGE INPUTS	W28.10-E-203
OUT101 A01 A02 OUT102 A03 A04	BREAKER TRIP	W28.10-E-309A
OUT103 A05 A06		
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14		
ALARM A15 A16	RELAY FAILURE ALARM	W28.10-E-545
Z25 + POWER SUPPLY / BATT.MONITOR - Z26	125V DC SUPPLY	W28.10-E-309A
Z27	CHASSIS GROUND	W28.10-E-309A
(REAR) PORT 1 — RS485 (REAR) IRIG-B — 7, 8 (REAR) PORT 2 — EIA-232 (REAR) PORT 3 — EIA-232 (FRONT) PORT F — EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

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DATE: 18-SEP-2014 11:42
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIFICATIONS
FEEDERS U28 & U30 PROTECTIVE RELAYS CONTACT TABLES

SCALE NONE
DATE JAN2009

W28.10-E-310
DRAWING NUMBER

1
REV.

25A-L

SYNCHRONIZING RELAY SEL 451-4 CONTACT TABLE (ONE ADD. I/O - 4U)

CONTACTS	FUNCTION	DRAWING
A20 — IN 101 — A21	BREAKER STATUS - MAIN FEEDER TO SWGR M1 & T23	W28.10-E-309B
A22 — IN 102 — A23	BREAKER STATUS - 52G1	W28.10-E-309B
A24 — IN 103 — A25	BREAKER STATUS - 52G2	W28.10-E-309B
A26 — IN 104 — A27	BREAKER STATUS - 52G3	W28.10-E-309B
A28 — IN 105 — A29	BREAKER STATUS - 52-4 (U30 FEEDER BKR)	W28.10-E-309B
A31 — IN 106 — A30		
A31 — IN 107 — A32		
Z01 — IAW — Z02		
Z03 — IBW — Z04		
Z05 — ICW — Z06		
Z07 — IAX — Z08		
Z09 — IBX — Z10		
Z11 — ICX — Z12		
Z13 — VAY — Z14	PGS1 SWGR BUS VOLTAGE INPUT	W28.10-E-203
Z15 — VBY — Z16		
Z17 — VCY — Z18		
Z19 — VAZ — Z20	PGS1 MAIN BKR 52-5 LINE VOLTAGE INPUT	W28.10-E-203
Z21 — VBZ — Z22		W28.10-E-203
Z23 — VCZ — Z24		
A01 + — OUT 101 — A02	PGS1 BKR 52-5 TRIP CIRCUIT	W28.10-E-309B
A03 + — OUT 102 — A04		
A05 + — OUT 103 — A06		
A07 — OUT 104 — A08		
A09 — OUT 105 — A10		
A12 — OUT 106 — A11 A13	② PGS1 SWGR BUS OVER FREQUENCY TO SEL 2506-PGS1	W28.10-E-542
A15 — OUT 107 — A14 A16		
A18 — OUT 108 — A17 A19	RELAY FAIL ALARM	W28.10-E-545
Z25 + — BATT.MONITOR — - Z26		
Z27 + — BATT.MONITOR — - Z28		
Z29 + — POWER SUPPLY — - Z30	125V DC POWER SUPPLY	W28.10-E-309B
Z31	CHASSIS GROUND	
(REAR) PORT 1 — EIA-232	2032 COMM. PROCESSOR + IRIG-B TIME CODE SIGNAL INPUT	W28.10-E-560
(REAR) PORT 2 — EIA-232	AUTO-SYNC. INTERFACE W/3351-1	W28.10-E-560
(REAR) PORT 3 — EIA-232	MIRRORED BIT COMM. TO 451-H2-1 ②	W28.10-E-560
(REAR) PORT 5 — ETHERNET		
(FRONT) PORT F — EIA-232		

CONTACTS	FUNCTION	DRAWING
B01 — OUT 201 — B02	RAISE FREQUENCY COMMAND TO WOODWARD MSLC	W28.10-E-309B
B03 — OUT 202 — B04	LOWER FREQUENCY COMMAND TO WOODWARD MSLC	W28.10-E-309B
B05 — OUT 203 — B06	RAISE VOLTAGE COMMAND TO GEN 1, 2 & 3 UNIT PLC	W28.10-E-309B
B07 — OUT 204 — B08	LOWER VOLTAGE COMMAND TO GEN 1, 2 & 3 UNIT PLC	W28.10-E-309B
B09 — OUT 205 — B10	SYNC COMMAND TO WOODWARD MSLC	W28.10-E-309B
B11 — OUT 206 — B12		
B13 — OUT 207 — B14		
B15 — OUT 208 — B16		
B17 — OUT 209 — B18		
B19 — OUT 210 — B20		
B21 — OUT 211 — B22		
B23 — OUT 212 — B24		
B25 — OUT 213 — B26		
B28 — OUT 214 — B27 B29		
B31 — OUT 215 — B30 B32		
B33 — IN 201 — B34		
B35 — IN 202 — B36		
B37 — IN 203 — B38		
B39 — IN 204 — B40		
B41 — IN 205 — B42		
B43 — IN 206 — B44		
B45 — IN 207 — B46		
B47 — IN 208 — B48		

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NO.	DATE	REVISION	BY	REC.	APP.
③	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
②	01/24/11	REVISED PER 01/14/11 SEL FAT	CGT		
①	04/24/10	REVISED SEL 451-4 OUTPUTS 101,203,204, & 206	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

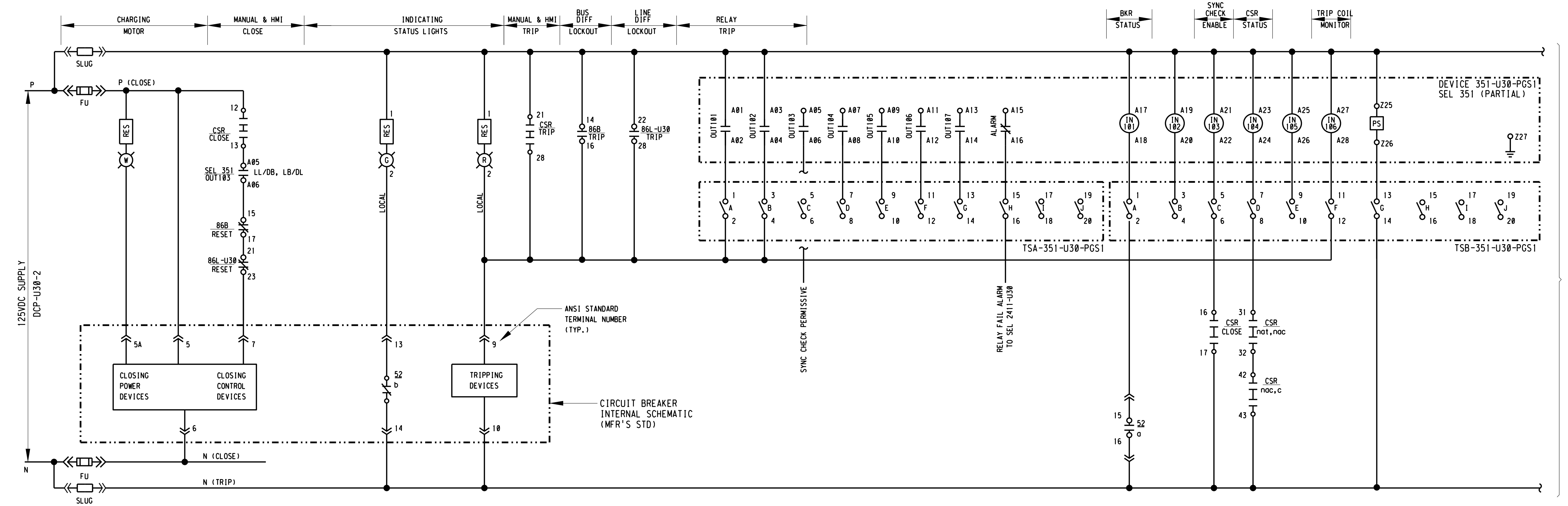
CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 GENERATOR 5KV SWITCHGEAR MODIF. PROTECTIVE RELAY CONTACT TABLES AUTO SYNC. RELAY SEL 451-4

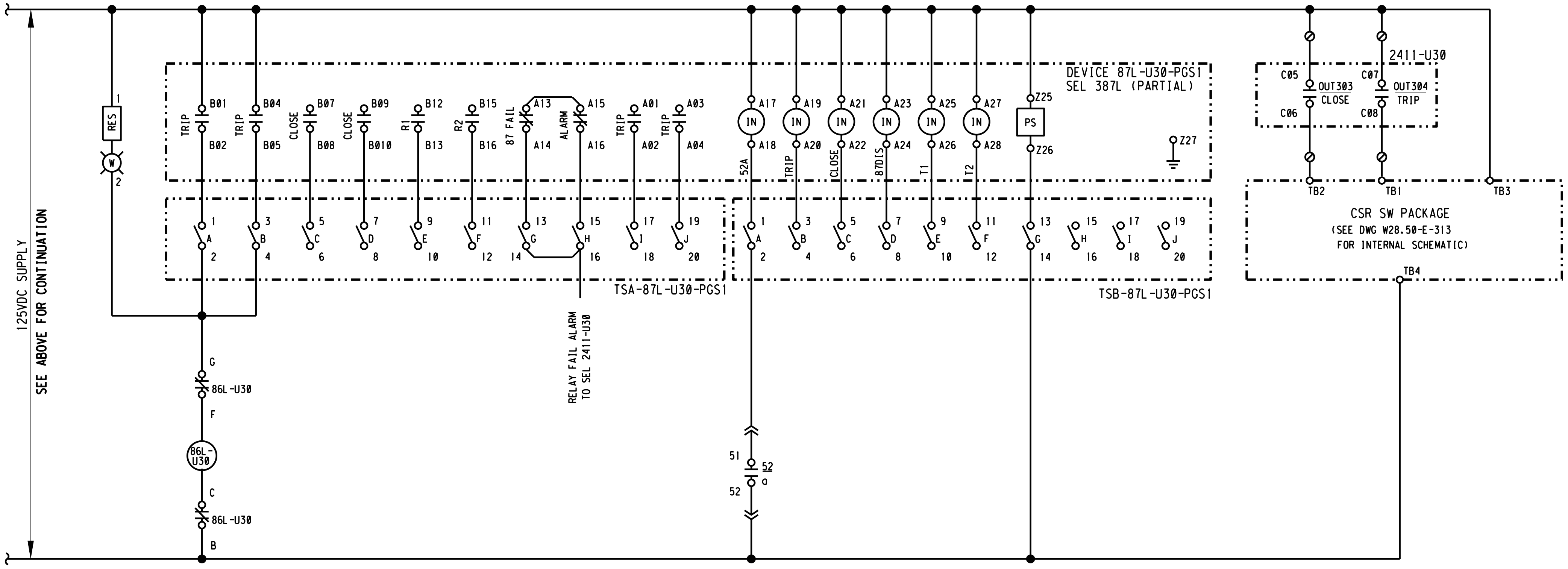
SCALE NONE
DATE JAN2009
W28.10-E-311
DRAWING NUMBER
3
REV.

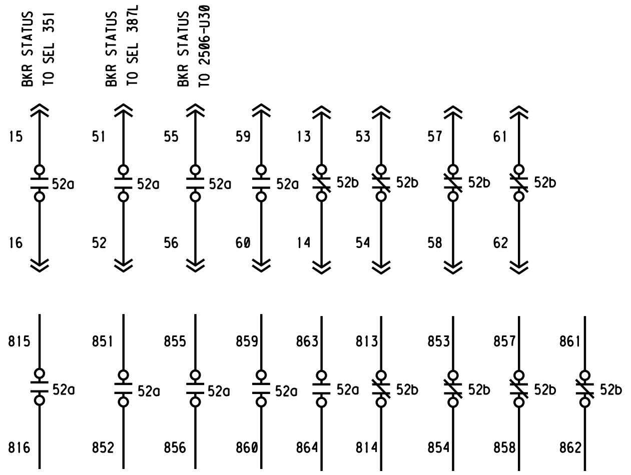


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

① U30 5KV PGS1 TIE FEEDER BREAKER DC CONTROL SCHEMATIC

NONE


125VDC SUPPLY
SEE ABOVE FOR CONTINUATION
RES
W
86L-U30
DEVICE 87L-U30-PGS1 SEL 387L (PARTIAL)
TRIP
CLOSE
R1
R2
87 FAIL
ALARM
52A
87DIS
T1
T2
IN
PS
TSA-87L-U30-PGS1
TSB-87L-U30-PGS1
RELAY FAIL ALARM TO SEL 2411-U30
52 a
2411-U30
OUT303 CLOSE
OUT304 TRIP
CSR SW PACKAGE (SEE DWG W28.50-E-313 FOR INTERNAL SCHEMATIC)
TB1
TB2
TB3
TB4



② BREAKER AUX. CONTACTS

NONE

NOTES:

1. CSR CONTROL SWITCH CONTACT DEVELOPMENT AND ESCUTCHEON PLATE REQUIREMENTS SHALL BE SIMILAR TO THAT SHOWN ON DWG. W28.50-E-313.

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NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
5KV PGS 1 TIE FEEDER BREKER DC CONTROL SCHEMATIC

SCALE NONE
DATE JAN2009
W28.50-E-312
DRAWING NUMBER
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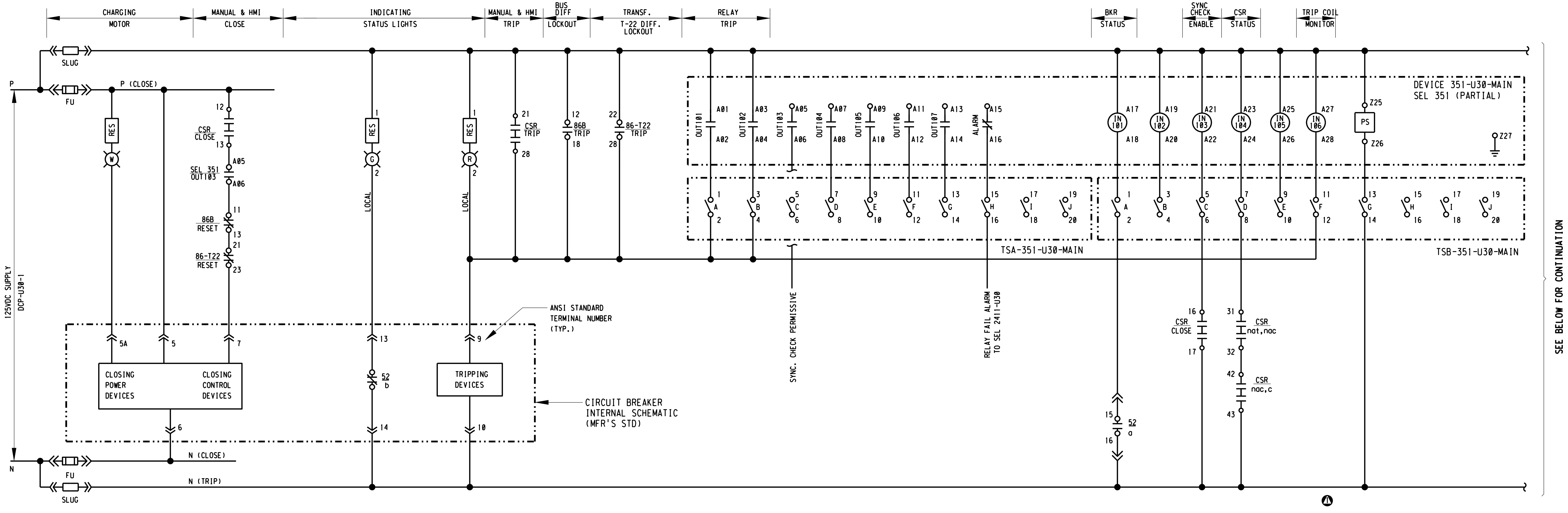
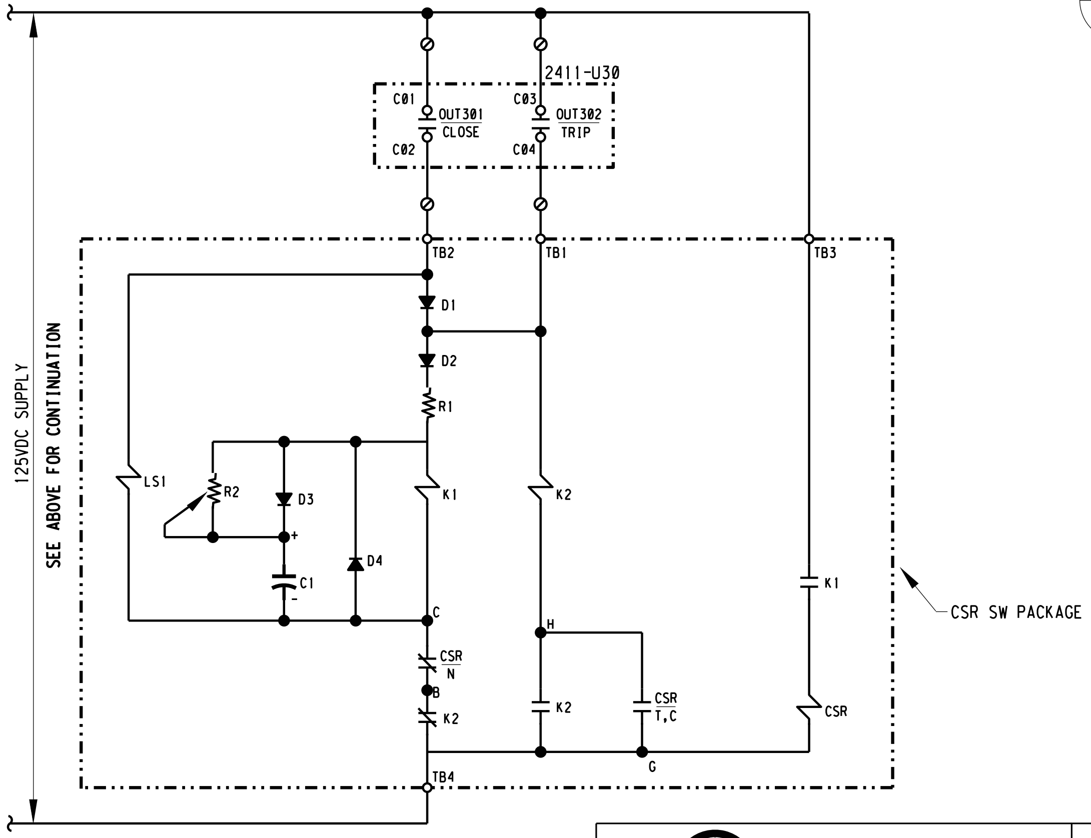


STANDARD: FUSES IN CLOSE CKT.
SLUG IN TRIP CKT. (FUSES OPTIONAL)

1 U30 MAIN BREAKER DC CONTROL SCHEMATIC
- NONE

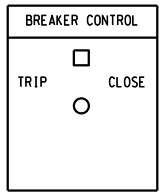


DECK	CONTACTS	POSITION			
		TRIP	nat	nac	CLOSE
1	12 —||——||— 13				X
	16 —||——||— 17				X
2	21 —||——||— 28	X			
	24 —||——||— 25	X			
3	31 —||——||— 32		X	X	
	35 —||——||— 36		X	X	
4	42 —||——||— 43			X	X
	46 —||——||— 47			X	X
5	51 —||——||— 52	X	X		
	55 —||——||— 56	X	X		

nat=normal after TRIP
nac=normal after CLOSE

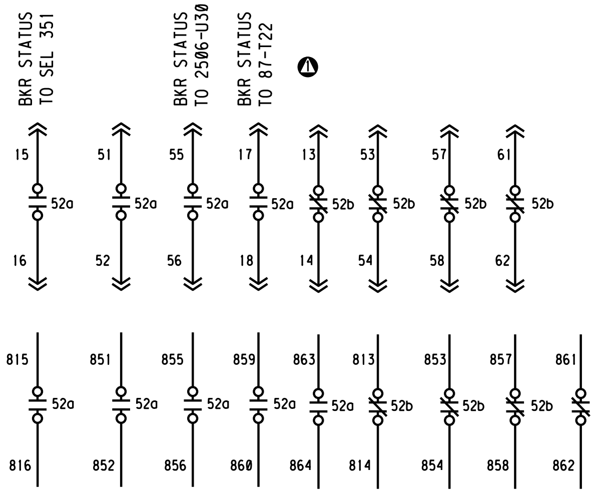
CIRCUIT BREAKER
CONTROL SWITCH

UNIVERSAL
CIRCUIT 57



(TYPICAL PLATE)

2 CSR CONTACT CHART
- NONE



3 BREAKER AUX. CONTACTS
- NONE

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NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	03/25/11	REV. PER KBL INTERCONNECTS & SWGR MFR SHOP DWGS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
MAIN BREKER DC CONTROL SCHEMATIC

SCALE NONE
DATE MAR2011

W28.50-E-313
DRAWING NUMBER

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REV.

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PRIMARY UNIT SUBSTATION U30
MAIN BREAKER

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 – IN 101 – A18	BREAKER STATUS	W28.50-E-313
A19 – IN 102 – A20		
A21 – IN 103 – A22	SYNC CHECK ENABLE	W28.50-E-313
A23 – IN 104 – A24	CSR INPUT	W28.50-E-313
A25 – IN 105 – A26		
A27 – IN 106 – A28	TRIP COIL MONITOR (BKR CONTACT WEAR)	W28.50-E-313
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06 Z07 – IN – Z08	CURRENT INPUTS	W28.20-E-202 & W28.50-E-204
Z09 – VA Z10 – VB Z11 – VC – Z12 Z13 – VS – VN – Z14	VOLTAGE INPUTS	W28.20-E-202 & W28.50-E-204
OUT101 A01 A02	BREAKER TRIP	W28.50-E-313
OUT102 A03 A04		
OUT103 A05 A06	SYNC. CHECK PERMISSIVE	W28.50-E-313
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14		
ALARM A15 A16	RELAY FAILURE ALARM	W28.50-E-543
Z25 + POWER SUPPLY - Z26 BATT. MONITOR	125V DC SUPPLY	W28.50-E-313
Z27	CHASSIS GROUND	W28.50-E-313
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

PRIMARY UNIT SUBSTATION U30
PGS1 TIE FEEDER

LINE CURRENT DIFF. RELAY SEL 387L CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 – 52A – A18	BREAKER STATUS	W28.50-E-312
A19 – TRIP – A20		
A21 – CLOSE – A22		
A23 – 87 DIS – A24		
A25 – T1 – A26		
A27 – T2 – A28		
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06	CURRENT INPUTS	W28.20-E-202 & W28.50-E-204
TRIP A01 A02		
TRIP A03 A04		
CLOSE A05 A06		
CLOSE A07 A08		
R1 A09 A10		
R2 A11 A12		
87 FAIL A13 A14	87 FAIL ALARM	W28.50-E-543
ALARM A15 A16	RELAY FAILURE ALARM	W28.50-E-543
B01 – TRIP – B02 B04 – TRIP – B05 B07 – CLOSE – B08 B09 – CLOSE – B10 B12 – OUT – B13 B15 – OUT 206 – B16	BREAKER TRIP	W28.50-E-312
Z25 + POWER SUPPLY - Z26 BATT. MONITOR	125V DC SUPPLY	W28.50-E-312
Z27	CHASSIS GROUND	W28.50-E-312
(REAR) CH. X – FO	MIRRORED BIT COMM.	W28.20-E-560
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

PRIMARY UNIT SUBSTATION U30
PGS1 TIE FEEDER

OVERCURRENT RELAY SEL 351 CONTACT TABLE

CONTACTS	FUNCTION	DRAWING
A17 – IN 101 – A18	BREAKER STATUS	W28.50-E-312
A19 – IN 102 – A20		
A21 – IN 103 – A22	SYNC CHECK ENABLE	W28.50-E-312
A23 – IN 104 – A24	CSR INPUT	W28.50-E-312
A25 – IN 105 – A26		
A27 – IN 106 – A28	TRIP COIL MONITOR (BKR CONTACT WEAR)	W28.50-E-312
Z01 – IA – Z02 Z03 – IB – Z04 Z05 – IC – Z06 Z07 – IN – Z08	CURRENT INPUTS	W28.20-E-202 & W28.50-E-204
Z09 – VA Z10 – VB Z11 – VC – Z12 Z13 – VS – VN – Z14	VOLTAGE INPUTS	W28.20-E-202 & W28.50-E-204
OUT101 A01 A02	BREAKER TRIP	W28.50-E-312
OUT102 A03 A04		
OUT103 A05 A06	SYNC. CHECK PERMISSIVE	W28.50-E-312
OUT104 A07 A08		
OUT105 A09 A10		
OUT106 A11 A12		
OUT107 A13 A14		
ALARM A15 A16	RELAY FAILURE ALARM	W28.50-E-543
Z25 + POWER SUPPLY - Z26 BATT. MONITOR	125V DC SUPPLY	W28.50-E-312
Z27	CHASSIS GROUND	W28.50-E-312
(REAR) PORT 1 – RS485 (REAR) IRIG-B – 7 8 (REAR) PORT 2 – EIA-232 (REAR) PORT 3 – EIA-232 (FRONT) PORT F – EIA-232	2032 COMM. PROC. + IRIG-B TIME CODE SIGNAL INPUT	W28.20-E-560

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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
5KV BREKERS PROTECTIVE RELAYS CONTACT TABLES

SCALE NONE
DATE JAN2009
W28.50-E-314
DRAWING NUMBER
1
REV.

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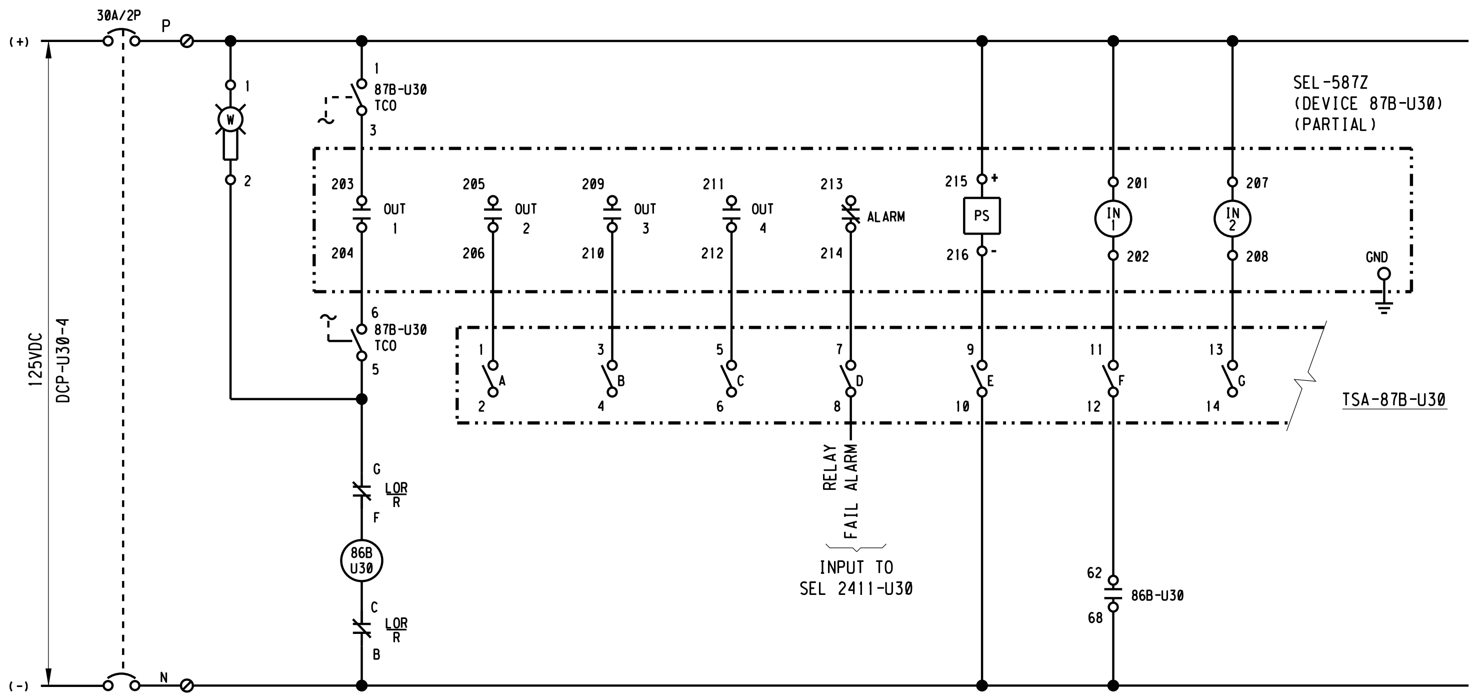


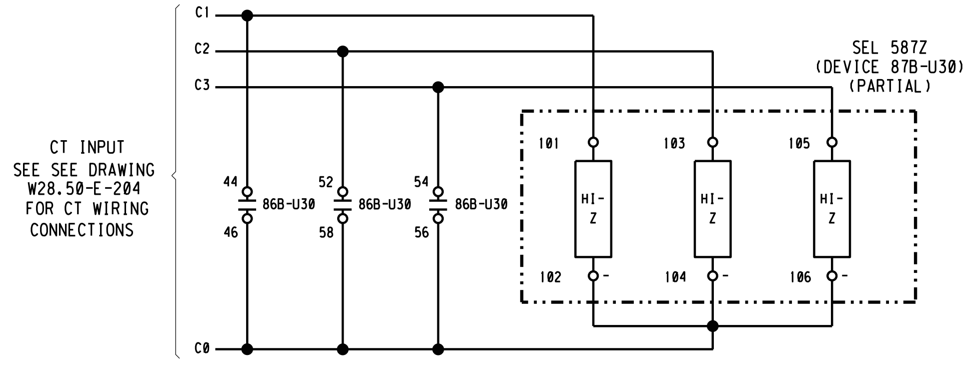
LOCK-OUT RELAY

RESET
TRIP ○

CONTACT DEVELOPMENT					
DECK	CONTACTS	POSITION		FUNCTION	SHT NO.
		TRIP	RESET		
1	11 ○┤ H ├○ 13		X	PERMISSIVE CLOSE U30 MAIN BKR	W28.50-E-313
	12 ○┤ H ├○ 18	X		TRIP U30 MAIN BKR	W28.50-E-313
	15 ○┤ H ├○ 17		X	PERMISSIVE CLOSE U30-PGS1 TIE FOR BKR	W28.50-E-312
	14 ○┤ H ├○ 16	X		TRIP U30-PGS1 TIE FOR BKR	W28.50-E-312
2	21 ○┤ H ├○ 23		X		
	22 ○┤ H ├○ 28	X			
	25 ○┤ H ├○ 27		X		
	24 ○┤ H ├○ 26	X			
3	31 ○┤ H ├○ 33		X		
	32 ○┤ H ├○ 38	X			
	35 ○┤ H ├○ 37		X		
	34 ○┤ H ├○ 36	X			
4	41 ○┤ H ├○ 43		X		
	42 ○┤ H ├○ 48	X			
	45 ○┤ H ├○ 47		X		
	44 ○┤ H ├○ 46	X		SHORTED A ∅ CT, 87B-U30	THIS SHEET
5	51 ○┤ H ├○ 53		X		
	52 ○┤ H ├○ 58	X		SHORTED B ∅ CT, 87B-U30	THIS SHEET
	55 ○┤ H ├○ 57		X		
	54 ○┤ H ├○ 56	X		SHORTED C ∅ CT, 587Z-U30	THIS SHEET
6	61 ○┤ H ├○ 63		X		
	62 ○┤ H ├○ 68	X		INPUT TO SEL 87B-U30	THIS SHEET
	65 ○┤ H ├○ 67		X		
	64 ○┤ H ├○ 66	X		INPUT TO SEL 2411-U30	W28.50-E-543
7	71 ○┤ H ├○ 73		X		
	72 ○┤ H ├○ 78	X			
	75 ○┤ H ├○ 77		X		
	74 ○┤ H ├○ 76	X			

"X" INDICATES CONTACT CLOSED IN POSITION SHOWN

BUS DIFFERENTIAL LOCKOUT RELAY 86B-U30



BUS DIFFERENTIAL 87B-U30 AC SCHEMATIC

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT		
DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD
PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
BUS DIFFERENTIAL PROTECTION SCHEMATIC

SCALE NONE
DATE JAN2009
W28.50-E-314A
DRAWING NUMBER
1
REV.

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DATE: 18-SEP-2014 14:34
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ENCLOSURE NEMA 1, INTERRUPTING DUTY BREAKER 10,000 A, 125 VOLT DC, 150 A. MAIN BREAKER, 225 A. BUS
MOUNTING SURFACE,

DESCRIPTION	LOADS/WATTS P	LOADS/WATTS N	BKR./POLE	CKT. NO.	POLE P N	CKT. NO.	BKR./POLE	LOADS/WATTS P	LOADS/WATTS N	DESCRIPTION
BKR PGS2-GTG1	-	-	30/2	1		2	30/2	-	-	BKR PGS2-GTG2 DC CNTL PWR (FUT.)
SPARE	-	-	30/2	3		4	30/2	-	-	BKR PGS2-100 (MAIN FEEDER TO SWGR H2) DC CNTL PWR
BKR PGS2-101 (U29 FEEDER) DC CNTL PWR	-	-	30/2	5		6	30/2	-	-	BKR PGS2-102 (SPARE FEEDER BKR) DC CNTL PWR (FUT.)
SEL 2411-PGS2	-	-	20/2	7		8	30/2	-	-	BKR PGS2-103 (U30 FEEDER BKR) DC CNTL PWR
SEL 2506-PGS2	-	-	20/2	9		10	20/2	-	-	SEL 451-4 (25A-L)
SEL-9321 POWER SUPPLY	-	-	20/2	11		12	30/2	-	-	SEL 587Z BUS DIFF. & BKR FAILURE DC CNTL PWR
SEL 2032-PGS2-1	-	-	20/2	13		14	30/2	-	-	XFMR T-22 DIFF. PROTECTION
SEL 2032-PGS2-2	-	-	20/2	15		16	20/2	-	-	BKR TEST CABINET
SPARE	-	-	20/2	17		18	20/2	-	-	SPARE
	-	-	20/2	19		20	20/2	-	-	
	-	-	20/2	21		22	20/2	-	-	
	-	-	20/2	23		24	20/2	-	-	
	-	-						-	-	

TOTAL: - KVA   PANEL # "DCPS"   FEEDER SIZE 2-1/C #2/0 AWG

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0 1 2 3

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NO.	DATE	REVISION		BY	REC.	APP.
△	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 15KV SWITCHGEAR
DC PANEL SCHEDULE

SCALE NONE
DATE JAN2009

W28.20-E-315
DRAWING NUMBER

1
REV.

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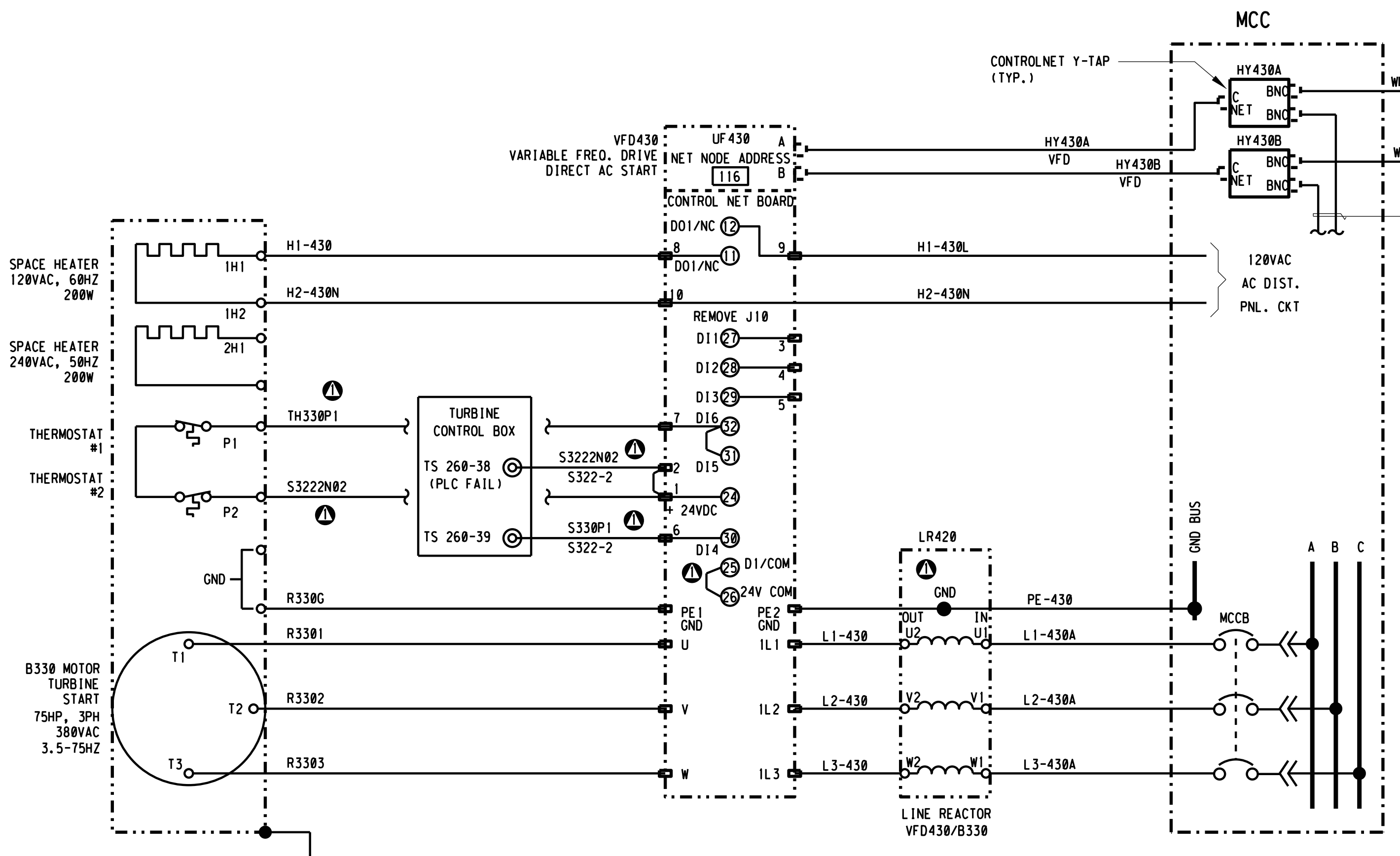
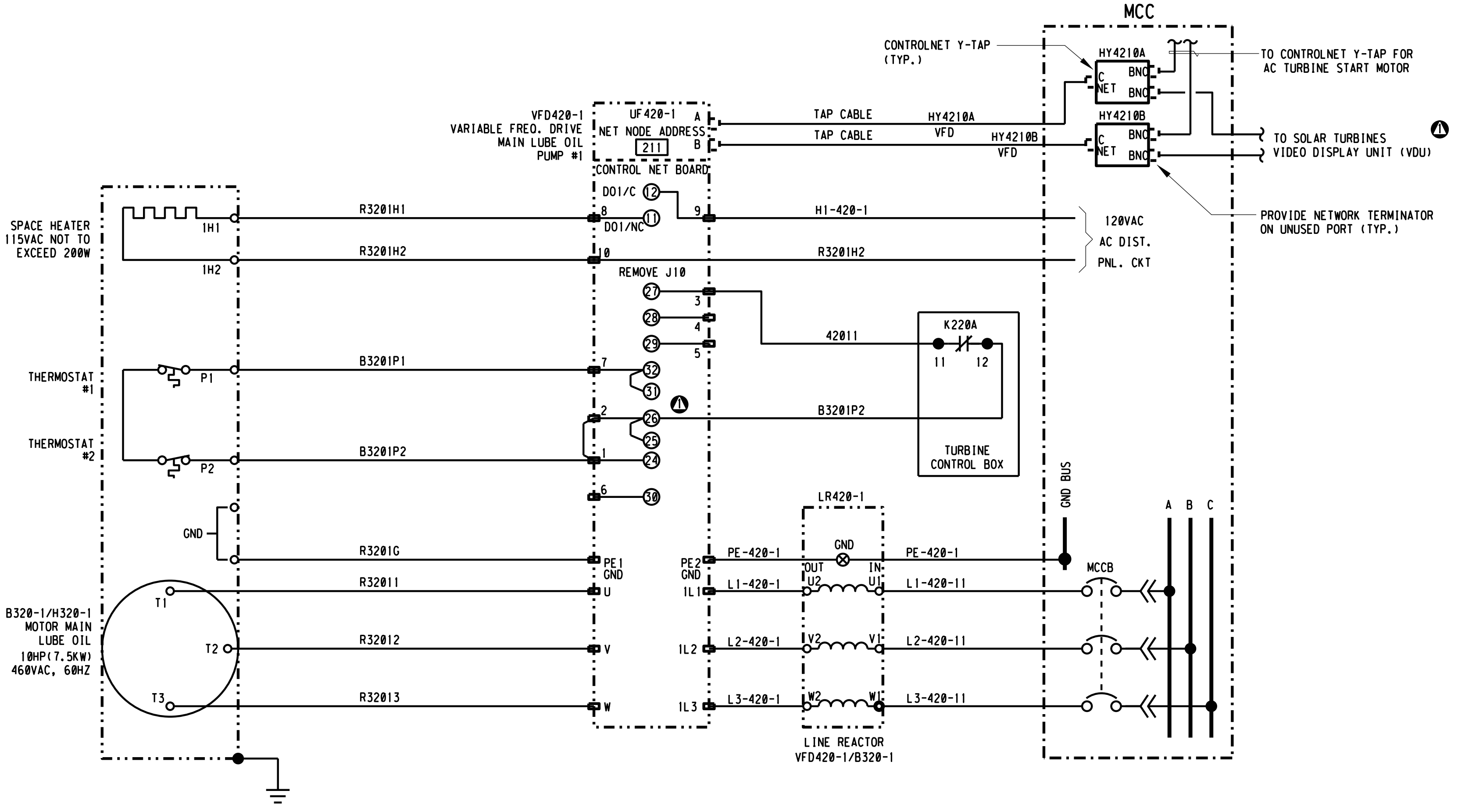
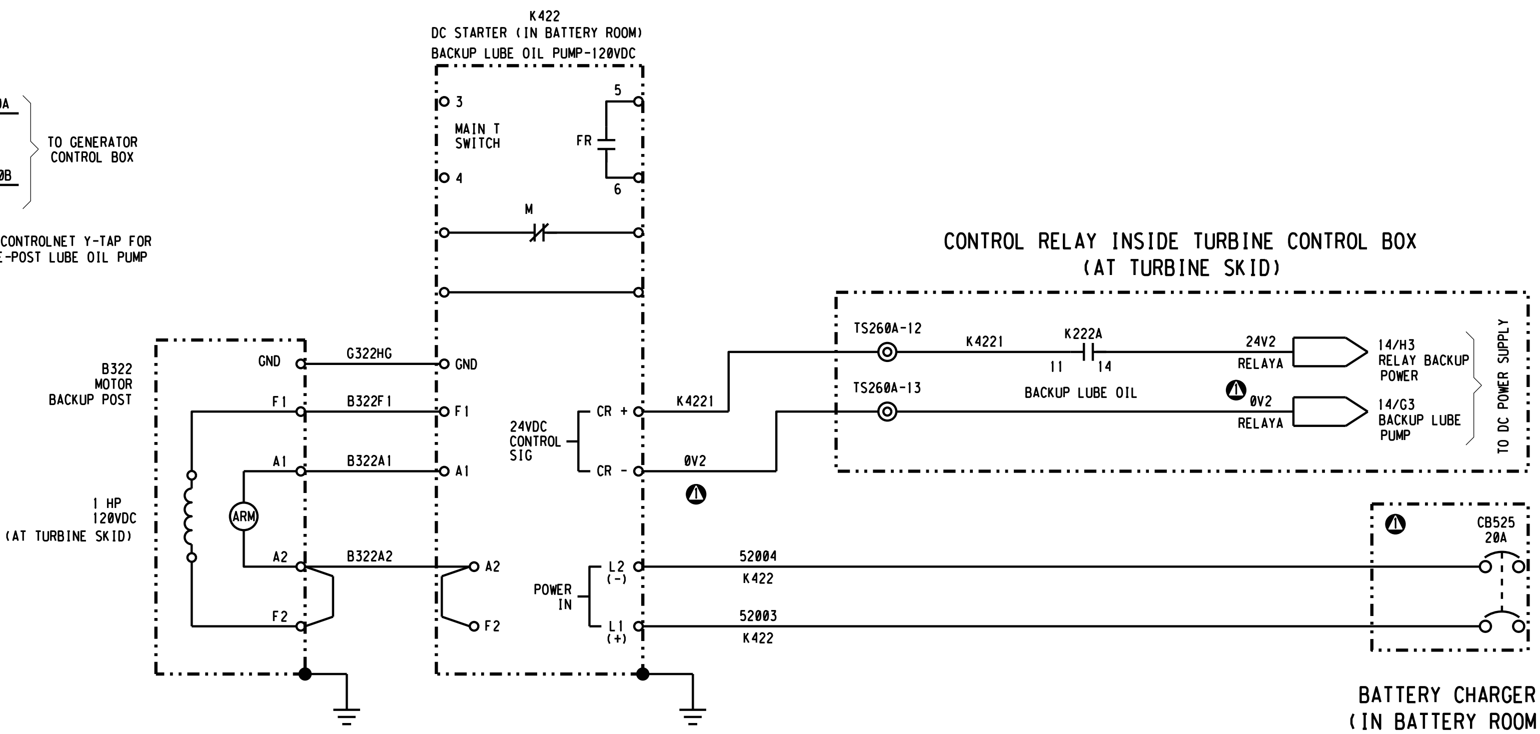


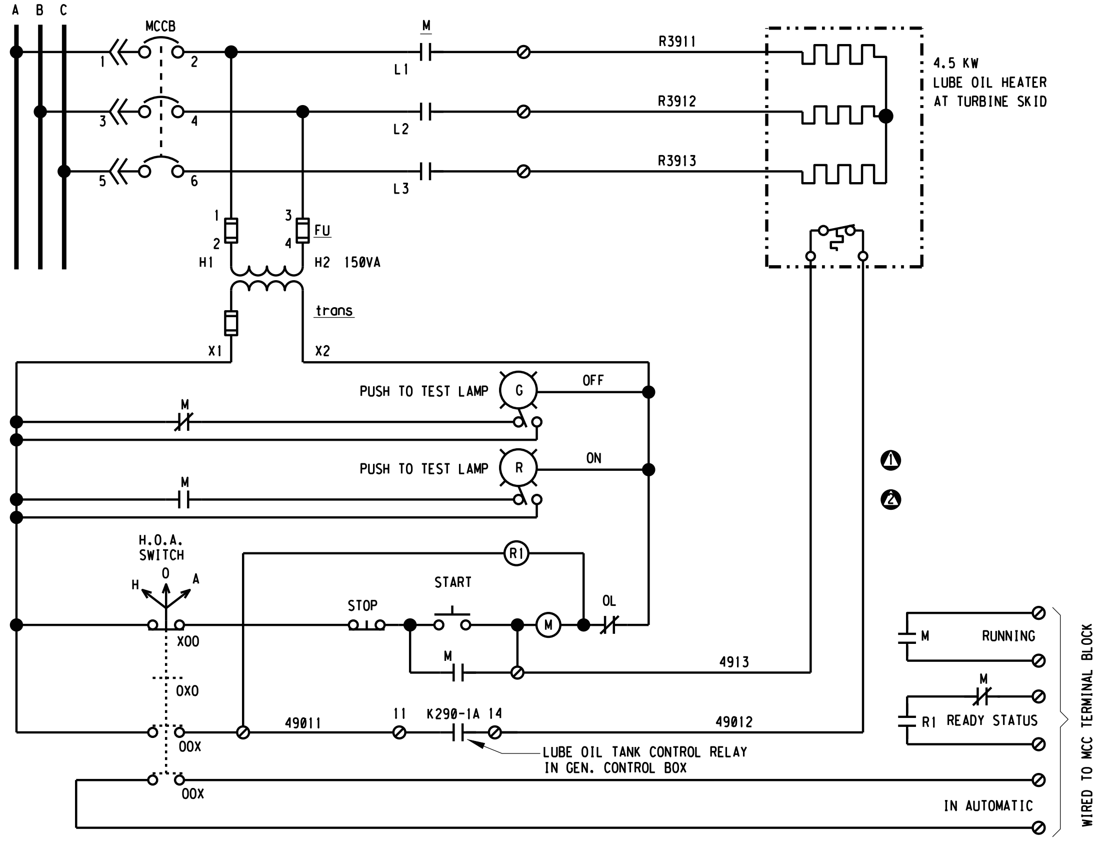
AC TURBINE START MOTOR


MCC
CONTROLNET Y-TAP (TYP.)
HY4210A
HY4210B
TO CONTROLNET Y-TAP FOR AC TURBINE START MOTOR
TO SOLAR TURBINES VIDEO DISPLAY UNIT (VDU)
PROVIDE NETWORK TERMINATOR ON UNUSED PORT (TYP.)
VFD420-1 VARIABLE FREQ. DRIVE MAIN LUBE OIL PUMP #1
UF420-1 NET NODE ADDRESS 211
CONTROL NET BOARD
TAP CABLE
HY4210A VFD
HY4210B VFD
SPACE HEATER 115VAC NOT TO EXCEED 200W
1H1 1H2
R3201H1 R3201H2
DO1/C DO1/NC
H1-420-1 R3201H2
120VAC AC DIST. PNL. CKT
REMOVE J10
42011
K220A 11 12
TURBINE CONTROL BOX
THERMOSTAT #1 THERMOSTAT #2
P1 P2
B3201P1 B3201P2
GND R3201G
PE1 GND PE2 GND
B320-1/H320-1 MOTOR MAIN LUBE OIL 10HP(7.5KW) 460VAC, 60HZ
T1 T2 T3
R32011 R32012 R32013
U V W IL1 IL2 IL3
PE-420-1
L1-420-1 L2-420-1 L3-420-1
LR420-1
OUT IN U2 U1 V2 V1 W2 W1
GND
L1-420-11 L2-420-11 L3-420-11
LINE REACTOR VFD420-1/B320-1
GND BUS
MCCB
A B C

AC PRE-POST LUBE OIL PUMP



DC BACKUP LUBE OIL PUMP CONTROL SCHEMATIC



LUBE OIL TANK HEATER CONTROL SCHEMATIC

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NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	06/09/11	REV. PER T/G MFR SHOP DWGS	CGT		
1	03/25/11	REV. PER T/G MFR SHOP DWGS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 CONTROL SCHEMATICS
ON SKIDS MOTORS AND LUBE OIL TANK HEATER

SCALE NONE
DATE MAR2011
W28.20-E-316
DRAWING NUMBER
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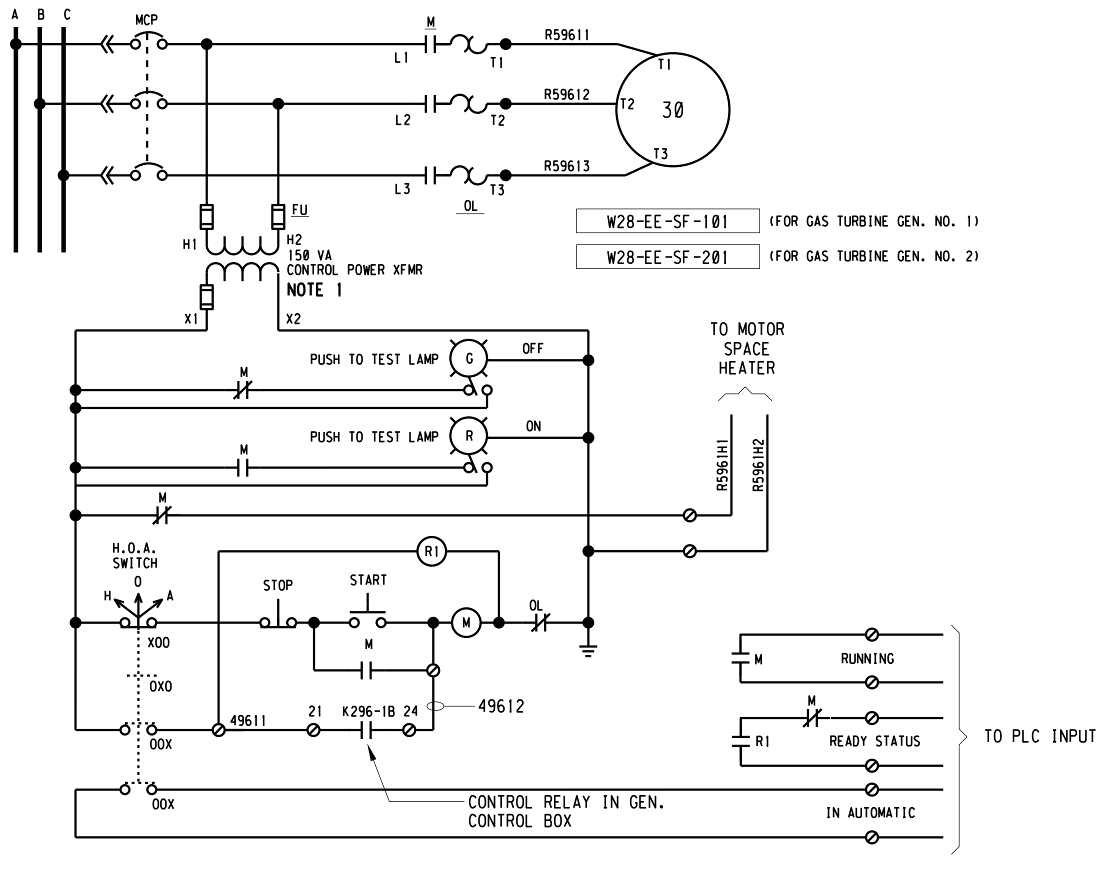
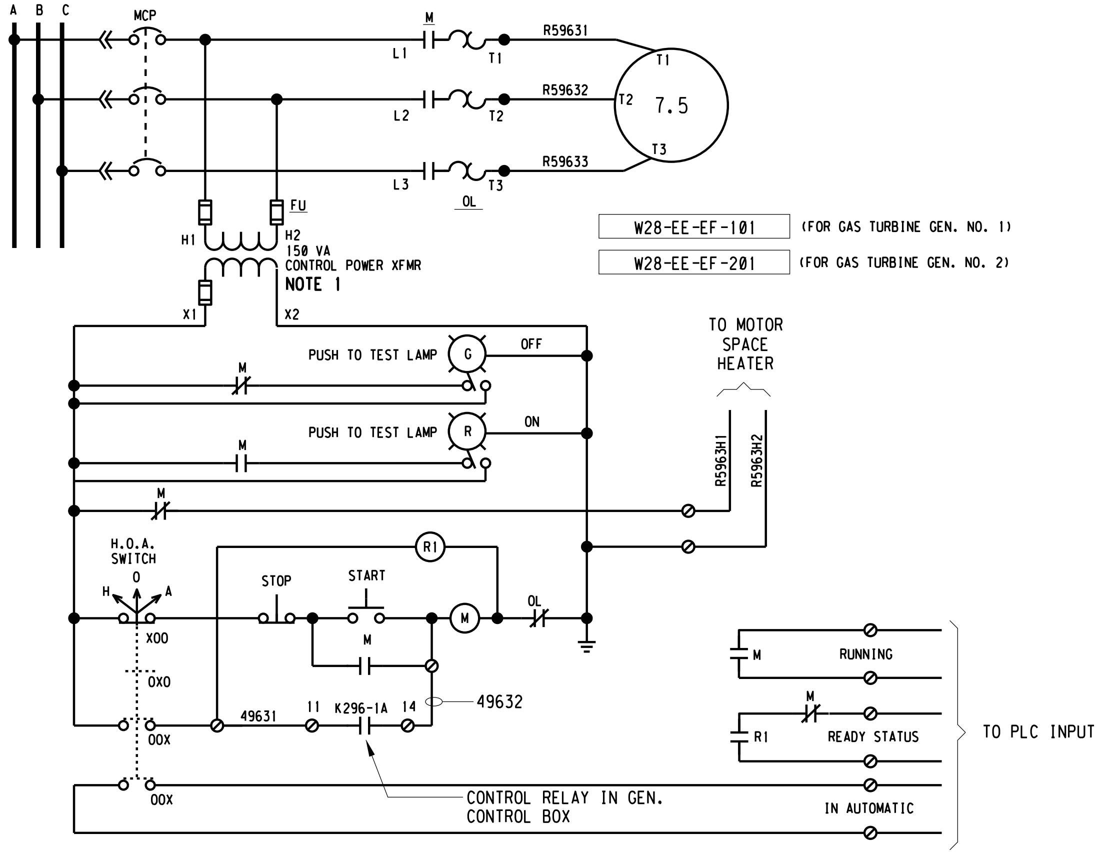


TURBINE ENCLOSURE INTAKE VENT FAN



TURBINE ENCLOSURE EXHAUST VENT FAN

NOTES:

1. CONTROL POWER TRANSFORMER SIZE TO BE CONFIRMED BY MANUFACTURER.

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3" ON ORIGINAL DOCUMENT
0 1 2 3

MTH engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
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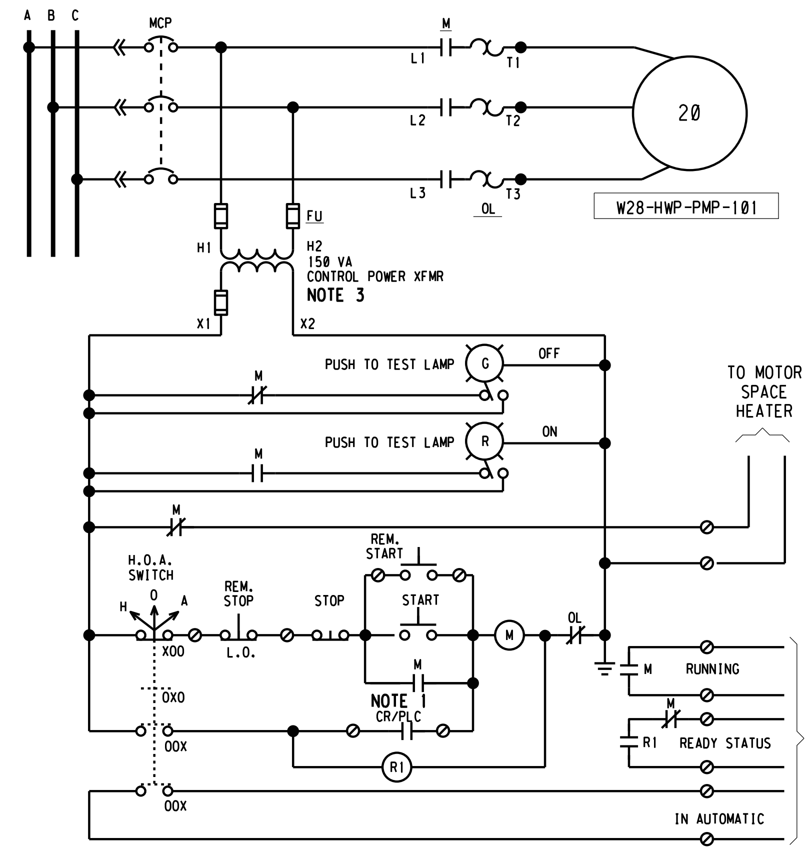
EBMUD

PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

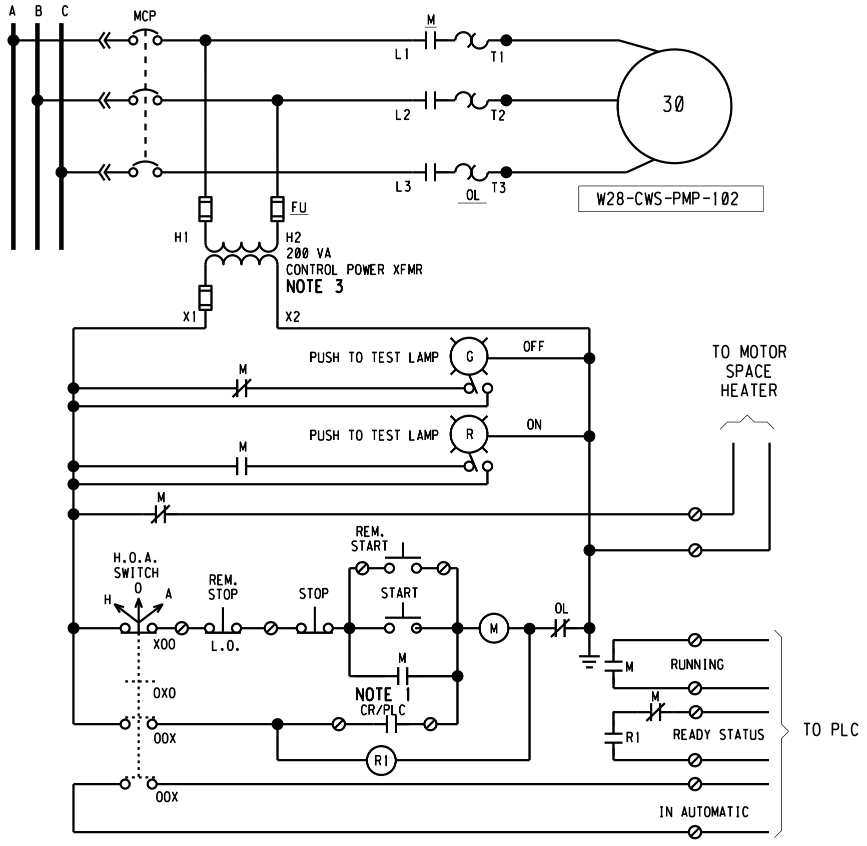
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 CONTROL SCHEMATICS
OFF SKID MOTORS

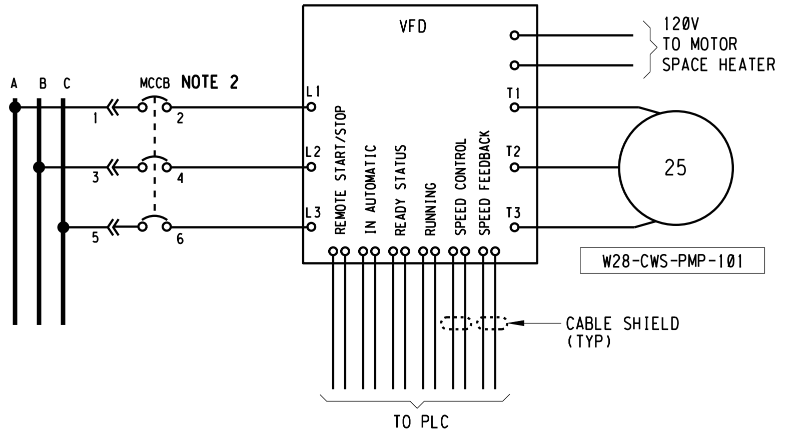
SCALE NONE
DATE JAN2009
W28.20-E-317
DRAWING NUMBER
1
REV.



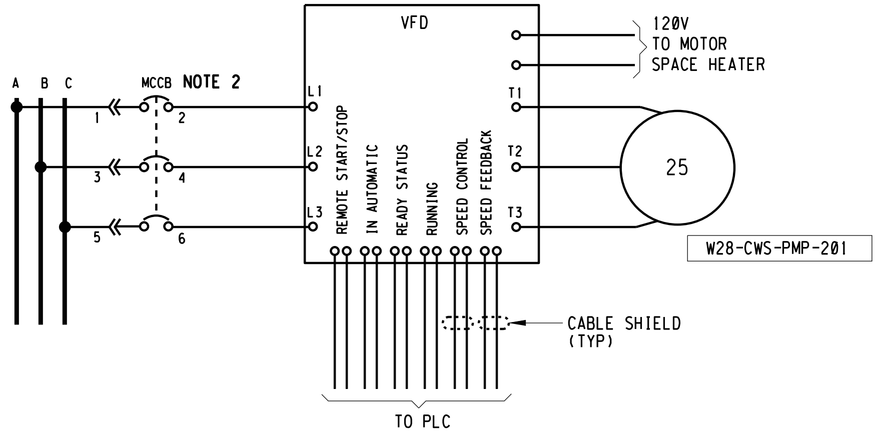
HOT WATER PUMP NO. 1



COOLING H20 LOOP PUMP NO. 1



NO.3 COOLING H20 PUMP NO. 1



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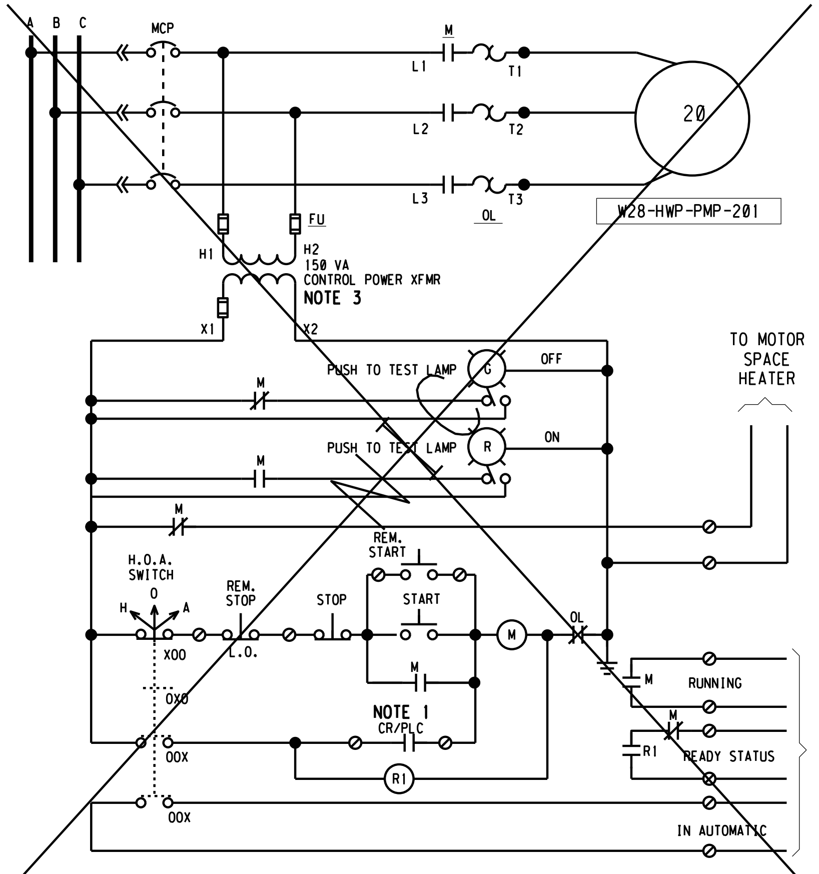
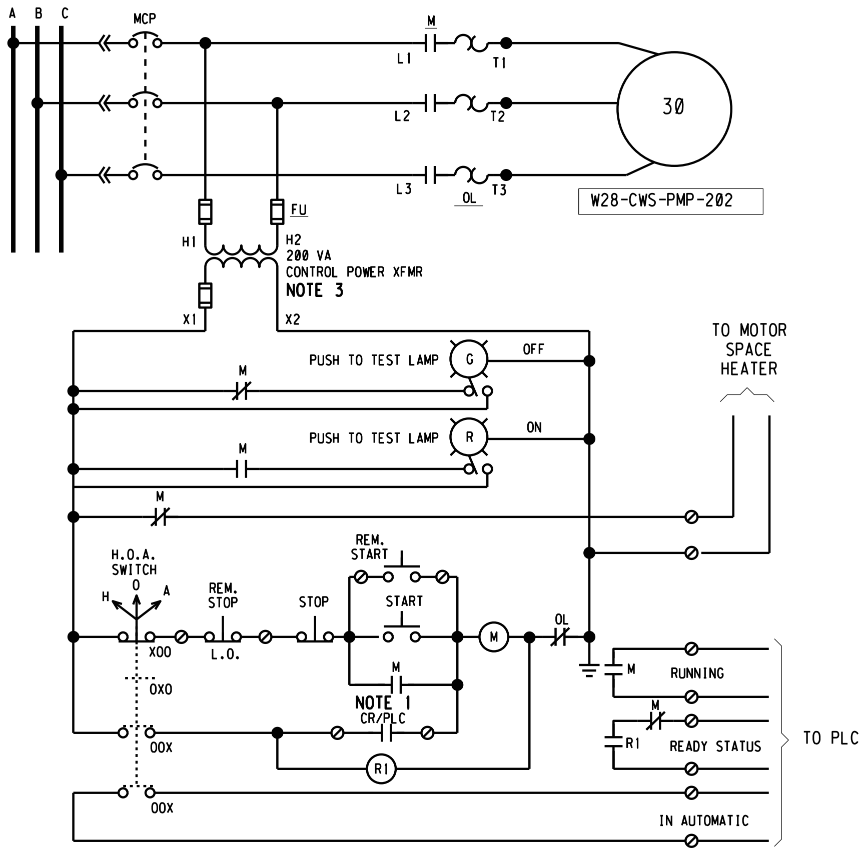


HOT WATER PUMP NO. 2
(FUTURE UNIT, N.I.C.)



COOLING H20 LOOP PUMP NO. 2

NOTES:

1. CR IS FIELD DEVICE CONTACT FOR AUTOMATIC OPERATION THRU PLC.
2. CIRCUIT BREAKER TRIP RATING TO BE CONFIRMED WITH MANUFACTURER OF VFD.
3. CONTROL POWER TRANSFORMER SIZE TO BE CONFIRMED BY MANUFACTURER.

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DATE: 18-SEP-2014 14:53
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REF 9: REF9$FILENAME

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carollo

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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
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EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 CONTROL SCHEMATICS
PLANT AUXILIARIES

SHEET NO. 319

SCALE NONE
DATE JAN2009
W28.20-E-318
DRAWING NUMBER
1
REV.

GT-1 TURBINE CONTROL BOX INTERCONNECTION WIRING

CABLE NUMBER	CABLE SIZE & DESCRIPTION	FROM		CIR. WIRE ID NUMBER	TO		REMARKS	CABLE ROUTE
		LOCATION	MFR REF. SHT. NO.		LOCATION	MFR REF. SHT. NO.		
TC1001	2/C #16	GT1 MAIN LUBE OIL PUMP VFD	149310 SHEET 53	B3201P2-GT1 42011-GT1	GT1 TURBINE CONTROL BOX	149311 SHEET 7	GT1 MAIN PRE/POST LUBE OIL PUMP STATUS INPUT TO VFD	TCB, TRAY-2, TRAY-1, TRAY-7, MCC-1, WIRE GUTTER, VFD
TC1002	2/C #16	PGS2 PWR PLANT MANUAL CONTROL PNL	149310 △1 SHEET 17	S510-GT1 S510P-GT1	GT1 TURBINE CONTROL BOX		START SWITCH (REMOTE)	TCB, TRAY-2, TRAY-1, TRAY-6, MANUAL CONTROL PANEL
TC1003	2/C #16	PGS2 PWR PLANT MANUAL CONTROL PNL	149310 SHEET 18	S511-GT1 S511P-GT1	GT1 TURBINE CONTROL BOX		NORMAL STOP SWITCH (REMOTE)	TCB, TRAY-2, TRAY-1, TRAY-6, MANUAL CONTROL PANEL
TC1004	2/C #16	ENCL VENT FILTER DELTA-P SW.	149310 △1 SHEET 59	S5963-GT1 S5963P-GT1	GT1 TURBINE CONTROL BOX		ENCL. SUPPLY AIR FILTER DIFFERENTIAL PRESSURE SW HI-ALARM	TCB, TRAY-2, TRAY-1, X861, PULL BOX, SLT, DC J-BOX, SLT, PRESSURE SW
TC1005	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 SHEET 40	S570N-GT1 S570P-GT1	GT1 TURBINE CONTROL BOX		TURBINE START PERMISSIVE-WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1006	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 △1 SHEET 40	S571N-GT1 S571P-GT1	GT1 TURBINE CONTROL BOX		TURBINE IGNITE PERMISSIVE-WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1007	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 SHEET 40	S572N-GT1 S572P-GT1	GT1 TURBINE CONTROL BOX		MALFUNCTION SUMMARY ALARM-WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1008	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 △1 SHEET 40	S573N-GT1 S573P-GT1	GT1 TURBINE CONTROL BOX		MALFUNCTION SUMMARY SHUTDOWN-WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1009	2 TSP #16 △1	AIR INLET FILTER DELTA-P SW.	149310 SHEET 31	TPD799AN-GT1 TPD799AP-GT1	GT1 TURBINE CONTROL BOX		COMBUSTION AIR INLET FILTER DIFFERENTIAL PRESSURE TRANSMITTER - TOTAL FILTER △1	TCB, TRAY-2, TRAY-1, X800, PULL BOX, SLT, DC J-BOX, SLT, PRESSURE TRANSMITTER △1
TC1010	2 TSP #16	AIR INLET FILTER DELTA-P SW.	149310 △1 SHEET 31	TPD799BN-GT1 TPD799BP-GT1	GT1 TURBINE CONTROL BOX		COMBUSTION AIR INLET FILTER DIFFERENTIAL PRESSURE TRANSMITTER - THIRD STAGE △1	TCB, TRAY-2, TRAY-1, X800, PULL BOX, SLT, DC J-BOX, SLT, PRESSURE TRANSMITTER
TC1010P							NOT USED	△1
TC1011	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 SHEET 40	WHRS575P-GT1 WHRS575N-GT1	GT1 TURBINE CONTROL BOX		TURBINE RUNNING STATUS TO WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1012	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 △1 SHEET 40	WHRS576P-GT1 WHRS576N-GT1	GT1 TURBINE CONTROL BOX		PURGE FLOW ESTABLISHED STATUS TO WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1013	2/C #16	HEAT RECOVERY SYS CONTROL PNL	149310 SHEET 40	WHRS577P-GT1 WHRS577N-GT1	GT1 TURBINE CONTROL BOX		WASTE HEAT READY STATUS TO WASTE HEAT RECOVERY SYSTEM	TCB, TRAY-2, X801, PULL BOX, SLT, WHRS UNIT NO. 1 CONTROL PANEL
TC1014	2/C #16	CO2 CYLINDER CABINET	149310 △1 SHEET 66	L59820P-GT1 L59820-GT1	GT1 TURBINE CONTROL BOX		SOLENOID PRIMARY RELEASE #1, CO2 BOTTLE MANIFOLD	TCB, TRAY-2, TRAY-1, TRAY-3, X809, SLT, CO2 MANIFOLD
TC1015	2/C #16	CO2 CYLINDER CABINET	149310 SHEET 66	L59824P-GT1 L59824-GT1	GT1 TURBINE CONTROL BOX		SOLENOID PRIMARY RELEASE #2, CO2 BOTTLE MANIFOLD	TCB, TRAY-2, TRAY-1, TRAY-3, X809, SLT, CO2 MANIFOLD
TC1016	2/C #14 TYPE MC-HL	PGS2 FIRE ALARM INTERFACE MODULE	149310 △1 SHEET 62	Z298145-GT1 Z298146-GT1	GT1 TURBINE CONTROL BOX		FIRE & GAS SYSTEM TROUBLE ALARM, FIRE 501	TCB, TRAY-2, TRAY-1, TO ADDRESSABLE INTERFACE MODULE
TC1017	2/C #14 TYPE MC-HL	PGS2 FIRE ALARM INTERFACE MODULE	149310 SHEET 62	Z298121-GT1 Z298122-GT1	GT1 TURBINE CONTROL BOX		FIRE DETECTED, SHUTDOWN, FIRE 502	TCB, TRAY-2, TRAY-1, TO ADDRESSABLE INTERFACE MODULE
TC1018	2/C #16	CO2 CYLINDER CABINET	149310 △1 SHEET 67	Z298805-GT1 Z298802-GT1	GT1 TURBINE CONTROL BOX		VENT SWITCH TOP, PRIMARY, CO2 VALVE ISOLATION AREA	TCB, TRAY-2, TRAY-1, TRAY-3, X809, SLT, CO2 BOTTLE MANIFOLD
TC1019	2/C #16	CO2 CYLINDER CABINET	149310 SHEET 67	Z29880-GT1 Z298803-GT1	GT1 TURBINE CONTROL BOX		ENCLOSURE BOTTOM SWITCH, PRIMARY, CO2 VALVE ISOLATION AREA	TCB, TRAY-2, TRAY-1, TRAY-3, X809, SLT, CO2 BOTTLE MANIFOLD
TC1020	2/C #16	CO2 CYLINDER CABINET	149310 △1 SHEET 67	Z298811-GT1 Z298812-GT1	GT1 TURBINE CONTROL BOX		VENT SWITCH TOP, EXTENDED, CO2 VALVE ISOLATION AREA	TCB, TRAY-2, TRAY-1, TRAY-3, X810, SLT, CO2 BOTTLE MANIFOLD
TC1021	2/C #16	CO2 CYLINDER CABINET	149310 SHEET 67	Z298808-GT1 Z298809-GT1	GT1 TURBINE CONTROL BOX		ENCLOSURE BOTTOM SWITCH, EXTENDED, CO2 VALVE ISOLATION AREA	TCB, TRAY-2, TRAY-1, TRAY-3, X810, SLT, CO2 BOTTLE MANIFOLD
TC1022	2/C #16	CO2 CYLINDER CABINET	149310 △1 SHEET 67	Z298817-GT1 Z298818-GT1	GT1 TURBINE CONTROL BOX		CO2 RELEASE CONFIRM SWITCH (EXTENDED)	TCB, TRAY-2, TRAY-1, TRAY-3, X810, SWITCH RELEASE-FIRE CYLINDER CABINET
TC1023	2/C #16	CO2 CYLINDER CABINET	149310 SHEET 67	Z298814-GT1 Z298815-GT1	GT1 TURBINE CONTROL BOX		CO2 RELEASE CONFIRM SWITCH (PRIMARY)	TCB, TRAY-2, TRAY-1, TRAY-3, X810, SWITCH RELEASE-FIRE CYLINDER CABINET
TC1024A	2 TSP #16	FUEL WOBBE INDEX	149310 △1 SHEET 21	206506-GT1 206507-GT1	GT1 TURBINE CONTROL BOX		GAS FUEL SUPPLY WOBBE INDEX	TCB, X761, SLT, GAS FUEL WI
TC1024B	2 TSP #16	FUEL LOWER HEATING VALUE XMTR	149310 SHEET 21	206508-GT1 206509-GT1	GT1 TURBINE CONTROL BOX		GAS FUEL SUPPLY LOWER HEATING VALUE	TCB, X761A, SLT, GAS FUEL LHV
TC1025	2 TSP #18	GT1 MASS FLOW & DENSITY XMTR	149310 △1 SHEET 20	TF386N-GT1 TF386P-GT1	GT1 TURBINE CONTROL BOX		TRANSMITTER MASS FLOW & DENSITY MAIN GAS FUEL FLOW, INPUT TO MODULE ZF2043	TCB, X761, SLT, GAS FLOW XTMR FIT120-1
TC1026	2/C #16	PGS2 PWR PLANT MANUAL CONTROL PNL	149310 SHEET 19	24V2-GT1 K213A1-GT1	GT1 TURBINE CONTROL BOX		EMERGENCY STOP PUSHBUTTON, (REMOTE)	TCB, TRAY-2, TRAY-1, TRAY-6, MANUAL CONTROL PANEL
TC1027	2/C #16	GT1 AC START MOTOR VFD	149310 △1 SHEET 16	S330P1-GT1 S3222N02-GT1	GT1 TURBINE CONTROL BOX	149310 SHEET 53	TURBINE AC START MOTOR VFD INTERLOCK WITH BACKUP LUBE PUMP ACTIVATION SWITCH	TCB, TRAY-2, TRAY-1, TRAY-7, MCC-1, WIRE GUTTER, VFD
TC1028	2/C #16	GT1 MASS FLOW & DENSITY XMTR	149310 SHEET 20	24V3-GT1 0V3-GT1	GT1 TURBINE CONTROL BOX		24V DC POWER TO GT1 MASS FLOW AND DENSITY XMTR, MAIN GAS FUEL FLOW, POWER SUPPLY	TCB, X761, SLT, GAS FLOW XTMR FIT120-1
TC1029	2/C #16	BACKUP LUBE OIL PUMP MOTOR STARTER	149310 △1 SHEET 54	K4221-GT1 0V2-GT1	GT1 TURBINE CONTROL BOX		DC STARTER BACK UP LUBE OIL PUMP (24 VDC CONTROL SIGNAL)	TCB, TRAY-2, TRAY-1, X759, DC STARTER GT1
TC1030	1 #8	IE200-0		GYIE200-GT1	GND-IE200	149312 SHEET 2	INSTRUMENT EARTH GROUND	CONNECT TO GROUND GRID PER MANUFACTURER'S REQUIREMENTS
TC1031	1 #8	PE200-00		GYPE200-GT1	GND-PE200	149312 SHEET 2	PHYSICAL EARTH GROUND	CONNECT TO GROUND GRID PER MANUFACTURER'S REQUIREMENTS
TC1032	1 #6	FG200		GYFG200-GT1	GND-FG200	149312 SHEET 2	FRAME GROUND	CONNECT TO GROUND GRID PER MANUFACTURER'S REQUIREMENTS
TC1033	2/C #16	PGS2 SWGR UNIT 1			GT1 TURBINE CONTROL BOX	△1	SPARE	TCB, TRAY-2, TRAY-1, TRAY-9, MV SWITCHGEAR AUX CUBICLE
TC1034	2/C #16	PGS2 SWGR UNIT 1			GT1 TURBINE CONTROL BOX		SPARE	TCB, TRAY-2, TRAY-1, TRAY-9, MV SWITCHGEAR AUX CUBICLE
TC1035	(2) 4/C #16	PGS2 PWR PLANT MANUAL CONTROL PNL		△1	GT1 TURBINE CONTROL BOX		SPARE CABLES △1	TCB, TRAY-2, TRAY-1, TRAY-6, MANUAL CONTROL PANEL

GENERAL NOTES:

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3" ON ORIGINAL DOCUMENT
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NO.	DATE	REVISION	BY	REC.	APP.
△2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△1	03/25/11	REV. PER T/G MFR SHOP DWGS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
GT-1 TURBINE CONTROL BOX
INTERCONNECTION WIRING

SCALE NONE
DATE MAR2011
W28.20-E-319 DRAWING NUMBER
2 REV.

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REF 8: REF8#FILENAME
REF 9: REF9#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
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USER: vuong
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GT-1 GENERATOR CONTROL BOX INTERCONNECTION WIRING

CABLE NUMBER	CABLE SIZE & DESCRIPTION	FROM		CIR. WIRE ID NUMBER	TO		REMARKS	CABLE ROUTE
		LOCATION	MFR REF. SHT. NO.		LOCATION	MFR REF. SHT. NO.		
PGS2-GT1 -CNA	COAX 18 GA	WASTE HEAT RECOVERY SYS SYS HXR-101 CONTROL PNL			GT1 GENERATOR CONTROL BOX		Y-TAP CONTROLNET COAX CABLE - SEE DWG SD317A-W28-I-560	GCB, TRAY-3, X863, WASTE HEAT RECOVERY SYSTEM HXR-101 CONTROL PANEL
PGS2-GT1 -CNB	COAX 18 GA	WASTE HEAT RECOVERY SYS SYS HXR-101 CONTROL PNL			GT1 GENERATOR CONTROL BOX		Y-TAP CONTROLNET COAX CABLE - SEE DWG SD317A-W28-I-560	
PGS2-VFD -TRB1-CNA	COAX 18 GA	GT-1 GENERATOR CONTROL BOX			VFD-STARTER VFD-LUBE OIL		Y-TAP CONTROLNET COAX CABLE - SEE DWG SD317A-W28-I-560	GCB, TRAY-3, TRAY-1, TRAY-7, MCC-1 (EXTEND TO VFD'S VIA WIRE GUTTER)
PGS2-VFD -TRB1-CNB	COAX 18 GA	GT-1 GENERATOR CONTROL BOX			VFD-STARTER VFD-LUBE OIL		Y-TAP CONTROLNET COAX CABLE- SEE DWG SD317A-W28-I-560	
GC1006	2/C #16 GA	MCC-1	149310 SHEET 56	49011-GT1 49012-GT1	GT1 GENERATOR CONTROL BOX		CONTROL INTERLOCK TO MCC STARTER - LUBE OIL TANK HEATER	GCB, TRAY-3, TRAY-1, TRAY-7, MCC-1
GC1007	2/C #16	MCC-1	149310 △2 SHEET 60	49631-GT1 49632-GT1	GT1 GENERATOR CONTROL BOX		CONTROL INTERLOCK CONTACT TO MCC-1 STARTER-ENCLOSURE EXHAUST VENT FAN	GCB, TRAY-3, TRAY-1, TRAY-7, MCC-1
GC1008	2/C #16	MCC-1	149310 SHEET 60	49611-GT1 49612-GT1	GT1 GENERATOR CONTROL BOX		CONTROL INTERLOCK CONTACT TO MCC-1 STARTER-ENCLOSURE INLET SUPPLY FAN	GCB, TRAY-3, TRAY-1, TRAY-7, MCC-1
GC1009	4/C #12	PGS2 SWGR	△2 149310 SHEET 43	R331-GT1 R332-GT1 R333-GT1 R-GND	GT1 GENERATOR CONTROL BOX		PGS2 SWGR BUS POTENTIAL INPUT TO CGCM	GCB, TRAY-3, TRAY-1, TRAY-9, MV SWITCHGEAR AUX CUBICLE
GC1010	4/C #12	PGS2 SWGR	△2 149310 SHEET 43 △2	R300-GT1 R301-GT1 R302-GT1 R-GND	GT1 GENERATOR CONTROL BOX		GENERATOR LINE SIDE POTENTIAL INPUT TO CGCM	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1011							LOAD SHARE (RESERVE FOR FUTURE GT-2 CONNECTION)	
GC1012							CROSS CURRENT (RESERVE FOT FUTURE GT-2 CONNECTION)	
GC1013	2/C #16	PGS2 SWGR	149310 SHEET 46	GEN507P-GT1 GEN507N-GT1	GT1 GENERATOR CONTROL BOX		TURBINE GENERATOR SIGNAL TO CLOSE GENERATOR BREAKER	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1014	2/C #16	PGS2 SWGR	149310 △2 SHEET 46	GEN506P-GT1 GEN506N-GT1	GT1 GENERATOR CONTROL BOX		TURBINE GENERATOR SIGNAL TO TRIP GENERATOR BREAKER	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1015	2/C #12	PGS2 SWGR	149310 SHEET 47	24V3-GT1 8862-GT1	GT1 GENERATOR CONTROL BOX		UTILITY POWER AVAILABLE AT PGS2 (FROM 2506-PGS2 RELAY) △1	GCB, TRAY-3, TRAY-1, △2 TRAY-9, MV SWITCHGEAR GT-1 CUBICLE
GC1016	4/C #12	PGS2 SWGR	149310 △2 SHEET 47	8861-GT1 8860-GT1 24V3-GT1 SP-GT1	GT1 GENERATOR CONTROL BOX		GENERATOR BREAKER AUX. CONTACT ("a" AND "b" CONTACTS)	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1021	4/C #12	PGS2 SWGR	149310 △2 SHEET 44	B851-GT1 B853-GT1 B855-GT1 B856-GT1	GT1 GENERATOR CONTROL BOX		GENERATOR CURRENT TRANSFORMER LEADS	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1023	2/C #12	PGS2 SWGR			GT1 GENERATOR CONTROL BOX		SPARE △2	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1024	2/C #12	MCC-1	149310 △2 SHEET 46	R361H1-GT1 R361H2-GT1	GT1 GENERATOR CONTROL BOX		120V AC POWER TO GENERATOR HOUSING SPACE HEATER	GCB, TRAY-3, TRAY-1, TRAY-7, MCC-1
GC1025	2/C #16 GA	MCC-1	149310 △2 SHEET 46	4611-GT1 4612-GT1	GT1 GENERATOR CONTROL BOX		GENERATOR SPACE HEATER CONTROL	GCB, TRAY-3, TRAY-1, TRAY-7, MCC-1
GC1026	2/C #12	PGS2 SWGR	149310 SHEET 47	SGM600-GT1 SGM600P-GT1	GT1 GENERATOR CONTROL BOX		GENERATOR PROTECTION RELAY-FAULT SUMMARY	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1027	4/C #12	PGS2 SWGR	149310 △2 SHEET 47	SDF600-GT1 SDF600P-GT1	GT1 GENERATOR CONTROL BOX		GENERATOR DIFF. PROTECTION RELAY-FAST TURBINE SHUTDOWN	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE

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3" ON ORIGINAL DOCUMENT
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NO.	DATE	REVISION	BY	REC.	APP.
△3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△2	03/25/11	REV. PER T/G MFR SHOP DWGS	CGT		
△1	04/24/10	CHANGED UTILITY PWR AVAIL. STATUS TO SEL 2506-PGS2	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT		
	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
GT-1 GENERATOR CONTROL BOX
INTERCONNECTION WIRING

SCALE NONE
DATE APR2010
W28.20-E-320
DRAWING NUMBER
3
REV.

USER: vuong
DATE: 24-SEP-2014 15:59
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GT-1 GENERATOR CONTROL BOX INTERCONNECTION WIRING

CABLE NUMBER	CABLE SIZE & DESCRIPTION	FROM		CIR. WIRE ID NUMBER	TO		REMARKS	CABLE ROUTE
		LOCATION	MFR REF. SHT. NO.		LOCATION	MFR REF. SHT. NO.		
GC1032	2/C #12	PGS2 PWR PLANT MANUAL CONTROL PNL	149310 △1 SHEET 49	SYNC500-GT1 SYNC500P-GT1	GT1 GENERATOR CONTROL BOX		AUTO-SYNCHRONIZE INITIATE CONTACT FROM MANUAL CONTROL PANEL	GCB, TRAY-3, TRAY-1, TRAY-6, MANUAL CONTROL PANEL
GC1033	2/C #12	GT-1 BATTERY CHARGER	149310 SHEET 13	BC5203-GT1 BC5202-GT1	GT1 GENERATOR CONTROL BOX		BATTERY CHARGER FAIL ALARM	GCB, TRAY-3, TRAY-1, X752, BATTERY CHARGER-GT1
GC1034	2/C #12	GT-1 BATTERY CHARGER	149310 △1 SHEET 13	PS200P-1-GT1 52002-GT1	GT1 GENERATOR CONTROL BOX		120 VDC INPUT TO 24V DC POWER SUPPLY MODULE PS200 FROM BATTERY CHARGER	GCB, TRAY-3, TRAY-1, X752, BATTERY CHARGER-GT1
GC1035	2/C #6	GT-1 BATTERY CHARGER	149310 SHEET 13	52007-GT1 52008-GT1	GT1 GENERATOR CONTROL BOX	149310 SHEET 24	120 VDC POWER TO GAS FUEL METERING AND PILOT VALVE ACTUATORS FROM BATTERY CHARGER	GCB, TRAY-3, TRAY-1, X755, BATTERY CHARGER-GT1
GC1036	2/C #10	GT-1 BATTERY CHARGER	149310 △1 SHEET 13	52009-GT1 52010-GT1	GT1 GENERATOR CONTROL BOX	149310 SHEET 26	120 VDC POWER TO INLET GUIDE VANE, BLEED VALVE AND AIR DIVERTER VALVE ACTUATORS FROM BATTERY CHARGER (VERIFY REQUIREMENT WITH MANUFACTURER)	GCB, TRAY-3, TRAY-1, X755, BATTERY CHARGER-GT1
GC1037	1/C #6	GT-1 GENERATOR CONTROL BOX	149310 SHEET 13	GYIE201	GROUND GRID		INSTRUMENT EARTH GROUND	CONNECT TO GROUND GRID PER MANUFACTURER'S REQUIREMENTS
GC1038	1/C #6	GT-1 GENERATOR CONTROL BOX	149310 △1 SHEET 13	GYPE201	GROUND GRID		PHYSICAL EARTH GROUND	CONNECT TO GROUND GRID PER MANUFACTURER'S REQUIREMENTS
GC1039	1/C #6	GT-1 GENERATOR CONTROL BOX	149310 SHEET 13	GYFG201	GROUND GRID		FRAME GROUND	CONNECT TO GROUND GRID PER MANUFACTURER'S REQUIREMENTS
GC1040	4/C #12	PGS2 SWGR	149310 △1 SHEET 48	S552AP,S552A S552BP,S552B	GT1 GENERATOR CONTROL BOX		VOLTAGE RAISE/LOWER CONTACTS FROM 451-PGS2 RELAY	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1041	4/C #12	PGS2 SWGR	149310 △1 SHEET 37	S554,S554P S555,S555P	GT1 GENERATOR CONTROL BOX		SPEED RAISE/LOWER CONTACTS FROM 451-PGS2 RELAY	GCB, TRAY-3, TRAY-1, TRAY-12, MV SWITCHGEAR GT-1 CUBICLE
GC1042							NOT USED	△1

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engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION	BY	REC.	APP.
△2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
△1	03/25/11	REV. PER T/G MFR SHOP DWGS	CGT		

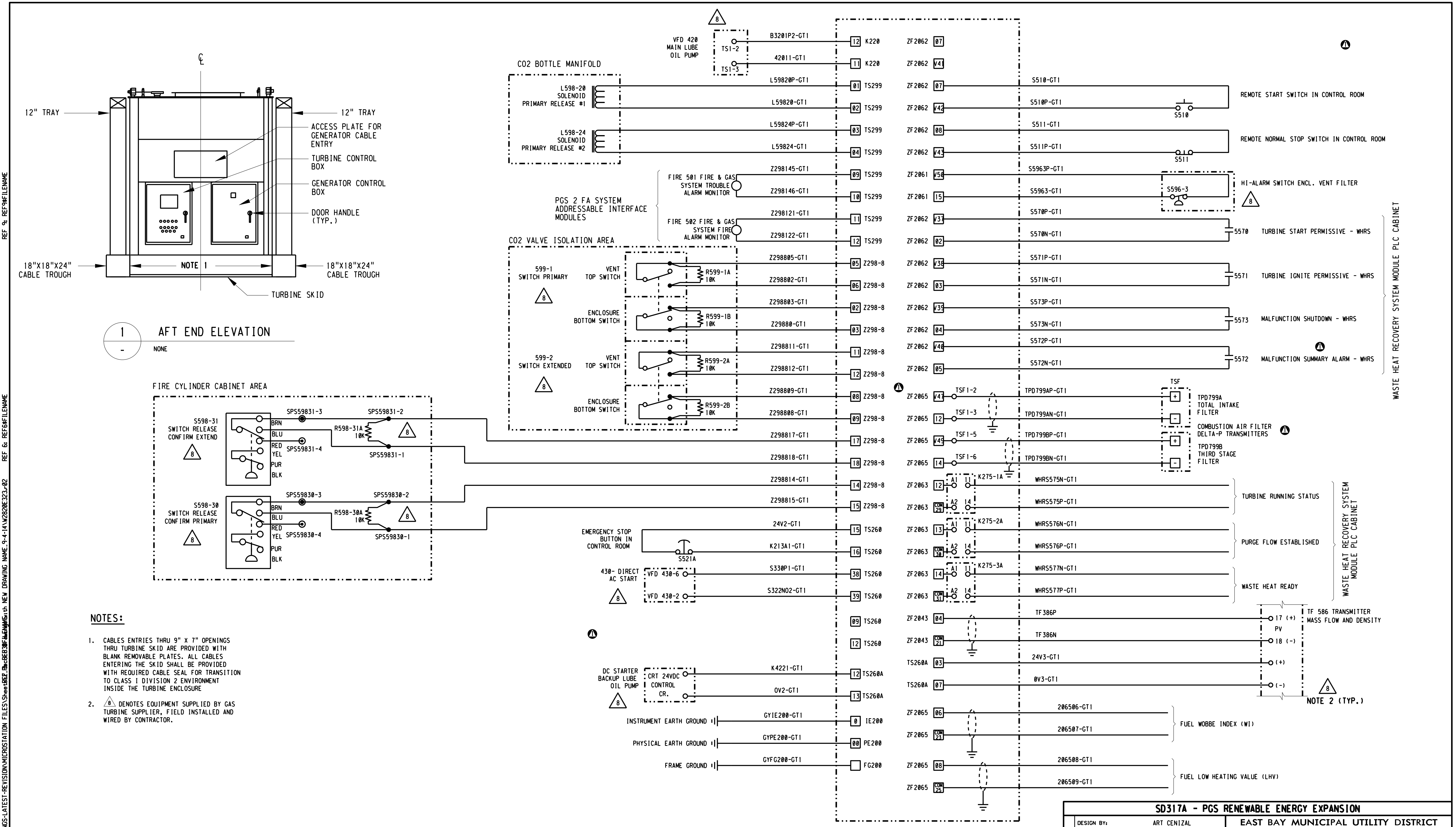
SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
GT-1 GENERATOR CONTROL BOX
INTERCONNECTION WIRING

SCALE NONE
DATE MAR2011
W28.20-E-320A
DRAWING NUMBER
2
REV.



NOTES:

1. CABLES ENTRIES THRU 9" X 7" OPENINGS THRU TURBINE SKID ARE PROVIDED WITH BLANK REMOVABLE PLATES. ALL CABLES ENTERING THE SKID SHALL BE PROVIDED WITH REQUIRED CABLE SEAL FOR TRANSITION TO CLASS I DIVISION 2 ENVIRONMENT INSIDE THE TURBINE ENCLOSURE
2. 8 DENOTES EQUIPMENT SUPPLIED BY GAS TURBINE SUPPLIER, FIELD INSTALLED AND WIRED BY CONTRACTOR.

3" ON ORIGINAL DOCUMENT

0 1 2 3

engineers, inc.
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santa clara, ca 95054
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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	03/25/11	REV. PER T/G MFR SHOP DWGS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
GT-1 TURBINE CONTROL BOX
WIRING DIAGRAM

SCALE NONE
DATE MAR2011
W28.20-E-323
DRAWING NUMBER
2
REV.

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REF 9: REF9$FILENAME
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REF 6: REF6$FILENAME
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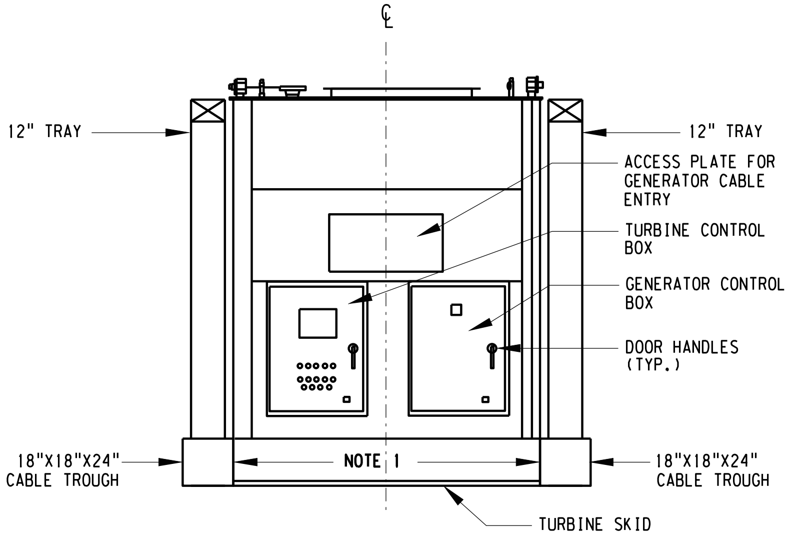
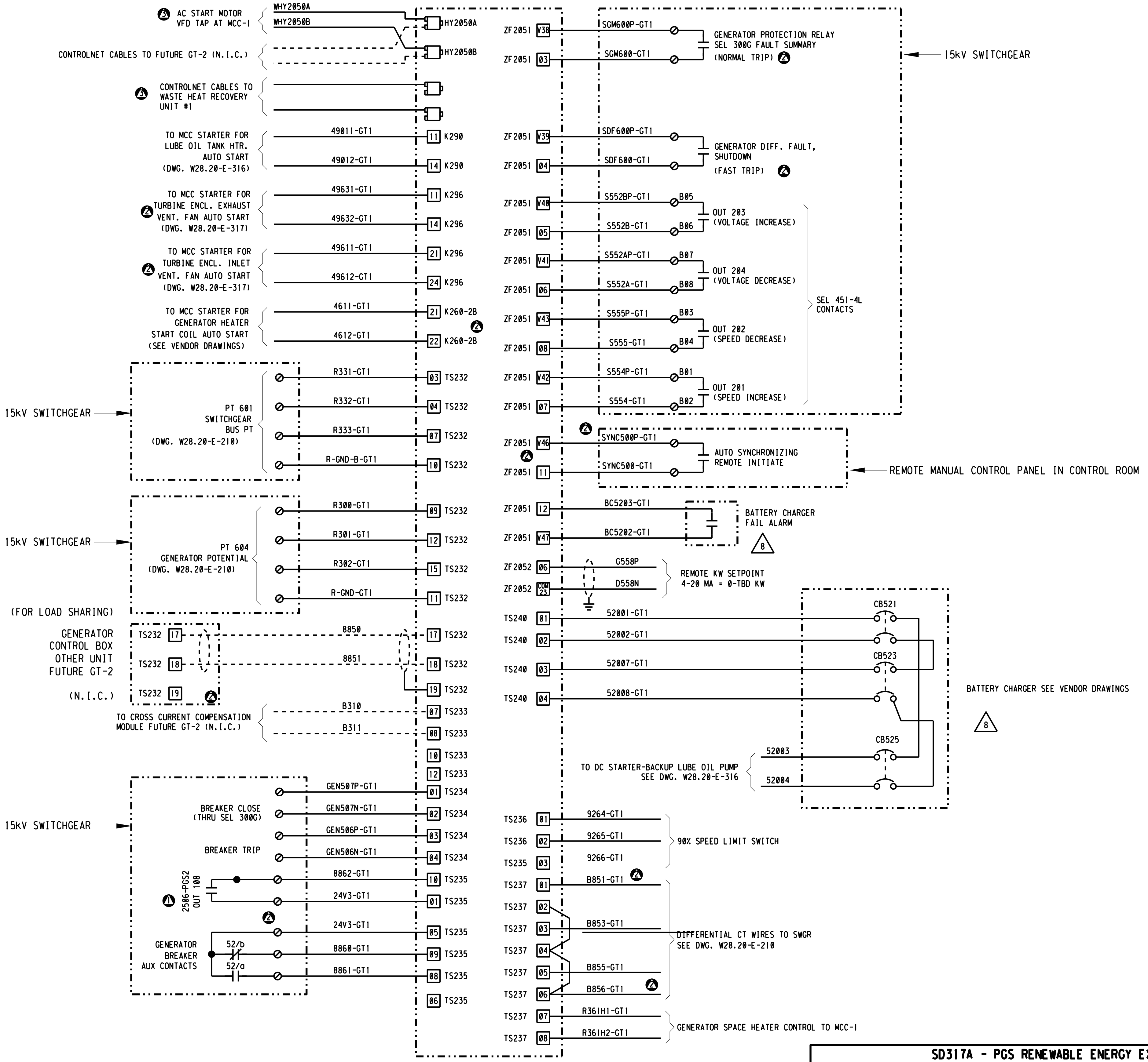


1 AFT END ELEVATION
-
NONE



NOTES:

1. CABLES ENTRIES THRU 9" X 7" OPENINGS THRU TURBINE SKID ARE PROVIDED WITH BLANK REMOVABLE PLATES. ALL CABLES ENTERING THE SKID SHALL BE PROVIDED WITH REQUIRED CABLE SEAL FOR TRANSITION TO CLASS I DIVISION 2 ENVIRONMENT INSIDE THE TURBINE ENCLOSURE
2. △8 DENOTES EQUIPMENT SUPPLIED BY GAS TURBINE SUPPLIER, FIELD INSTALLED AND WIRED BY CONTRACTOR.

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PROJECT NO. 07688-01-03

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NO.	DATE	REVISION		BY	REC.	APP.
4	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
3	04/13/11	REVISED CONTROLNET CONNECTIONS		CGT		
2	03/25/11	REVISED PER T/G MFR SHOP DWGS		CGT		
1	04/24/10	REVISED UTILITY PWR AVAIL. STATUS INPUT		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
GT-1 GENERATOR CONTROL BOX
WIRING DIAGRAM

SCALE NONE
DATE APR2011
W28.20-E-324
DRAWING NUMBER
4
REV.

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
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REF 2: REF2$FILENAME
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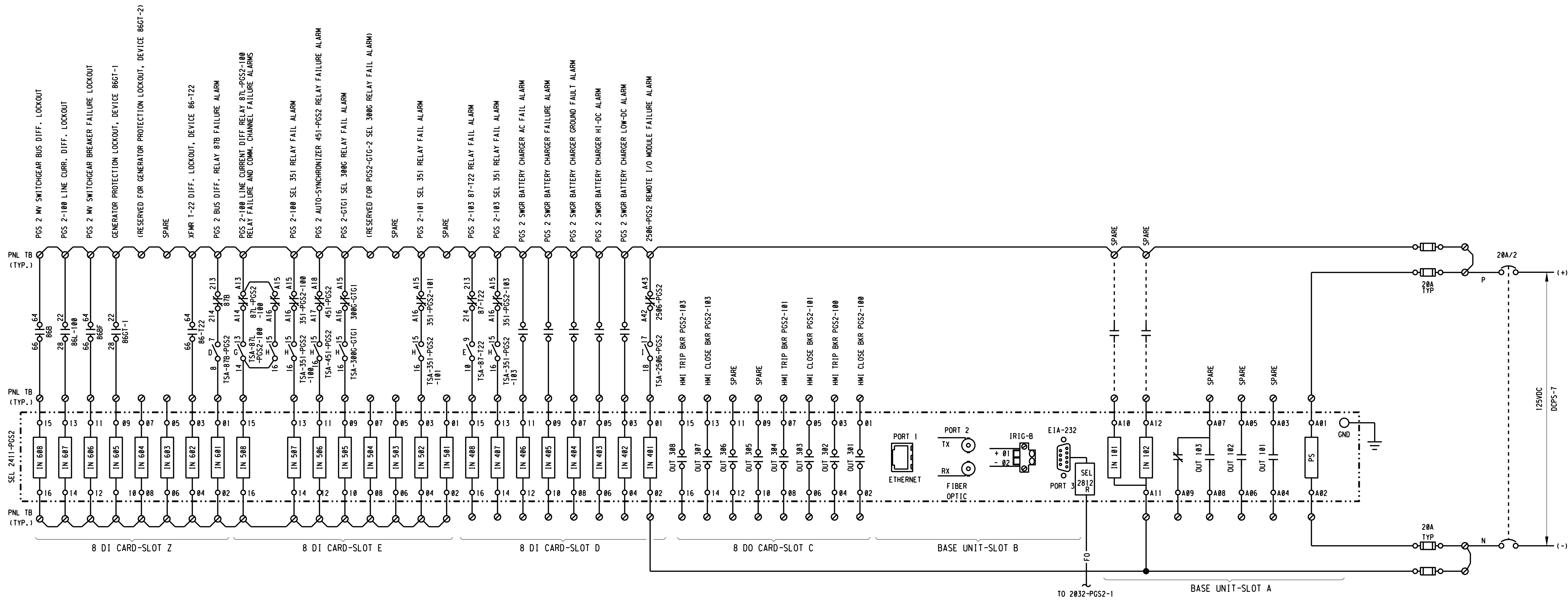
PGS 2 MV SWITCHGEAR BUS DIFF. LOCKOUT
PGS 2-100 LINE CURR. DIFF. LOCKOUT
PGS 2 MV SWITCHGEAR BREAKER FAILURE LOCKOUT
GENERATOR PROTECTION LOCKOUT, DEVICE 86GT-1
(RESERVED FOR GENERATOR PROTECTION LOCKOUT, DEVICE 86GT-2)
SPARE
XFMR T-22 DIFF. LOCKOUT, DEVICE 86-T22
PGS 2 BUS DIFF. RELAY 87B FAILURE ALARM
PGS 2-100 LINE CURRENT DIFF RELAY 87L-PGS2-100 RELAY FAILURE AND COMM. CHANNEL FAILURE ALARMS
PGS 2-100 SEL 351 RELAY FAIL ALARM
PGS 2 AUTO-SYNCHRONIZER 451-PGS2 RELAY FAILURE ALARM
PGS 2-GTG1 SEL 300G RELAY FAIL ALARM
(RESERVED FOR PGS2-GTG-2 SEL 300G RELAY FAIL ALARM)
SPARE
PGS 2-101 SEL 351 RELAY FAIL ALARM
SPARE
PGS 2-103 87-T22 RELAY FAIL ALARM
PGS 2-103 SEL 351 RELAY FAIL ALARM
PGS 2 SWGR BATTERY CHARGER AC FAIL ALARM
PGS 2 SWGR BATTERY CHARGER FAILURE ALARM
PGS 2 SWGR BATTERY CHARGER GROUND FAULT ALARM
PGS 2 SWGR BATTERY CHARGER HI-DC ALARM
PGS 2 SWGR BATTERY CHARGER LOW-DC ALARM
2506-PGS2 REMOTE I/O MODULE FAILURE ALARM
SPARE
SPARE
PNL TB (TYP.)
66 64 86B
28 22 86L-100
66 64 86BF
28 22 86GT-1
66 64 86-T22
213 214 87B
D 7 8 TSA-87B-PGS2
A13 A14 87L-PGS2-100 A15 A16
G 3 14 TSA-87L-PGS2-100 15 16
A15 A16 351-PGS2-100
H 15 16 TSA-351-PGS2-100
A18 A17 451-PGS2
H 15 16 TSA-451-PGS2
A15 A16 300G-GTG1
H 15 16 TSA-300G-GTG1
A15 A16 351-PGS2-101
H 15 16 TSA-351-PGS2-101
213 214 87-T22
E 9 10 TSA-87-T22
A15 A16 351-PGS2-103
H 15 16 TSA-351-PGS2-103
A43 A42 2506-PGS2
17 18 TSA-2506-PGS2
HMI TRIP BKR PGS2-103
HMI CLOSE BKR PGS2-103
SPARE
SPARE
HMI TRIP BKR PGS2-101
HMI CLOSE BKR PGS2-101
HMI TRIP BKR PGS2-100
HMI CLOSE BKR PGS2-100
SPARE
SPARE
SPARE
SEL 2411-PGS2
IN 608 IN 607 IN 606 IN 605 IN 604 IN 603 IN 602 IN 601
15 13 11 09 07 05 03 01
16 14 12 10 08 06 04 02
IN 508 IN 507 IN 506 IN 505 IN 504 IN 503 IN 502 IN 501
15 13 11 09 07 05 03 01
16 14 12 10 08 06 04 02
IN 408 IN 407 IN 406 IN 405 IN 404 IN 403 IN 402 IN 401
15 13 11 09 07 05 03 01
16 14 12 10 08 06 04 02
OUT 308 OUT 307 OUT 306 OUT 305 OUT 304 OUT 303 OUT 302 OUT 301
15 13 11 09 07 05 03 01
16 14 12 10 08 06 04 02
PORT 1
ETHERNET
PORT 2
TX
RX
FIBER OPTIC
IRIG-B
+ 01
- 02
EIA-232
PORT 3
SEL 2812 R
FO
TO 2032-PGS2-1
IN 101 IN 102 OUT 103 OUT 102 OUT 101 PS
A10 A12 A07 A05 A03 A01
A11 A09 A08 A06 A04 A02
GND
8 DI CARD-SLOT Z
8 DI CARD-SLOT E
8 DI CARD-SLOT D
8 DO CARD-SLOT C
BASE UNIT-SLOT B
BASE UNIT-SLOT A
20A TYP
20A/2
P
N
(+)
(-)
125VDC
DCPS-7

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 SWITCHGEAR I/O PROCESSOR
SEL-2411-PGS2 SCHEMATIC

SCALE NONE
DATE MAR2011
W28.20-E-540
DRAWING NUMBER
1
REV.

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REF 2: REF2$FILENAME
REF 3: [illegible]

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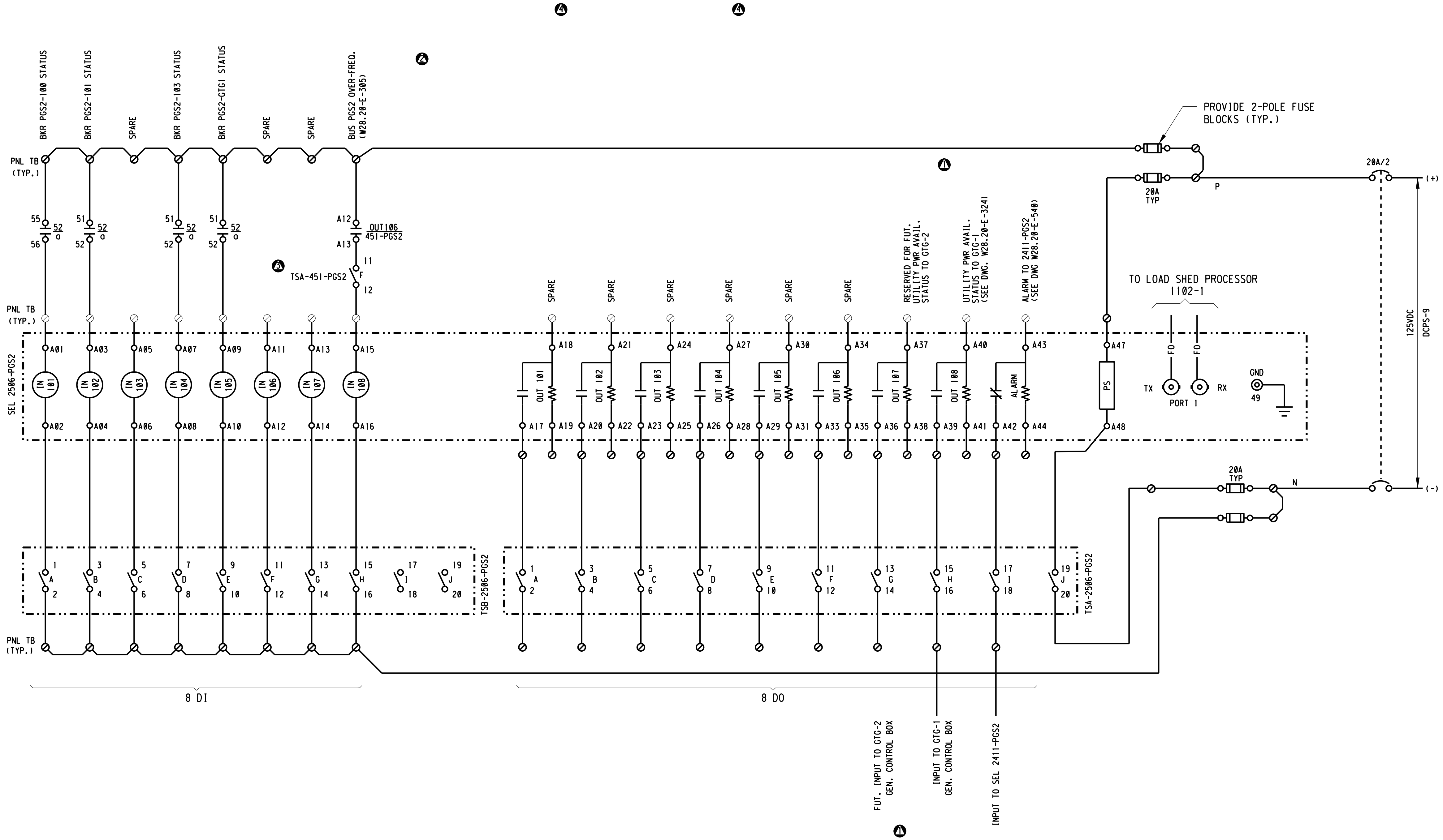
PLOT SCALE: 0.167279:1



3" ON ORIGINAL DOCUMENT
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NO.	DATE	REVISION	BY	REC.	APP.
5	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
4	03/25/11	DELETED TS LIMIT SHIFT & DROOP MODE OUTPUTS	CGT		
3	01/24/11	ADDED TEST SWITCH TO 451-PGS2 OUT 106	CGT		
2	08/18/10	ADDED OVER-FREQ. I/O's	SEL		
1	04/24/10	ADDED UTILITY PWR AVAIL. STATUS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 SWITCHGEAR REMOTE I/O MODULE
SEL-2506-PGS2 SCHEMATIC

SCALE NONE
DATE MAR2011
W28.20-E-541
DRAWING NUMBER
5
REV.

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DATE: 18-SEP-2014 15:45
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PLOT SCALE: 0.167614:1

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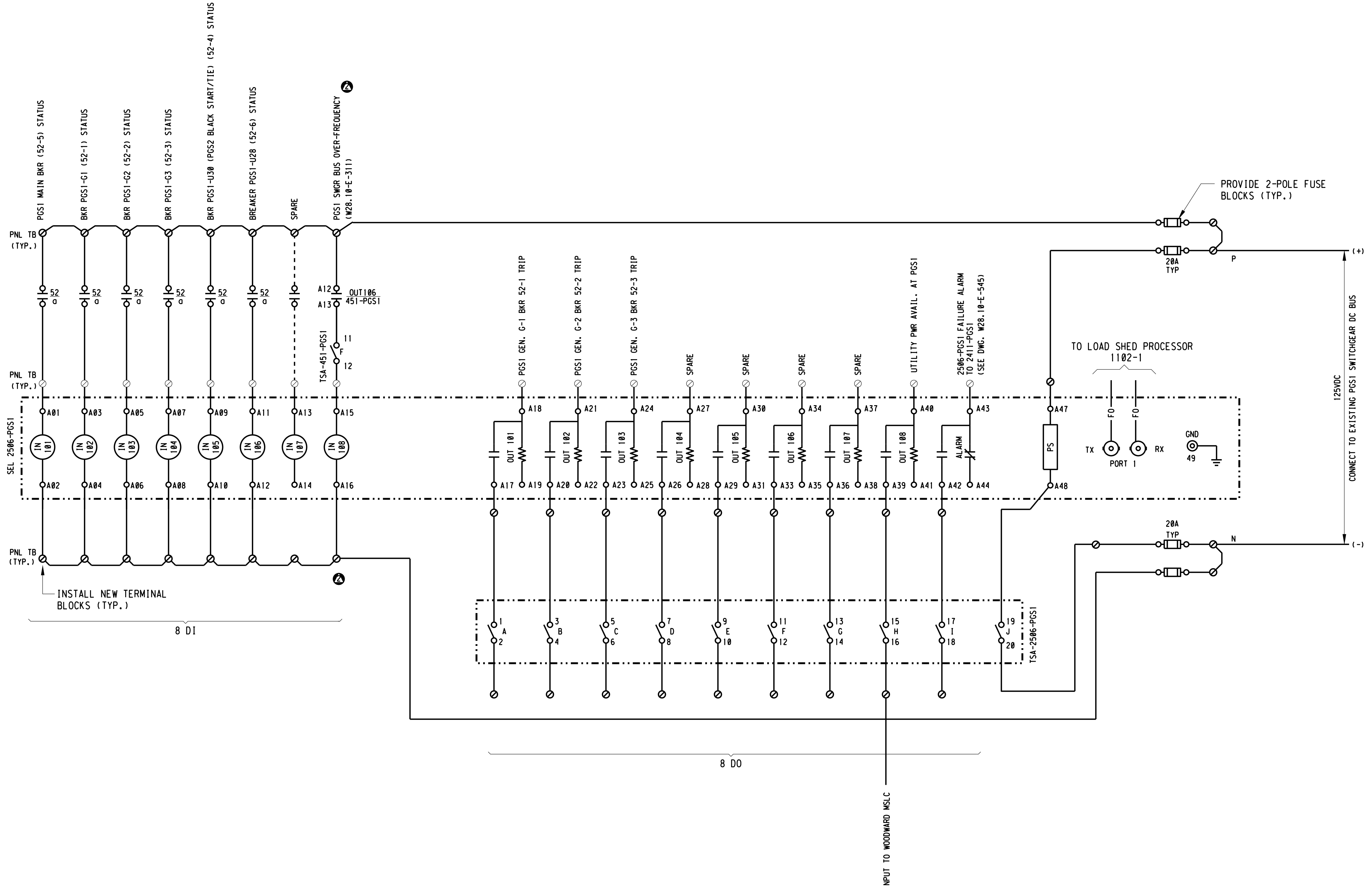
PGS1 MAIN BKR (52-5) STATUS
BKR PGS1-G1 (52-1) STATUS
BKR PGS1-G2 (52-2) STATUS
BKR PGS1-G3 (52-3) STATUS
BKR PGS1-U30 (PGS2 BLACK START/TIE) (52-4) STATUS
BREAKER PGS1-U28 (52-6) STATUS
SPARE
PGS1 SWGR BUS OVER-FREQUENCY (W28.10-E-311)
2
PNL TB (TYP.)
52 a
A12
A13
OUT106 451-PGS1
TSA-451-PGS1
11
F
12
SEL 2506-PGS1
A01
A02
A03
A04
A05
A06
A07
A08
A09
A10
A11
A12
A13
A14
A15
A16
IN 101
IN 102
IN 103
IN 104
IN 105
IN 106
IN 107
IN 108
INSTALL NEW TERMINAL BLOCKS (TYP.)
8 DI
PGS1 GEN. G-1 BKR 52-1 TRIP
PGS1 GEN. G-2 BKR 52-2 TRIP
PGS1 GEN. G-3 BKR 52-3 TRIP
SPARE
UTILITY PWR AVAIL. AT PGS1
2506-PGS1 FAILURE ALARM TO 2411-PGS1 (SEE DWG. W28.10-E-545)
A18
A21
A24
A27
A30
A34
A37
A40
A43
OUT 101
OUT 102
OUT 103
OUT 104
OUT 105
OUT 106
OUT 107
OUT 108
ALARM
A17
A19
A20
A22
A23
A25
A26
A28
A29
A31
A33
A35
A36
A38
A39
A41
A42
A44
A47
PS
A48
TO LOAD SHED PROCESSOR 1102-1
FO
TX
RX
PORT 1
GND
49
PROVIDE 2-POLE FUSE BLOCKS (TYP.)
20A TYP
P
N
(+)
(-)
125VDC
CONNECT TO EXISTING PGS1 SWITCHGEAR DC BUS
TSA-2506-PGS1
1 A 2
3 B 4
5 C 6
7 D 8
9 E 10
11 F 12
13 G 14
15 H 16
17 I 18
19 J 20
8 DO
INPUT TO WOODWARD MSLC

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NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	01/24/11	REVISED PER 01/14/11 SEL FAT	CGT		
1	04/24/10	ADDED UTILITY PWR AVAIL. STATUS	CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 SWITCHGEAR REMOTE I/O MODULE
SEL-2506-PGS1 SCHEMATIC (LOAD SHED MODULE)

SCALE NONE
DATE APR2010
W28.10-E-542
DRAWING NUMBER
3
REV.

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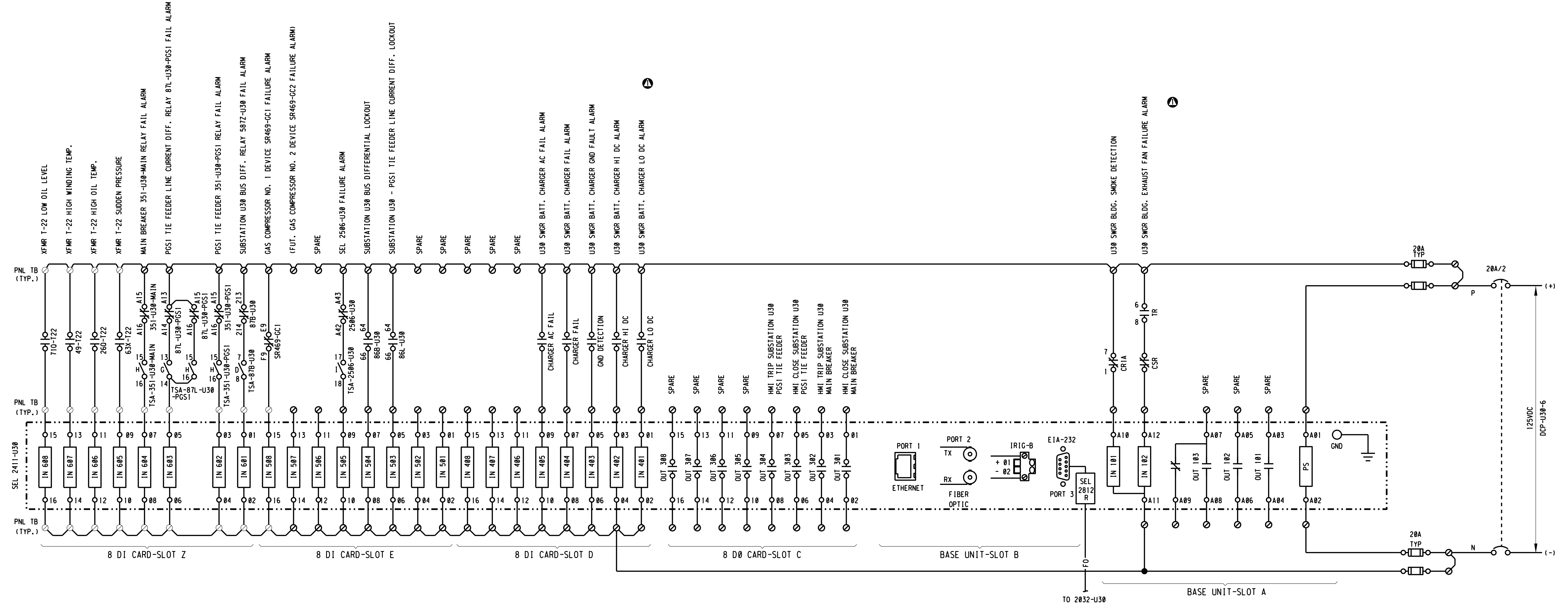
XFMR T-22 LOW OIL LEVEL
XFMR T-22 HIGH WINDING TEMP.
XFMR T-22 HIGH OIL TEMP.
XFMR T-22 SUDDEN PRESSURE
MAIN BREAKER 351-U30-MAIN RELAY FAIL ALARM
PGS1 TIE FEEDER LINE CURRENT DIFF. RELAY 87L-U30-PGS1 FAIL ALARM
PGS1 TIE FEEDER 351-U30-PGS1 RELAY FAIL ALARM
SUBSTATION U30 BUS DIFF. RELAY 587Z-U30 FAIL ALARM
GAS COMPRESSOR NO. 1 DEVICE SR469-GC1 FAILURE ALARM
(FUT. GAS COMPRESSOR NO. 2 DEVICE SR469-GC2 FAILURE ALARM)
SPARE
SEL 2506-U30 FAILURE ALARM
SUBSTATION U30 BUS DIFFERENTIAL LOCKOUT
SUBSTATION U30 - PGS1 TIE FEEDER LINE CURRENT DIFF. LOCKOUT
SPARE
SPARE
SPARE
SPARE
SPARE
U30 SWGR BATT. CHARGER AC FAIL ALARM
U30 SWGR BATT. CHARGER FAIL ALARM
U30 SWGR BATT. CHARGER GND FAULT ALARM
U30 SWGR BATT. CHARGER HI DC ALARM
U30 SWGR BATT. CHARGER LO DC ALARM
U30 SWGR BLDG. SMOKE DETECTION
U30 SWGR BLDG. EXHAUST FAN FAILURE ALARM
PNL TB (TYP.)
71Q-T22
49-T22
26Q-T22
63X-T22
351-U30-MAIN
TSA-351-U30-MAIN
87L-U30-PGS1
TSA-87L-U30-PGS1
351-U30-PGS1
TSA-351-U30-PGS1
87B-U30
TSA-87B-U30
SR469-GC1
2506-U30
TSA-2506-U30
86B-U30
86L-U30
CHARGER AC FAIL
CHARGER FAIL
GND DETECTION
CHARGER HI DC
CHARGER LO DC
SPARE
SPARE
SPARE
SPARE
HMI TRIP SUBSTATION U30 PGS1 TIE FEEDER
HMI CLOSE SUBSTATION U30 PGS1 TIE FEEDER
HMI TRIP SUBSTATION U30 MAIN BREAKER
HMI CLOSE SUBSTATION U30 MAIN BREAKER
TR
CR1A
CSR
SPARE
SPARE
SPARE
SEL 2411-U30
IN 608
IN 607
IN 606
IN 605
IN 604
IN 603
IN 602
IN 601
IN 508
IN 507
IN 506
IN 505
IN 504
IN 503
IN 502
IN 501
IN 408
IN 407
IN 406
IN 405
IN 404
IN 403
IN 402
IN 401
OUT 308
OUT 307
OUT 306
OUT 305
OUT 304
OUT 303
OUT 302
OUT 301
PORT 1
ETHERNET
PORT 2
TX
RX
FIBER OPTIC
IRIG-B
+ 01
- 02
EIA-232
PORT 3
SEL 2812 R
IN 101
IN 102
OUT 103
OUT 102
OUT 101
PS
GND
8 DI CARD-SLOT Z
8 DI CARD-SLOT E
8 DI CARD-SLOT D
8 D0 CARD-SLOT C
BASE UNIT-SLOT B
BASE UNIT-SLOT A
FO
TO 2032-U30
20A TYP
20A/2
20A TYP
P
N
(+)
(-)
125VDC
DCP-U30-6

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0 1 2 3

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NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	01/24/11	REVISED PER KBL INTERCONNECT WIRING		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
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EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

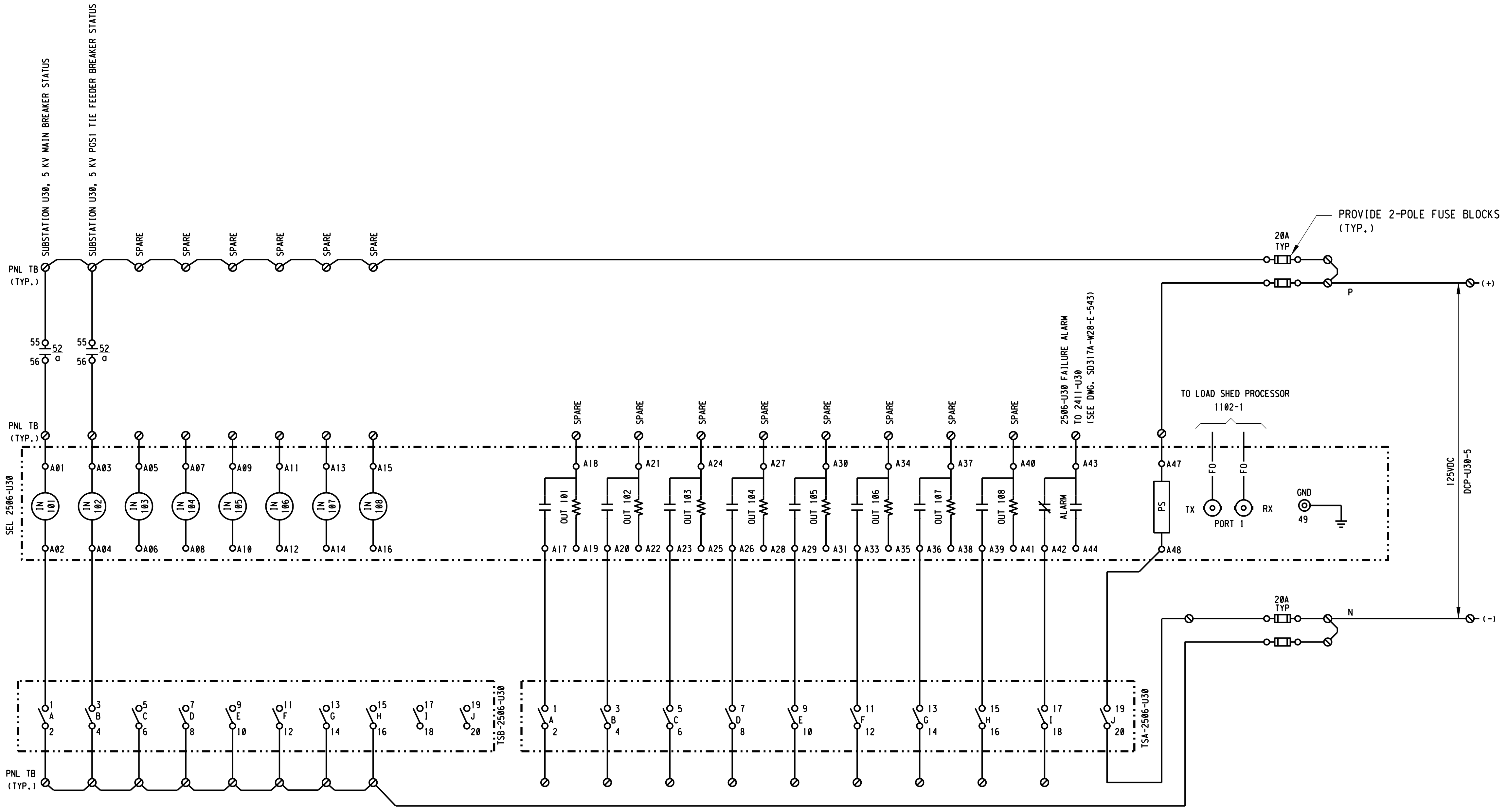
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
I/O PROCESSOR SEL-2411-U30 SCHEMATIC

SCALE NONE
DATE MAR2011

W28.50-E-543
DRAWING NUMBER

2
REV.



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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
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PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PRIMARY UNIT SUBSTATION U30
REMOTE I/O MODULE SEL-2506-U30 SCHEMATIC

SCALE NONE
DATE MAR2011
W28.50-E-544
DRAWING NUMBER
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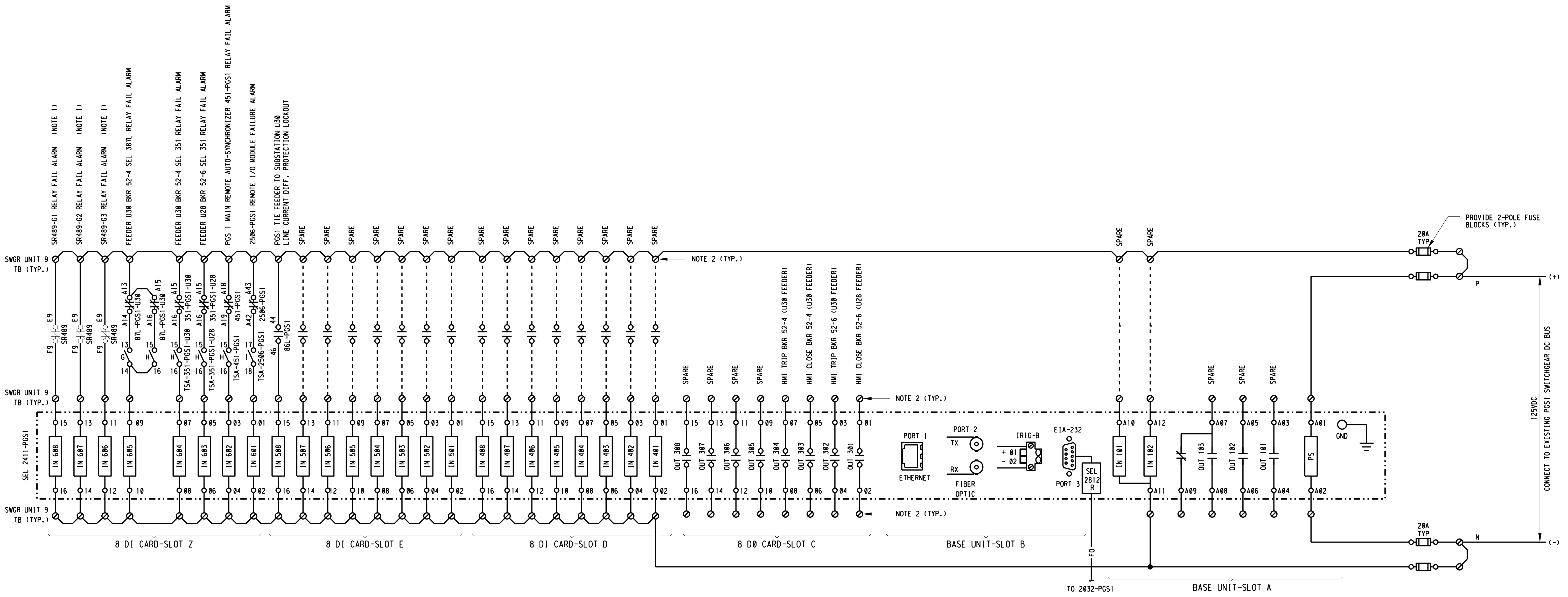

1 / - I/O PROCESSOR 2411-PGS1 SCHEMATIC

NONE

NOTES:

1. PROVIDE NEW WIRING TO CONNECT EXISTING DEVICE SR489 ALARM CONTACT TO NEW 2411-PGS1.
2. PROVIDE NEW 600V, 30A RATED TERMINAL BLOCKS IN PGS1 SWITCHGEAR UNIT 9 FOR TERMINATING NEW DEVICE 2411-PGS1 I/O WIRING.
3. PROVIDE NEW ALARM WIRING AS SHOWN. ALARM WIRING SHALL BE INSTALLED FROM I/O PROCESSOR IN SWITCHGEAR UNIT 9 TO RESPECTIVE SWITCHGEAR SECTIONS AS APPLIABLE.

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 SWITCHGEAR MODIFICATION
I/O PROCESSOR SEL-2411-PGS1 SCHEMATIC

SCALE NONE
DATE JAN2009

W28.10-E-545
DRAWING NUMBER

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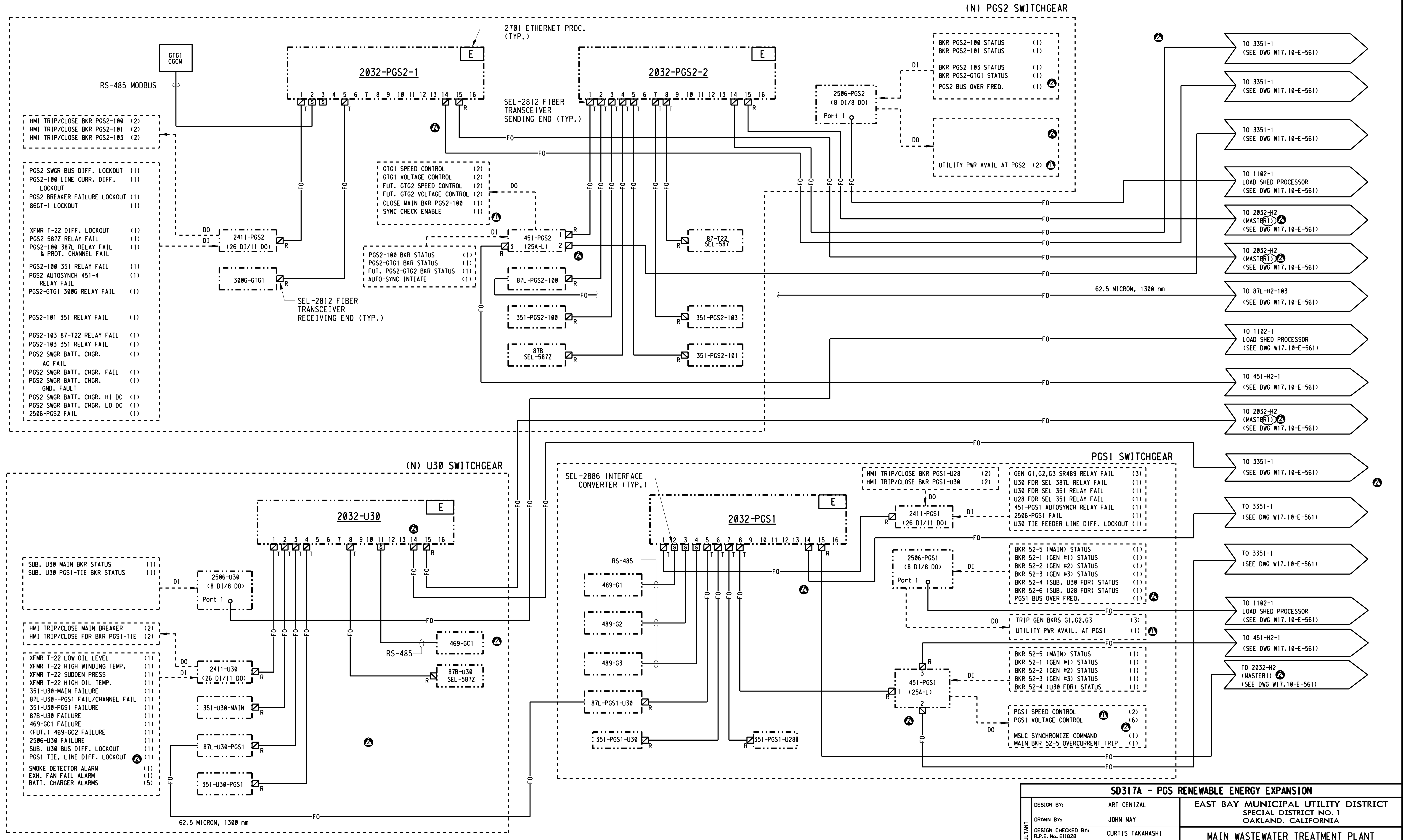
(N) PGS2 SWITCHGEAR
2701 ETHERNET PROC. (TYP.)
GTG1 CGCM
RS-485 MODBUS
2032-PGS2-1
2032-PGS2-2
E
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
SEL-2812 FIBER TRANSCEIVER SENDING END (TYP.)
SEL-2812 FIBER TRANSCEIVER RECEIVING END (TYP.)
HMI TRIP/CLOSE BKR PGS2-100 (2)
HMI TRIP/CLOSE BKR PGS2-101 (2)
HMI TRIP/CLOSE BKR PGS2-103 (2)
PGS2 SWGR BUS DIFF. LOCKOUT (1)
PGS2-100 LINE CURR. DIFF. LOCKOUT (1)
PGS2 BREAKER FAILURE LOCKOUT (1)
86GT-1 LOCKOUT (1)
XFMR T-22 DIFF. LOCKOUT (1)
PGS2 587Z RELAY FAIL (1)
PGS2-100 387L RELAY FAIL & PROT. CHANNEL FAIL (1)
PGS2-100 351 RELAY FAIL (1)
PGS2 AUTOSYNCH 451-4 RELAY FAIL (1)
PGS2-GTG1 300G RELAY FAIL (1)
PGS2-101 351 RELAY FAIL (1)
PGS2-103 87-T22 RELAY FAIL (1)
PGS2-103 351 RELAY FAIL (1)
PGS2 SWGR BATT. CHGR. AC FAIL (1)
PGS2 SWGR BATT. CHGR. FAIL (1)
PGS2 SWGR BATT. CHGR. GND. FAULT (1)
PGS2 SWGR BATT. CHGR. HI DC (1)
PGS2 SWGR BATT. CHGR. LO DC (1)
2506-PGS2 FAIL (1)
2411-PGS2 (26 DI/11 DO)
300G-GTG1
GTG1 SPEED CONTROL (2)
GTG1 VOLTAGE CONTROL (2)
FUT. GTG2 SPEED CONTROL (2)
FUT. GTG2 VOLTAGE CONTROL (2)
CLOSE MAIN BKR PGS2-100 (1)
SYNC CHECK ENABLE (1)
PGS2-100 BKR STATUS (1)
PGS2-GTG1 BKR STATUS (1)
FUT. PGS2-GTG2 BKR STATUS (1)
AUTO-SYNC INTIATE (1)
451-PGS2 (25A-L)
87L-PGS2-100
351-PGS2-100
87B SEL-587Z
87-T22 SEL-587
351-PGS2-103
351-PGS2-101
2506-PGS2 (8 DI/8 DO) Port 1
BKR PGS2-100 STATUS (1)
BKR PGS2-101 STATUS (1)
BKR PGS2 103 STATUS (1)
BKR PGS2-GTG1 STATUS (1)
PGS2 BUS OVER FREQ. (1)
UTILITY PWR AVAIL AT PGS2 (2)
DI
DO
FO
T
S
R
62.5 MICRON, 1300 nm
TO 3351-1 (SEE DWG W17.10-E-561)
TO 1102-1 LOAD SHED PROCESSOR (SEE DWG W17.10-E-561)
TO 2032-H2 (MASTER1) (SEE DWG W17.10-E-561)
TO 87L-H2-103 (SEE DWG W17.10-E-561)
TO 451-H2-1 (SEE DWG W17.10-E-561)
(N) U30 SWITCHGEAR
2032-U30
SUB. U30 MAIN BKR STATUS (1)
SUB. U30 PGS1-TIE BKR STATUS (1)
2506-U30 (8 DI/8 DO) Port 1
HMI TRIP/CLOSE MAIN BREAKER (2)
HMI TRIP/CLOSE FDR BKR PGS1-TIE (2)
XFMR T-22 LOW OIL LEVEL (1)
XFMR T-22 HIGH WINDING TEMP. (1)
XFMR T-22 SUDDEN PRESS (1)
XFMR T-22 HIGH OIL TEMP. (1)
351-U30-MAIN FAILURE (1)
87L-U30--PGS1 FAIL/CHANNEL FAIL (1)
351-U30-PGS1 FAILURE (1)
87B-U30 FAILURE (1)
469-GC1 FAILURE (1)
(FUT.) 469-GC2 FAILURE (1)
2506-U30 FAILURE (1)
SUB. U30 BUS DIFF. LOCKOUT (1)
PGS1 TIE, LINE DIFF. LOCKOUT (1)
SMOKE DETECTOR ALARM (1)
EXH. FAN FAIL ALARM (1)
BATT. CHARGER ALARMS (5)
2411-U30 (26 DI/11 DO)
351-U30-MAIN
87L-U30-PGS1
351-U30-PGS1
469-GC1
RS-485
87B-U30 SEL-587Z
PGS1 SWITCHGEAR
SEL-2886 INTERFACE CONVERTER (TYP.)
2032-PGS1
489-G1
489-G2
489-G3
87L-PGS1-U30
351-PGS1-U30
351-PGS1-U28
HMI TRIP/CLOSE BKR PGS1-U28 (2)
HMI TRIP/CLOSE BKR PGS1-U30 (2)
2411-PGS1 (26 DI/11 DO)
GEN G1,G2,G3 SR489 RELAY FAIL (3)
U30 FDR SEL 387L RELAY FAIL (1)
U30 FDR SEL 351 RELAY FAIL (1)
U28 FDR SEL 351 RELAY FAIL (1)
451-PGS1 AUTOSYNCH RELAY FAIL (1)
2506-PGS1 FAIL (1)
U30 TIE FEEDER LINE DIFF. LOCKOUT (1)
2506-PGS1 (8 DI/8 DO) Port 1
BKR 52-5 (MAIN) STATUS (1)
BKR 52-1 (GEN #1) STATUS (1)
BKR 52-2 (GEN #2) STATUS (1)
BKR 52-3 (GEN #3) STATUS (1)
BKR 52-4 (SUB. U30 FDR) STATUS (1)
BKR 52-6 (SUB. U28 FDR) STATUS (1)
PGS1 BUS OVER FREQ. (1)
TRIP GEN BKRS G1,G2,G3 (3)
UTILITY PWR AVAIL. AT PGS1 (1)
451-PGS1 (25A-L)
BKR 52-4 (U30 FDR) STATUS (1)
PGS1 SPEED CONTROL (2)
PGS1 VOLTAGE CONTROL (6)
MSLC SYNCHRONIZE COMMAND (1)
MAIN BKR 52-5 OVERCURRENT TRIP (1)
3" ON ORIGINAL DOCUMENT
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SD317A - PGS RENEWABLE ENERGY EXPANSION

NO.	DATE	REVISION	BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB SD317A	CT		
2	01/24/11	REVISED PER SEL 01/14/11 FAT MARK-UPS & COORD. W/SOLAR TURB.	CGT		
1	04/24/10	ADDED UTILITY PWR AVAIL. TO SEL 2506	CGT		

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 1 AND PGS 2 SWITCHGEAR SCADA AND LOAD SHEDDING SYSTEM COMMUNICATION BLOCK DIAGRAM

SCALE NONE
DATE APR2010
W28.20-E-560
DRAWING NUMBER
3
REV.

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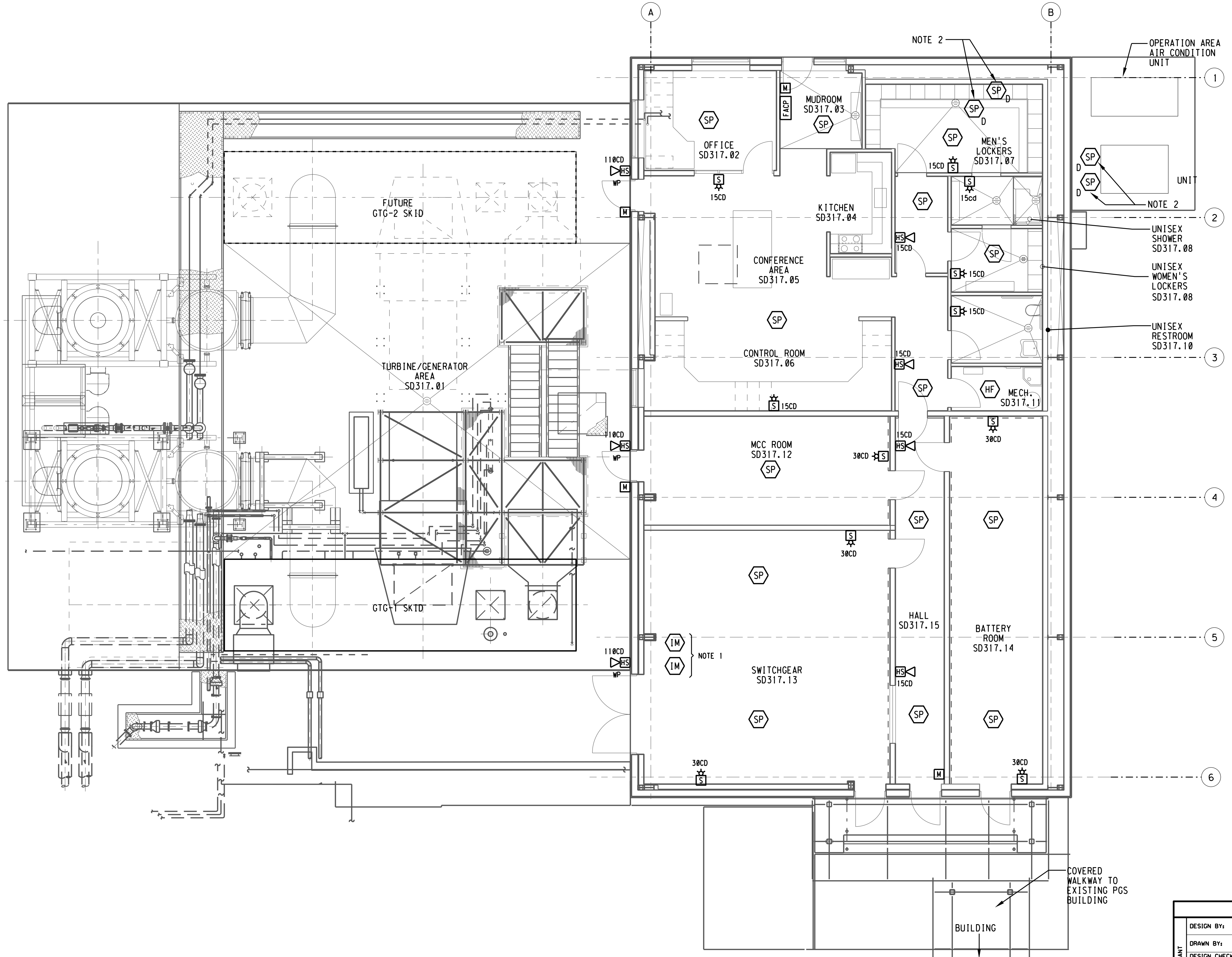


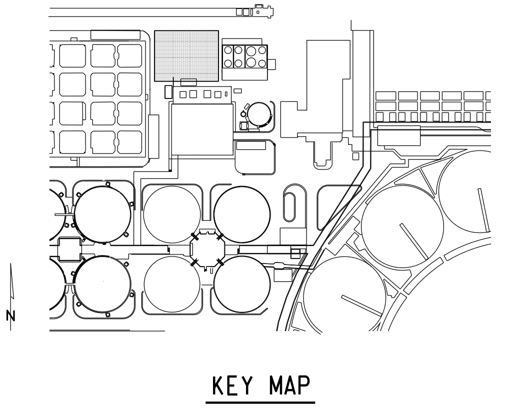
GENERAL NOTES:

REFER TO SPECIFICATION SECTION 16710 FOR FIRE ALARM SYSTEM REQUIREMENTS.

ALL WIRING SHALL BE IN CONDUIT, U.O.N. MINIMUM CONDUIT SIZE SHALL BE 3/4"C.

SHEET NOTES:

1. PROVIDE ADDRESSIBLE INTERFACE MODULE TO MONITOR GAS TURBINE GENERATOR FIRE ALARM AND FIRE/GAS TROUBLE CONTACTS. MOUNT EACH MODULE IN A 4" SQUARE X 2" DEEP JUNCTION BOX. PROVIDE TYPE MC-HL CABLE BETWEEN INTERFACE MODULE AND TURBINE CONTROL BOX.
2. SEE MECHANICAL DRAWINGS W28.20-M-802 FOR LOCATION OF DUCT MOUNTED SMOKE DETECTORS.



KEY MAP

3" ON ORIGINAL DOCUMENT
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PROJECT NO. 07688-01-03

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SD317A - PGS RENEWABLE ENERGY EXPANSION

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	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
FIRE ALARM PLAN

SCALE 3/16'=1'
DATE JAN2009
W28.20-E-701
DRAWING NUMBER
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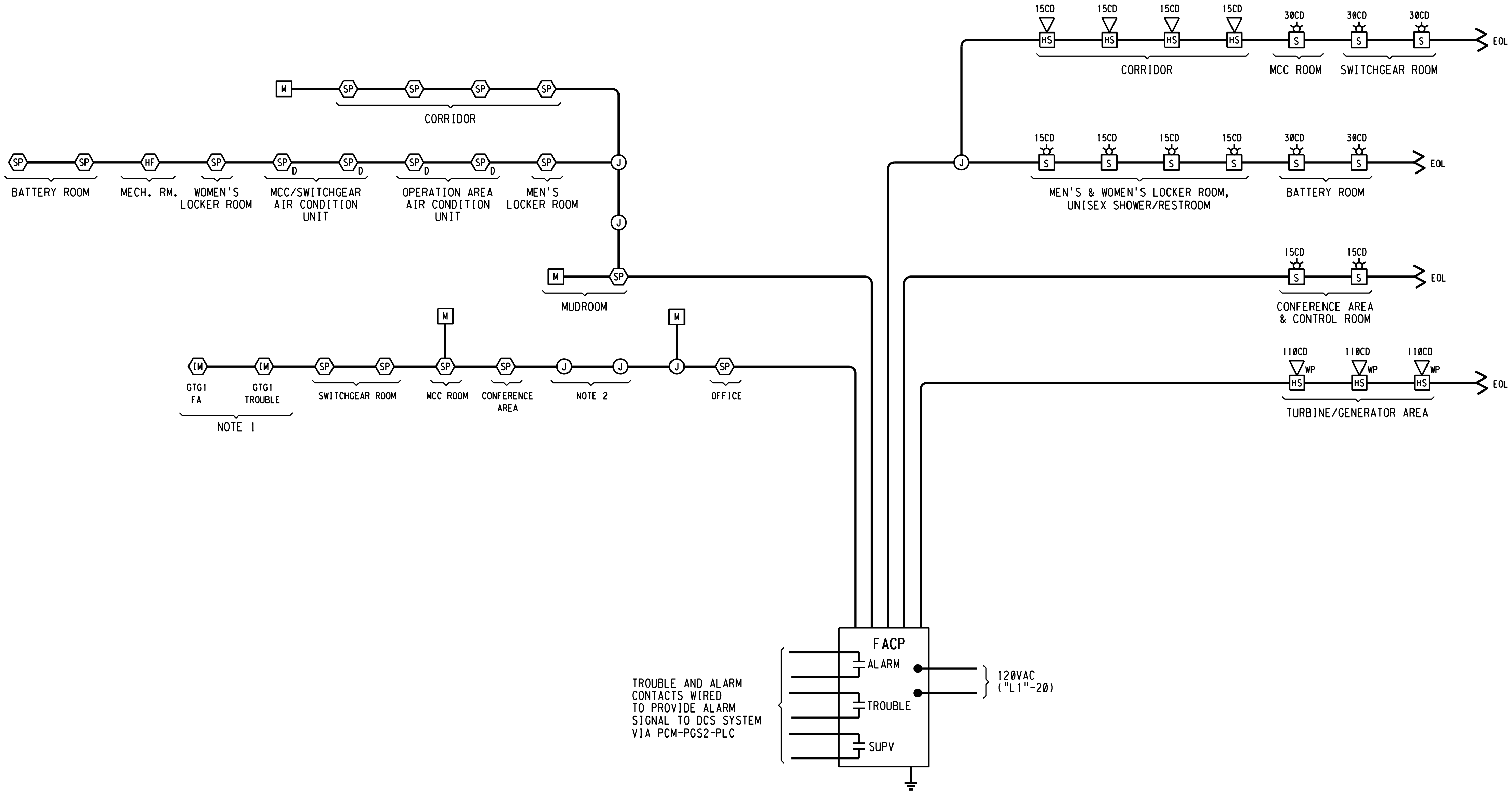
REF 9: REF9$FILENAME

GENERAL NOTES:

REFER TO SPECIFICATION SECTION 16710 FOR FIRE ALARM SYSTEM REQUIREMENTS.

SHEET NOTES:

1. PROVIDE ADDRESSIBLE INTERFACE MODULES TO MONITOR GAS TURBINE GENERATOR FIRE ALARM AND TROUBLE ALARM CONTACTS.
2. PROVIDE JUNCTION BOXES FOR FUTURE INTERFACE MODULES FOR GAS TURBINE GENERATOR GTG-2 TROUBLE AND FIRE ALARM CONTACTS.



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FIRE ALARM SYSTEM - RISER DIAGRAM

NONE

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SD317A - PGS RENEWABLE ENERGY EXPANSION

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PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.

RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
FIRE ALARM SYSTEM - RISER DIAGRAM

SCALE NONE
DATE JAN2009

W28.20-E-750
DRAWING NUMBER

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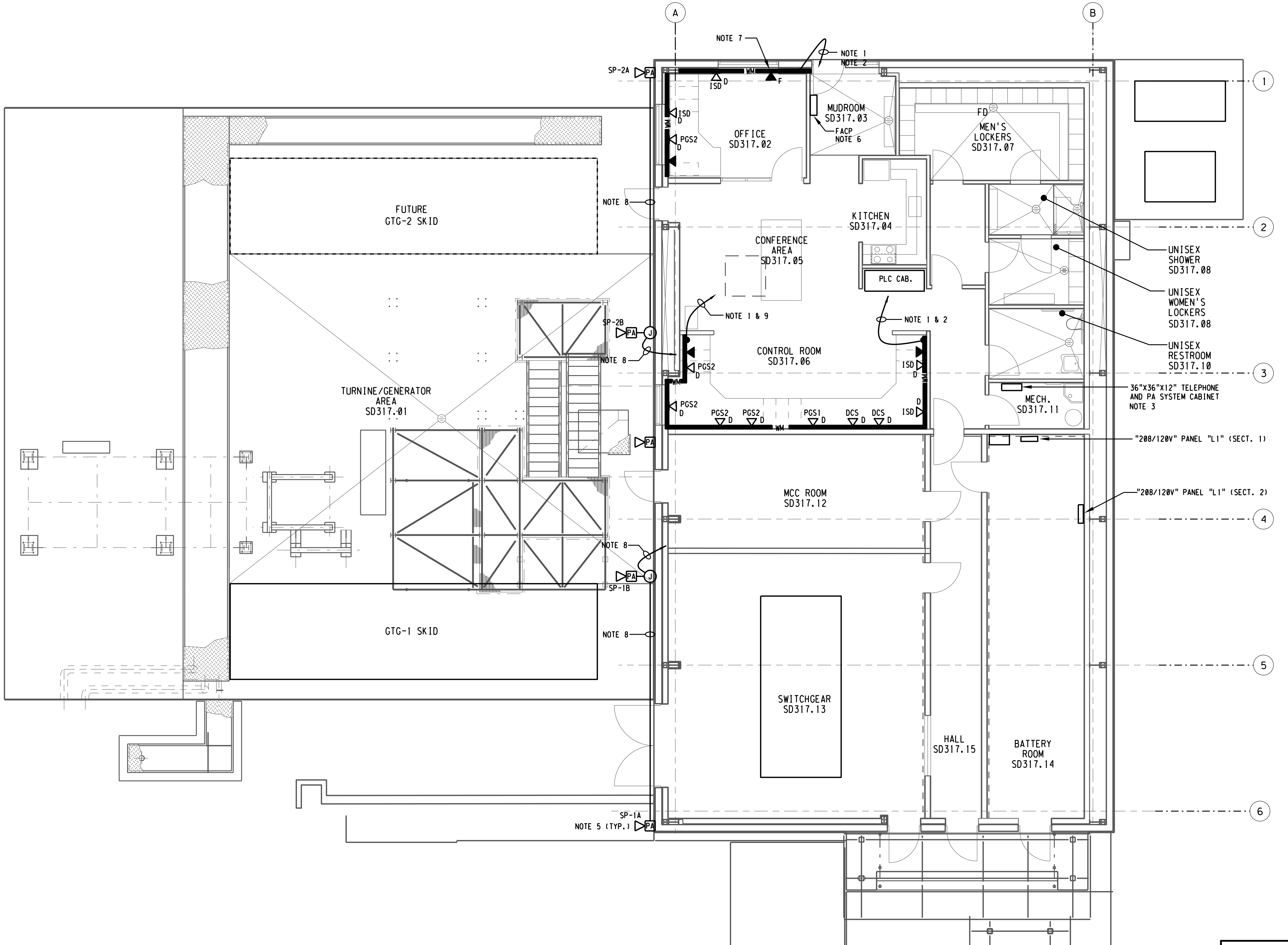
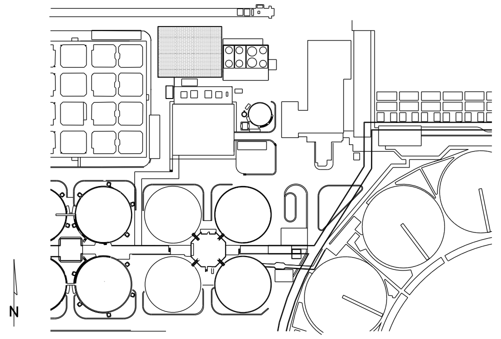


GENERAL NOTES:

SEE DRAWING W28.20-E-850 FOR PA SYSTEM BLOCK DIAGRAM.

SHEET NOTES:

1. PROVIDE 1"C TO CEILING SPACE WITH NETWORK CABLING TO PLC CABINET.
2. PROVIDE TELEPHONE CABLING TO TELEPHONE CABINET.
3. TELEPHONE AND PA SYSTEM CABINET WITH PAGING CONTROLLER, AMPLIFIER, AND VOICE ACTIVATED RELAY INSTALLED WITHIN.
4. NOT USED.
5. PA SYSTEM SPEAKER, BOGEN #SPT30A, MOUNTED AT +13'-6" A.F.F. (UNDER BUTLER BUILDING EAVE).
6. PROVIDE 3/4"C AND TELEPHONE CABLE FROM FACP TO TELEPHONE CABINET.
7. TELEPHONE OUTLET FOR FAX MACHINE.
8. PROVIDE 3/4"C AND CABLING TO AMPLIFIER IN PA SYSTEM CABINET WITHIN MECHNICAL ROOM.
9. PROVIDE 1"C TO PLC CABINET AND INSTALL CONTROLNET CABLING AS SHOWN ON DWG. SD317A-W28-I-560.



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SD317A - PGS RENEWABLE ENERGY EXPANSION

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
TELEPHONE, PA SYSTEM AND DATA COMMUNICATION PLAN

SCALE 3/16'=1'
DATE JAN2009

W28.20-E-801
DRAWING NUMBER

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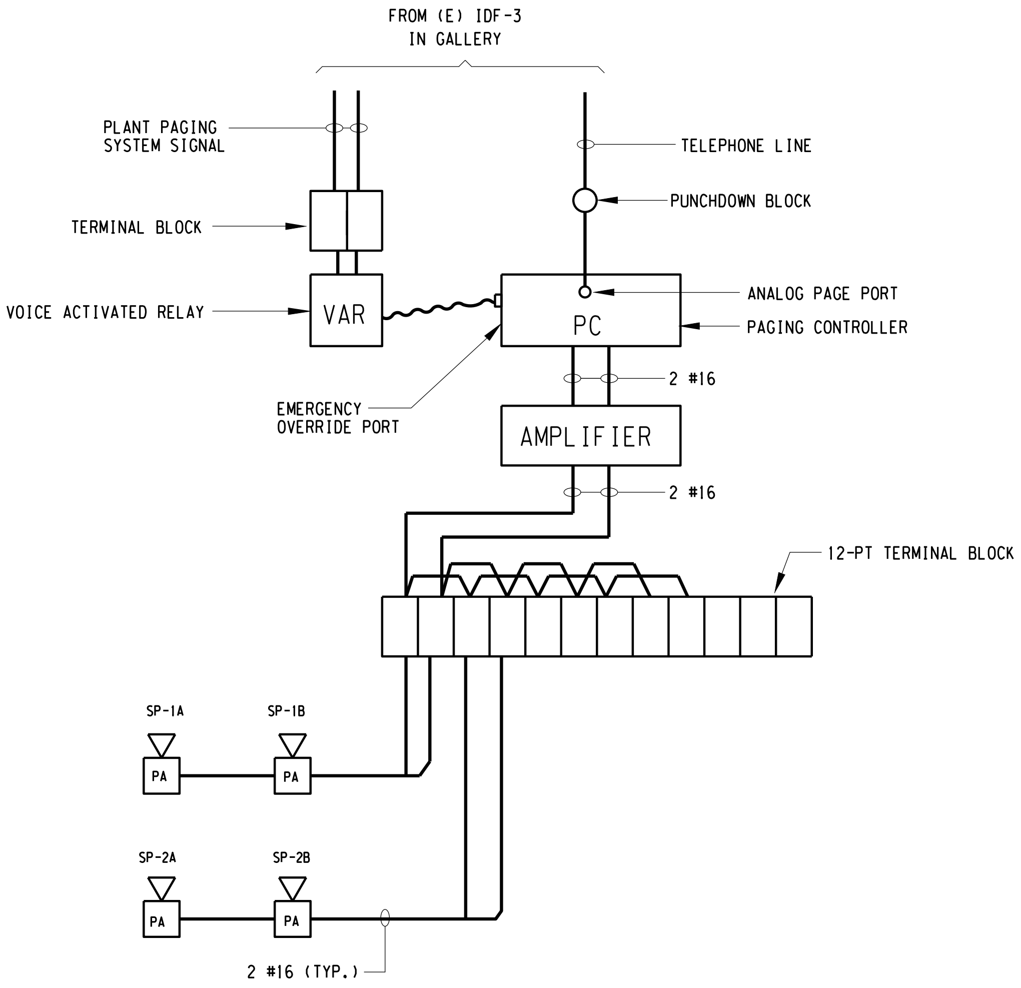
REV.



PGS 2 PA SYSTEM BLOCK DIAGRAM

NONE

3" ON ORIGINAL DOCUMENT
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	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PGS 2 BUILDING
PAGING SYSTEM BLOCK DIAGRAM

SCALE NONE
DATE JAN2009

W28.20-E-850
DRAWING NUMBER

1
REV.

USER: vuong
DATE: 19-SEP-2014 10:52
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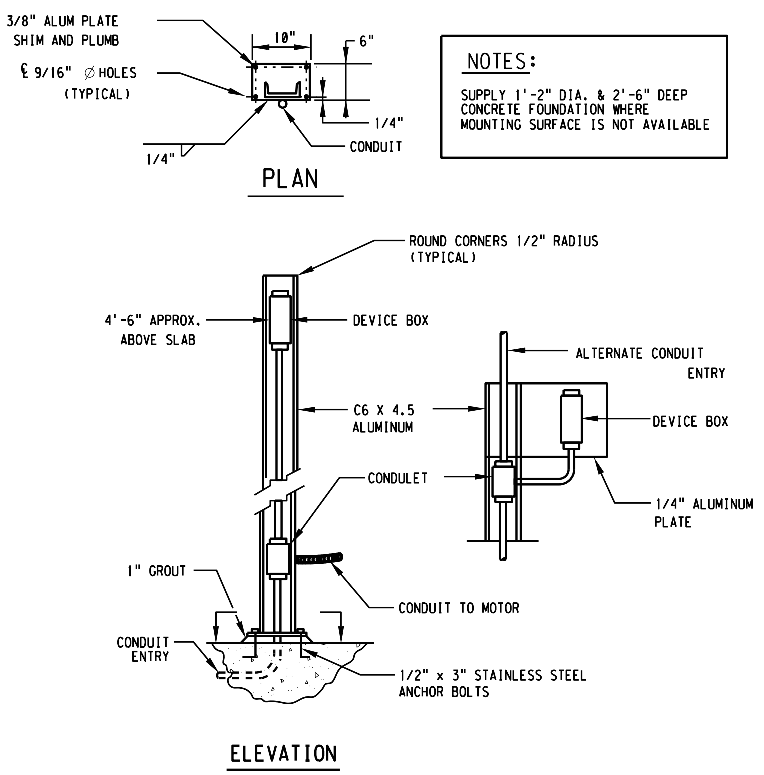


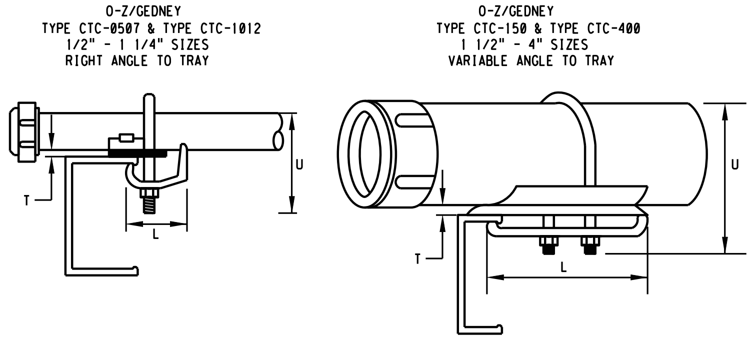
NOTES:

SUPPLY 1'-2" DIA. & 2'-6" DEEP CONCRETE FOUNDATION WHERE MOUNTING SURFACE IS NOT AVAILABLE

1 PUSHBUTTON STATION

-

NONE

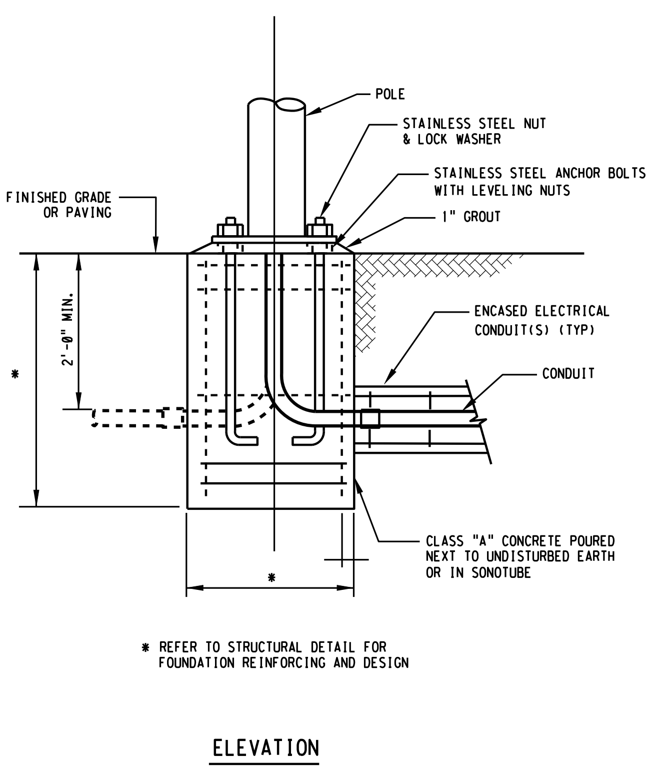


RSG TRADE SIZE (INCHES)	CATALOG NUMBER	U-BOLT & NUT SIZE	DIMENSIONS IN INCHES W	L	T	U	RECOMMENDED INS. TORQUE INCH - LBS.
1/2 - 3/4	CTC-0507	1/4 - 20	2 1/4	2 1/4	1/4	2 1/2	60
1 - 1 1/4	CTC-1012	5/16 - 18	2 7/8	2 1/4	1/4	3 1/4	115
1 1/2	CTC-150	5/16 - 18	3 7/8	3 1/2	3/8	3 1/2	115
2	CTC-200	3/8 - 16	4 1/2	4	3/8	4	190
2 1/2	CTC-250	3/8 - 16	5	4 1/2	3/8	4 1/2	190
3	CTC-300	3/8 - 16	5 5/8	5 1/8	3/8	5 1/4	190
3 1/2	CTC-350	3/8 - 16	6 1/8	5 1/2	3/8	5 3/4	190
4	CTC-400	3/8 - 16	6 5/8	6	3/8	6 1/4	190

2 RSG TO CABLE TRAY CLAMPS

-

NONE

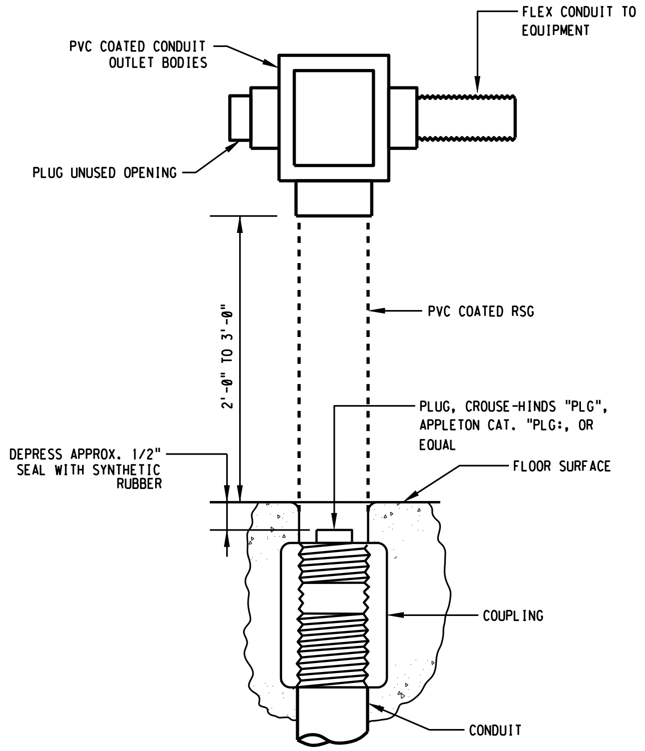


* REFER TO STRUCTURAL DETAIL FOR FOUNDATION REINFORCING AND DESIGN

3 AREA LIGHTING FIXTURE MOUNTING

-

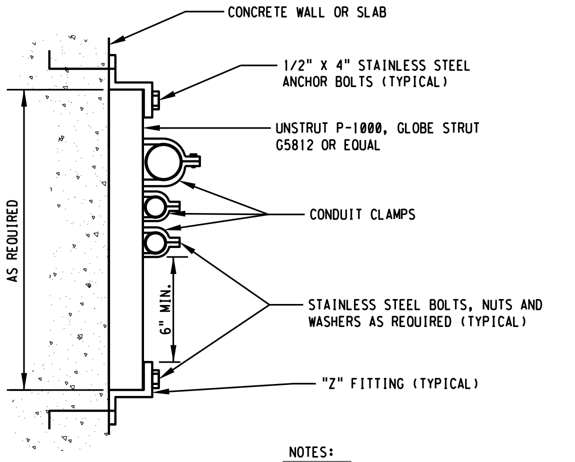
NONE



4 CONDUIT FLOOR STUB-UP

-

NONE


CONCRETE WALL OR SLAB
1/2" X 4" STAINLESS STEEL
ANCHOR BOLTS (TYPICAL)
UNISTRUT P-1000, GLOBE STRUT
G5812 OR EQUAL
CONDUIT CLAMPS
AS REQUIRED
6" MIN.
STAINLESS STEEL BOLTS, NUTS AND
WASHERS AS REQUIRED (TYPICAL)
"Z" FITTING (TYPICAL)

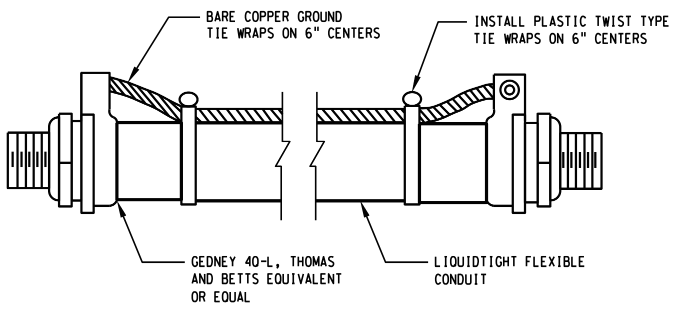
NOTES:

1. THIS DETAIL FOR BOTH VERTICAL AND HORIZONTAL MOUNTING.
2. CHANNEL AND ALL SUPPORT DEVICES TO BE HOT DIP GALVANIZED STEEL. FIELD COAT ALL CUTS, ETC. TO MATCH.
3. CHANNELS TO BE SPACED 5' MAXIMUM.

5 TYPICAL CONDUIT SUPPORTS

-

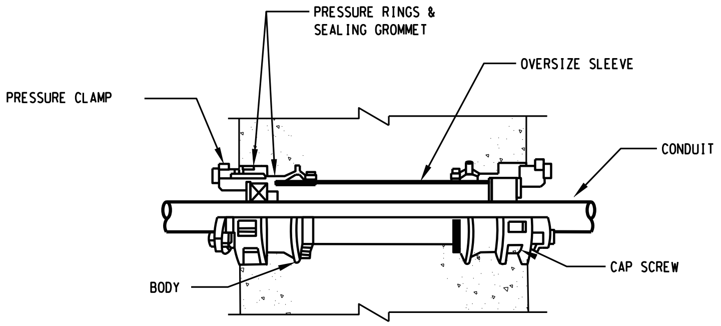
NONE



6 FLEXIBLE CONDUIT GROUNDING

-

NONE



NOTES:

1. USE O.Z. GEDNEY SEAL, TYPE "FSK" OR "WSK"

7 CONDUIT THRUWALL SEALS

-

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

ELECTRICAL DETAILS

SCALE NONE
DATE JAN2009

W28.20-E-901
DRAWING NUMBER

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REV.

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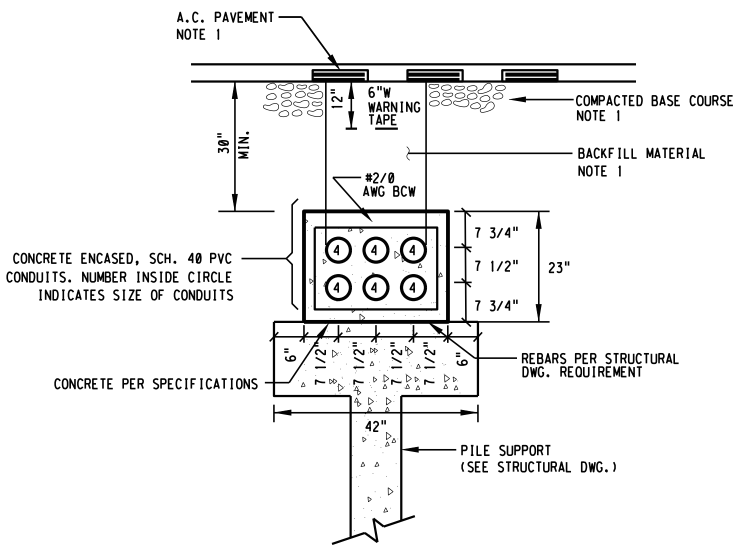
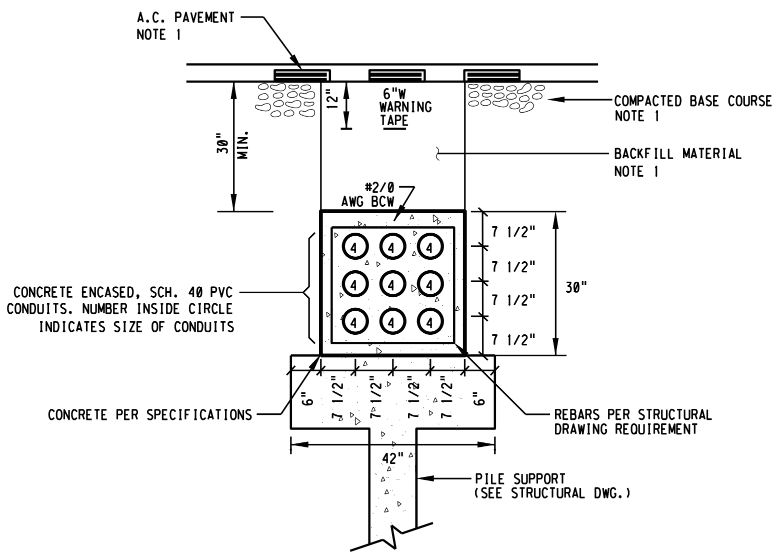

A.C. PAVEMENT
NOTE 1
6"W WARNING TAPE
12"
30" MIN.
COMPACTED BASE COURSE
NOTE 1
BACKFILL MATERIAL
NOTE 1
#2/0 AWG BCW
7 3/4"
7 1/2"
7 3/4"
23"
CONCRETE ENCASED, SCH. 40 PVC CONDUITS. NUMBER INSIDE CIRCLE INDICATES SIZE OF CONDUITS
4
REBARS PER STRUCTURAL DWG. REQUIREMENT
CONCRETE PER SPECIFICATIONS
6"
7 1/2"
7 1/2"
7 1/2"
7 1/2"
6"
42"
PILE SUPPORT (SEE STRUCTURAL DWG.)

NOTES:

1. REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR SURFACE, BACKFILL AND AGGREGATE BASE COURSE REQUIREMENTS.

1 HIGH VOLTAGE DUCTBANK
-

NONE

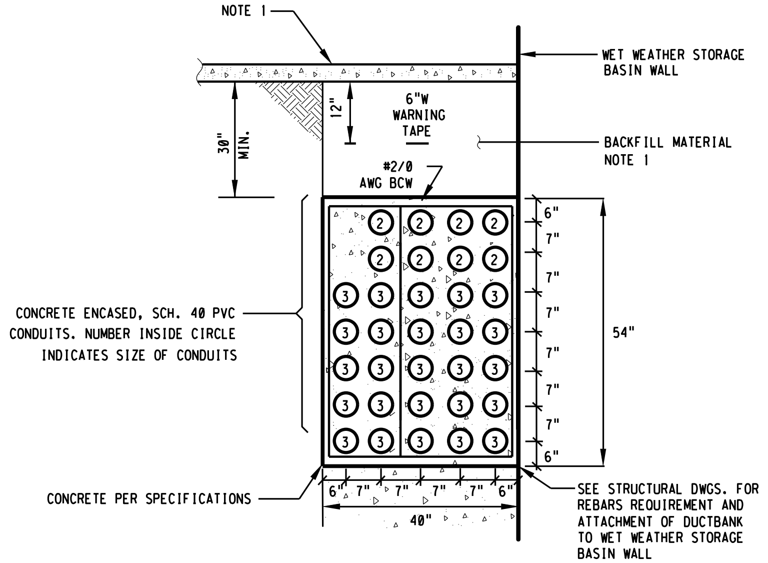

A.C. PAVEMENT
NOTE 1
6"W WARNING TAPE
12"
30" MIN.
COMPACTED BASE COURSE
NOTE 1
BACKFILL MATERIAL
NOTE 1
#2/0 AWG BCW
7 1/2"
7 1/2"
7 1/2"
7 1/2"
30"
CONCRETE ENCASED, SCH. 40 PVC CONDUITS. NUMBER INSIDE CIRCLE INDICATES SIZE OF CONDUITS
4
CONCRETE PER SPECIFICATIONS
REBARS PER STRUCTURAL DRAWING REQUIREMENT
6"
7 1/2"
7 1/2"
7 1/2"
7 1/2"
6"
42"
PILE SUPPORT (SEE STRUCTURAL DWG.)

NOTES:

1. REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR SURFACE, BACKFILL AND AGGREGATE BASE COURSE REQUIREMENTS.

2 HIGH VOLTAGE DUCTBANK
-

NONE

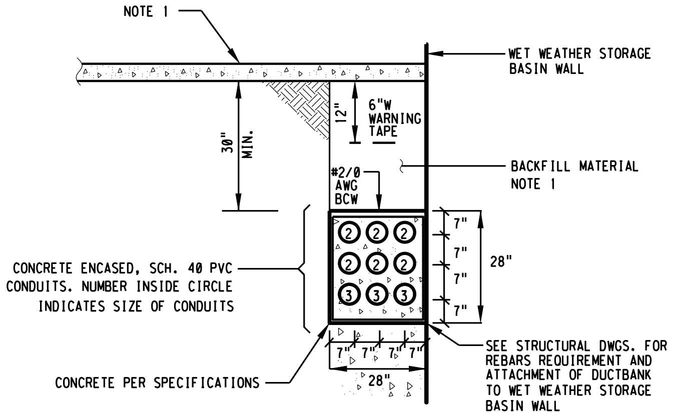

NOTE 1
WET WEATHER STORAGE BASIN WALL
12"
6"W WARNING TAPE
30" MIN.
BACKFILL MATERIAL
NOTE 1
#2/0 AWG BCW
6"
7"
7"
7"
7"
7"
7"
6"
54"
CONCRETE ENCASED, SCH. 40 PVC CONDUITS. NUMBER INSIDE CIRCLE INDICATES SIZE OF CONDUITS
2
3
CONCRETE PER SPECIFICATIONS
6"
7"
7"
7"
7"
6"
40"
SEE STRUCTURAL DWGS. FOR REBARS REQUIREMENT AND ATTACHMENT OF DUCTBANK TO WET WEATHER STORAGE BASIN WALL

NOTES:

1. REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR SURFACE, BACKFILL AND AGGREGATE BASE COURSE REQUIREMENTS.

3 LOW VOLTAGE DUCTBANK
-

NONE

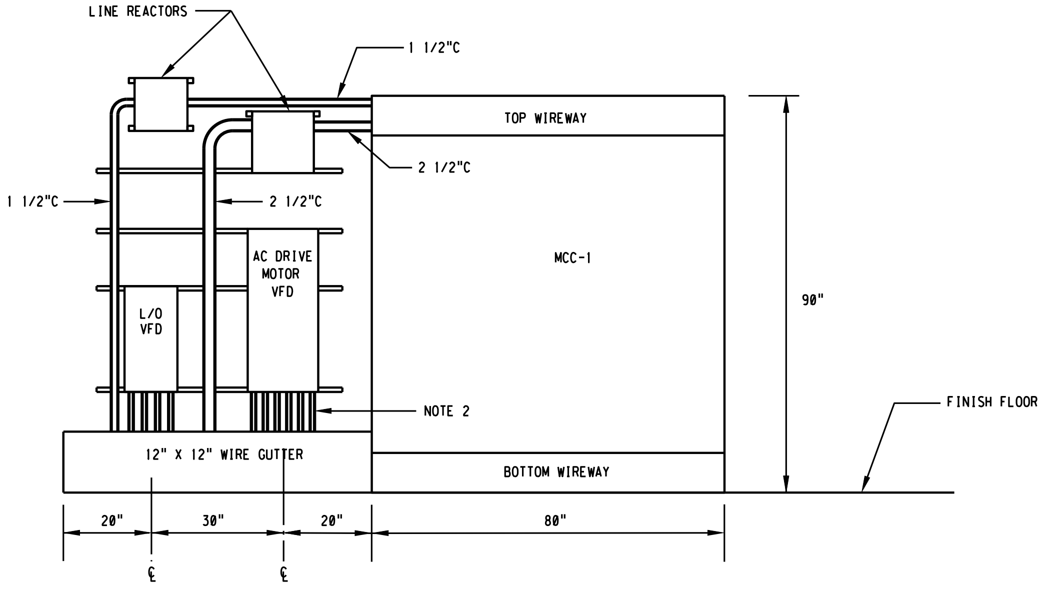

NOTE 1
WET WEATHER STORAGE BASIN WALL
12"
6"W WARNING TAPE
30" MIN.
BACKFILL MATERIAL
NOTE 1
#2/0 AWG BCW
7"
7"
7"
7"
28"
CONCRETE ENCASED, SCH. 40 PVC CONDUITS. NUMBER INSIDE CIRCLE INDICATES SIZE OF CONDUITS
2
3
CONCRETE PER SPECIFICATIONS
7"
7"
7"
7"
28"
SEE STRUCTURAL DWGS. FOR REBARS REQUIREMENT AND ATTACHMENT OF DUCTBANK TO WET WEATHER STORAGE BASIN WALL

NOTES:

1. REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR SURFACE, BACKFILL AND AGGREGATE BASE COURSE REQUIREMENTS.

4 LOW VOLTAGE DUCTBANK
-

NONE



NOTES:

1. VFDS AND LINE REACTORS ARE SUPPLIED BY GT SUPPLIER AND INSTALLED BY CONTRACTOR.
2. 12" NIPPLES, SIZES AND QUANTITY AS PER VFDS SUPPLIER REQUIREMENT.

5 ELEVATION- DETAIL MTG OF VFDS AND REACTORS
-

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

ELECTRICAL DETAILS

SCALE NONE
DATE JAN2009

W28.20-E-902
DRAWING NUMBER

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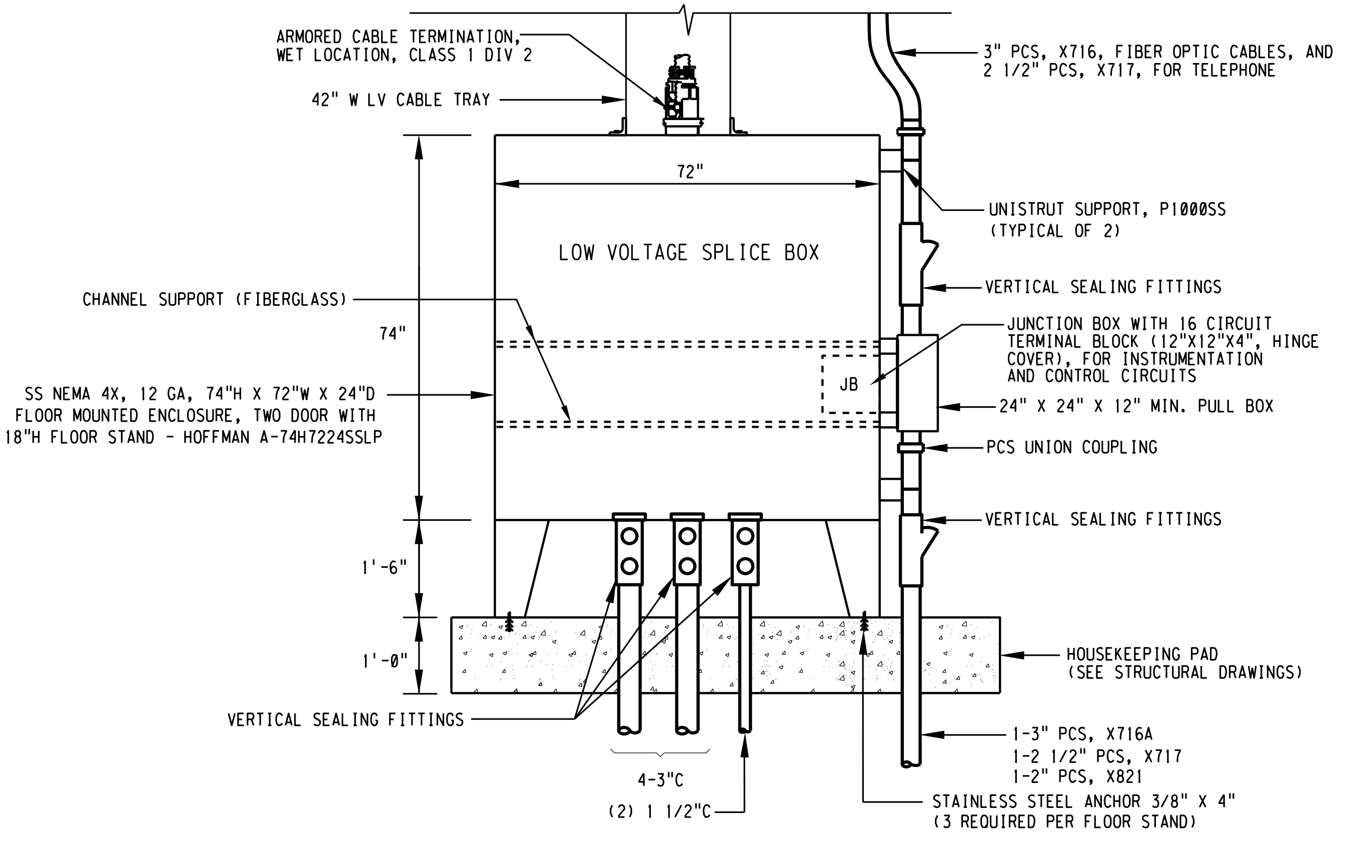
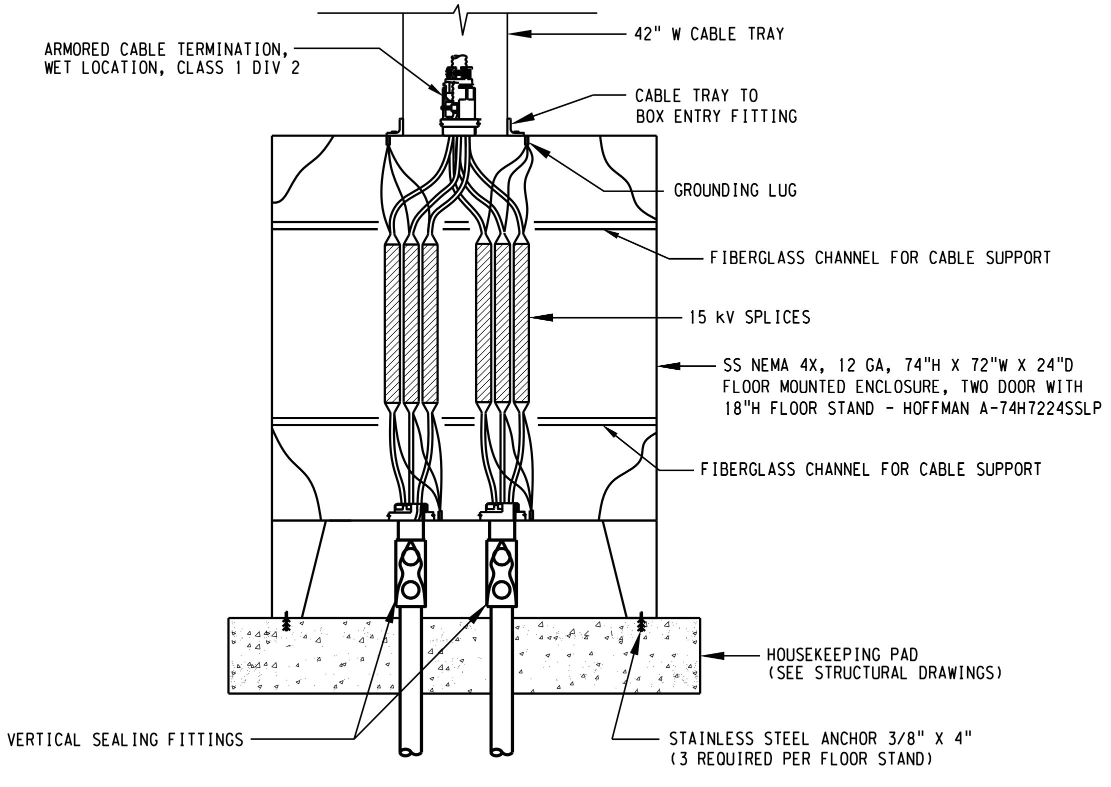

ARMORED CABLE TERMINATION, WET LOCATION, CLASS 1 DIV 2
42" W LV CABLE TRAY
3" PCS, X716, FIBER OPTIC CABLES, AND 2 1/2" PCS, X717, FOR TELEPHONE
72"
LOW VOLTAGE SPLICE BOX
UNISTRUT SUPPORT, P1000SS (TYPICAL OF 2)
VERTICAL SEALING FITTINGS
CHANNEL SUPPORT (FIBERGLASS)
74"
JUNCTION BOX WITH 16 CIRCUIT TERMINAL BLOCK (12"X12"X4", HINGE COVER), FOR INSTRUMENTATION AND CONTROL CIRCUITS
JB
SS NEMA 4X, 12 GA, 74"H X 72"W X 24"D FLOOR MOUNTED ENCLOSURE, TWO DOOR WITH 18"H FLOOR STAND - HOFFMAN A-74H7224SSLP
24" X 24" X 12" MIN. PULL BOX
PCS UNION COUPLING
VERTICAL SEALING FITTINGS
1'-6"
1'-0"
HOUSEKEEPING PAD (SEE STRUCTURAL DRAWINGS)
VERTICAL SEALING FITTINGS
1-3" PCS, X716A
1-2 1/2" PCS, X717
1-2" PCS, X821
4-3"C
(2) 1 1/2"C
STAINLESS STEEL ANCHOR 3/8" X 4" (3 REQUIRED PER FLOOR STAND)

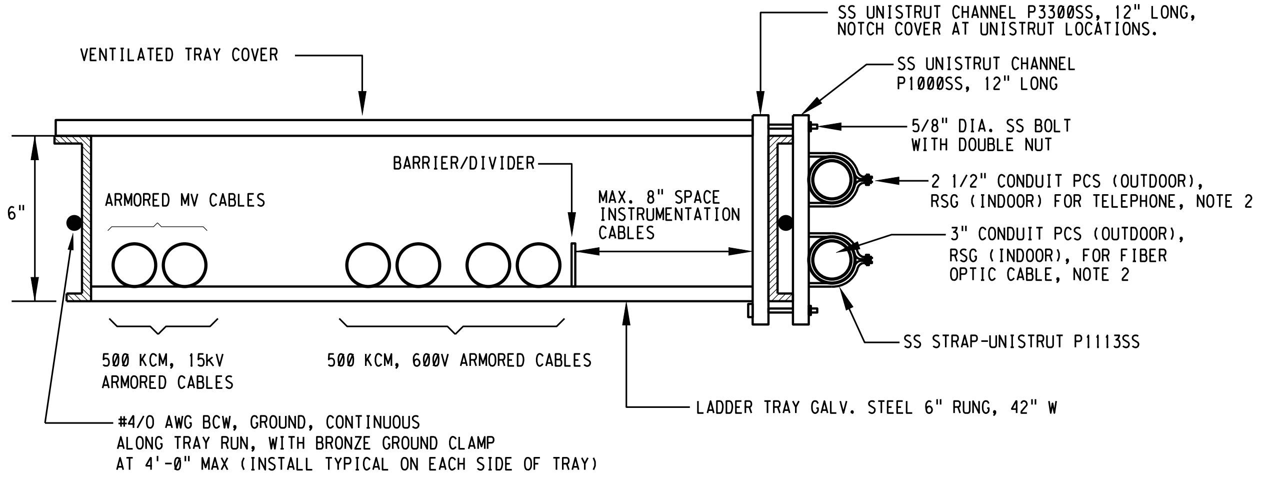
LOW VOLTAGE SPLICE BOX


ARMORED CABLE TERMINATION, WET LOCATION, CLASS 1 DIV 2
42" W CABLE TRAY
CABLE TRAY TO BOX ENTRY FITTING
GROUNDING LUG
FIBERGLASS CHANNEL FOR CABLE SUPPORT
15 kV SPLICES
SS NEMA 4X, 12 GA, 74"H X 72"W X 24"D FLOOR MOUNTED ENCLOSURE, TWO DOOR WITH 18"H FLOOR STAND - HOFFMAN A-74H7224SSLP
FIBERGLASS CHANNEL FOR CABLE SUPPORT
HOUSEKEEPING PAD (SEE STRUCTURAL DRAWINGS)
VERTICAL SEALING FITTINGS
STAINLESS STEEL ANCHOR 3/8" X 4" (3 REQUIRED PER FLOOR STAND)

MV SPLICE BOX

1 / - FRONT VIEWS OF BACK TO BACK SPLICE BOXES GAS CONDITIONING AREA (MV SPLICES SHOWN)

NONE

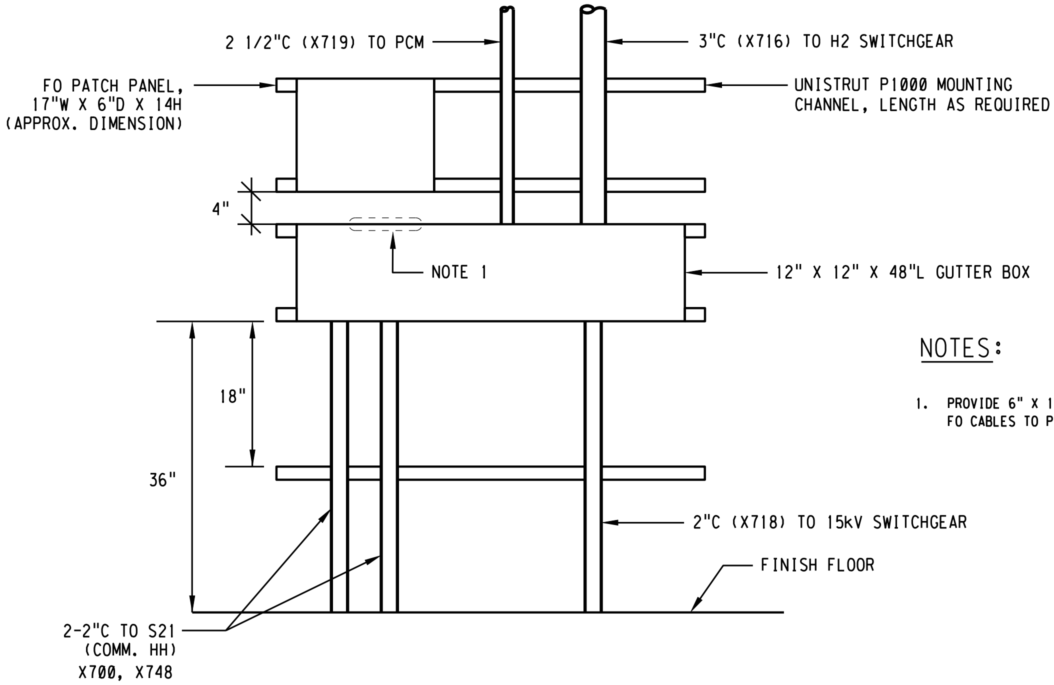

SS UNISTRUT CHANNEL P3300SS, 12" LONG, NOTCH COVER AT UNISTRUT LOCATIONS.
VENTILATED TRAY COVER
SS UNISTRUT CHANNEL P1000SS, 12" LONG
5/8" DIA. SS BOLT WITH DOUBLE NUT
BARRIER/DIVIDER
2 1/2" CONDUIT PCS (OUTDOOR), RSG (INDOOR) FOR TELEPHONE, NOTE 2
6"
ARMORED MV CABLES
MAX. 8" SPACE INSTRUMENTATION CABLES
3" CONDUIT PCS (OUTDOOR), RSG (INDOOR), FOR FIBER OPTIC CABLE, NOTE 2
SS STRAP-UNISTRUT P1113SS
500 KCM, 15kV ARMORED CABLES
500 KCM, 600V ARMORED CABLES
LADDER TRAY GALV. STEEL 6" RUNG, 42" W
#4/0 AWG BCW, GROUND, CONTINUOUS ALONG TRAY RUN, WITH BRONZE GROUND CLAMP AT 4'-0" MAX (INSTALL TYPICAL ON EACH SIDE OF TRAY)

NOTES:

1. PROVIDE CONDUIT SUPPORT AT 8'-0" MAXIMUM SPACING.
2. PROVIDE PULLING ELBOWS/MOGUL FITTINGS AS REQUIRED.

2 / - CABLES INSTALLATION ON TRAY SYSTEM (OUTDOOR)

NONE


2 1/2"C (X719) TO PCM
3"C (X716) TO H2 SWITCHGEAR
FO PATCH PANEL, 17"W X 6"D X 14H (APPROX. DIMENSION)
UNISTRUT P1000 MOUNTING CHANNEL, LENGTH AS REQUIRED (TYP.)
4"
NOTE 1
12" X 12" X 48"L GUTTER BOX
18"
36"
2"C (X718) TO 15kV SWITCHGEAR
FINISH FLOOR
2-2"C TO S21 (COMM. HH) X700, X748

NOTES:

1. PROVIDE 6" X 10" GROMMETED OVAL OPENING FOR FO CABLES TO PATCH PANEL BOTTOM ENTRY.

3 / - DETAIL-FO ENCLOSURE, WALL MOUNT IN SWGR ROOM

NONE

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT
DESIGN BY: ART CENIZAL
DRAWN BY: TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828 CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828 CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580 JULIO HERDOCIA

EBMUD
PROJECT MANAGER R.P.E.
RECOMMENDED: SR. ENGINEER R.P.E. No.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

ELECTRICAL DETAILS

SCALE NONE
DATE JAN2009
W28.20-E-903
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 28-OCT-2014 11:43
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\W28.20-E-903.dgn
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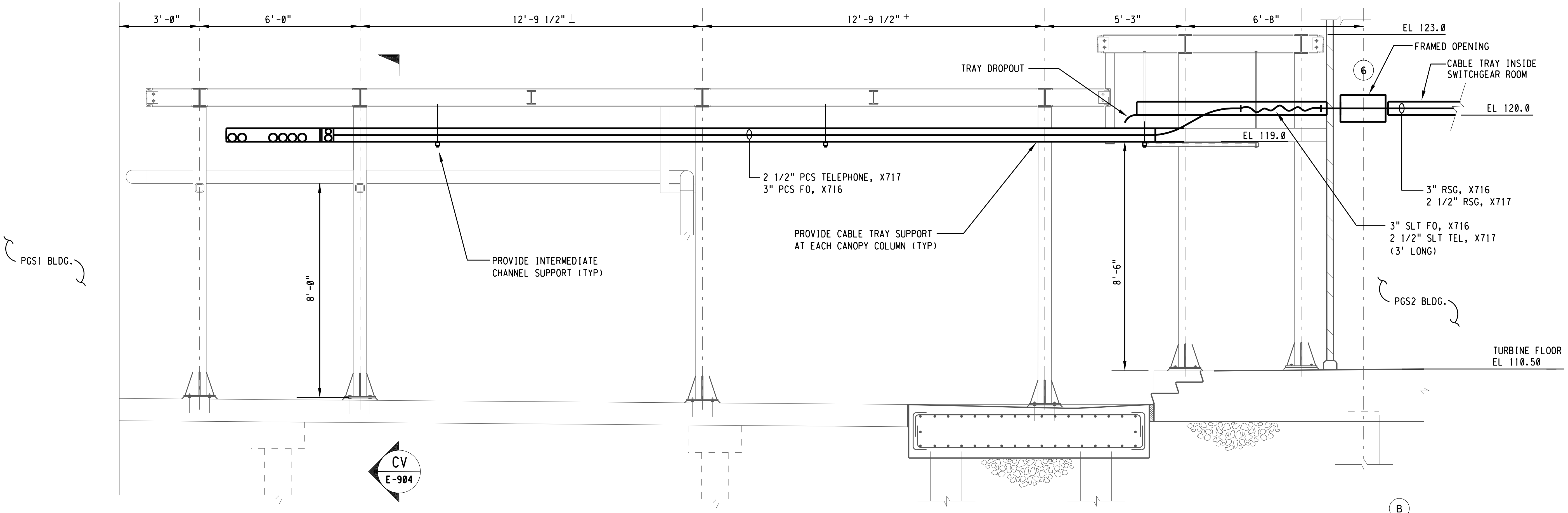
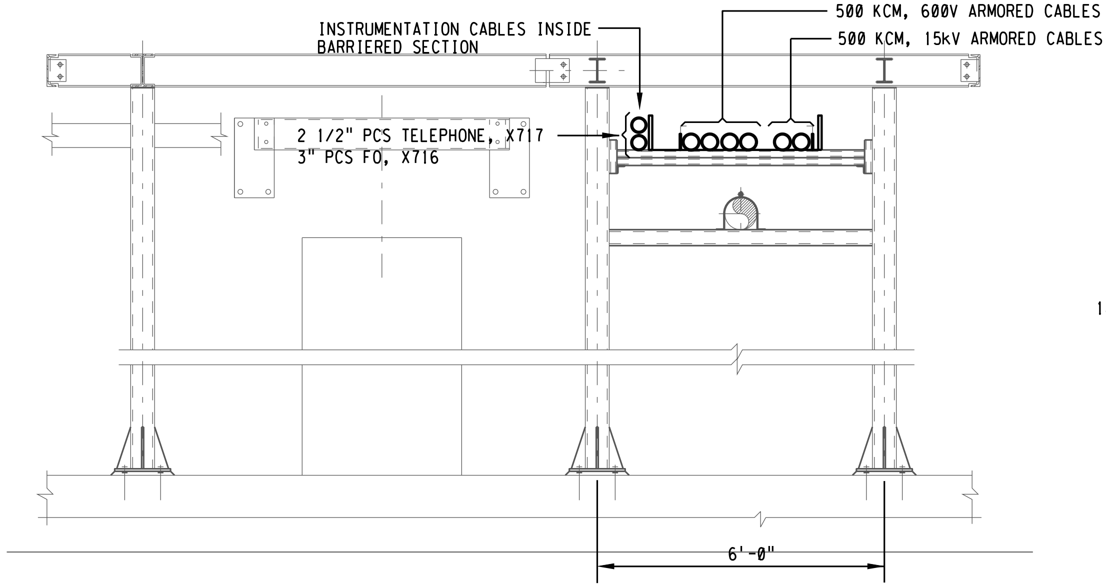
REF 9: REF9$FILENAME



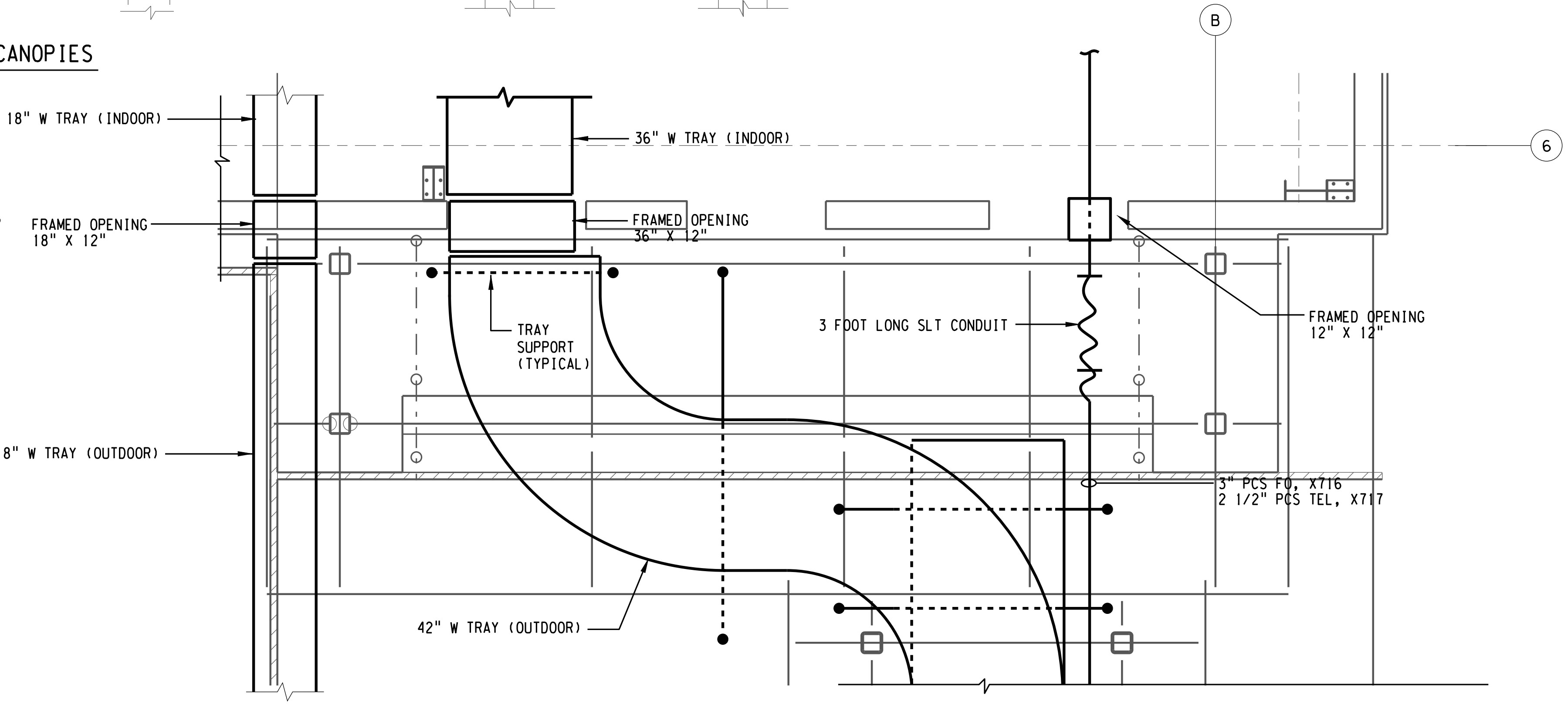
CN E-904 ELEVATION - CABLE TRAYS THRU BUILDING WALL AND BELOW CANOPIES

1/2"=1'


500 KCM, 600V ARMORED CABLES
INSTRUMENTATION CABLES INSIDE
BARRIERED SECTION
500 KCM, 15kV ARMORED CABLES
2 1/2" PCS TELEPHONE, X717
3" PCS FO, X716
6'-0"

CV E-904 SECTION

3/4"=1'



1 E-904 PLAN VIEW - CABLE TRAY UNDER UPPER CANOPY

1/2"=1'

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
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NO.	DATE	REVISION		BY	REC.	APP.
△	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.

RECOMMENDED:
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SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
CABLE TRAYS THRU BUILDING WALL AND BELOW CANOPIES
SECTIONS AND DETAILS

SCALE AS SHOWN
DATE JAN2009

W28.20-E-904
DRAWING NUMBER

1
REV.

USER: vuong
DATE: 19-SEP-2014 10:59
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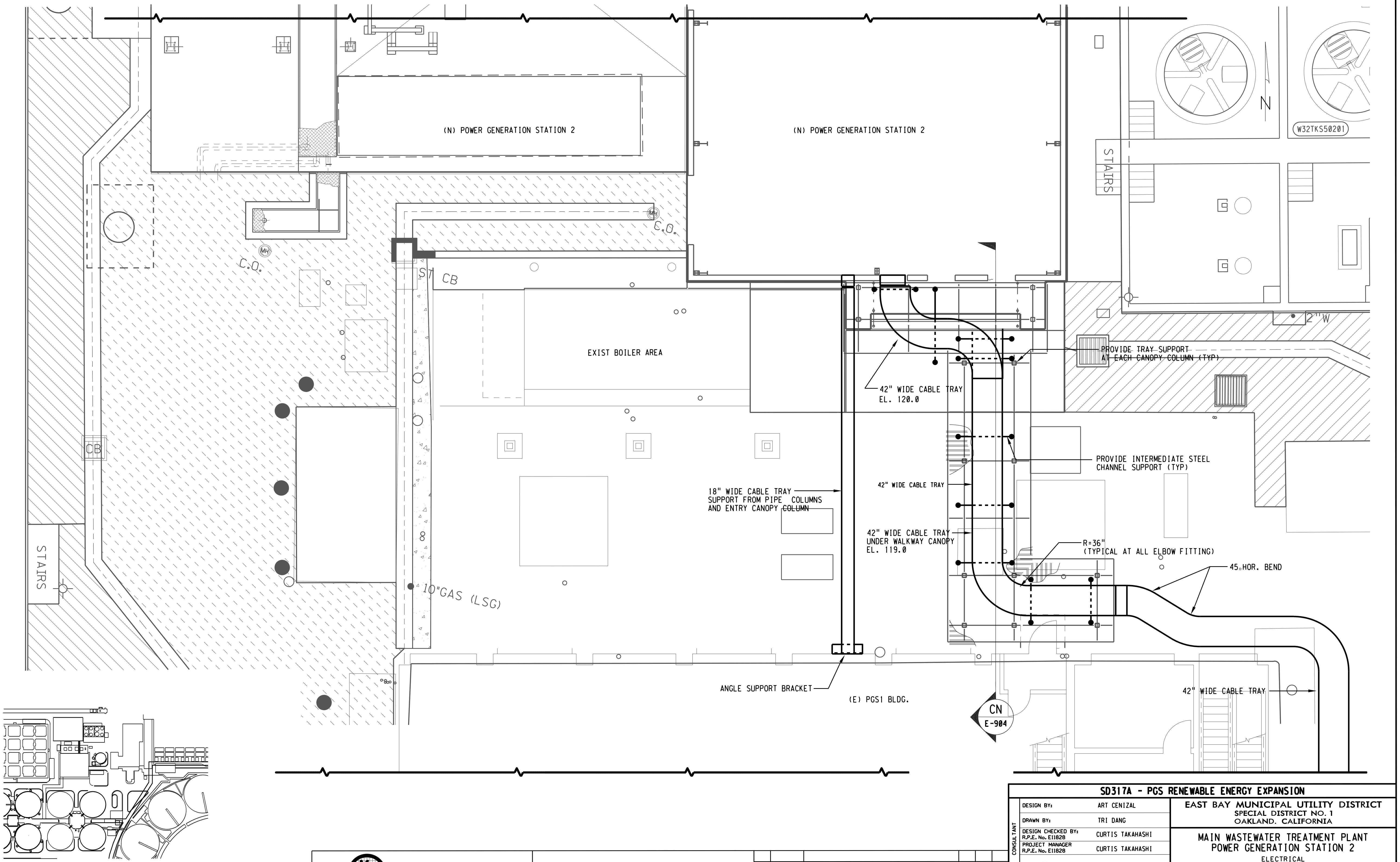
(N) POWER GENERATION STATION 2
(N) POWER GENERATION STATION 2
N
W32TKS50201
STAIRS
C.O.
C.O.
MH
MH
ST CB
EXIST BOILER AREA
PROVIDE TRAY SUPPORT AT EACH CANOPY COLUMN (TYP)
42" WIDE CABLE TRAY EL. 120.0
CB
PROVIDE INTERMEDIATE STEEL CHANNEL SUPPORT (TYP)
42" WIDE CABLE TRAY
18" WIDE CABLE TRAY SUPPORT FROM PIPE COLUMNS AND ENTRY CANOPY COLUMN
42" WIDE CABLE TRAY UNDER WALKWAY CANOPY EL. 119.0
R=36" (TYPICAL AT ALL ELBOW FITTING)
45° HOR. BEND
STAIRS
10"GAS (LSG)
2"W
ANGLE SUPPORT BRACKET
(E) PGS1 BLDG.
42" WIDE CABLE TRAY
CN
E-904
N

KEY MAP

3" ON ORIGINAL DOCUMENT
0 1 2 3

USER: vuong
DATE: 19-SEP-2014 11:02
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\PGS2_Rec\E83 [illegible] with NEW DRAWING NAME_9-4-14\W2820E905.r01

PLOT SCALE: 10.713583:1

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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

engineers, inc.
3350 scott blvd., bldg. 11
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FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT		
DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD	
PROJECT MANAGER R.P.E.	
RECOMMENDED: SR. ENGINEER R.P.E. No.	

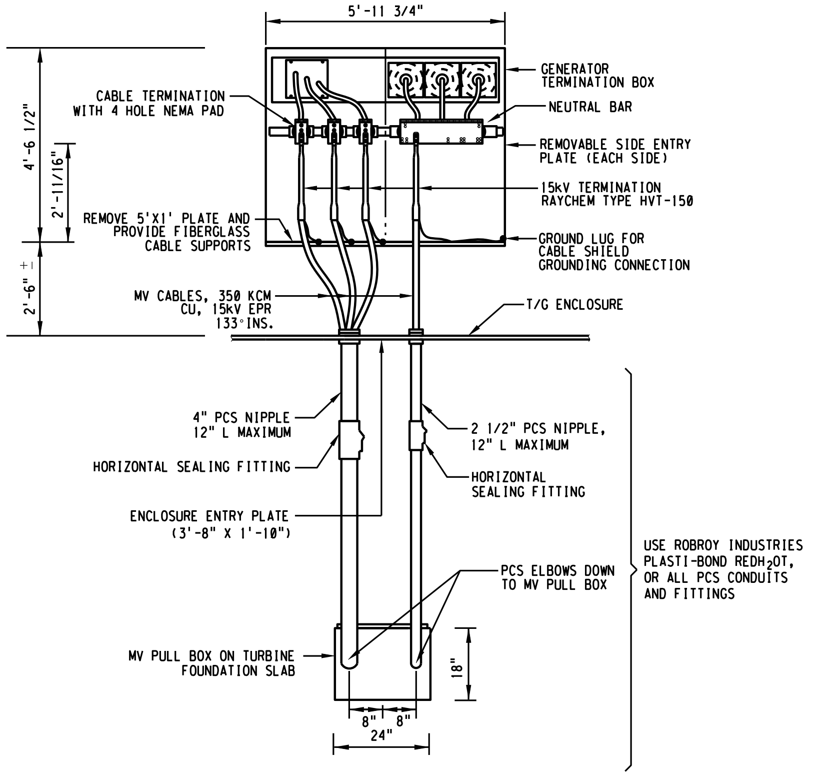
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
PARTIAL CABLE TRAY PLAN
BETWEEN PGS 2 AND PGS 1 BUILDINGS

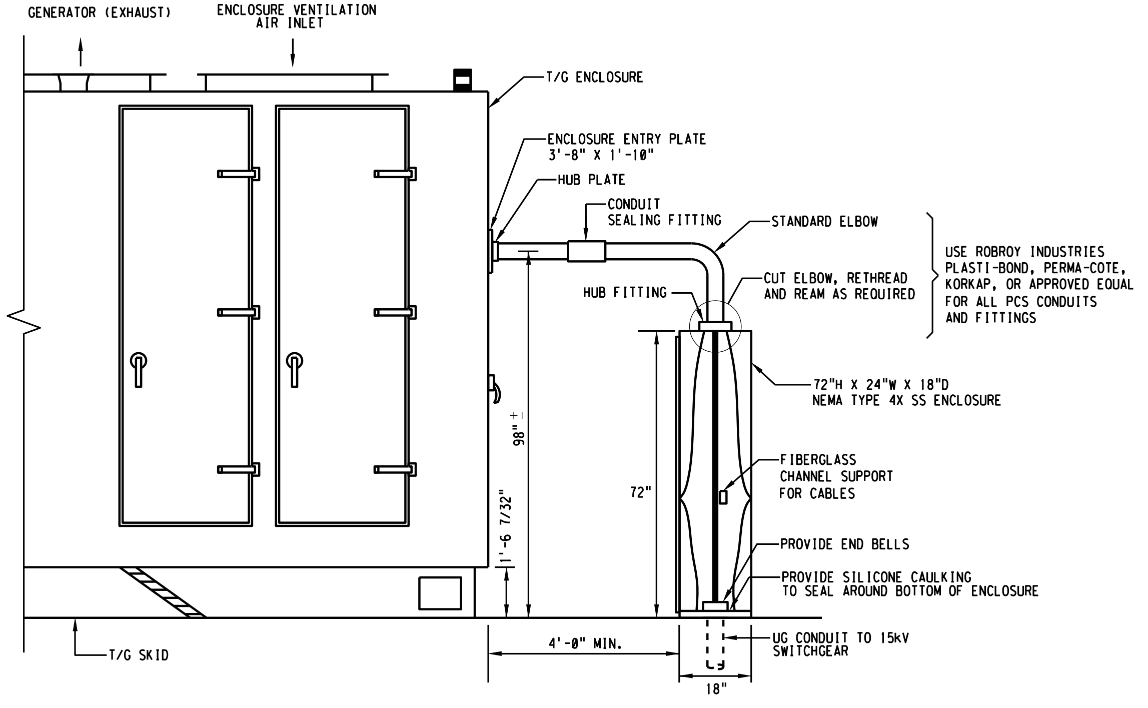
SCALE 3/16'=1'
DATE JAN2009

W28.20-E-905
DRAWING NUMBER

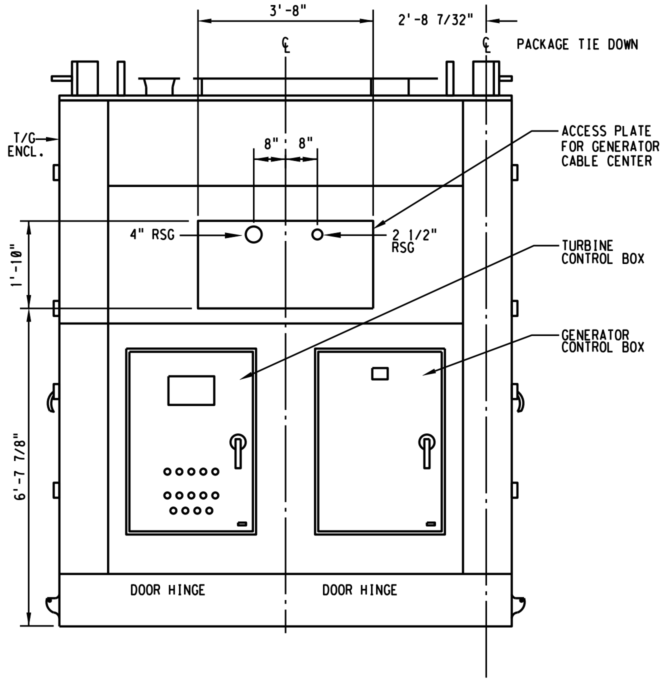
1
REV.


5'-11 3/4"
GENERATOR TERMINATION BOX
NEUTRAL BAR
CABLE TERMINATION WITH 4 HOLE NEMA PAD
REMOVABLE SIDE ENTRY PLATE (EACH SIDE)
15kV TERMINATION RAYCHEM TYPE HVT-150
4'-6 1/2"
2'-11/16"
REMOVE 5'X1' PLATE AND PROVIDE FIBERGLASS CABLE SUPPORTS
GROUND LUG FOR CABLE SHIELD GROUNDING CONNECTION
2'-6" ±
MV CABLES, 350 KCM CU, 15kV EPR 133%INS.
T/G ENCLOSURE
4" PCS NIPPLE 12" L MAXIMUM
2 1/2" PCS NIPPLE, 12" L MAXIMUM
HORIZONTAL SEALING FITTING
HORIZONTAL SEALING FITTING
ENCLOSURE ENTRY PLATE (3'-8" X 1'-10")
USE ROBROY INDUSTRIES PLASTI-BOND REDH2OT, OR ALL PCS CONDUITS AND FITTINGS
PCS ELBOWS DOWN TO MV PULL BOX
MV PULL BOX ON TURBINE FOUNDATION SLAB
18"
8"
8"
24"

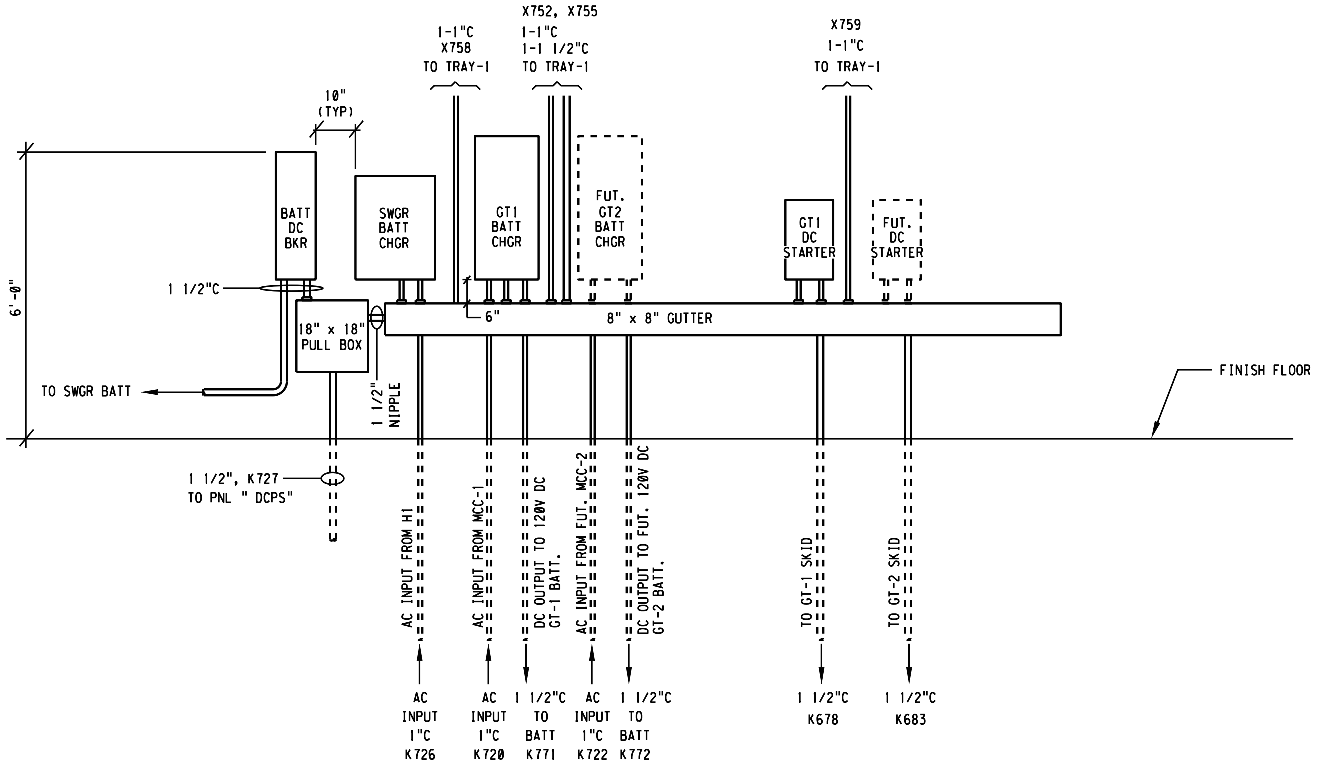
1 PLAN
-
NONE


GENERATOR (EXHAUST)
ENCLOSURE VENTILATION AIR INLET
T/G ENCLOSURE
ENCLOSURE ENTRY PLATE 3'-8" X 1'-10"
HUB PLATE
CONDUIT SEALING FITTING
STANDARD ELBOW
USE ROBROY INDUSTRIES PLASTI-BOND, PERMA-COTE, KORKAP, OR APPROVED EQUAL FOR ALL PCS CONDUITS AND FITTINGS
HUB FITTING
CUT ELBOW, RETHREAD AND REAM AS REQUIRED
72"H X 24"W X 18"D NEMA TYPE 4X SS ENCLOSURE
98" ±
72"
1'-6 7/32"
FIBERGLASS CHANNEL SUPPORT FOR CABLES
PROVIDE END BELLS
PROVIDE SILICONE CAULKING TO SEAL AROUND BOTTOM OF ENCLOSURE
T/G SKID
4'-0" MIN.
UG CONDUIT TO 15kV SWITCHGEAR
18"

2 SIDE ELEVATION
-
NONE



3 T/G AFT END ELEVATION
-
NONE



4 BATTERY CHARGER AND DC STARTER MOUNITNG DETAIL
-
NONE

USER: vuong PLOT SCALE: 4.017992:1
DATE: 19-SEP-2014 11:03
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\REF_Rec[illegible]with NEW DRAWING NAME_9-4-14\W2820E906.r01

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REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 7: REF7$FILENAME
REF 8: REF8$FILENAME
REF 9: REF9$FILENAME

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT

DESIGN BY:	ART CENIZAL
DRAWN BY:	TRI DANG
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA

EBMUD

PROJECT MANAGER
R.P.E.
RECOMMENDED:
SR. ENGINEER
R.P.E. No.

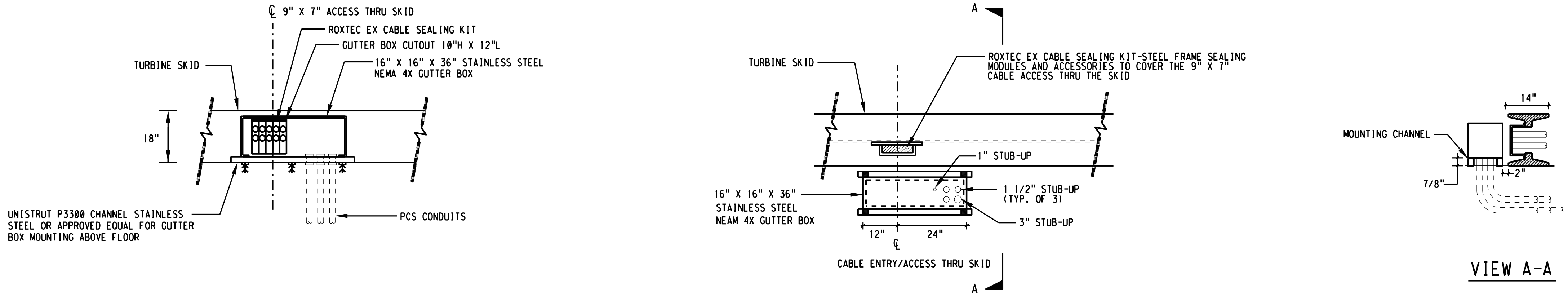
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
GENERATOR CABLE TERMINATION DETAIL AND
BATTERY CHARGER/DC STARTER MOUNTING DETAIL

SCALE NONE
DATE JAN2009

W28.20-E-906
DRAWING NUMBER

1
REV.


℄ 9" X 7" ACCESS THRU SKID
ROXTEC EX CABLE SEALING KIT
GUTTER BOX CUTOUT 10"H X 12"L
16" X 16" X 36" STAINLESS STEEL NEMA 4X GUTTER BOX
TURBINE SKID
18"
UNISTRUT P3300 CHANNEL STAINLESS STEEL OR APPROVED EQUAL FOR GUTTER BOX MOUNTING ABOVE FLOOR
PCS CONDUITS
A
TURBINE SKID
ROXTEC EX CABLE SEALING KIT-STEEL FRAME SEALING MODULES AND ACCESSORIES TO COVER THE 9" X 7" CABLE ACCESS THRU THE SKID
1" STUB-UP
1 1/2" STUB-UP (TYP. OF 3)
3" STUB-UP
16" X 16" X 36" STAINLESS STEEL NEAM 4X GUTTER BOX
12"
24"
℄
CABLE ENTRY/ACCESS THRU SKID
A
14"
MOUNTING CHANNEL
7/8"
2"

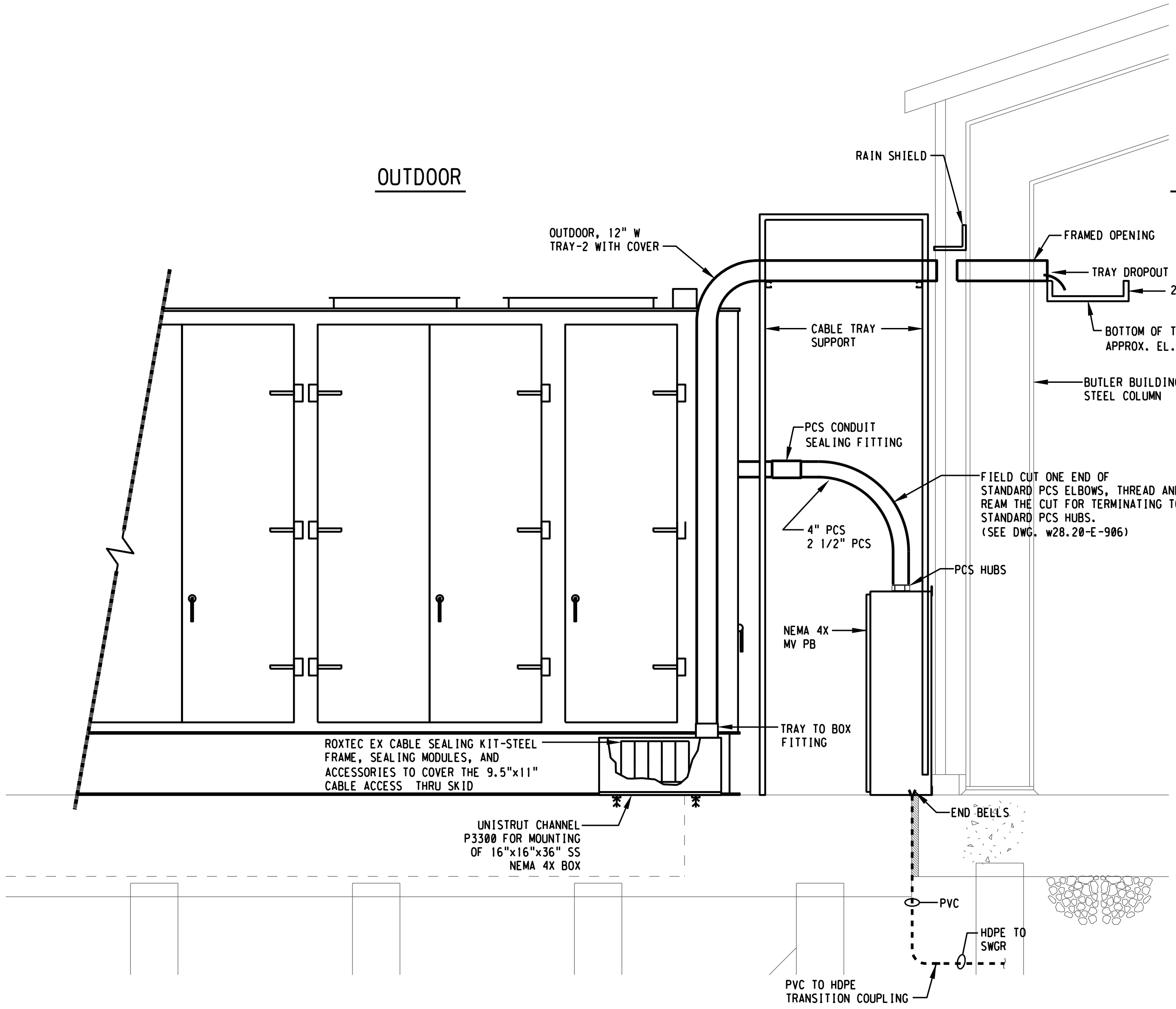
ELEVATION

PLAN

VIEW A-A

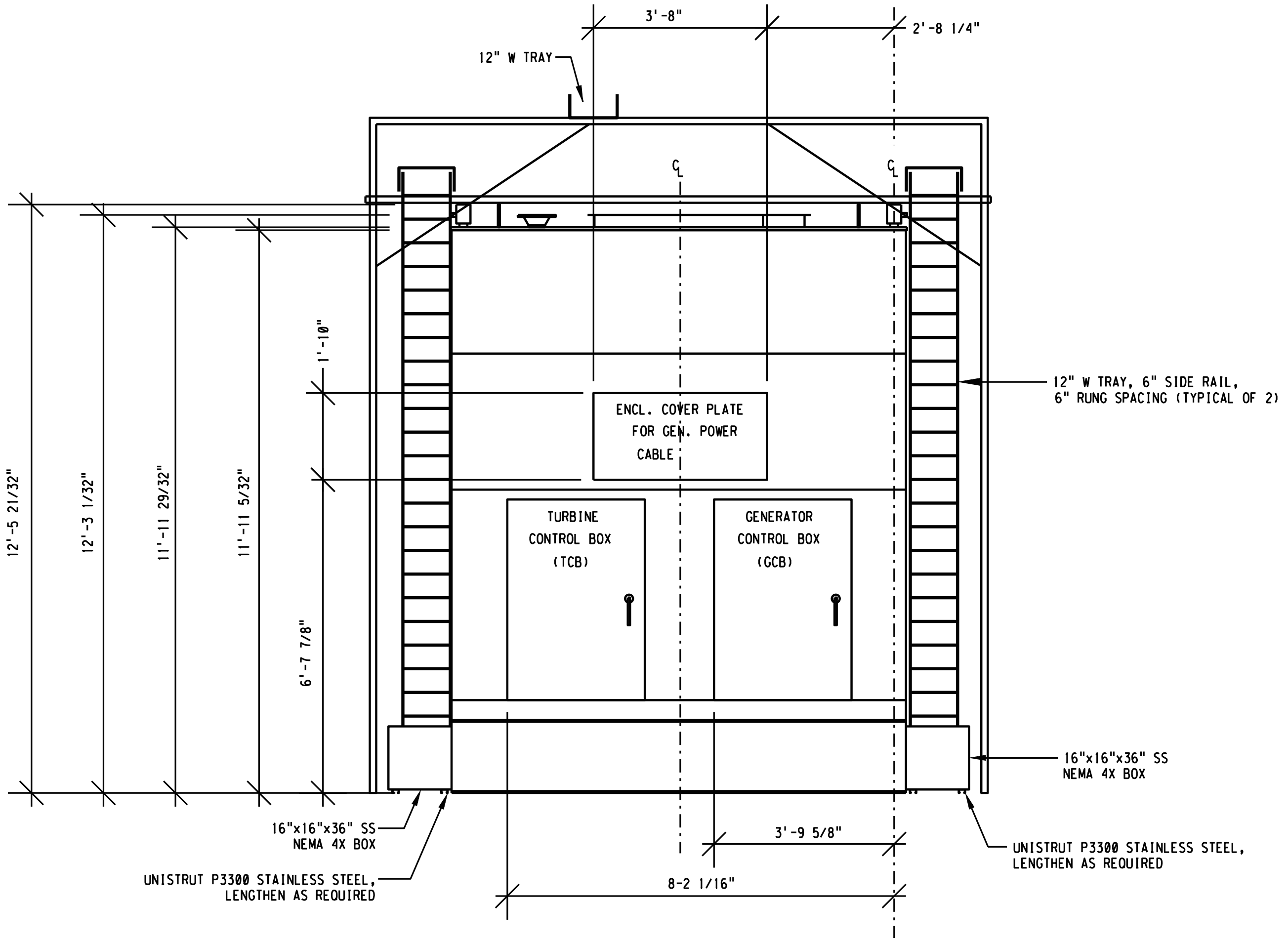
1 CABLE ENTRY DETAIL

- NONE (FOR AC L.O. TANK HEATER, DC BACK-UP LUBE OIL PUMP, ENCLOSURE LIGHTING, AC STARTER MOTOR, AC MAIN LUBE OIL PUMP).


OUTDOOR
INDOOR
RAIN SHIELD
OUTDOOR, 12" W TRAY-2 WITH COVER
FRAMED OPENING
TRAY DROPOUT
24" W TRAY-1
CABLE TRAY SUPPORT
BOTTOM OF TRAY AT APPROX. EL.12' AFF
BUTLER BUILDING STEEL COLUMN
PCS CONDUIT SEALING FITTING
FIELD CUT ONE END OF STANDARD PCS ELBOWS, THREAD AND REAM THE CUT FOR TERMINATING TO STANDARD PCS HUBS. (SEE DWG. W28.20-E-906)
4" PCS
2 1/2" PCS
PCS HUBS
NEMA 4X MV PB
ROXTEC EX CABLE SEALING KIT-STEEL FRAME, SEALING MODULES, AND ACCESSORIES TO COVER THE 9.5"x11" CABLE ACCESS THRU SKID
TRAY TO BOX FITTING
UNISTRUT CHANNEL P3300 FOR MOUNTING OF 16"x16"x36" SS NEMA 4X BOX
END BELLS
PVC
HDPE TO SWGR
PVC TO HDPE TRANSITION COUPLING

2 LEFT SIDE ELEVATION

- NONE


3'-8"
2'-8 1/4"
12" W TRAY
℄
℄
1'-10"
12" W TRAY, 6" SIDE RAIL, 6" RUNG SPACING (TYPICAL OF 2)
ENCL. COVER PLATE FOR GEN. POWER CABLE
TURBINE CONTROL BOX (TCB)
GENERATOR CONTROL BOX (GCB)
12'-5 21/32"
12'-3 1/32"
11'-11 29/32"
11'-11 5/32"
6'-7 7/8"
16"x16"x36" SS NEMA 4X BOX
16"x16"x36" SS NEMA 4X BOX
3'-9 5/8"
8-2 1/16"
UNISTRUT P3300 STAINLESS STEEL, LENGTHEN AS REQUIRED
UNISTRUT P3300 STAINLESS STEEL, LENGTHEN AS REQUIRED

AFT END EVEVATION

USER: vuong PLOT SCALE: 4.006629:1
DATE: 28-OCT-2014 13:43
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[illegible]FILENAME REF 6: REF6$FILENAME REF 9: REF9$FILENAME

3" ON ORIGINAL DOCUMENT
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carollo

NO.	DATE	REVISION		BY	REC.	APP.
1	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		

NONE

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
TURBINE SKID CABLE ENTRIES
DETAILS

SHEET NO. 342

SCALE NONE
DATE JAN2009

W28.20-E-907
DRAWING NUMBER

1
REV.

USER: vuong
DATE: 19-SEP-2014 11:07
FILE: M:\08688-01-05_PGS2-DRAWINGS-LATEST-REVISION\MICROSTATION FILES\Sheets\RE_RecBEB30\drawing with NEW DRAWING NAME_9-4-14\W2820E908.r02
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REF 2: REF2$FILENAME
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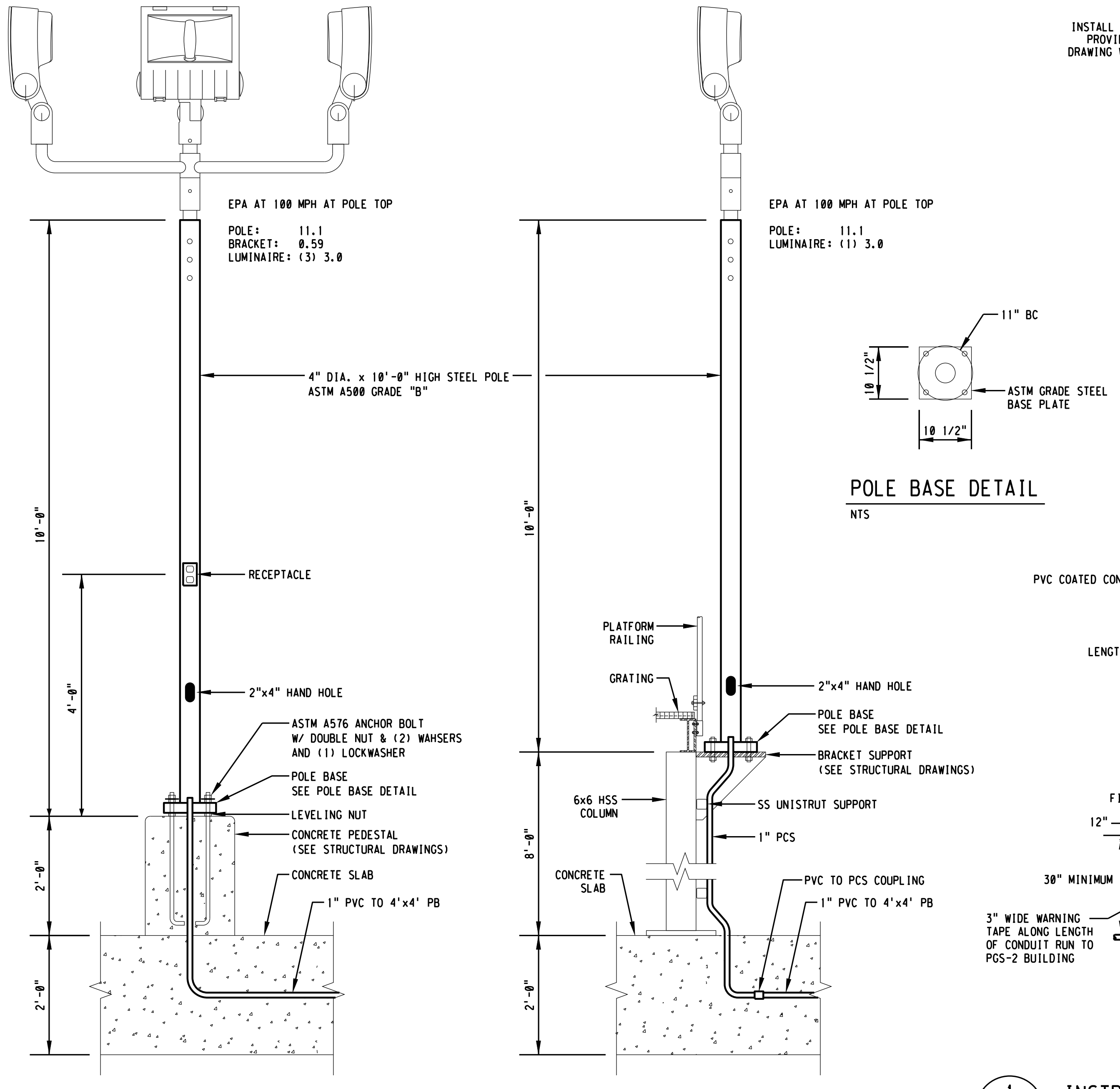
REF 9: REF9$FILENAME

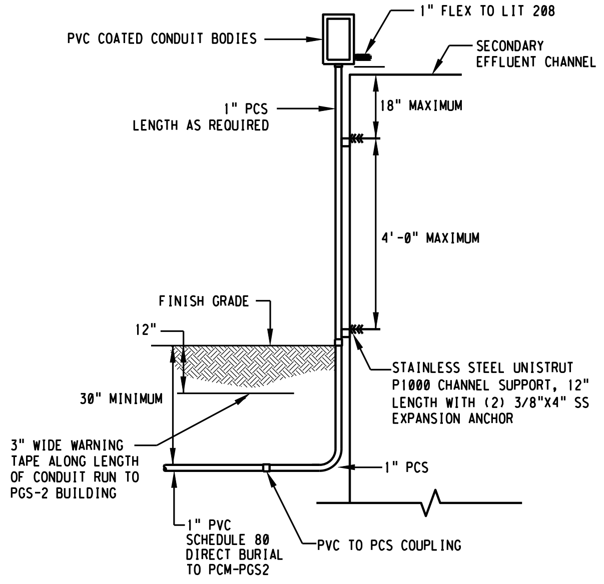

EPA AT 100 MPH AT POLE TOP
POLE: 11.1
BRACKET: 0.59
LUMINAIRE: (3) 3.0
EPA AT 100 MPH AT POLE TOP
POLE: 11.1
LUMINAIRE: (1) 3.0
4" DIA. x 10'-0" HIGH STEEL POLE ASTM A500 GRADE "B"
10'-0"
4'-0"
2'-0"
2'-0"
10'-0"
8'-0"
2'-0"
RECEPTACLE
2"x4" HAND HOLE
ASTM A576 ANCHOR BOLT W/ DOUBLE NUT & (2) WAHSERS AND (1) LOCKWASHER
POLE BASE SEE POLE BASE DETAIL
LEVELING NUT
CONCRETE PEDESTAL (SEE STRUCTURAL DRAWINGS)
CONCRETE SLAB
1" PVC TO 4'x4' PB
PLATFORM RAILING
GRATING
2"x4" HAND HOLE
POLE BASE SEE POLE BASE DETAIL
BRACKET SUPPORT (SEE STRUCTURAL DRAWINGS)
6x6 HSS COLUMN
SS UNISTRUT SUPPORT
1" PCS
CONCRETE SLAB
PVC TO PCS COUPLING
1" PVC TO 4'x4' PB
11" BC
10 1/2"
10 1/2"
ASTM GRADE STEEL BASE PLATE

POLE BASE DETAIL
NTS

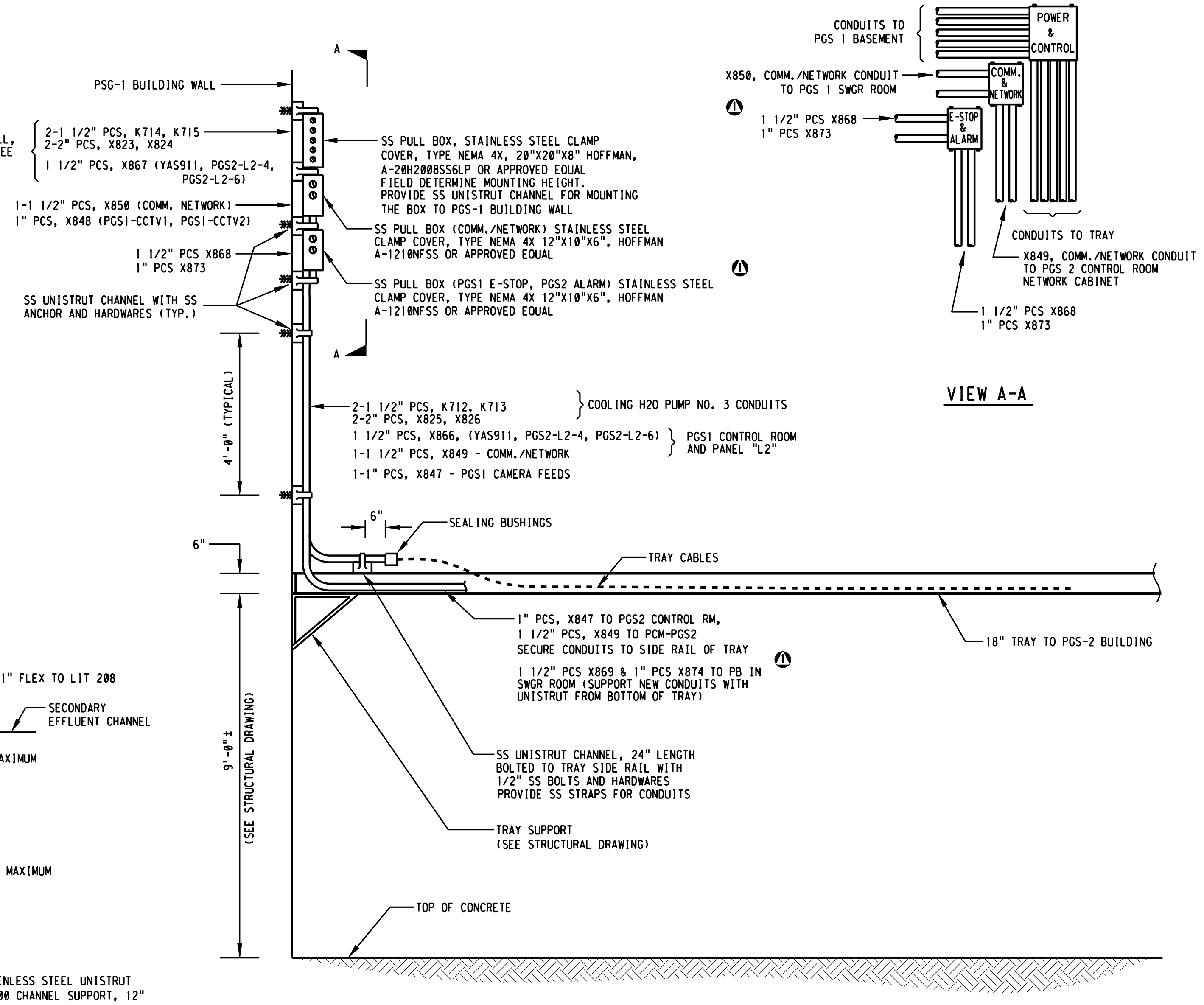
POLE ON CONCRETE PEDESTAL
NTS

POLE ON PLATFORM
NTS

2 POLE MOUNTED LIGHTING FIXTURE DETAIL
NTS


PVC COATED CONDUIT BODIES
1" FLEX TO LIT 208
SECONDARY EFFLUENT CHANNEL
1" PCS LENGTH AS REQUIRED
18" MAXIMUM
4'-0" MAXIMUM
FINISH GRADE
12"
30" MINIMUM
STAINLESS STEEL UNISTRUT P1000 CHANNEL SUPPORT, 12" LENGTH WITH (2) 3/8"x4" SS EXPANSION ANCHOR
3" WIDE WARNING TAPE ALONG LENGTH OF CONDUIT RUN TO PGS-2 BUILDING
1" PCS
1" PVC SCHEDULE 80 DIRECT BURIAL TO PCM-PGS2
PVC TO PCS COUPLING

1 INSTRUMENTATION CONDUIT TO LIT 208
NTS


INSTALL CONDUITS ALONG PGS-1 BUILDING WALL, PROVIDE SS UNISTRUT CHANNEL SUPPORT, SEE DRAWING W28.50-E-102 FOR CONDUIT ROUTING
A
A
PSG-1 BUILDING WALL
2-1 1/2" PCS, K714, K715
2-2" PCS, X823, X824
1 1/2" PCS, X867 (YAS911, PGS2-L2-4, PGS2-L2-6)
1-1 1/2" PCS, X850 (COMM. NETWORK)
1" PCS, X848 (PGS1-CCTV1, PGS1-CCTV2)
1 1/2" PCS X868
1" PCS X873
SS UNISTRUT CHANNEL WITH SS ANCHOR AND HARDWARES (TYP.)
SS PULL BOX, STAINLESS STEEL CLAMP COVER, TYPE NEMA 4X, 20"X20"X8" HOFFMAN, A-20H2008SS6LP OR APPROVED EQUAL FIELD DETERMINE MOUNTING HEIGHT. PROVIDE SS UNISTRUT CHANNEL FOR MOUNTING THE BOX TO PGS-1 BUILDING WALL
SS PULL BOX (COMM./NETWORK) STAINLESS STEEL CLAMP COVER, TYPE NEMA 4X 12"X10"X6", HOFFMAN A-1210NFSS OR APPROVED EQUAL
SS PULL BOX (PGS1 E-STOP, PGS2 ALARM) STAINLESS STEEL CLAMP COVER, TYPE NEMA 4X 12"X10"X6", HOFFMAN A-1210NFSS OR APPROVED EQUAL
1
1
4'-0" (TYPICAL)
2-1 1/2" PCS, K712, K713
2-2" PCS, X825, X826
COOLING H20 PUMP NO. 3 CONDUITS
1 1/2" PCS, X866, (YAS911, PGS2-L2-4, PGS2-L2-6)
1-1 1/2" PCS, X849 - COMM./NETWORK
PGS1 CONTROL ROOM AND PANEL "L2"
1-1" PCS, X847 - PGS1 CAMERA FEEDS
6"
SEALING BUSHINGS
6"
TRAY CABLES
1" PCS, X847 TO PGS2 CONTROL RM, 1 1/2" PCS, X849 TO PCM-PGS2
SECURE CONDUITS TO SIDE RAIL OF TRAY
1 1/2" PCS X869 & 1" PCS X874 TO PB IN SWGR ROOM (SUPPORT NEW CONDUITS WITH UNISTRUT FROM BOTTOM OF TRAY)
1
18" TRAY TO PGS-2 BUILDING
9'-0"± (SEE STRUCTURAL DRAWING)
SS UNISTRUT CHANNEL, 24" LENGTH BOLTED TO TRAY SIDE RAIL WITH 1/2" SS BOLTS AND HARDWARES PROVIDE SS STRAPS FOR CONDUITS
TRAY SUPPORT (SEE STRUCTURAL DRAWING)
TOP OF CONCRETE
CONDUITS TO PGS 1 BASEMENT
POWER & CONTROL
X850, COMM./NETWORK CONDUIT TO PGS 1 SWGR ROOM
COMM. & NETWORK
1
1 1/2" PCS X868
1" PCS X873
E-STOP & ALARM
CONDUITS TO TRAY
X849, COMM./NETWORK CONDUIT TO PGS 2 CONTROL ROOM NETWORK CABINET
1 1/2" PCS X868
1" PCS X873

VIEW A-A

3 COOLING H20 PUMP NO.3 CABLE & CONDUITS INSTALLATION/ NETWORK CONDUIT INSTALLATION
NTS

3" ON ORIGINAL DOCUMENT
0 1 2 3

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PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
2	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
1	08/30/11	ADDED PB & E-STOP & ALARM CKTS		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

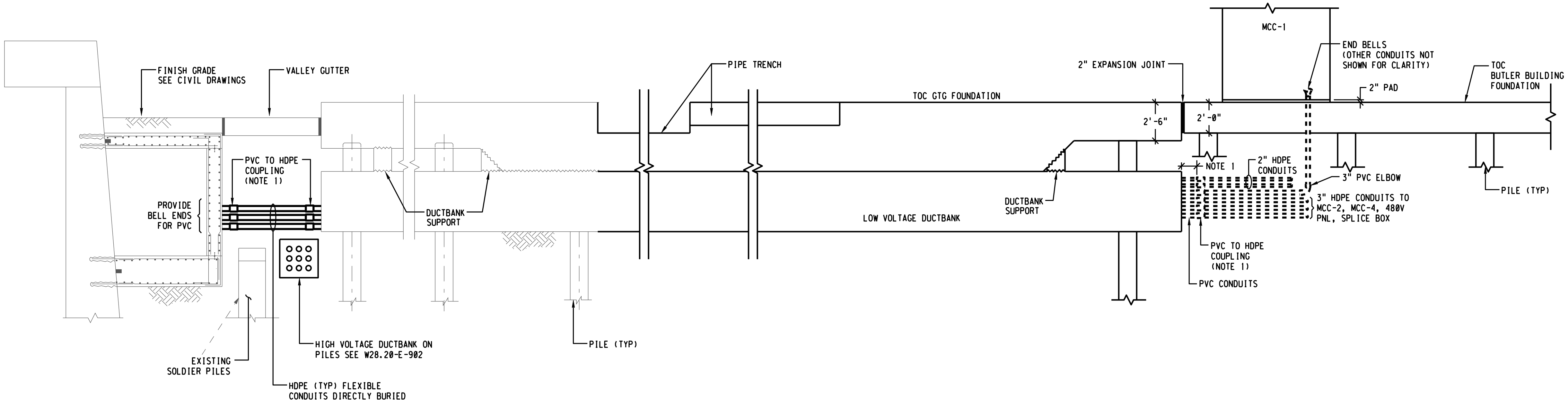
ELECTRICAL DETAILS

SHEET NO.343

SCALE NONE
DATE AUG, 2011

W28.20-E-908
DRAWING NUMBER

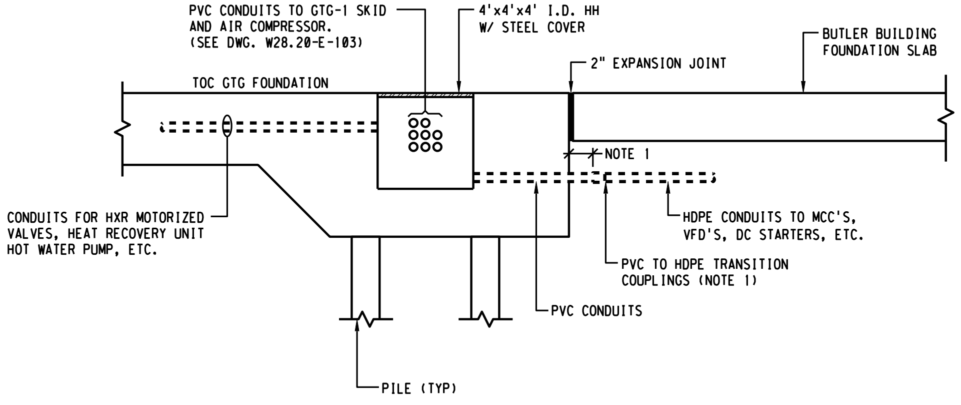
2
REV.



1 / -

INSTALLATION DETAIL - LOW VOLTAGE DUCTBANK AND DIRECT BURIED HDPE BELOW FOUNDATION SLAB

NONE



2 / -

INSTALLATION DETAIL - IN-SLAB HANDHOLE (GT 1/2 PB)

NONE

NOTES:

1. PROVIDE SUFFICIENT LENGTHS OF RIGID PVC CONDUITS AT THE END OF CONCRETE ENCASEMENT TO INSTALL THE PVC TO HDPE COUPLING. COUPLINGS SHALL BE STANDARD CARLON "E-LOC" COUPLINGS FOR USE WITH SMOOTHWALL OD CONTROLLED INNERDUCT SCHEDULE 40 AND SCHEDULE 80. CONDUITS SCHEDULE (PVC AND HDPE) SHALL MATCH FOR SAME INNER DIAMETER.

3" ON ORIGINAL DOCUMENT
0 1 2 3

engineers, inc.
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SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	TRI DANG
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
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EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL

ELECTRICAL DETAILS

SCALE NONE
DATE JAN2009
W28.20-E-909
DRAWING NUMBER
1
REV.

USER: vuong
DATE: 24-SEP-2014 10:32
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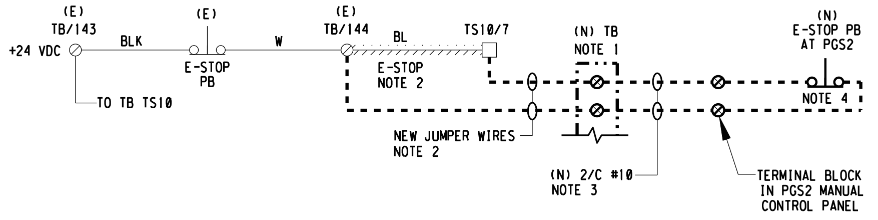
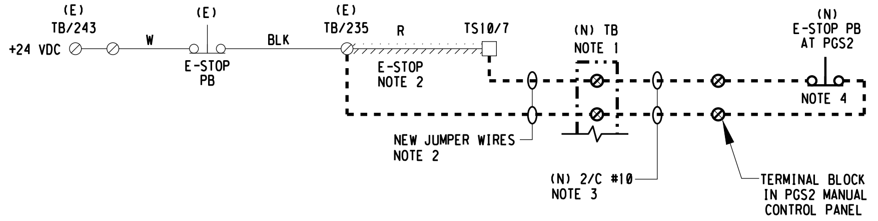


PGS1 SWGR AUXILIARY CUBICLE UNIT NO. 1



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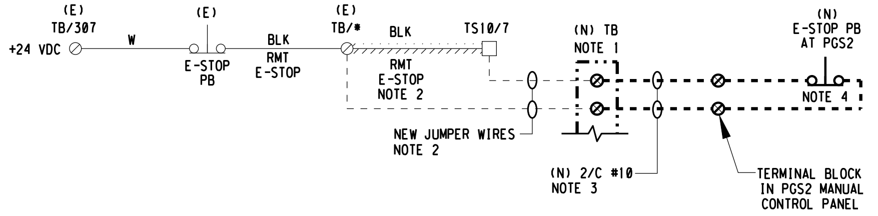
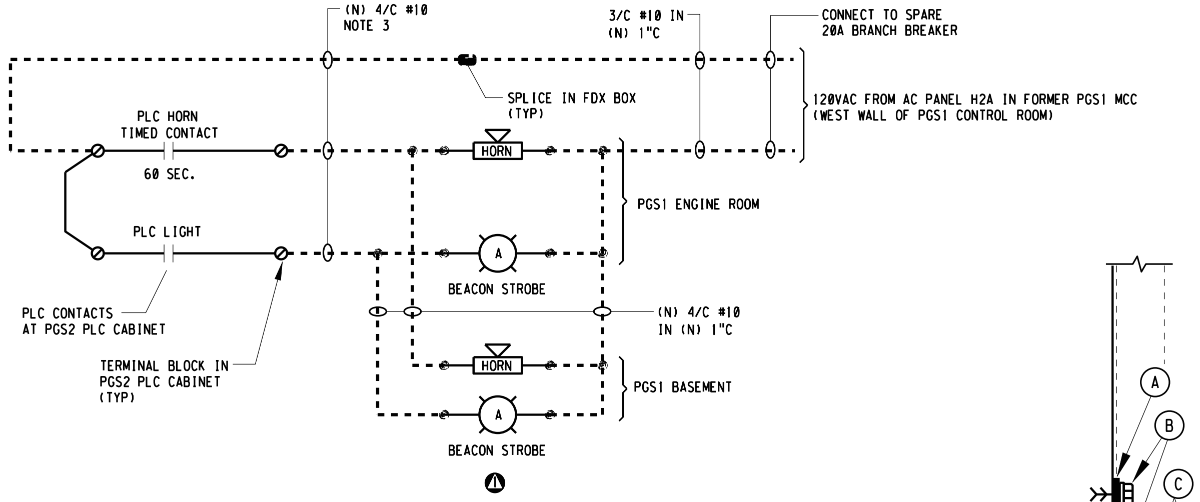
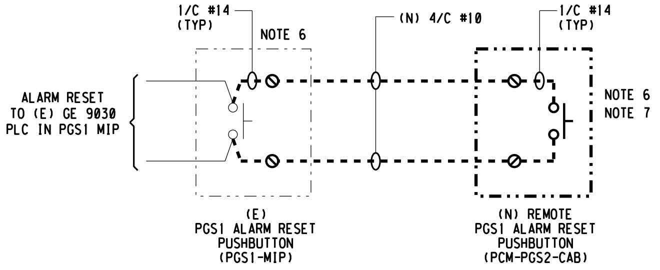


PGS1 SWGR AUXILIARY CUBICLE UNIT NO. 3

1 PGS1 ENGINE GENERATOR EMERGENCY STOP CIRCUIT MODIFICATION DIAGRAM
-

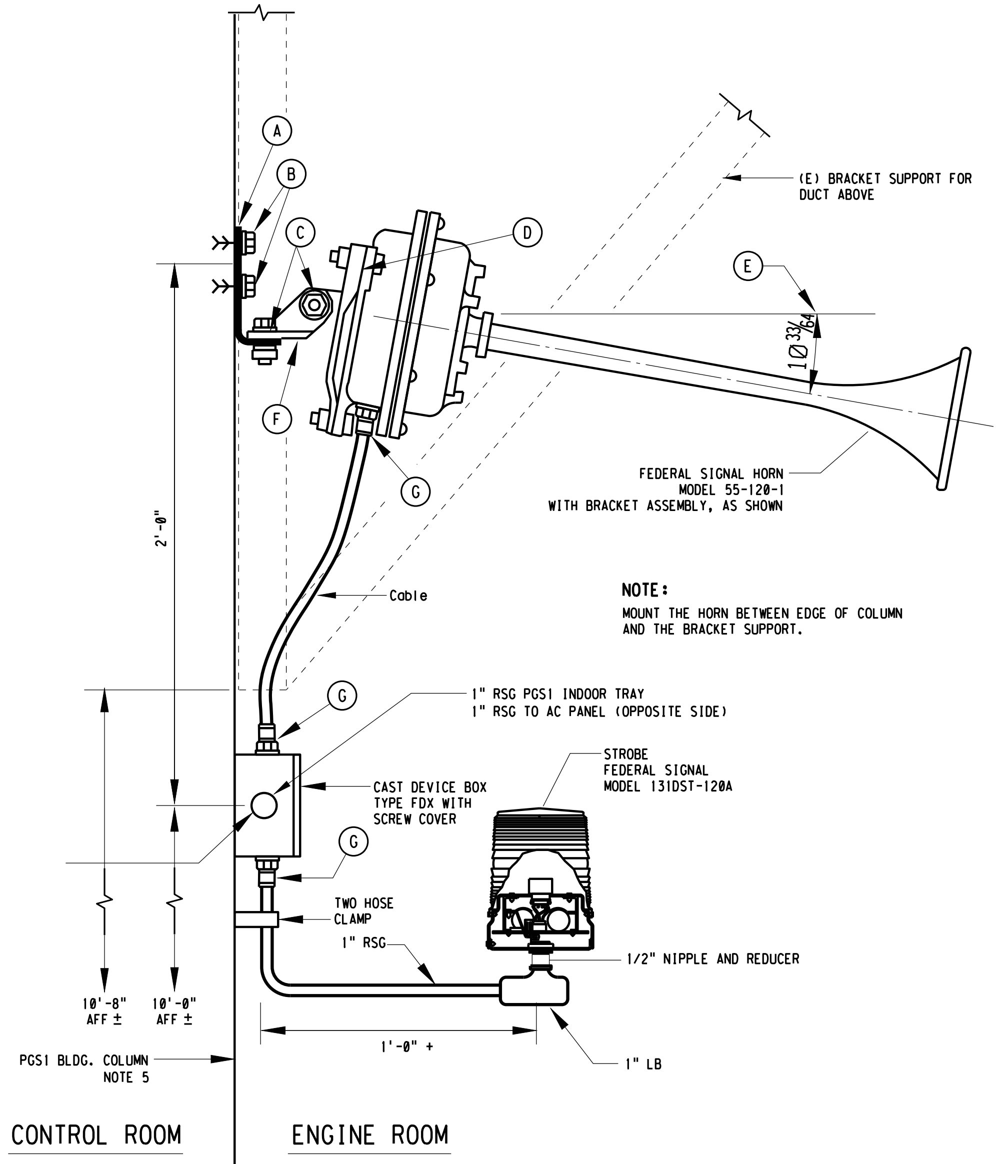


2 PGS2 TROUBLE ALARM SCHEMATIC
- FOR REMOTE INDICATION AT PGS1 BUILDING


1/C #14 (TYP)
NOTE 6
(N) 4/C #10
1/C #14 (TYP)
ALARM RESET TO (E) GE 9030 PLC IN PGS1 MIP
NOTE 6 NOTE 7
(E) PGS1 ALARM RESET PUSHBUTTON (PGS1-MIP)
(N) REMOTE PGS1 ALARM RESET PUSHBUTTON (PCM-PGS2-CAB)

4 PGS1 REMOTE ALARM RESET
- PUSHBUTTON AT PGS2 CONTROL ROOM

A. WALL BRACKET
B. MOUNTING BOLTS
C. LOCKWASHERS
D. HOUSING BRACKET
E. AT LEAST 10° BELOW HORIZONTAL
F. SWIVEL
G. TYPE CG WATERPROOF CABLE CONNECTOR


A
B
C
D
E
F
G
(E) BRACKET SUPPORT FOR DUCT ABOVE
10 33/64
FEDERAL SIGNAL HORN MODEL 55-120-1 WITH BRACKET ASSEMBLY, AS SHOWN
2'-0"
Cable
1" RSG PGS1 INDOOR TRAY
1" RSG TO AC PANEL (OPPOSITE SIDE)
STROBE FEDERAL SIGNAL MODEL 131DST-120A
CAST DEVICE BOX TYPE FDX WITH SCREW COVER
TWO HOSE CLAMP
1" RSG
1/2" NIPPLE AND REDUCER
10'-8" AFF ±
10'-0" AFF ±
1'-0" +
1" LB
PGS1 BLDG. COLUMN NOTE 5
CONTROL ROOM
ENGINE ROOM

NOTE:

MOUNT THE HORN BETWEEN EDGE OF COLUMN AND THE BRACKET SUPPORT.

3 PGS2 ALARM HORN AND STROBE MOUNTING DETAIL
- N.T.S.

2

NOTES:

1. PROVIDE (N) SIX POINT TERMINAL BLOCKS (TB) TO TERMINATE (N) WIRES FROM PGS2 MANUAL CONTROL PANEL. LOCATE THE (N) TERMINAL BLOCKS IN AVAILABLE SPACE AT RIGHT-HAND-SIDE OF (E) TERMINAL BLOCKS INSIDE PGS1 SWGR AUXILIARY CUBICLES.
2. REMOVE (E) WIRES SHOWN AND PROVIDE (N) JUMPER WIRES TO CONNECT THE (N) E-STOP BUTTON IN SERIES WITH THE EXISTING DEVICES.
3. INSTALL (3) 4/C #10 TRAY CABLES FOR E-STOP CIRCUIT AND INSTALL (1) 4/C #10 TRAY CABLES FOR ALARM CIRCUIT. FIELD DETERMINE EXACT ROUTING OF E-STOP CABLES AND PGS2 ALARM CABLES. SEE DWGS W28.50-E-102, W28.20-E-125, W28.20-E-130 FOR CONDUIT/CABLE ROUTING DETAILS. 1 1
4. SEE DWG. W28.20-E-223 REV. 1 FOR INSTALLATION OF NEW DEVICES ON MANUAL CONTROL PANEL IN PGS2 CONTROL ROOM.
5. MOUNT THE (N) HORN AND STROBE LIGHT ON THE BUILDING COLUMN APPROXIMATELY OUTSIDE THE EXISTING AC PANEL IN THE CONTROL ROOM.
6. EXISTING ALARM RESET PUSHBUTTON AT PGS1 IS SQUARE D, CLASS 9001, TYPE KA2. NEW PUSHBUTTON AT PGS2 TO MATCH STYLE OF ADJACENT PUSHBUTTON ON PCM-PGS2 ENCLOSURE DOOR. NEW PUSHBUTTON OPERATOR TO MATCH CONTACT ARRANGEMENT OF EXISTING PGS1 ALARM RESET PUSH BUTTON. 2
7. PROVIDE NAMEPLATE FOR NEW PUSHBUTTON ENGRAVED TO READ, "PGS1 REMOTE ALARM RESET".

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MH engineers, inc.
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(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

carollo

NO.	DATE	REVISION		BY	REC.	APP.
3	6JUN2013	IN SERVICE 3AUG2012 RECORD DRAWING INSP. MAB	SD317A	CT		
2	09/29/11	ADDED PGS1 REMOTE ALARM RESET PUSH BUTTON AT PGS2		CGT		
1	09/23/11	ADDED HORN/STROBE IN PGS1 BASEMENT		CGT		

SD317A - PGS RENEWABLE ENERGY EXPANSION

CONSULTANT	DESIGN BY:	ART CENIZAL
	DRAWN BY:	JOHN MAY
	DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
	PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
	APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
EBMUD	PROJECT MANAGER R.P.E.	
	RECOMMENDED: SR. ENGINEER R.P.E. No.	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND. CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
POWER GENERATION STATION 2
ELECTRICAL
DETAIL - PGS2 REMOTE ALARM AT PGS1 &
PGS1 ALARM RESET & REMOTE EMERGENCY STOP AT PGS2
SHEET NO. 163

SCALE NONE
DATE SEP2011
W28.20-E-910
DRAWING NUMBER
3
REV.