1/G1 COMMUNITY VICINITY PLAN
1"=300'

SCHEDULE OF DRAWINGS:

G1	PROJECT DESCRIPTION, SCHEDULE OF DRAWINGS, & COMMUNITY VICINTY PLAN
M1	MECHANICAL DEMOLITION & NEW WORK PLAN
M2.1	BASE BID WORK ELEVATIONS & DETAILS
M2.2	ADDITIVE ALTERNATE #2 WORK ELEVATIONS & DETAILS
M3	GENERATOR SKID DETAILS
M4	ENGINE COOLING SYSTEM UPGRADES
M5	WATER BLOCKING FUEL FILTER DETAILS
E1	ELECTRICAL DEMOLITION & NEW WORK PLANS
E2	GENERATOR INSTALLATION DETAILS
E3.1	SWITCHGEAR MODIFICATIONS
E3.2	24VDC ENGINE WIRING JUNCTION BOX

PROJECT DESCRIPTION

1. THE EXISTING ARCTIC VILLAGE POWER PLANT WAS ORIGINALLY CONSTRUCTED IN 2004. THE PLANT PRESENTLY HAS MULTIPLE MECHANICAL AND ELECTRICAL DEFICIENCIES REQUIRING UPGRADES TO PROVIDE RELIABLE PRIME POWER SERVICE FOR THE COMMUNITY.

2. THE PRIMARY PURPOSE OF THIS PROJECT UNDER THE BASE BID SCOPE IS TO INSTALL TWO NEW 150kW PRIME POWER TIER 3 MARINE DIESEL ENGINE–GENERATORS (GEN#1 & GEN#2) AND TO UPGRADE THE SWITCHGEAR WITH NEW EASYGEN GENERATOR CONTROLLERS AND OTHER NEW CONTROL DEVICES AS REQUIRED FOR THE NEW ELECTRONICALLY OPERATED ENGINES..

3. AS FUNDING ALLOWS, THE SCOPE OF THE PROJECT WILL BE INCREASED TO INCLUDE THE FOLLOWING WORK ITEMS:
   ADDITIVE ALTERNATE #1 – PERFORM A COMPLETE COOLING SYSTEM FLUSH AND GLYCOL COOLANT REPLACEMENT.
   ADDITIVE ALTERNATE #2 – INSTALL ONE ADDITIONAL NEW 100kW PRIME POWER TIER 3 MARINE DIESEL ENGINE–GENERATOR (GEN#4).

4. IN ADDITION, MINOR UPGRADES & MODIFICATIONS WILL BE MADE TO THE PLANT MECHANICAL AND ELECTRICAL SYSTEMS AS INDICATED.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: PROJECT DERSCRIPTION, SCHEDULE OF DRAWINGS, & COMMUNITY VICINITY PLAN

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: ARCTDERA M1-3 | SHEET: G1 OF 1
PROJECT NUMBER:

DEMOLITION GENERAL NOTES:

1. THIS PLANT PROVIDES PRIME POWER TO THE COMMUNITY OF ARCTIC VILLAGE. KEEP OUTAGES TO A MINIMUM AND COORDINATE ALL REQUIRED OUTAGES WITH THE UTILITY.
2. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL. AREAS CONTAINING EXISTING EQUIPMENT AND PIPING TO BE REMOVED INDICATED BY HATCHING.
3. TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO GENERATION EQUIPMENT BEING REMOVED DURING DEMOLITION EXCEPT ENGINE BLOCKS, SEE GENERAL NOTE 5. TARP GENERATORS AND SEAL ALL EXPOSED CONNECTIONS PRIOR TO REMOVING FROM PLANT. TURN ALL REMOVED EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION.
4. DRAIN ALL PIPING PRIOR TO DEMOLITION. DRAIN ENGINE BLOCKS PRIOR TO REMOVAL. TURN USED OIL AND GLYCOL OVER TO THE UTILITY FOR FINAL DISPOSITION
5. RENDER ALL EXISTING ENGINE BLOCKS TAKEN OUT OF SERVICE UNUSABLE BY CUTTING A MINIMUM 3"x3" HOLE IN ENGINE CRANK CASE. FILL OUT A CERTIFICATE OF DESTRUCTION FOR EACH ENGINE AND INCLUDE PHOTOGRAPHIC DOCUMENTATION OF THE HOLE AND THE ASSOCIATED ENGINE NAMEPLATE.

BASE BID DEMOLITION SPECIFIC NOTES:

1. REMOVE EXISTING GENSET AND A PORTION OF THE EXHAUST PIPING AS REQUIRED FOR NEW CONNECTION. SEE ELEVATION 1/M2.1. SEE ELECTRICAL FOR ADDITIONAL DEMOLITION DETAILS.
2. REMOVE EXISTING GEN#1 & GEN#2 4" MUFFLER AT FLANGED PIPE CONNECTION.
3. REMOVE A PORTION OF THE COOLANT SUCTION CONNECTION AT GEN#1 & GEN#2. SEE DETAIL 2/M2.1.
4. REMOVE ALL EXISTING ENGINE COOLANT, PREHEAT, & VENT HOSES AT GEN#1, GEN#2, GEN#3, R-1, R-2, & ET-1. SEE ELEVATION 1/M2.1 AND SHEET M4.
5. DEMOLISH FUEL PIPING THIS AREA FOR NEW WATER BLOCKING FILTER INSTALLATION, SEE SHEET M5.

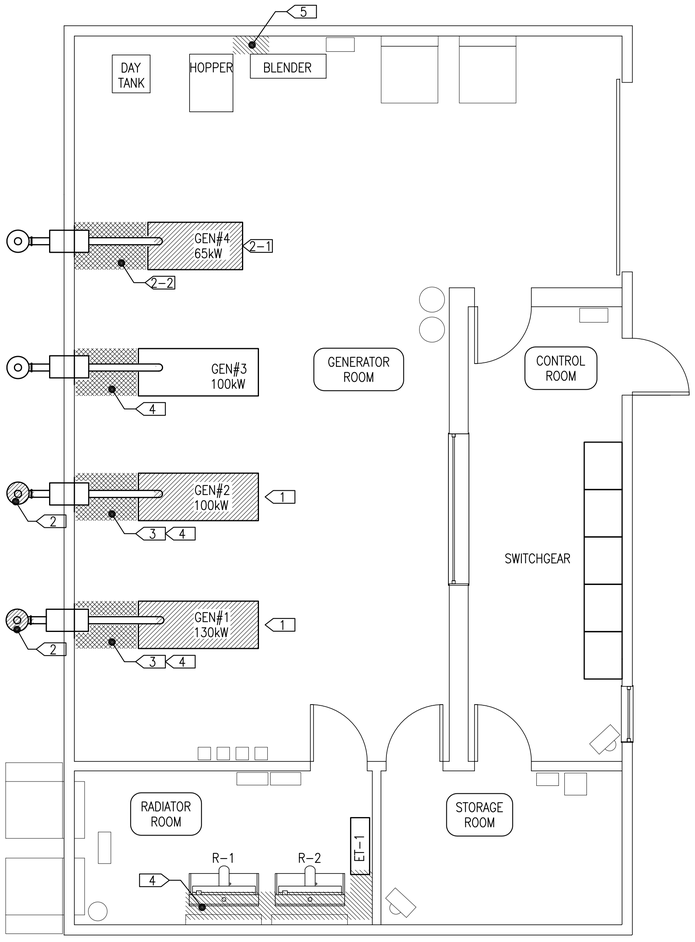
ADDITIVE ALTERNATE #1 DEMOLITION SPECIFIC NOTES:

NO DEMOLITION REQUIRED FOR ADDITIVE ALTERNATIVE #1 SCOPE OF WORK. SEE MECHANICAL NEW WORK NOTES.

ADDITIVE ALTERNATE #2 DEMOLITION SPECIFIC NOTES:

2-1. REMOVE EXISTING GENSET AND A PORTION OF THE EXHAUST PIPING AS REQUIRED FOR NEW CONNECTION. SEE ELEVATION 1/M2.2. SEE ELECTRICAL FOR ADDITIONAL DEMOLITION DETAILS.

2-2. REMOVE A PORTION OF THE COOLANT SUCTION CONNECTION AND REMOVE ALL EXISTING ENGINE COOLANT, PREHEAT, & VENT HOSES. SEE ELEVATION 1/M2.2 AND SHEET M4.



1 M1 DEMOLITION PLAN & NOTES
3/8"=1'-0"

NEW WORK GENERAL NOTES:

1. EXISTING EQUIPMENT AND PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT AND PIPING TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. UNDER BASE BID FURNISH 20 GALLONS OF NEW EXTENDED LIFE ETHYLENE GLYCOL SOLUTION PRE-MIXED TO A RATIO OF 60% GLYCOL TO 40% WATER. NOTE THAT UNDER ADDITIVE ALTERNATE #1 THIS QUANTITY IS DELETED.

BASE BID NEW WORK SPECIFIC NOTES:

1. INSTALL COMPLETE NEW GENSET #1 & #2 INCLUDING COOLANT, FUEL, EXHAUST, AND CRANK VENT CONNECTIONS. SEE ELEVATION 1/M2.1. SEE ELECTRICAL FOR ADDITIONAL INSTALLATION DETAILS.
2. INSTALL NEW 5" MUFFLER ON GEN#1 & GEN#2. SEE ELEVATION 1/M2.1.
3. REPLACE A PORTION OF THE COPPER SUCTION CONNECTION AT GEN#1 & GEN#2. SEE DETAIL 2/M2.1
4. REPLACE ALL EXISTING ENGINE COOLANT, PREHEAT, & VENT HOSES AT GEN#1, GEN#2, GEN#3, R-1, R-2, & ET-1. SEE ELEVATION 1/M2.1 AND SHEET M4.
5. INSTALL NEW WATER BLOCK FILTER IN DAY TANK SUPPLY PIPING, SEE SHEET M5.
6. SEE ELECTRICAL
7. SEE ELECTRICAL.
8. SEE ELECTRICAL
9. SEE ELECTRICAL
10. ON GEN#3 REPLACE EXISTING OIL PRESSURE SENSOR WITH NEW MURPHY ES2P-100 PRESSURE SENSOR AND REPLACE EXISTING WATER TEMPERATURE SENSOR WITH NEW MURPHY ES2T-250-1/2 TEMPERATURE SENSOR. DRAIN FLUIDS AND REFILL AS REQUIRED FOR INSTALLATION. SEE ELECTRICAL FOR WIRING & SWITCHGEAR UPGRADES.
11. NOTE THAT GEN #4 HAS HIGH HOURS & IS UNDER CAPACITY SO UNDER BASE BID IT WILL REMAIN IN PLACE BUT BE TAKEN OUT OF SERVICE. CLOSE OFF COOLANT, FUEL, & OIL VALVES.
12. INSTALL 1" COPPER CRANKCASE VENTILATION SYSTEM ON EXISTING GEN #3 SIMILAR TO NEW GEN #1 & GEN #2. SEE ELEVATION 1/M2.1.

ADDITIVE ALTERNATE #1 NEW WORK SPECIFIC NOTES:

1-1. FLUSH COMPLETE COOLANT SYSTEM AND REFILL WITH NEW GLYCOL. SEE INSTRUCTIONS SHEET M4.

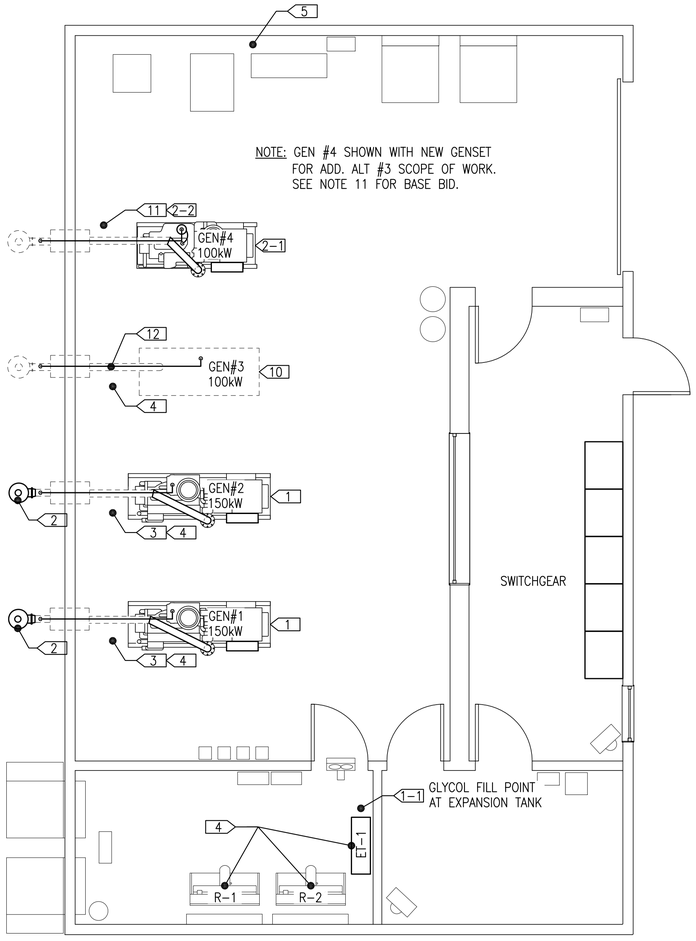
ADDITIVE ALTERNATE #2 NEW WORK SPECIFIC NOTES:

2-1. INSTALL COMPLETE NEW GENSET #4 INCLUDING COOLANT, FUEL, EXHAUST, & CRANK VENT CONNECTIONS. SEE INSTALLATION ELEVATION 1/M2.2. SEE ELECTRICAL FOR ADDITIONAL INSTALLATION DETAILS.

2-2. REPLACE A PORTION OF THE COOLANT SUCTION CONNECTION AND REPLACE ALL EXISTING COOLANT/VENT/PRE-HEAT HOSES WITH NEW SILICONE HOSE AT GEN#4. SEE ELEVATION 1/M2.2 AND SHEET M4.

2-3. SEE ELECTRICAL

2-4. SEE ELECTRICAL



2 M1 NEW WORK PLAN & NOTES
3/8"=1'-0"

ENGINE GENERATOR SCHEDULE

GENSET	DESCRIPTION	GENSET	DESCRIPTION
GEN #1 GEN #2 (2021 DERA BASE BID)	ENGINE – 223 HP, 150 EKW PRIME, JOHN DEERE 6068AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 24 VDC. GENERATOR – MINIMUM 170KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274G OR APPROVED EQUAL.	GEN #4 (EXISTING)	ENGINE – 65 EKW PRIME, JOHN DEERE 4045TF150, NON-CERTIFIED. STARTING AND CONTROL VOLTAGE = 12 VDC. GENERATOR – 65KW CONTINUOUS AT 105°C RISE, MARATHON 362PSL1604.
GEN #3 (EXISTING)	ENGINE – 100 EKW PRIME, JOHN DEERE 6068TF250, NON-CERTIFIED. STARTING AND CONTROL VOLTAGE = 12 VDC. GENERATOR – 100KW CONTINUOUS AT 105°C RISE, MARATHON 431PSL6202.	GEN #4 (2021 DERA ADD. ALT.)	ENGINE – 148 HP, 100 EKW PRIME, JOHN DEERE 4045AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 24 VDC. GENERATOR – MINIMUM 125KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274E OR APPROVED EQUAL.

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

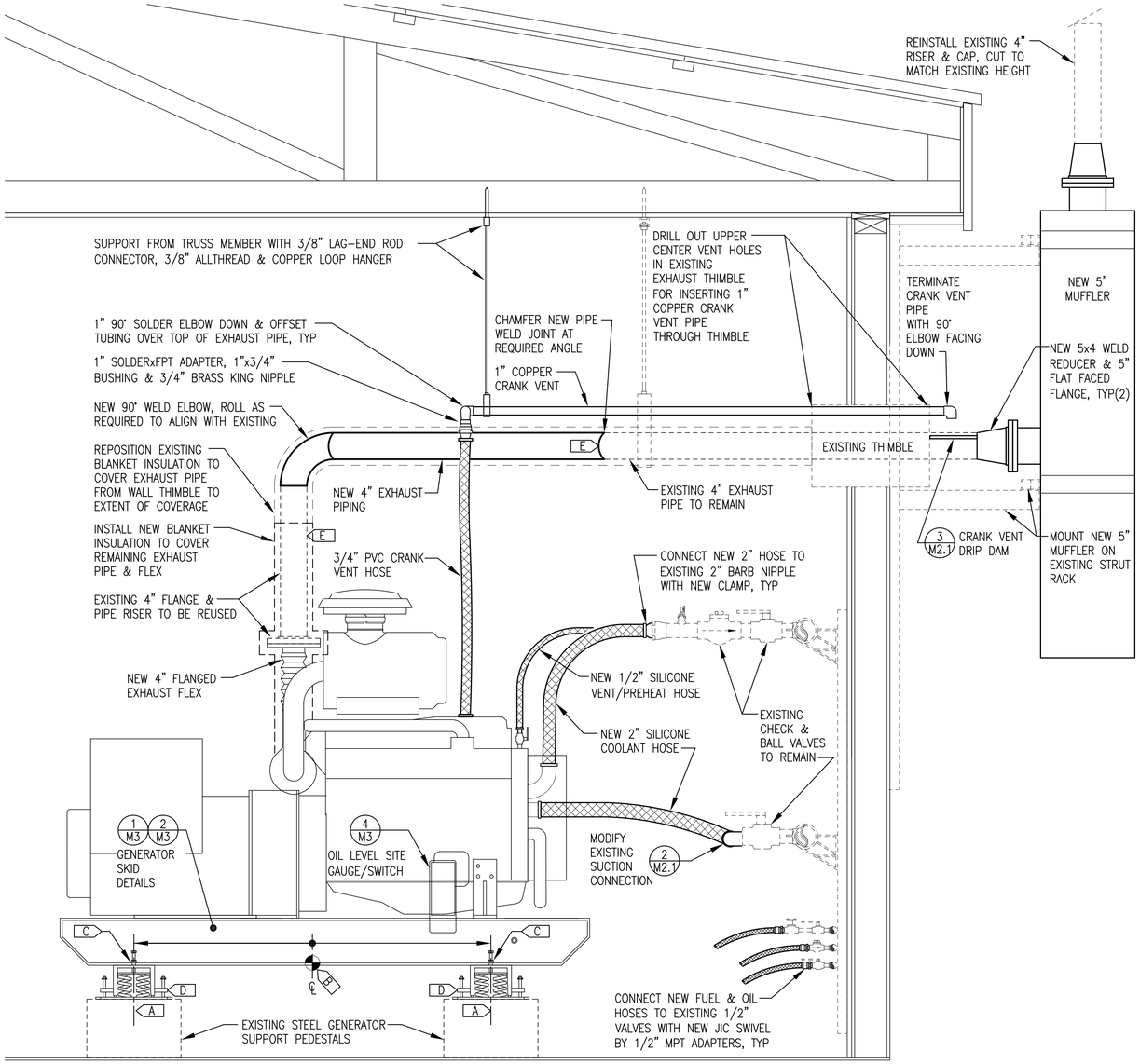
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: MECHANICAL DEMOLITION & NEW WORK PLANS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: ARCTDERA G&M | SHEET: M1 OF 5
PROJECT NUMBER:



1 M2.1 GEN #1 INSTALLATION (GEN #2 SIMILAR)
1"=1'-0"

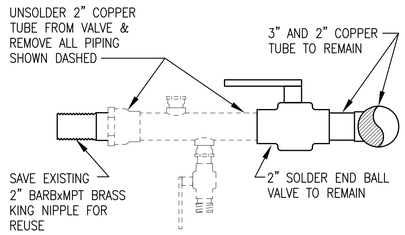
GENERATOR INSTALLATION GENERAL NOTES:

1. EXISTING EQUIPMENT AND PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT AND PIPING TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. ALL EXHAUST PIPING SCHEDULE 40 STEEL WITH BUTT WELD JOINTS, SIZE AS INDICATED. ALL CRANK VENT PIPING COPPER TUBE WITH SOLDER JOINTS.
4. NOT ALL PIPE, HOSE AND FITTINGS SHOWN FOR CLARITY, SEE PIPING ISOMETRIC 1/M4 FOR ADDITIONAL DETAILS.

GENERATOR INSTALLATION SPECIFIC NOTES:

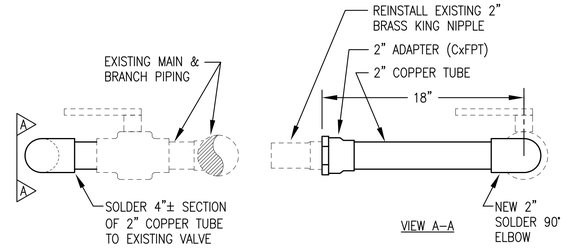
- A: CENTER VIBRATION ISOLATORS ON EXISTING PEDESTALS AND FASTEN WITH 1/2" BOLTS.
- B: SHOP LOCATE BALANCE POINT AND MARK SKID. FIELD POSITION GENSET WITH BALANCE POINT CENTERED BETWEEN ISOLATORS.
- C: DRILL BOTTOM OF SKID TO ALIGN WITH ISOLATOR ATTACHMENT BOLT, CENTER WEDGE WASHER OVER HOLE, AND WELD TO SKID, WIRE BRUSH WELD AREA AND APPLY TOUCH UP PAINT TO MATCH SKID. FASTEN ISOLATOR TO SKID AND BASE.
- D: ADJUST SPRING VIBRATION ISOLATOR LEVELING BOLTS TO ACHIEVE A UNIFORM INSTALLATION HEIGHT OF APPROXIMATELY 5-3/4" THEN TIGHTEN LOCKING NUTS. ADJUST NUTS ON STABILIZER BOLTS TO ACHIEVE A UNIFORM CLEARANCE OF APPROXIMATELY 1/8" THEN TIGHTEN LOCKING NUTS. VERIFY UNIT MOVES FREELY ON ISOLATORS.
- E: FIT AND WELD EXHAUST PIPE AFTER ADJUSTING ISOLATORS.

DEMO NOTES: 1) EXISTING TO REMAIN SHOWN DARK-SOLID.
2) EXISTING FOR DEMOLITION SHOWN LIGHT-DASHED.
3) TAKE STEPS TO PROTEC BAL VALVE DURING DEMOLITION. IF VALVE IS DAMAGED, DRAIN SYSTEM & REPLACE WITH NEW FULL PORT VALVE.



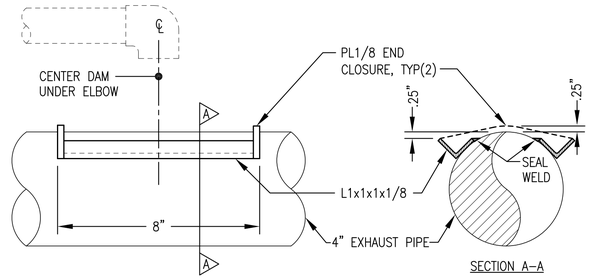
DEMOLITION

NEW WORK NOTES: 1) EXISTING SHOWN LIGHT-DASHED
2) NEW WORK SHOWN DARK-SOLID



NEW WORK

2 M2.1 EXISTING 2" SUCTION CONNECTION MODIFICATION
NO SCALE



3 M2.1 CRANKCASE VENT DRIP DAM
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

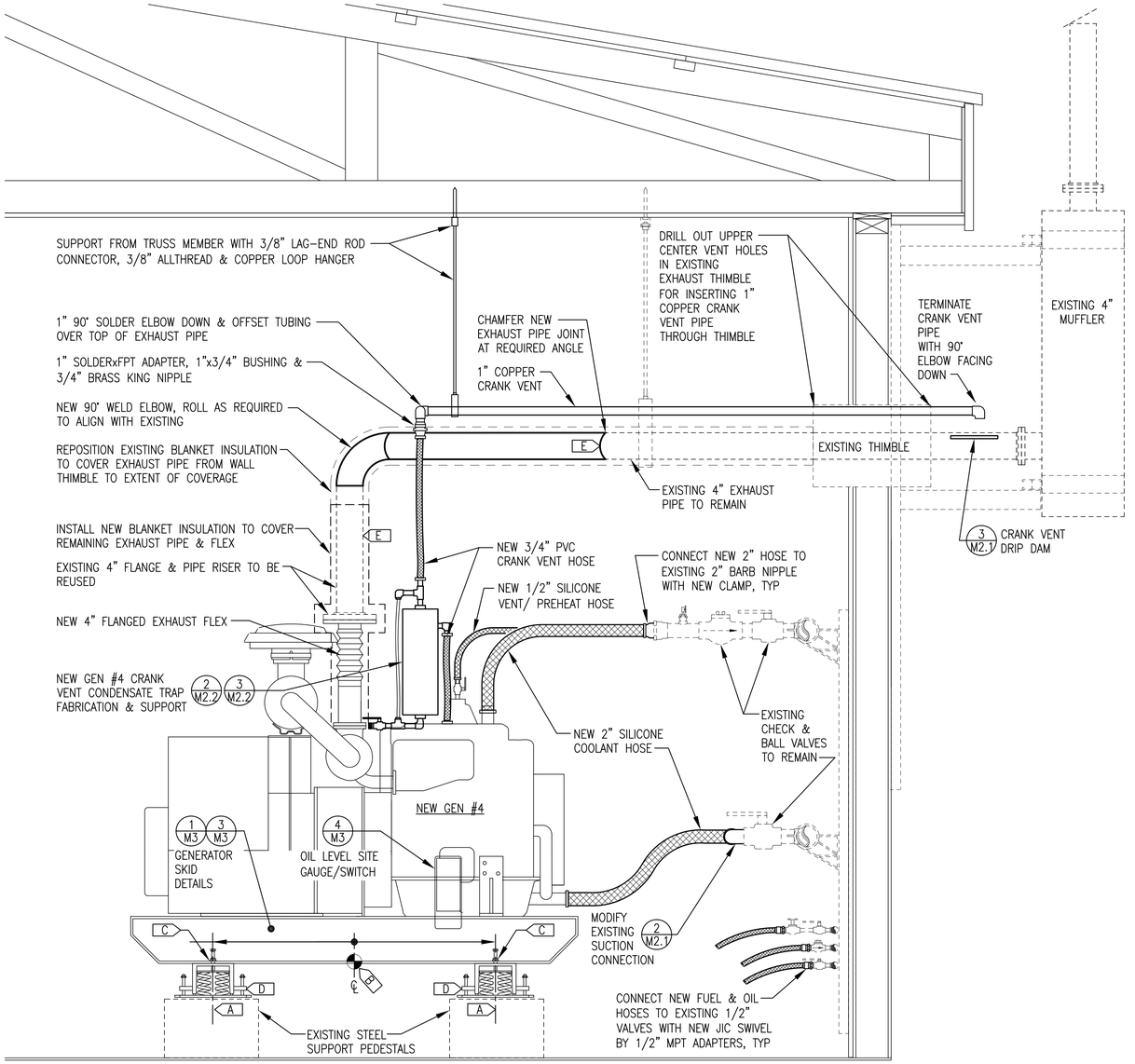
STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: BASE BID WORK ELEVATIONS & DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: ARCTDERA G&M | SHEET: M2.1 OF 5
PROJECT NUMBER:



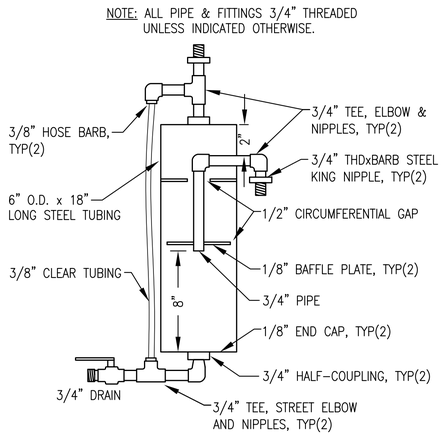
1 M2.2 ADDITIVE ALTERNATE #2 GEN #4 INSTALLATION
1"=1'-0"

GENERATOR INSTALLATION GENERAL NOTES:

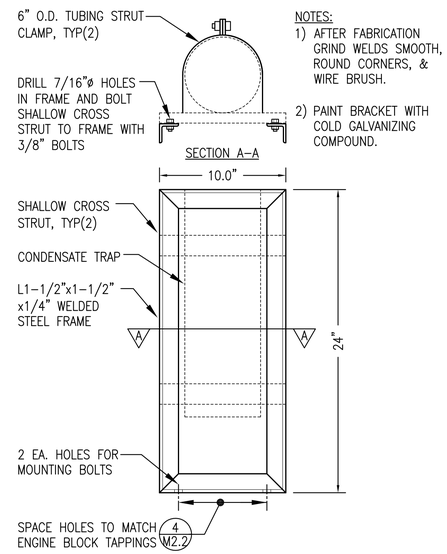
1. EXISTING EQUIPMENT AND PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT AND PIPING TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. ALL EXHAUST PIPING SCHEDULE 40 STEEL WITH BUTT WELD JOINTS, SIZE AS INDICATED. ALL CRANK VENT PIPING COPPER TUBE WITH SOLDER JOINTS.
4. NOT ALL PIPE, HOSE AND FITTINGS SHOWN FOR CLARITY, SEE PIPING ISOMETRIC 1/M4 FOR ADDITIONAL DETAILS.

GENERATOR INSTALLATION SPECIFIC NOTES:

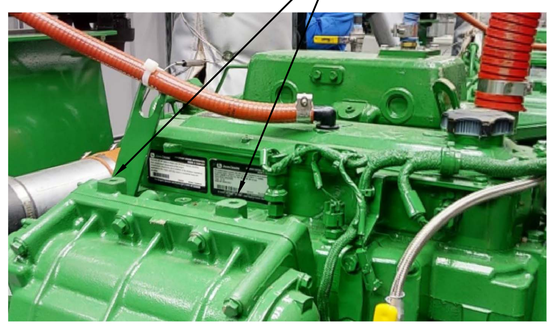
- A CENTER VIBRATION ISOLATORS ON EXISTING PEDESTALS AND FASTEN WITH 1/2" BOLTS.
- B SHOP LOCATE BALANCE POINT AND MARK SKID. FIELD POSITION GENSET WITH BALANCE POINT CENTERED BETWEEN ISOLATORS.
- C DRILL BOTTOM OF SKID TO ALIGN WITH ISOLATOR ATTACHMENT BOLT, CENTER WEDGE WASHER OVER HOLE, AND WELD TO SKID, WIRE BRUSH WELD AREA AND APPLY TOUCH UP PAINT TO MATCH SKID. FASTEN ISOLATOR TO SKID AND BASE.
- D ADJUST SPRING VIBRATION ISOLATOR LEVELING BOLTS TO ACHIEVE A UNIFORM INSTALLATION HEIGHT OF APPROXIMATELY 5-3/4" THEN TIGHTEN LOCKING NUTS. ADJUST NUTS ON STABILIZER BOLTS TO ACHIEVE A UNIFORM CLEARANCE OF APPROXIMATELY 1/8" THEN TIGHTEN LOCKING NUTS. VERIFY UNIT MOVES FREELY ON ISOLATORS.
- E FIT AND WELD EXHAUST PIPE AFTER ADJUSTING ISOLATORS.



2 M2.2 CONDENSATE TRAP FABRICATION
NO SCALE



3 M2.2 CONDENSATE TRAP SUPPORT BRACKET
NO SCALE



4 M2.2 CONDENSATE TRAP SUPPORT BRACKET MOUNT HOLES
NO SCALE

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

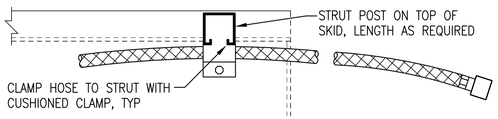
TITLE: ADDITIVE ALTERNATE #2 WORK ELEVATIONS & DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

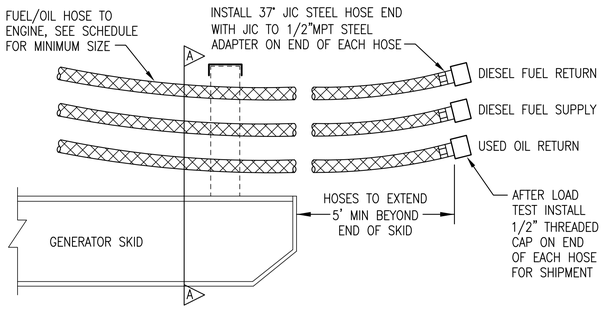
DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: ARCTDERA G&M | SHEET: M2.2 OF 5
PROJECT NUMBER:

MINIMUM HOSE SIZE SCHEDULE		
FUEL SUPPLY	FUEL RETURN	USED OIL
#8	#8	#8

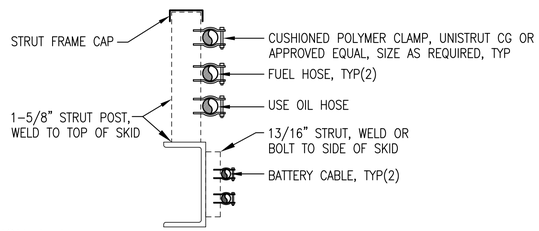
NOTE:
GROUP HOSES ON LEFT SKID AS SHOWN TO COORDINATE WITH COOLANT HOSES.



LEFT SKID PLAN (TOP) VIEW

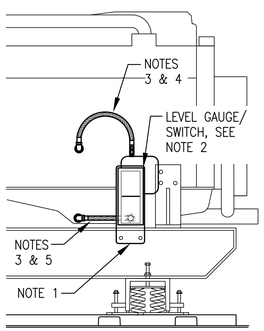


ELEVATION (SIDE) VIEW



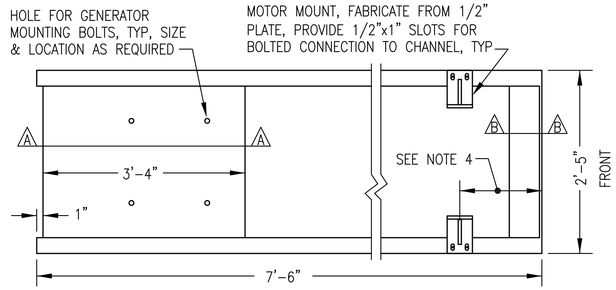
SECTION A–A

1 M3 FUEL & OIL HOSE TERMINATIONS
NO SCALE

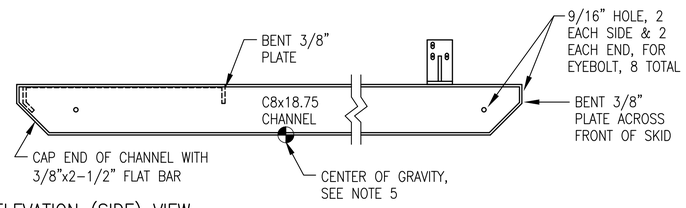


NOTES:
1) 1/4" STEEL SUPPORT PLATE PRE–DRILLED TO MATCH GAUGE/SWITCH MOUNTS, CHANNEL SKID HOLES AND BOTTOM HOSE ENTRANCE. BOLT TO INSIDE (BACK) OF CHANNEL SKID AT HEIGHT AS REQUIRED TO CENTER GAUGE AT NORMAL FULL OIL LEVEL. ADJUST SWITCH CONTACTS 1/2" ABOVE & BELOW.
2) MOUNT OIL LEVEL GAUGE/SWITCH TO STEEL SUPPORT PLATE WITH RUBBER SHOCK MOUNTS .
3) #8 HOSE WITH 1/2" OR 3/8" NPT JIC SWIVEL ENDS AS REQUIRED.
4) CONNECT TOP (VENT) PORT TO ENGINE CRANK CASE WITH HOSE. ROUTE UPPER HOSE TO AVOID LOW POINT TRAPS.
5) CONNECT BOTTOM PORT TO ENGINE OIL PAN WITH HOSE. DO NOT TEE INTO OIL DRAIN LINE. ROUTE LOWER HOSE BACK THROUGH PRE–DRILLED HOLE IN STEEL PLATE.

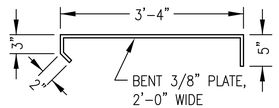
4 M3 TYPICAL OIL LEVEL GAUGE/SWITCH INSTALLATION
NO SCALE



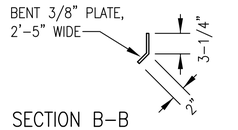
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A

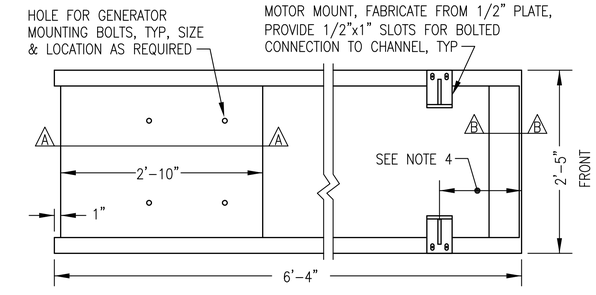


SECTION B–B

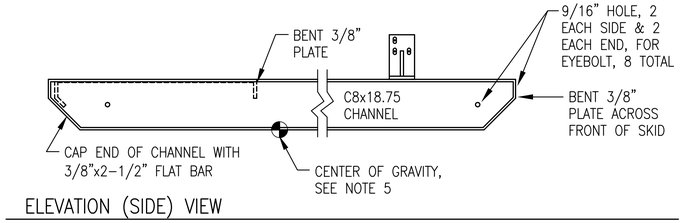
NOTES:

1) FABRICATE FROM ASTM A–36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL–PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE–GENERATOR.
4) PLACE UNIT ON SKID SO THAT THE EXHAUST RISER CENTERLINE IS 4'–2" FROM THE FRONT OF THE SKID.
5) AFTER FINAL ASSEMBLY, DETERMINE THE BALANCE POINT AND CLEARLY MARK CG ON SKID WITH PAINT MARKER.
6) FURNISH AND SHIP LOOSE 4 EACH HEAVY STEEL WEDGE WASHERS WITH EACH GENSET.

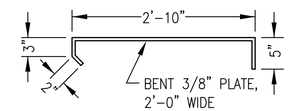
2 M3 GENSET #1 & #2 (JOHN DEERE 6068AFM85) SKID FABRICATION
NO SCALE



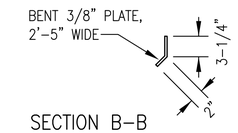
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A



SECTION B–B

NOTES:

1) FABRICATE FROM ASTM A–36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL–PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE–GENERATOR.
4) PLACE UNIT ON SKID SO THAT THE EXHAUST RISER CENTERLINE IS 3'–2" FROM THE FRONT OF THE SKID.
5) AFTER FINAL ASSEMBLY, DETERMINE THE BALANCE POINT AND CLEARLY MARK CG ON SKID WITH PAINT MARKER.
6) FURNISH AND SHIP LOOSE 4 EACH HEAVY STEEL WEDGE WASHERS WITH EACH GENSET.

3 M3 GENSET #4 (JOHN DEERE 4045AFM85) SKID FABRICATION
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

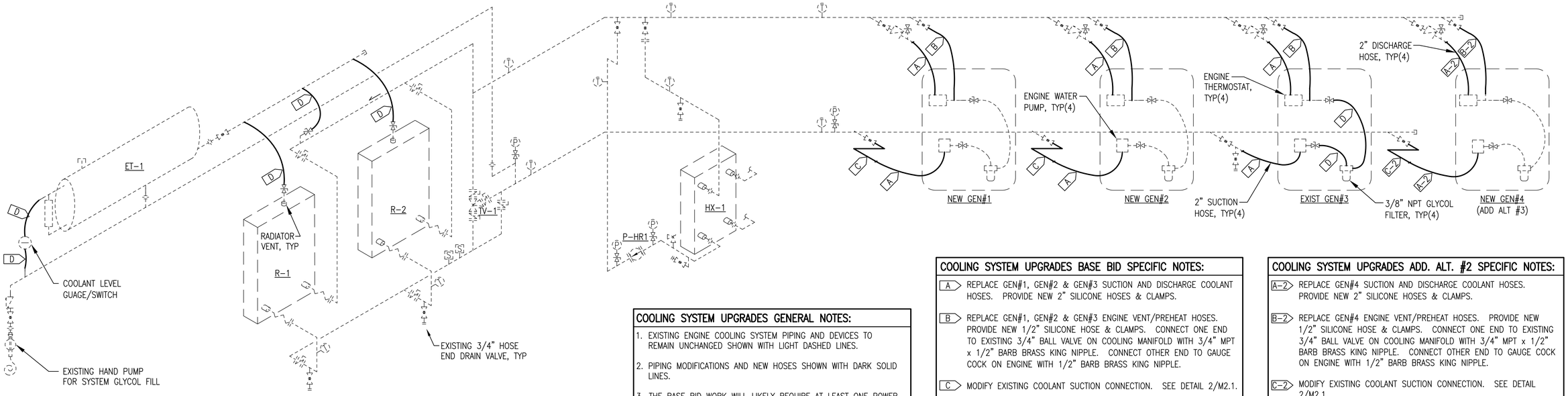
STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: GENERATOR SKID DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: ARCTDERA G&M | SHEET: M3 OF 5
PROJECT NUMBER:



1 M4 ENGINE COOLING SYSTEM UPGRADE ISOMETRIC
NO SCALE

COOLING SYSTEM UPGRADES GENERAL NOTES:

1. EXISTING ENGINE COOLING SYSTEM PIPING AND DEVICES TO REMAIN UNCHANGED SHOWN WITH LIGHT DASHED LINES.
2. PIPING MODIFICATIONS AND NEW HOSES SHOWN WITH DARK SOLID LINES.
3. THE BASE BID WORK WILL LIKELY REQUIRE AT LEAST ONE POWER OUTAGE. THE ADDITIVE ALTERNATE #1 WORK WILL REQUIRE MULTIPLE OUTAGES. PLAN WORK TO MINIMIZE OUTAGES AND SCHEDULE ALL OUTAGES IN ADVANCE WITH THE UTILITY.

COOLING SYSTEM UPGRADES BASE BID SPECIFIC NOTES:

- A: REPLACE GEN#1, GEN#2 & GEN#3 SUCTION AND DISCHARGE COOLANT HOSES. PROVIDE NEW 2" SILICONE HOSES & CLAMPS.
- B: REPLACE GEN#1, GEN#2 & GEN#3 ENGINE VENT/PREHEAT HOSES. PROVIDE NEW 1/2" SILICONE HOSE & CLAMPS. CONNECT ONE END TO EXISTING 3/4" BALL VALVE ON COOLING MANIFOLD WITH 3/4" MPT x 1/2" BARB BRASS KING NIPPLE. CONNECT OTHER END TO GAUGE COCK ON ENGINE WITH 1/2" BARB BRASS KING NIPPLE.
- C: MODIFY EXISTING COOLANT SUCTION CONNECTION. SEE DETAIL 2/M2.1.
- D: REPLACE ALL OTHER SMALL DIAMETER GLYCOL HOSE AS INDICATED ON ISOMETRIC. PROVIDE NEW 1/2" SILICONE HOSE & CLAMPS. INSTALL ON 1/2" BARB x NPT BRASS KING NIPPLES, SIZE AS REQUIRED.

COOLING SYSTEM UPGRADES ADD. ALT. #2 SPECIFIC NOTES:

- A-2: REPLACE GEN#4 SUCTION AND DISCHARGE COOLANT HOSES. PROVIDE NEW 2" SILICONE HOSES & CLAMPS.
- B-2: REPLACE GEN#4 ENGINE VENT/PREHEAT HOSES. PROVIDE NEW 1/2" SILICONE HOSE & CLAMPS. CONNECT ONE END TO EXISTING 3/4" BALL VALVE ON COOLING MANIFOLD WITH 3/4" MPT x 1/2" BARB BRASS KING NIPPLE. CONNECT OTHER END TO GAUGE COCK ON ENGINE WITH 1/2" BARB BRASS KING NIPPLE.
- C-2: MODIFY EXISTING COOLANT SUCTION CONNECTION. SEE DETAIL 2/M2.1.

ADDITIVE ALTERNATE #1 ENGINE COOLING SYSTEM FLUSH & GLYCOL REPLACEMENT INSTRUCTIONS

ENGINE COOLING SYSTEM GLYCOL REPLACEMENT GENERAL NOTES:

1. HOSE REPLACEMENT WORK IS UNDER BASE BID OR ADDITIVE ALTERNATE #2 AS SPECIFICALLY NOTED. ALL OTHER WORK INDICATED BELOW IS INCLUDED IN ADDITIVE ALTERNATE #1.
2. ENGINE COOLANT SYSTEM VOLUME IS APPROXIMATELY 100 GALLONS. PROVIDE A MINIMUM OF 5 EACH NEW EMPTY 55 GALLON DRUMS TO CONTAIN CONTAMINATED COOLANT AND CLEANING SOLUTION.
3. PROVIDE 2 EACH 55 GALLON DRUMS NEW EXTENDED LIFE ETHYLENE GLYCOL SOLUTION PRE-MIXED TO A RATIO OF 60% GLYCOL TO 40% WATER.
4. PLAN WORK TO MINIMIZE OUTAGES AND SCHEDULE ALL OUTAGES IN ADVANCE WITH THE UTILITY.
5. WHEN DRAINING FLUID AS NOTED BELOW, DRAIN FROM ALL LOW POINTS AND USE LOW PRESSURE AIR AS REQUIRED TO CLEAR ISOLATED SECTIONS.

STEP 1: ENGINE COOLING SYSTEM DRAIN/CLEAN

6. SHUT DOWN ALL GENERATORS AND LOCK/TAG OUT. TURN OFF PUMP P-HR1.
7. DRAIN THE EXISTING COOLANT INTO DRUMS AND TURN OVER TO UTILITY.
8. REMOVE GEN #3 THERMOSTAT TO ENSURE FULL FLOW IN PIPING FROM ENGINE WATER PUMP.
9. FILL SYSTEM WITH FRESH WATER AND HEAVY DUTY ALKYLINE-BASED ENGINE CLEANING SOLUTION, CUMMINS FLEETGUARD RESTORE, OR EQUAL, 1 GALLON (OR 4 LITRES) PER 10 GALLONS OF FRESH WATER.
10. START ALL OPERABLE GENERATORS TO CIRCULATE THE CLEANING SOLUTION AND RUN FOR 24 HOURS MINIMUM.
11. TURN ON PUMP P-HR1 TO FORCE FLOW THROUGH THE HEAT EXCHANGER.
12. ALLOW CIRCULATION THROUGH ONE RADIATOR AT A TIME TO MAXIMIZE CLEANING SOLUTION FLOW VELOCITY THROUGH THE RADIATOR CORES. ALTERNATE BETWEEN THE TWO RADIATORS FOR APPROXIMATELY EQUAL TIME.
13. SHUT DOWN ALL GENERATORS AND LOCK/TAG OUT. TURN OFF PUMP P-HR1.

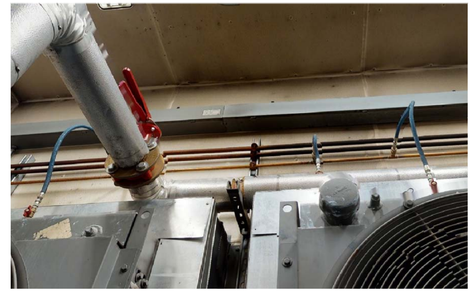
STEP 2: ENGINE COOLING SYSTEM DRAIN/FLUSH

14. DRAIN THE USED CLEANING SOLUTION FROM THE SYSTEM WITHIN 1/2 HOUR OF ENGINE SHUT DOWN TO AVOID SETTLING OUT SOLIDS. DRAIN INTO DRUMS AND TURN OVER TO UTILITY.
15. FILL SYSTEM WITH FRESH WATER.
16. START ALL OPERABLE GENERATORS TO PROVIDE SYSTEM FLUSH. TURN ON PUMP P-HR1. BRING SYSTEM UP TO OPERATING TEMPERATURE AND OPERATE FOR 2 HOURS MINIMUM. CAREFULLY INSPECT THE ENTIRE SYSTEM FOR ANY LEAKS WHILE FLUSHING. IF ANY LEAKS ARE DETECTED, SHUT OFF GENERATORS, REPAIR AS REQUIRED, AND BEGIN THIS STEP OVER.
17. SHUT DOWN ALL GENERATORS AND LOCK/TAG OUT. TURN OFF PUMP P-HR1.

STEP 3: ENGINE COOLING SYSTEM DRAIN/FILL

18. DRAIN THE WATER.
19. REINSTALL GEN #3 THERMOSTAT WITH A NEW GASKET. ENGINE SERIAL # SE6068Z001177.
20. FILL SYSTEM WITH A SOLUTION OF EXTENDED LIFE ETHYLENE GLYCOL PRE-MIXED TO A RATIO OF 60% GLYCOL TO 40% WATER.
21. START ALL OPERABLE GENERATORS TO PROVIDE SYSTEM FINAL TEST. TURN ON PUMP P-HR1. BRING SYSTEM UP TO OPERATING TEMPERATURE. OPERATE FOR AN ADDITIONAL 2 HOURS MINIMUM. CAREFULLY PURGE ALL AIR FROM SYSTEM AND INSPECT THE ENTIRE SYSTEM FOR ANY LEAKS. ENSURE THAT COOLANT LEVEL IS MID WAY ON EXPANSION TANK SITE GAUGE AT CONCLUSION OF TEST.
22. PUT SYSTEM BACK IN AUTO MODE OR MANUALLY SELECT A GENERATOR TO RETURN TO NORMAL SINGLE GENERATOR OPERATION.

2 M4 TYPICAL EXISTING ENGINE COOLANT HOSES
NO SCALE



3 M4 RADIATOR VENT HOSES
NO SCALE

4 M4 EXPANSION TANK HOSES
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

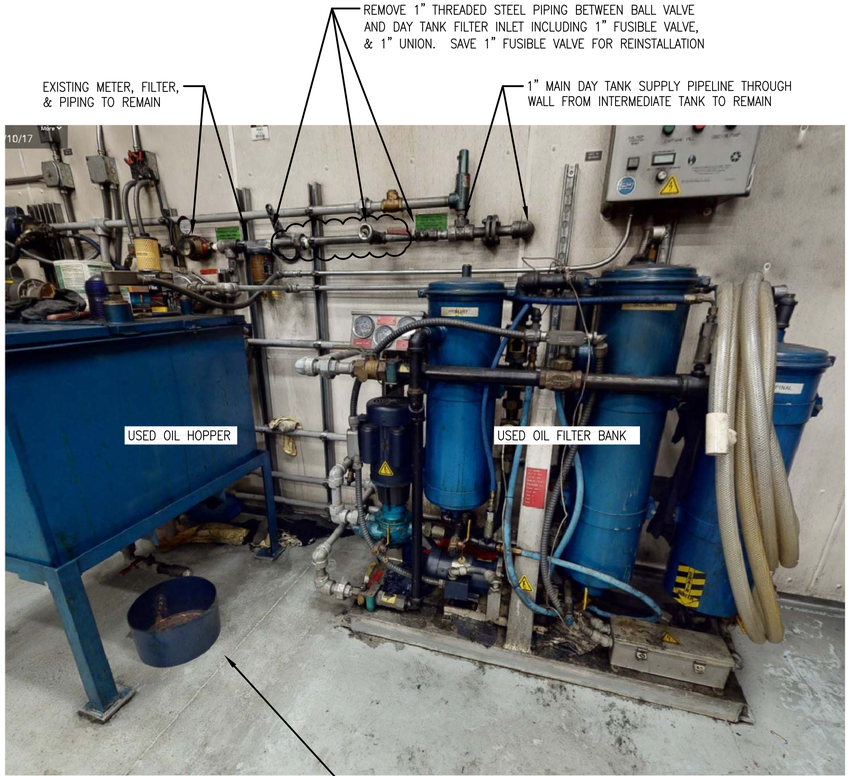
STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

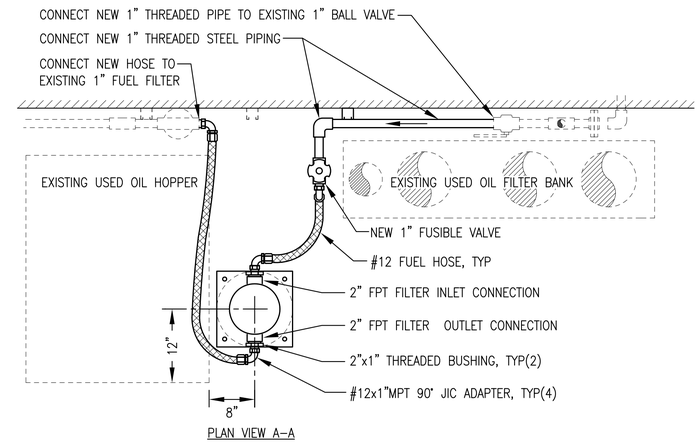
TITLE: ENGINE COOLING SYSTEM UPGRADES

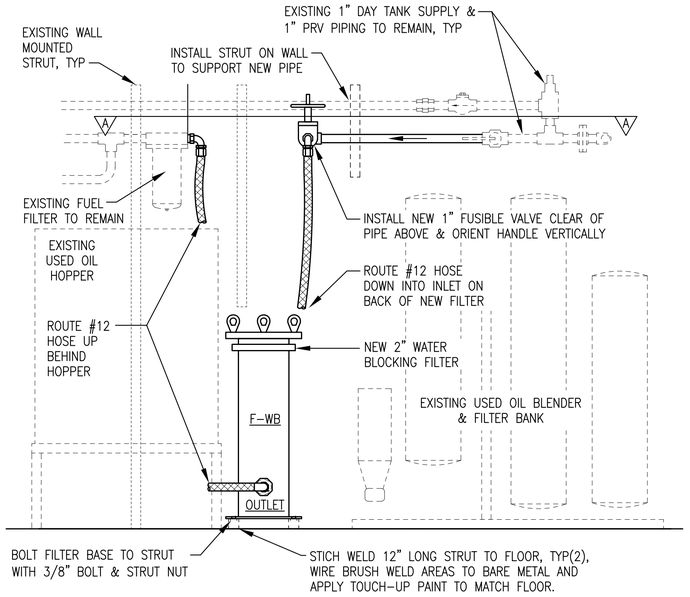
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 2/25/21
FILE NAME: ARCTDERA G&M	SHEET: M4 OF 5
PROJECT NUMBER:	



1 M5 NEW WATER BLOCKING FILTER LOCATION & FUEL PIPING DEMOLITION DETAIL
NO SCALE





2 M5 NEW WATER BLOCKING FILTER INSTALLATION DETAIL
1"=1'-0"

WATER BLOCKING FILTER INSTALLATION NOTES:

1) FURNISH THREE FILTER ELEMENTS, ONE INSTALLED PLUS TWO SPARES.

2) INSTALLATION OF THE FILTER WILL TEMPORARILY DISRUPT FUEL SUPPLY TO THE POWER PLANT. PRIOR TO INSTALLING COORDINATE WITH THE PLANT OPERATOR TO ENSURE ADEQUATE FUEL SUPPLY TO KEEP POWER ON.

FUEL SYSTEM EQUIPMENT SCHEDULE			
SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
F-WB	WATER BLOCKING FUEL FILTER	SINGLE ELEMENT FILTER, 2" ANSI 150# FLANGED INLET/OUTLET,10 MICRON WATER BLOCKING FILTER	FILTER HOUSING: CIM-TEK VIKING 1F FILTER ELEMENT: CIM-TEK #30034

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: WATER BLOCKING FUEL FILTER DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: ARCTDERA G&M | SHEET: M5 OF 5
PROJECT NUMBER:

DEMOLITION GENERAL NOTES:

1. THIS PLANT PROVIDES PRIME POWER TO THE COMMUNITY OF ARCTIC VILLAGE. KEEP OUTAGES TO A MINIMUM AND COORDINATE ALL REQUIRED OUTAGES WITH THE UTILITY AND SCHOOL.
2. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL. AREAS CONTAINING EXISTING EQUIPMENT AND PIPING TO BE REMOVED INDICATED BY HATCHING.
3. ENSURE ALL EQUIPMENT AND CIRCUITS TO BE REMOVED ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL AFFECTED CIRCUIT BREAKERS AND DISCONNECTS.
4. TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO ELECTRICAL EQUIPMENT AND CONDUCTORS BEING SALVAGED FOR REUSE. TURN ALL REMOVED MATERIALS AND EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION IF NOT REUSED.

DEMOLITION SPECIFIC NOTES:

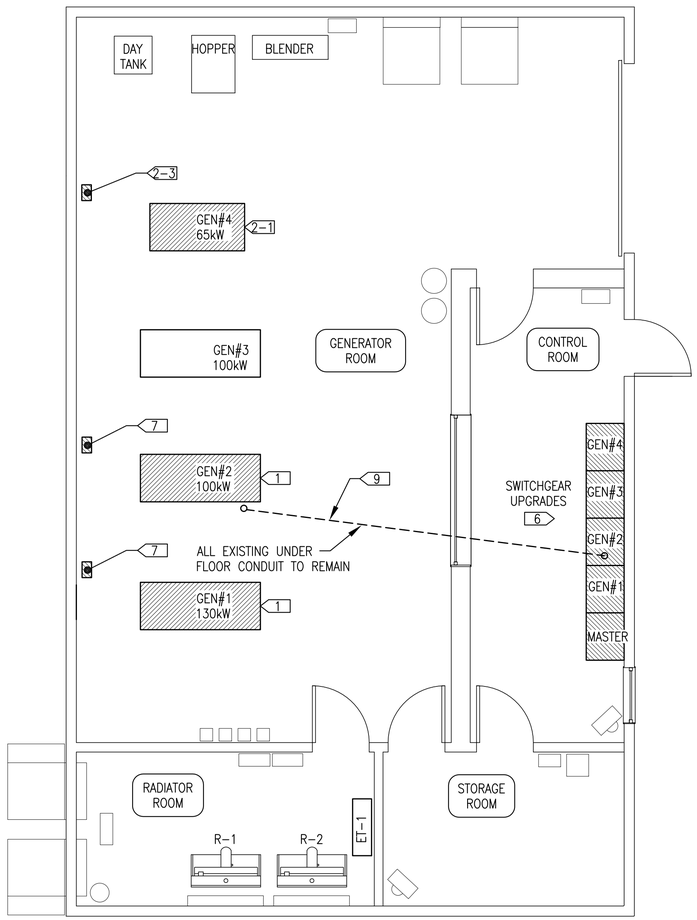
- 1 REMOVE EXISTING GENSET IN ITS ENTIRETY. ALL POWER & CONTROL CONDUCTORS TO REMAIN IN SERVICE EXCEPT AS INDICATED IN SPECIFIC NOTE 9 BELOW. TAPE ENDS OF EXISTING CONDUCTORS & COIL IN SECURE LOCATION TO PROTECT FROM DAMAGE DURING GENSET REPLACEMENT. REMOVE ALL ABOVE FLOOR FLEX & FITTINGS EXCEPT WELDED NIPPLES AT FLOOR PENETRATIONS TO REMAIN.
- 2 SEE MECHANICAL
- 3 SEE MECHANICAL
- 4 SEE MECHANICAL
- 5 SEE MECHANICAL
- 6 REMOVE SWITCHGEAR COMPONENTS AS REQUIRED FOR UPGRADES, SEE NEW WORK NOTE.
- 7 REMOVE EXISTING 12V BATTERY & CHARGER FOR REPLACEMENT, SEE NEW WORK NOTE.
- 8 SEE DEMOLITION NOTE 1 AND NEW WORK NOTE.
- 9 DISCONNECT AT BOTH ENDS AND CAREFULLY PULL OUT EXISTING GEN #2 POWER CONDUCTORS FROM 2" UNDER-FLOOR CONDUIT. TURN OVER TO UTILITY.

ADDITIVE ALTERNATE #1 DEMO SPECIFIC NOTES:

SEE MECHANICAL.

ADDITIVE ALTERNATE #2 DEMOLITION SPECIFIC NOTES:

- 2-1 REMOVE EXISTING GENSET IN ITS ENTIRETY. ALL POWER & CONTROL CONDUCTORS TO REMAIN IN SERVICE. TAPE ENDS OF EXISTING CONDUCTORS & COIL IN SECURE LOCATION TO PROTECT FROM DAMAGE DURING GENSET REPLACEMENT. REMOVE ALL ABOVE FLOOR FLEX & FITTINGS EXCEPT WELDED NIPPLES AT FLOOR PENETRATIONS TO REMAIN.
- 2-2 SEE MECHANICAL
- 2-3 REMOVE 12V BATTERY & CHARGER FOR REPLACEMENT, SEE NEW WORK NOTE.



1 E1 DEMOLITION PLAN & NOTES
1/4"=1'-0"

NEW WORK GENERAL NOTES:

1. EXISTING EQUIPMENT TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. RECONNECT EXISTING POWER & CONTROL CONDUCTORS & ASSOCIATED CONDUIT & FITTINGS TO NEW GENSETS AS INDICATED.

NEW WORK SPECIFIC NOTES:

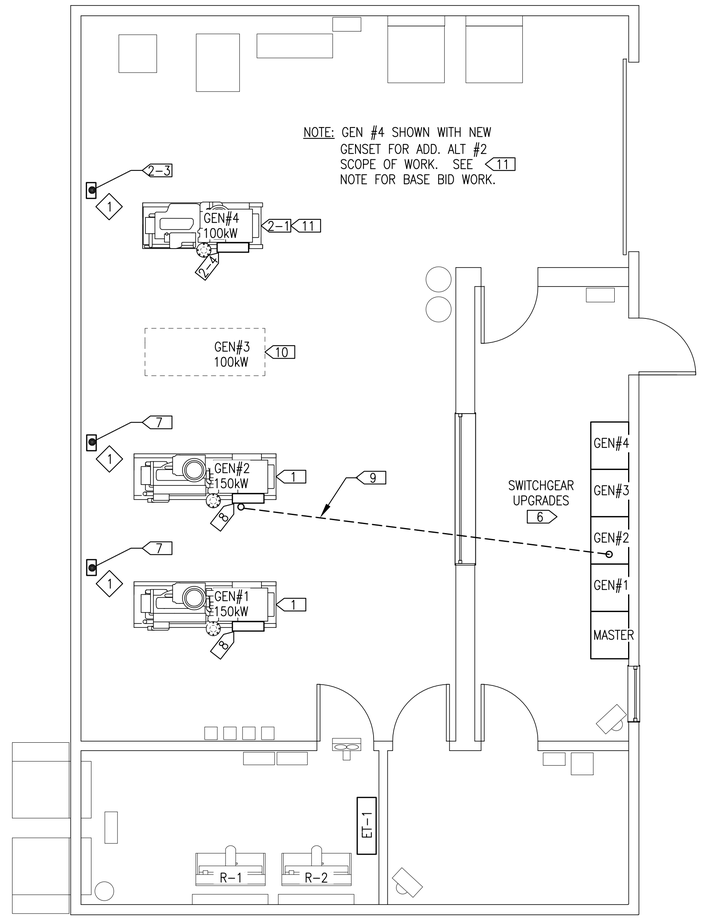
- 1 INSTALL NEW ABOVE FLOOR LT FLEX, MOGULS & FITTINGS, & CONNECT EXISTING POWER CONDUCTORS TO NEW GENSET. SEE ELEVATION 1/E2. SEE MECHANICAL FOR ADDITIONAL GENSET INSTALLATION DETAILS.
- 2 SEE MECHANICAL
- 3 SEE MECHANICAL
- 4 SEE MECHANICAL
- 5 SEE MECHANICAL
- 6 MODIFY SWITCHGEAR AS REQUIRED TO INCORPORATE NEW ENGINES INCLUDING NEW EASYGENS, PLC, ETC. SEE SHEET E3.1.
- 7 INSTALL NEW 24V BATTERY CHARGER, TWO NEW BATTERIES, & STARTER CABLES FOR NEW GENSETS #1 & #2. SEE DETAIL 4/E2.
- 8 INSTALL NEW 24V ENGINE WIRING J-BOX ON GEN#1 & GEN#2, SEE ELEVATION 1/E2. REUSE EXISTING CONTROL CONDUCTORS FROM GENERATOR TO SWITCHGEAR. TERMINATE ALL ACTIVE CONTROL CONDUCTORS AS SHOWN ON SHEET E3.2. TAPE ENDS & NEATLY COIL UNUSED CONDUCTORS IN J-BOX.
- 9 PULL IN NEW 3#2/0, #2N, #2G 150°C X-FLEX POWER CONDUCTORS IN EXISTING BELOW FLOOR 2" GRC. SEE ELEVATION 1/E2.
- 10 ON GEN#3 CONNECT EXISTING SHIELDED PAIRS TO NEW OIL PRESSURE & WATER TEMP SENDERS USING EXISTING TERMINALS IN GENERATOR ENCLOSURE. SEE DETAIL 3/E3.1 FOR CONNECTION OF NEW DEVICES TO SWITCHGEAR.
- 11 NOTE THAT GEN #4 HAS HIGH HOURS & IS UNDER CAPACITY SO UNDER BASE BID IT WILL REMAIN IN PLACE BUT BE TAKEN OUT OF SERVICE. LOCK & TAG OUT OF SERVICE.
- 12 SEE MECHANICAL

ADDITIVE ALTERNATE #1 NEW WORK SPECIFIC NOTES:

SEE MECHANICAL

ADDITIVE ALTERNATE #2 NEW WORK SPECIFIC NOTES:

- 2-1 INSTALL NEW ABOVE FLOOR LT FLEX, MOGULS & FITTINGS. CONNECT NEW POWER CONDUCTORS TO NEW GENSET. SEE ELEVATION 1/E2. SEE MECHANICAL FOR ADDITIONAL GENSET INSTALLATION DETAILS.
- 2-2 SEE MECHANICAL.
- 2-3 INSTALL NEW 24V BATTERY CHARGER, TWO NEW BATTERIES, & STARTER CABLES FOR NEW GEN#4. SEE DETAIL 4/E2.
- 2-4 INSTALL NEW 24V ENGINE WIRING J-BOX ON GEN#4, SEE ELEVATION 1/E2. REUSE EXISTING CONTROL CONDUCTORS FROM GENERATOR TO SWITCHGEAR. TERMINATE ALL ACTIVE CONTROL CONDUCTORS AS SHOWN ON SHEET E3.2. TAPE ENDS AND NEATLY COIL UNUSED CONDUCTORS IN J-BOX



2 E1 NEW WORK PLAN & NOTES
1/4"=1'-0"

ELECTRICAL CONDUCTOR SCHEDULE

SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL	NOTES:
GENERATOR 480V POWER LEADS (ENGINE STARTER CABLES SIMILAR)	EXTRA FLEXIBLE CABLE, COPPER CONDUCTOR. TYPE VW-1, TEW INSULATION, MINIMUM 600V, LISTED 105°C	BELDEN, COBRA, OMINI, OR POLAR	TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT 105°C.
GENERAL USE CONDUCTORS	CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.		

NOTES:

1) FOR NO. 6 AWG AND SMALLER CONDUCTORS COLOR CODING SHALL BE PROVIDED BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION. FOR ALL CONDUCTORS LARGER THAN NO. 6 SCOTCH 35 MARKING TAPE OR EQUIVALENT MAY BE USED TO COLOR CODE THE CABLE. WHERE MARKING TAPE IS USED IDENTIFY AT EVERY ACCESSIBLE LOCATION WITH A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION.

2) GROUNDING - PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE OF THE SAME TYPE AS THE PHASE CONDUCTORS AND SHALL BE SIZED AS INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

COLOR CODING - UNLESS SPECIFICALLY INDICATED OTHERWISE COLOR CODE CONDUCTORS AS FOLLOWS:
- 480-VOLT POWER CONDUCTORS
  - PHASE A - BROWN
  - PHASE B - ORANGE
  - PHASE C - YELLOW
  - NEUTRAL - WHITE W/YELLOW STRIPE
- 120/208-VOLT POWER CONDUCTORS
  - PHASE A - BLACK
  - PHASE B - RED
  - PHASE C - BLUE
  - NEUTRAL - WHITE
- 24 VOLT DC CONDUCTORS
  - +24VDC - RED
  - -24VDC - BLACK

CONTROL & INSTRUMENT CONDUCTORS
COLOR CODED PER MANUFACTURER'S STANDARD

ENGINE GENERATOR SCHEDULE

GEN #1 GEN #2 (2021 DERA BASE BID)	ENGINE - 223 HP, 150 EKW PRIME, JOHN DEERE 6068AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 24 VDC. GENERATOR - MINIMUM 170KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274G OR APPROVED EQUAL.
GEN #3 (EXISTING)	ENGINE - 100 EKW PRIME, JOHN DEERE 6068TF250, NON-CERTIFIED. STARTING AND CONTROL VOLTAGE = 12 VDC. GENERATOR - 100KW CONTINUOUS AT 105°C RISE, MARATHON 431PSL6202.
GEN #4 (EXISTING)	ENGINE - 65 EKW PRIME, JOHN DEERE 4045TF150, NON-CERTIFIED. STARTING AND CONTROL VOLTAGE = 12 VDC. GENERATOR - 65KW CONTINUOUS AT 105°C RISE, MARATHON 362PSL1604.
GEN #4 (2021 DERA ADD. ALT.)	ENGINE - 148 HP, 100 EKW PRIME, JOHN DEERE 4045AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 24 VDC. GENERATOR - MINIMUM 125KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274E OR APPROVED EQUAL.

ELECTRICAL EQUIPMENT SCHEDULE

SYMBOL	DESCRIPTION	MANUFACTURER/MODEL
1	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120 VAC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS.	SENS NRG22-20-RCLS OR APPROVED EQUAL.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

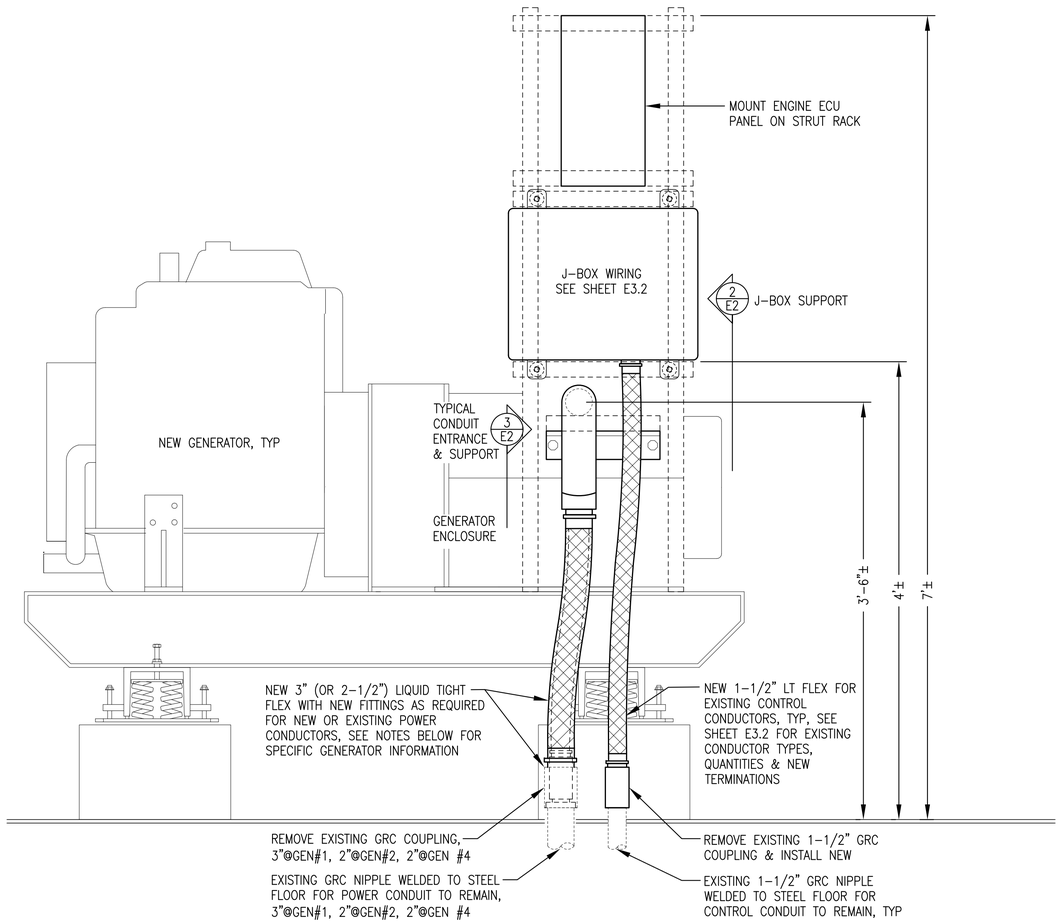
STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: ELECTRICAL DEMOLITION & NEW WORK PLANS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 2/25/21
FILE NAME: ARCTDERA E1-3	SHEET: E1 OF 3
PROJECT NUMBER:	



GENERATOR SPECIFIC NOTES:

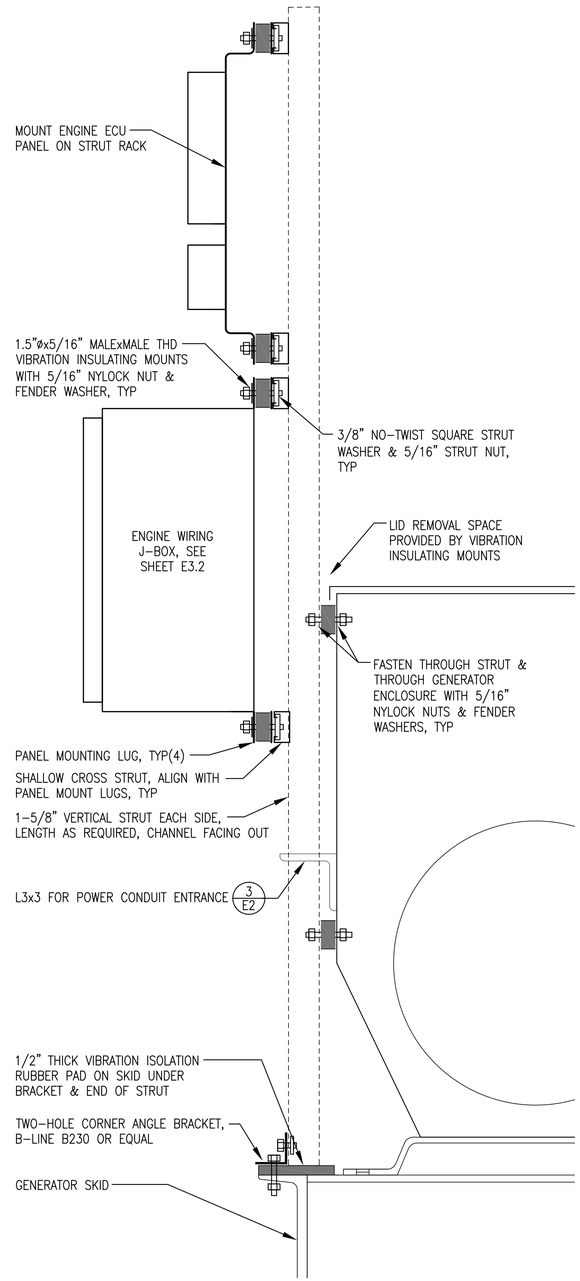
1. NEW GEN#1 – RECONNECT EXISTING 4#4/0, #2G 105°C TYPE MTW CABLE. TERMINATE AT NEW GEN#1 WITH NEW COPPER COMPRESSION LUGS COMPATIBLE WITH & RATED FOR USE AT THE FULL AMPACITY OF THE 105°C CABLE. PROVIDE NEW 3" LT FLEX & 3" MOGUL LB FOR CONNECTION TO GEN#1.

2. NEW GEN#2 – FURNISH & INSTALL NEW 3#2/0, #2N, #2G 150°C X-FLEX POWER CONDUCTORS. TERMINATE AT NEW GEN#2 & AT SWITCHGEAR WITH NEW COPPER COMPRESSION LUGS COMPATIBLE WITH & RATED FOR USE AT THE FULL AMPACITY OF THE 150°C CABLE. REMOVE EXISTING 2" GRC COUPLING AT FLOOR ENTRANCE & INSTALL 2-1/2"x2" GRC HEX BUSHING ON EXISTING 2" NIPPLE WITH NEW 2-1/2" COUPLING, 2-1/2" LT FLEX, & 2-1/2" MOGUL LB FOR NEW GEN#2 CONNECTION.

3. NEW GEN#4 (ADD ALT #3) – RECONNECT EXISTING 4#2/0, #2G 105°C TYPE MTW CABLE. TERMINATE AT NEW GEN#4 WITH NEW COPPER COMPRESSION LUGS COMPATIBLE WITH & RATED FOR USE AT THE FULL AMPACITY OF THE 105°C CABLE. REMOVE EXISTING 2" GRC COUPLING AT FLOOR ENTRANCE & INSTALL NEW 2-1/2"x2" GRC HEX BUSHING, 2-1/2" COUPLING, 2-1/2" LT FLEX, & 2-1/2" MOGUL LB AT NEW GEN#4 CONNECTION.

1 E2 TYPICAL NEW GENSET INSTALLATION

1-1/2"=1'-0"



2 E2 J-BOX SUPPORT

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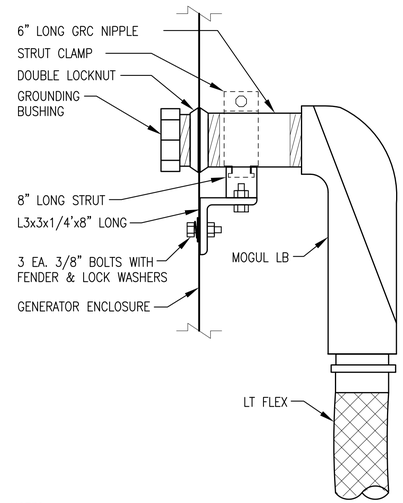
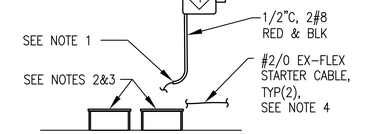


NOTES:

1. GEN#1: PROVIDE NEW 3" LT FLEX, MOGUL, NIPPLE & FITTINGS
2. GEN#2 & GEN#4: PROVIDE NEW 2-1/2" LT FLEX, MOGUL, NIPPLE & FITTINGS

3 E2 POWER CONDUIT ENTRANCE & SUPPORT

NO SCALE



NOTES:

1. INSTALL BUSHING IN END OF EMT & ROUTE 2#8 CHARGING LEADS TO BATTERY.
2. PROVIDE TWO EACH MINIMUM 800 COLD CRANK AMP 12-VOLT SEALED MAINTENANCE FREE STARTING BATTERIES, OPTIMA RED TOP NAPA PART# BAT N993478RED OR APPROVED EQUAL.
3. INSTALL EACH BATTERY IN A RACK SIZED TO SECURELY HOLD THE BATTERY AND PLACE OUT OF TRAFFIC AREA IN CONVENIENT LOCATION NEAR BACK WALL.
4. ROUTE BATTERY CABLES TO FRONT OF SKID, SEE SHEET M3. ROUTE FROM SKID DIRECTLY UNDER FUEL HOSES TO WALL AND TYWRAP CABLES TO FUEL PIPES ALONG WALL. CUT TO PROVIDE 6"± SERVICE LOOP FOR FINAL TERMINATION ON BATTERIES. CONNECT TO BATTERIES WITH STRAIGHT CRIMP TERMINAL FITTINGS AND TOP MOUNT TERMINAL COVERS, POLAR WIRE OR EQUAL.

4 E2 BATTERY, CHARGER & CABLES INSTALLATION

NO SCALE"

ISSUED FOR CONSTRUCTION FEBRUARY 2020

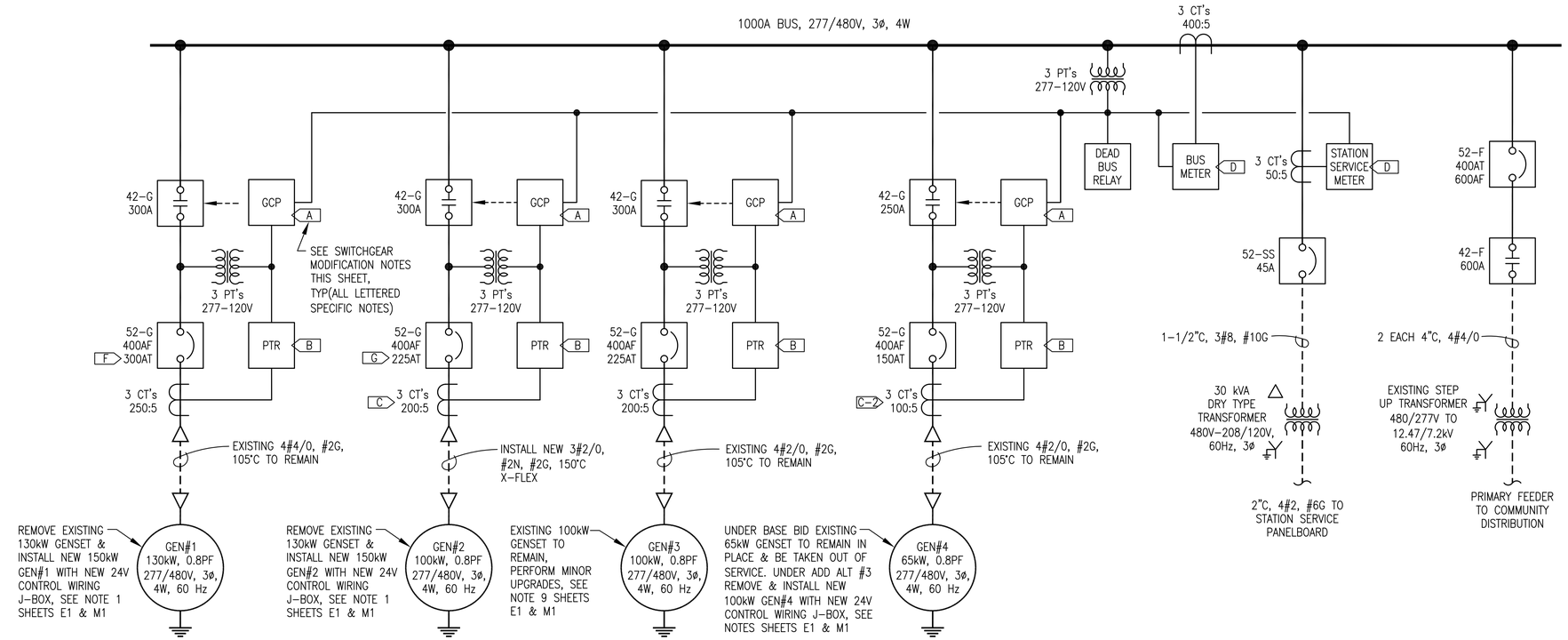
STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

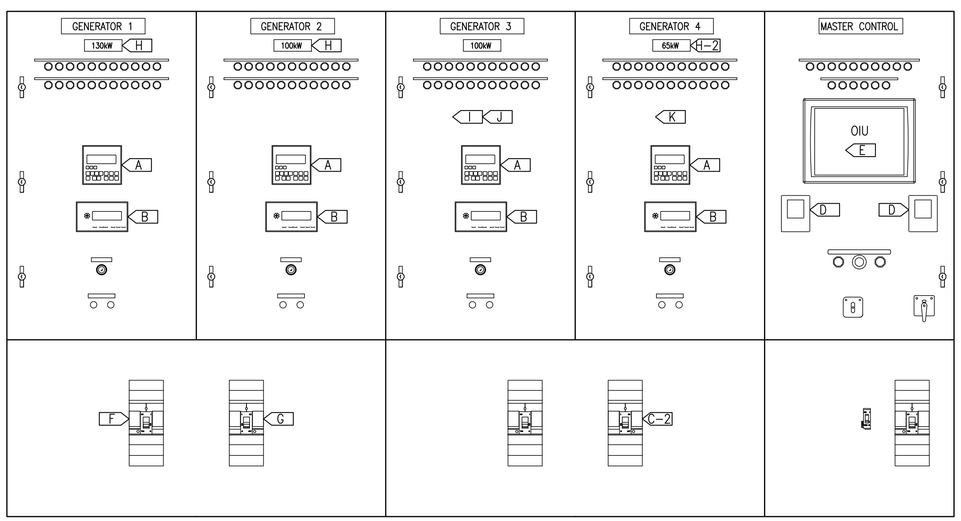
TITLE: GENERATOR INSTALLATION DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

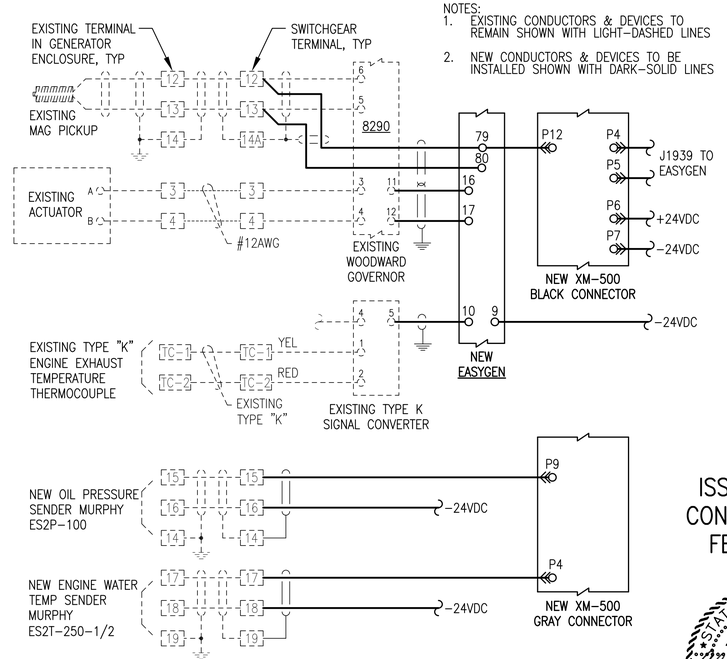
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 2/25/21
FILE NAME: ARCTDERA E1-3	SHEET: E2 OF 3
PROJECT NUMBER:	



1 E3.1 SWITCHGEAR MODIFICATION ONE–LINE DIAGRAM
NO SCALE



2 E3.1 SWITCHGEAR MODIFICATION ELEVATION
NO SCALE



3 E3.1 GEN#3 SWITCHGEAR WIRING DETAILS
NO SCALE

SWITCHGEAR MODIFICATION GENERAL NOTES:

1) ALL WORK THIS SHEET TO PERFORMED UNDER BASE BID EXCEPT AS SPECIFICALLY NOTED.
2) ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL OR REPLACEMENT.
3) ENSURE ALL EQUIPMENT AND CIRCUITS TO BE REMOVED ARE DE–ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL AFFECTED CIRCUIT BREAKERS AND DISCONNECTS.
4) SEE SPECIFICATIONS FOR DETAIL ON NEW DEVICES AND EQUIPMENT.
5) INSTALL BLANK PLATES TO COVER OPENINGS AS REQUIRED AFTER REMOVAL OF EXISTING DOOR–MOUNTED DEVICES AND PRIOR TO INSTALLING NEW DEVICES.

SWITCHGEAR MODIFICATION SPECIFIC NOTES:

- A: REMOVE EXISTING GCP & REPLACE WITH NEW EASYGEN.
- B: REMOVE EXISTING PROTECTIVE TRIP RELAY & ALL ASSOCIATED WIRING & INSTALL BLANK COVER PLATE.
- C: REMOVE EXISTING 200:5 CT's FROM GEN#2 SECTION AND INSTALL NEW 250:5 CT'S.
- C–2: UNDER ADD ALT #2 REMOVE EXISTING 100:5 CT's FROM GEN#4 SECTION AND INSTALL NEW 200:5 CT'S.
- D: REMOVE EXISTING BUS & STATION SERVICE METERS & REPLACE WITH NEW.
- E: REMOVE EXISTING PLC, OPERATOR INTERFACE UNIT, & ASSOCIATED DEVICES & REPLACE WITH NEW.
- F: REMOVE EXISTING 300A TRIP PLUG & INSTALL NEW 250A TRIP PLUG. THE EXISTING BREAKER IS A G.E. SPECTRA RMS CAT. # SGHA36AT0400.
- G: REMOVE EXISTING 225A TRIP PLUG & INSTALL NEW 250A TRIP PLUG. THE EXISTING BREAKER IS A G.E. SPECTRA RMS CAT. # SGHA36AT0400.
- H: REMOVE EXISTING kW RATING PLACARD & REPLACE WITH NEW "150 kW" PLACARD.
- H–2: UNDER ADD ALT #2 REMOVE EXISTING kW RATING PLACARD & REPLACE WITH NEW "100 kW" PLACARD.
- I: MODIFY GEN#3 SWITCHGEAR SECTION WIRING AS REQUIRED FOR CONNECTION OF MAG PICKUP, ENGINE GOVERNOR, EXHAUST TEMP THERMOCOUPLES, PRESSURE SENDER, & ENGINE WATER TEMP SENDER TO NEW EASYGEN & XM–500. SEE DETAIL 3/E3.1.
- J: EXISTING GEN#3 IS A 12VDC UNIT WITH 12V BATTERY CHARGER & 12V BATTERY WHICH ARE TO REMAIN AS IS. GEN#3 WILL CONTINUE TO PROVIDE 12VDC POWER TO THE GEN#2 SWITCHGEAR SECTION. REPLACE EXISTING 12V–24V POWER CONVERTER WITH NEW.
- K: UNDER BASE BID GEN#4 WILL REMAIN IN PLACE BUT BE TAKEN OUT OF SERVICE. UPGRADE SWITCHGEAR FOR FUTURE TIER 3 MARINE ENGINE EQUIVALENT TO GEN #1 & #2 SECTIONS. LEAVE EXISTING CONTROL WIRING FROM GEN #4 DISCONNECTED AT SWITCHGEAR, TAPE ENDS, COIL NEATLY, & SECURE INSIDE SWITCHGEAR.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

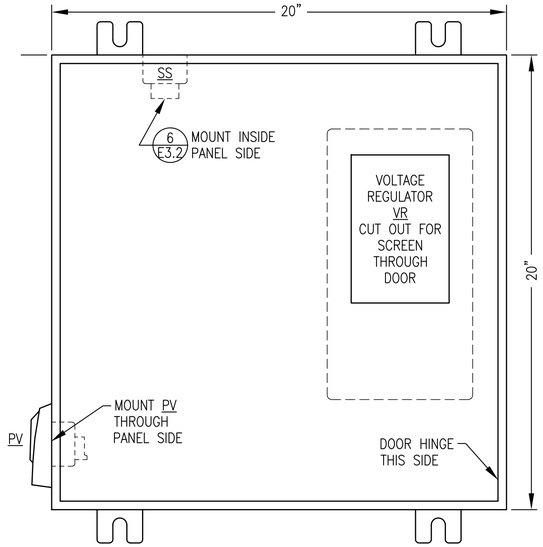
STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: SWITCHGEAR MODIFICATIONS

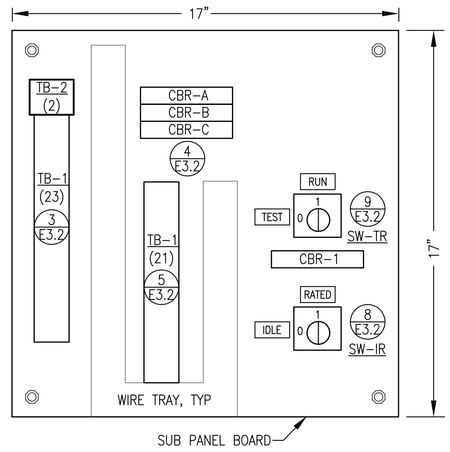
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: CWV/BCG | DATE: 2/25/21
FILE NAME: ARCTDERA E1–3 | SHEET: E3.1 OF 3
PROJECT NUMBER:



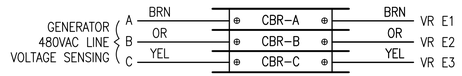
1 E4 JUNCTION BOX FRONT PANEL LAYOUT

NO SCALE



2 E4 JUNCTION BOX SUB PANEL LAYOUT

NO SCALE



4 E3.2 CIRCUIT BREAKER CONNECTIONS

NO SCALE

BILL OF MATERIALS			
TAG	MANUFACTURER	MODEL	DESCRIPTION
CBR-A/B/C	ALLEN-BRADLEY	1489-M1-C010	RAIL MOUNT CIRCUIT BREAKER, 1P, 1A
CBR-1	ALLEN-BRADLEY	1489-M1-C050	RAIL MOUNT CIRCUIT BREAKER, 1P, 5A
ENCL.	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
PV	MURPHY	PV101-C-MSTD	POWER VIEW W/HARNESS
SS	CATERPILLAR	9X-8124	STARTER AUXILIARY SOLENOID, 24V
SW-IR/SW-TR	ALLEN-BRADLEY	194L-A12-225-2	CHANGEOVER SWITCH, 12A, 2P
	ALLEN-BRADLEY	194L-HE-4A-175	90 DEGREE I-O HANDLE
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK
VR	BASLER	DECS-150 5NS1V1N1S	DIGITAL VOLTAGE REGULATOR

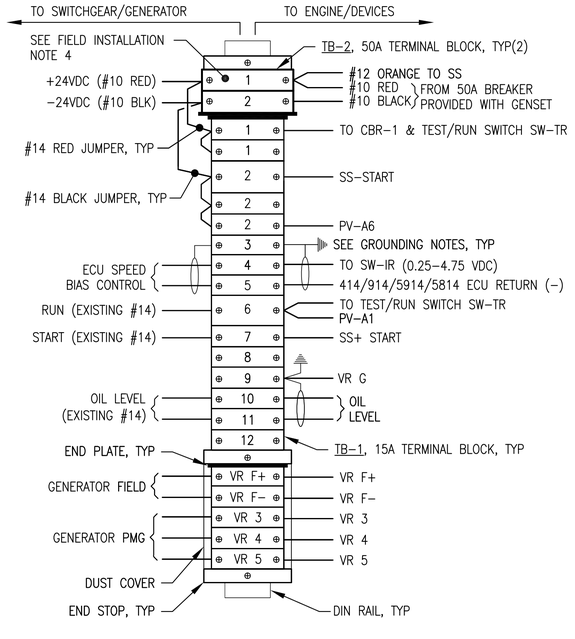
NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

SHOP FABRICATION NOTES:

1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
2) INSTALL IN A NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL AND HINGED LOCKABLE DOOR. SIZE AS INDICATED.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE AS REQUIRED TO MATCH TERMINALS. LABEL ALL TERMINALS EXACTLY AS INDICATED ON THE DETAILS.
4) ALL WIRE #14AWG EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. LABEL BOTH ENDS OF ALL JUMPERS WITH THE ENGINE PANEL TERMINAL NUMBER.
5) PROVIDE MECHANICAL GROUND LUGS FASTENED TO BACK PANEL AND GROUNDED TO ENGINE-GENERATOR. GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.
6) PROVIDE WIRING HARNESSES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN LIQUID TIGHT FLEX OR FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
7) SHOP TEST EACH NEW ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

FIELD INSTALLATION NOTES:

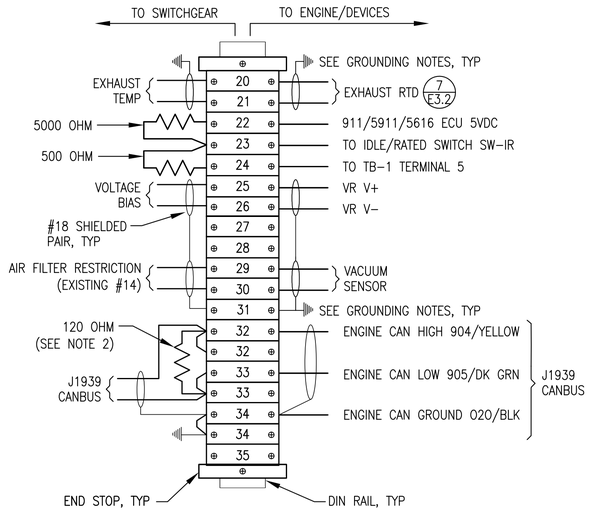
1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE ENGINE PANEL TERMINAL NUMBER.
2) ON SHIELDED CONDUCTORS GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.
3) GEN#1, GEN#2 & GEN#4 (ADD ALT #2) TO BE FURNISHED WITH NEW J-BOXES SHOP CONNECTED TO GENSET AS INDICATED & SPECIFIED.
4) ALL #14, #12, #10, AND #18 SHIELDED PAIRS FROM GENERATOR TO SWITCHGEAR ARE EXISTING. TAPE ENDS AND NEATLY COIL ANY UNUSED CONDUCTORS IN J-BOX.
5) RELABEL ALL TERMINALS IN SWITCHGEAR TO MATCH NEW J-BOX TERMINAL NUMBERS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH ENGINE PANEL TERMINAL NUMBER.



NOTE: TYPICAL JOHN DEERE ECU CONNECTION NUMBERS SHOWN. SEE WIRING HARNESS FOR EACH ENGINE FOR ACTUAL ECU CONNECTIONS.

3 E3.2 TERMINAL STRIP CONNECTIONS

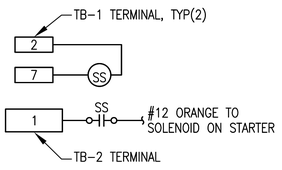
NO SCALE



NOTES: 1) ALL RESISTORS 0.25W.
2) REMOVE RESISTOR IF ENGINE WIRING HARNESS HAS 120 OHM END OF LINE RESISTOR.

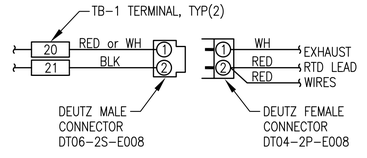
5 E3.2 TERMINAL STRIP CONNECTIONS

NO SCALE



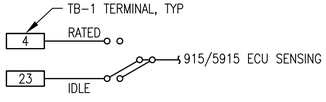
6 E3.2 STARTER AUX SOLENOID SS WIRING

NO SCALE



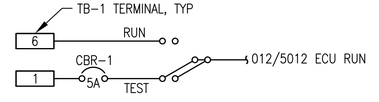
7 E3.2 EXHAUST RTD CONNECTOR

NO SCALE



8 E3.2 IDLE/RATED SWITCH SW-IR WIRING

NO SCALE



9 E3.2 TEST/RUN SWITCH SW-TR WIRING

NO SCALE

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
ARCTIC VILLAGE POWER PLANT UPGRADE

TITLE: 24VDC ENGINE WIRING JUNCTION BOX

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: CWV/BCG | DATE: 2/25/21
FILE NAME: ARCTDERA E1-3 | SHEET: E3.2 OF 3
PROJECT NUMBER:

1 / G1 COMMUNITY VICINITY PLAN
1"=100'

SCHEDULE OF DRAWINGS

G1	PROJECT DESCRIPTION, SCHEDULE OF DRAWINGS, & COMMUNITY VICINITY PLAN
M1	BASE BID MECHANICAL DEMOLITION & NEW WORK PLANS
M2.1	BASE BID GENSET INSTALLATION DETAILS
M2.2	BASE BID ENGINE EXHAUST DETAILS
M3	BASE BID GENSET FABRICATION DETAILS
M4	BASE BID NEW WORK PLANS & DETAILS
M5	ADDITIVE ALTERNATE DEMOLITION & NEW WORK PLANS & DETAILS
M6	ADDITIVE ALTERNATE NEW WORK DETAILS
M7	ADDITIVE ALTERNATE 100 GALLON DAY TANK FABRICATION
E1	BASE BID ELECTRICAL DEMOLITION & NEW WORK PLANS
E2	BASE BID ELECTRICAL PLANS & DETAILS
E3.1	BASE BID NEW SWITCHGEAR DETAILS
E3.2	BASE BID 24VDC ENGINE WIRING JUNCTION BOX
E4	BASE BID DEMOLITION & NEW WORK DETAILS
E5	ADDITIVE ALTERNATE ELECTRICAL DEMOLITION & NEW WORK PLANS
E6	ADDITIVE ALTERNATE NEW WORK DETAILS
E7	REFERENCE DRAWING FOR EXISTING DAY TANK CONTROL PANEL

PROJECT DESCRIPTION

1) THE EXISTING CHENEGA BAY POWER PLANT WAS ORIGINALLY CONSTRUCTED IN 2008. SEVERAL MODIFICATIONS HAVE BEEN MADE SINCE ORIGINAL CONSTRUCTION. THE PLANT PRESENTLY HAS MULTIPLE MECHANICAL AND ELECTRICAL DEFICIENCIES REQUIRING UPGRADES TO PROVIDE RELIABLE PRIME POWER SERVICE FOR THE COMMUNITY.

2) THE PRIMARY PURPOSES OF THIS PROJECT UNDER THE BASE BID SCOPE ARE TO: INSTALL TWO NEW TIER 3 MARINE DIESEL ENGINE-GENERATOR SETS (GENSETS); REPLACE THE EXISTING SWITCHGEAR WITH NEW PLC CONTROLLED SWITCHGEAR FOR AUTOMATIC PARALLELING OF ALL GENSETS; AND TO INSTALL MOTORIZED DAMPERS ON ALL VENTILATION OPENINGS TO ALLOW PROPER OPERATION OF THE EXISTING FIRE SUPPRESSION SYSTEM. SEE MECHANICAL SHEETS M1-M4 AND ELECTRICAL SHEETS E1-E4 FOR ALL BASE BID WORK.

3) IN ADDITION, MINOR MODIFICATIONS WILL BE MADE TO THE PLANT MECHANICAL AND ELECTRICAL SYSTEMS AS INDICATED.

4) AS FUNDING ALLOWS, THE SCOPE OF THE PROJECT WILL BE INCREASED TO INCLUDE THE FOLLOWING:
ADDITIVE ALTERNATE #1 – REPLACE THE POWER PLANT DAY TANK WITH A NEW AUTOMATIC FILL DAY TANK TO IMPROVE OPERATIONAL RELIABILITY AND REDUCE SPILL RISK.
ADDITIVE ALTERNATE #2 – UPGRADE THE POWER PLANT DAY TANK FILL PIPELINE AND CONNECTIONS TO BULK FUEL TANKS TO IMPROVE OPERATIONAL RELIABILITY AND REDUCE SPILL RISK.

5) AN EXISTING PORTABLE ENGINE-GENERATOR DESIGNATED AS "E-GEN" IS PRESENTLY LOCATED ADJACENT TO THE POWER PLANT. IT WILL BE USED TO PROVIDE COMMUNITY POWER WHILE REPLACING THE SWITCHGEAR, GENSETS AND OTHER EQUIPMENT IN THE POWER PLANT. SEE PRIME POWER COORDINATION REQUIREMENTS ON SHEET E1 FOR WORK REQUIRED TO ENABLE TEMPORARY COMMUNITY POWER FROM THE E-GEN.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: PROJECT DESCRIPTION, SCHEDULE OF DRAWINGS, & COMMUNITY VICINITY PLAN

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: CHENDERA G&M | SHEET: G1 OF 1
PROJECT NUMBER:

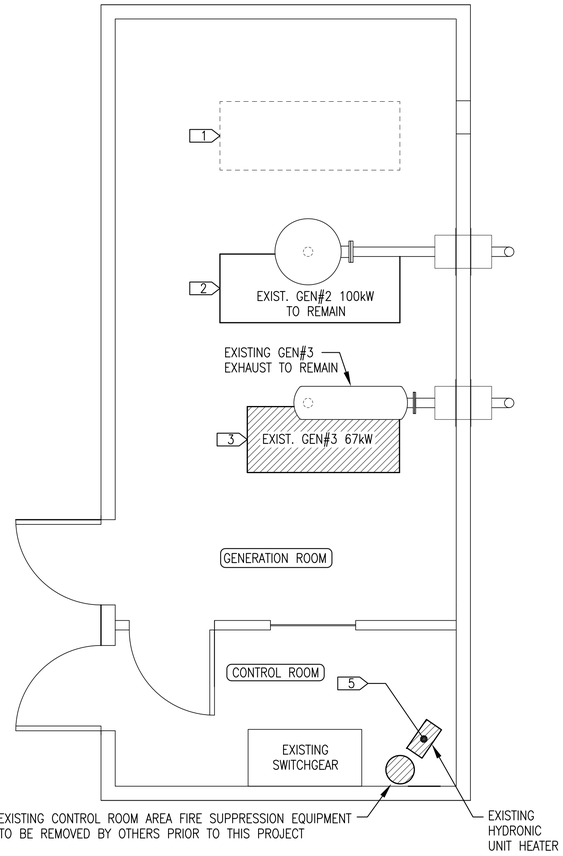
DEMOLITION GENERAL NOTES:

1. THIS PLANT PROVIDES PRIME POWER TO THE COMMUNITY OF CHENEGA BAY. KEEP OUTAGES TO A MINIMUM AND COORDINATE ALL REQUIRED OUTAGES WITH THE UTILITY. SEE NOTES ON SHEET E1.
2. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL. AREAS CONTAINING EXISTING EQUIPMENT AND PIPING TO BE REMOVED INDICATED BY HATCHING.
3. TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO GENERATION EQUIPMENT BEING REMOVED DURING DEMOLITION EXCEPT ENGINE BLOCKS, SEE GENERAL NOTE 5. TARP GENERATORS AND SEAL ALL EXPOSED CONNECTIONS PRIOR TO REMOVING FROM PLANT. TURN ALL REMOVED EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION.
4. DRAIN ENGINE BLOCKS AND ASSOCIATED PIPING/HOSES PRIOR TO REMOVAL. TURN USED OIL AND GLYCOL OVER TO THE UTILITY FOR FINAL DISPOSITION
5. RENDER ALL EXISTING ENGINE BLOCKS TAKEN OUT OF SERVICE UNUSABLE BY CUTTING A MINIMUM 3"x3" HOLE IN ENGINE CRANK CASE. FILL OUT A CERTIFICATE OF DESTRUCTION FOR EACH ENGINE AND INCLUDE PHOTOGRAPHIC DOCUMENTATION OF THE HOLE AND THE ASSOCIATED ENGINE NAMEPLATE.

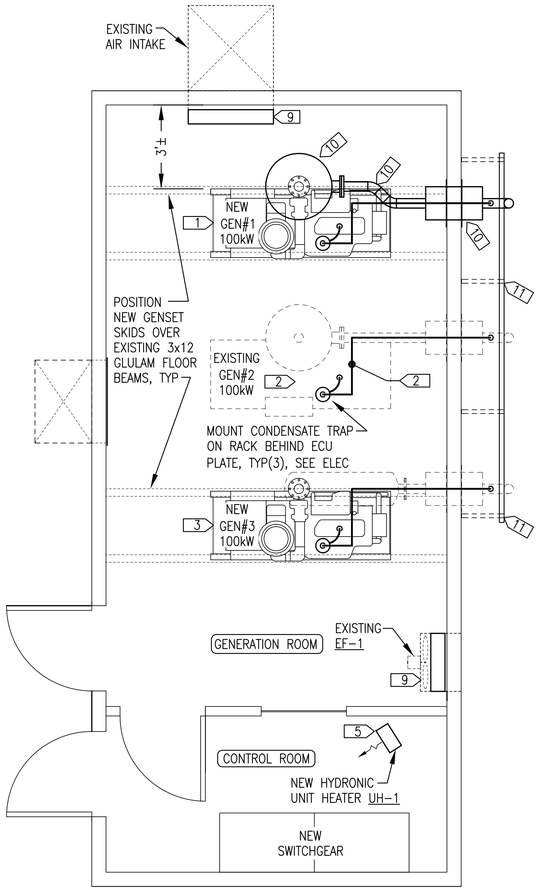
DEMOLITION SPECIFIC NOTES:

1. GEN#1 WAS PREVIOUSLY REMOVED FROM THE PLANT IN ITS ENTIRETY.
2. GEN#2 WAS RECENTLY INSTALLED AND IS COMPLETE EXCEPT FOR MINOR MODIFICATIONS. SEE NEW WORK PLAN.
3. REMOVE EXISTING GEN#3 AND A PORTION OF THE EXHAUST PIPING AS REQUIRED FOR NEW CONNECTION. SEE ELEVATION 2/M2.1. SEE ELECTRICAL FOR ADDITIONAL DEMOLITION DETAILS.
4. SEE ELECTRICAL
5. REMOVE EXISTING HYDRONIC UNIT HEATER TO MAKE ROOM FOR INSTALLATION OF NEW SWITCHGEAR. SEE DEMOLITION DETAIL 3/M1.

3/M1 CONTROL ROOM HYDRONIC UNIT HEATER DEMOLITION
NO SCALE



1/M1 DEMOLITION PLAN
3/8"=1'-0"



2/M1 NEW WORK PLAN
3/8"=1'-0"

NEW WORK GENERAL NOTES:

1. EXISTING EQUIPMENT AND PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT AND PIPING TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. UNDER BASE BID FURNISH 20 GALLONS OF NEW EXTENDED LIFE ETHYLENE GLYCOL SOLUTION PRE-MIXED TO A RATIO OF 60% GLYCOL TO 40% WATER.

NEW WORK SPECIFIC NOTES:

1. INSTALL COMPLETE NEW GENSET #1 INCLUDING COOLANT, FUEL, EXHAUST, AND CRANK VENT CONNECTIONS. SEE ELEVATION 1/M2.1. SEE ELECTRICAL FOR ADDITIONAL INSTALLATION DETAILS.
2. REMOVE EXISTING CRANK VENT FILTER AND INSTALL NEW CONDENSATE TRAP AND CRANK VENT PIPING ON EXISTING GEN#2 IDENTICAL TO NEW GEN#3, SEE ELEVATION 2/M2.1.
3. INSTALL COMPLETE NEW GENSET #3 INCLUDING COOLANT, FUEL, EXHAUST, AND CRANK VENT CONNECTIONS. SEE ELEVATION 2/M2.2. SEE ELECTRICAL FOR ADDITIONAL INSTALLATION DETAILS.
4. SEE ELECTRICAL.
5. INSTALL NEW UNIT HEATER IN CONTROL ROOM. SEE DETAIL 6/M4 AND ELECTRICAL.
6. SEE ELECTRICAL
7. SEE ELECTRICAL
8. SEE ELECTRICAL
9. INSTALL NEW DAMPERS WITH MOTORIZED ACTUATORS ON AIR INTAKE AND FAN OPENINGS. SEE PLAN 1/M4.
10. INSTALL NEW 4" DISC TYPE SILENCER CENTERED OVER EXHAUST RISER. INSTALL NEW WALL THIMBLE IN EXISTING WALL OPENING. INSTALL NEW 4" EXHAUST PIPE WITH 45° OFFSET. SEE ELEVATION1/M2.1.
11. INSTALL NEW EXTERIOR SUPPORT ON NEW AND EXISTING EXHAUST PIPES, SEE DETAIL 1/M2.2.

ENGINE GENERATOR SCHEDULE

GENSET	DESCRIPTION
GEN #1 GEN #3 (2021 DERA)	ENGINE – 148 HP, 100 EKW PRIME, JOHN DEERE 4045AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 24 VDC. GENERATOR – MINIMUM 125KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274E OR APPROVED EQUAL.
GEN #2 (EXISTING)	ENGINE – 148 HP, 100 EKW PRIME, JOHN DEERE 4045AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 12 VDC. GENERATOR – MINIMUM 105KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274D OR APPROVED EQUAL.

HYDRONIC EQUIPMENT SCHEDULE

UH-1	CONTROL ROOM HEAT	HORIZONTAL DISCHARGE HOT WATER UNIT HEATER, 13 MBH AT 1.3 GPM 200F EWT AND 60F EAT, 1/60HP, 120V, 1ø. MODINE HSB-18 OR APPROVED EQUAL.
P-UH1	CONTROL ROOM HEAT	GRUNDFOS UPS15-42F OR APPROVED EQUAL. 4 GPM AT 2' TDH, 1/25HP, 115V, SPEED 1. PROVIDE 3/4" SOLDER COMPANION FLANGES, GASKETS, AND BOLTS.

VENTILATION EQUIPMENT SCHEDULE:

EF-1 & COMBUS. AIR	FAN & INTAKE DAMPERS	OPPOSED BLADE LOW-LEAKAGE CONTROL DAMPER, GALVANIZED STEEL CONSTRUCTION, 304 STAINLESS STEEL BEARINGS AND JAMB SEALS, EPDM BLADE SEALS, AND WELDED STEEL AIRFOIL BLADES. GREENHECK VCD-33 OR APPROVED EQUAL.
MD	MOTORIZED DAMPER ACTUATOR	120V SPRING RETURN ACTUATOR, BELIMO AF-BUP OR APPROVED EQUAL.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

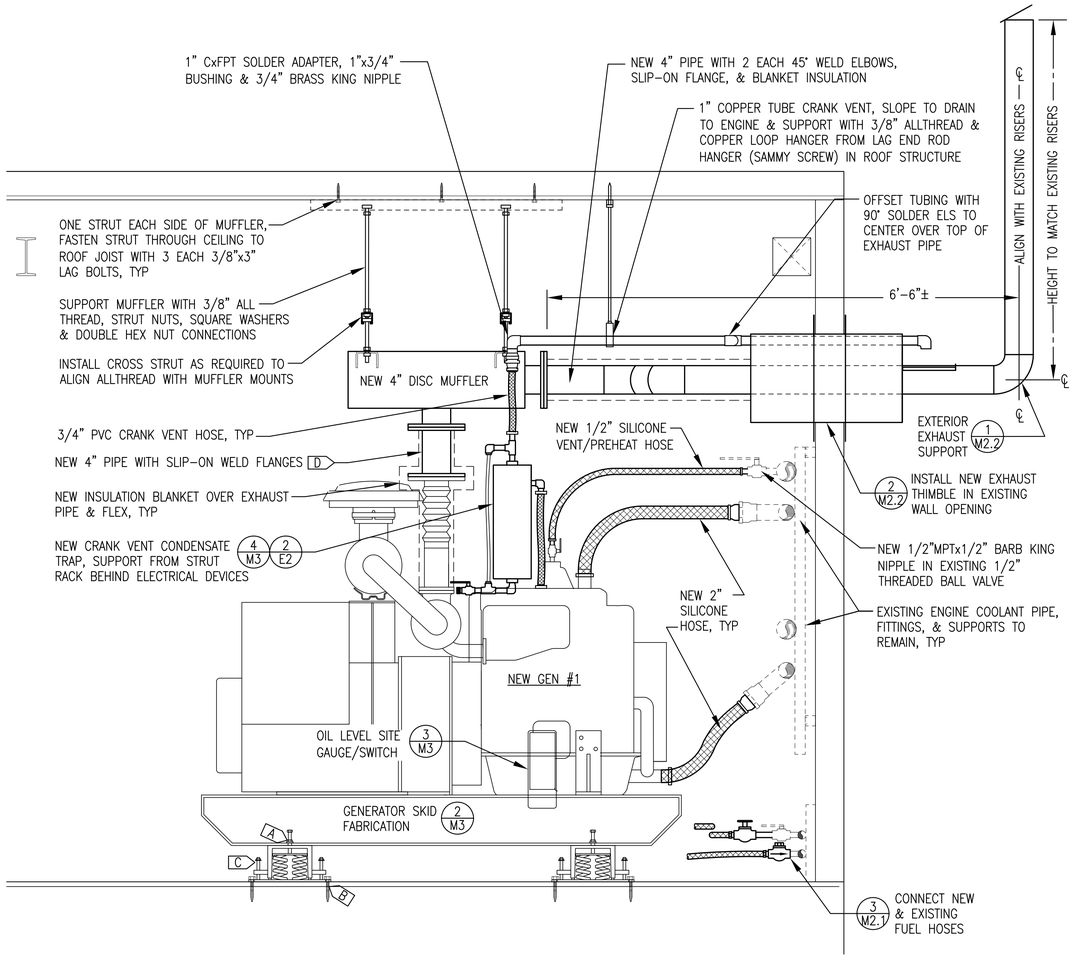
STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

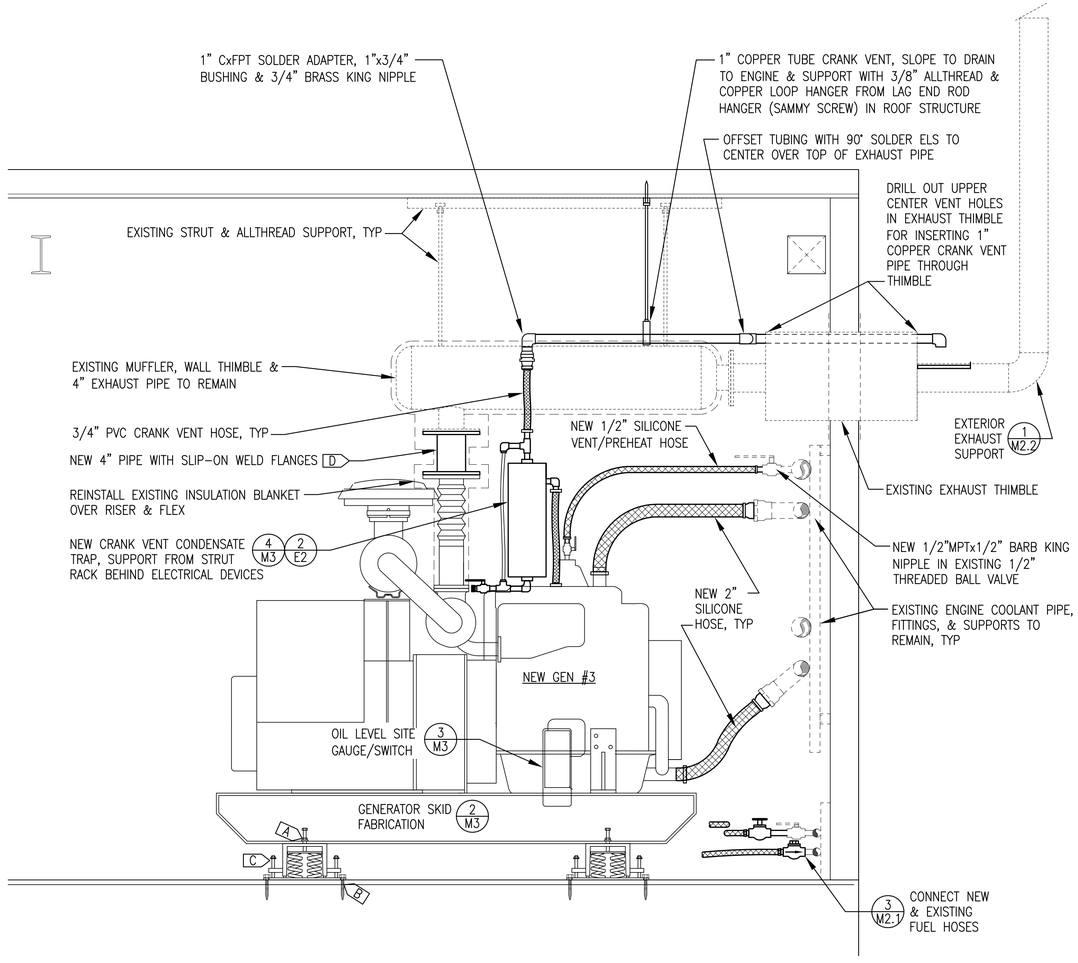
TITLE: BASE BID MECHANICAL DEMOLITION & NEW WORK PLANS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

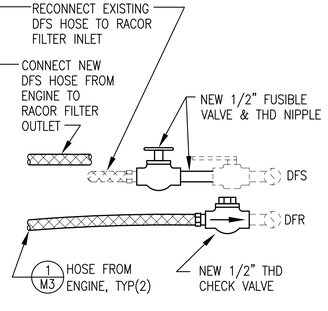
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: CHENDERA G&M | SHEET: M1 OF 6
PROJECT NUMBER:



1/M2.1 NEW GENSET #1 INSTALLATION ELEVATION
1"=1'-0"



2/M2.1 NEW GENSET #3 INSTALLATION ELEVATION
1"=1'-0"



3/M2.1 GEN#1 & #3 FUEL OIL PIPING CONNECTIONS
NO SCALE

NOTES:

1) EXISTING TUBING, VALVES, FITTING & HOSE SHOWN LIGHT-DASHED
2) EXISTING PIPING IS 1/2" SS TUBING. NEW & EXISTING VALVES & FITTINGS ARE 1/2" THREADED.
3) FIELD CUT NEW ENGINE MOUNTED HOSES TO LENGTH AS REQUIRED & REINSTALL JIC FITTINGS.

GENSET INSTALLATION GENERAL NOTES:

1) EXISTING PIPING & EQUIPMENT TO REMAIN SHOWN WITH LIGHT DASHED LINES.
2 NEW EQUIPMENT TO BE INSTALLED SHOWN WITH DARK SOLID LINES.

GENSET INSTALLATION SPECIFIC NOTES:

A> CENTER VIBRATION ISOLATORS ON WEDGE WASHERS IN GENSET SKID.

B> FASTEN NEW VIBRATION ISOLATORS THROUGH FLOOR INTO EXISTING GLULAM BEAM WITH 2 EACH 1/2"x5" LAG BOLTS. SEAL FLOOR PENETRATIONS WITH POLYURETHANE CAULK TO MAINTAIN CONTAINMENT.

C> ADJUST SPRING VIBRATION ISOLATOR LEVELING BOLTS TO ACHIEVE A UNIFORM INSTALLATION HEIGHT OF APPROXIMATELY 5-3/4" THEN TIGHTEN LOCKING NUTS. ADJUST NUTS ON STABILIZER BOLTS TO ACHIEVE A UNIFORM CLEARANCE OF APPROXIMATELY 1/8" THEN TIGHTEN LOCKING NUTS. VERIFY UNIT MOVES FREELY ON ISOLATORS.

D> FIT AND WELD EXHAUST PIPE AFTER ADJUSTING ISOLATORS.

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: BASE BID GENSET INSTALLATION DETAILS

Gray Stassel Engineering, Inc.
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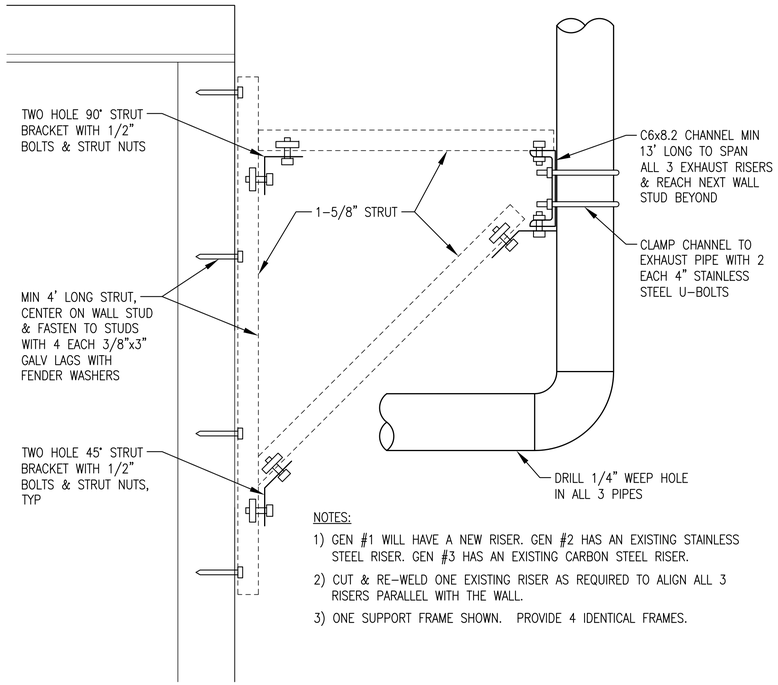


NOTES:

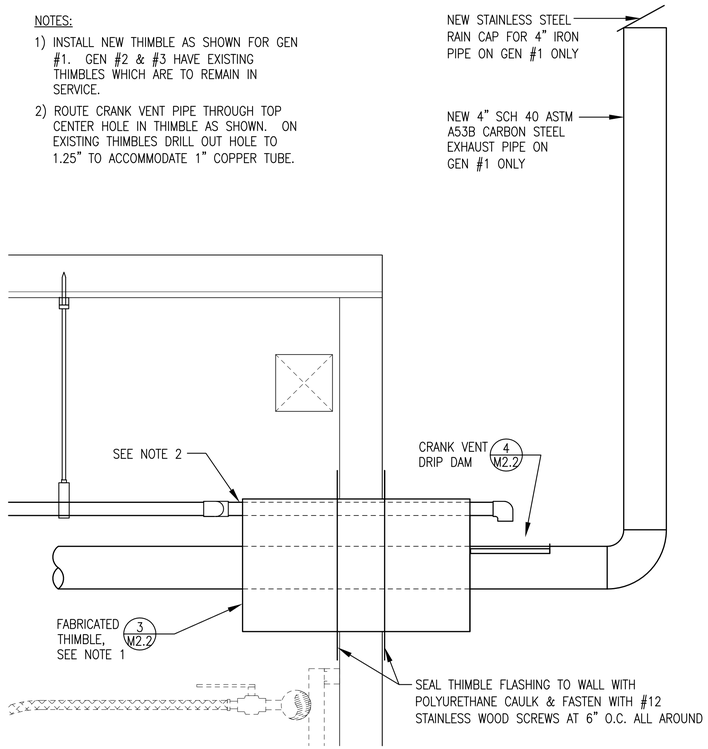
1) GEN #1 WILL HAVE A NEW RISER. GEN #2 HAS AN EXISTING STAINLESS STEEL RISER. GEN #3 HAS AN EXISTING CARBON STEEL RISER.
2) CUT & RE-WELD ONE EXISTING RISER AS REQUIRED TO ALIGN ALL 3 RISERS PARALLEL WITH THE WALL.
3) ONE SUPPORT FRAME SHOWN. PROVIDE 4 IDENTICAL FRAMES.

1 M2.2 EXTERIOR EXHAUST PIPE SUPPORT

NO SCALE

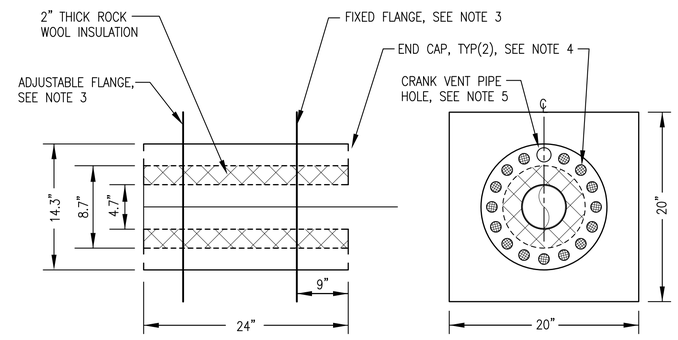
NOTES:

1) INSTALL NEW THIMBLE AS SHOWN FOR GEN #1. GEN #2 & #3 HAVE EXISTING THIMBLES WHICH ARE TO REMAIN IN SERVICE.
2) ROUTE CRANK VENT PIPE THROUGH TOP CENTER HOLE IN THIMBLE AS SHOWN. ON EXISTING THIMBLES DRILL OUT HOLE TO 1.25" TO ACCOMMODATE 1" COPPER TUBE.



2 M2.2 EXHAUST THIMBLE INSTALLATION

NO SCALE

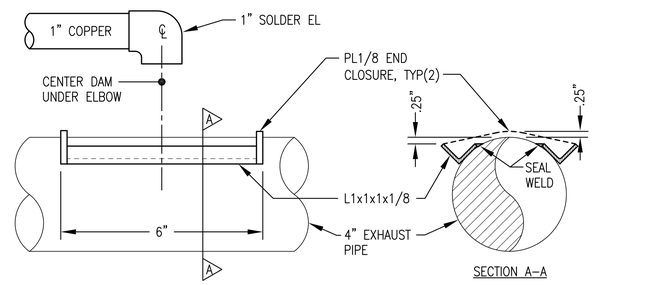


NOTES:

1) FABRICATE 2 EACH THIMBLES FOR 5" NOMINAL PIPE SIZE AND 1 EACH THIMBLE FOR 4" NOMINAL PIPE SIZE. SEE CHART FOR DIMENSIONS.
2) FABRICATE ENTIRE ASSEMBLY FROM MINIMUM 16 GAUGE TYPE 304 STAINLESS STEEL WITH ALL JOINTS SEAL WELDED.
3) FABRICATE TWO IDENTICAL SQUARE FLANGES. SEAL WELD FIXED FLANGE TO OUTER SHELL. ADJUSTABLE FLANGE TO SHIP LOOSE FOR FIELD INSTALLATION.
4) SEAL WELD END CAPS TO INNER AND OUTER SHELLS. PROVIDE 1"ø VENT HOLES INTO UNINSULATED SPACE BOTH ENDS, QUANTITY AS INDICATED, EQUALLY SPACED. ON EXTERIOR (FIXED FLANGE) END INSTALL 1/8" STAINLESS STEEL BUG SCREEN.
5) AT TOP-CENTER LOCATION EACH END PROVIDE 1.25"ø HOLE WITHOUT SCREEN FOR CRANK VENT PIPE INSTALLATION.

3 M2.2 EXHAUST PIPE THIMBLE FABRICATION

NO SCALE



4 M2.2 CRANKCASE DRIP DAM FABRICATION DETAIL

NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: BASE BID ENGINE EXHAUST DETAILS

Gray Stassel Engineering, Inc.
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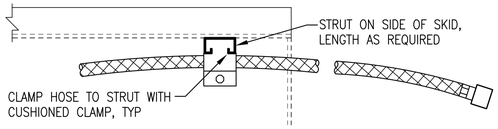
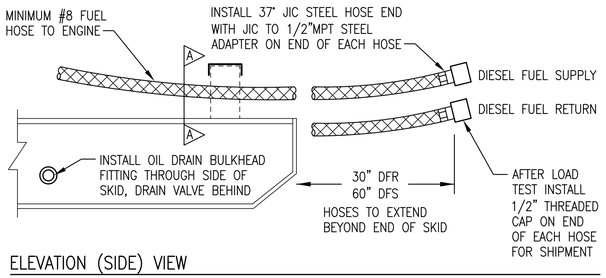
PROJECT NUMBER:

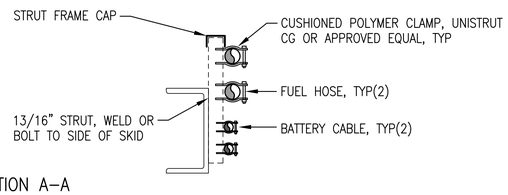
NOTE: GROUP HOSES ON LEFT SKID AS SHOWN TO COORDINATE WITH COOLANT HOSES.



LEFT SKID PLAN (TOP) VIEW

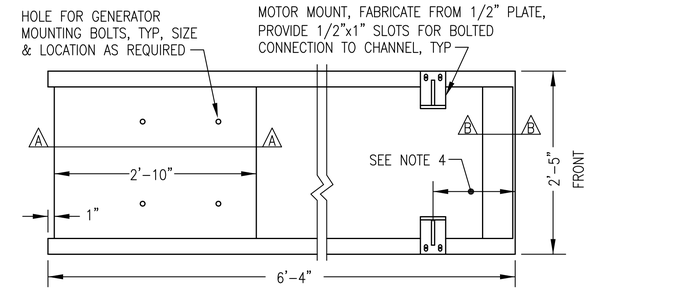


ELEVATION (SIDE) VIEW

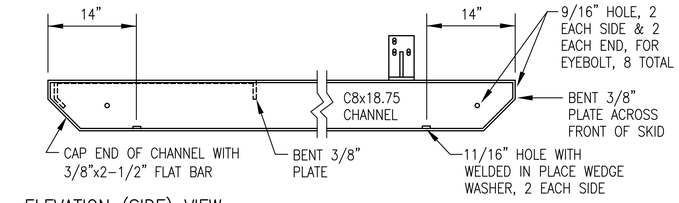


SECTION A–A

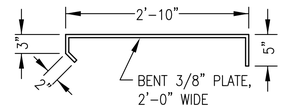
1 M3 FUEL/OIL HOSE & BATTERY CABLE INSTALLATION ON SKID
NO SCALE



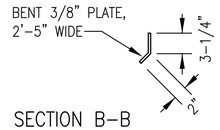
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A

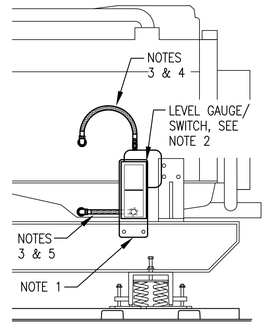


SECTION B–B

NOTES:

1) FABRICATE FROM ASTM A–36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL–PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE–GENERATOR.
4) PLACE UNIT ON SKID SO THAT THE EXHAUST RISER CENTERLINE IS 3'–3" FROM THE FRONT OF THE SKID.

2 M3 GENSET #1 & #3 (JOHN DEERE 4045AFM85) SKID DESIGN
NO SCALE

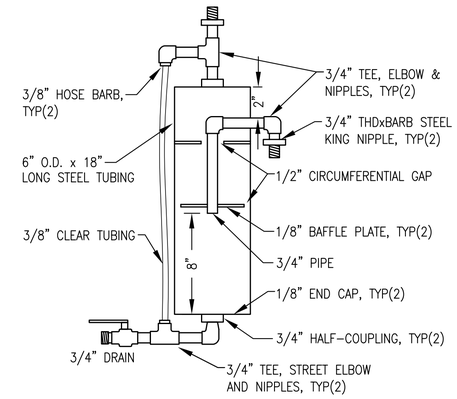


NOTES:

1) 1/4" STEEL SUPPORT PLATE PRE–DRILLED TO MATCH GAUGE/SWITCH MOUNTS, CHANNEL SKID HOLES AND BOTTOM HOSE ENTRANCE. BOLT TO INSIDE (BACK) OF CHANNEL SKID AT HEIGHT AS REQUIRED TO CENTER GAUGE AT NORMAL FULL OIL LEVEL. ADJUST SWITCH CONTACTS 1/2" ABOVE & BELOW.
2) SEE ENGINE GENERATOR SPECIFICATIONS FOR LEVEL/GUAGE SWITCH. MOUNT TO STEEL SUPPORT PLATE WITH RUBBER SHOCK MOUNTS.
3) #8 HOSE WITH 1/2" OR 3/8" NPT JIC SWIVEL ENDS AS REQUIRED.
4) CONNECT TOP (VENT) PORT TO ENGINE CRANK CASE WITH HOSE. ROUTE UPPER HOSE TO AVOID LOW POINT TRAPS.
5) CONNECT BOTTOM PORT TO ENGINE OIL PAN WITH HOSE. DO NOT TEE INTO OIL DRAIN LINE. ROUTE LOWER HOSE BACK THROUGH PRE–DRILLED HOLE IN STEEL PLATE.

3 M3 TYPICAL OIL LEVEL GAUGE/SWITCH INSTALLATION
NO SCALE

NOTE: ALL PIPE & FITTINGS 3/4" THREADED UNLESS INDICATED OTHERWISE.



4 M3 CONDENSATE TRAP FABRICATION
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER BRIAN C. GRAY ME 8210

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: BASE BID GENSET FABRICATION DETAILS

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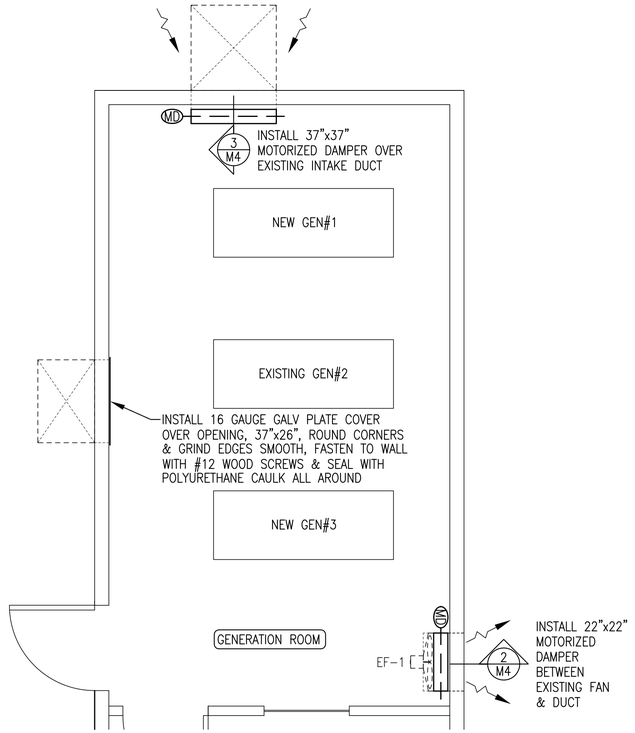
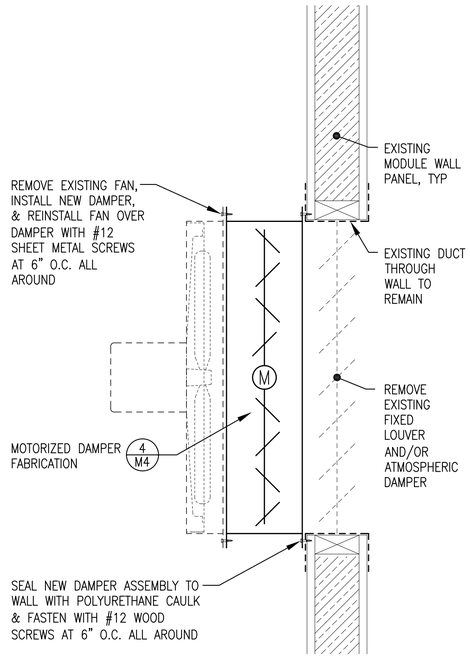
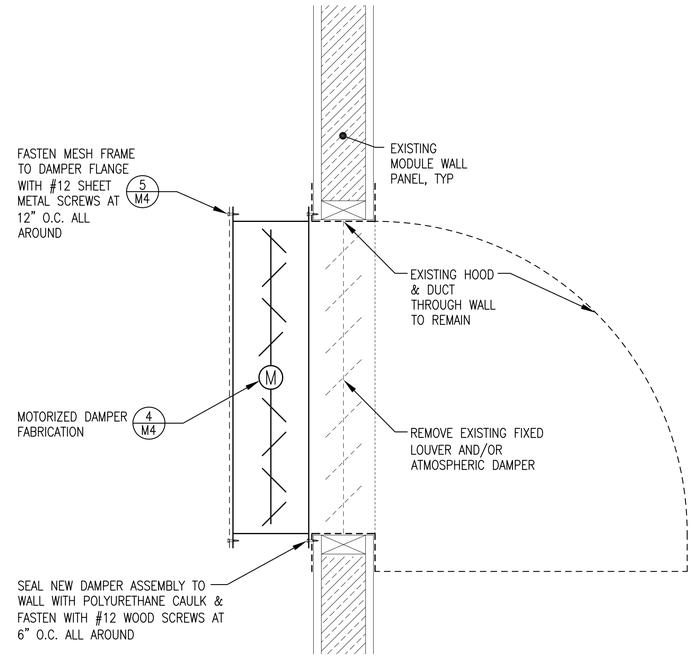


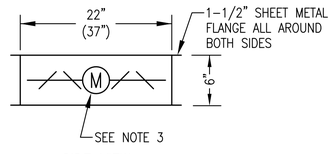
1 M4 GENERATION ROOM VENTILATION UPGRADE PLAN
3/8"=1'-0"



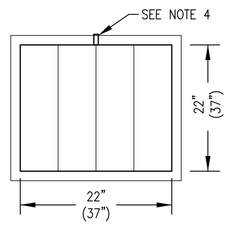
2 M4 EXHAUST FAN EF-1 DAMPER INSTALLATION
NO SCALE



3 M4 AIR INTAKE DAMPER INSTALLATION
NO SCALE



SIDE VIEW



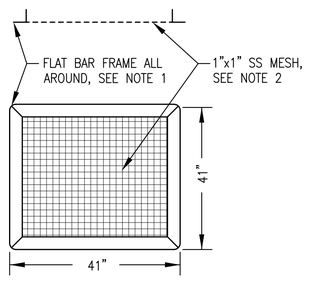
TOP VIEW

NOTES:
1. FABRICATE ONE EACH 22"x22" ASSEMBLY FOR FAN EF-1.
2. FABRICATE ONE EACH 37"x37" ASSEMBLY FOR INTAKE.
3. PROVIDE MIN 3" DAMPER ROD EXTENSION ON SIDE INDICATED AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

4 M4 TYPICAL MOTORIZED DAMPER FABRICATION
1"=1'-0"

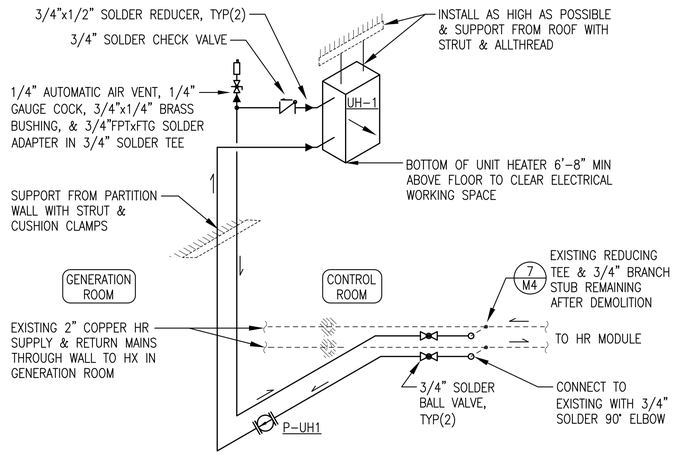
VENTILATION UPGRADE GENERAL NOTES

1) PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL MECHANICAL CODE AND APPLICABLE SMACNA STANDARDS. FASTEN AND SUPPORT AS INDICATED.
2) FABRICATE ALL DAMPER AND FAN ASSEMBLIES FROM MINIMUM 20 GAUGE GALVANIZED SHEET METAL WITH STANDARD MECHANICAL JOINTS SEALED AIR TIGHT.
3) SEE SCHEDULE SHEET M1 FOR EQUIPMENT SPECIFICATIONS.



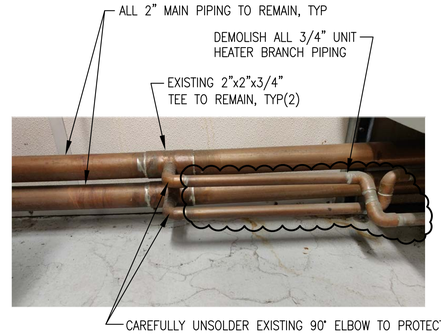
NOTES:
1. FABRICATE FRAME FROM 2"x1/4" ALUMINUM FLAT BAR WITH MITERED AND WELDED CORNERS. ROUND OUTSIDE CORNERS 1/2" RADIUS.
2. INSTALL 1"x1" STAINLESS STEEL WIRE MESH IN HEMMED STAINLESS STEEL FRAME AND RIVET TO FLAT BAR FRAME.

5 M4 INTAKE MESH FRAME FABRICATION
1"=1'-0"



NOTES:
1) ALL PIPING 3/4" TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.
2) PRIOR TO STARTING, FLUSH INTERIOR OF PIPING TO REMOVE ALL DEBRIS AND RESIDUE.
3) SET PUMP TO SPEED 1.

6 M4 NEW CONTROL ROOM UNIT HEATER INSTALLATION
NO SCALE



NOTE:
EXISTING HEAT RECOVERY SYSTEM IS FILLED WITH PROPYLENE GLYCOL SOLUTION AND THE UTILITY HAS A SPARE DRUM OF PROPYLENE GLYCOL IN THE HEAT RECOVERY MODULE. DRAIN SYSTEM AS REQUIRED AND SALVAGE GLYCOL. AFTER COMPLETION OF PIPING MODIFICATIONS, CHARGE SYSTEM WITH SALVAGED AND NEW GLYCOL, PURGE AIR, AND RETURN TO NORMAL OPERATING PRESSURE.

7 M4 UNIT HEATER PIPING DEMO AT CONNECTION TO 2" MAINS
NO SCALE

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

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CHENEGA BAY POWER PLANT UPGRADE

TITLE: BASE BID NEW WORK PLANS & DETAILS

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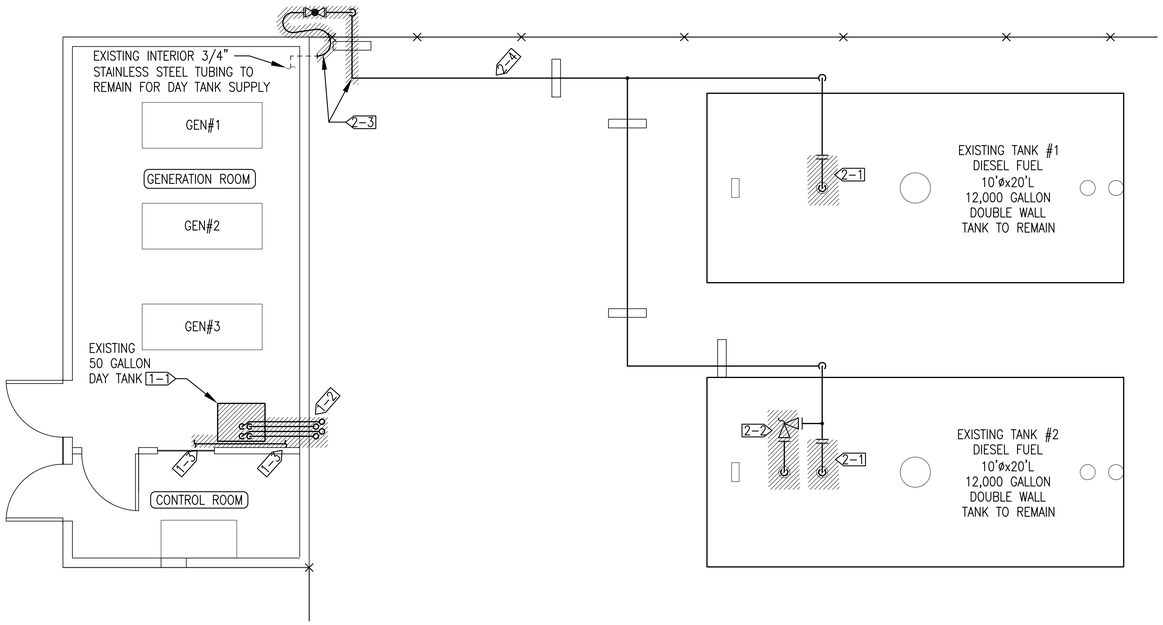


1 M5 ADDITIVE ALTERNATE DEMOLITION PLAN
1/4"=1'-0"

ADDITIVE ALTERNATE DEMOLITION GENERAL NOTES:

1. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL. AREAS CONTAINING EXISTING EQUIPMENT AND PIPING TO BE REMOVED INDICATED BY HATCHING.
2. TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO FUEL SYSTEM EQUIPMENT BEING REMOVED DURING DEMOLITION. TURN ALL REMOVED EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION.
3. SEE ELECTRICAL PLANS FOR ADDITIONAL DEMOLITION.
4. DRAIN & PURGE ALL PIPING PRIOR TO REMOVAL OR MODIFICATION.
5. AT TIME OF DEMOLITION DIP TANKS WITH WATER CUT PASTE TO DETERMINE FUEL & WATER LEVEL & PROVIDE RESULTS TO ENGINEER.

ADDITIVE ALTERNATE #1 INTERIOR DEMOLITION SPECIFIC NOTES:

1-1 SEE ELECTRICAL DEMOLITION FOR DISCONNECTION OF POWER & REMOVAL OF EXISTING DAY TANK CONTROL PANEL & CONDUCTORS. UPON COMPLETION OF ELECTRICAL DEMOLITION REMOVE EXISTING 50 GALLON DAY TANK IN ITS ENTIRETY, INCLUDING ALL TANK-MOUNTED ELECTRICAL & CONTROL DEVICES. SAVE TWO EACH GEAR PUMPS, ONE FOR REINSTALLATION & ONE FOR SPARE.

1-2 DEMOLISH ALL INTERIOR & EXTERIOR 2" THREADED STEEL VENT PIPING & PATCH ALL VENT PIPE WALL PENETRATIONS TO MATCH EXISTING.

1-3 ALL INTERIOR DIESEL PIPING INCLUDING DAY TANK SUPPLY, GEN SUPPLY, & GEN RETURN ARE 3/4" STAINLESS TUBING WITH SWAGE FITTINGS. SEE NEW DAY TANK INSTALLATION DETAILS SHEET M6 FOR LIMITS OF DEMOLITION & MODIFICATIONS TO EXISTING TUBING.

ADDITIVE ALTERNATE #2 EXTERIOR DEMOLITION SPECIFIC NOTES:

2-1 REMOVE EXISTING 1" FLANGED WITHDRAWAL DROP TUBE IN ITS ENTIRETY.

2-2 REMOVE EXISTING 1" FLANGED PRV IN ITS ENTIRETY.

2-3 CUT & REMOVE EXISTING 1" STEEL PIPE AT POWER PLANT ENTRANCE AS INDICATED INCLUDING; 1" WELD ELBOW, 1" FLANGED BALL VALVE, & FUEL HOSE. EXISTING 1/2" FEMALE THREAD END ON SS TUBING AT BUILDING ENTRANCE TO REMAIN FOR CONNECTION TO NEW FLEX.

2-4 ALL EXISTING 1" STEEL PIPING TO REMAIN UNLESS INDICATED OTHERWISE. REMOVE EXISTING PIPE CLAMPS AT SUPPORTS IN PREPARATION FOR CLEANING & PAINTING.

ADDITIVE ALTERNATE FUEL SYSTEM EQUIPMENT SCHEDULE:

HAND PUMP	DIESEL	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100 OR APPROVED EQUAL
SV-NC SV-NO	SOLENOID VALVES	1/2" THREADED END BRASS BODY, 1/2" NPT CONDUIT CONNECTION, 120VAC, SS CORE, MOLDED EPOXY COIL ENCLOSURE, INTERNAL PILOT OPERATED, 150 PSI DIFFERENTIAL OPENING PRESSURE, LIQUID TIGHT AND FULL MODULATION AT 0 PSI DIFFERENTIAL.	NORMALLY CLOSED - ASCO CAT. NO. 8210G94, NORMALLY OPEN - ASCO CAT. NO. 8210G34, OR APPROVED EQUAL
G-DT	DAY TANK LEVEL GAUGE	MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL, 25 PSIG MAX OPERATING PRESSURE, 35" LIQUID COLUMN PLUS 4" RISER.	ROCHESTER MODEL 8660 OR APPROVED EQUAL
VENT CAP	NORMAL & EMERGENCY	ALUMINUM BODY, STAINLESS STEEL SCREEN, 3" FPT CONNECTION	MORRISON FIGURE 155 OR APPROVED EQUAL
AV-1 AV-2	ACTUATED BALL VALVES	ACTUATED BALL VALVE ASSEMBLY RATED TO -50F. TYPE 304 STAINLESS STEEL FABRICATED COUPLING BRACKET, SHAFT, AND FASTENERS CONFIGURED TO ALLOW WRENCH ACCESS FOR MANUAL OPERATION OF VALVE WITHOUT REMOVING ACTUATOR. LOW TEMP BALL VALVE, 150# RF FLANGED ENDS. ELECTRIC ACTUATOR WITH OPERATING VOLTAGE, NEMA RATING, AND TORQUE AS INDICATED. CONFIGURE WITHOUT MANUAL OVERRIDE SHAFT EXTENSION. FURNISH WITH PTC SELF REGULATING HEATER, AUXILIARY SWITCH SET (AUXILIARY SWITCHES 3 & 4), AND EXXON BEACON 325 SEVERE COLD LUBRICANT.	VALVE ASSEMBLY: DG VALVE (780) 413-1760 OR APPROVED EQUAL 1" BALL VALVE - 151 IN-LB OPERATING TORQUE @ -50F NUTRON MODEL T3-R10R01LZ NEMA 7 ACTUATOR - 600 IN-LBS TORQUE, 10 SECOND STROKE TIME, 0.50 LOCKED ROTOR AMPS. RCS MODEL SXR-1023

ADDITIVE ALTERNATE VALVE & PUMP TAG SCHEDULE

VALVE & PUMP TAGS - 3"x5"x.08" ALUMINUM, 3/16" HOLES IN ALL FOUR CORNERS, BLACK GERBER THERMAL TRANSFER FILM PRINTED LETTERS ON GERBER 220 HIGH PERFORMANCE VINYL BACKGROUND, COLOR AS INDICATED, ONE SIDE ONLY. WARNING LITES OR EQUAL.

APPLE GREEN (DIESEL)

21 "NORMALLY OPEN, CLOSE ONLY FOR EMERGENCIES & TEMPORARY MAINTENANCE OF DAY TANK & FILTER"
22 "NORMALLY CLOSED, OPEN ONLY FOR HAND PRIMING DAY TANK"
23 "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ACTUATOR VALVE"

INSTALLATION - SECURE EACH TAG TIGHT TO VALVE, PIPE, OR DEVICE WITH STAINLESS STEEL TIE WIRE THROUGH ALL FOUR CORNERS

ADDITIVE ALTERNATE WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

WARNING SIGNS & INFORMATIONAL PLACARDS - PROVIDE DECALS AND SIGN BOARDS AS INDICATED IN THE SCHEDULE BELOW, QUANTITY & LOCATION WHERE SHOWN ON THE WARNING SIGN/PLACARD PLAN THIS SHEET.

(#) DECALS - DECALS TO BE WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, ONE SIDE ONLY, 10"x14". WARNING LITES OR EQUAL. APPLY TO FACE OF DOORS OR ELECTRICAL ENCLOSURES WHERE INDICATED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

(#) BOARDS - SIGN BOARDS TO BE EQUAL TO DECALS EXCEPT MOUNTED ON 0.08" ALUMINUM PLATE, 10"x14". PROVIDE 3/16" HOLES IN ALL FOUR CORNERS. ATTACH TO CHAIN LINK FENCING WITH HOG RINGS OR STAINLESS STEEL TIES. ATTACH TO WALLS OR STRUCTURES WITH STAINLESS STEEL SCREWS OR BOLTS.

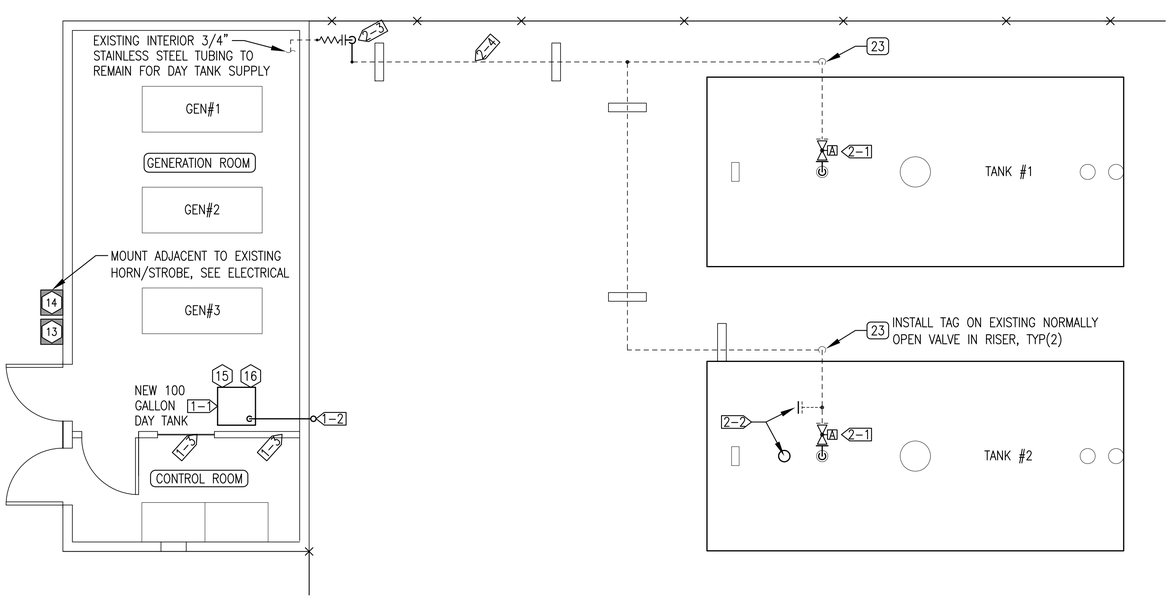
WARNING SIGNS - RED LETTERING ON WHITE BACKGROUND.

13 "FUEL OIL DAY TANK ALARM"
14 "IN CASE OF SPILL CALL DEC 1-800-478-9300"

INFORMATIONAL PLACARDS - BLACK LETTERING ON WHITE BACKGROUND.

15 "CHECK BULK TANK LEVEL DAILY, SWITCH TO OTHER BULK TANK WHEN LEVEL DROPS BELOW 1'-6" "

16 "TO MANUALLY FILL DAY TANK IN CASE OF EMERGENCY:
1) TURN OFF POWER TO THE DAY TANK CONTROL PANEL
2) MANUALLY OPEN ACTUATOR VALVE ON BULK TANK USING A WRENCH
3) OPEN NORMALLY CLOSED VALVE BY HAND PUMP
4) OPERATE HAND PUMP WHILE MONITORING LEVEL GAUGE"



2 M5 ADDITIVE ALTERNATE NEW WORK PLAN
1/4"=1'-0"

NEW WORK GENERAL NOTES:

1. ALL PIPING SHOWN WITH LIGHT/DASHED LINES THIS PLAN EXISTING TO REMAIN IN SERVICE.
2. ALL PIPING & DEVICES SHOWN WITH DARK/SOLID LINES THIS PLAN ARE NEW OR REUSED AND ARE TO BE INSTALLED THIS PROJECT.
3. TANKS & PIPING PRESENTLY CONTAIN DIESEL FUEL. PREFABRICATE TANK WITHDRAWAL PIPES OFF THE TANKS. INERT EXISTING PIPES PROIOR TO CUTTING & WELDING. PERFORM ALL WELDING IN ACCORDANCE WITH APPROPRIATE HOT WORK PROCEDURES PER NFPA 51B.

ADDITIVE ALTERNATE #1 NEW WORK SPECIFIC NOTES:

1-1 INSTALL NEW SINGLE WALL 100 GALLON DAY TANK. SEE DETAILS 1/M6 & 2/M6. SEE ELECTRICAL FOR ADDITIONAL INSTALLATION DETAILS.

1-2 INSTALL NEW 3" VENT. SEE DETAIL 1/M6.

1-3 CONNECT NEW PIPING TO EXISTING 3/4" STAINLESS TUBING WITH SWAGE ELBOWS & TEES. SEE DETAILS 1/M6 & 2/M6.

ADDITIVE ALTERNATE #2 NEW WORK SPECIFIC NOTES:

2-1 INSTALL NEW 1" DROP TUBE WITH ACTUATOR VALVE. SEE DETAIL 4/M6. SEE ELECTRICAL FOR ADDITIONAL INSTALLATION DETAILS.

2-2 INSTALL NEW ANSI 150# 1" BLIND FLANGE ON OLD PRV PIPING CONNECTION AND INSTALL 4" FORGED STEEL PIPE PLUG ON OLD PRV TANK CONNECTION.

2-3 INSTALL NEW 1" WELDED STEEL DAY TANK SUPPLY PIPING WITH FLEX AT POWER PLANT ENTRANCE. SEE DETAIL 5/M6.

2-4 WIRE BRUSH ALL EXISTING 1" STEEL DAY TANK SUPPLY PIPE & FITTINGS TO BARE METAL & APPLY TWO COATS OF COLD GALVANIZING COMPOUND. AFTER COATING INSTALL NEW GALVANIZED STRUT CLAMPS ON ALL SLEEPER SUPPORTS.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: ADDITIVE ALTERNATE DEMOLITION & NEW WORK PLANS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: CHENDERA M5-7 | SHEET: M5 OF 7
PROJECT NUMBER:

PIPING DIAGRAM GENERAL NOTES:

1) ALL EXISTING PIPE & FITTINGS TO REMAIN SHOWN WITH LIGHT-DASHED LINES. ALL OTHER PIPE, FITTINGS & EQUIPMENT NEW UNLESS SPECIFICALLY INDICATED OTHERWISE.

2) ALL NEW FUEL PIPING SCH 80 BLACK STEEL WITH THREADED JOINTS EXCEPT FOR SOCKET WELD CONNECTIONS WHERE INDICATED. ALL NEW VENT PIPING 3" SCH 40 BLACK STEEL WITH BUTT WELD JOINTS. ALL EXISTING INTERIOR FUEL PIPING 3/4" O.D. STAINLESS STEEL TUBE WITH COMPRESSION (SWAGE) FITTINGS.

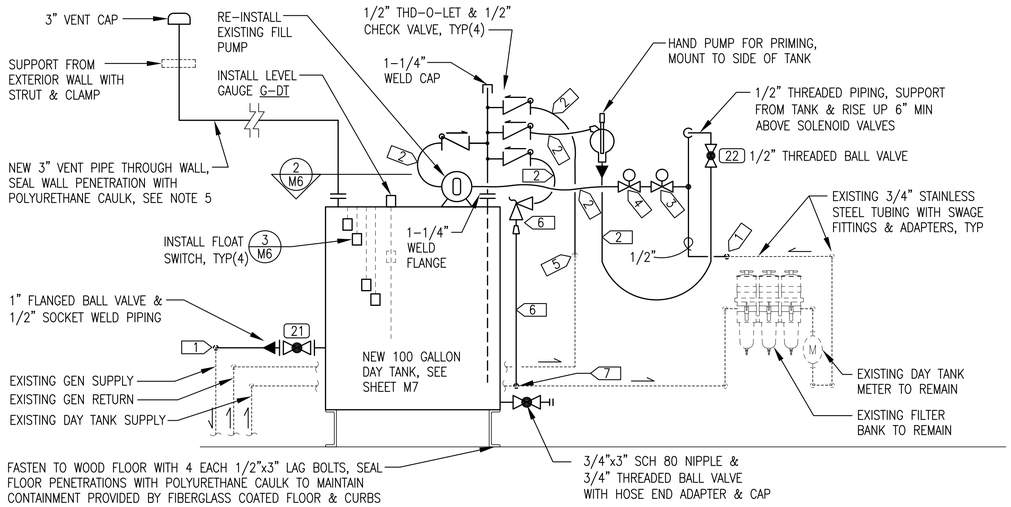
3) ON ALL HOSES INSTALL JICxNPT SWIVEL ENDS, SIZE REQUIRED TO MATCH PIPING OR PUMP.

4) SUPPORT DAY TANK PIPING & DEVICES FROM TANK MOUNTED STRUT

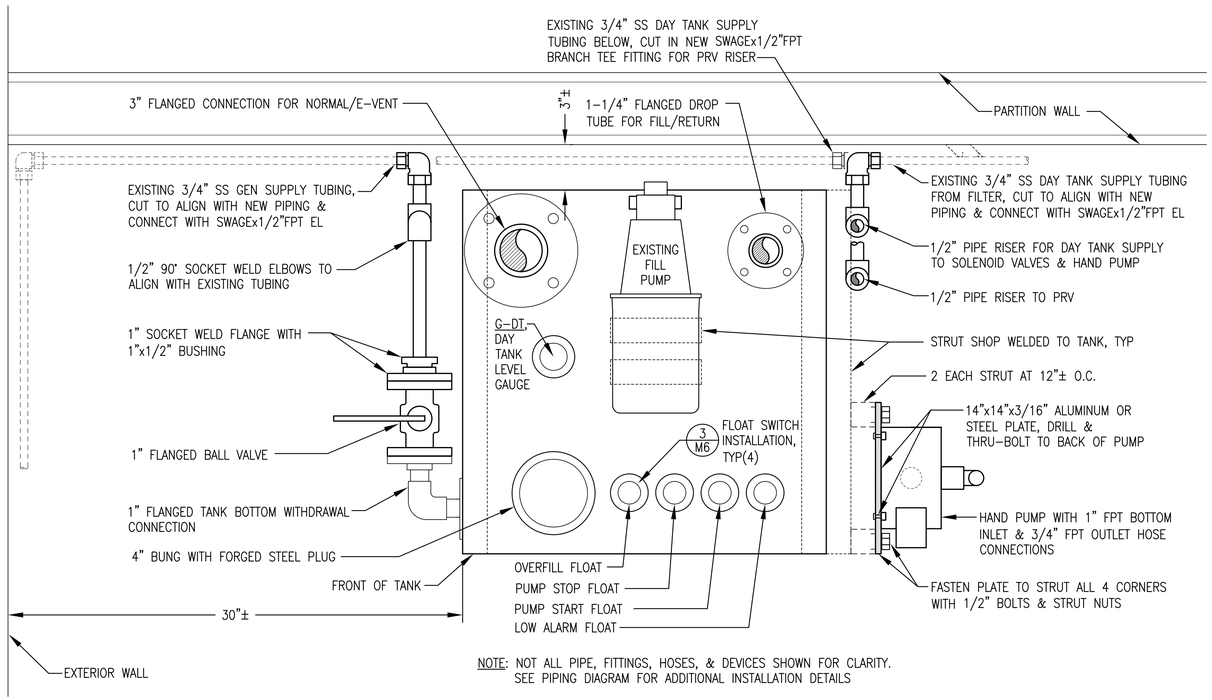
5) WIRE BRUSH VENT PIPE TO REMOVE MILL SCALE, DEGREASE, & APPLY TWO COATS COLD GALVANIZING COATING.

PIPING DIAGRAM SPECIFIC NOTES:

1. CUT EXISTING 3/4" TUBING TO ALIGN WITH NEW PIPING & INSTALL NEW SWAGEx1/2"FPT 90° ELBOW.
2. #10 HOSE WITH 3/8", 1/2", OR 3/4" NPT ENDS.
3. 1/2" NO SOLENOID VALVE.
4. 1/2" NC SOLENOID VALVE.
5. CONNECT NEW FUEL HOSE TO EXISTING SWAGEx1/2"FPT ADAPTER ON GENERATOR RETURN.
6. CLAMP 1/2" PIPE RISER TO STRUT ON SIDE OF TANK, INSTALL 1/2"x3/8" THREADED BELL REDUCER ON TOP WITH 3/8" THREADED PRV, 10 PSI SETPOINT.
7. CUT EXISTING 3/4" TUBING & INSERT NEW SWAGEx1/2"FPT BRANCH TEE FOR PRV RISER.

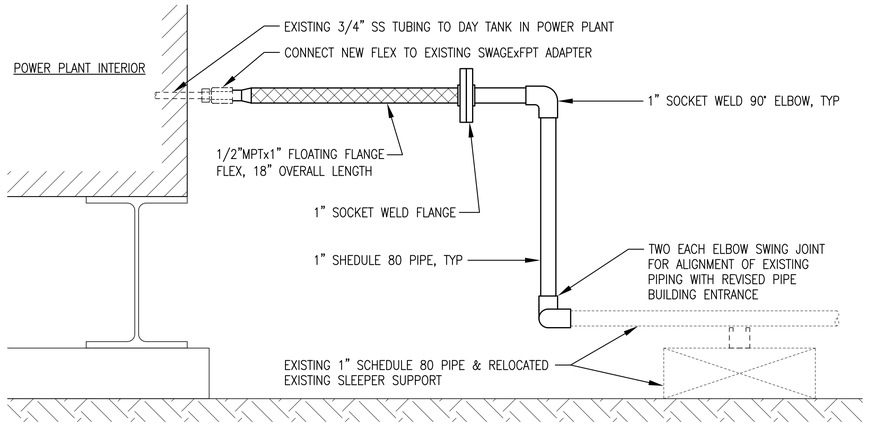


1 M6 DAY TANK PIPING NEW DIAGRAM (ADD ALT #1)
NO SCALE



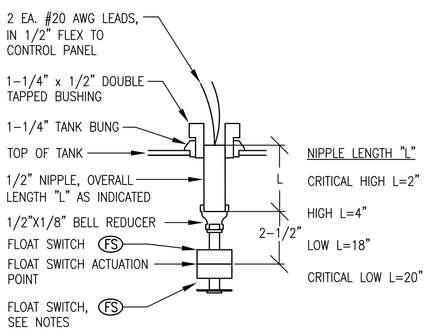
NOTE: NOT ALL PIPE, FITTINGS, HOSES, & DEVICES SHOWN FOR CLARITY. SEE PIPING DIAGRAM FOR ADDITIONAL INSTALLATION DETAILS

2 M6 DAY TANK & PIPING ENLRGED PLAN (ADD ALT #1)
NO SCALE

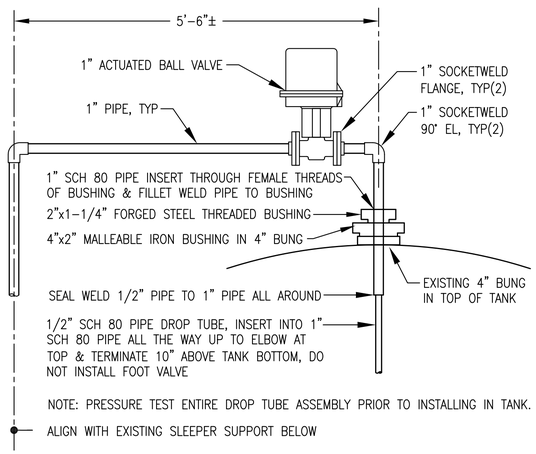


5 M6 DAY TANK SUPPLY PIPELINE POWER PLANT ENTRANCE (ADD ALT #2)
NO SCALE

NOTES:
1) FLOAT SWITCH (FS) SPECIFIED ON INSTRUMENTATION SCHEDULE SHEET E5.
2) PRIOR TO INSTALLATION CHASE THREADS ON FLOAT SWITCH WITH 1/8" PIPE DIE TO CLEAN OFF ANY EXCESS EPOXY, USE CARE TO AVOID DAMAGING WIRES.



3 M6 DAY TANK FLOAT SWITCH INSTALLATION (ADD ALT #1)
NO SCALE



4 M6 TYPICAL BULK TANK DROP TUBE INSTALLATION (ADD ALT #2)
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: ADDITIVE ALTERNATE NEW WORK DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

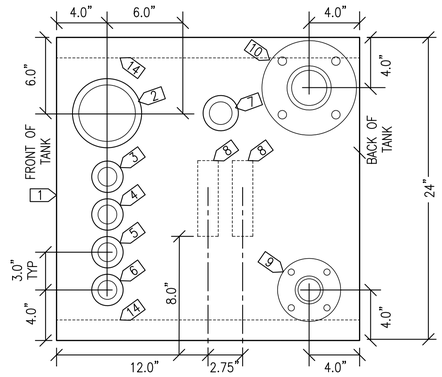
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 2/25/21
FILE NAME: CHENDERA M5-7	SHEET: M6 OF 7
PROJECT NUMBER:	

DAY TANK GENERAL NOTES:

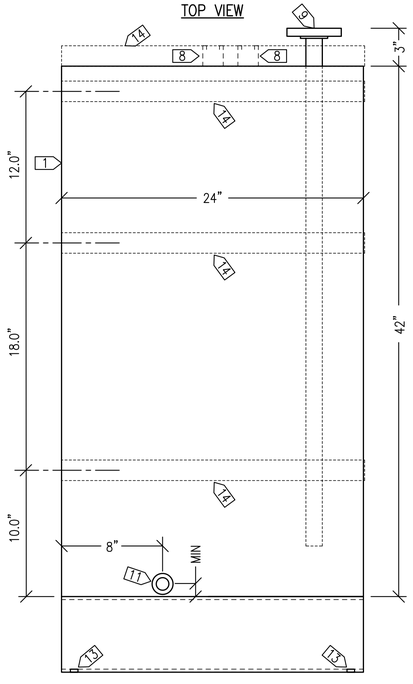
1) FABRICATE SINGLE WALL 100 GALLON NOMINAL CAPACITY DAY TANK. FABRICATE IN ACCORDANCE WITH UL 142.
2) FABRICATE FROM ASTM A-36 STEEL PLATE, 10 GAUGE MINIMUM EXCEPT FOR TOP 3/16" MINIMUM. ALL TANK SEAM JOINTS TO BE FULL CONTINUOUS WELDS IN ACCORDANCE WITH UL 142 FIGURE 6.5 – #1, #6, #7, OR #8.
3) PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. ALL STRUT TO BE 1-5/8"x1-5/8"x12 GA SOLID BACK PLAIN (BLACK), B-LINE B22 PLN OR EQUAL. SEAL WELD ALL TANK ATTACHMENTS.
4) INSTALL ALL FPT OPENINGS IN ACCORDANCE WITH UL 142 FIGURE 7.1 – #4 UNLESS INDICATED OTHERWISE. ALL DROP TUBES SCH 80 ASTM A106B STEEL PIPE WITH MPT OR FLANGED END AS INDICATED.
5) PRESSURE TEST COMPLETED ASSEMBLY TO 5 PSIG MAXIMUM USING SOAPY WATER SOLUTION ON ALL WELD JOINTS.
6) UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.
7) LABEL ALL OPENINGS WITH 1/4" BLACK LETTERS INDICATING FUNCTION AS LISTED IN PARENTHESES IN SPECIFIC NOTES.
8) UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS AND AIR DRY INTERIOR. SEAL 4" BUNG WITH THREADED STEEL PIPE PLUG. INSTALL 1-1/4" VENT CAP WHERE INDICATED. SEAL ALL OTHER FPT OPENINGS WITH PLASTIC OR STEEL PLUGS. SEAL FLANGED OPENINGS WITH WOOD OR METAL PLATE BLINDS.

DAY TANK SPECIFIC NOTES:

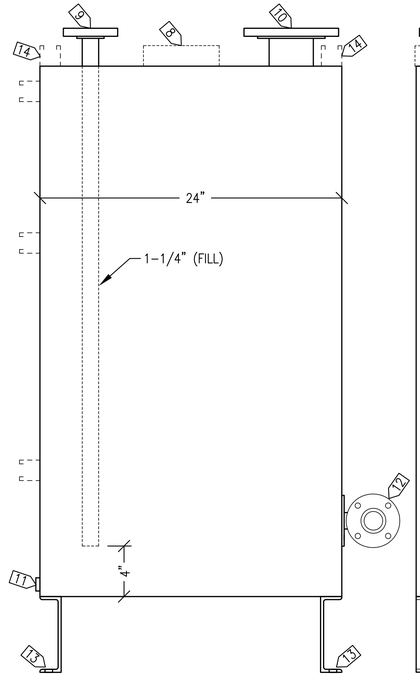
1> PROVIDE 2" HIGH LETTERING: "DIESEL FUEL 100 GALLONS"
2> 4" FPT (MANUAL FILL) – INSTALL THREADED STEEL PLUG
3> 1-1/4" FPT (OVERFILL) – INSTALL VENT CAP FOR SHIPPING
4> 1-1/4" FPT (PUMP STOP)
5> 1-1/4" FPT (PUMP START)
6> 1-1/4" FPT (LOW ALARM)
7> 1-1/2" FPT (TANK GAUGE)
8> 1-5/8"x1-5/8" STRUT, 6" LONG
9> 1-1/4" SCH 80 DROP TUBE (FILL) WITH 150# FLANGE
10> 3" SCH 40 VENT WITH 150# FLANGE
11> 3/4" FPT (DRAIN)
12> 1" FLANGE (SUPPLY) – SEE DETAIL 2/M7
13> C6x8.2, 24" LONG, WITH 9/16"ø MOUNTING HOLE 1" IN FROM EACH END
14> 1-5/8"x1-5/8" STRUT, 24" LONG



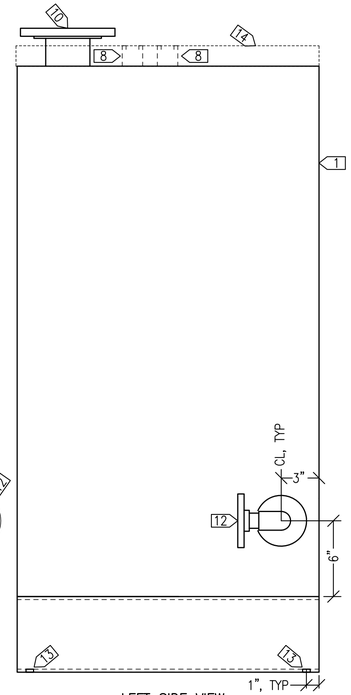
TOP VIEW



RIGHT SIDE VIEW

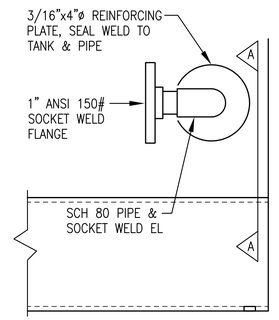


BACK VIEW

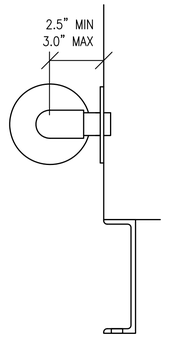


LEFT SIDE VIEW

1 / M7 100 GALLON SINGLE WALL DAY TANK (ADD ALT #1)
2"=1'-0"



SIDE ELEVATION



SECTION A-A

2 / M7 1" FLANGED SUPPLY CONNECTION
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: ADDITIVE ALTERNATE 100 GALLON DAY TANK FABRICATION

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 2/25/21
FILE NAME: CHENDERA M5-7 | SHEET: M7 OF 7
PROJECT NUMBER:

PRIME POWER COORDINATION REQUIREMENTS:

1. THIS PLANT PROVIDES PRIME POWER TO THE COMMUNITY OF CHENEGA BAY. KEEP OUTAGES TO A MINIMUM AND COORDINATE ALL REQUIRED OUTAGES WITH THE UTILITY.
2. THE UTILITY OWNS A 78kW MOBILE GENSET (E-GEN). A TRANSFER SWITCH WITH TWIST LOCK CONNECTOR IS LOCATED ON THE EXTERIOR OF THE POWER PLANT AND IS USED TO CONNECT THE E-GEN TO THE STEP UP TRANSFORMER BANK (GRID) USING A TWIST LOCK CONNECTOR POWER CORD. SEE PRIME POWER COORDINATION SPECIFIC NOTES BELOW FOR MODIFICATIONS TO THE TRANSFER SWITCH WIRING TO BE PERFORMED PRIOR TO PLACING THE COMMUNITY ON THE E-GEN. THE E-GEN WILL BE USED TO PROVIDE COMMUNITY POWER WHILE INSTALLING THE NEW SWITCHGEAR, GENERATORS AND OTHER EQUIPMENT IN THE POWER PLANT.
3. THE E-GEN WILL NO LONGER PROVIDE POWER PLANT STATION SERVICE POWER AFTER THE MODIFICATIONS TO THE TRANSFER SWITCH. THE CONTRACTOR WILL NEED TO PROVIDE TEMPORARY CONSTRUCTION POWER. SINGLE PHASE POWER MAY BE AVAILABLE FROM THE ADJACENT WAREHOUSE

PRIME POWER COORDINATION SPECIFIC NOTES:

SCHEDULE A BRIEF OUTAGE TO PERFORM THE FOLLOWING TASKS IMMEDIATELY PRIOR TO ENERGIZING THE COMMUNITY WITH THE E-GEN.

A DISCONNECT THE POWER PLANT FEEDER FROM THE TRANSFER SWITCH BY REMOVING THE 4#4/0, #2G CABLES BETWEEN THE SWITCHGEAR POWER DISTRIBUTION BLOCK AND THE TRANSFER SWITCH LINE SIDE CONNECTION TERMINALS. SHORT THE EXISTING BUS METER CT'S LOCATED IN THE TRANSFER SWITCH CABINET.

B DISCONNECT THE POWER PLANT STATION SERVICE FROM THE TRANSFER SWITCH BY REMOVING THE 3#6, #6G CABLES BETWEEN THE SWITCHGEAR FUSE BLOCK AND THE TRANSFER SWITCH LOAD SIDE CONNECTION TERMINALS.

DEMOLITION GENERAL NOTES:

1. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL. AREAS CONTAINING EXISTING EQUIPMENT AND PIPING TO BE REMOVED INDICATED BY HATCHING.
2. ENSURE ALL EQUIPMENT AND CIRCUITS TO BE REMOVED ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL AFFECTED CIRCUIT BREAKERS AND DISCONNECTS.
3. TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO ELECTRICAL EQUIPMENT AND CONDUCTORS BEING SALVAGED FOR REUSE. TURN ALL REMOVED MATERIALS AND EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION IF NOT REUSED.

DEMOLITION SPECIFIC NOTES:

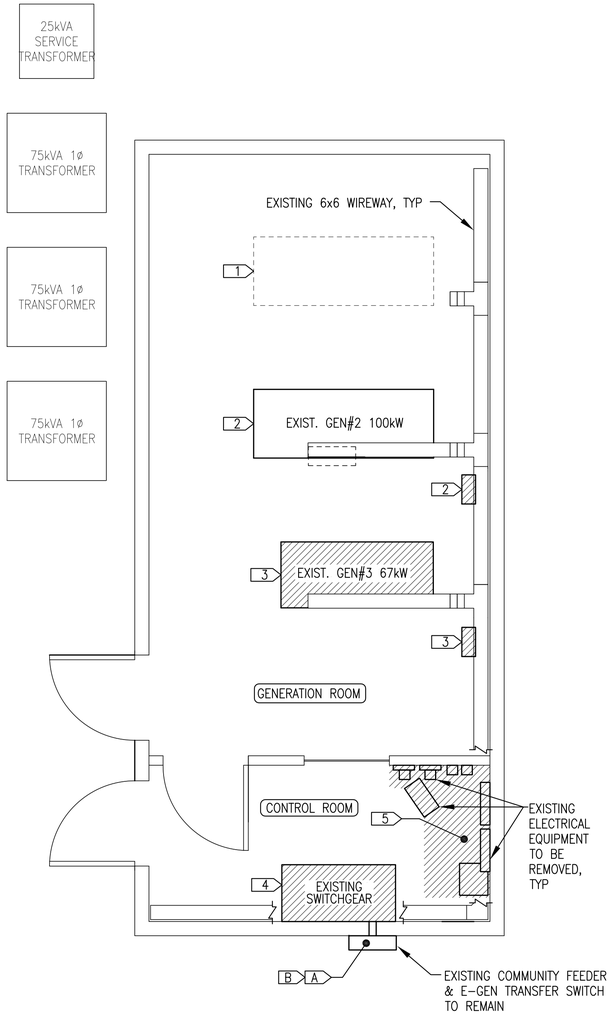
1 GEN#1 WAS PREVIOUSLY REMOVED FROM PLANT IN ITS ENTIRETY.

2 GEN#2 WAS RECENTLY INSTALLED NEW AND IS TO REMAIN IN SERVICE.

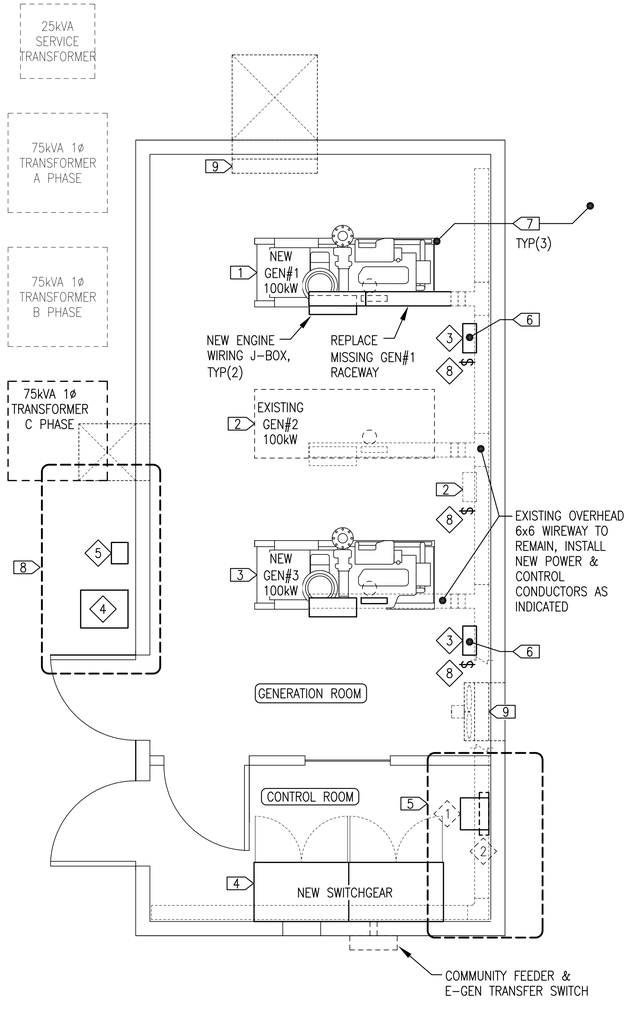
3 REMOVE EXISTING GEN#3 IN ITS ENTIRETY, INCLUDING ALL EXISTING POWER & CONTROL CONDUCTORS AND 12VDC BATTERY CHARGER. OVERHEAD WIREWAY TO REMAIN AS IS.

4 REMOVE EXISTING SWITCHGEAR IN ITS ENTIRETY. REMOVE ALL EXISTING CONDUIT CONNECTED TO SWITCHGEAR. ALL EXISTING GEN#1 & GEN#3 POWER & CONTROL CONDUCTORS TO BE REMOVED. ALL EXISTING GEN#2 POWER & CONTROL CONDUCTORS TO REMAIN FOR CONNECTION TO NEW SWITCHGEAR. TAPE ENDS & COIL IN SECURE LOCATION TO PROTECT FROM DAMAGE DURING SWITCHGEAR REPLACEMENT.

5 REMOVE EXISTING ELECTRICAL EQUIPMENT THIS AREA AS REQUIRED FOR INSTALLATION OF NEW SWITCHGEAR. SEE PHOTO SHEET E4 FOR DEMOLITION DETAILS.



1 E1 DEMOLITION PLAN
3/8"=1'-0"



2 E1 NEW WORK PLAN
3/8"=1'-0"

NEW WORK GENERAL NOTES:

1. EXISTING EQUIPMENT TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. INSTALL NEW POWER & CONTROL CONDUCTORS & ASSOCIATED RACEWAY AT NEW GENSETS AS INDICATED.

BASE BID TASKS SPECIFIC NOTES:

1 INSTALL NEW GEN#1 COMPLETE WITH ALL NEW POWER & CONTROL CONDUCTORS & NEW ENGINE WIRING J-BOX. REPLACE MISSING OVERHEAD RACEWAY AS REQUIRED. SEE ELEVATION 2/E2 FOR COMPLETE ELECTRICAL INSTALLATION. SEE MECHANICAL FOR ADDITIONAL DETAILS. NOTE THAT NEW GEN#1 IS 24VDC.

2 EXISTING GEN#2 IS A 12VDC UNIT WITH 12V BATTERY CHARGER & PARALLEL CONNECTED 12V BATTERIES WHICH ARE TO REMAIN AS IS. GEN#2 WILL PROVIDE 12VDC POWER TO THE NEW GEN#2 SWITCHGEAR SECTION FOR RUN SIGNAL & CONTROL POWER. SEE SWITCHGEAR SHOP DRAWINGS FOR CONNECTION TO 12V-24V POWER CONVERTER IN SWITCHGEAR. NOTE THAT NEW GEN#1 & GEN#3 ARE 24VDC UNITS.

3 INSTALL NEW GEN#3 COMPLETE WITH ALL NEW POWER & CONTROL CONDUCTORS & NEW ENGINE WIRING J-BOX. SEE ELEVATION 2/E2 FOR COMPLETE ELECTRICAL INSTALLATION. SEE MECHANICAL FOR ADDITIONAL DETAILS. NOTE THAT NEW GEN#3 IS 24VDC.

4 INSTALL COMPLETE NEW SWITCHGEAR. CONNECT NEW & EXISTING POWER & CONTROL WIRING AS REQUIRED. SEE SHEET E3.1 FOR DETAILS.

5 INSTALL NEW & RELOCATED ELECTRICAL EQUIPMENT THIS AREA. SEE ENLARGED PLAN 3/E4.

6 INSTALL NEW 24V BATTERY CHARGER & NEW BATTERIES. SEE DETAIL 5/E2.

7 INSTALL GROUNDING GRID & CONNECT GENERATOR SKID, SEE GROUNDING PLAN 1/E2.

8 INSTALL NEW 10kVAR 277V SINGLE PHASE SHUNT REACTOR & FUSED DISCONNECT ON PHASE C TRANSFORMER CIRCUIT, SEE ENLARGED PLAN 5/E4 & SWITCHGEAR ONE-LINE DIAGRAM 2/E3.1.

9 INSTALL WIRING & CONTROLS FOR NEW MOTORIZED DAMPERS ON INTAKE & FAN VENTILATION OPENINGS, SEE PLAN 3/E2.

EXISTING ELECTRICAL EQUIPMENT TO BE RELOCATED

SYMBOL	SERVICE	DESCRIPTION
1	EXISTING STATION SERVICE TRANSFORMER	DRY TYPE, ENCLOSURE TYPE 3R WITH INTEGRAL WALL MOUNT BRACKETS, SINGLE PHASE, 15kVA, HV 480V, LV 240/120V. GENERAL ELECTRIC CAT.# 9T21B9103
2	EXISTING STATION SERVICE PANELBOARD	SINGLE PHASE, 3 WIRE, 240/120V, 225A, 18 CIRCUITS, BOLT-IN BREAKERS, SURFACE MOUNT, NEMA 1. GENERAL ELECTRIC CAT.# AQU1182RCX-AXT1B4 RETROFIT WITH NEW 100A MAIN BREAKER KIT.

NOTE: SEE SHEET E4 FOR NEW EQUIPMENT SCHEDULE.

ENGINE GENERATOR SCHEDULE

GENSET	DESCRIPTION
GEN #1 GEN #3 (2021 DERA)	ENGINE – 148 HP, 100 EKW PRIME, JOHN DEERE 4045AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 24 VDC. GENERATOR – MINIMUM 125KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274E OR APPROVED EQUAL.
GEN #2 (EXISTING)	ENGINE – 148 HP, 100 EKW PRIME, JOHN DEERE 4045AFM85, TIER 3 MARINE OR APPROVED EQUAL. STARTING AND CONTROL VOLTAGE = 12 VDC. GENERATOR – MINIMUM 105KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD UCI274D OR APPROVED EQUAL.

ELECTRICAL CONDUCTOR SCHEDULE

SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL	NOTES:
GENERATOR 480V POWER LEADS (ENGINE STARTER CABLES SIMILAR)	EXTRA FLEXIBLE CABLE, COPPER CONDUCTOR. TYPE VW-1, TEW INSULATION, MINIMUM 600V, LISTED 105°C	BELDEN, COBRA, OMINI, OR POLAR	TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT 105°C.
GENERAL USE CONDUCTORS	CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.		
SHIELDED/TWISTED INSTRUMENT & CONTROL & CANBUS CONDUCTORS	#18 AWG STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE & PVC OUTER JACKET	BELDEN PART #'S SINGLE PAIR: #1120A FOUR PAIR: #1049A SINGLE TRIAD: #1121A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
EHTERNET (CAT5e) COMMUNICATION CONDUCTORS	SOLID BARE COPPER CONDUCTORS, 300V FEP INSULATION & JACKET, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE	FOUR PAIR #24 BELDEN 1585LC	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY. ROUTE IN SEPARATE DEDICATED RACEWAY.

COLOR CODING – UNLESS SPECIFICALLY INDICATED OTHERWISE COLOR CODE CONDUCTORS AS FOLLOWS:
- 480-VOLT POWER CONDUCTORS
  - PHASE A – BROWN
  - PHASE B – ORANGE
  - PHASE C – YELLOW
  - NEUTRAL – WHITE W/YELLOW STRIPE
- 120/208-VOLT POWER CONDUCTORS
  - PHASE A – BLACK
  - PHASE B – RED
  - PHASE C – BLUE
  - NEUTRAL – WHITE
- 24 VOLT DC CONDUCTORS
  - +24VDC – RED
  - -24VDC – BLACK

CONTROL & INSTRUMENT CONDUCTORS COLOR CODED PER MANUFACTURER'S STANDARD

NOTES:
1) FOR NO. 6 AWG AND SMALLER CONDUCTORS COLOR CODING SHALL BE PROVIDED BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION. FOR ALL CONDUCTORS LARGER THAN NO. 6 SCOTCH 35 MARKING TAPE OR EQUIVALENT MAY BE USED TO COLOR CODE THE CABLE. WHERE MARKING TAPE IS USED IDENTIFY AT EVERY ACCESSIBLE LOCATION WITH A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION.

2) GROUNDING – PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE OF THE SAME TYPE AS THE PHASE CONDUCTORS AND SHALL BE SIZED AS INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

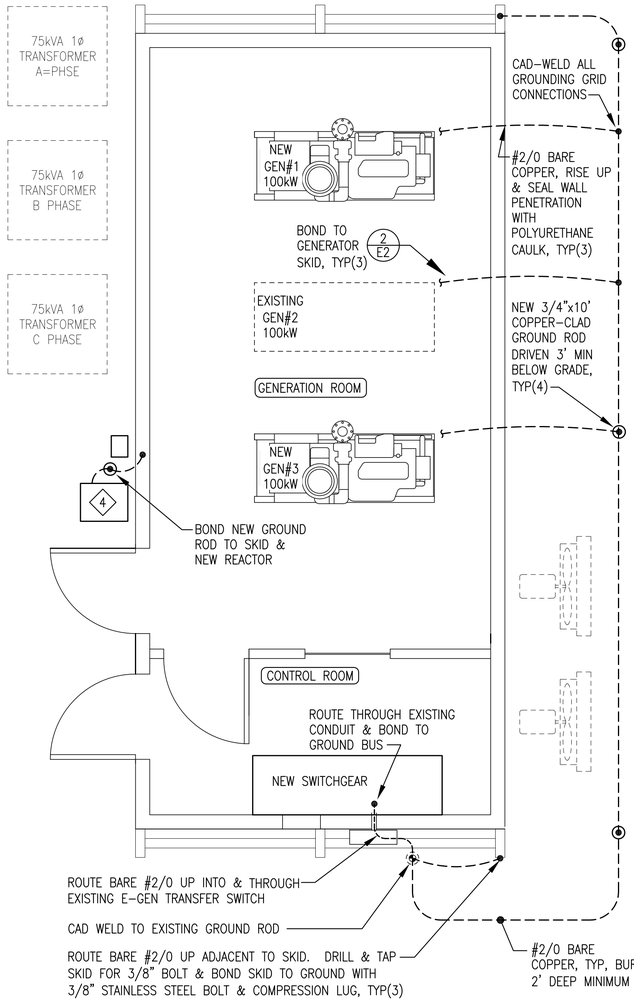
STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: BASE BID ELECTRICAL DEMOLITION & NEW WORK PLANS

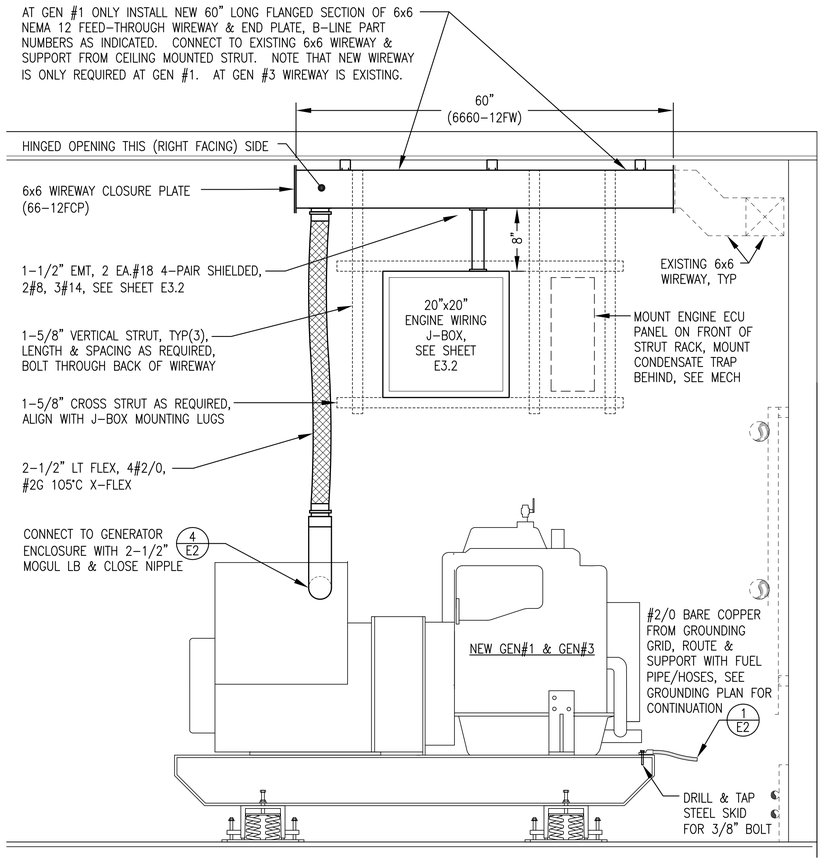
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 2/25/21
FILE NAME: CHENDERA E1-4 | SHEET: E1 OF 6
PROJECT NUMBER:



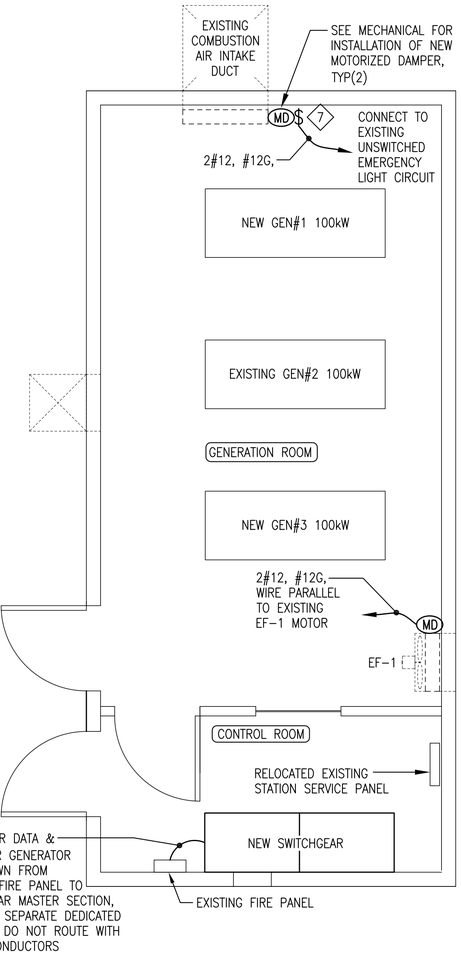
1 E2 GROUNDING PLAN

3/8"=1'-0"



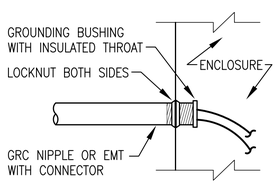
2 E2 TYPICAL GENERATOR INSTALLATION

1"=1'-0"



3 E2 VENTILATION SYSTEM UPGRADE WIRING PLAN

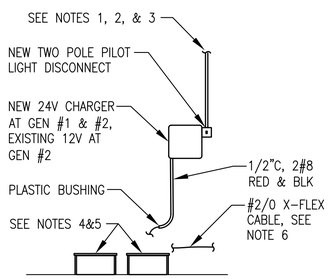
3/8"=1'-0"



NOTES:
1. THIS DETAIL APPLIES TO CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS.
2. AT A MINIMUM INSTALL GROUNDING BUSHING ON ALL GENERATOR POWER CONDUIT, COMMUNITY FEEDER CONDUIT, STATION SERVICE FEEDERS, AND WHERE OTHERWISE INDICATED OR REQUIRED. BOND GROUNDING BUSHING TO EQUIPMENT GROUNDING CONDUCTOR.
3. INSTALL PLASTIC BUSHING WHERE GROUNDING BUSHING IS NOT REQUIRED.
4. ON GENERATOR ENCLOSURES MAKE ALL CONNECTIONS AS TIGHT AS POSSIBLE.

4 E2 TYP ENCLOSURE CONNECTION

NO SCALE



NOTES:
1. GEN#1: SET NEW CHARGER FOR 24VDC OPERATION. PROVIDE NEW DISCONNECT AND CONNECT TO EXISTING 240V CIRCUIT FOR GEN #2 CHARGER.
2. GEN#2: EXISTING CHARGER TO REMAIN SET FOR 12VDC OPERATION. PROVIDE NEW DISCONNECT AND RE-CONNECT TO EXISTING 240V CIRCUIT FOR GEN #2 CHARGER.
3. GEN#3: SET NEW CHARGER FOR 24V DC OPERATION. PROVIDE NEW DISCONNECT AND RE-CONNECT TO EXISTING 240V CIRCUIT FOR GEN #3 CHARGER.
4. PROVIDE TWO EACH MINIMUM 800 COLD CRANK AMP 12-VOLT SEALED MAINTENANCE FREE STARTING BATTERIES, OPTIMA RED TOP NAPA PART# BAT N993478RED OR APPROVED EQUAL.
5. INSTALL EACH BATTERY IN A RACK SIZED TO SECURELY HOLD THE BATTERY AND PLACE OUT OF TRAFFIC AREA IN CONVENIENT LOCATION NEAR BACK WALL.
6. ROUTE BATTERY CABLES TO FRONT OF SKID, SEE SHEET M3. ROUTE FROM SKID DIRECTLY UNDER FUEL HOSES TO WALL AND TYWRAP CABLES TO FUEL PIPES ALONG WALL. CUT TO PROVIDE 6"± SERVICE LOOP FOR FINAL TERMINATION ON BATTERIES. CONNECT TO BATTERIES WITH STRAIGHT CRIMP TERMINAL FITTINGS AND TOP MOUNT TERMINAL COVERS, POLAR WIRE OR EQUAL.

5 E2 BATTERY, CHARGER & CABLES INSTALLATION

NO SCALE"

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

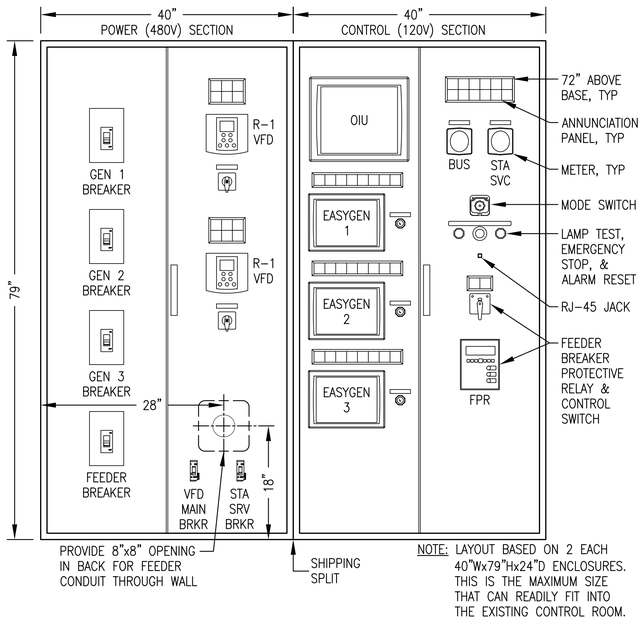
STATE OF ALASKA 49TH — CLOIS W. VERSYP EE 7802 — REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

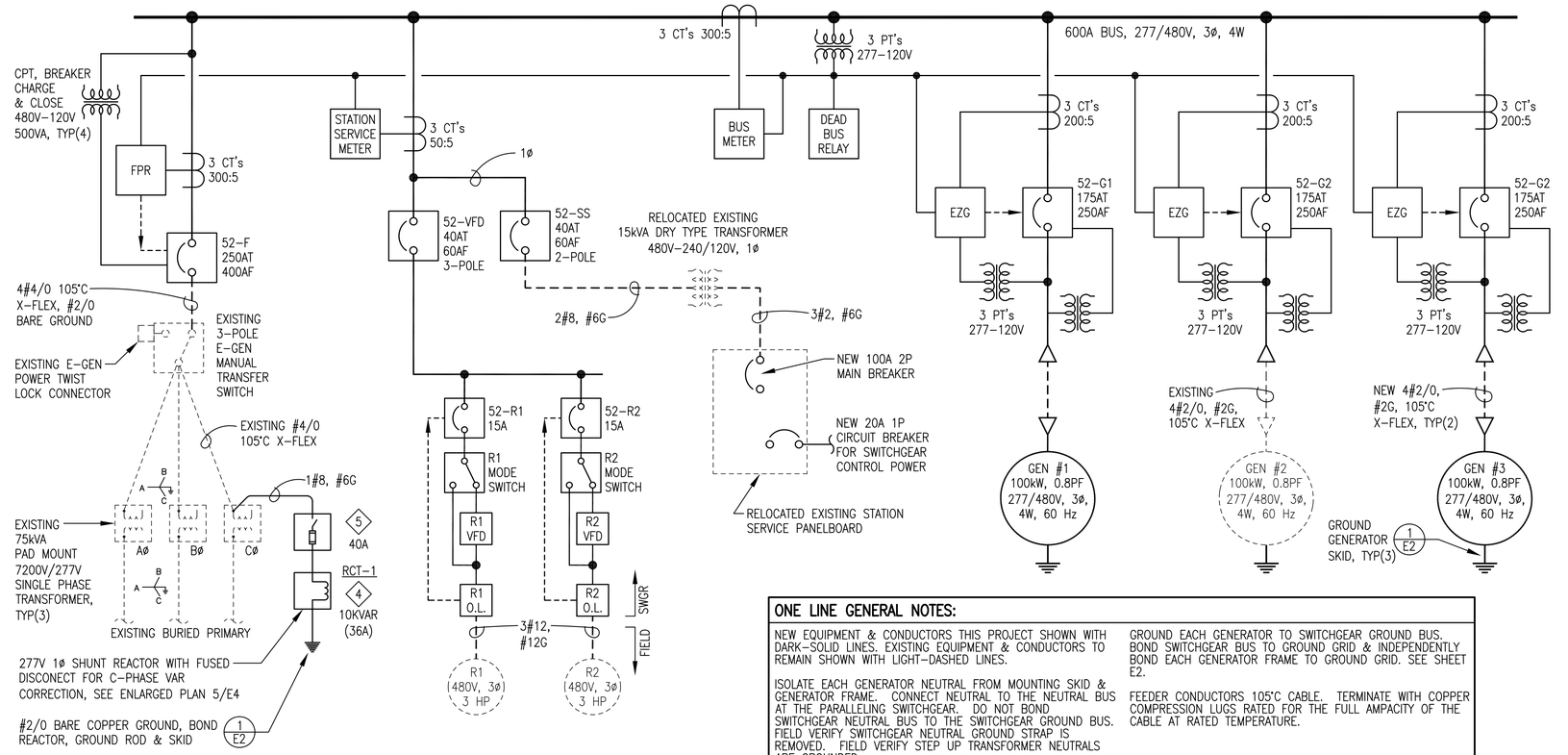
TITLE: BASE BID ELECTRICAL PLANS & DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 2/25/21
FILE NAME: CHENDERA E1-4	SHEET: E2 OF 6
PROJECT NUMBER:	



1 E3.1 NEW SWITCHGEAR FRONT ELEVATION
NO SCALE



2 E3.1 NEW SWITCHGEAR ONE-LINE DIAGRAM
NO SCALE

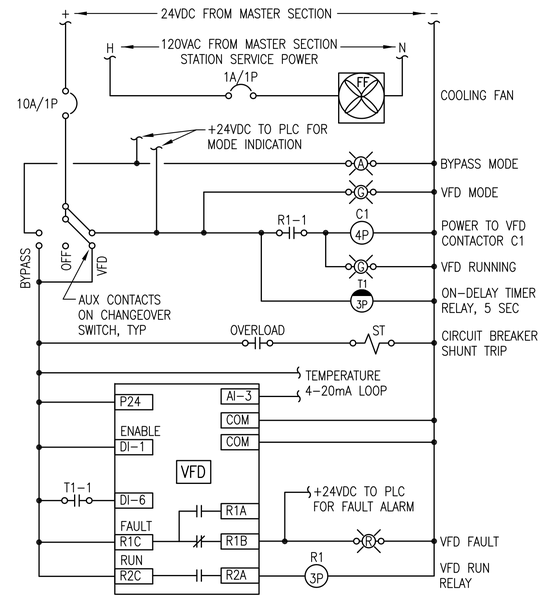
ONE LINE GENERAL NOTES:

NEW EQUIPMENT & CONDUCTORS THIS PROJECT SHOWN WITH DARK-SOLID LINES. EXISTING EQUIPMENT & CONDUCTORS TO REMAIN SHOWN WITH LIGHT-DASHED LINES.

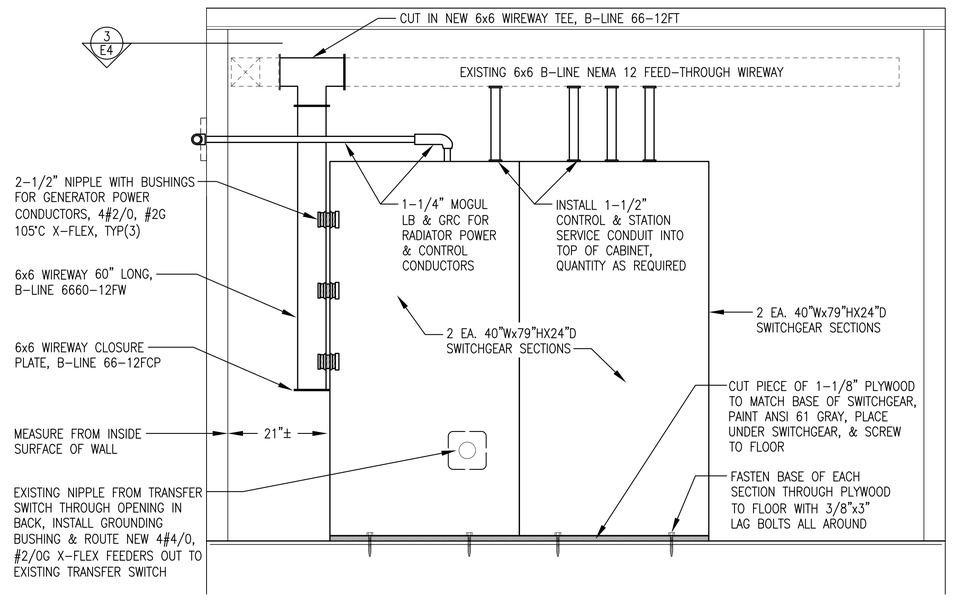
ISOLATE EACH GENERATOR NEUTRAL FROM MOUNTING SKID & GENERATOR FRAME. CONNECT NEUTRAL TO THE NEUTRAL BUS AT THE PARALLELING SWITCHGEAR. DO NOT BOND SWITCHGEAR NEUTRAL BUS TO THE SWITCHGEAR GROUND BUS. FIELD VERIFY SWITCHGEAR NEUTRAL GROUND STRAP IS REMOVED. FIELD VERIFY STEP UP TRANSFORMER NEUTRALS ARE GROUNDED.

GROUND EACH GENERATOR TO SWITCHGEAR GROUND BUS. BOND SWITCHGEAR BUS TO GROUND GRID & INDEPENDENTLY BOND EACH GENERATOR FRAME TO GROUND GRID. SEE SHEET E2.

FEEDER CONDUCTORS 105°C CABLE. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE.



3 E3.1 TYPICAL RADIATOR VFD LOGIC DIAGRAM
NO SCALE



4 E3.1 SWITCHGEAR INSTALLATION SECTION
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

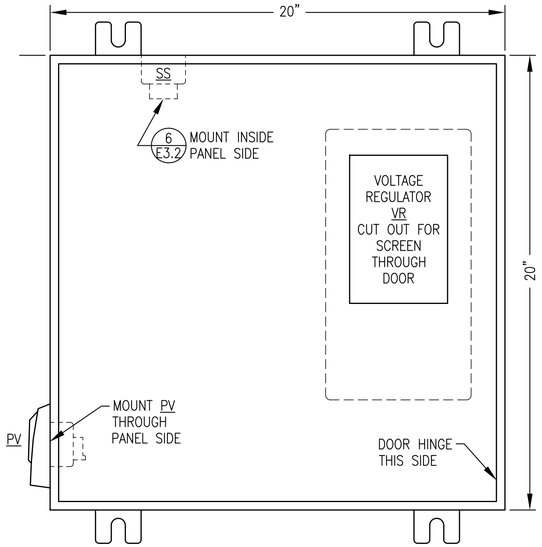
STATE OF ALASKA 49TH — CLOIS W. VERSYP EE 7802 — REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

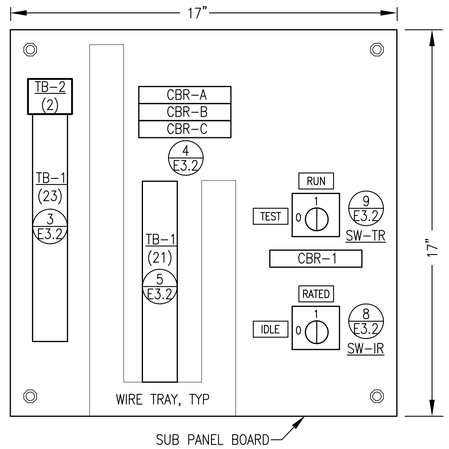
TITLE: BASE BID NEW SWITCHGEAR DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

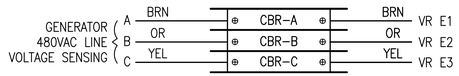
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 2/25/21
FILE NAME: CHENDERA E1-4 | SHEET: E3.1 OF 6
PROJECT NUMBER:



1 E3.2 JUNCTION BOX FRONT PANEL LAYOUT
NO SCALE



2 E3.2 JUNCTION BOX SUB PANEL LAYOUT
NO SCALE



4 E3.2 CIRCUIT BREAKER CONNECTIONS
NO SCALE

BILL OF MATERIALS			
TAG	MANUFACTURER	MODEL	DESCRIPTION
CBR-A/B/C	ALLEN-BRADLEY	1489-M1-C010	RAIL MOUNT CIRCUIT BREAKER, 1P, 1A
CBR-1	ALLEN-BRADLEY	1489-M1-C050	RAIL MOUNT CIRCUIT BREAKER, 1P, 5A
ENCL.	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
PV	MURPHY	PV101-C-MSTD	POWER VIEW W/HARNESS
SS	CATERPILLAR	9X-8124	STARTER AUXILIARY SOLENOID, 24V
SW-IR/SW-TR	ALLEN-BRADLEY	194L-A12-225-2	CHANGEOVER SWITCH, 12A, 2P
	ALLEN-BRADLEY	194L-HE-4A-175	90 DEGREE I-O HANDLE
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK
VR	BASLER	DECS-150 5NS1V1N1S	DIGITAL VOLTAGE REGULATOR

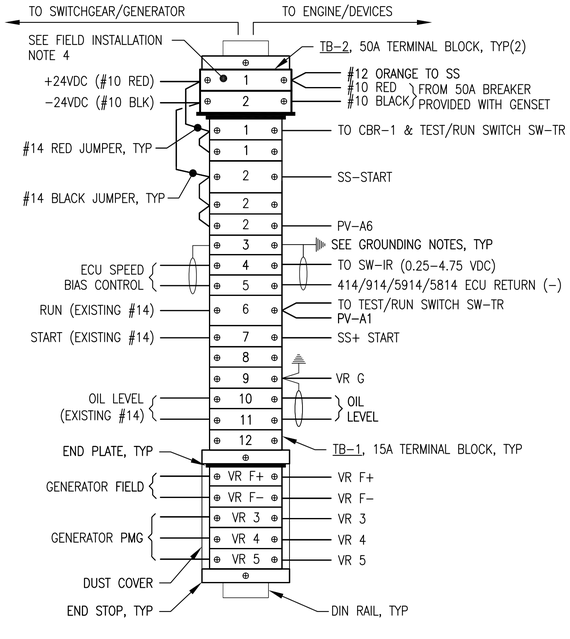
NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

SHOP FABRICATION NOTES:

1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
2) INSTALL IN A NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL AND HINGED LOCKABLE DOOR. SIZE AS INDICATED.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE AS REQUIRED TO MATCH TERMINALS. LABEL ALL TERMINALS EXACTLY AS INDICATED ON THE DETAILS.
4) ALL WIRE #14AWG EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. LABEL BOTH ENDS OF ALL JUMPERS WITH THE ENGINE PANEL TERMINAL NUMBER.
5) PROVIDE MECHANICAL GROUND LUGS FASTENED TO BACK PANEL AND GROUNDED TO ENGINE-GENERATOR. GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.
6) PROVIDE WIRING HARNESSES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN LIQUID TIGHT FLEX OR FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
7) SHOP TEST EACH NEW ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

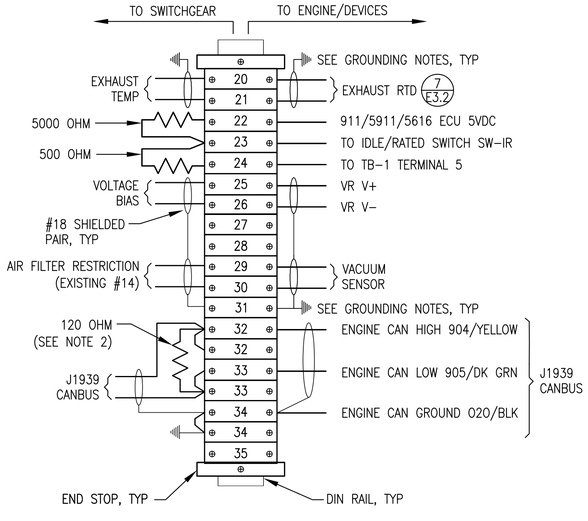
FIELD INSTALLATION NOTES:

1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE ENGINE PANEL TERMINAL NUMBER.
2) ON SHIELDED CONDUCTORS GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.
3) GEN#1, GEN#2 & GEN#4 (ADD ALT #2) TO BE FURNISHED WITH NEW J-BOXES SHOP CONNECTED TO GENSET AS INDICATED & SPECIFIED.
4) ALL #14, #12, #10, AND #18 SHIELDED PAIRS FROM GENERATOR TO SWITCHGEAR ARE EXISTING. TAPE ENDS AND NEATLY COIL ANY UNUSED CONDUCTORS IN J-BOX.
5) RELABEL ALL TERMINALS IN SWITCHGEAR TO MATCH NEW J-BOX TERMINAL NUMBERS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH ENGINE PANEL TERMINAL NUMBER.



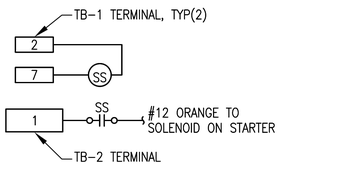
NOTE: TYPICAL JOHN DEERE ECU CONNECTION NUMBERS SHOWN. SEE WIRING HARNESS FOR EACH ENGINE FOR ACTUAL ECU CONNECTIONS.

3 E3.2 TERMINAL STRIP CONNECTIONS
NO SCALE

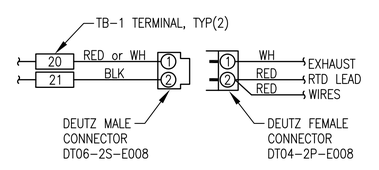


NOTES: 1) ALL RESISTORS 0.25W.
2) REMOVE RESISTOR IF ENGINE WIRING HARNESS HAS 120 OHM END OF LINE RESISTOR.

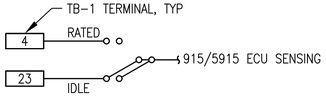
5 E3.2 TERMINAL STRIP CONNECTIONS
NO SCALE



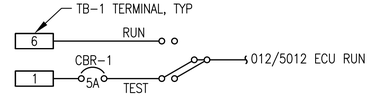
6 E3.2 STARTER AUX SOLENOID SS WIRING
NO SCALE



7 E3.2 EXHAUST RTD CONNECTOR
NO SCALE



8 E3.2 IDLE/RATED SWITCH SW-IR WIRING
NO SCALE



9 E3.2 TEST/RUN SWITCH SW-TR WIRING
NO SCALE

ISSUED FOR CONSTRUCTION
FEBRUARY 2020

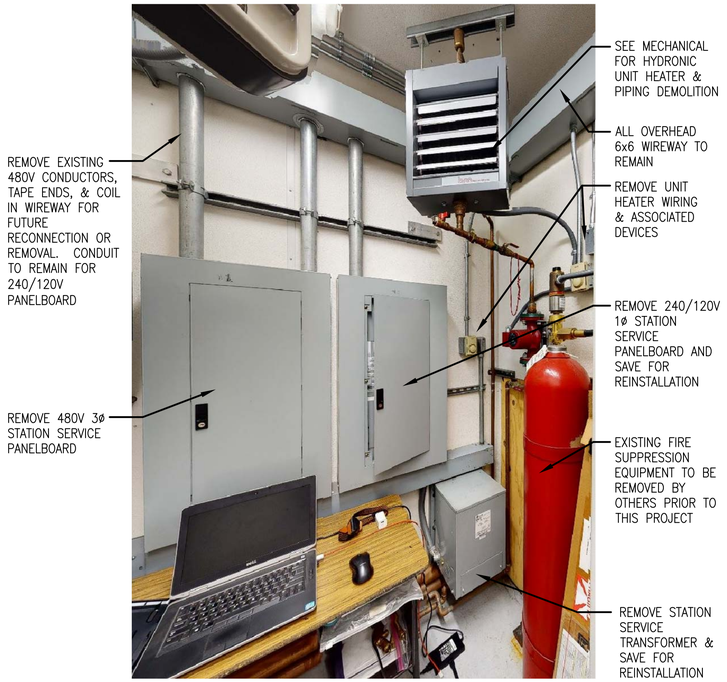
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

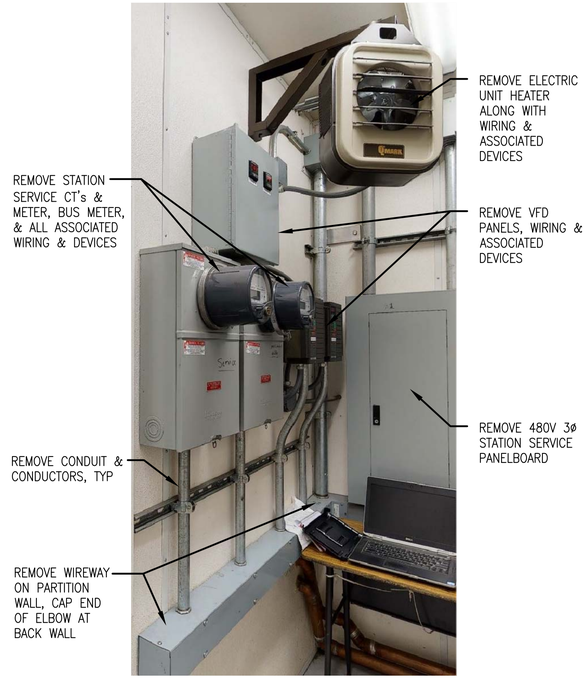
TITLE: BASE BID 24VDC ENGINE WIRING JUNCTION BOX

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

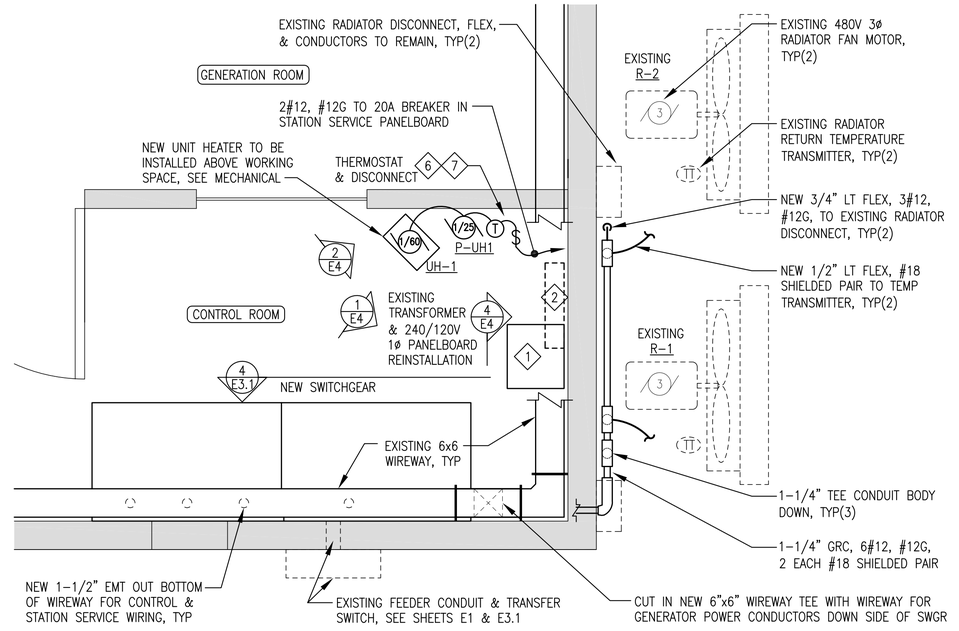
DRAWN BY: BCG | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 2/25/21
FILE NAME: CHENDERA E1-4 | SHEET: E3.2 OF 6
PROJECT NUMBER:



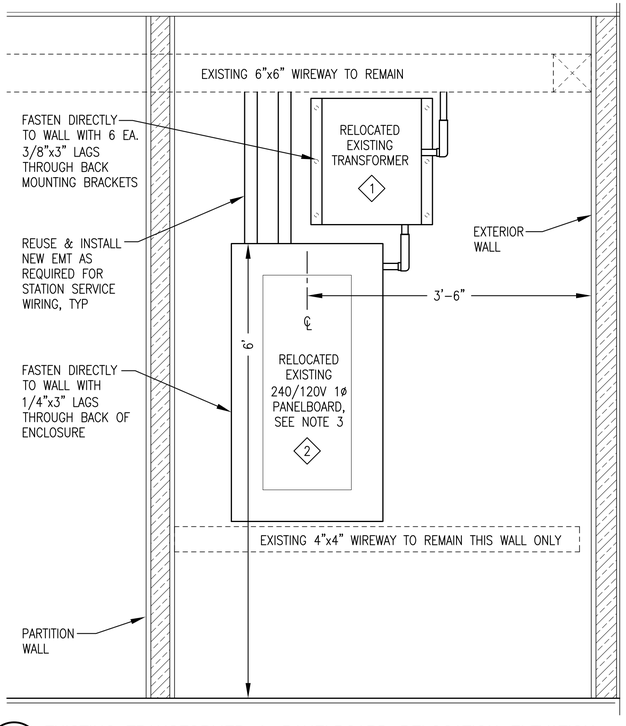
1 E4 CONTROL ROOM BACK WALL EQUIPMENT DEMOLITION
NO SCALE



2 E4 CONTROL ROOM PARTITION WALL EQUIPMENT DEMOLITION
NO SCALE



3 E4 ENLARGED CONTROL ROOM AREA NEW WORK PLAN
3/4"=1'-0"



4 E4 EXISTING TRANSFORMER & PANELBOARD RELOCATION ELEVATION
1"=1'-0"

NOTES:

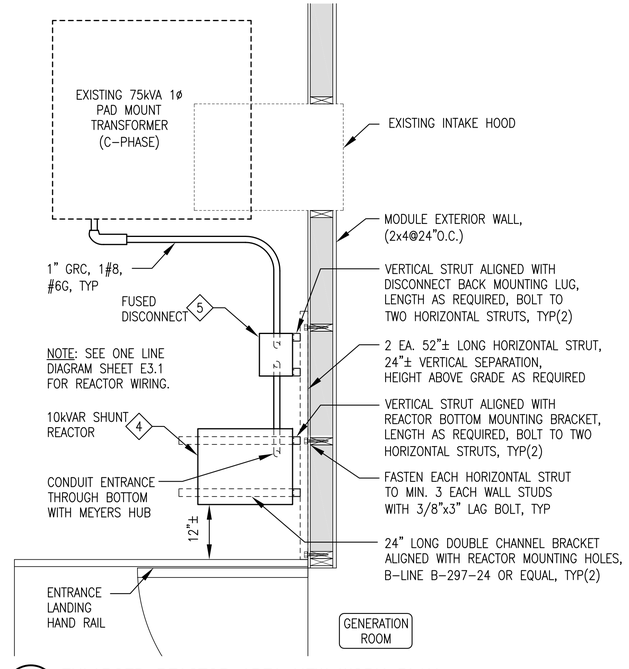
1) PROVIDE ALL NEW PRIMARY & SECONDARY CONDUCTORS FOR RELOCATED STATION SERVICE TRANSFORMER.

2) RE-ROUTE EXISTING STATION SERVICE CONDUCTORS & RECONNECT TO ORIGINAL BREAKERS IN RELOCATED PANELBOARD. EXTEND CONDUCTORS AS REQUIRED WITH LISTED INSULATED SPLICE BLOCKS IN WIREWAY.

3) THE EXISTING 240/120V PANELBOARD IS A GENERAL ELECTRIC CAT.# QU1182RCX-AXT1B4. INSTALL NEW 100A, 2P MAIN BREAKER. REMOVE EXISTING 20A 2P BREAKER FOR OLD GEN #1 CHARGER & REPLACE WITH TWO NEW 20A 1P BREAKERS.

4) INSTALL KNOCKOUT PLUGS IN ALL UNUSED OPENINGS IN WIREWAYS & PANELBOARD AFTER CONDUIT REMOVAL & REPLACEMENT.

5) INTERIOR WALL SURFACES ARE FIBERGLASS OVER 3/4" PLYWOOD.



5 E4 ENLARGED REACTOR AREA NEW WORK PLAN
3/4"=1'-0"

NEW ELECTRICAL EQUIPMENT/DEVICE SCHEDULE

SYMBOL	SERVICE	DESCRIPTION	MANUFACTURER/MODEL
◇3	BATTERY CHARGER	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120/240 VAC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS	SENS NRG22-20-RCLS OR APPROVED EQUAL
◇4	POWER FACTOR CORRECTION INDUCTIVE SHUNT REACTOR	IRON CORE, 10kVAR, 277VAC, SINGLE PHASE, 36A, 5.110HMS, 13.75mH, NEMA 4 TYPE 304 STAINLESS STEEL ENCLOSURE. PAINT ANSI 61 GREY.	REX POWER MAGNETICS CATALOG NUMBER 36C13.57E3/E4X OR APPROVED EQUAL
◇5	REACTOR FUSED DISCONNECT	FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 2PST, 600V, 60A, PROVIDE WITH 2 EA. 40A TYPE R FUSES	SIEMENS HF262R OR APPROVED EQUAL
◇6	LINE VOLTAGE THERMOSTAT	HEATING/COOLING THERMOSTAT, 16 FLA @ 120V, SPDT, 50F TO 80F RANGE.	DAYTON 1UHH2 OR APPROVED EQUAL
◇7	1 POLE DISCONNECT WITH PILOT LIGHT	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	LEGRAND PS20AC1-RPL OR APPROVED EQUAL
◇8	2 POLE DISCONNECT WITH PILOT LIGHT	TWO POLE SNAP SWITCH WITH RED PILOT LIGHT, 120/277V, 20A, 1HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	LEGRAND PS20AC2-RPL OR APPROVED EQUAL

ISSUED FOR CONSTRUCTION FEBRUARY 2020

STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

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FILE NAME: CHENDERA E1-4 | SHEET: E4 OF 6
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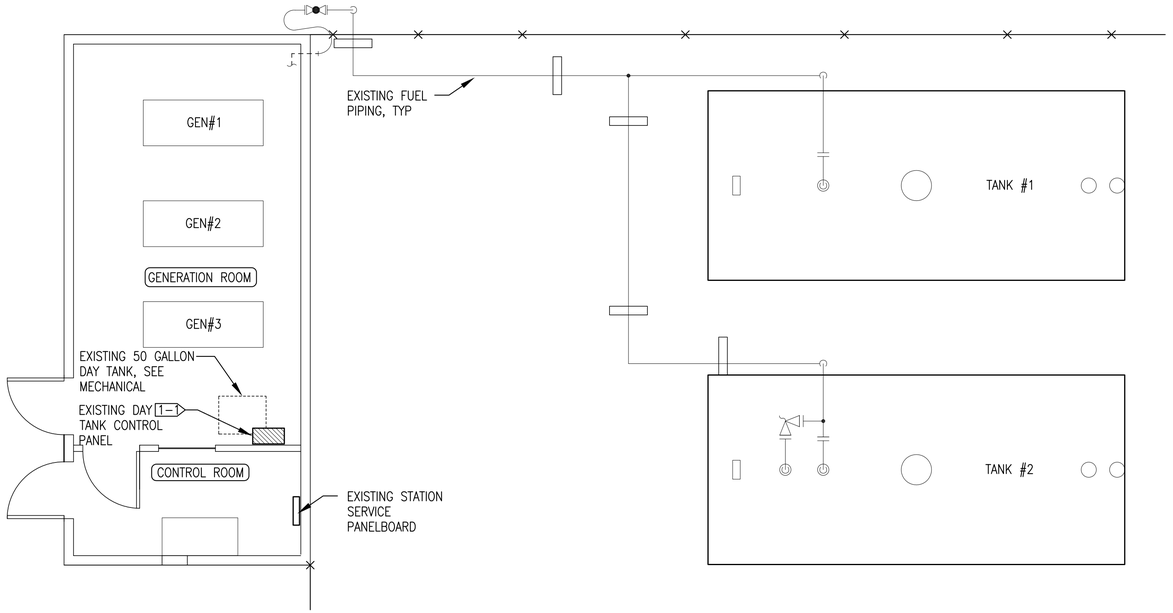


1 M5 ADDITIVE ALTERNATE DEMOLITION PLAN
1/4"=1'-0"

ADDITIVE ALTERNATE DEMOLITION GENERAL NOTES:

1. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL. AREAS CONTAINING EXISTING EQUIPMENT AND CONDUCTORS TO BE REMOVED INDICATED BY HATCHING
2. ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL.
3. ENSURE ALL EQUIPMENT AND CIRCUITS TO BE REMOVED ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL AFFECTED CIRCUIT BREAKERS AND DISCONNECTS.
4. TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO ELECTRICAL EQUIPMENT AND CONDUCTORS BEING SALVAGED FOR REUSE. TURN ALL REMOVED MATERIALS AND EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION IF NOT REUSED.

ADDITIVE ALTERNATE #1 INTERIOR DEMOLITION SPECIFIC NOTES:

1-1 OPEN DAY TANK CIRCUIT BREAKER IN PANELBOARD & DISCONNECT ALL POWER & CONTROL CONDUCTORS FROM CONTROL PANEL TERMINALS. TAPE ENDS, LABEL, & COIL CONDUCTORS FOR RECONNECTION. CAREFULLY REMOVE CONTROL PANEL FROM WALL & SAVE FOR REINSTALLATION ON NEW DAY TANK.

ADDITIVE ALTERNATE #2 EXTERIOR DEMOLITION SPECIFIC NOTES:

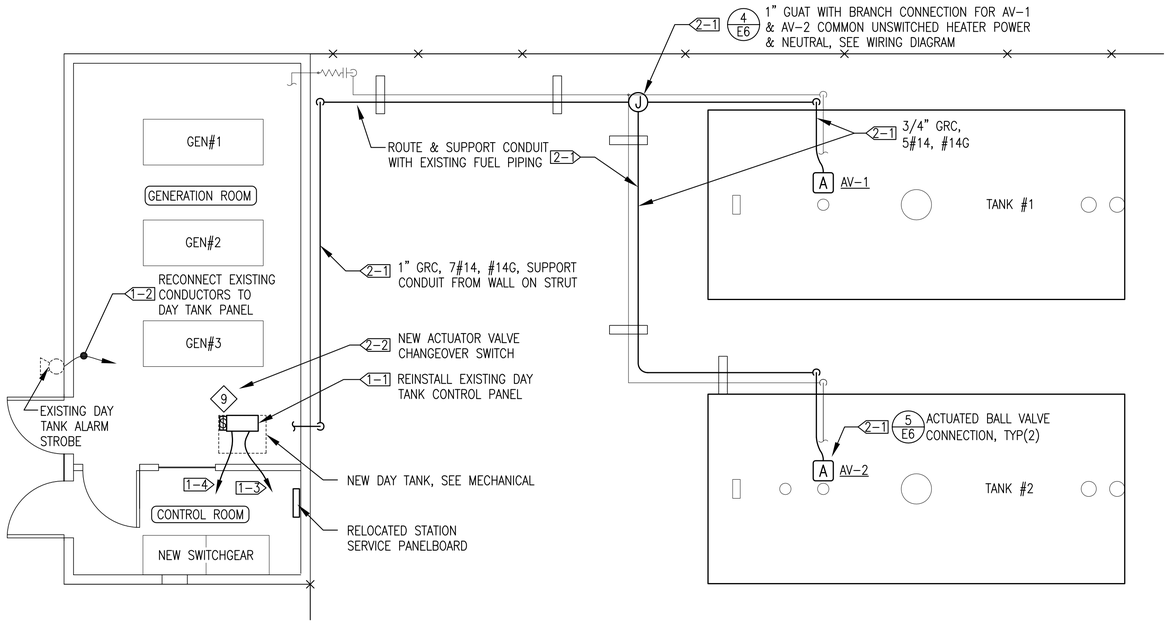
NO ELECTRICAL DEMOLITION REQUIRED UNDER ADDITIVE ALTERNATE #2.

ADDITIVE ALTERNATE ELECTRICAL EQUIPMENT/DEVICE SCHEDULE

SYMBOL	SERVICE	DESCRIPTION	MANUFACTURER/MODEL
9	ACTUATOR VALVE CHANGEOVER SWITCH	MULTI-STEP SWITCH, 2 POLE-3 WAY, WITHOUT OFF, 6A 4-HOLE FRONT PANEL MOUNT	SALZER 61069S6B13TDYR

ADDITIVE ALTERNATE INSTRUMENTATION EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
FS	DAY TANK/HOPPER FLOAT SWITCH	VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VASPST NC/NO SWITCH, 1/8" NPT, 1"MAX ø BUNA-N FLOAT FOR S.G=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2



2 M5 ADDITIVE ALTERNATE NEW WORK PLAN
1/4"=1'-0"

NEW WORK GENERAL NOTES:

1. EXISTING EQUIPMENT TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
2. NEW EQUIPMENT TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
3. ALL FUEL TANKS AT THIS FACILITY USED TO STORE DIESEL FUEL ONLY, NO CLASSIFIED AREAS.
4. THE EXISTING DAY TANK CONTROL PANEL WAS INSTALLED BUT NOT FULLY UTILIZED. SEE ATTACHED REFERENCE DRAWING E7 FOR ORIGINAL PANEL LOGIC & SEQUENCE OF OPERATION. SEE SHEET E6 FOR RE-INSTALLATION & CONNECTION.

ADDITIVE ALTERNATE #1 NEW WORK SPECIFIC NOTES:

1-1 INSTALL EXISTING DAY TANK CONTROL PANEL ON NEW 100 GALLON DAY TANK, SEE DETAIL 1/E6.

1-2 INSTALL ALL ASSOCIATED NEW & EXISTING DEVICES, SEE MECHANICAL. CONNECT NEW & EXISTING AS SHOWN ON SHEET E6 & PERFORM FUNCTIONAL TESTING AS INDICATED.

1-3 CONNECT 2#12, #12G TO EXISTING CIRCUIT BREAKER IN PANELBOARD. PROVIDE NEW CONDUCTORS IF EXISTING ARE TOO SHORT TO REACH.

1-4 ROUTE 2#14 FOR LOW LEVEL SHUTDOWN TO NEW SWITCHGEAR.

ADDITIVE ALTERNATE #2 NEW WORK SPECIFIC NOTES:

2-1 INSTALL NEW CONDUIT & CONDUCTORS TO ACTUATOR VALVES.

2-1 INSTALL ACTUATOR VALVE CHANGEOVER SWITCH ON SIDE OF DAY TANK PANEL & CONNECT AS INDICATED ON SHEET E6. PERFORM FUNCTIONAL TEST OF BOTH ACTUATOR VALVES AS INDICATED.

ISSUED FOR CONSTRUCTION FEBRUARY 2020

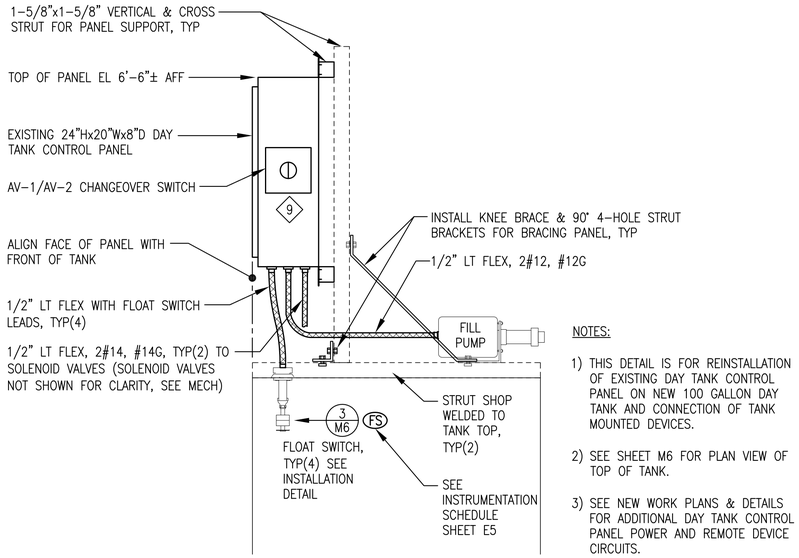
STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

TITLE: ADDITIVE ALTERNATE
ELECTRICAL DEMOLITION & NEW WORK PLANS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

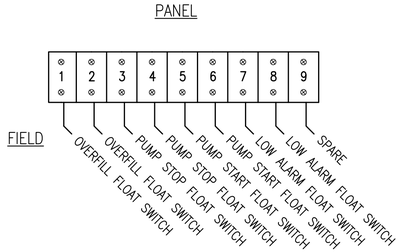
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CW/BCG | DATE: 2/25/21
FILE NAME: CHENDERA E5-6 | SHEET: E5 OF 6
PROJECT NUMBER:



NOTES:

1) THIS DETAIL IS FOR REINSTALLATION OF EXISTING DAY TANK CONTROL PANEL ON NEW 100 GALLON DAY TANK AND CONNECTION OF TANK MOUNTED DEVICES.
2) SEE SHEET M6 FOR PLAN VIEW OF TOP OF TANK.
3) SEE NEW WORK PLANS & DETAILS FOR ADDITIVE DAY TANK CONTROL PANEL POWER AND REMOTE DEVICE CIRCUITS.

1 E6 REINSTALLATION OF EXISTING DAY TANK CONTROL PANEL ON NEW DAY TANK (ADD ALT #1)
NO SCALE



2 E6 EXISTING DAY TANK CONTROL PANEL TERMINAL STRIP TB-1 (ADD ALT #1)
NO SCALE

PANEL — FIELD

10	—	CONTROL PANEL POWER FROM STATION SERVICE PANEL
11	—	ALARM/STROBE POWER
12	—	FILL PUMP PDF-1 MOTOR POWER
13	—	NOT USED
14	—	SPARE
15	—	SPARE
16	—	CONTROL PANEL NEUTRAL FROM STATION SERVICE PANEL
17	—	ALARM/STROBE NEUTRAL
18	—	FILL PUMP PDF-1 MOTOR NEUTRAL
19	—	NOT USED
20	—	DAY TANK NC SOLENOID VALVE NEUTRAL
21	—	DAY TANK NO SOLENOID VALVE NEUTRAL
22	—	ADD ALT #2 (ACTUATOR VALVE NEUTRAL)
23	—	SPARE NEUTRAL
24	—	SPARE NEUTRAL
25	—	ENGINE RUN-DRY PREVENTION L1 TO SWITCHGEAR
26	—	ENGINE RUN-DRY PREVENTION L2 TO SWITCHGEAR
27	—	NOT USED
28	—	NOT USED
29	—	NC SOLENOID VALVE POWER
30	—	NO SOLENOID VALVE POWER
31	—	ADD ALT #2 (ACTUATOR VALVE OPEN)
32	—	ADD ALT #2 (ACTUATOR VALVE CLOSE)
33	—	ADD ALT #2 (ACTUATOR VALVE HEATER/END SWITCH)
34	—	ADD ALT #2 (ACTUATOR VALVE OPEN INDICATOR)
35	—	SPARE

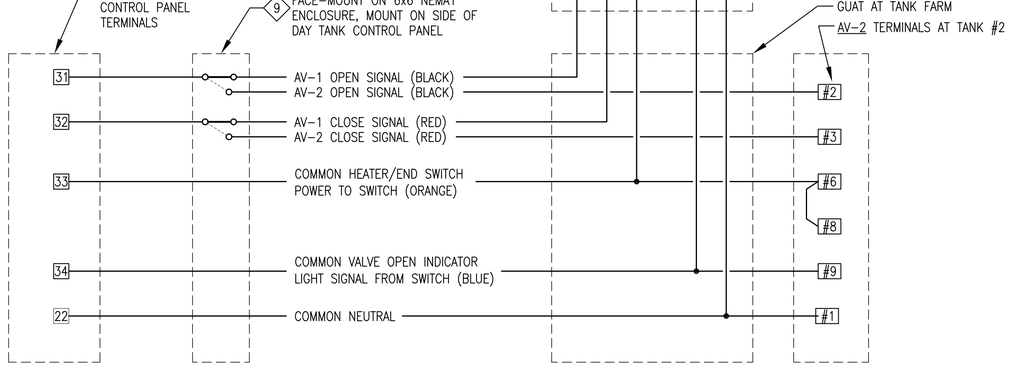
3 E6 EXISTING DAY TANK CONTROL PANEL TERMINAL STRIP TB-2 (ADD ALT #1)
NO SCALE

ADDITIVE ALTERNATE #1 EXISTING DAY TANK PANEL REINSTALLATION NOTES:

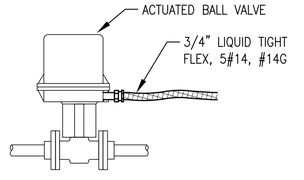
1) SEE DEMOLITION PLAN SHEET E5 FOR DISCONNECTION & REMOVAL OF EXISTING DAY TANK CONTROL PANEL FROM WALL. REINSTALL THE EXISTING DAY TANK CONTROL PANEL ON THE NEW 100 GALLON DAY TANK AS INDICATED. TERMINATE ALL NEW & EXISTING POWER & CONTROL CONDUCTORS ON THE EXISTING TERMINAL STRIPS AS INIDCATED.
2) ALL FIELD WIRING BETWEEN PANEL TERMINALS AND REMOTE DEVICES TO BE #14 AWG EXCEPT POWER & PUMP WIRING #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS.
3) PRIOR TO INSTALLING VERIFY THAT ALL FLOAT SWITCHES ARE ORIENTED FOR N.C. (OPEN ON RISE) OPERATION.
4) PRIOR TO TESTING PANEL FUNCTION FILL PUMP CAVITY WITH LUBE OIL & VERIFY PROPER ROTATION OF PUMP (SUCTION ON PUMP INLET).
5) SET TIMER "MODE" DIP SWITCHES FOR "ON-DELAY" FUNCTION.
6) FIELD TEST PANEL TO VERIFY ALL CONTROL AND ALARM FUNCTIONS. MANIPULATE FLOAT SWITCHES BY REACHING IN THROUGH ADJACENT 4" BUNG. TEMPORARILY SET TIMING RELAY TO 15 SECONDS TO VERIFY TIME-OUT AND RESET FUNCTIONS.
7) AFTER FIELD TEST SET TIMING RELAY TIME DELAY TO 30 MINUTES (APPROX. 35 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 2 GPM).
8) AFTER FUNTIONAL TESTING, PRIME PIPING SYSTEM WITH HAND PRIMING PUMP TO REMOVE AIR PRIOR TO BEGINNING DAY TANK FILL. ON THE INITIAL TANK FILL THE PUMP TEST/RESET BUTTON MAY HAVE TO BE MANUALLY RESET IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE.

ADDITIVE ALTERNATE #2 ACTUATOR VALVE INSTALLATION NOTES:

1) TWO EXISTING BULK TANKS ARE PROVIDED FOR FILLING THE DAY TANK WITH ONLY ONE TANK IN SERVICE AT A TIME. INSTALL A 2-POSITION CHANGEOVER SWITCH ON THE SIDE OF THE DAY TANK PANEL TO ALLOW THE OPERATOR TO SELECT THE BULK TANK TO BE USED.
2) AFTER COMPLETION OF ACTUATOR VALVE INSTALLATIONS, PERFORM A BRIEF FILL TEST SIMILAR TO ADD. ALT. #1 NOTE 6 FOR EACH ACTUATOR VALVE. VERIFY THAT EACH VALVE OPENS & CLOSES PROPERLY BY HAVING A SECOND PERSON OBSERVE THE VALVE POSITION INDICATOR PIN. VERIFY THAT THE VALVE OPEN LIGHT TURNS ON & OFF.



4 E6 ACTUATOR VALVE AND CHANGEOVER SWITCH WIRING DIAGRAM (ADD ALT #2)
NO SCALE



NOTE:
ACTUATOR VALVE CONTROLLED FROM CHANGEOVER SWITCH & DAY TANK CONTROL PANEL IN MODULE.
SEE DETAIL 4/E6 FOR TERMINATIONS.
SEE MECHANICAL FOR ACTUATOR VALVE INSTALLATION

5 E6 ACTUATOR VALVE CONNECTION (ADD ALT #2)
NO SCALE

ISSUED FOR CONSTRUCTION FEBRUARY 2020

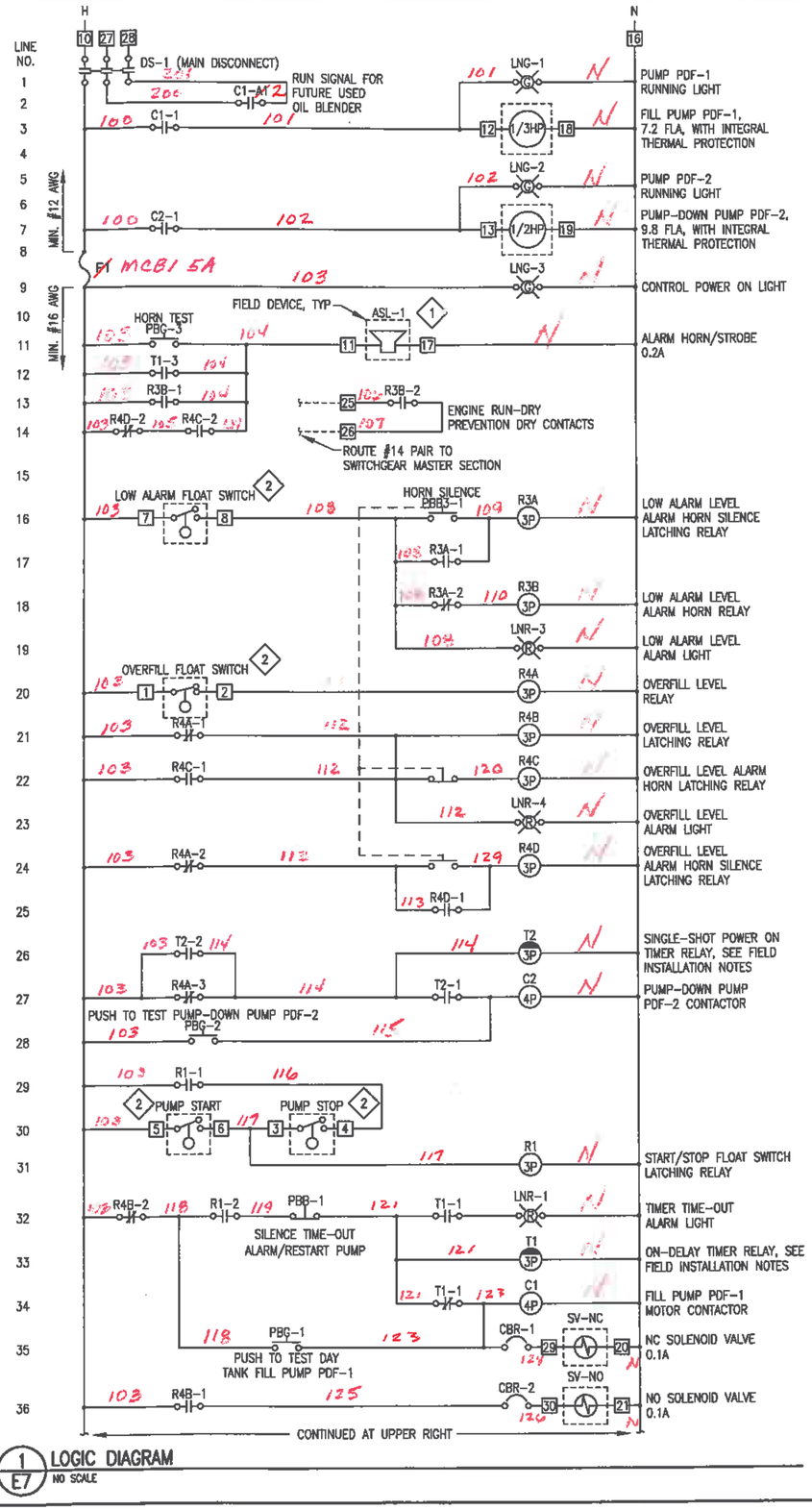
STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

PROJECT: FFY19 DERA PROJECT
CHENEGA BAY POWER PLANT UPGRADE

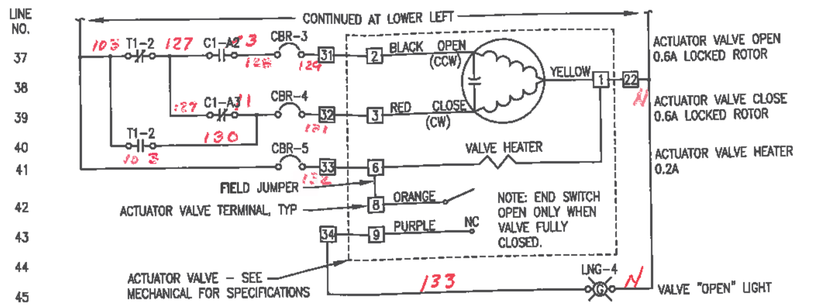
TITLE: ADDITIVE ALTERNATE NEW WORK DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 2/25/21
FILE NAME: CHENDERA E5-6 | SHEET: E6 OF 6
PROJECT NUMBER:



1 / E7 LOGIC DIAGRAM
NO SCALE



1 / E7 LOGIC DIAGRAM (CONTINUED)
NO SCALE

SEQUENCE OF OPERATIONS:

1. WHEN THE DAY TANK CIRCUIT BREAKER AND CONTROL POWER SELECTOR SWITCH ARE CLOSED; THE POWER LIGHT IS ON AND POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE HEATER/"OPEN" LIGHT CIRCUIT.

2. WHEN THE DAY TANK IS NOT CALLING FOR FUEL, POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE CLOSE CIRCUIT. WHEN THE ACTUATOR IS IN THE FULLY CLOSED POSITION, THE CLOSING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #2 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT IS OFF.

3. NORMAL FILL OPERATION – WHEN THE FUEL LEVEL DROPS TO THE "PUMP START" SWITCH, TIMER T1 IS STARTED, THE N.C. DAY TANK SOLENOID VALVE OPENS, THE REMOTE ACTUATOR VALVE OPENS & THE VALVE "OPEN" LIGHT TURNS ON, DAY TANK FILL PUMP P–DF1 IS ENERGIZED, THE PUMP P–DF1 "ON" LIGHT TURNS ON, AND THE USED OIL BLENDER RUN CIRCUIT DRY CONTACTS ARE CLOSED. WHEN THE ACTUATOR IS IN THE FULLY OPEN POSITION, THE OPENING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #7 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT REMAINS ON. WHEN FUEL REACHES THE "PUMP STOP" FLOAT SWITCH BEFORE TIMER T1 TIMES–OUT, TIMER T1 IS RESET, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, DAY TANK FILL PUMP P–DF1 IS DE–ENERGIZED, THE PUMP P–DF1 "ON" LIGHT TURNS OFF, AND THE USED OIL BLENDER RUN CIRCUIT DRY CONTACTS ARE OPENED.

4. TIMER OPERATION – IF TIMER T1 TIMES OUT; THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, DAY TANK FILL PUMP P–DF1 DE–ENERGIZES, THE PUMP P–DF1 "ON" LIGHT TURNS OFF, THE USED OIL BLENDER RUN CIRCUIT DRY CONTACTS ARE OPENED, THE "TIME–OUT" ALARM LIGHT TURNS ON, AND THE ALARM HORN SOUNDS. PRESSING THE "TIME–OUT ALARM SILENCE / PUMP RESTART" BUTTON RESETS THE TIMER, SILENCES THE ALARM HORN, AND STARTS THE NORMAL FILL OPERATION. (SEE FIELD INSTALLATION NOTES FOR TIMER T1 SETTING).

5. OVERFILL FUEL LEVEL – IF THE TANK OVERFILLS AND THE FUEL LEVEL REACHES THE "OVERFILL" FLOAT SWITCH, THE N.O. DAY TANK SOLENOID VALVE CLOSES, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE VALVE "OPEN" LIGHT TURNS OFF, DAY TANK FILL PUMP P–DF1 DE–ENERGIZES, THE PUMP P–DF1 "ON" LIGHT TURNS OFF, THE USED OIL BLENDER RUN CIRCUIT DRY CONTACTS ARE OPENED, TIMER T2 IS STARTED, PUMP–DOWN PUMP P–DF2 ENERGIZES FOR A TIMED INTERVAL, THE PUMP P–DF2 "ON" LIGHT TURNS ON, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, AND THE ALARM HORN SOUNDS. WHILE THE FUEL LEVEL REMAINS ABOVE THE "OVERFILL" FLOAT LEVEL, PRESSING THE LEVEL ALARM HORN "SILENCE/RESET" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "OVERFILL LEVEL" ALARM LIGHT ON. AFTER THE OVERFILL FAULT HAS BEEN CORRECTED (THE FUEL LEVEL FALLS BELOW THE "OVERFILL" FLOAT SWITCH), PRESSING THE LEVEL ALARM HORN "SILENCE/RESET" BUTTON TURNS OFF THE "OVERFILL LEVEL" ALARM LIGHT, OPENS THE N.O. DAY TANK SOLENOID VALVE, AND TURNS OFF THE ALARM HORN (IF NOT PREVIOUSLY SILENCED). THE LEVEL ALARM HORN "SILENCE/RESET" BUTTON MUST BE PRESSED AFTER THE OVERFILL FAULT HAS BEEN CORRECTED FOR THE NORMAL FILL OPERATION TO REPEAT WHEN THE FUEL LEVEL REACHES THE "PUMP START" FLOAT SWITCH. (SEE FIELD INSTALLATION NOTES FOR TIMER T2 SETTING).

6. LOW FUEL LEVEL – IF THE FUEL LEVEL FALLS BELOW THE "LOW ALARM" FLOAT SWITCH, THE "LOW FUEL LEVEL" ALARM LIGHT TURNS ON AND THE ALARM HORN SOUNDS. THE LEVEL ALARM HORN "SILENCE/RESET" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "LOW FUEL LEVEL" ALARM LIGHT ON. PRESSING THE "TIME–OUT ALARM SILENCE / PUMP RESTART" BUTTON RESETS THE TIMER AND STARTS THE NORMAL FILL OPERATION. WHEN THE FUEL LEVEL RISES ABOVE THE "LOW ALARM" FLOAT SWITCH THE "LOW FUEL LEVEL" ALARM LIGHT TURNS OFF AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED).

7. PUMP TEST – MOMENTARY CONTACT BUTTONS ARE PROVIDED TO TEST THE PUMPS. PRESSING THE DAY TANK FILL PUMP P–DF1 "PUSH TO TEST" BUTTON STARTS TIMER T1, MOMENTARILY OPENS THE N.C. DAY TANK SOLENOID VALVE AND ACTUATED BALL VALVE, ENERGIZES DAY TANK FILL PUMP P–DF1, TURNS ON THE PUMP P–DF1 "ON" LIGHT, AND CLOSES THE USED OIL BLENDER RUN CIRCUIT CONTACTS. PUMP P–DF1 IS LOCKED OUT IF THE TANK IS AT THE OVERFILL LEVEL. PRESSING THE PUMP DOWN PUMP P–DF2 "PUSH TO TEST" BUTTON ENERGIZES PUMP DOWN PUMP P–DF2 AND TURNS ON THE PUMP P–DF2 "ON" LIGHT.

12/3/2013

LEGEND

R# CONTROL RELAY	CB–# CIRCUIT BREAKER	R#–| NORMALLY OPEN CONTACT	SW–| NORMALLY OPEN FLOAT SWITCH
T# TIME DELAY RELAY	CBR–# RAIL MOUNT CIRCUIT BREAKER	R#–|/| NORMALLY CLOSED CONTACT	SW–|/| NORMALLY CLOSED FLOAT SWITCH
C# CONTACTOR	PB–# NORMALLY OPEN MOMENTARY PUSH BUTTON	SS–# 2–POSITION SELECTOR SWITCH	O.L. OVERLOADS
[#] TERMINAL BLOCK	PB–# NORMALLY CLOSED MOMENTARY PUSH BUTTON	ASL–# ALARM & STROBE LIGHT	SV# SOLENOID VALVE

BILL OF MATERIALS (NOTE: PROVIDE MATERIALS AS SPECIFIED – NO SUBSTITUTIONS ALLOWED)

TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
C	2	ALLEN–BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
	1	ALLEN–BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
CBR	5	ALLEN–BRADLEY	1492GH010	CIRCUIT BREAKER, RAIL STYLE, 1 POLE, 1A
DS	1	ALLEN–BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	1	ALLEN–BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
F	1	BUSS	FNQR5	5A FUSE IN 3 FUSE HOLDER WITH 2 EACH SPARE FUSES
LNG	4	ALLEN–BRADLEY	800HQRH10G	GREEN LED PILOT LIGHT, 120V, NEMA 4X
LNR	3	ALLEN–BRADLEY	800HQRH10R	RED LED PILOT LIGHT, 120V, NEMA 4X
PBB	1	ALLEN–BRADLEY	800HAR2D2	MOMENTARY PUSH BUTTON, 1 NC, NEMA 4X, BLACK
PBB3	1	ALLEN–BRADLEY	800HAR2	MOMENTARY PUSH BUTTON, NEMA 4X, BLACK
	2	ALLEN–BRADLEY	800T–XD1	NO CONTACT BLOCK
	1	ALLEN–BRADLEY	800T–XD2	NC CONTACT BLOCK
PBG	3	ALLEN–BRADLEY	800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
R	7	ALLEN–BRADLEY	700HA33A1	3PDT RELAY
	7	ALLEN–BRADLEY	700HN101	11 PIN SOCKET BASE
T	2	ALLEN–BRADLEY	700HA33A1	3PDT RELAY
	2	ALLEN–BRADLEY	700HN205	11 PIN RELAY SOCKET BASE FOR TIMER
	2	ALLEN–BRADLEY	700HT3	SERIES B TIMING MODULE
TB–1	35	ALLEN–BRADLEY	1492CAM1	35A, 600V SCREW TERMINALS

PANEL NOTES:

1. PROVIDE COMPLETE UL LISTED PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN LOGIC DIAGRAM EXCEPT FOR FIELD DEVICES. FIELD DEVICES ARE INDICATED WITH DASHED OUTLINE. INSTALL IN A 24"x20"x8" NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK.

2. USE MIN #16 AWG ON ALL 5 AMP FUSED CIRCUITS AND MIN #12 AWG WIRE ON ALL OTHER CIRCUITS. TAG EACH END OF ALL JUMPERS WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS).

3. LABEL ALL PANEL DEVICES AND REMOTE EQUIPMENT CONNECTIONS AT THE TERMINAL BLOCK BY THE ITEM TITLE AS SHOWN ON THE TERMINAL STRIP DRAWING.

4. BENCH TEST COMPLETED UNIT. PROVIDE MIN 48 HOURS NOTICE TO ENGINEER TO SCHEDULE OBSERVATION OF BENCH TEST. PROVIDE SWITCHES AND LAMPS TO SIMULATE OPERATION OF ALL FIELD DEVICES.

5. FIELD WIRING AND FIELD INSTALLED DEVICES PROVIDED BY OTHERS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT PART OF THE PANEL BID.

6. POWER TO PANEL PROVIDED FROM DEDICATED 20A CIRCUIT BREAKER IN LISTED LOAD CENTER. SEE FIELD INSTALLATION NOTE #3.

FIELD INSTALLATION NOTES:

1. SEE MECHANICAL FOR DAY TANK INSTALLATION & PIPING. INSTALL CONTROL PANEL & FIELD DEVICES AS INDICATED TO PROVIDE REDUNDANT HIGH & LOW LIMIT CONTROLS & OVERFILL PROTECTION.

2. FIELD WIRING TO FLOAT SWITCHES, SOLENOID VALVES, AND ACTUATOR VALVES #14 AWG. ALL OTHER FIELD WIRING #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS.

3. PERFORM ALL FIELD WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS ON SHEET E6. PROVIDE POWER TO DAY TANK PANEL FROM DEDICATED 20A SINGLE POLE CIRCUIT BREAKER IN STATION SERVICE LOAD CENTER.

4. VERIFY THAT ALL FLOAT SWITCHES ARE ORIENTED FOR N.C. (OPEN ON RISE) OPERATION PRIOR TO INSTALLATION. ALL FLOATS SHOWN ON LOGIC DIAGRAM WITH TANK AT FULL (PUMP STOP) LEVEL.

5. VERIFY PROPER ROTATION OF ALL PUMPS. FILL PUMP CAVITY WITH LUBE OIL PRIOR TO INITIAL OPERATION.

6. FIELD TEST COMPLETED UNIT TO VERIFY ALL CONTROL AND ALARM FUNCTIONS. MANIPULATE FLOAT SWITCHES BY REACHING IN THROUGH ADJACENT 4" BUNG. TEMPORARILY SET TIMING RELAYS TO 30 SECONDS TO VERIFY TIME–OUT AND RESET FUNCTIONS.

7. SET FILL PUMP PDF–1 TIMING RELAY T1 TIME DELAY TO 30 MINUTES (APPROX. 35 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 2 GPM). ON THE INITIAL TANK FILL, THE PUMP TEST/RESET BUTTON MAY HAVE TO BE MANUALLY RESET IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE. SEE "SEQUENCE OF OPERATIONS". PRIME SYSTEM WITH HAND PRIMING PUMP PRIOR TO OPERATING DAY TANK PUMP.

8. SET PUMP–DOWN PUMP T2 TIMING RELAY TIME DELAY TO 4 MINUTES (24 GALS. REQUIRED TO DROP LEVEL INTO NORMAL OPERATING RANGE @ APPROX. 6 GPM).

EXISTING DAY TANK PANEL REFERENCE DRAWING

RECORD DRAWING
THESE DRAWINGS HAVE BEEN PREPARED FROM INFORMATION PROVIDED BY OTHERS. THERE IS NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.
DATE: 12/29/08

State of Alaska
Department of Community and Economic Development
AIDEA/AEA
Rural Energy Group
813 West Northern Lights Blvd.
Anchorage, Alaska 99503
ALASKA ENERGY AUTHORITY

PROJECT: ~~PILOT POINT~~ CHENEGA POWER SYSTEM UPGRADE

TITLE: DAY TANK CONTROL PANEL
LOGIC DIAGRAM & SEQUENCE OF OPERATIONS

ALASKA ENERGY AND ENGINEERING, INC
P.O. BOX 111405 ANCHORAGE, ALASKA 99511–1405 PHONE (907) 349–0100

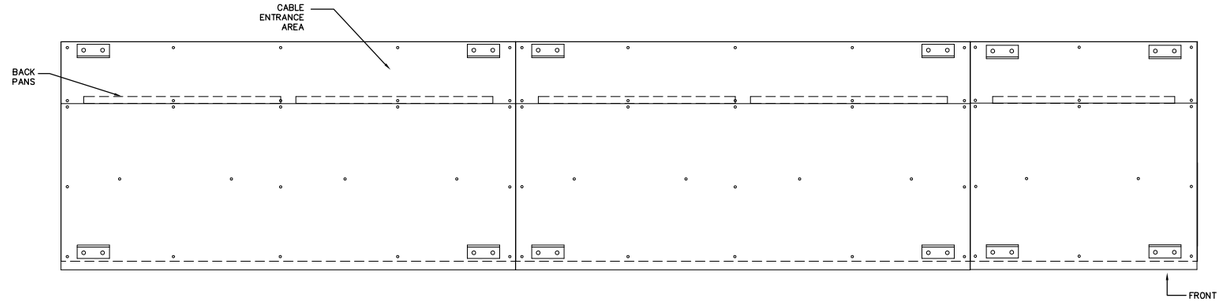
DRAWN BY: BCG	SCALE: NO SCALE	FILE NAME: PPNT PP E7–8	SHEET: E7 OF 8
DESIGNED BY: CWW/BCG	DATE: 5/12/08	PROJECT NUMBER: 03–10–9649	

ALASKA ENERGY AUTHORITY

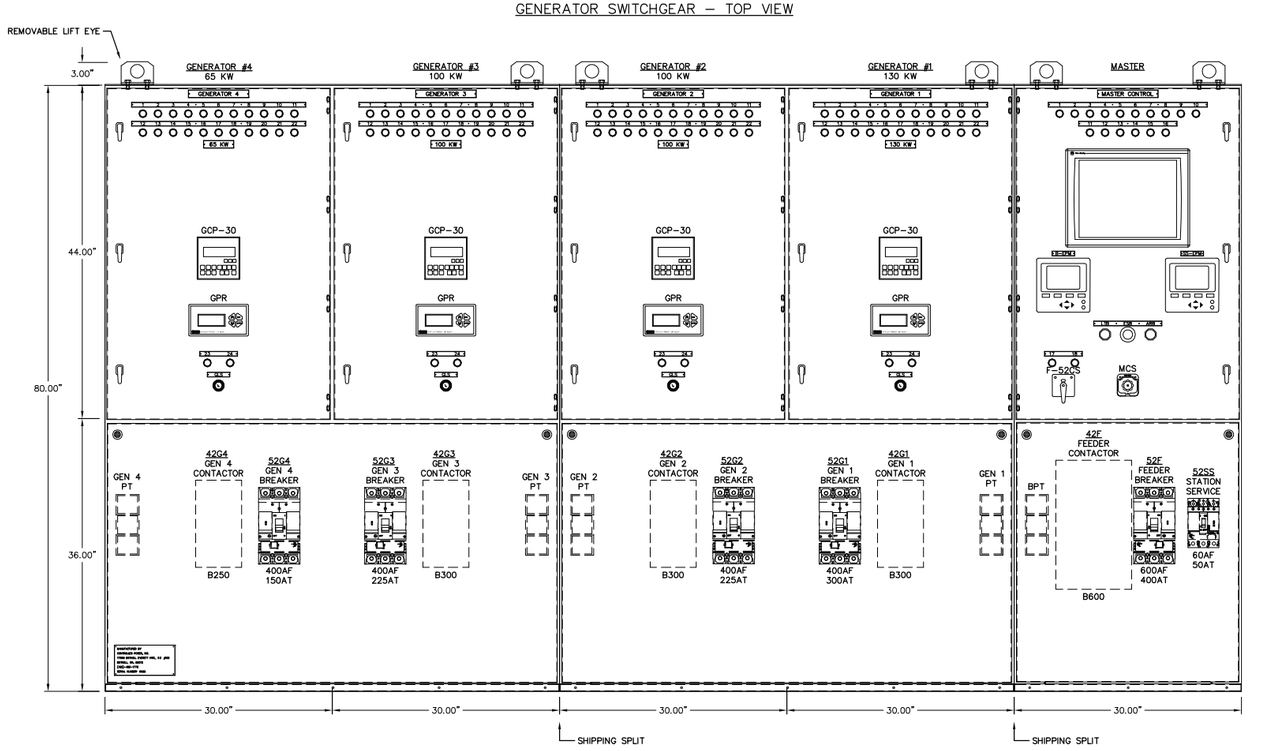
ARCTIC VILLAGE GENERATOR SWITCHGEAR
ALASKA ENERGY AUTHORITY PURCHASE ORDER No. REQ-04-230
CONTROLLED POWER, INC. JOB No. 5628

DRAWING No.	DRAWING TITLE
5628-2101-D	COVER SHEET
5628-3101-D	SCHEMATIC LEGEND AND NOTES
5628-4101-D	GENERATOR SWITCHGEAR ELEVATION VIEW, OUTLINE DIAGRAM
5628-5101-D	SINGLE LINE, SCHEMATIC DIAGRAM
5628-5201-D	GENERATOR 1 AC THREE LINE, SCHEMATIC DIAGRAM
5628-5202-D	GENERATOR 2 AC THREE LINE, SCHEMATIC DIAGRAM
5628-5203-D	GENERATOR 3 AC THREE LINE, SCHEMATIC DIAGRAM
5628-5204-D	GENERATOR 4 AC THREE LINE, SCHEMATIC DIAGRAM
5628-5205-D	MASTER AC THREE LINE AND DISTRIBUTION, SCHEMATIC DIAGRAM
5628-5301-D	GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM
5628-5302-D	GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM
5628-5303-D	GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM
5628-5304-D	GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM
5628-5305-D	GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM
5628-5306-D	GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM
5628-5307-D	GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM
5628-5308-D	GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM
5628-5309-D	GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM
5628-5310-D	GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM
5628-5311-D	GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM
5628-5312-D	GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM
5628-5313-D	MASTER DC CONTROL, SCHEMATIC DIAGRAM
5628-5314-D	MASTER DC CONTROL, SCHEMATIC DIAGRAM
5628-5315-D	MASTER DC CONTROL, SCHEMATIC DIAGRAM
5628-5316-D	FUEL FLOW SYSTEM WIRING, SCHEMATIC DIAGRAM
5628-5501-D	PLC COMMUNICATION DIAGRAM
5628-5601-D	COMMUNICATION NETWORK DIAGRAM
5628-5602-D	EPM MONITORING AND SYSTEM COMMUNICATION DIAGRAM
5628-5701-D	HEATER & LIGHTING CONTROL, SCHEMATIC DIAGRAM
5628-6101-D	CONTROL SWITCH TARGET DIAGRAM
5628-6201-D	NAMEPLATE ENGRAVING SCHEDULE, FABRICATION DETAIL
5628-7101-D	INTERCONNECTION DIAGRAM

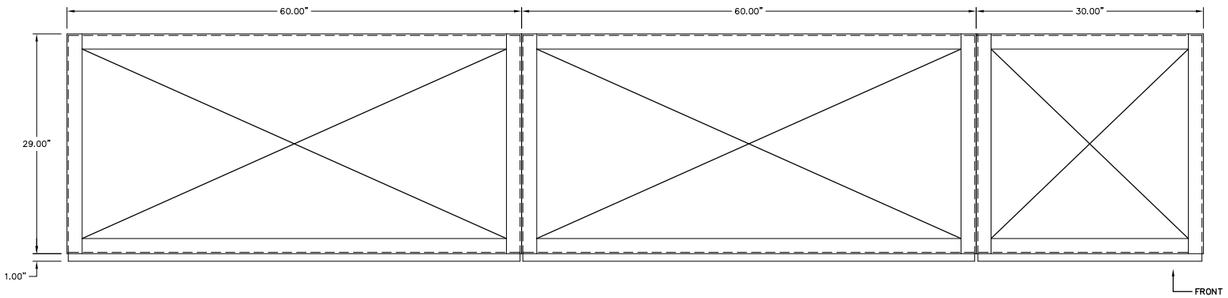
Plot date: 2005/12/9 - 14:21



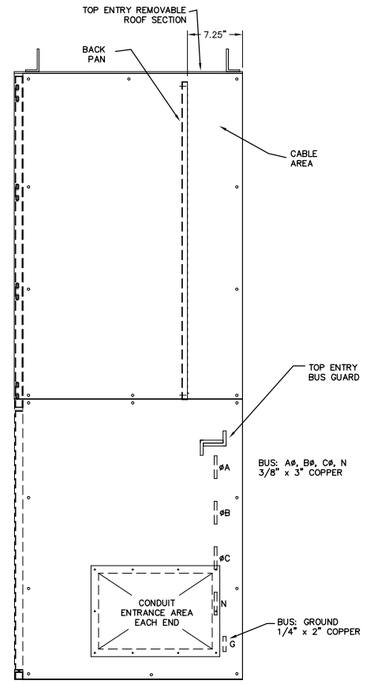
GENERATOR SWITCHGEAR – TOP VIEW



GENERATOR SWITCHGEAR – FRONT VIEW



GENERATOR SWITCHGEAR – PLAN VIEW



GENERATOR SWITCHGEAR – SIDE VIEW

GCP READOUT

* INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING LIST OF METERING, STATUS, AND ALARMS.

METERING LEGEND

1. VOLTS: A⌀, B⌀, C⌀ L-N, L-L
2. AMPS: A⌀, B⌀, C⌀
3. KW
4. PF
5. KWH

ALARM LEGEND

1. LOW OIL PRESSURE ALARM
2. LOW OIL PRESSURE SHUTDOWN
3. HIGH WATER TEMPERATURE ALARM
4. HIGH WATER TEMPERATURE SHUTDOWN
5. OVERCRANK
6. OVERSPEED
7. LOW OIL LEVEL

ANALOG INPUT LEGEND

1. OIL PRESSURE (PSI)
2. WATER TEMP (°F)

MISC. LEGEND

1. ENGINE HOURS
2. ENGINE START COUNTER
3. MAINTENANCE CALL

GPR FUNCTIONS

* INCLUDES, BUT NOT LIMITED TO:

27/59
81 o/u
32
50/51
40
47

SYMBOL:	NOMENCLATURE DESCRIPTION:
ARB	ALARM RESET BUTTON
B-EPM	BUS ELECTRONIC POWER METER – 6200ION
ESB	EMERGENCY STOP BUTTON
F-EPM	FEEDER ELECTRONIC POWER METER – 7500ION
GCP	GENERATOR CONTROL PACKAGE
GLS	GENERATOR LOCKOUT SWITCH
GPR	GENERATOR PROTECTIVE RELAY
OIU	OPERATOR INTERFACE UNIT
LTB	LAMP TEST BUTTON
MCS	MASTER CONTROL SWITCH
SS-EPM	STATION SERVICE POWER METER – 6200ION
42xx	CONTACTOR
52CS	BREAKER CONTROL SWITCH
52xx	CIRCUIT BREAKER

GENERATOR ANNUNCIATOR LEGEND:

1. ENGINE RUNNING
2. ENGINE IDLE
3. ENGINE ALARM
4. LOW OIL PRESSURE
5. OIL LEVEL
6. HIGH OIL TEMPERATURE
7. HIGH WATER TEMPERATURE
8. OVERSPEED
9. OVERCRANK
10. COOLDOWN/LOCKOUT
11. BATTERY CHARGER FAILURE
12. NORMAL STOP
13. NOT IN AUTO POSITION
14. GENERATOR BREAKER OPEN
15. FAIL TO SYNCHRONIZE
16. OVERCURRENT
17. UNDER VOLTAGE
18. OVER VOLTAGE
19. UNDER FREQUENCY
20. OVER FREQUENCY
21. LOSS OF EXCITATION
22. REVERSE POWER
23. CONTACTOR OPEN
24. CONTACTOR CLOSED

MASTER ANNUNCIATOR LEGEND

1. FIRE ALARM LIGHT
2. EMERGENCY STOP LIGHT
3. SYSTEM LOW WATER LEVEL LIGHT
4. DAY TANK CRITICAL LOW LIGHT
5. BUS UNDER/OVER VOLTAGE LIGHT
6. BUS UNDER/OVER FREQUENCY LIGHT
7. FEEDER BREAKER OVERCURRENT LIGHT
8. PRIMARY PLC FAILURE
9. OPERATING ON BACKUP PLC
10. BACKUP PLC FAILURE
11. HEAT RECOVERY NO LOAD
12. HEAT RECOVERY LOSS OF PRESSURE
13. HEAT RECOVERY LOSS OF FLOW
14. SPARE 1
15. SPARE 2
16. SPARE 3
17. FEEDER CONTACTOR OPEN
18. FEEDER CONTACTOR CLOSED

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR SWITCHGEAR, ELEVATION VIEW, OUTLINE DIAGRAM

SCALE: 1/10 | DATE: 05-03-05 | DWN. BY: GPN

DWG. No: 5628-4101-D | SHEET: 1 OF 1 | CKD. BY: JMD

JOB: ARCTIC VILLAGE

25.4mm 0 25.4mm 50.8mm
10" 0 10" 20"
SCALE: 1"=10"

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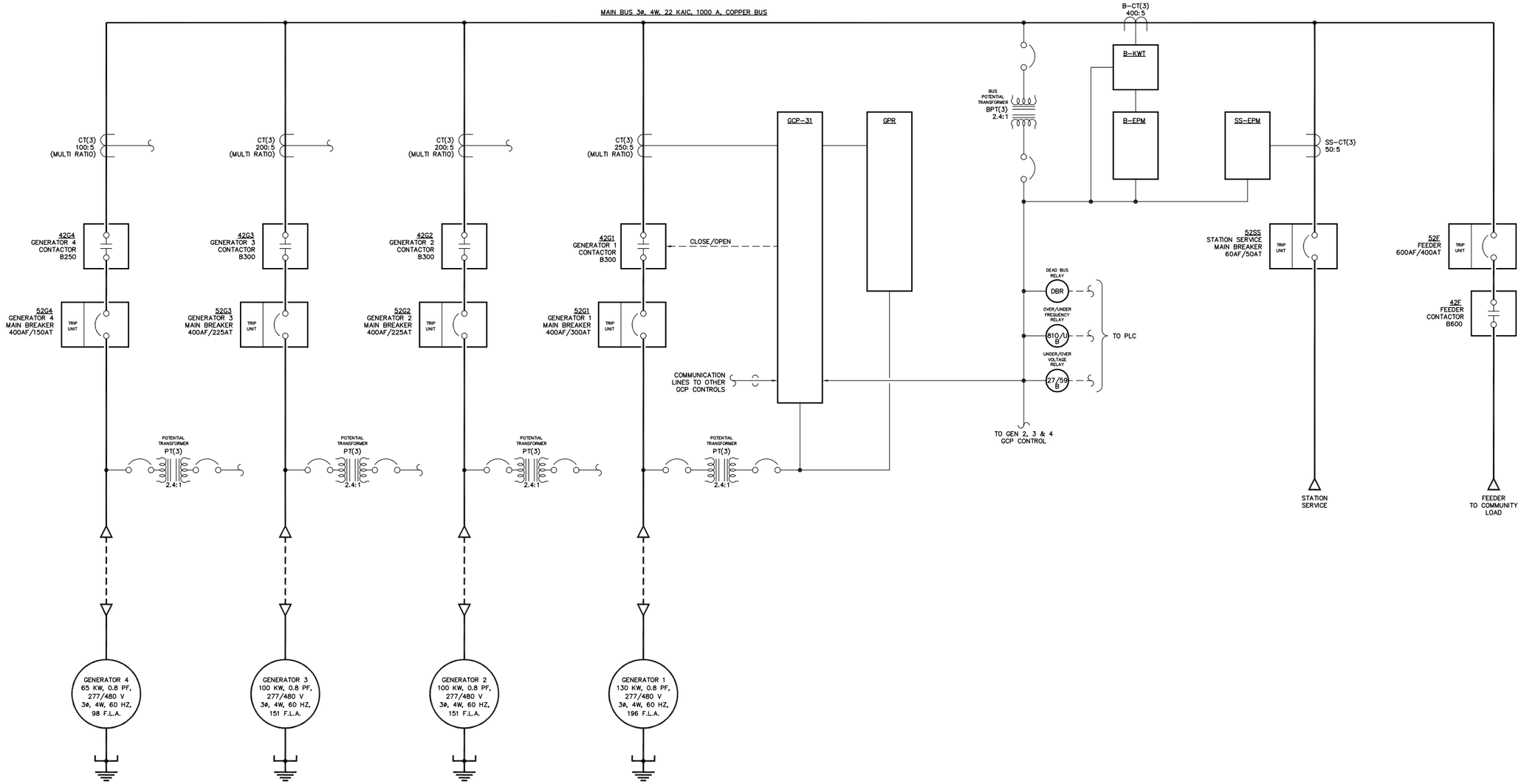
Anchorage, Alaska 99503

Plot date: 2005/12/9 – 14:21



NOTES:

1. GENERATORS 2 , 3 & 4 SIMILAR TO GENERATOR 1.

NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: SINGLE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5101-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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Plot date: 2005/12/9 – 14:20

RATIO	TAP
50:5	X2–X3
100:5	X1–X2
150:5	X1–X3
200:5	X4–X5
250:5	X3–X4
300:5	X2–X4
400:5	X1–X4
450:5	X3–X5
500:5	X2–X5
600:5	X1–X5

TO BUS

GND N ØA ØB ØC

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–C

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–B

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–A

MULTI RATIO CT'S

42–G1 B300

52–G1 400 AF 300 AT

GCP–31

GENERATOR PROTECTIVE RELAY GPR

8290

IDLE ADJUST POTENTIOMETER IAP

CW TO INCREASE

50K OHM 10 TURN 2 WATT (MOUNTED ON BACKPAN)

RMP (394)

MAGNETIC PICKUP MPU

12VDC FROM DWG No. 5628–5301–D LINE No. 257

MAG PICKUP

ACTUATOR

#12 AWG 130

#12 AWG 131

SPEED BIAS +/– 3V

BUS SENSING

BUS POTENTIAL TO MASTER AND GEN 2 SECTION DWG No. 5628–5202–D, 5628–5205–D LINE No. 72, 230

CB7 10A

42CR (295)

42–G1

CB1 .5A

CB2 .5A

CB3 .5A

CB4 2A

CB5 2A

CB6 2A

PT–1

PT–2

PT–3

2.4:1 150VA

MARATHON DVR 2000E VOLTAGE REGULATOR VR

AUX ADJUST

VOLTAGE BIAS +/– 3V

(LOCATED IN GEN)

GENERATOR 1
130 KW, 0.8 PF
3ø, 4W, 60 HZ
196 F.L.A.

T0 T1 T2 T3

NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628–3101–D.

REV.	DATE	DESCRIPTION	BY
C	08–30–05	SHOP AS BUILT	GPN
B	07–05–05	RELEASED FOR PRODUCTION	GPN
A	05–03–05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ–04–230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 1 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05–03–05	DWN. BY: GPN
DWG. No: 5628–5201–D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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Plot date: 2005/12/9 – 14:20

RATIO	TAP
50:5	X2–X3
100:5	X1–X2
150:5	X1–X3
200:5	X4–X5
250:5	X3–X4
300:5	X2–X4
400:5	X1–X4
450:5	X3–X5
500:5	X2–X5
600:5	X1–X5

TO BUS

GND N ØA ØB ØC

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–C

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–B

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–A

MULTI RATIO CT'S

42–G2 B300

52–G2 400 AF 225 AT

GENERATOR 2
100 KW, 0.8 PF
3ø, 4W, 60 HZ
151 F.L.A.

GCP–31

GENERATOR PROTECTIVE RELAY GPR

8290

IDLE ADJUST POTENTIOMETER IAP

CW TO INCREASE

50K OHM 10 TURN 2 WATT (MOUNTED ON BACKPAN)

RMP (694)

MAGNETIC PICKUP MPU

12VDC FROM DWG No. 5628–5304–D LINE No. 557

ACTUATOR

#12 AWG 130

#12 AWG 131

MAG PICKUP

SPEED BIAS +/– 3V

BUS SENSING

BUS POTENTIAL TO SECTION GEN 1 & 3 DWG No. 5628–5201–D, 5628–5203–D LINE No. 22, 123

CB7 10A

42CR(595)

CB1 .5A

CB2 .5A

CB3 .5A

CB4 2A

CB5 2A

CB6 2A

PT–1

PT–2

PT–3

2.4:1 150VA

MARATHON DVR 2000E VOLTAGE REGULATOR VR

AUX ADJUST

(LOCATED IN GEN)

VOLTAGE BIAS +/– 3V

NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628–3101–D.

REV.	DATE	DESCRIPTION	BY
C	08–30–05	SHOP AS BUILT	GPN
B	07–05–05	RELEASED FOR PRODUCTION	GPN
A	05–03–05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ–04–230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 2 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE | DATE: 05–03–05 | DWN. BY: GPN

DWG. No: 5628–5202–D | SHEET: 1 OF 1 | CKD. BY: JMD

JOB: ARCTIC VILLAGE

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Plot date: 2005/12/9 – 14:20

RATIO	TAP
50:5	X2–X3
100:5	X1–X2
150:5	X1–X3
200:5	X4–X5
250:5	X3–X4
300:5	X2–X4
400:5	X1–X4
450:5	X3–X5
500:5	X2–X5
600:5	X1–X5

NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628–3101–D.

REV.	DATE	DESCRIPTION	BY
C	08–30–05	SHOP AS BUILT	GPN
B	07–05–05	RELEASED FOR PRODUCTION	GPN
A	05–03–05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ–04–230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 3 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05–03–05	DWN. BY: GPN
DWG. No: 5628–5203–D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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Plot date: 2005/12/9 – 14:19

RATIO	TAP
50:5	X2–X3
100:5	X1–X2
150:5	X1–X3
200:5	X4–X5
250:5	X3–X4
300:5	X2–X4
400:5	X1–X4
450:5	X3–X5
500:5	X2–X5
600:5	X1–X5

TO BUS

GND N ØA ØB ØC

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–C

MULTI RATIO CT'S

109X5 109X4 109X3 109X2 106 109X1 109

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–B

MULTI RATIO CT'S

108X5 108X4 108X3 108X2 106 108X1 108

CURRENT TRANSFORMER SHORTING BLOCK CTSB1–A

MULTI RATIO CT'S

107X5 107X4 107X3 107X2 106 107X1 107

42–G4 B250

52–G4 400 AF 150 AT

GCP–31

GENERATOR PROTECTIVE RELAY GPR

109 32 31 119 — 119 7 9 106

108 30 29 118 — 118 4 6 106

107 26 25 117 — 117 1 3 106

8290

IDLE ADJUST POTENTIOMETER IAP

CW CCW 50K OHM 10 TURN 2 WATT (MOUNTED ON BACKPAN)

CW TO INCREASE

RMP (1294)

MAGNETIC PICKUP MPU

12VDC FROM DWG No. 5628–5310–D LINE No. 1157

158 159 MAG PICKUP

ACTUATOR

#12 AWG 130 #12 AWG 131

155 156 SPEED BIAS +/– 3V

BUS SENSING 23 411 24 412

BUS POTENTIAL TO GEN 3 SECTION DWG No. 5628–5203–D LINE No. 123

18 95

2 5 8 11 — 111 112 113 95

CB7 10A 171 172 42CR(1195) COM1 NO1 173 42–G4 A1 A2 194

CB1 .5A 91 96 CB2 .5A 92 97 CB3 .5A 93 98

PT–1 PT–2 PT–3 2.4:1 150VA

CB4 2A 101 111 CB5 2A 102 112 CB6 2A 103 113

111 20 111 — 111

112 21 112 — 112

113 22 113 — 113

95 Ø 95 — 95 95

MARATHON DVR 2000E VOLTAGE REGULATOR VR

AUX ADJUST A B (LOCATED IN GEN)

24 25 26 181 182 11 12 13 VOLTAGE BIAS +/– 3V

GENERATOR 4 65 KW, 0.8 PF 3ø, 4W, 60 HZ 98 F.L.A.

T0 T1 T2 T3

NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628–3101–D.

REV.	DATE	DESCRIPTION	BY
C	08–30–05	SHOP AS BUILT	GPN
B	07–05–05	RELEASED FOR PRODUCTION	GPN
A	05–03–05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ–04–230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 4 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE | DATE: 05–03–05 | DWN. BY: GPN

DWG. No: 5628–5204–D | SHEET: 1 OF 1 | CKD. BY: JMD

JOB: ARCTIC VILLAGE

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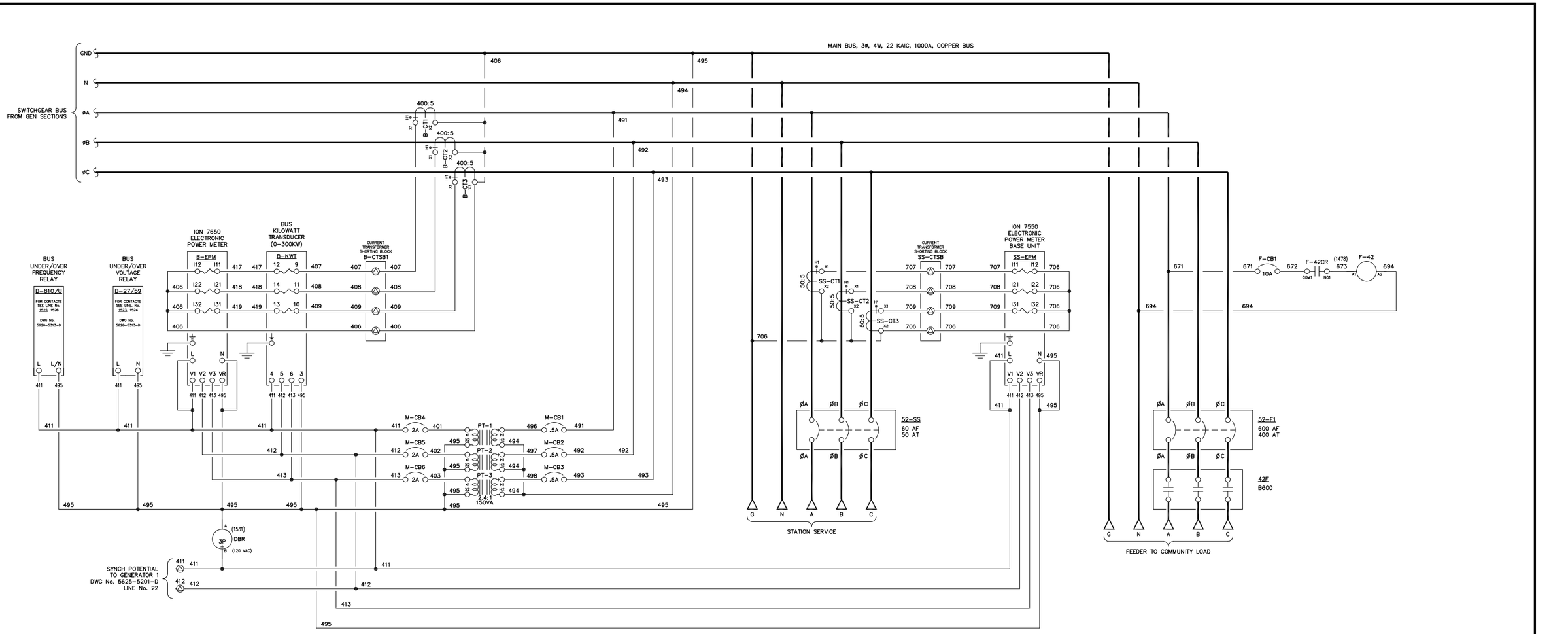
Anchorage, Alaska 99503

Plot date: 2005/12/9 – 14:19



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: MASTER AC THREE LINE AND DISTRIBUTION, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5205-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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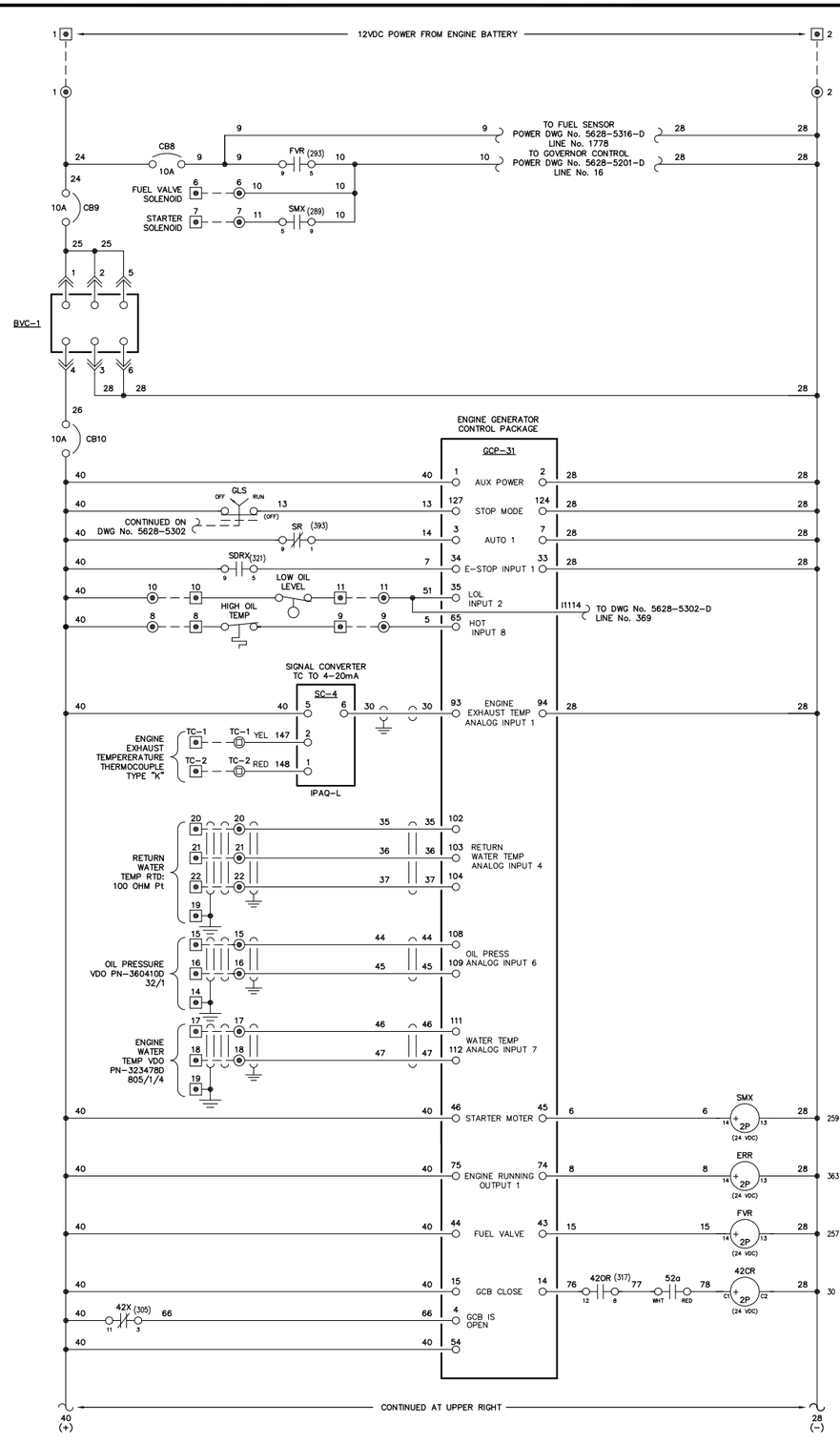
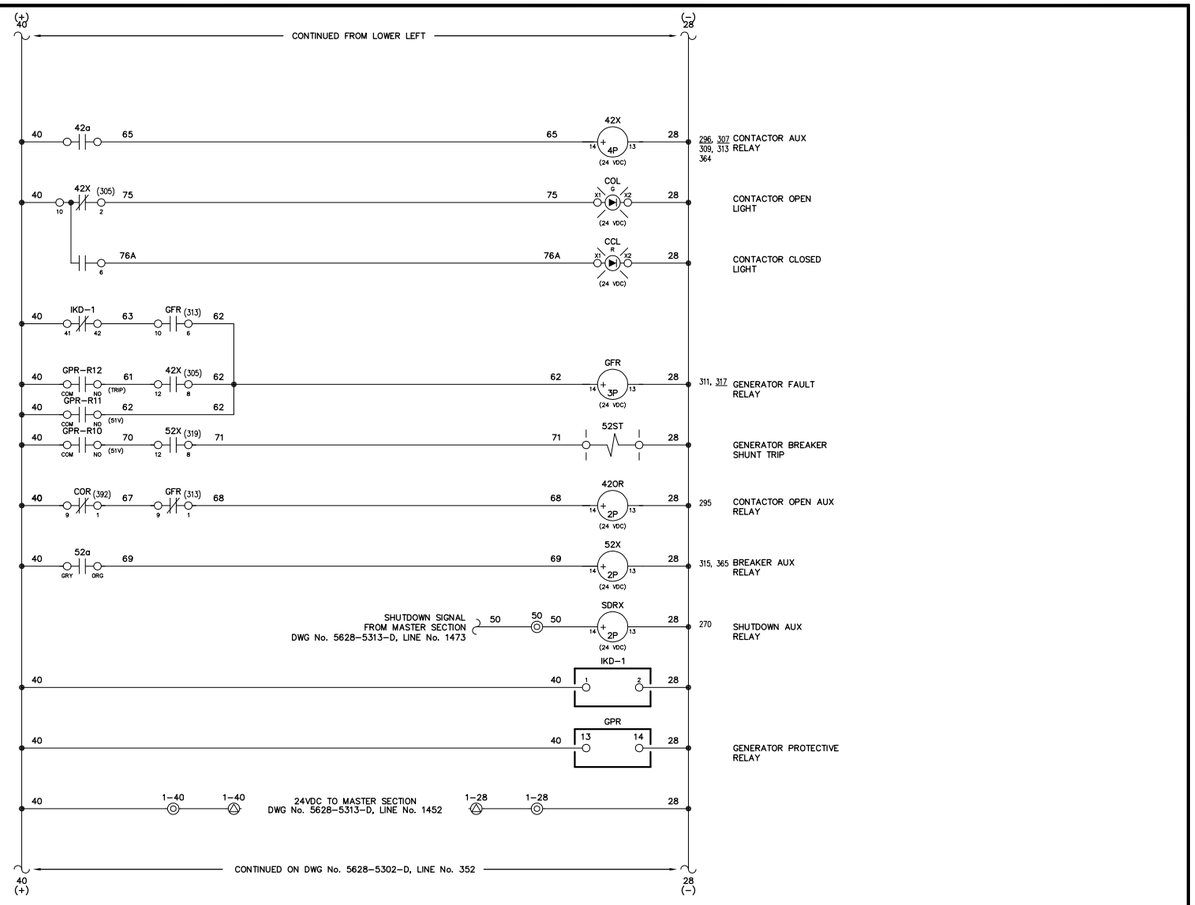
Plot date: 2005/12/9 – 14:19





NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5301-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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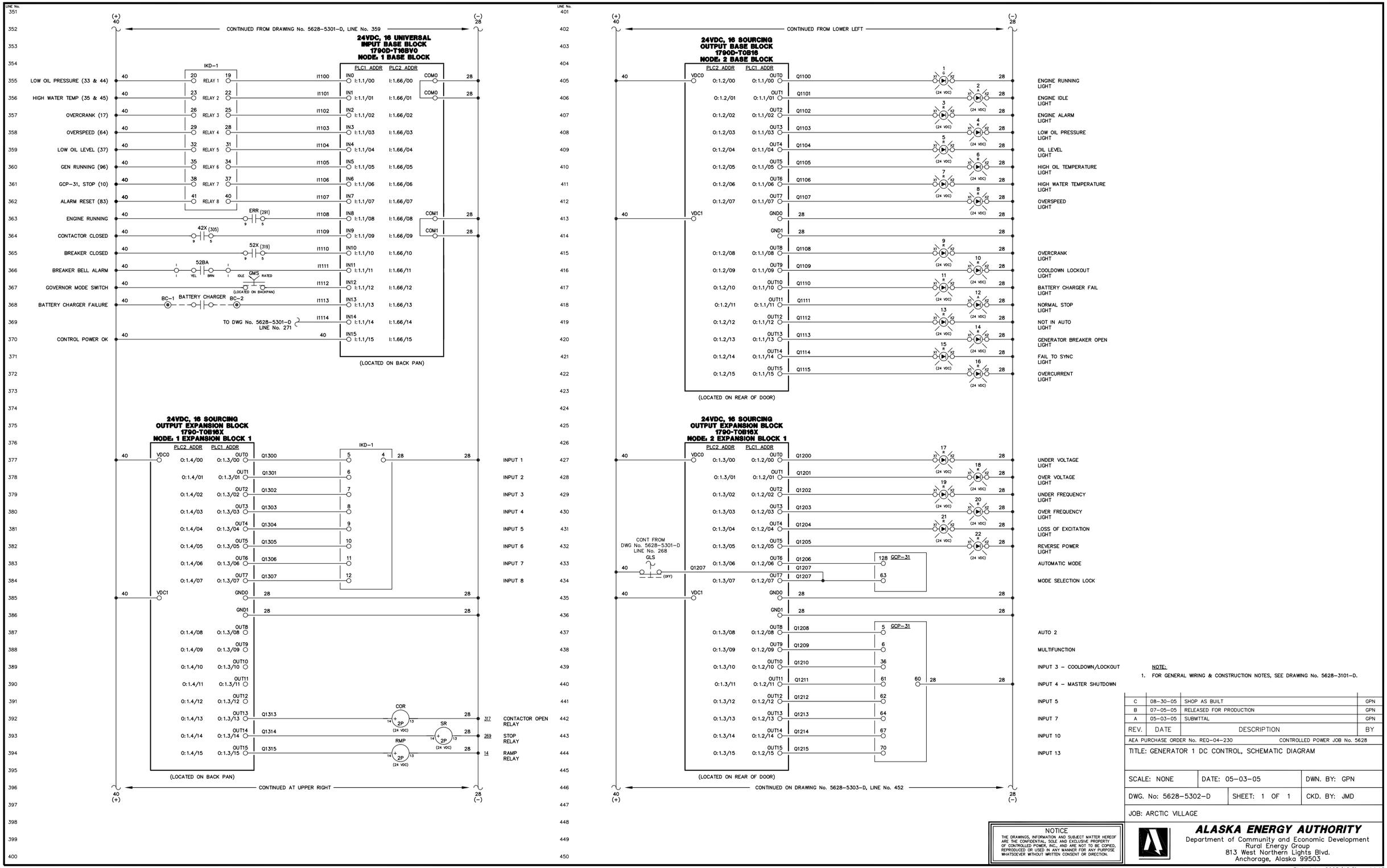
Plot date: 2005/12/9 – 14:18



NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5302-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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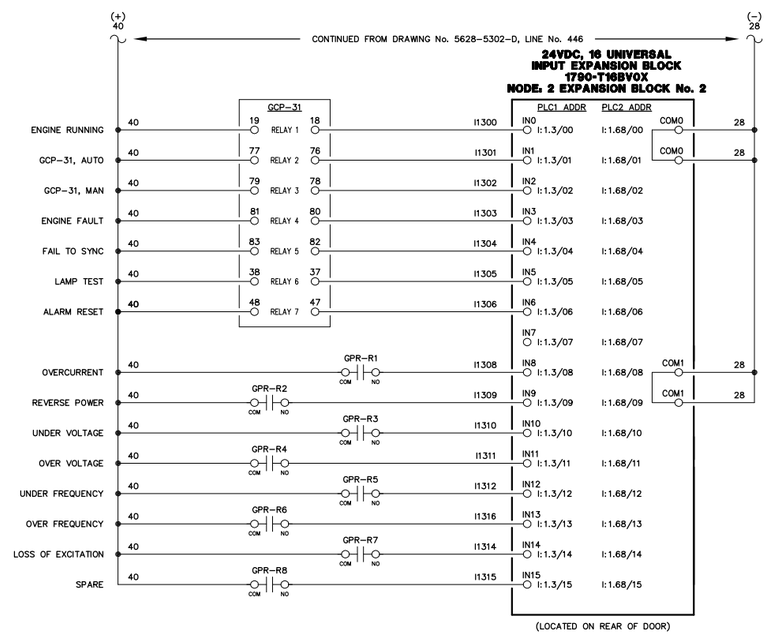
Plot date: 2005/12/9 – 14:18



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5303-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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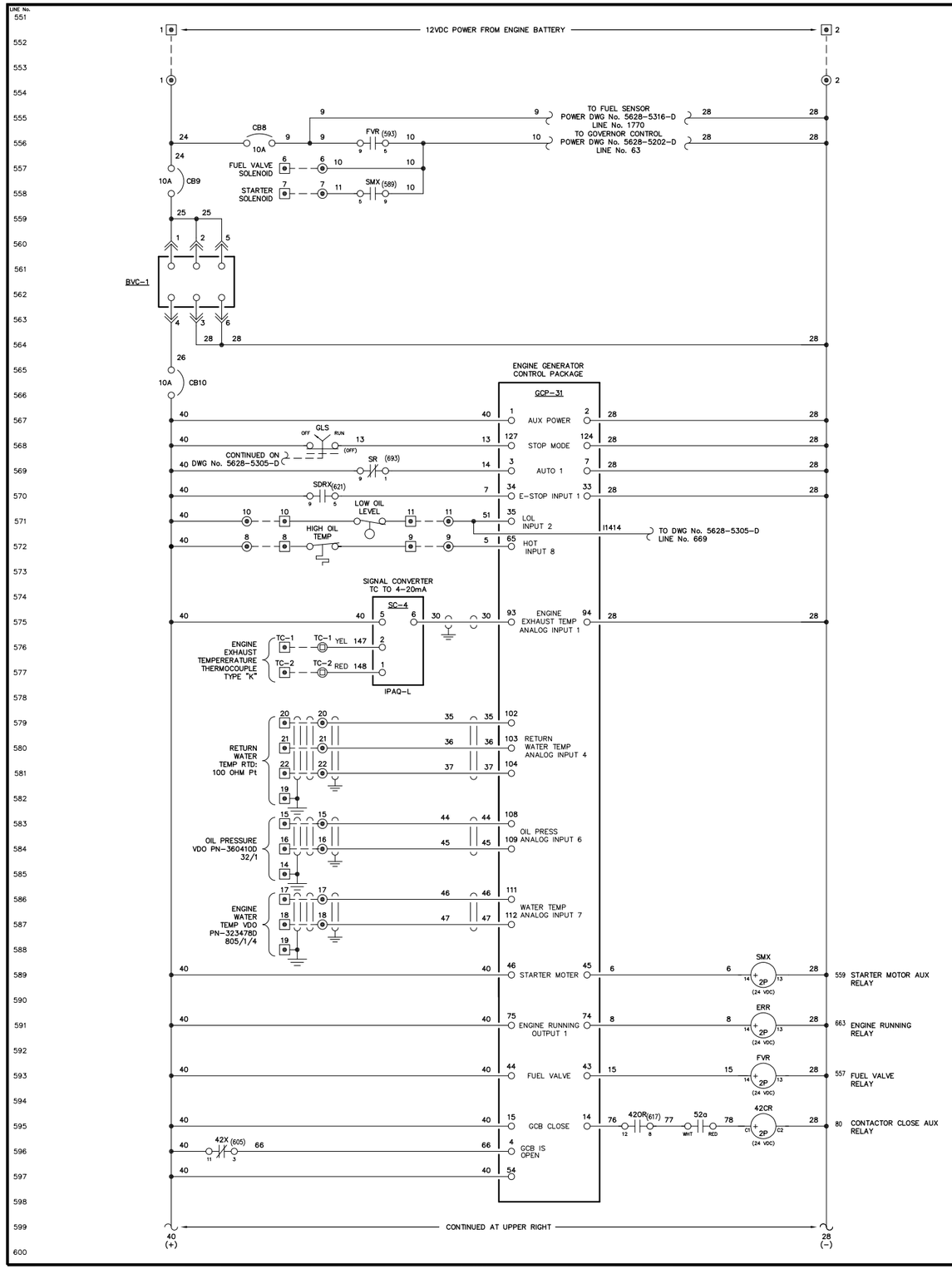
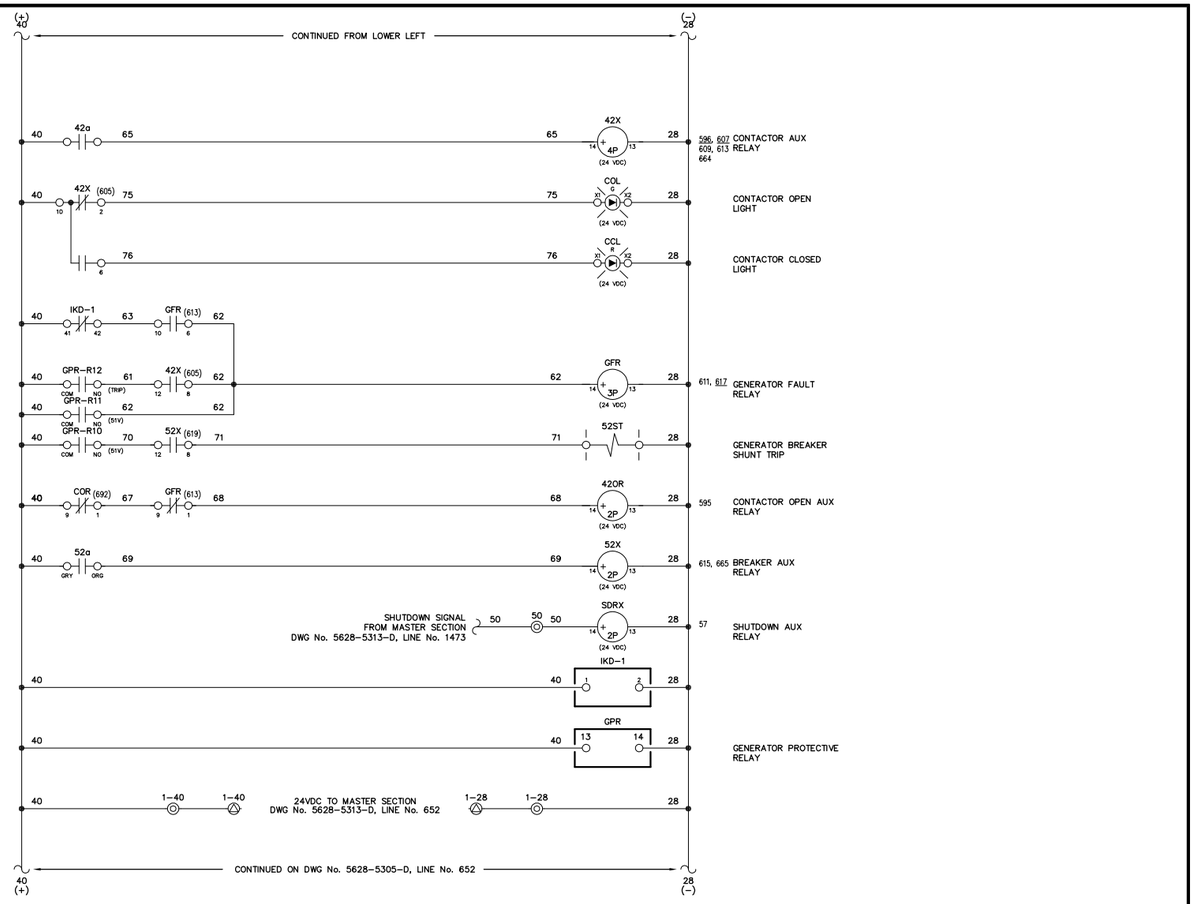
Plot date: 2005/12/9 – 14:18





NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5304-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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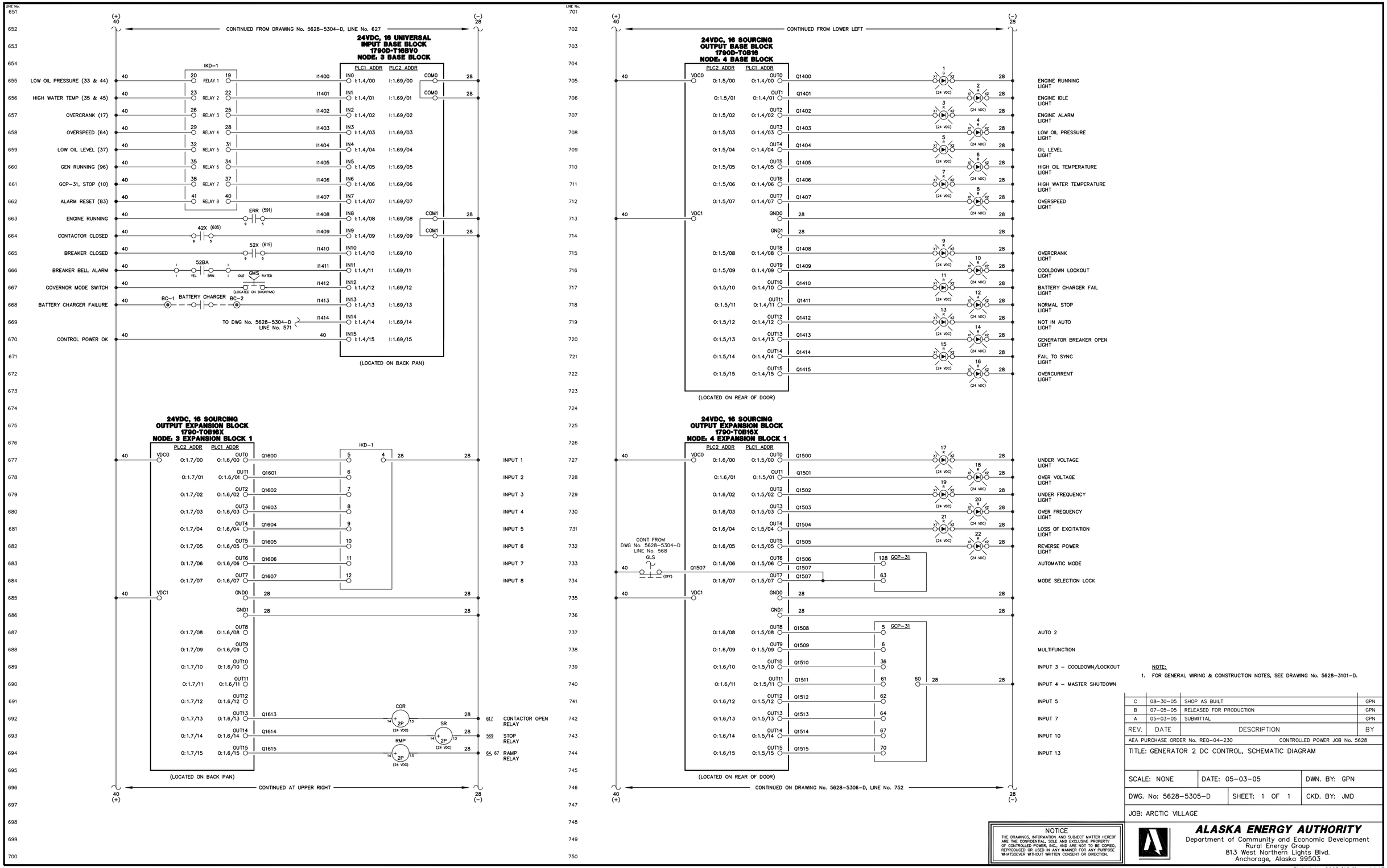
Plot date: 2005/12/9 – 14:18



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5305-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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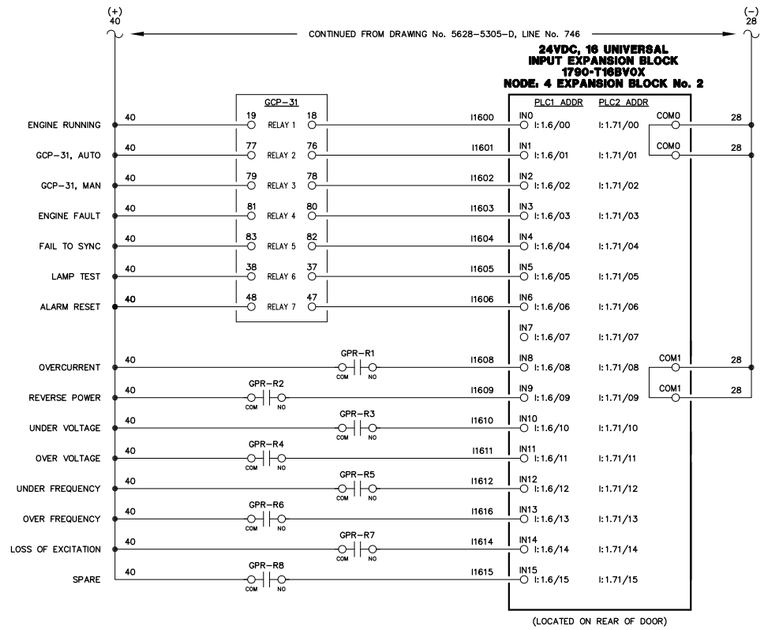
Plot date: 2005/12/9 – 14:17



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5306-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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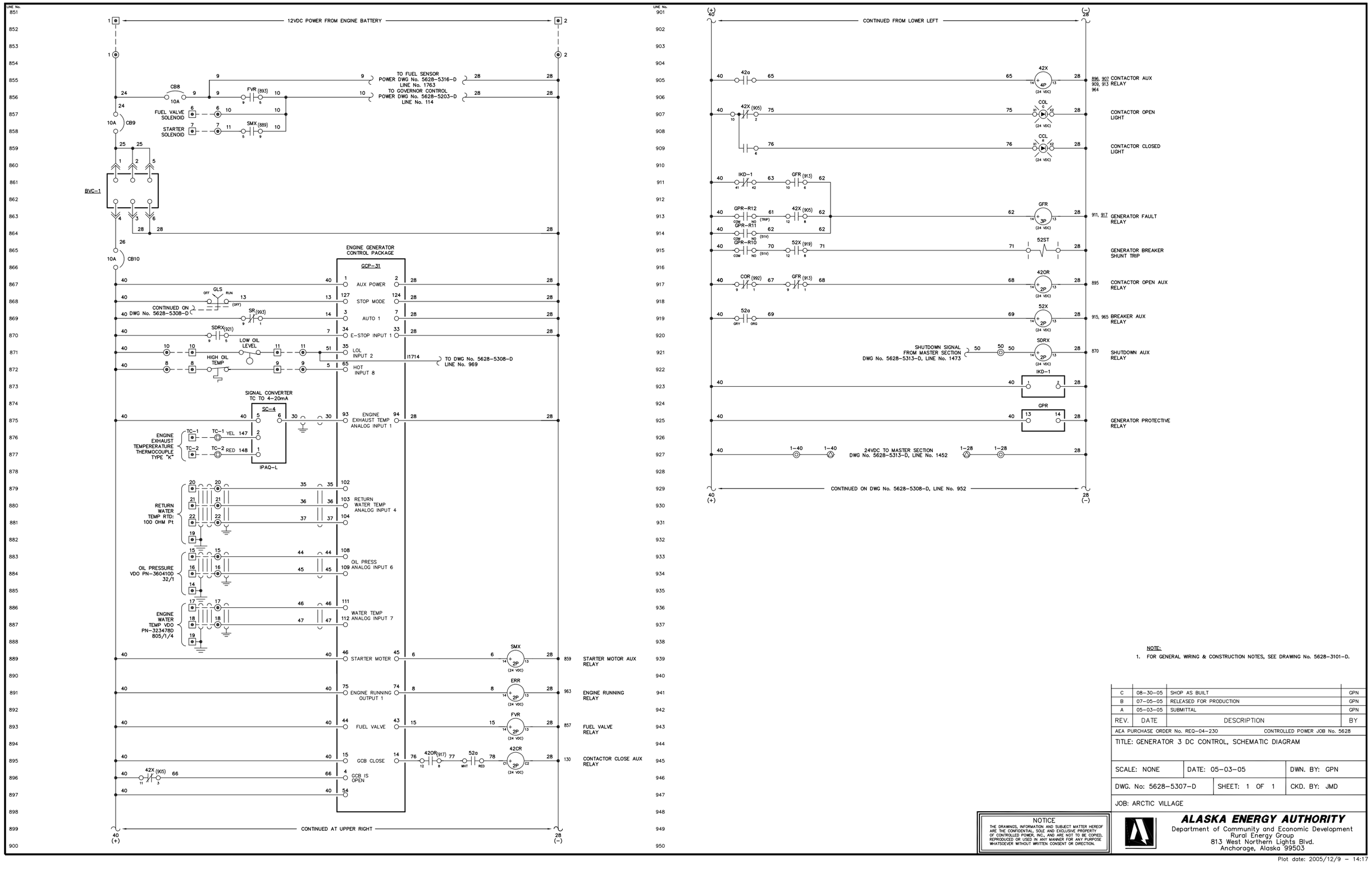
Plot date: 2005/12/9 – 14:17



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5307-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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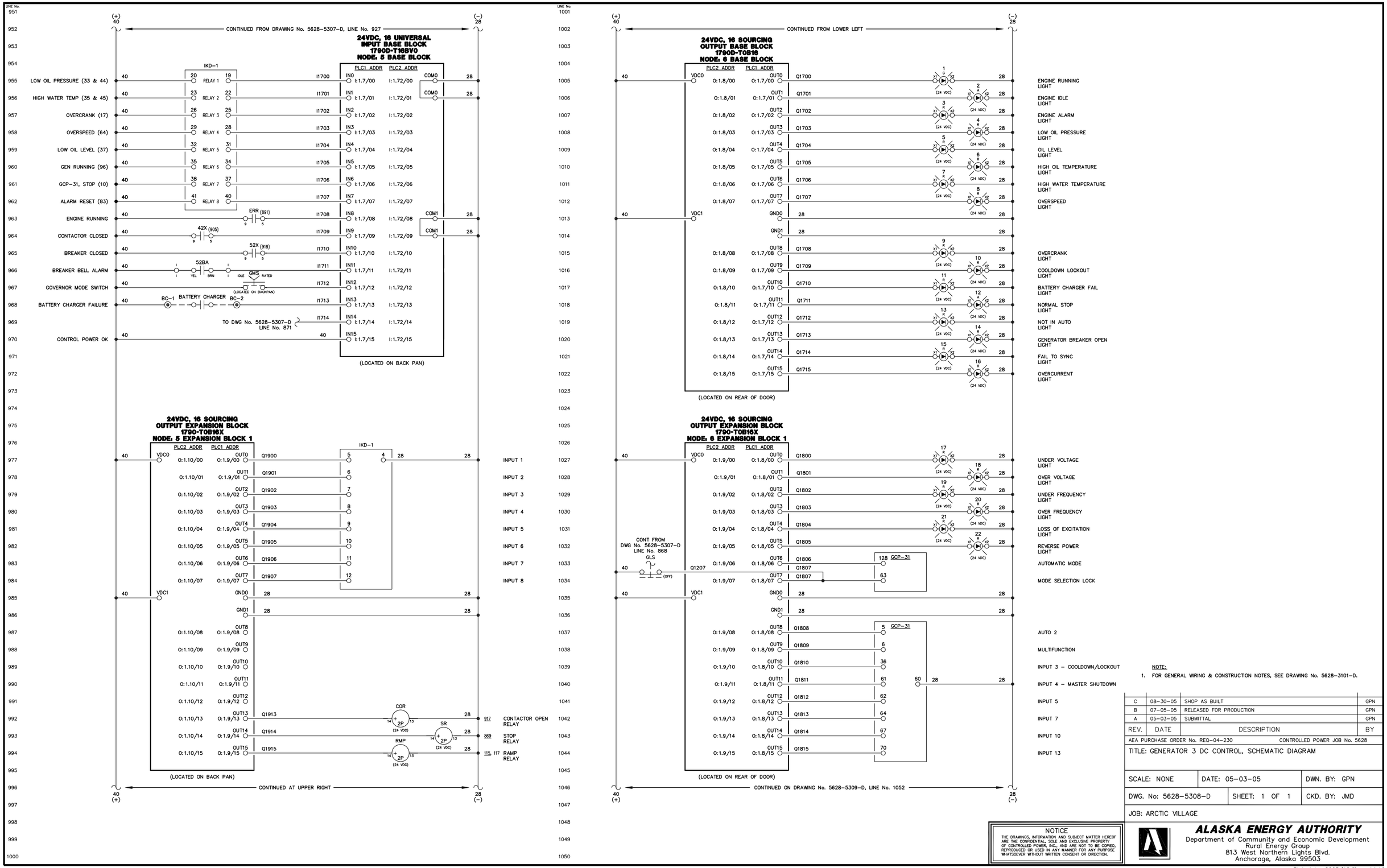
Plot date: 2005/12/9 – 14:17



NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5308-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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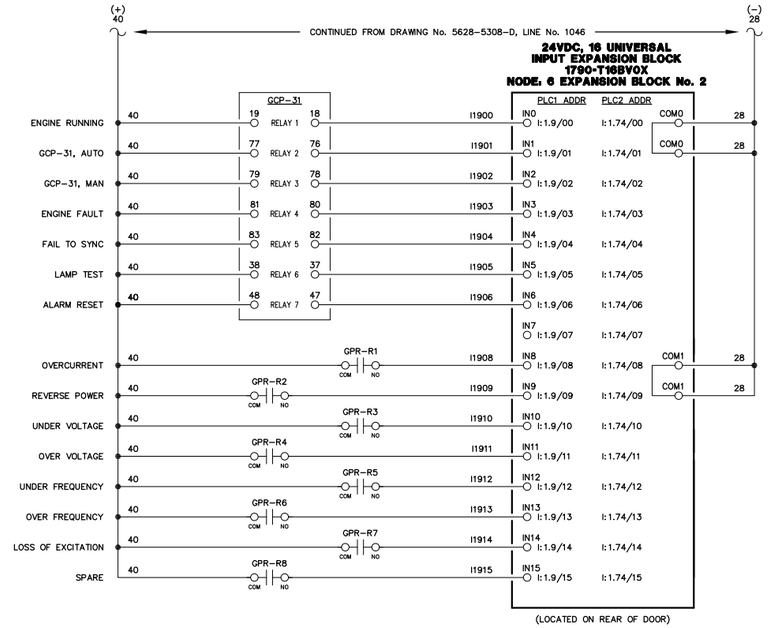
Plot date: 2005/12/9 – 14:16



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5309-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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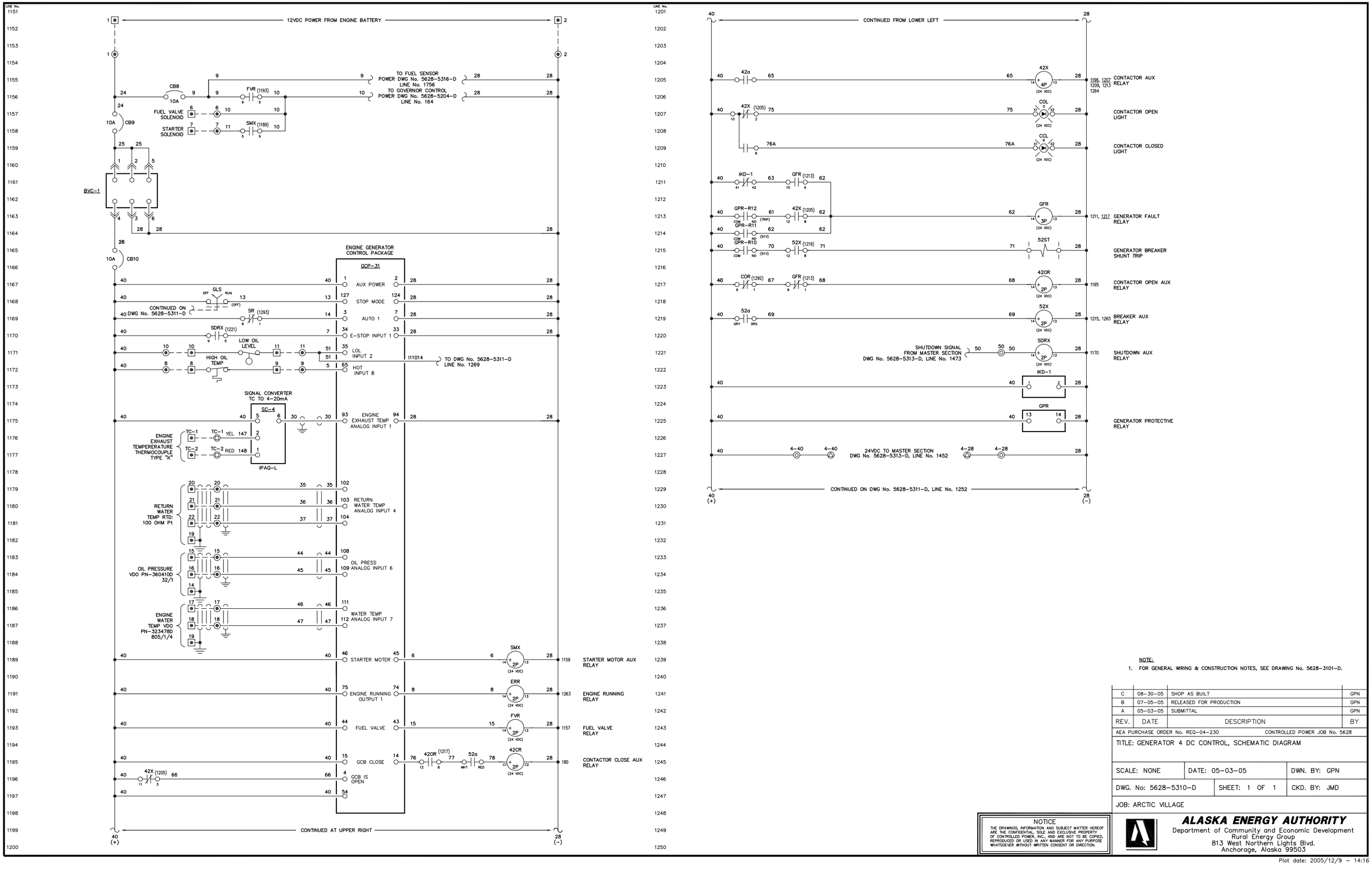
Plot date: 2005/12/9 – 14:16



NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5310-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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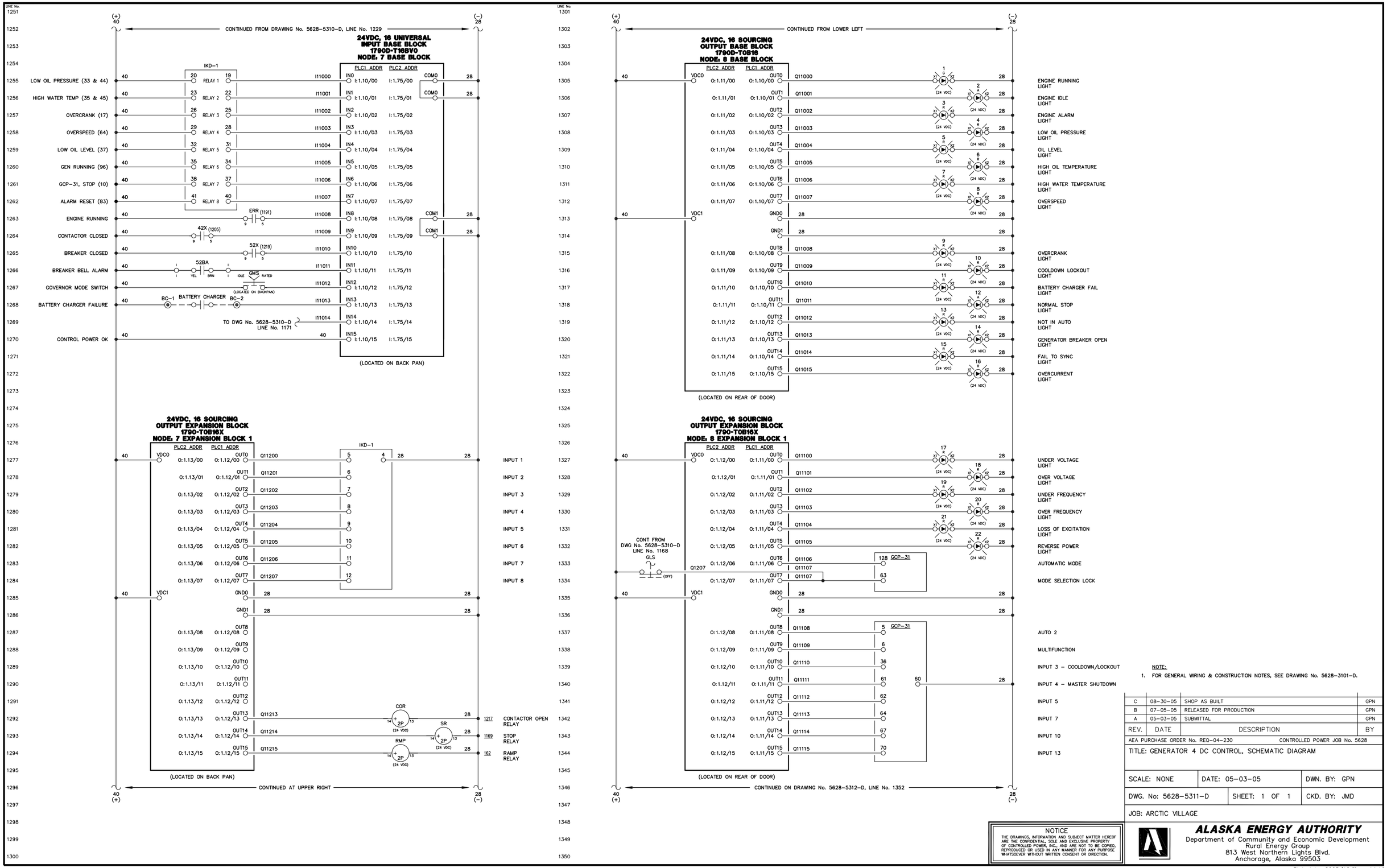
Plot date: 2005/12/9 – 14:16



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5311-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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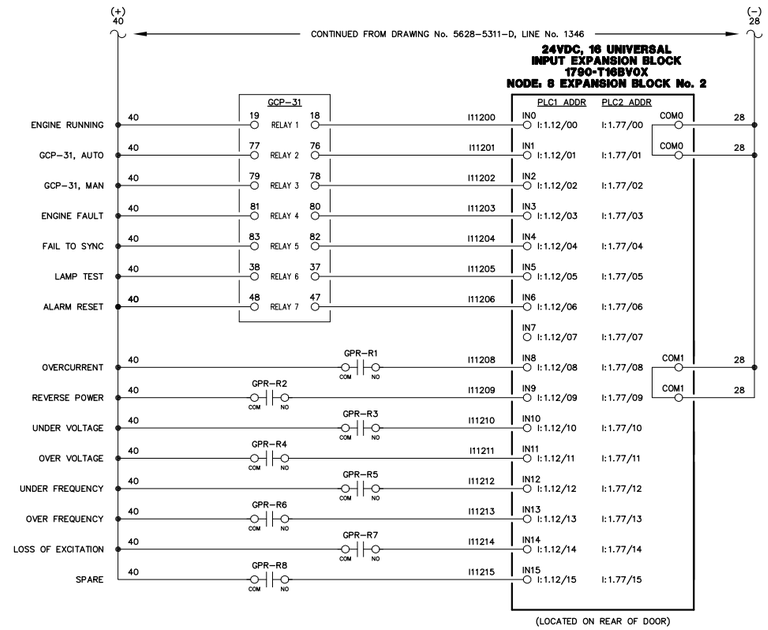
Plot date: 2005/12/9 – 14:16



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5312-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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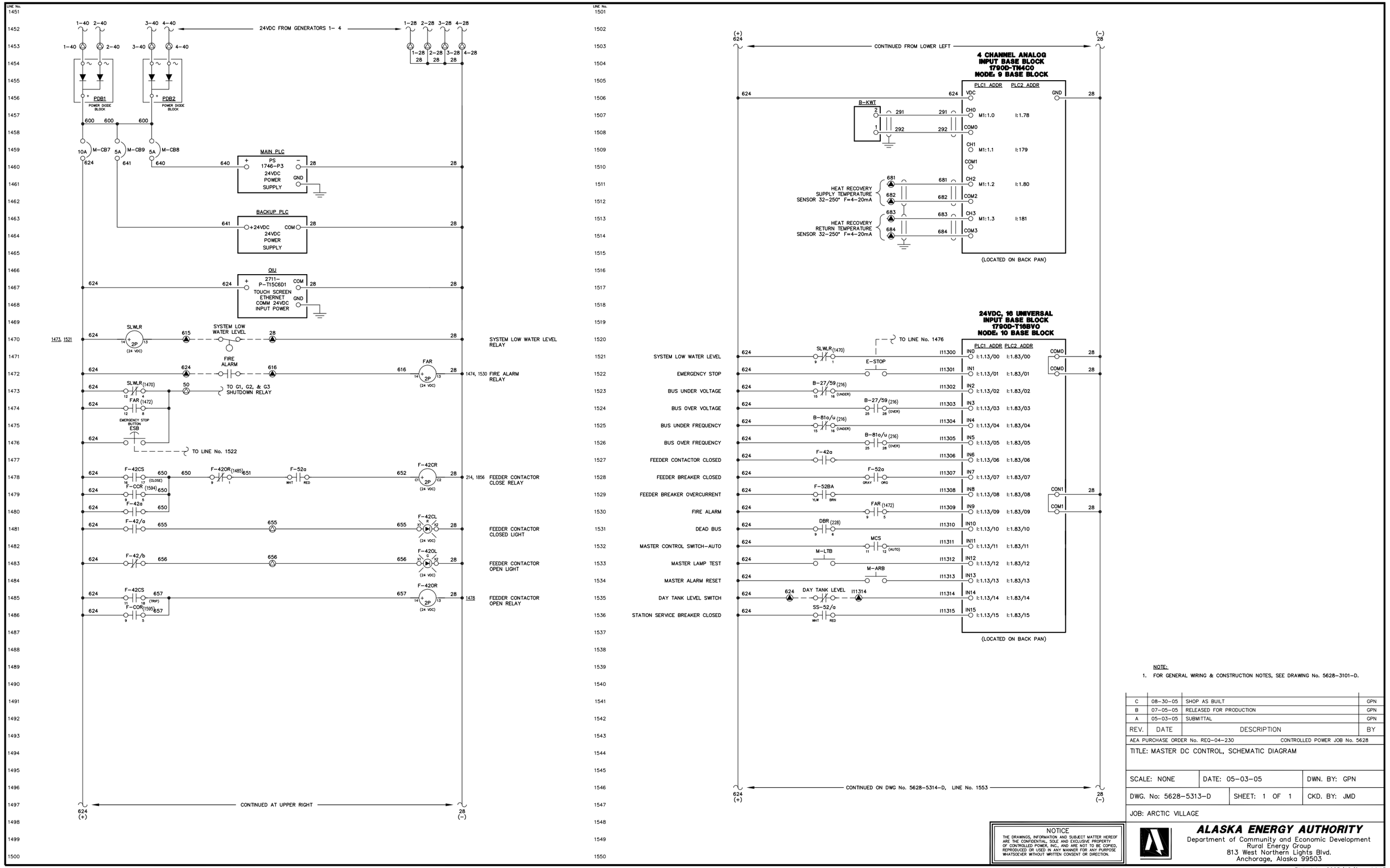
Plot date: 2005/12/9 - 14:15



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: MASTER DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5313-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: ARCTIC VILLAGE

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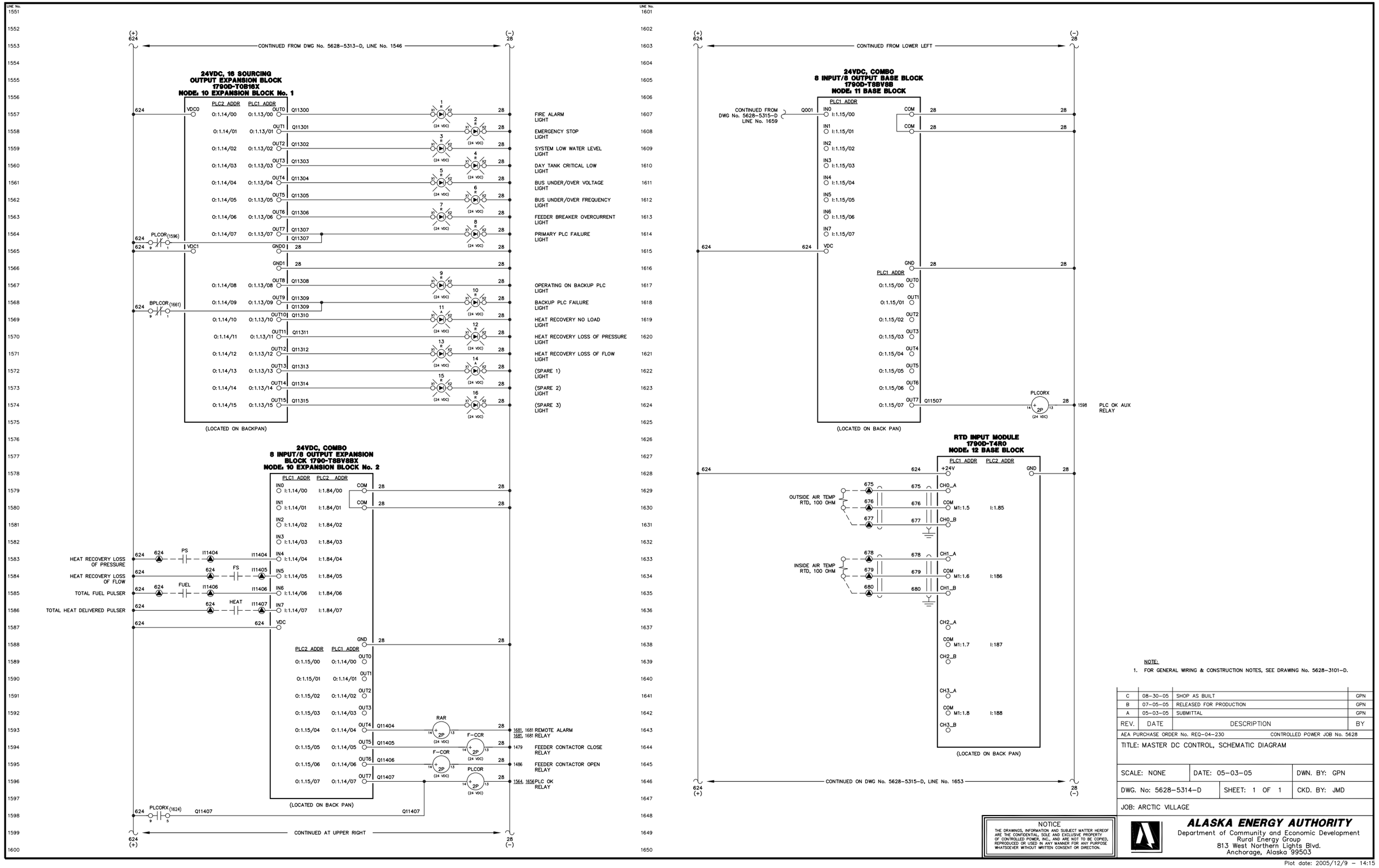
Plot date: 2005/12/9 - 14:15



NOTE:
1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: MASTER DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5314-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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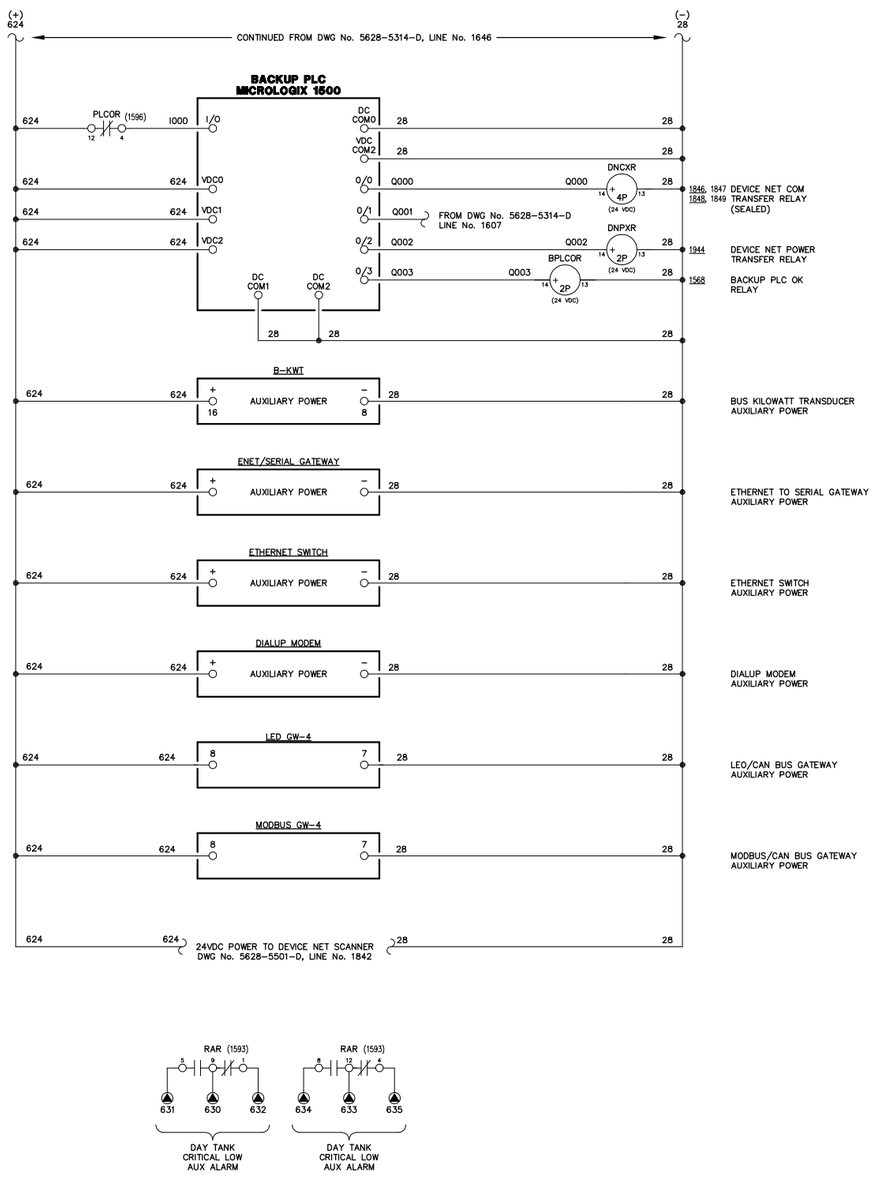
Plot date: 2005/12/9 – 14:15



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: MASTER DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5315-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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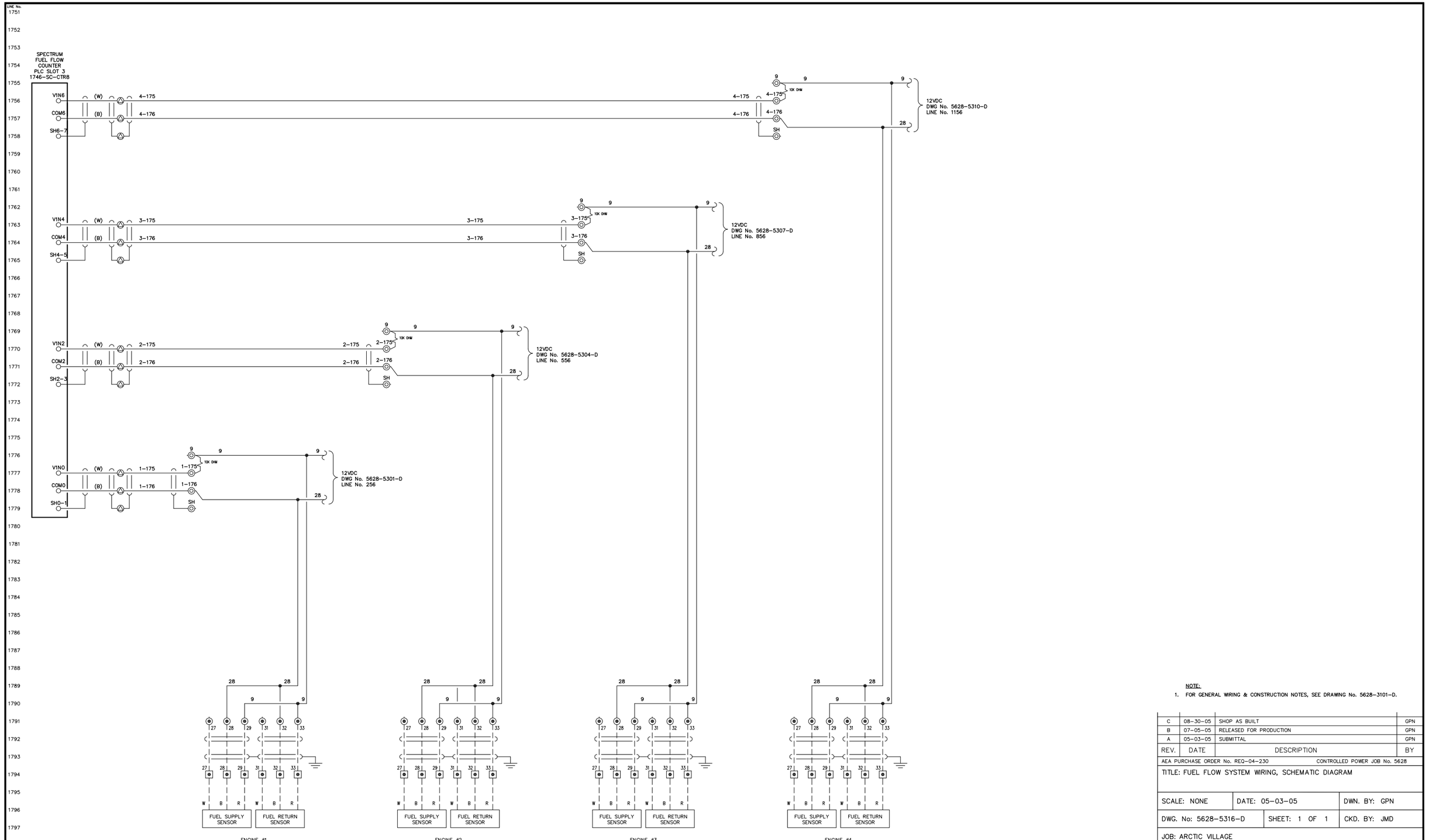
Plot date: 2005/12/9 – 14:14



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: FUEL FLOW SYSTEM WIRING, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5316-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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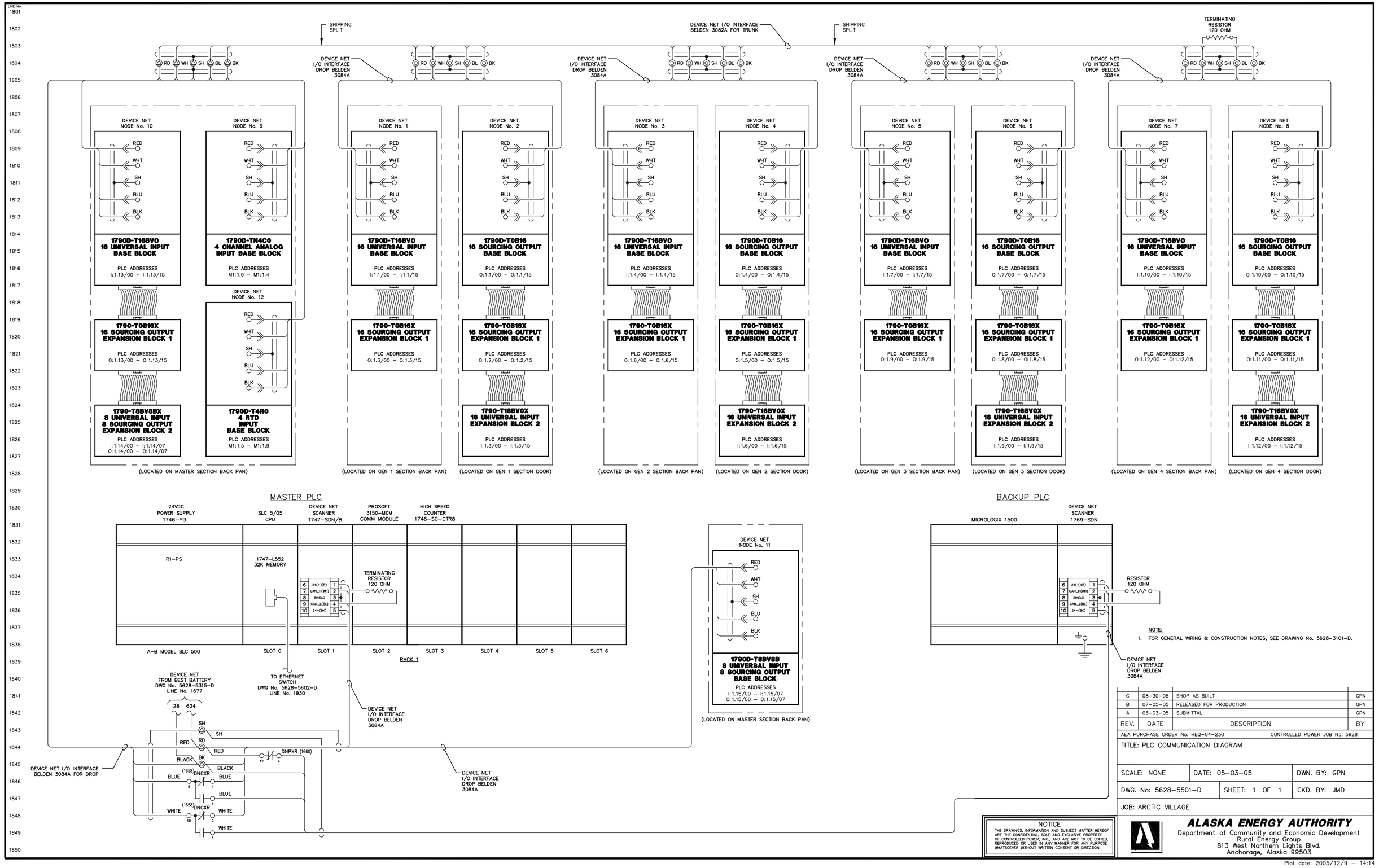
Plot date: 2005/12/9 - 14:14



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628–3101–D.

REV.	DATE	DESCRIPTION	BY
C	08–30–05	SHOP AS BUILT	GPN
B	07–05–05	RELEASED FOR PRODUCTION	GPN
A	05–03–05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ–04–230 CONTROLLED POWER JOB No. 5628

TITLE: PLC COMMUNICATION DIAGRAM

SCALE: NONE	DATE: 05–03–05	DWN. BY: GPN
DWG. No: 5628–5501–D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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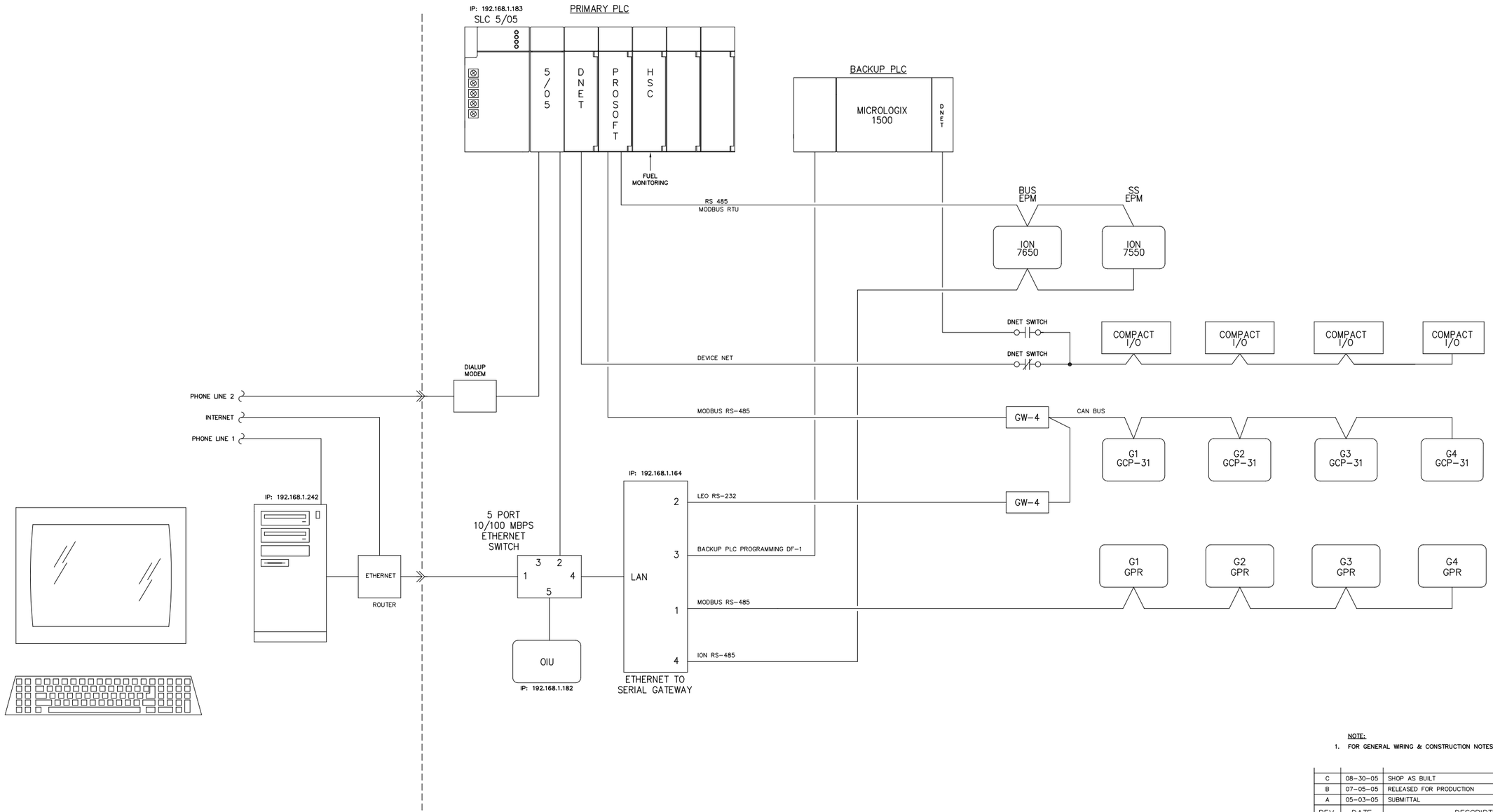
Plot date: 2005/12/9 – 14:14



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: COMMUNICATION NETWORK DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5601-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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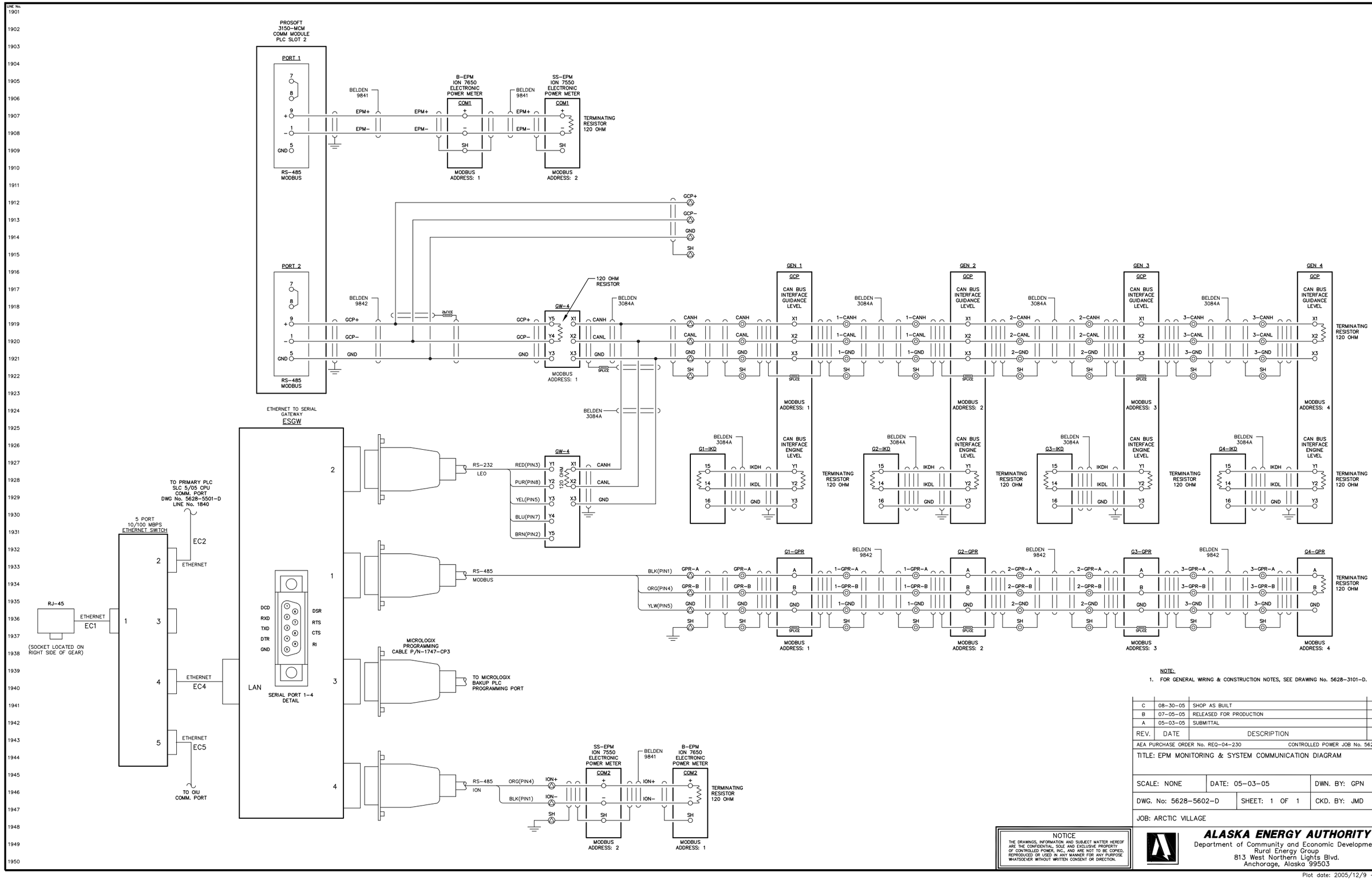
Plot date: 2005/12/9 - 14:13



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 CONTROLLED POWER JOB No. 5628

TITLE: EPM MONITORING & SYSTEM COMMUNICATION DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-5602-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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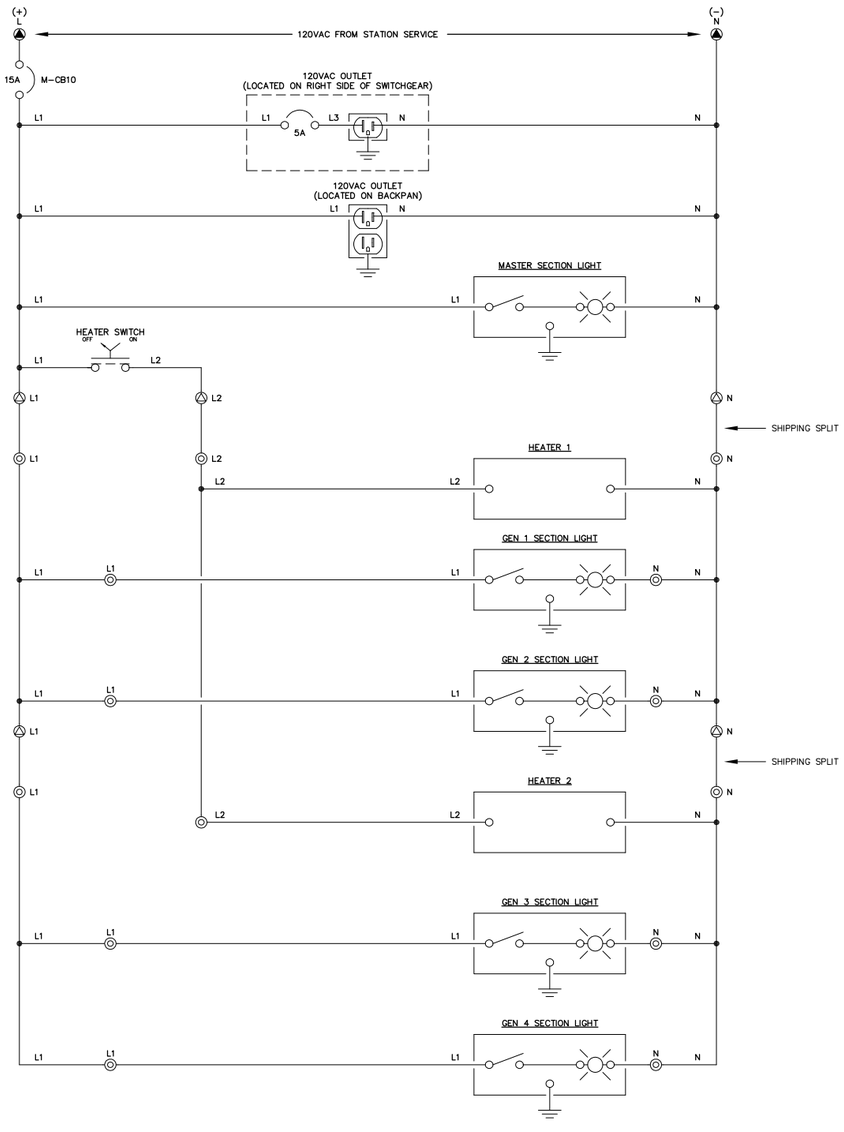
Plot date: 2005/12/9 – 14:12



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628–3101–D.

REV.	DATE	DESCRIPTION	BY
C	08–30–05	SHOP AS BUILT	GPN
B	07–05–05	RELEASED FOR PRODUCTION	GPN
A	05–03–05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ–04–230 CONTROLLED POWER JOB No. 5628

TITLE: HEATER & LIGHTING CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 05–03–05	DWN. BY: GPN
DWG. No: 5628–5701–D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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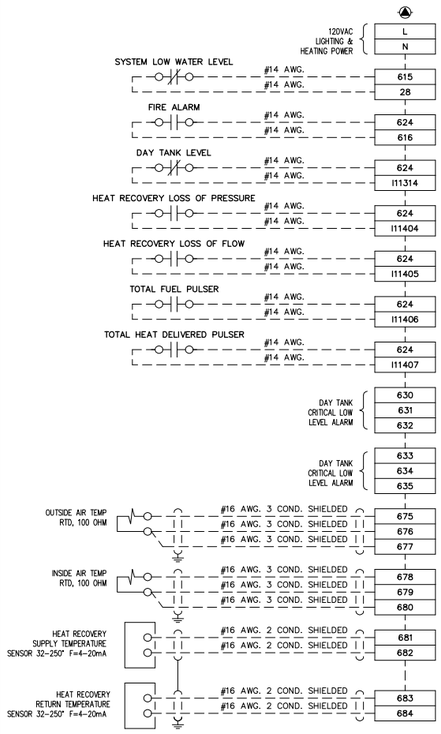
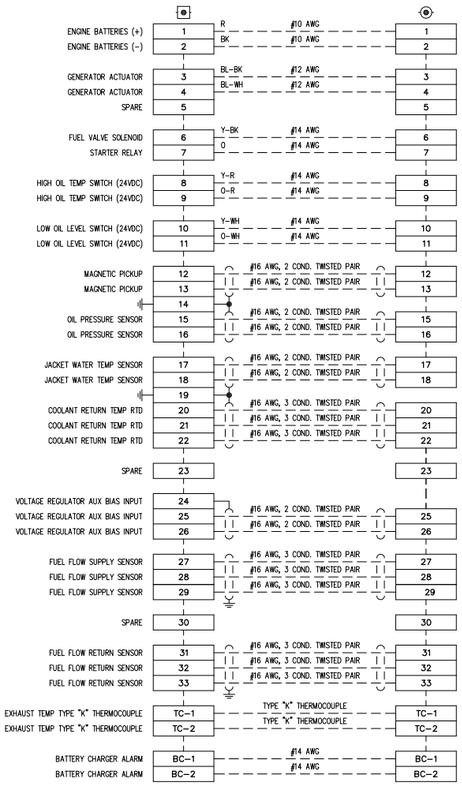
Plot date: 2005/12/9 – 14:12

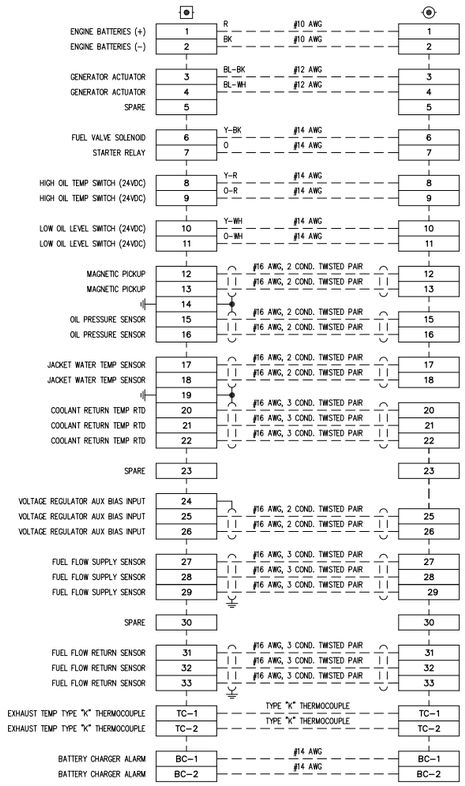
MASTER CONTROL



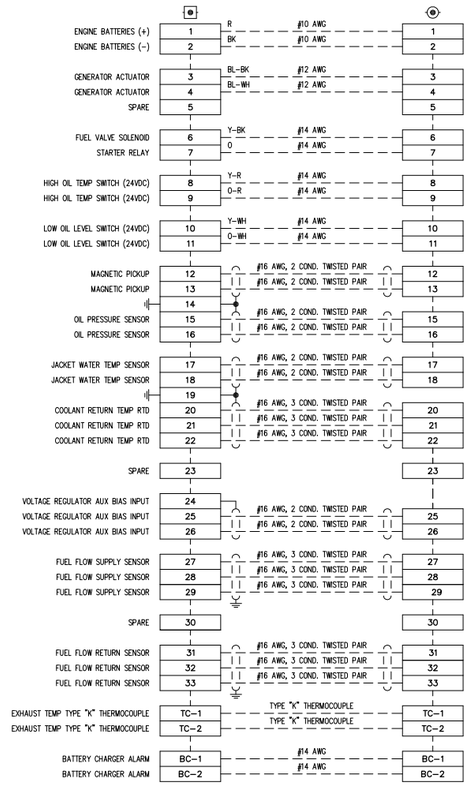
GENERATOR 1



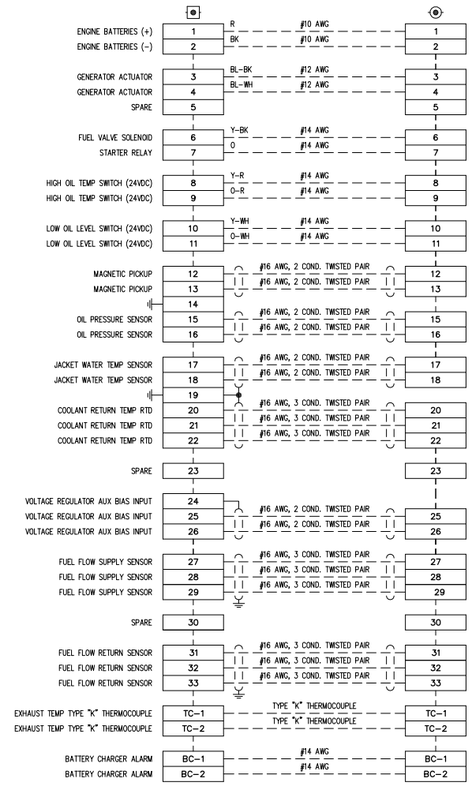
GENERATOR 2



GENERATOR 3



GENERATOR 4



NOTE:

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 5628-3101-D.

REV.	DATE	DESCRIPTION	BY
C	08-30-05	SHOP AS BUILT	GPN
B	07-05-05	RELEASED FOR PRODUCTION	GPN
A	05-03-05	SUBMITTAL	GPN

AEA PURCHASE ORDER No. REQ-04-230 — CONTROLLED POWER JOB No. 5628

TITLE: INTERCONNECTION DIAGRAM

SCALE: NONE	DATE: 05-03-05	DWN. BY: GPN
DWG. No: 5628-7101-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: ARCTIC VILLAGE		

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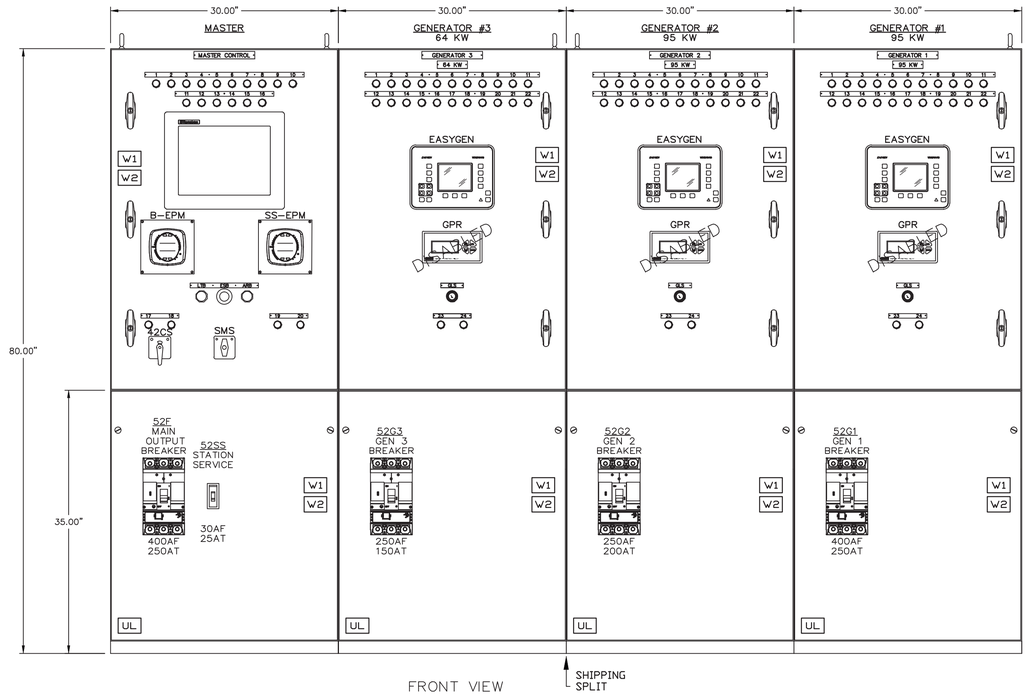
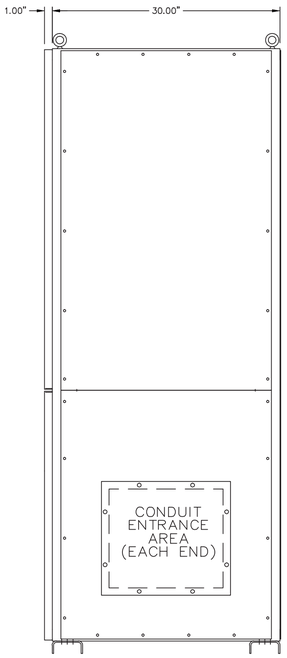
Plot date: 2005/12/9 - 14:22



FRONT VIEW



SIDE VIEW

DEVICE LEGEND

ARB	ALARM RESET BUTTON
B-EPM	BUS ELECTRONIC POWER METER - SHARK
ESB	EMERGENCY STOP BUTTON
EZGEN	GENERATOR CONTROL PACKAGE
GLS	GENERATOR LOCKOUT SWITCH
GPR	GENERATOR PROTECTIVE RELAY (DISABLED)
OIU	OPERATOR INTERFACE UNIT
LTB	LAMP TEST BUTTON
SMS	MASTER CONTROL SWITCH (AUTO-MANUAL)
SS-EPM	STATION SERVICE POWER METER - SHARK
42xx	CONTACTOR
42CS	CONTACTOR CONTROL SWITCH
52xx	CIRCUIT BREAKER

GENERATOR ANNUNCIATOR LEGEND:

1	ENGINE RUN	13	NOT IN AUTO POSITION
2	ENGINE IDLE	14	GENERATOR BREAKER OPEN
3	ENGINE ALARM	15	FAIL TO SYNCHRONIZE
4	LOW OIL PRESSURE	16	OVERCURRENT
5	LOW OIL LEVEL	17	UNDER VOLTAGE
6	HIGH OIL TEMPERATURE	18	OVER VOLTAGE
7	HIGH WATER TEMPERATURE	19	UNDER FREQUENCY
8	OVERSPEED	20	OVER FREQUENCY
9	OVERCRANK	21	LOSS OF EXCITATION
10	COOLDOWN/LOCKOUT	22	REVERSE POWER
11	BATTERY CHARGER FAILURE	23	CONTACTOR OPEN
12	NORMAL STOP	24	CONTACTOR CLOSED

MASTER ANNUNCIATOR LEGEND:

1	FIRE ALARM LIGHT	11	HEAT RECOVERY NO LOAD
2	EMERGENCY STOP LIGHT	12	HEAT RECOVERY LOSS OF PRESSURE
3	SYSTEM LOW WATER LEVEL LIGHT	13	HEAT RECOVERY LOSS OF FLOW
4	LOW FUEL LEVEL LIGHT	14	SPARE 1
5	BUS UNDER/OVER VOLTAGE LIGHT	15	SPARE 2
6	BUS UNDER/OVER FREQUENCY LIGHT	16	SPARE 3
7	FEEDER BREAKER OVERCURRENT LIGHT	17	FEEDER BREAKER OPEN
8	PRIMARY PLC FAILURE	18	FEEDER BREAKER CLOSED
9	OPERATING ON BACKUP PLC	19	STATION SERVICE BREAKER OPEN
10	BACKUP PLC FAILURE	20	STATION SERVICE BREAKER CLOSED

DRAWING LEGEND

1	PHYSICAL LAYOUT
2	SINGLE LINE DIAGRAM
3	BLANK
4A	GENERATOR 1 AC SCHEMATIC
4B	GENERATOR 2 AC SCHEMATIC
4C	GENERATOR 3 AC SCHEMATIC
4D	GENERATOR 4 AC SCHEMATIC
5	MASTER AC & DISTRIBUTION SCHEMATIC
6A	GENERATOR 1 DC CONTROL SCHEMATIC
6B	GENERATOR 2 DC CONTROL SCHEMATIC
6C	GENERATOR 3 DC CONTROL SCHEMATIC
6D	GENERATOR 4 DC CONTROL SCHEMATIC
7A	GENERATOR 1 DC CONTROL SCHEMATIC
7B	GENERATOR 2 DC CONTROL SCHEMATIC
7C	GENERATOR 3 DC CONTROL SCHEMATIC
7D	GENERATOR 4 DC CONTROL SCHEMATIC
8A	GENERATOR 1 DC CONTROL SCHEMATIC
8B	GENERATOR 2 DC CONTROL SCHEMATIC
8C	GENERATOR 3 DC CONTROL SCHEMATIC
8D	GENERATOR 4 DC CONTROL SCHEMATIC

DRAWING LEGEND

9	MASTER DC CONTROL SCHEMATIC
10	MASTER DC CONTROL SCHEMATIC
11	MASTER DC CONTROL SCHEMATIC
12	BLANK
13	BLANK
14	PLC COMMUNICATION DIAGRAM
15	COMMUNICATION NETWORK DIAGRAM
16	EPM MONITORING & SYSTEM COMMUNICATION DIAGRAM
17	HEATER & LIGHTING CONTROL SCHEMATIC
18	CONTROL SWITCH TARGET DIAGRAM
19	NAMEPLATE DETAILS
20	INTERCONNECTION DIAGRAM

NOTES

1	WIRE MARKERS: HEATSHRINK TYPE c/w INDELIBLE INK MARKINGS
2	WIRE TYPE: ALL CONNECTIONS TO BUS AND BREAKERS TO BE #14AWG SIS. WIRING THAT IS TO BE PROVIDED AS PART OF OR IS AN INTEGRAL PART OF SUPERVISORY CONTROL EQUIPMENT SHALL BE #18-14AWG SIS. CT WIRING TO BE #10AWG SIS MIN.
3	WIRING COLOR CODED: NO WIRE NUMBERS TO MATCH TERMINAL NUMBERS UNLESS NOTED
4	LOAD BUS TO BE 1000A 3PH 4W SILVER PLATED COPPER BRACED AT 35KA.
5	ENCLOSURE TYPE NEMA 1 BUILT TO UL891.
6	PAINT ASA #61 GREY EXTERIOR, WHITE MOUNTING PAN
7	ENCLOSURE SUPPLIED IN THREE PIECES
8	FULL LENGTH COPPER GROUND BUS 0.25" X 2.5" C/W (6) #6-250MCM GROUND LUGS
9	POWER CABLES: UTILITY FROM BOTTOM; GEN & LOAD TOP. FRONT AND REAR ACCESS REQUIRED.
10	LAMICOIDS WHITE C/W BLACK LETTERS, MECHANICALLY ATTACHED
11	CABLE LUG SIZES: GEN 1, 2: (1) #8 - 600MCM Cu/AL PER PHASE GEN 3, 4: (1) #8 - 350MCM Cu/AL PER PHASE LOAD: (1) #8 - 600MCM Cu/AL PER PHASE SS: (1) #12 - 3/0 Cu/AL PER PHASE

EZGEN READOUT

* INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING LIST OF METERING, STATUS, AND ALARMS.

METERING LEGEND
1. VOLTS: AØ, BØ, CØ L-N, L-L
2. AMPS: AØ, BØ, CØ
3. KW
4. PF
5. KWH

ALARM LEGEND
1. LOW OIL PRESSURE ALARM
2. LOW OIL PRESSURE SHUTDOWN
3. HIGH WATER TEMPERATURE ALARM
4. HIGH WATER TEMPERATURE SHUTDOWN
5. OVERCRANK
6. OVERSPEED
7. LOW OIL LEVEL

ANALOG INPUT LEGEND
1. OIL PRESSURE (PSI)
2. WATER TEMP (°F)

MISC. LEGEND
1. ENGINE HOURS
2. ENGINE START COUNTER
3. MAINTENANCE CALL

CROOKED CREEK SWITCHGEAR UPGRADE, 25 SHEETS TOTAL.
NOTE THAT THESE DRAWINGS SHOW A PRIOR UPGRADE TO EXISTING SWITCHGEAR THAT IS SIMILAR TO THE UPGRADE OF THE ARCTIC VILLAGE SWITCHGEAR. THEY ARE PROVIDED FOR REFERENCE ONLY TO SHOW THE TYPE AND EXTENT OF MODIFICATIONS.

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR CONTROL PANEL ELEVATION VIEW, OUTLINE DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-4101-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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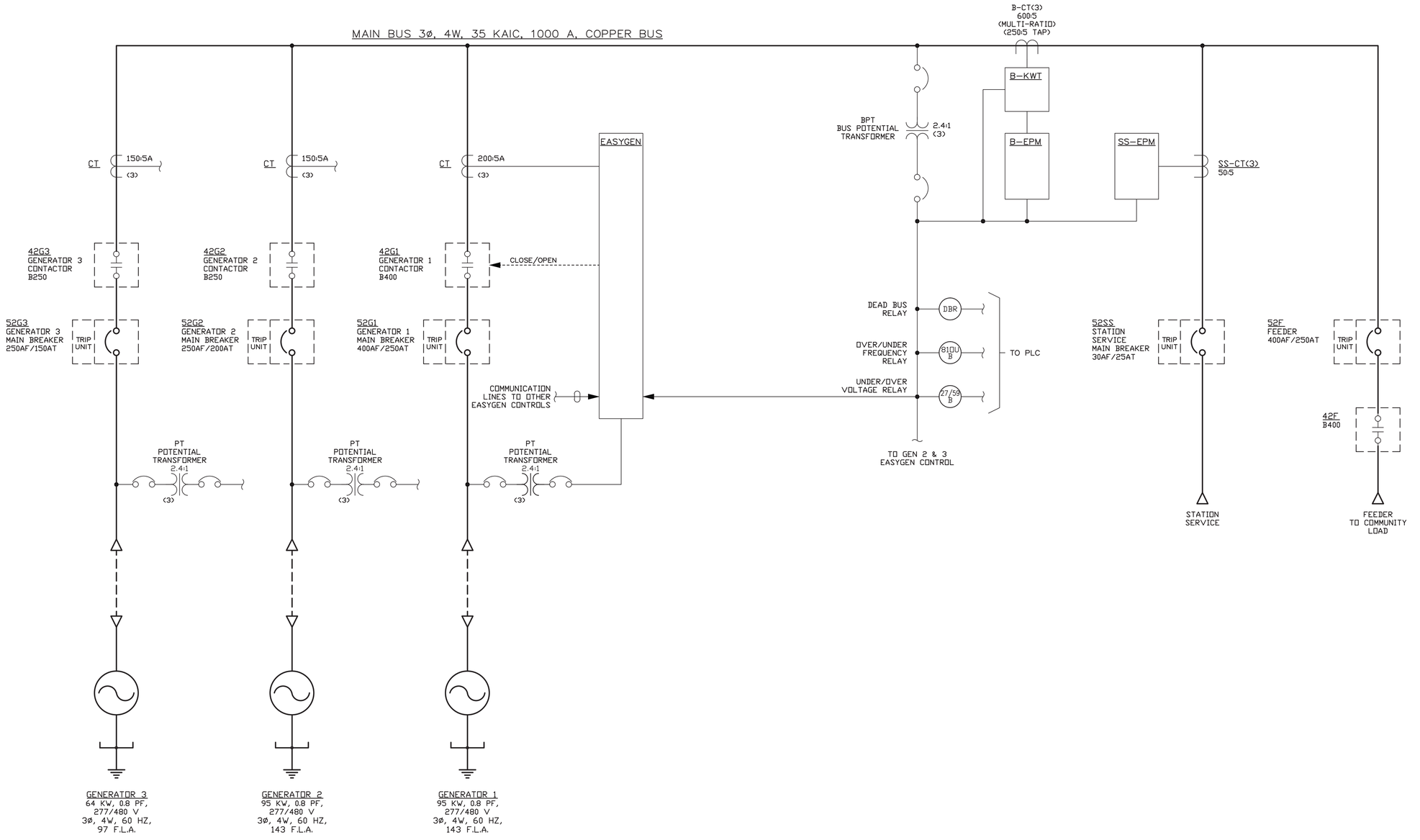

NOTE:
GENERATORS 2 & 3 SIMILAR TO GENERATOR 1.

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR SINGLE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5101-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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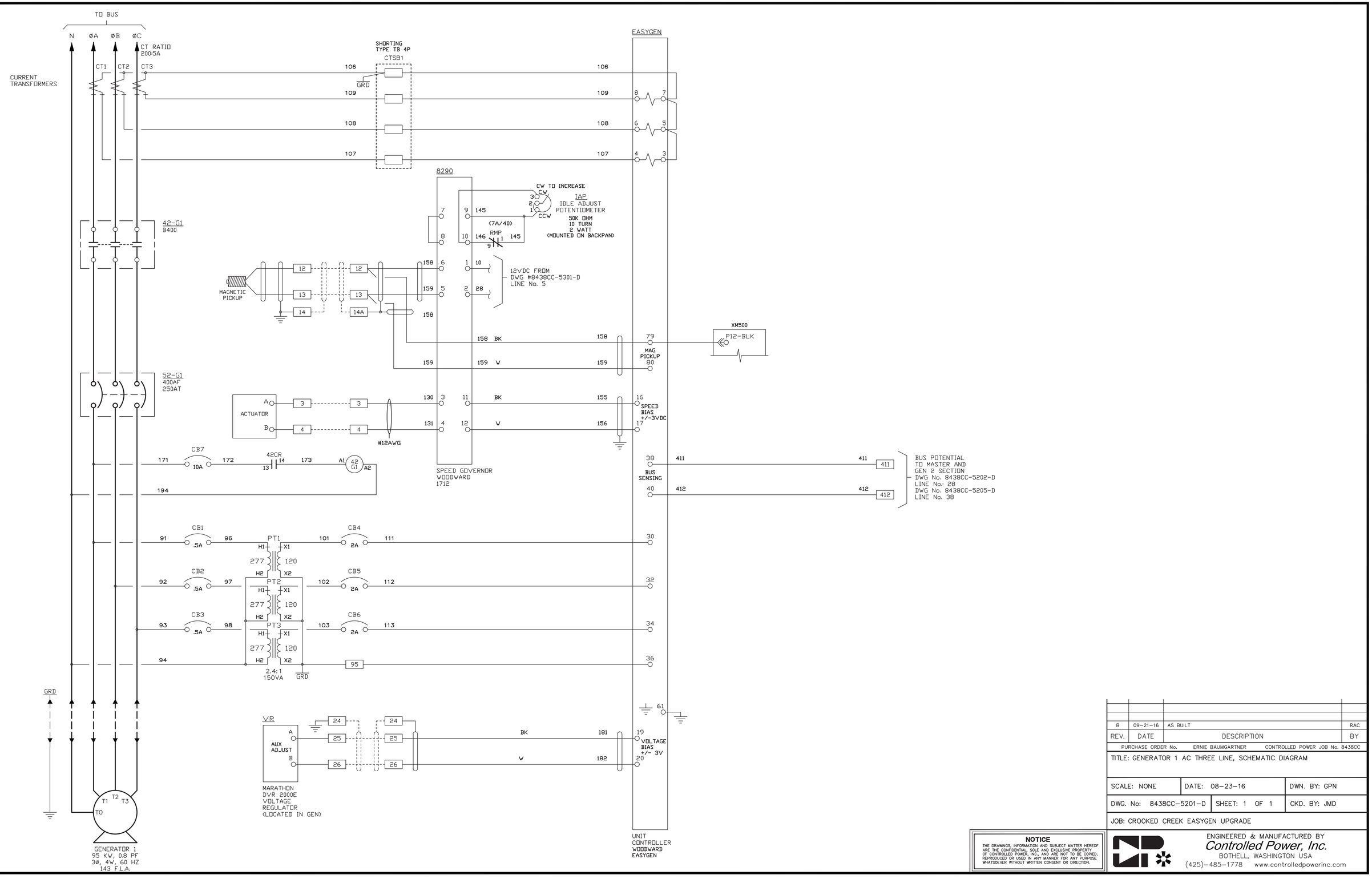

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 1 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5201-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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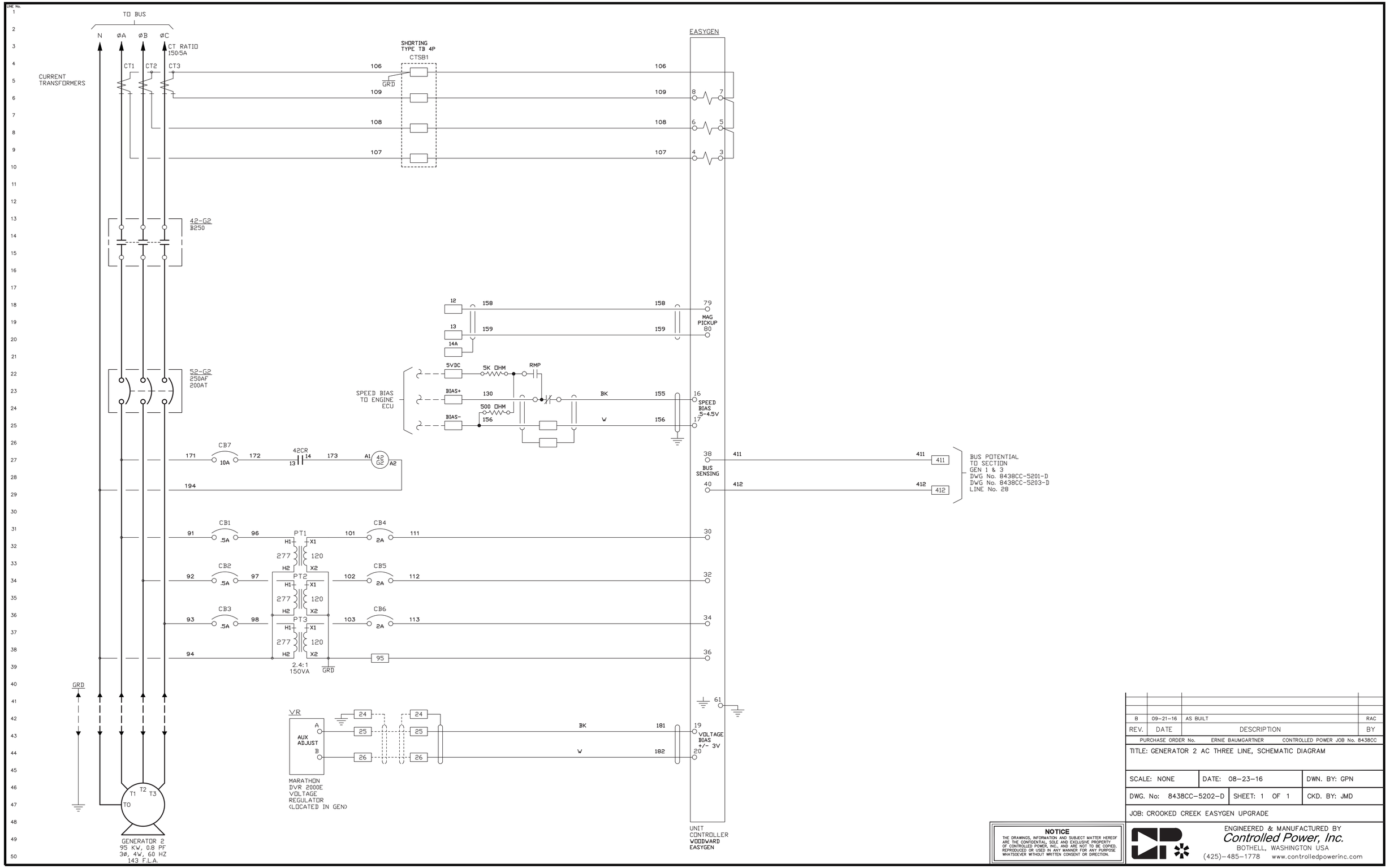

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 2 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5202-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: CROOKED CREEK EASYGEN UPGRADE		

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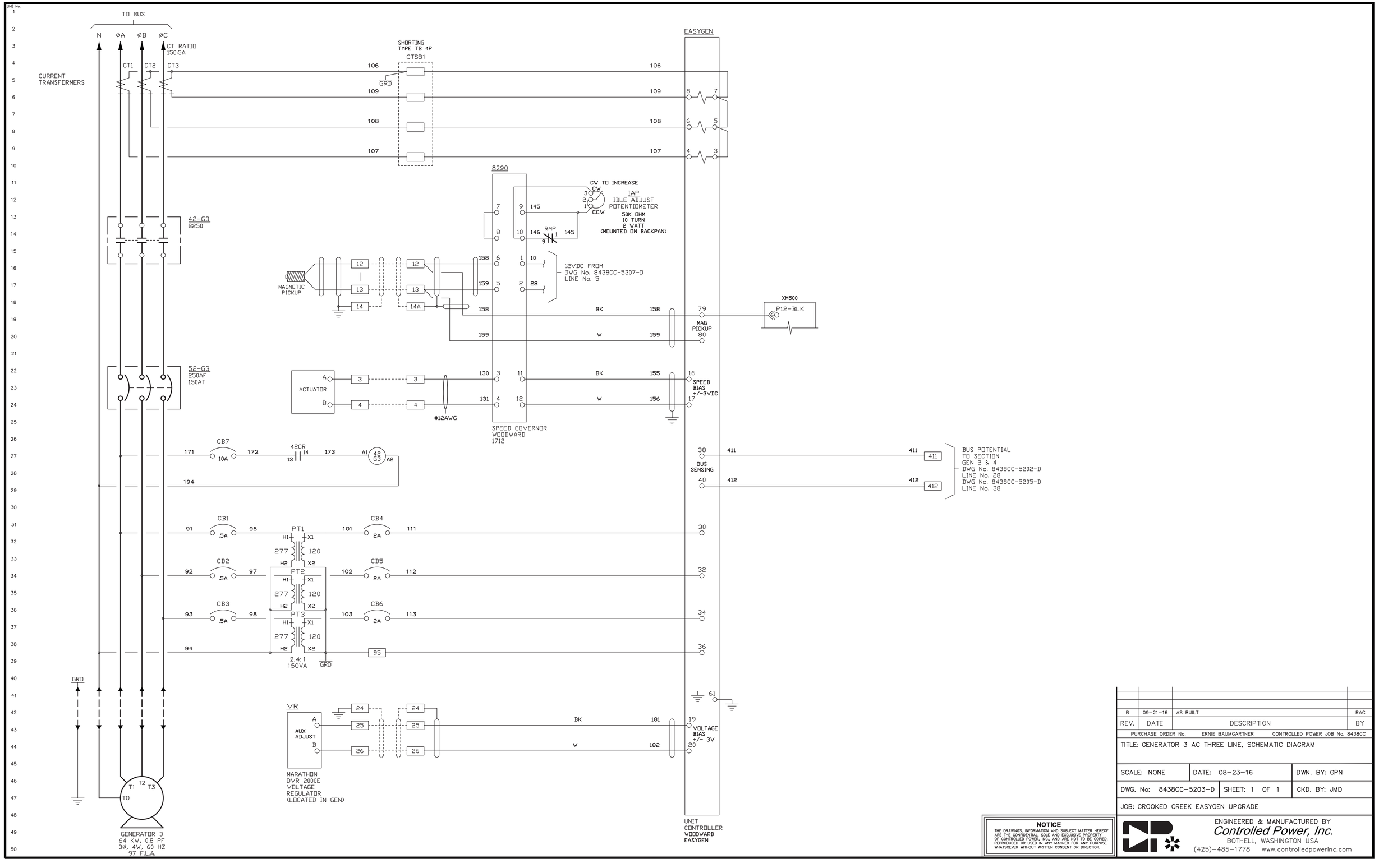

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 3 AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5203-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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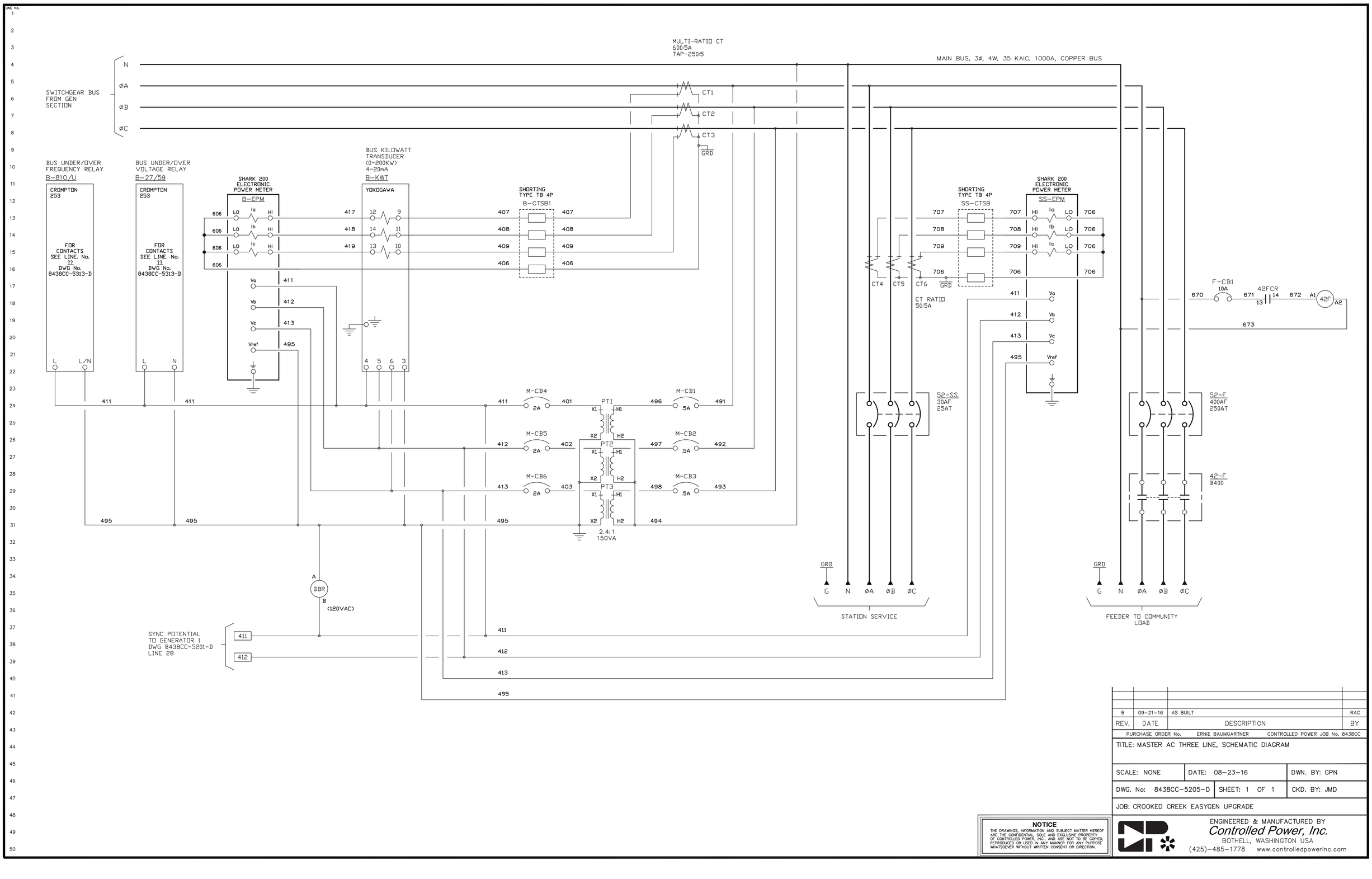

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: MASTER AC THREE LINE, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5205-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: CROOKED CREEK EASYGEN UPGRADE		

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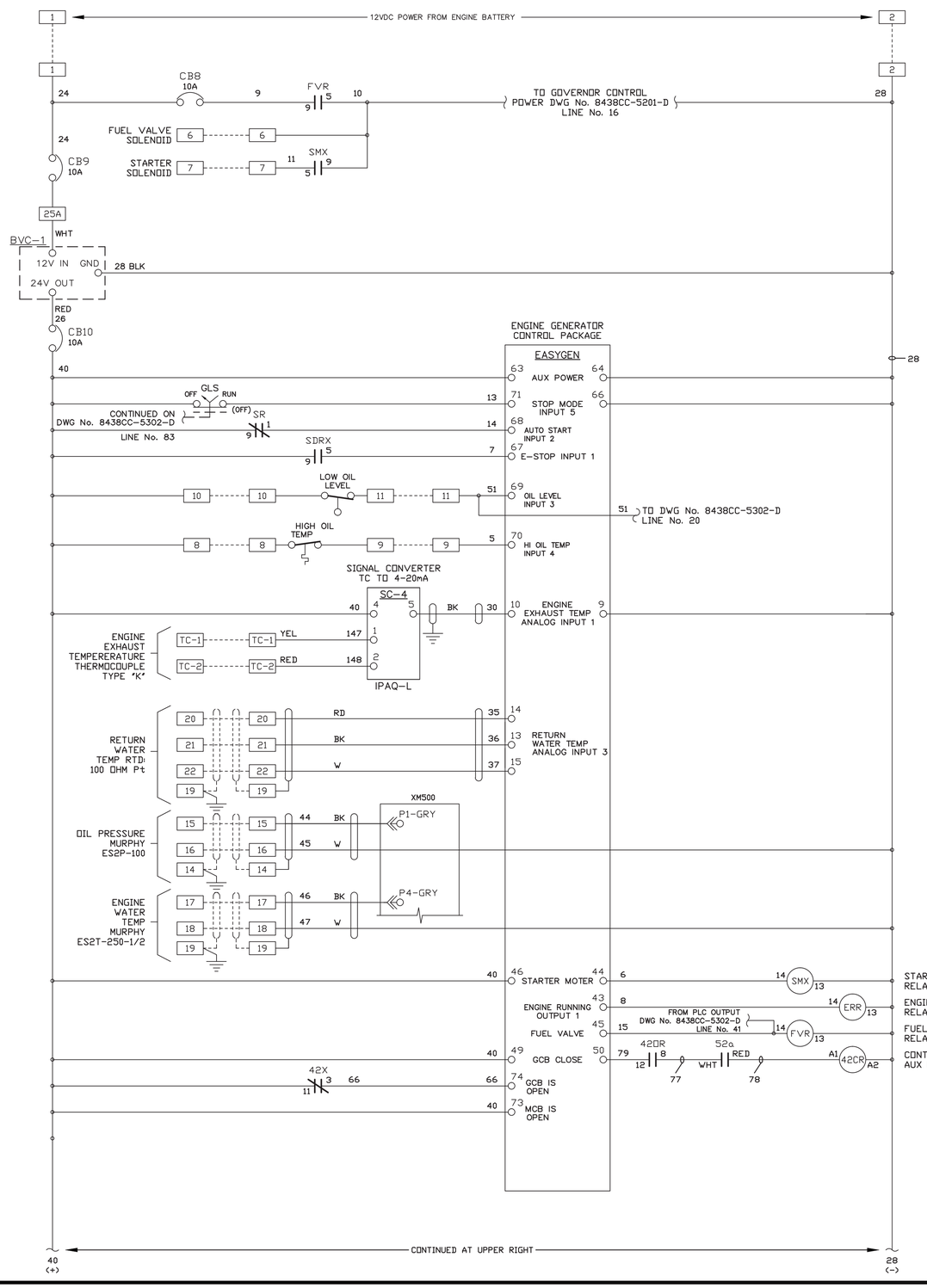

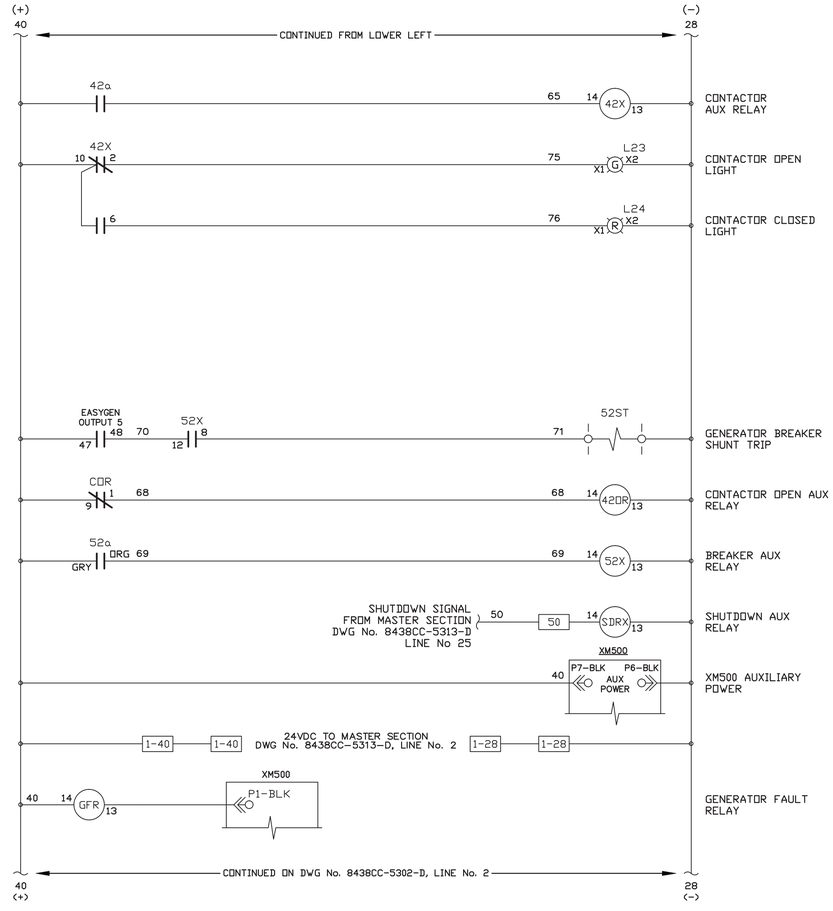

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. | ERNIE BAUMGARTNER | CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5301-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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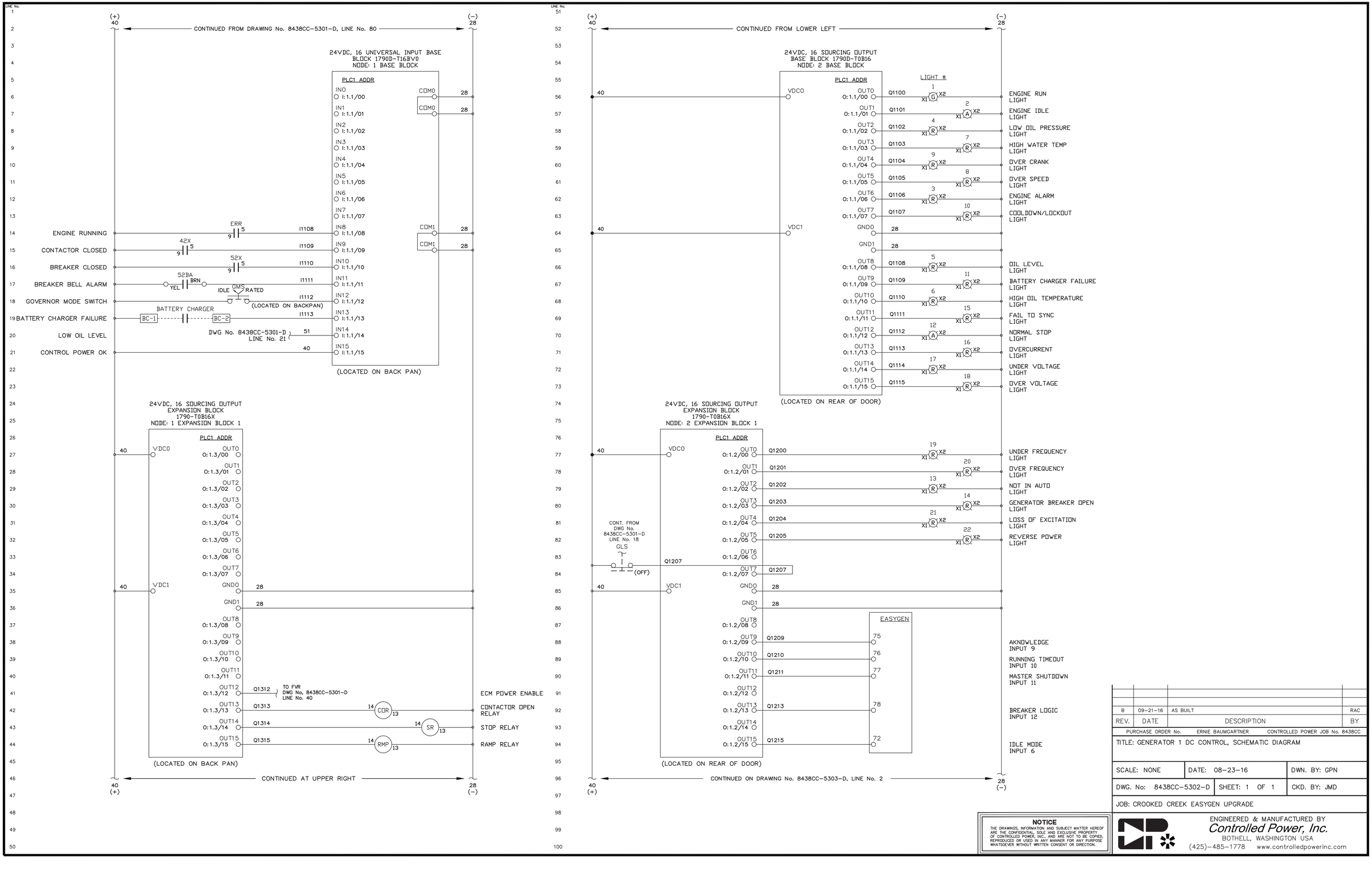

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5302-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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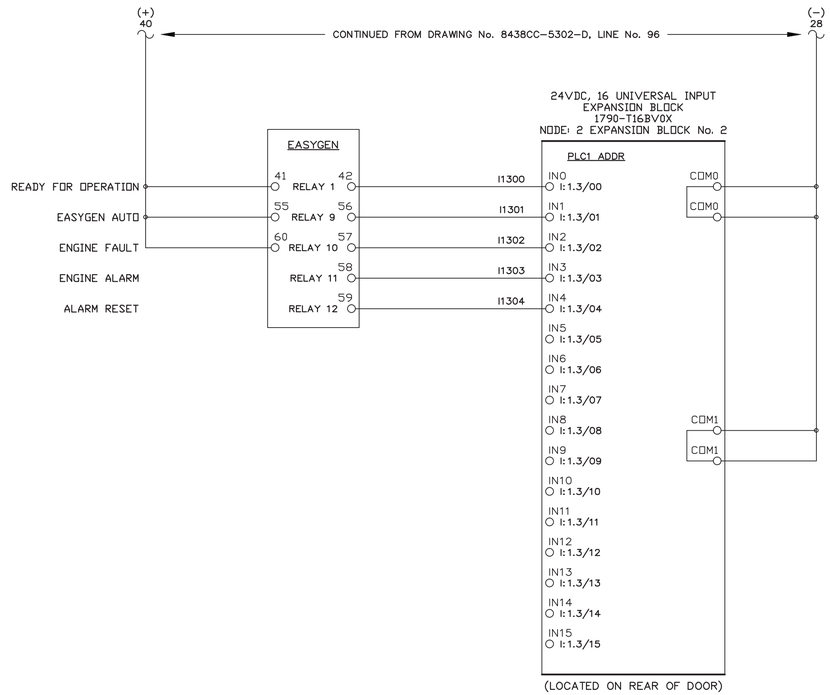

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5303-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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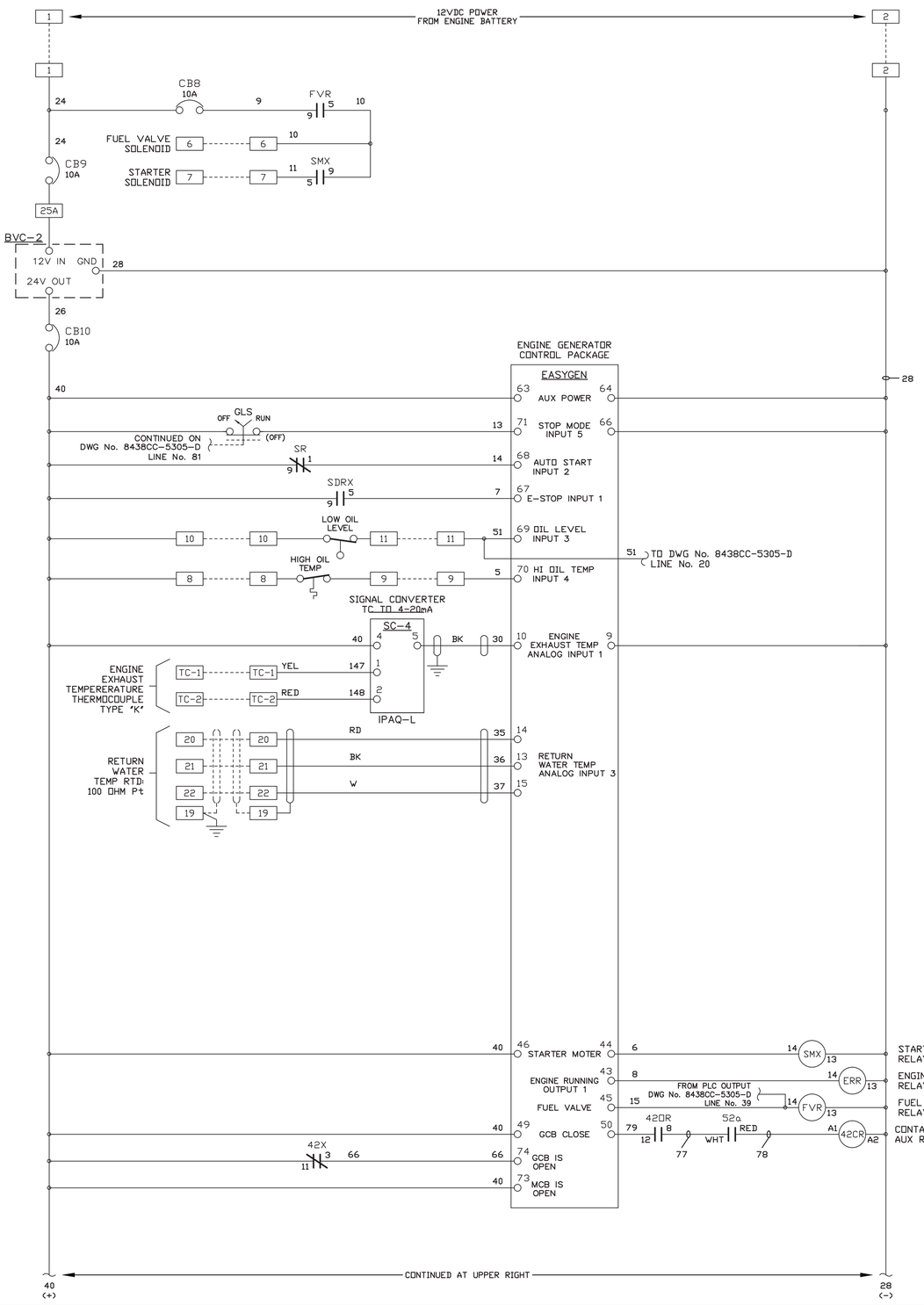

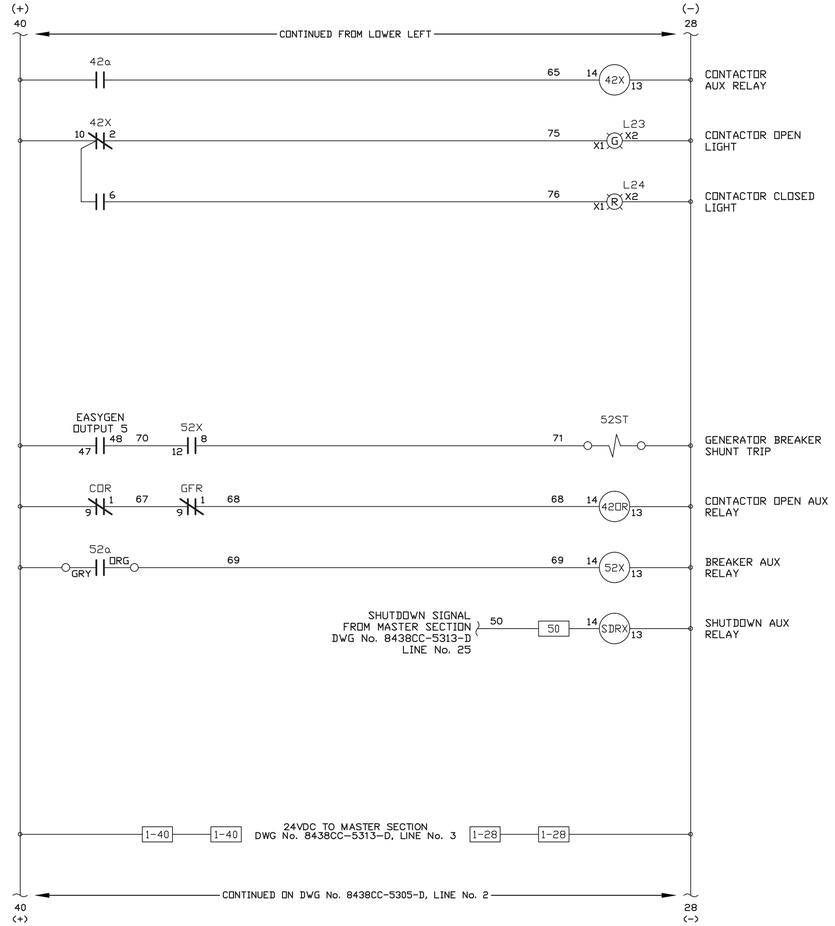

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5304-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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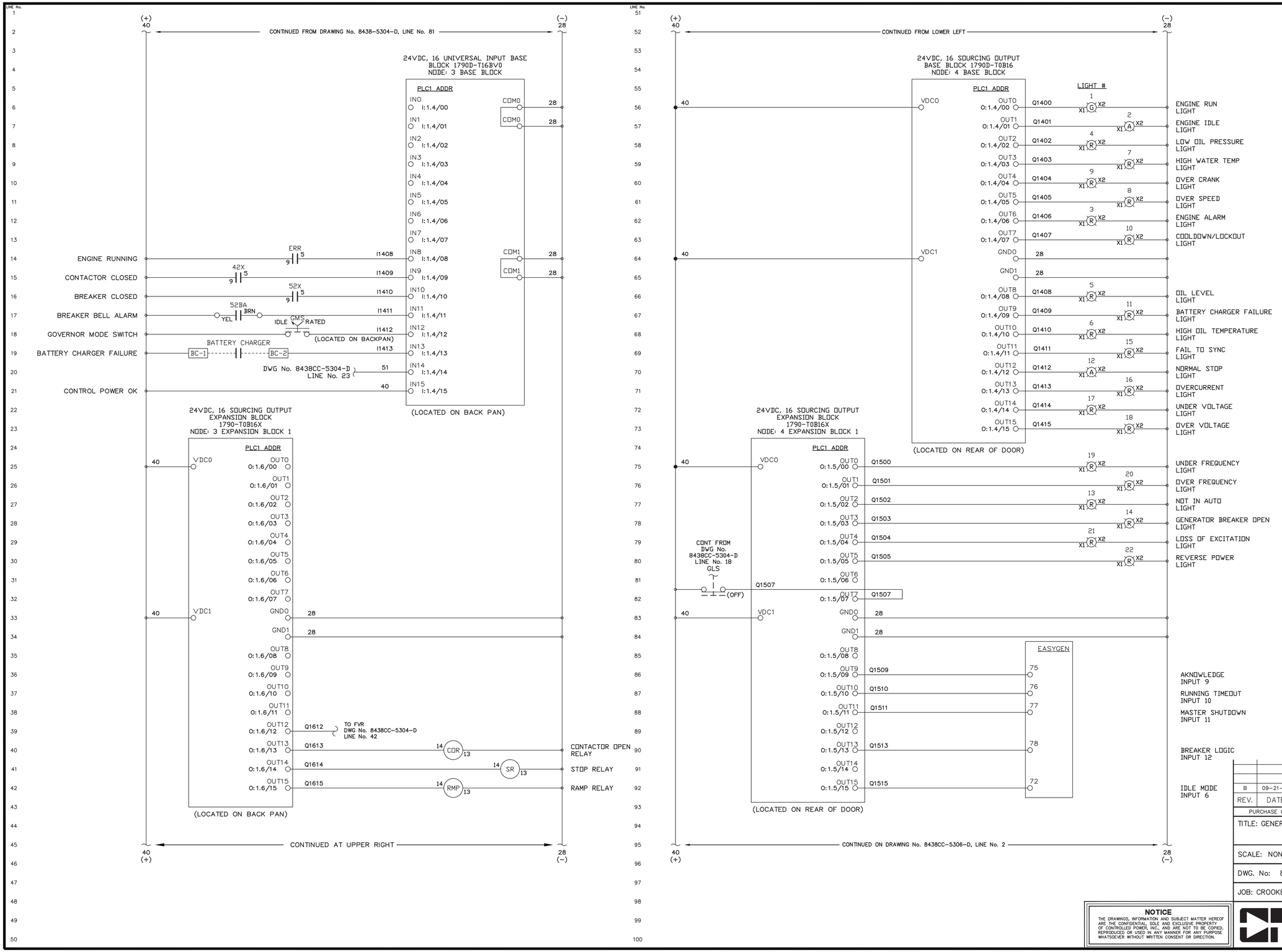

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5305-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: CROOKED CREEK EASYGEN UPGRADE		

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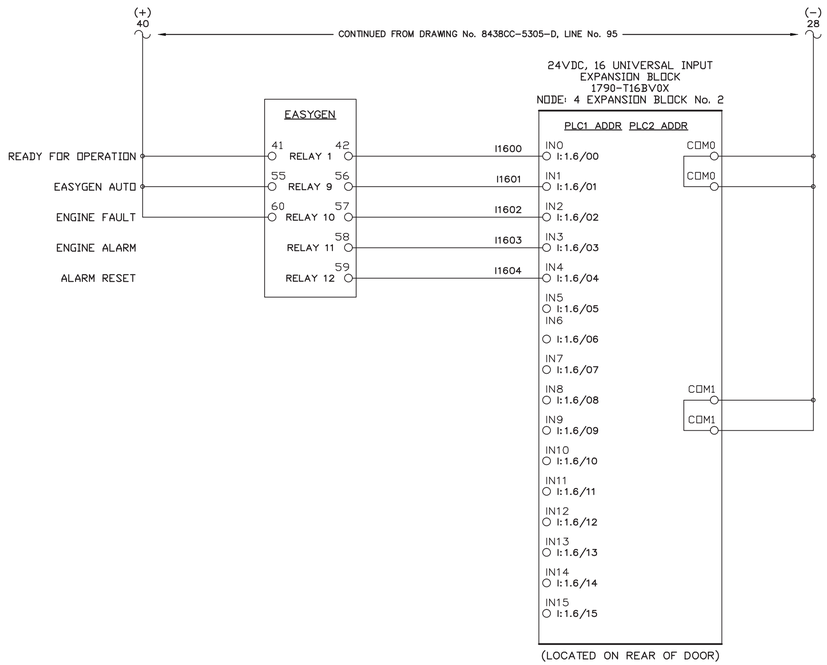

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5306-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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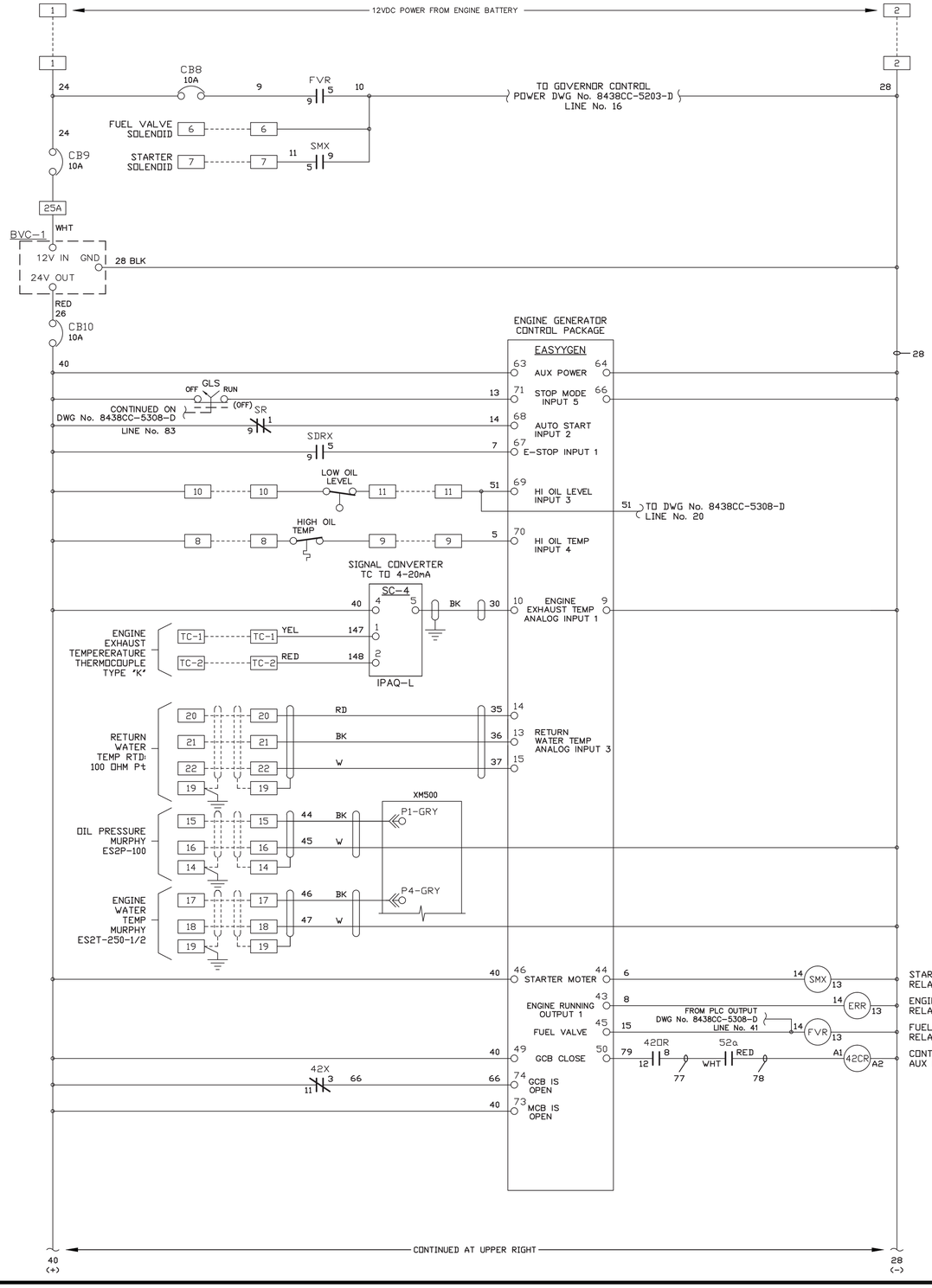

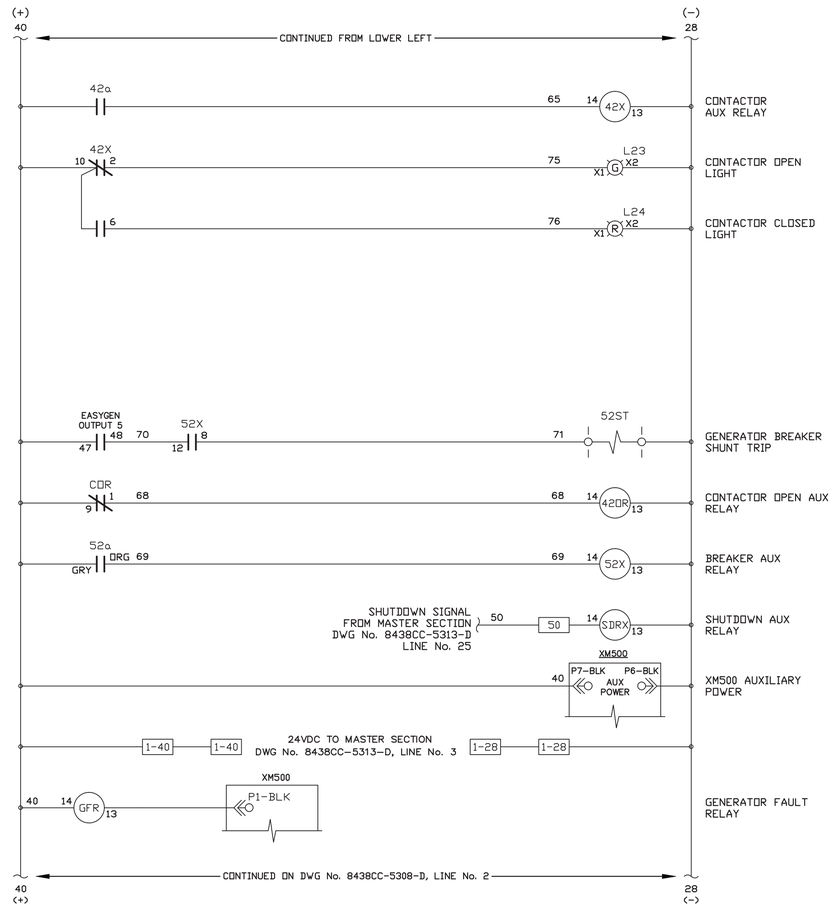

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5307-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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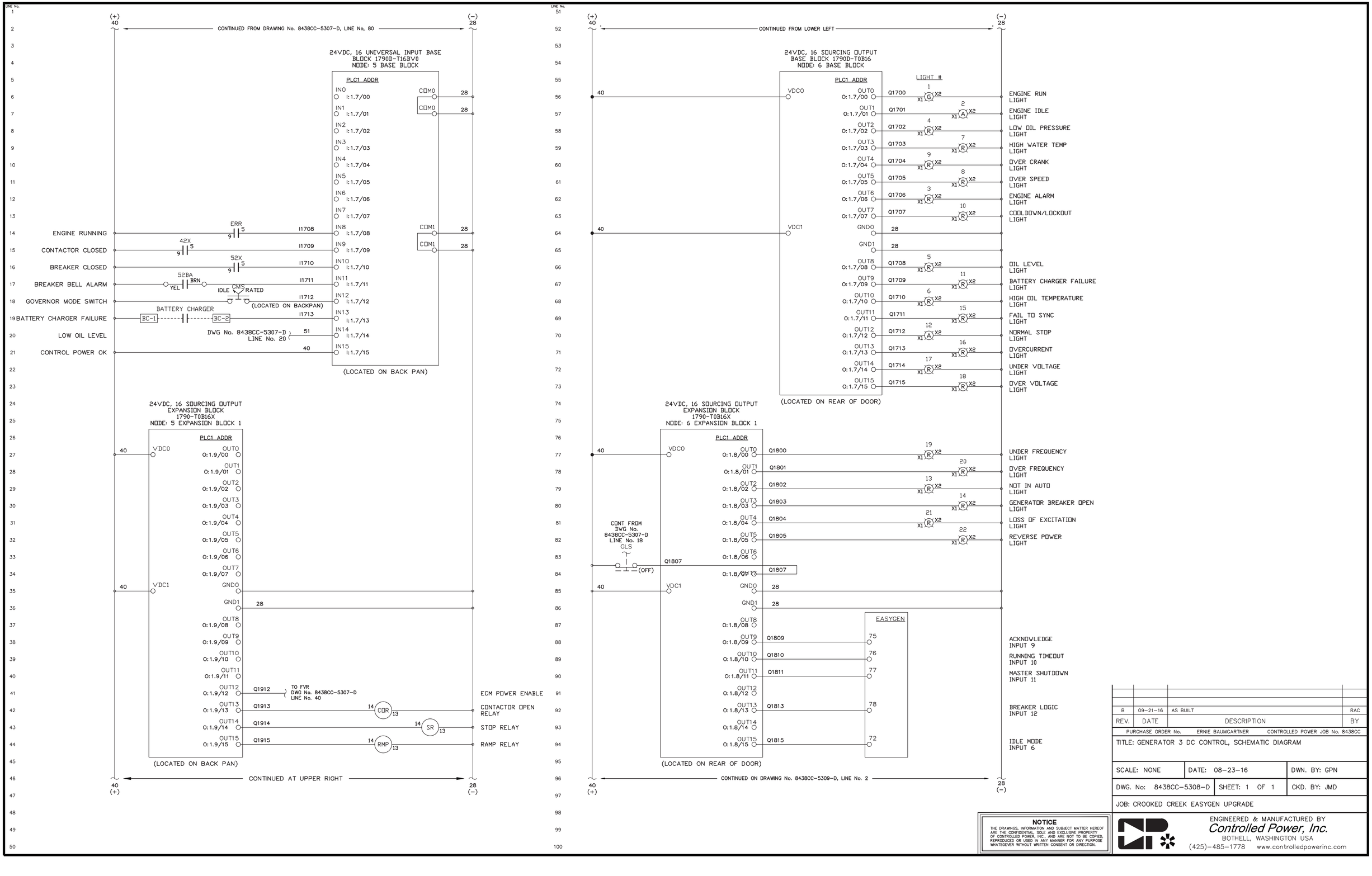

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5308-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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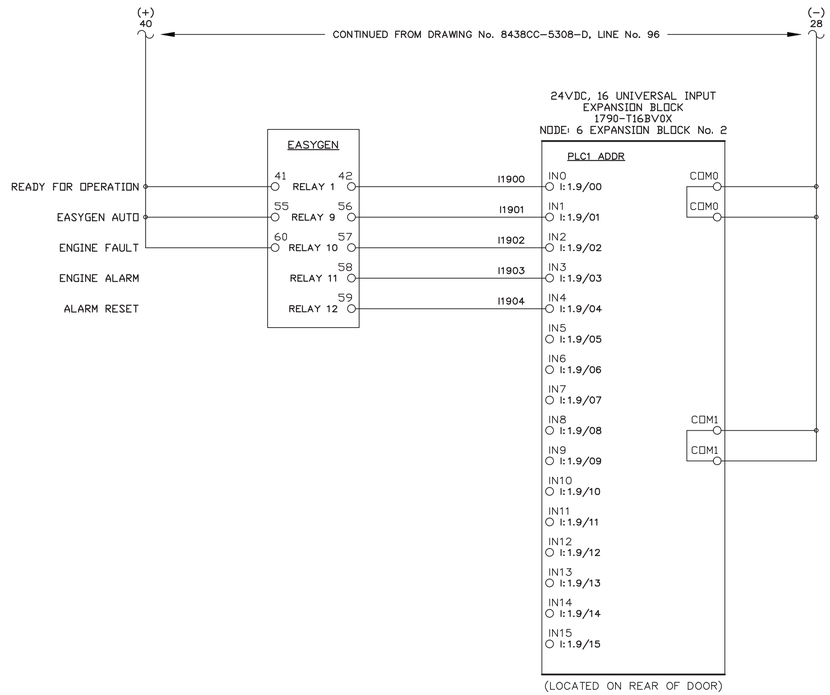

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5309-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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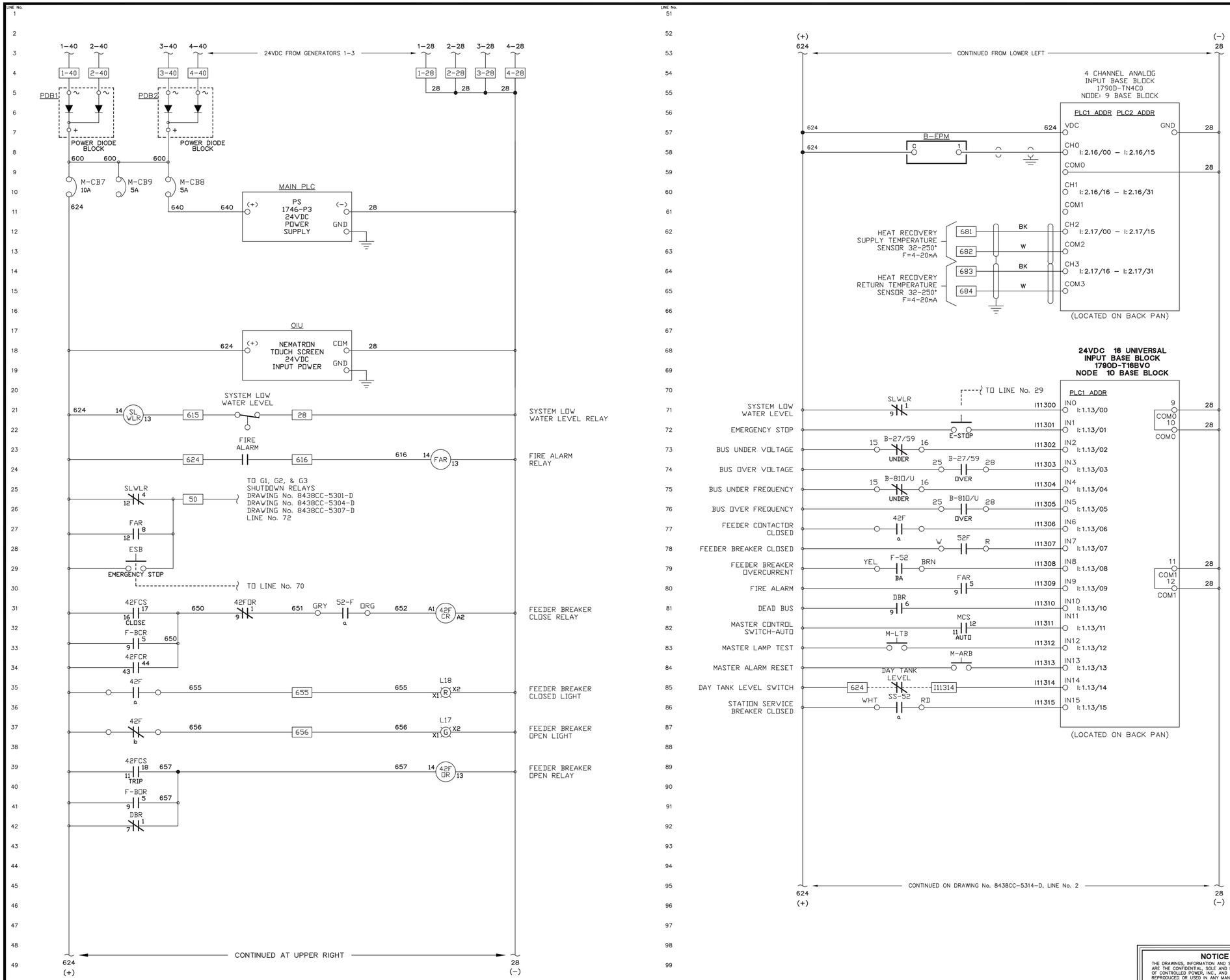

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: MASTER DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5313-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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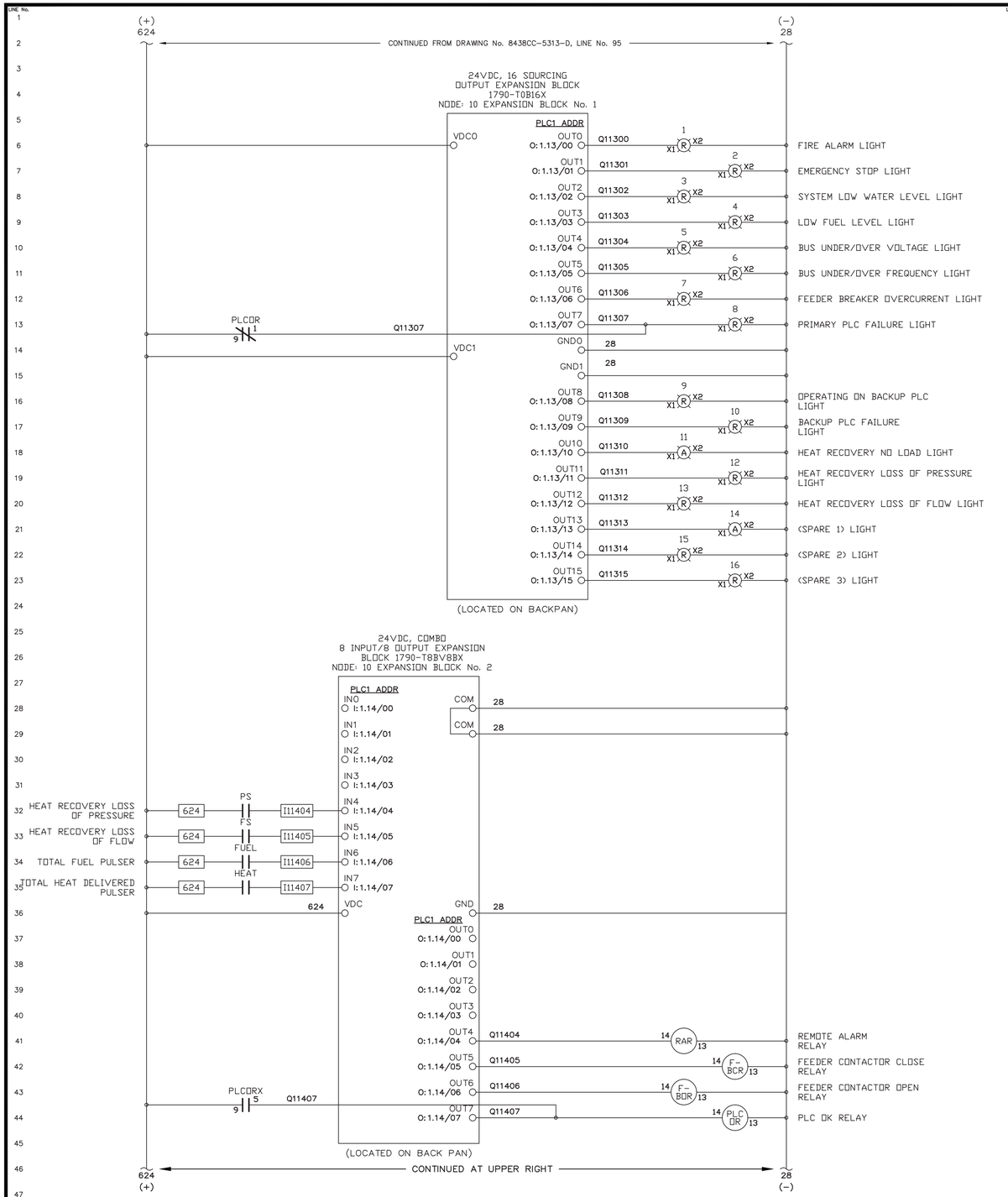

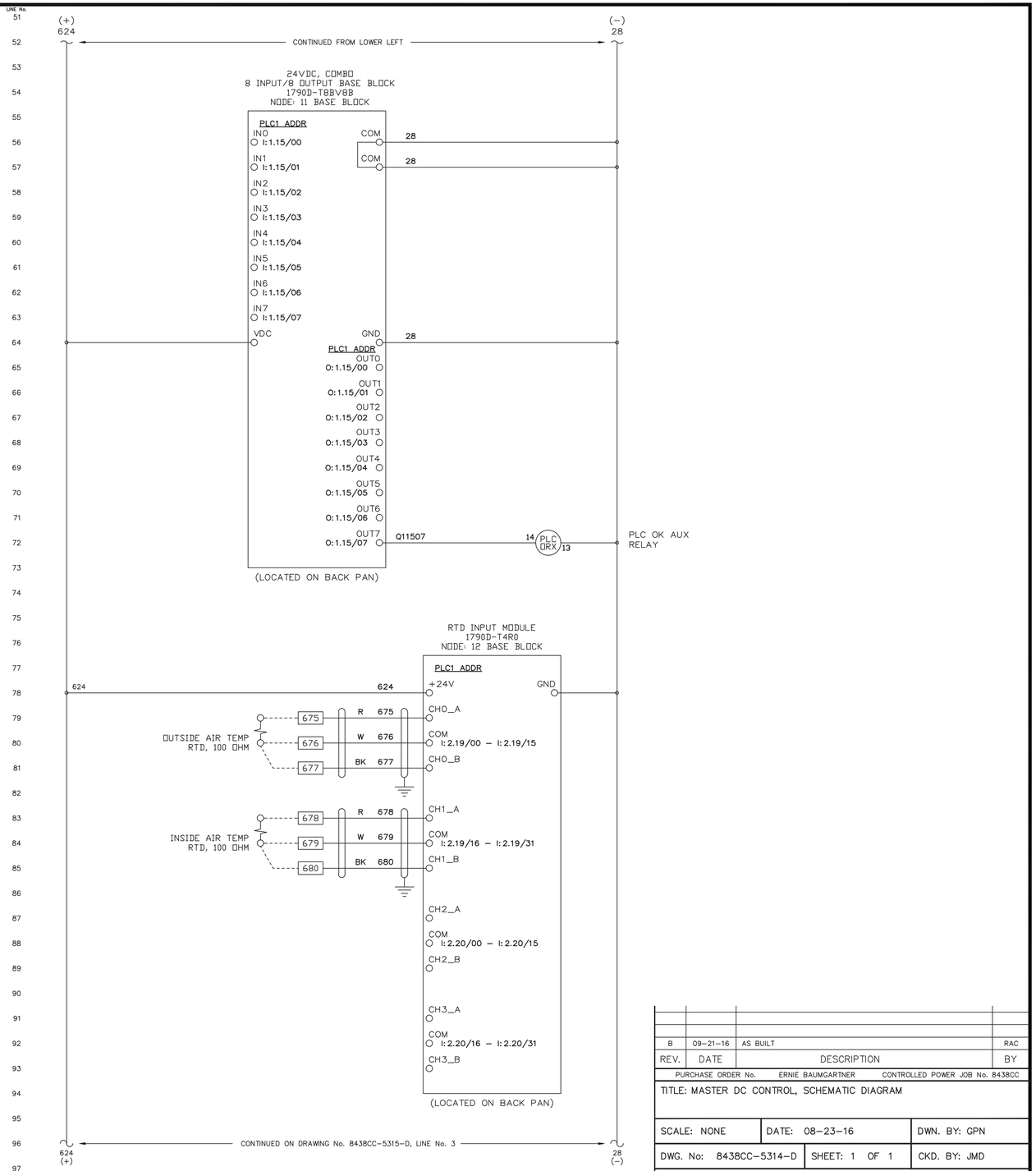

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: MASTER DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5314-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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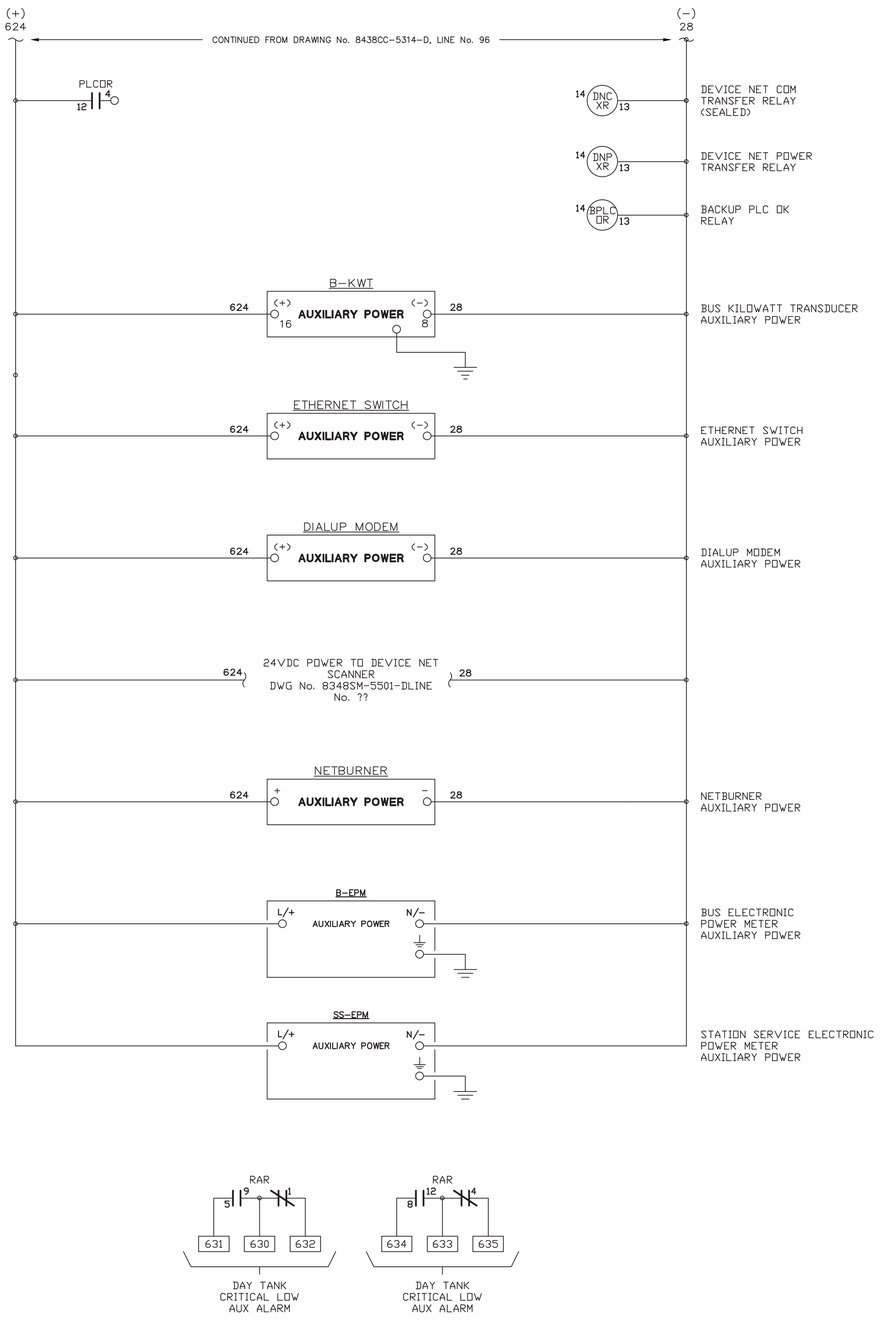

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: MASTER DC CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5315-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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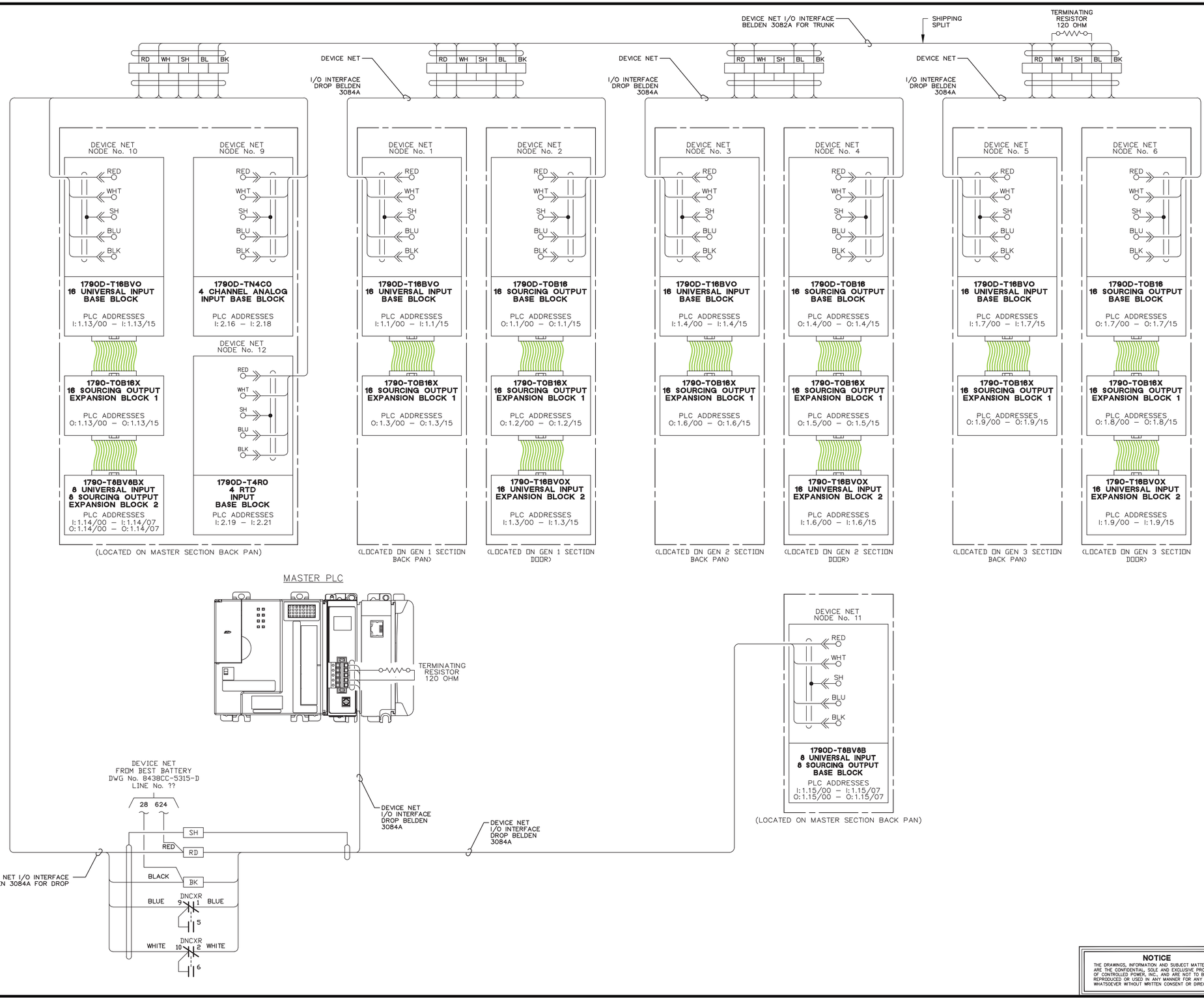

REV.	DATE	DESCRIPTION	BY
B	09–21–16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: PLC COMMUNICATION DIAGRAM

SCALE: NONE	DATE: 08–23–16	DWN. BY: GPN
DWG. No: 8438CC–5501–D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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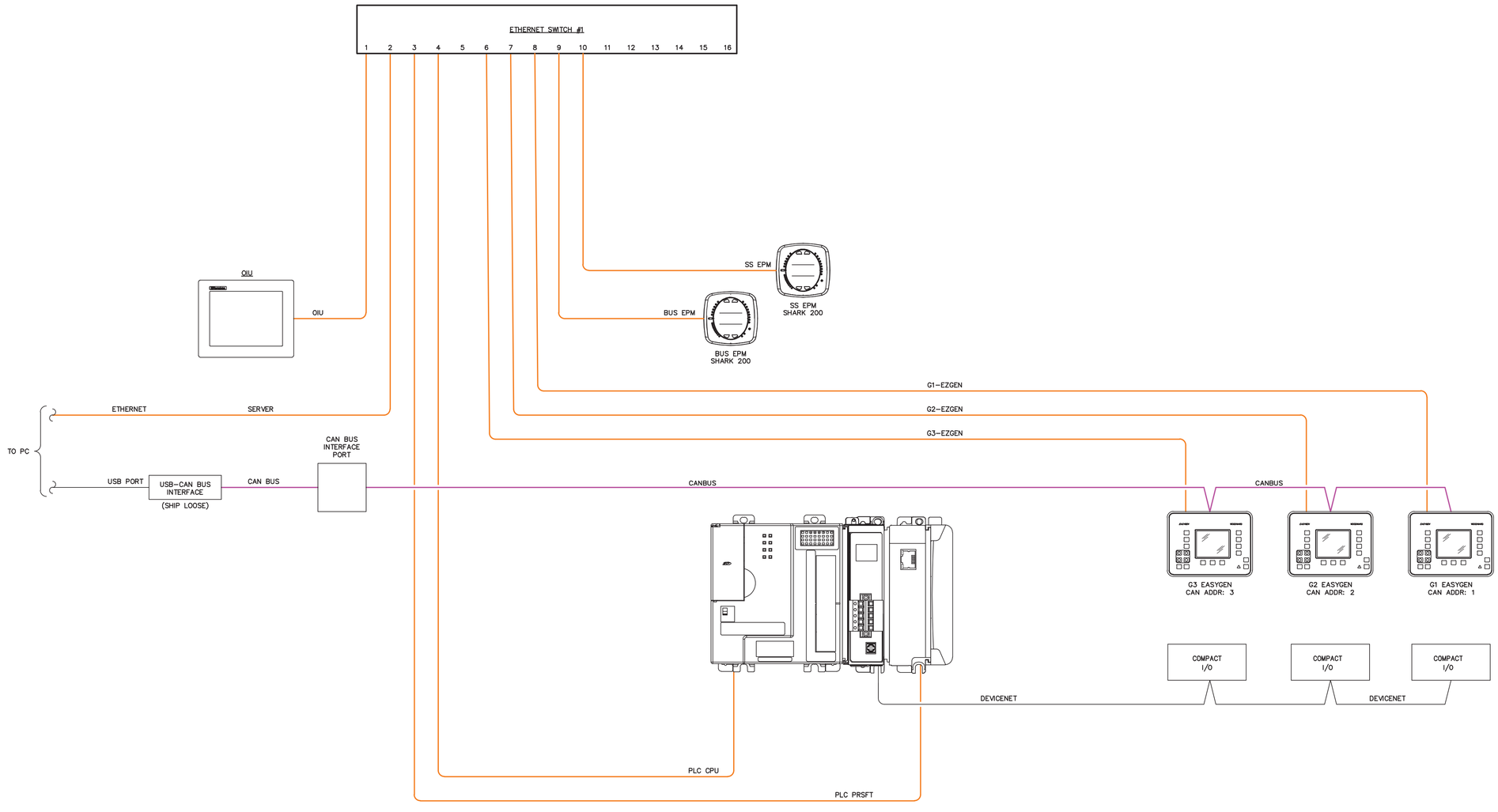
DEVICE	IP ADDRESS
SERVER	192.168.1.142
OIU	192.168.1.182
PLC CPU	192.168.1.183
PLC PROSOFT	192.168.1.187
BUS EPM	192.168.1.190
SS EPM	192.168.1.191
G1 EZGEN	192.168.1.161
G2 EZGEN	192.168.1.162
G3 EZGEN	192.168.1.163



REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. | ERNIE BAUMGARTNER | CONTROLLED POWER JOB No. 8438CC

TITLE: COMMUNICATION NETWORK DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5601-D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: CROOKED CREEK EASYGEN UPGRADE		

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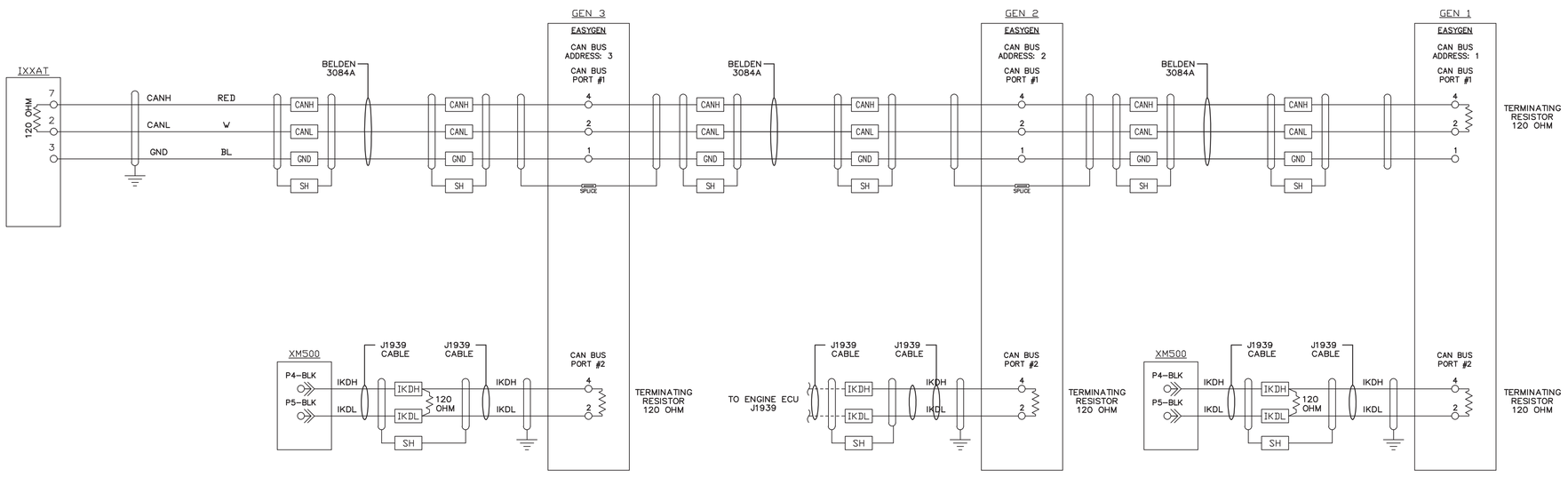

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: EPM MONITORING & SYSTEM COMMUNICATION DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-5602-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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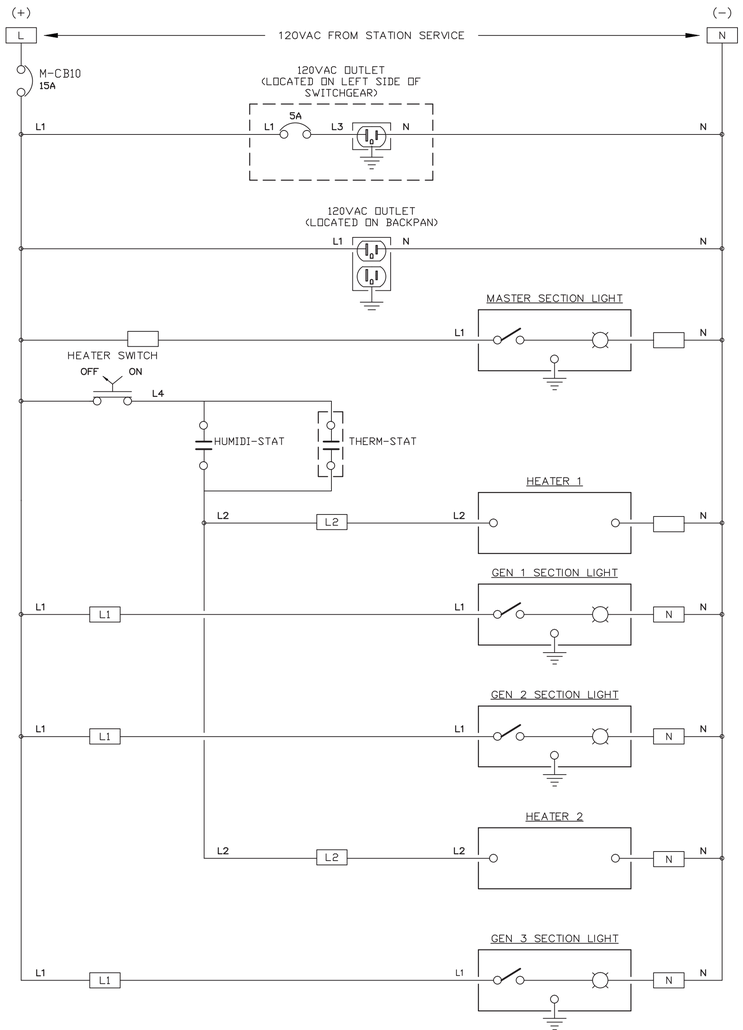

REV.	DATE	DESCRIPTION	BY
B	09−21−16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: HEATER & LIGHTING CONTROL, SCHEMATIC DIAGRAM

SCALE: NONE	DATE: 08−23−16	DWN. BY: GPN
DWG. No: 8438CC−5701−D	SHEET: 1 OF 1	CKD. BY: JMD
JOB: CROOKED CREEK EASYGEN UPGRADE		

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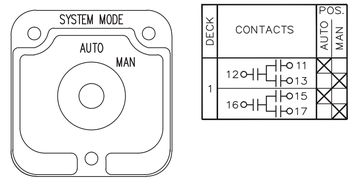
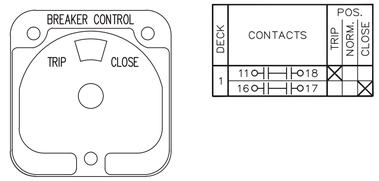
SYSTEM MODE SWITCH – SMS



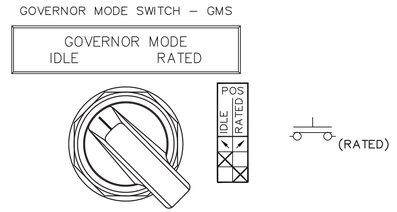
(ELECTROSWITCH 24201C)
KNURLED HANDLE
QTY 1

MAIN CONTACTOR CONTROL SWITCH – 42CS



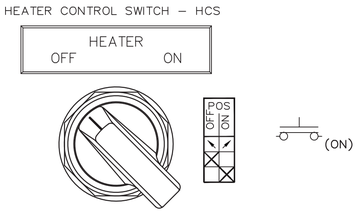
(ELECTROSWITCH 2438D)
PISTOL GRIP HANDLE
SPRING RETURN TO CENTER
QTY 1

GOVERNOR MODE SWITCH – GMS



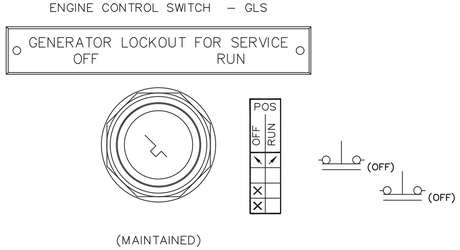
(MAINTAINED)
LOCATED ON BACK PAN

HEATER CONTROL SWITCH – HCS



(MAINTAINED)
LOCATED ON MASTER BACK PAN

ENGINE CONTROL SWITCH – GLS



(MAINTAINED)

REV.	DATE	DESCRIPTION	BY
B	09–21–16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: CONTROL SWITCH TARTGET DIAGRAM

SCALE: NONE	DATE: 08–23–16	DWN. BY: GPN
DWG. No: 8438CC–6101–D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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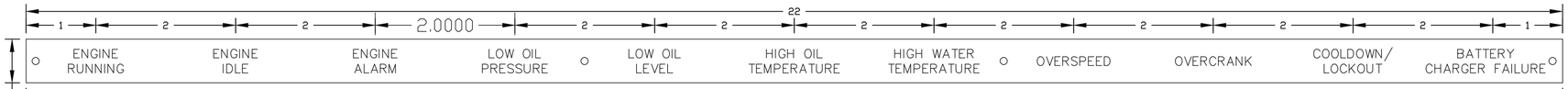
NP. 1 TEXT 1/8" QUANTITY 4 SCALE 1/1



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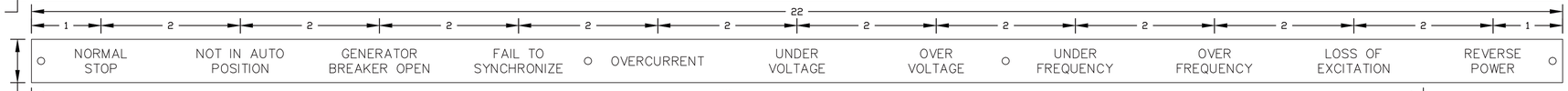
NP. 2 TEXT 1/8" QUANTITY 4 SCALE 1/1



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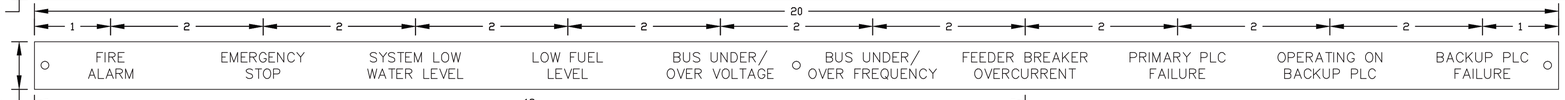
NP. 3 TEXT 1/8" QUANTITY 1 SCALE 1/1



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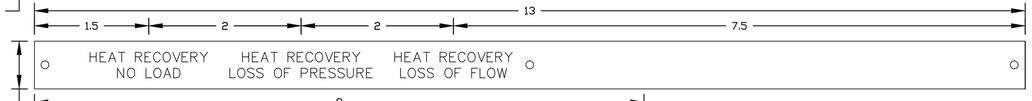
NP. 4 TEXT 1/8" QUANTITY 1 SCALE 1/1



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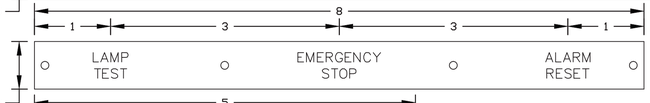
NP. 5 TEXT 1/8" QUANTITY 1 SCALE 1/1



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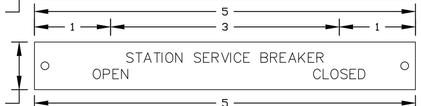
NP. 6 TEXT 1/8" QUANTITY 1 SCALE 1/1



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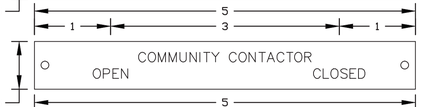
NP. 7 TEXT 1/8" QUANTITY 1 SCALE 1/1



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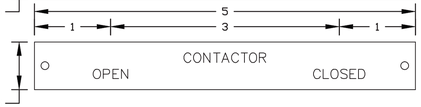
NP. 8 TEXT 1/8" QUANTITY 4 SCALE 1/1



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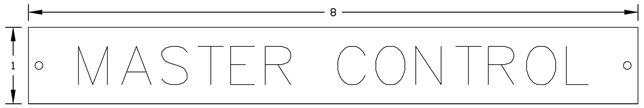
NP. 9 TEXT 1/2" QUANTITY 1 SCALE 1/1

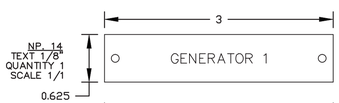


NP. 10 TEXT 1/2" QUANTITY 1 SCALE 1/1

NP. 11 TEXT 1/2" QUANTITY 1 SCALE 1/1

NP. 12 TEXT 1/2" QUANTITY 1 SCALE 1/1

NP. 14 TEXT 1/8" QUANTITY 1 SCALE 1/1



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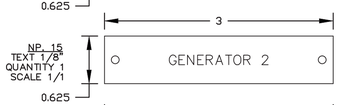
NP. 15 TEXT 1/8" QUANTITY 1 SCALE 1/1



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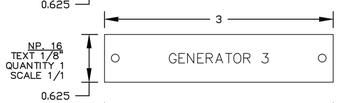
NP. 16 TEXT 1/8" QUANTITY 1 SCALE 1/1



0.625

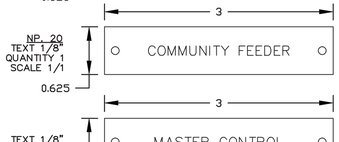
NP. 18 TEXT 1/8" QUANTITY 1 SCALE 1/1

0.625

NP. 19 TEXT 1/8" QUANTITY 2 SCALE 1/1

0.625

NP. 20 TEXT 1/8" QUANTITY 1 SCALE 1/1



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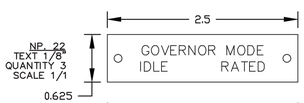
TEXT 1/8" QUANTITY 1 SCALE 1/1

0.625

NP. 22 TEXT 1/8" QUANTITY 3 SCALE 1/1



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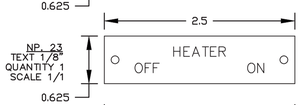
NP. 23 TEXT 1/8" QUANTITY 1 SCALE 1/1



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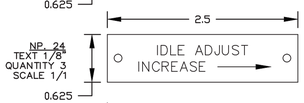
NP. 24 TEXT 1/8" QUANTITY 3 SCALE 1/1



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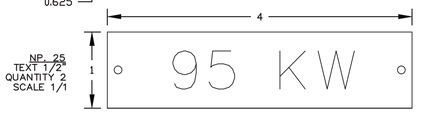
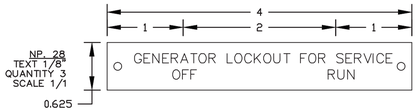
NP. 25 TEXT 1/2" QUANTITY 2 SCALE 1/1



NP. 26 TEXT 1/2" QUANTITY 1 SCALE 1/1

NP. 28 TEXT 1/8" QUANTITY 3 SCALE 1/1



0.625

NOTES:

1. ALL NAMEPLATES SHALL BE WHITE FACE WITH BLACK LETTERS EXCEPT AS NOTED.
2. ALL NAMEPLATES SHALL HAVE PRESSURE SENSITIVE ADHESIVE ON BACK
3. ALL NAMEPLATES MECHANICALLY ATTACHED

REV.	DATE	DESCRIPTION	BY
B	09-21-16	AS BUILT	RAC

PURCHASE ORDER No. ERNIE BAUMGARTNER CONTROLLED POWER JOB No. 8438CC

TITLE: NAMEPLATE ENGRAVING SCHEDULE, FABRICATION DIAGRAM

SCALE: NONE	DATE: 08-23-16	DWN. BY: GPN
DWG. No: 8438CC-6201-D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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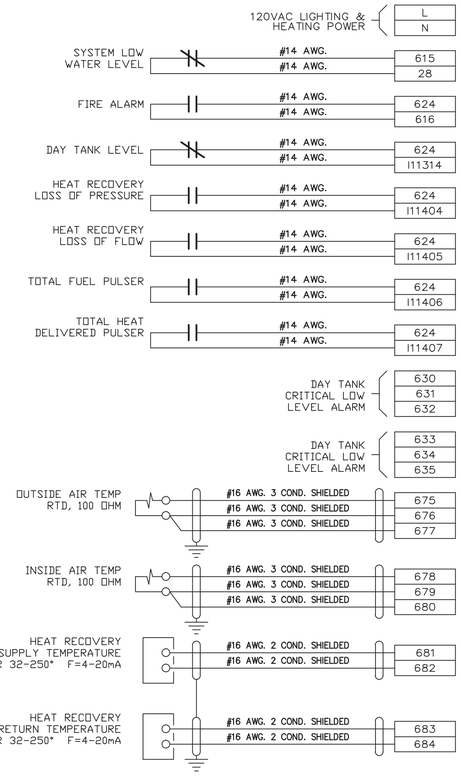
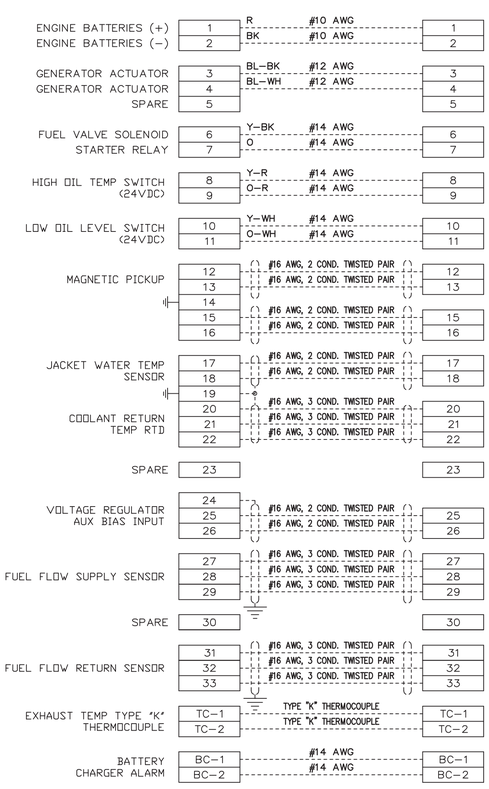
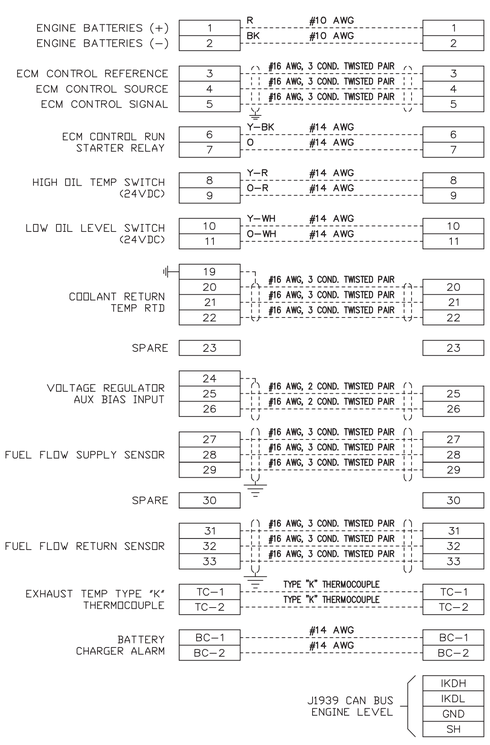
MASTER CONTROL



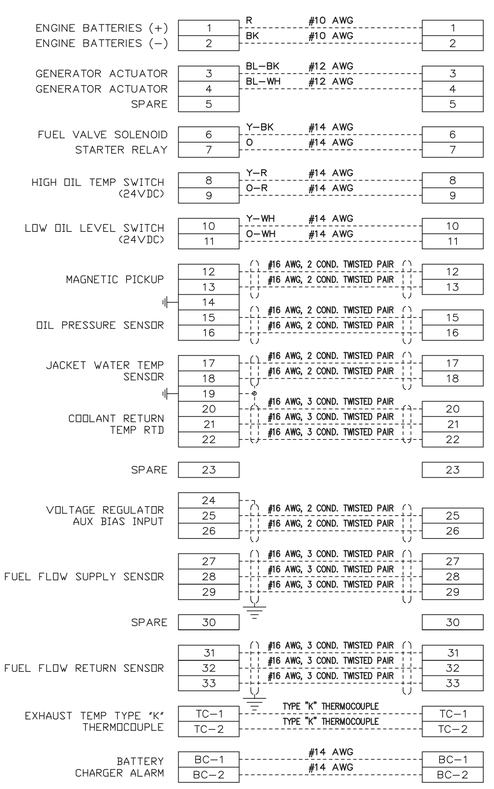
GENERATOR 1



GENERATOR 2



GENERATOR 3



REV.	DATE	DESCRIPTION	BY
B	09−21−16	AS BUILT	RAC

PURCHASE ORDER No. | ERNIE BAUMGARTNER | CONTROLLED POWER JOB No. 8438CC

TITLE: INTERCONNECTION DIAGRAM

SCALE: NONE	DATE: 08−23−16	DWN. BY: GPN
DWG. No: 8438CC−7101−D	SHEET: 1 OF 1	CKD. BY: JMD

JOB: CROOKED CREEK EASYGEN UPGRADE

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