

SCHEDULE OF DRAWINGS

MECHANICAL DRAWINGS

- VICINITY PLAN, LEGEND, & SCHEDULE OF DRAWINGS
- GEN#3 REPLACEMENT DEMOLITION & NEW WORK PLANS
- GEN#3 REPLACEMENT DEMOLTION & NEW WORK ELEVATIONS & DETAILS
- GEN#3 REPLACEMENT NEW CHARGE AIR SYSTEM DETAILS
- GEN#3 REPLACEMENT OWNER FURNISHED GENSET RENOVATION DETAILS
- DEMOLITION & NEW WORK PLANS
- GEN#3 INSTALLATION DETAILS
- GEN#3 INTERCONNECT WIRING DIAGRAM
- SWITCHGEAR MODIFICATIONS FRONT ELEVATIONS & NOTES

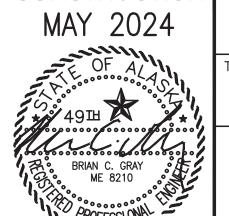
LEGEND

- N BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- I⊢D■ HOSE END DRAIN VALVE
- GAUGE COCK
- AUTOMATIC AIR VENT
- THERMOMETER
- P PRESSURE GAUGE
- TH TEMPERATURE SENSOR
- FLEXIBLE CONNECTOR
- → FLANGED JOINT →I UNION
- •—— ELBOW TURNED UP
- ELBOW TURNED DOWN
- PIPING CONNECTION (TEE) -- CHANGE OF PIPE SIZE
- DIRECTION OF FLOW

ABBREVIATIONS

- ø DIAMETER (PHASE)
- A AMPS
- AFF ABOVE FINISHED FLOOR
- BTU BRITISH THERMAL UNIT
- DFR DIESEL FUEL RETURN
- DFS DIESEL FUEL SUPPLY EWT ENTERING WATER TEMPERATURE
- EXIST EXISTING
- ECR ENGINE COOLANT RETURN
- ECS ENGINE COOLANT SUPPLY
- FPT FEMALE PIPE THREAD GA GAUGE
- GALV GALVANIZED
- GPM GALLONS PER MINUTE GRC GALVANIZED RIGID CONDUIT
- HP HORSEPOWER
- HRR HEAT RECOVERY RETURN
- HRS HEAT RECOVERY SUPPLY
- ID INSIDE DIAMETER KW KILOWATT
- LT LIQUID TIGHT LWT LEAVING WATER TEMPERATURE
- MAX MAXIMUM
- MBH THOUSAND BTU PER HOUR
- MIN MINIMUM
- MPT MALE PIPE THREAD NC NORMALLY CLOSED
- NO NORMALLY OPEN
- OC ON CENTER OD OUTSIDE DIAMETER
- PRV PRESSURE RELIEF VALVE
- PSI POUNDS/PER SQUARE INCH
- PSID PSI DIFFERENTIAL
- PSIG PSI GAUGE SCH SCHEDULE
- TDH TOTAL DEVELOPED HEAD
- TYP TYPICAL
- UOR USED OIL RETURN V VOLTS
- W WATTS
- WG WATER GAUGE
- WPD WATER PRESSURE DROP

ISSUED FOR CONSTRUCTION PROJECT: MAY 2024





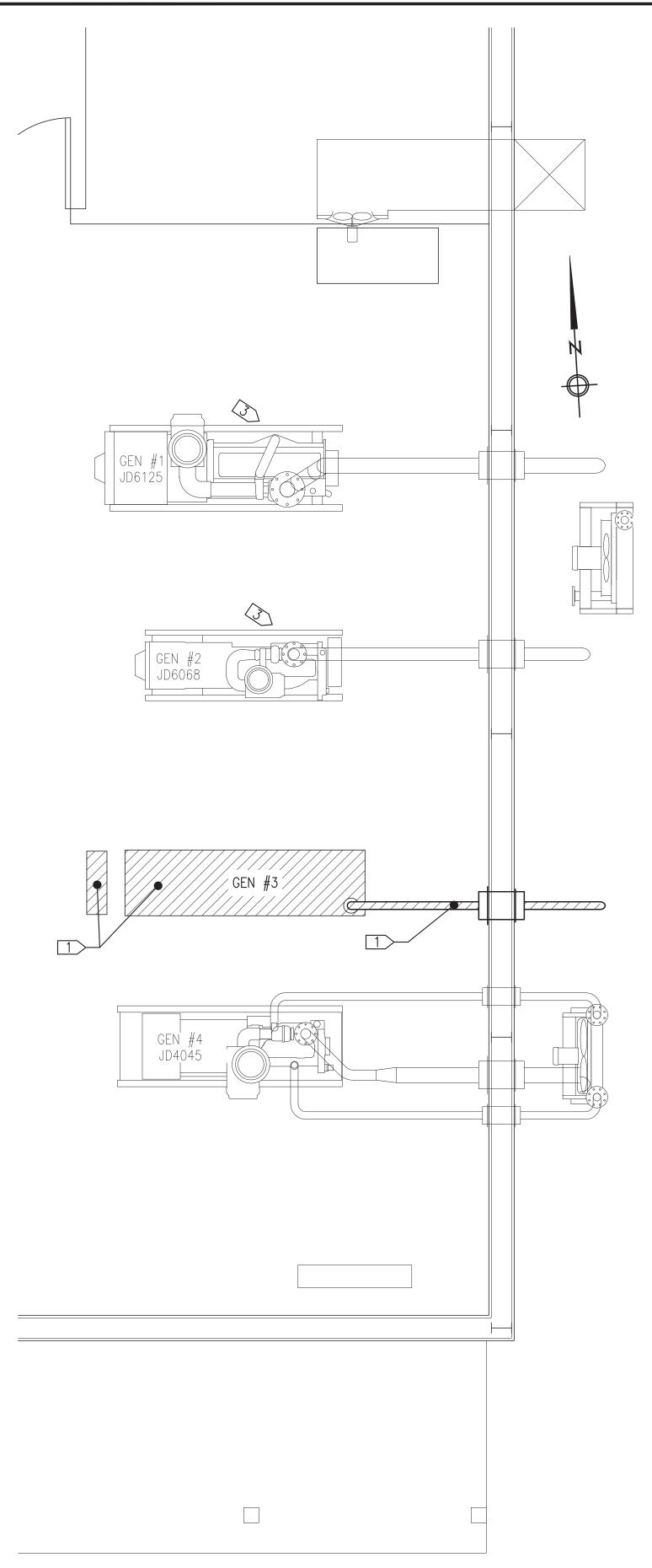
ALASKA ENERGY AUTHORITY

AVTEC POWER PLANT TRAINING FACILITY 2024 UPGRADE

VICINITY PLAN, LEGENDS, & SCHEDULE OF DRAWINGS



DRAWN BY:	JTD		SCALE:	AS NOTED
DESIGNED BY:	BCG		DATE:	5/13/24
FILE NAME: A	VTEC24	M1-M5	SHEET	:
PROJECT NUME	BER:		M 1	



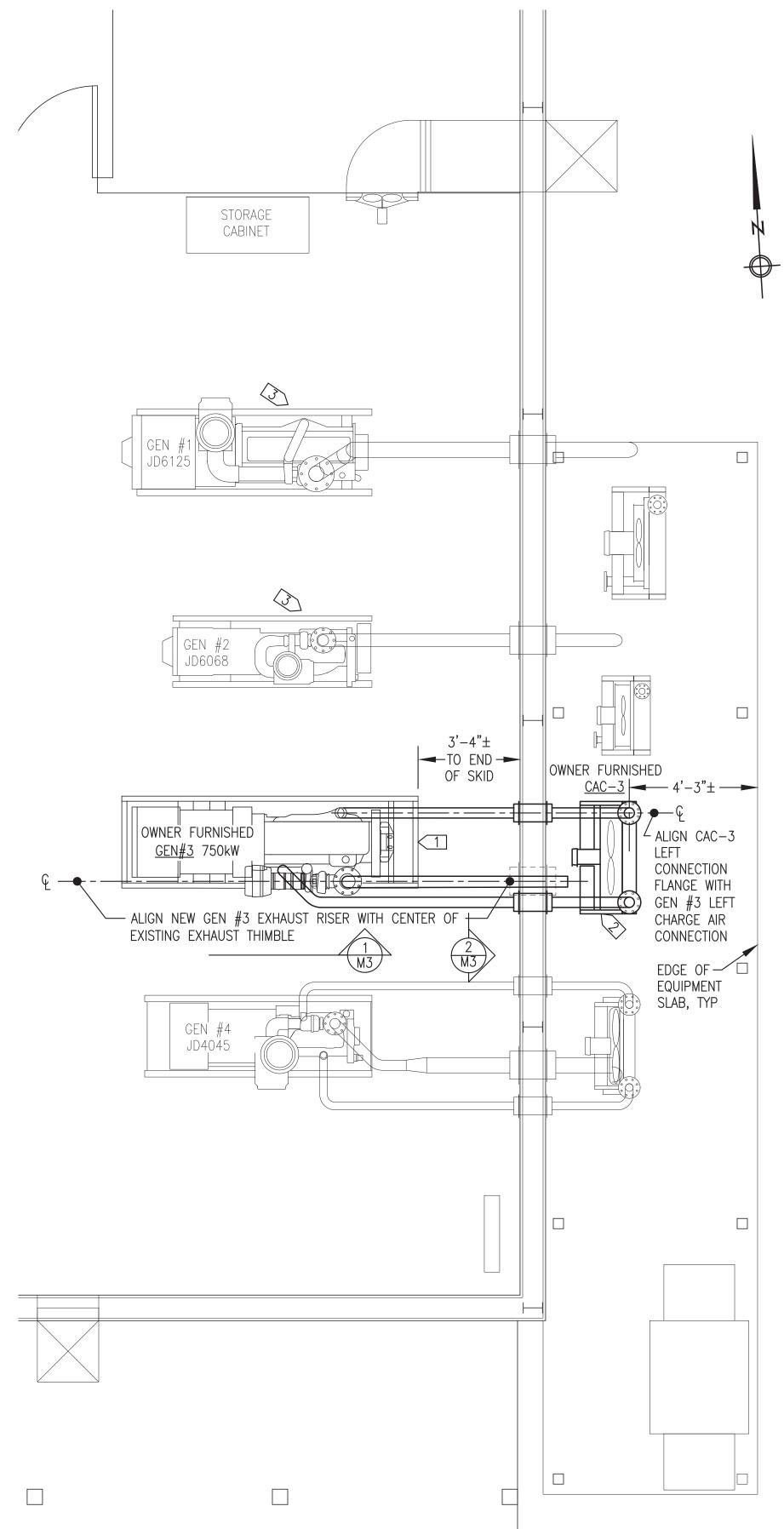
MECHANICAL EQUIPMENT DEMOLTION PLAN

DEMOLITION GENERAL NOTES:

- 1) SEE ELECTRICAL PLANS FOR ADDITIONAL DEMOLITION.
- 2) ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR DEMOLITION. EQUIPMENT TO BE REMOVED SHOWN HATCHED.
- 3) TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO GENERATOR AND TO SWITCHGEAR COMPONENTS BEING REMOVED DURING DEMOLITION. TURN ALL REMOVED EQUIPMENT OVER TO AVTEC FOR FINAL DISPOSITION.
- 4) DRAIN ALL PIPING AND HOSE CONNECTIONS PRIOR TO DEMOLITION. SAVE GLYCOL AND DIESEL FUEL FOR RE-USE IN NEW SYSTEMS. TURN USED OIL OVER TO AVTEC FOR FINAL DISPOSITION.

DEMOLITION SPECIFIC NOTES:

- 1 REMOVE EXISTING GEN#3 IN ITS ENTIRETY INCLUDING ENGINE, GENERATOR, SKID, MECHANICAL INSTRUMENTATION PANEL AND 3" EXHAUST PIPING. SEE ELECTRICAL FOR ADDITIONAL DEMOLITION. EXISTING 4" EXHAUST WALL THIMBLE TO REMAIN.
- 2 SEE NEW WORK.
- 3 REMOVE EXISTING VDO OIL PRESSURE AND JACKET WATER TEMPERATURE SENDING UNITS FOR REPLACEMENT WITH NEW UNITS.
- 4 SEE ELECTRICAL.



2 NEW MECHANICAL EQUIPMENT LAYOUT PLAN

NEW WORK GENERAL NOTES:

- 1) SEE ELECTRICAL PLANS FOR ADDITIONAL NEW WORK.
- 2) EXISTING EQUIPMENT TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES. NEW EQUIPMENT TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
- 3) ONLY OUTLINE OF MAJOR NEW WORK TASKS SHOWN THIS SHEET. SEE SHEETS M3-M4 FOR ADDITIONAL DETAILS.

NEW WORK SPECIFIC NOTES:

- 1 INSTALL COMPLETE OWNER FURNISHED RENOVATED GEN#3
 ASSEMBLY, EXHAUST, CHARGE AIR, CRANK VENT, AND MODIFIED
 COOLING CONNECTIONS. SEE DETAILS AND ELEVATIONS SHEETS
 M3-M4.
- 2 INSTALL OWNER FURNISHED CHARGE AIR COOLER CAC-3. SEE DETAILS AND ELEVATIONS SHEETS M3-M4.
- PROVIDE NEW TWO-WIRE UNGROUNDED OIL PRESSURE AND JACKET WATER TEMPERATURE SENDING UNITS: 0-100 PSI RANGE, 1/8" NPT CONNECTION, MURPHY ES2P-100 P/N: 05701858 AND 100-250F RANGE, 1/2" NPT CONNECTION, MURPHY ES2T-250-1/2 P/N: 10702013, OR APPROVED EQUAL.
- 4 SEE ELECTRICAL.





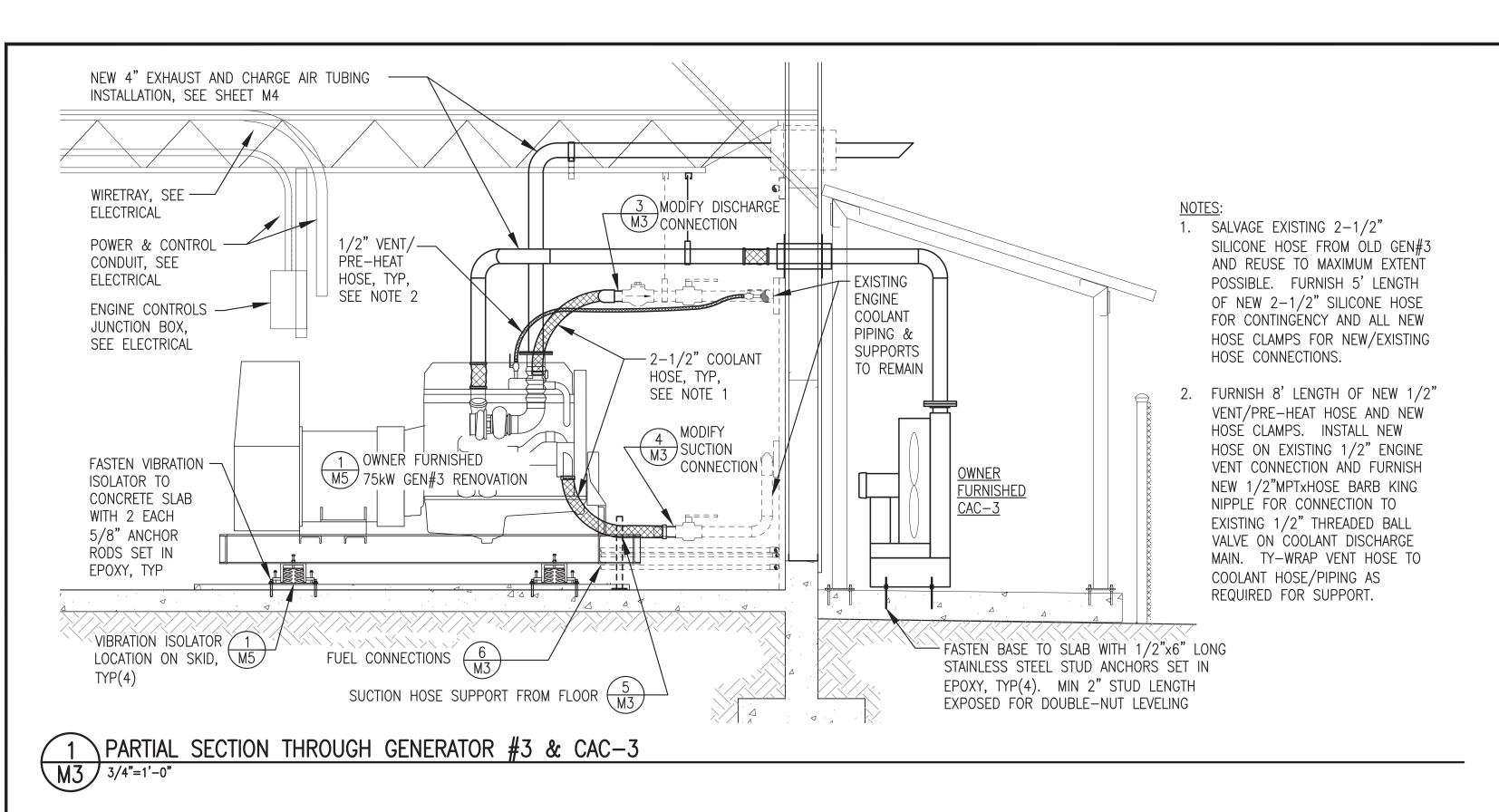
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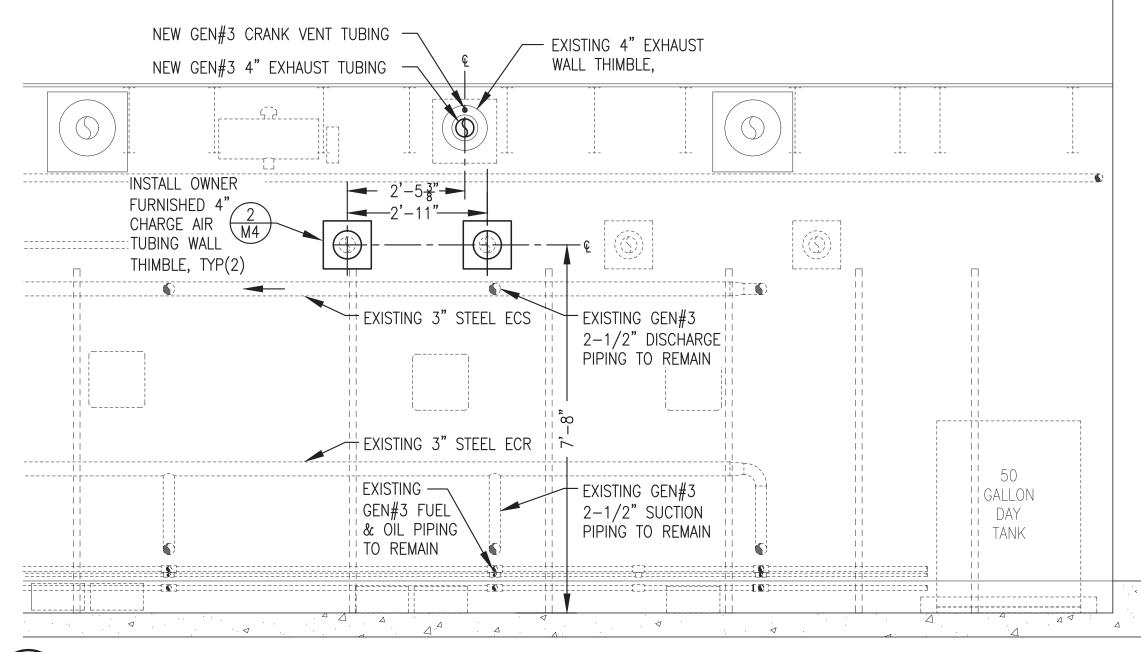
AVTEC POWER PLANT TRAINING FACILITY 2024 UPGRADE

GEN#3 REPLACEMENT
DEMOLTION & NEW WORK P

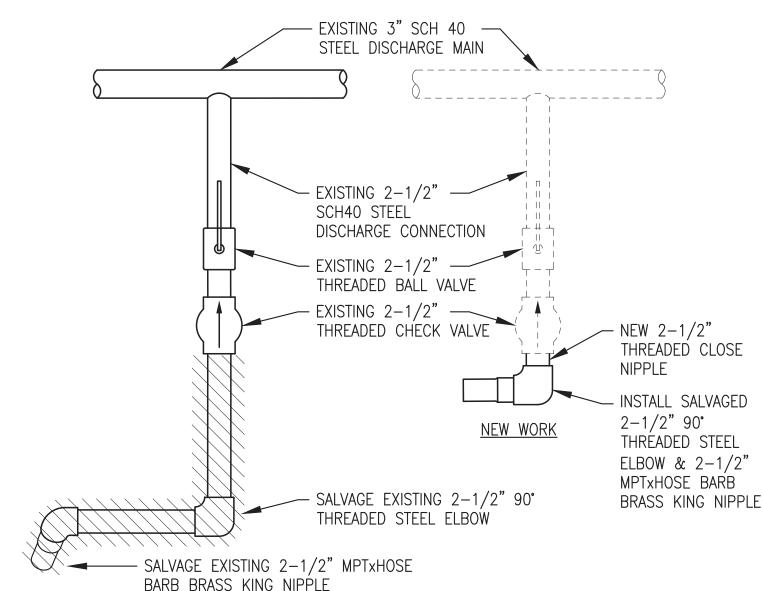


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DESIGNED BY: BCG DATE	E: 5/13/24
TILE NAME: AVTEC24 M1-M5 SHE	
PROJECT NUMBER:	2 5





PARTIAL BACK WALL ELEVATION M3 3/4"=1'-0"



DEMOLITION NOTES: EXISTING EQUIPMENT & PIPING TO BE REMOVED SHOWN

ALL PIPING & EQUIPMENT NOT SHOWN HATCHED TO REMAIN IN SERVICE IN ORIGINAL LOCATION.

NEW WORK NOTES:

HATCHED.

- EXISTING EQUIPMENT & PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT-DASHED LINES
- NEW EQUIPMENT & PIPING TO BE INSTALLED SHOWN WITH DARK-SOLID LINES.

SCH 40 STEEL SUCTION CONNECTION RISER ─ EXISTING 2-1/2" — SCH40 STEEL SUCTION CONNECTION ─ EXISTING 2-1/2" — THREADED BALL VALVE SALVAGED 2-1/2" TO REMAIN MPTxHOSE BARB BRASS KING - DEMOLISH EXISTING NIPPLE STRUT BRACKET SUPPORT **DEMOLITION** SALVAGE EXISTING 2-1/2" MPTxHOSE BARB BRASS KING NIPPLE

EXISTING 2-1/2" —

HOSE WITH VIBRA-CUSHION AS REQUIRED FOR SNUG FIT IN OVERSIZED CLAMP \sim 2-1/2" SILICONE SUCTION HOSE — ALIGN STRUT & CUSHION CLAMP WITH HOSE AS REQUIRED -18" LONG RIGHT ANGLE STRUT BRACKET CONCRETE SLAB 1/2"x6" STUD SET IN EPOXY, TYP(2)

·3" RIGID (3.5" I.D.) STRUT CLAMP, B-LINE B2015 OR EQUAL, WRAP

4 GEN#3 SUCTION CONNECTION MODIFICATIONS (PLAN VIEW) M3 1"-1'-0"

GEN#3 DISCHARGE CONNECTION MODIFICATIONS (PLAN VIEW) M3/1"=1'-0"

- EXISTING PIPING, TYP EXISTING 1/2" THREADED CONNECTION, TYP(3) DIESEL FUEL RETURN USED OIL RETURN NEW HOSE -FROM GEN#3, DIESEL FUEL SUPPLY

1. ALL EXISTING GENERATOR FUEL BRANCH PIPING CONNECTIONS TO REMAIN SHOWN WITH LIGHT DASHED LINES.

AEROQUIP HOSES PROVIDED WITH RENOVATED GEN#3. ALL EQUIPPED WITH STRAIGHT AND OPTIONAL 90° JIC SWIVELS & 1/2" MPT ADAPTERS. CUT TO LENGTH AS REQUIRED & RE-INSTALL ENDS.

GEN#3 SUCTION HOSE SUPPORT (ELEVATION) M3 NO SCALE

> ISSUED FOR CONSTRUCTION PROJECTS MAY 2024

> > BRIAN C. GRAY ME 8210



AVTEC POWER PLANT TRAINING FACILITY 2024 UPGRADE

GEN#3 REPLACEMENT

DEMOLTION & NEW WORK ELEVATIONS & DETAILS



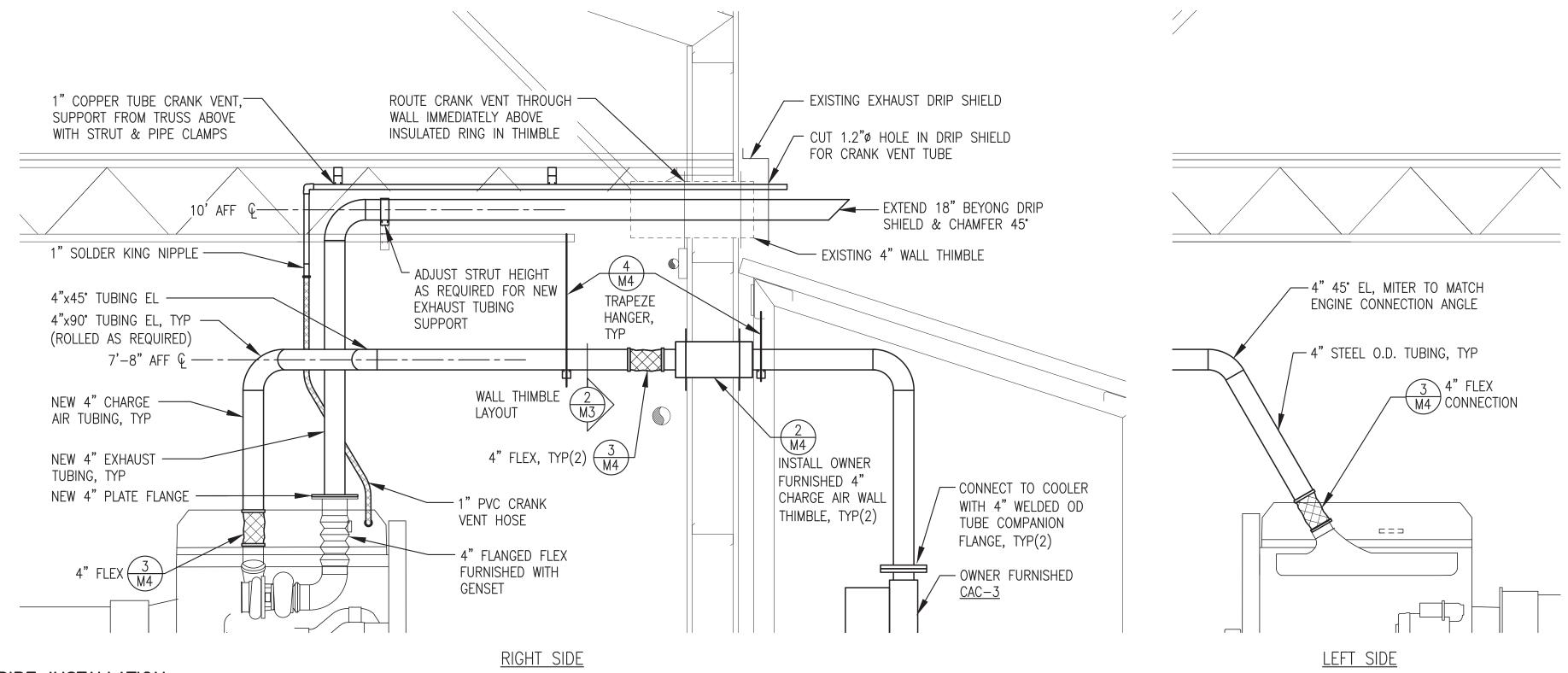
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DESIGNED BY: BCG	DATE: 5/13/24
FILE NAME: AVTEC24 M1-M5	SHEET:
PROJECT NUMBER:	M3 3

\GEN#3 FUEL PIPING CONNECTIONS (ELEVATION)

DEMOLITION

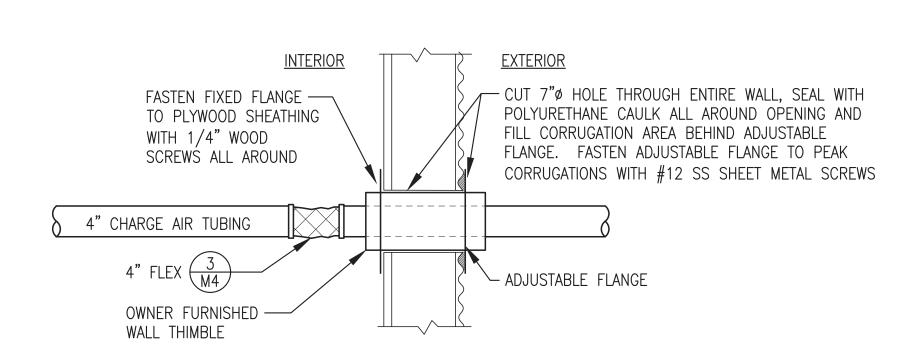


- ALL EXHAUST PIPE AND CHARGE AIR PIPE TO BE LIGHT WALL CARBON STEEL O.D. EXHAUST TUBING, SIZE AS INDICATED. ALL ELBOWS TO BE SHORT RADIUS FITTINGS TO MATCH TUBING. ALL JOINTS TO BE WELDED EXCEPT AS INDICATED.
- 2. ALL CRANK VENT PIPING TO 1" TYPE L COPPER WITH SOLDER FITTINGS.
- 3. ENGINE EXHAUST FLEX FURNISHED WITH GENERATOR RENOVATION.
- 4. ALL CHARGE AIR TUBING FLEX CONNECTIONS 4" HIGH TEMPERATURE DOUBLE HUMP SILICONE TURBO SLEEVES. FASTEN WITH STAINLESS STEEL T-BOLT CLAMPS.
- 5. MAKE CONNECTIONS TO EXHAUST FLEX AND CHARGE AIR COOLER WITH O.D. TUBE BY ANSI 125# STEEL PLATE FLANGES. INSTALL HIGH TEMPERATURE FULL FACE GASKETS. FASTEN WITH PLAIN (BLACK) OR STAINLESS STEEL BOLTS. COAT BOLTS AND FLANGE GASKETS WITH HIGH TEMPERATURE ANTI-SEIZE PRIOR TO ASSEMBLY.



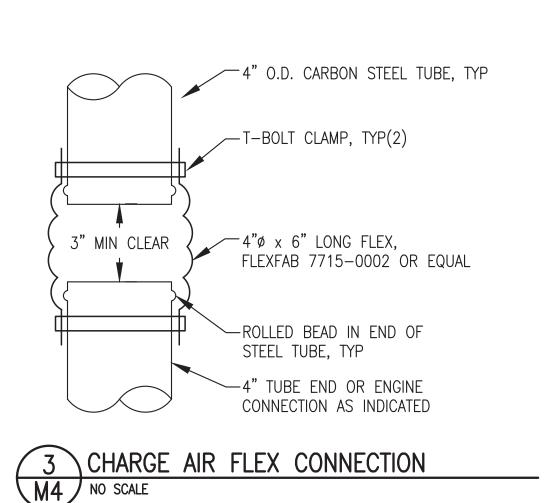
1 GEN #3 EXHAUST, CHARGE AIR TUBING & CRANK VENT PIPE INSTALLATION

M4 3/4"=1'0"



2 CHARGE AIR TUBING WALL PENETRATION

M4 NO SCALE



-SUPPORT FROM TRUSS MEMBER OR ANGLE ABOVE SUPPORT FROM STRUT ABOVE DOUBLE NUT, TYP(3) └─HANGER — \sim 3/8" ROD, TYP OPTIONS — 4"O.D. TUBING CLAMP, B-LINE B2016 OR EQUAL STANDARD OR DOUBLE STRUT, LENGTH AS REQUIRED

-3/8" HEX NUT & HEAVY

WASHER, TYP(2)

4 CHARGE AIR TUBE TRAPEZE HANGER M4 NO SCALE

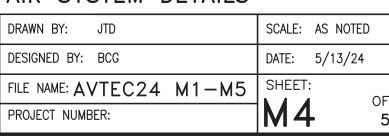
> ISSUED FOR CONSTRUCTION PROJECT: MAY 2024

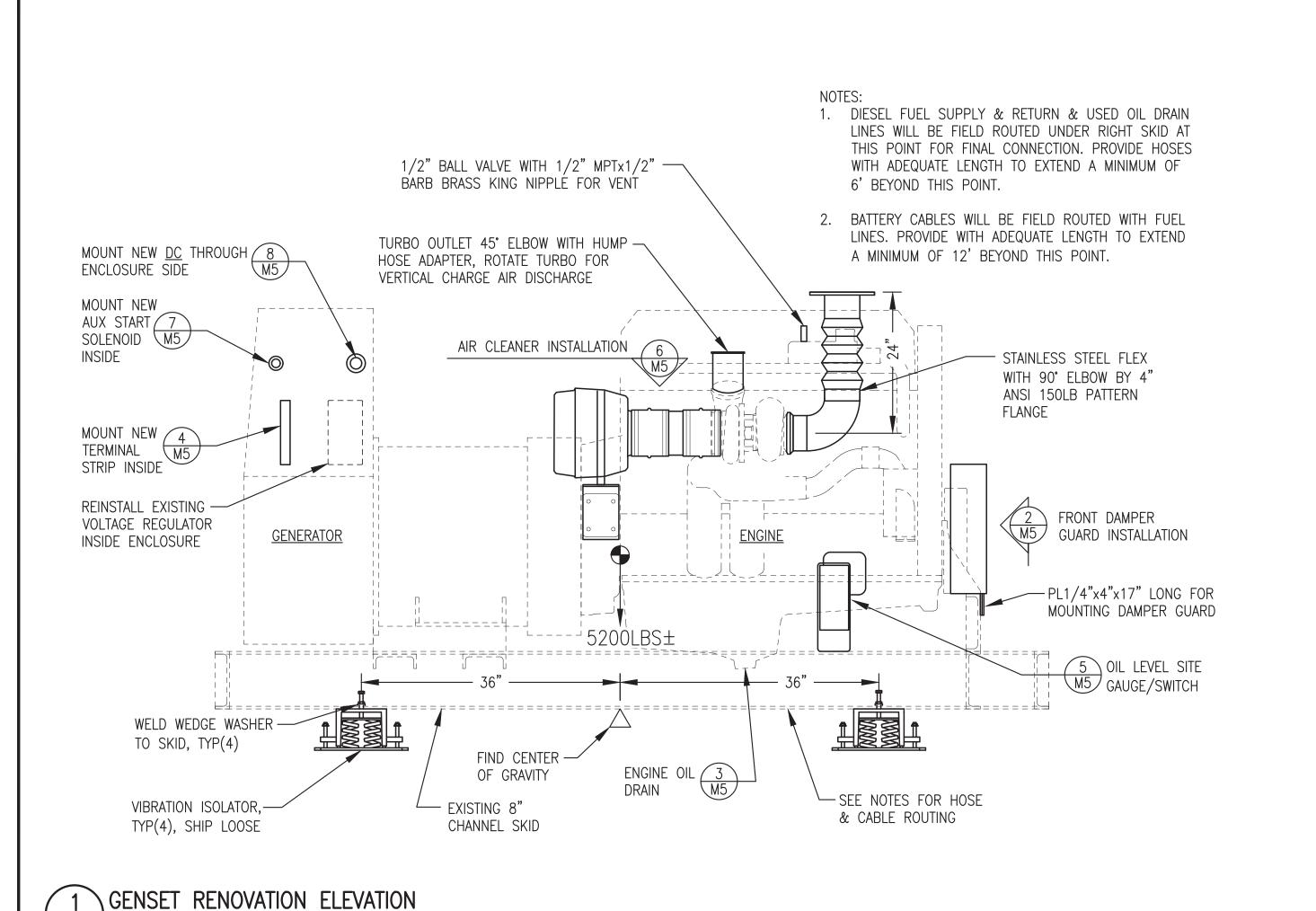


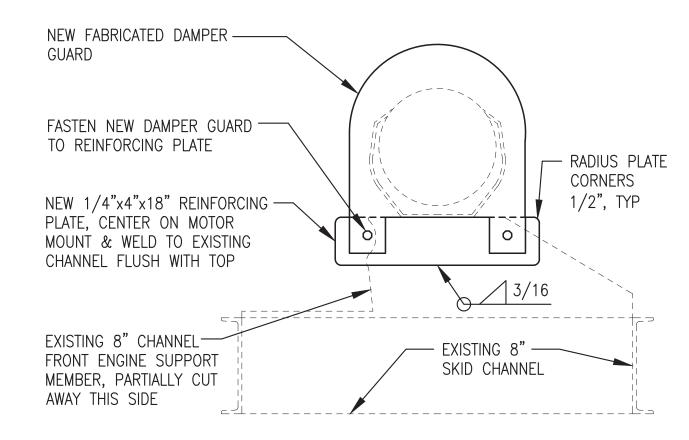
GEN#3 REPLACEMENT

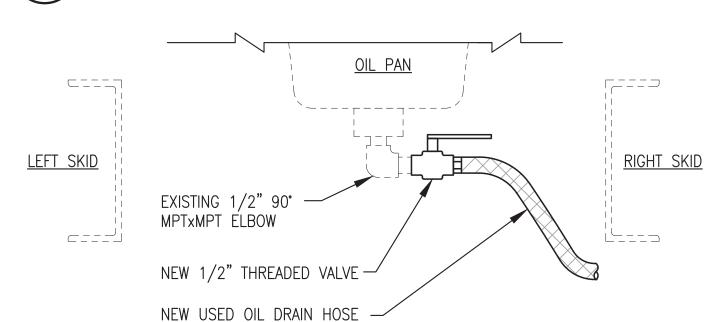
NEW CHARGE AIR SYSTEM DETAILS DRAWN BY: JTD









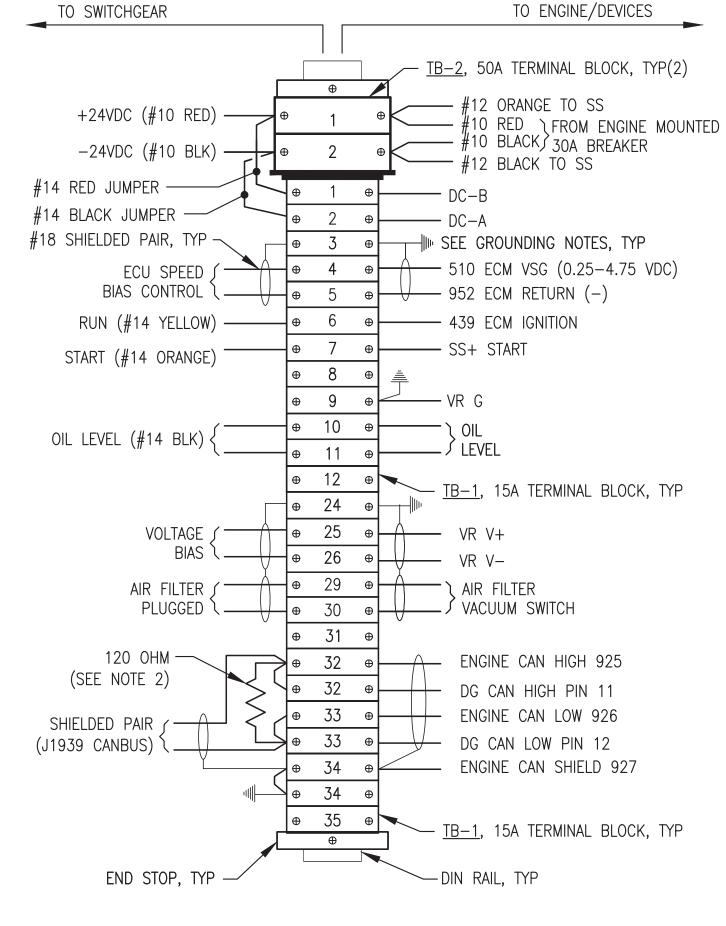


FRONT DAMPER GUARD INSTALLATION

M5 NO SCALE

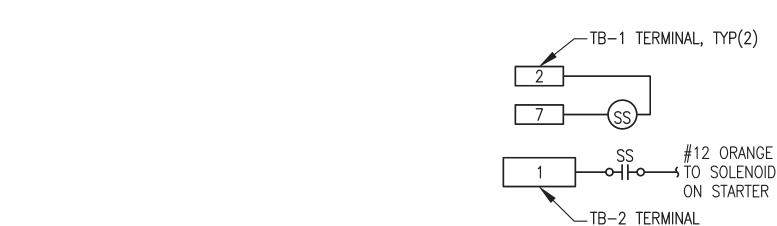
3 ENGINE OIL DRAIN

M5 NO SCALE

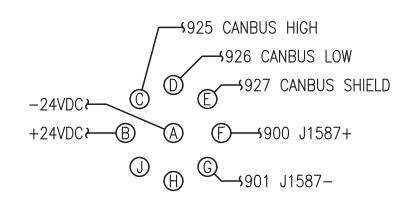


NOTE: TYPICAL JOHN DEERE ECU CONNECTION NUMBERS SHOWN. SEE WIRING HARNESS FOR EACH ENGINE FOR ACTUAL ECU CONNECTIONS.





SS NOTE: PROVIDE ONE EACH JOHN DEERE MODEL AT145341 STARTER AUXILIARY SOLENOID, 24V.



PROVIDE ONE EACH DEUTSCH MODEL HD10-9-1939P 9-PIN, CAN-BUS DIAGNOSTIC CONNECTOR WITH OPTIONAL HD18-009 STRAIN RELIEF, HDC16-9 DUST CAP, HD10-9-GKT GASKET, AND JDL062397 LANYARD.







BRIAN C. GRAY ME 8210



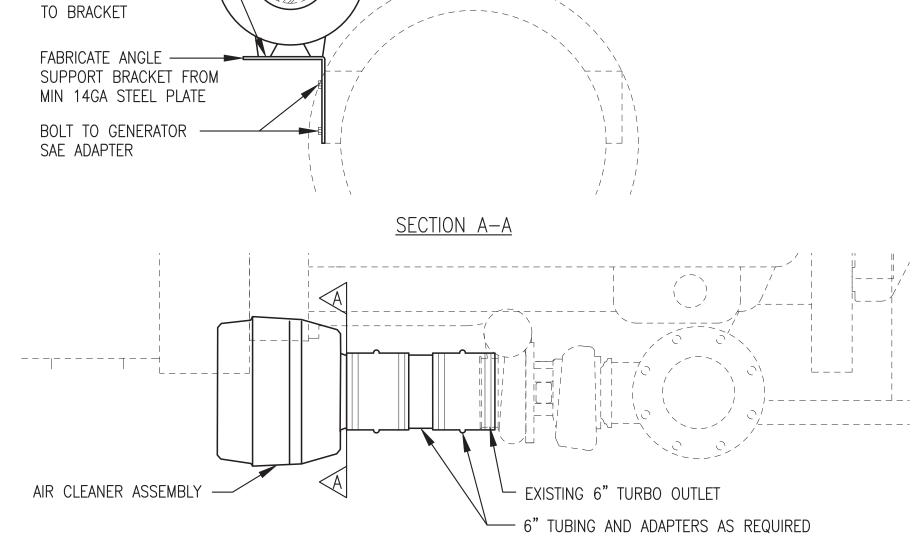
CONSTRUCTION PROJECT: MAY 2024 AVTEC POWER PLANT TRAINING FACILITY 2024 UPGRADE

GEN#3 REPLACEMENT

OWNER FURNISHED GENSET RENOVATION DETAILS Gray **Stassel** Engineering, Inc.

P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD SCALE: AS NOTED DESIGNED BY: BCG DATE: 5/13/24 FILE NAME: AVTEC24 M1-M5 SHEET: M5 PROJECT NUMBER: 5/10/24



AIR CLEANER INSTALLATION $M5 / 2^{n} = 1' - 0$

6" TUBING & ADAPTERS —

AS REQUIRED

BOLT AIR CLEANER -

MOUNTING FEET

·LEVEL GAUGE/ - SWITCH, SEE NOTE 2 3 & 5

M5 1"=1'-0"

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.

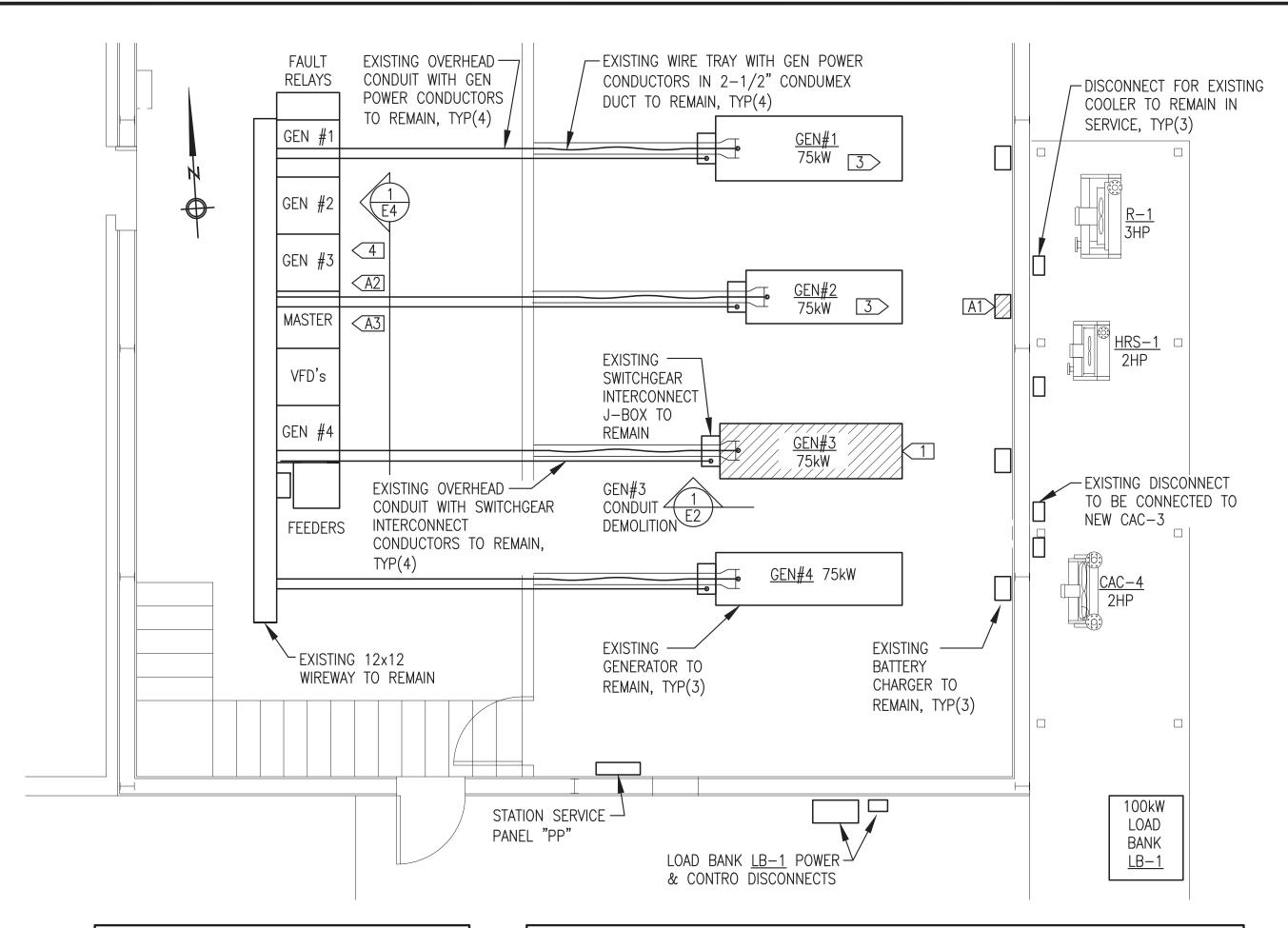
4) CONNECT TOP (VENT) PORT TO ENGINE CRANK CASE WITH HOSE. ROUTE UPPER HOSE WITH HIGH POINT 4" MIN ABOVE TOP OF FLOAT SWITCH.

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.

LEVEL GAUGE/SWITCH INSTALLATION

NOTES 3 & 4

<u>PLAN VIEW</u>



DEMOLITION GENERAL NOTES:

- 1) SEE MECHANICAL PLANS FOR ADDITIONAL DEMOLITION WORK.
-) ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR DEMOLITION. EQUIPMENT TO BE REMOVED SHOWN HATCHED
- 3) ENSURE ALL EQUIPMENT AND CIRCUITS ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL CIRCUIT BREAKERS AND DISCONNECTS.
- 4) TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO GENERATOR AND TO SWITCHGEAR COMPONENTS BEING REMOVED DURING DEMOLITION. TURN ALL REMOVED EQUIPMENT OVER TO AVTEC FOR FINAL DISPOSITION.

DEMOLITION SPECIFIC NOTES:

- 1 REMOVE EXISTING GEN#3 IN ITS ENTIRETY, SEE MECHANICAL. DISCONNECT EXISTING POWER CONDUCTORS FROM GENERATOR LEAVING EXISTING LUGS CONNECTED. COIL AND SECURE IN PROTECTED LOCATION FOR REUSE. EXISTING J-BOX AND INTERCONNECT WIRING BETWEEN J-BOX AND SWITCHGEAR TO REMAIN FOR REUSE. ALL EXISTING WIRING BETWEEN J-BOX AND GENERATOR TO BE DEMOLISHED. SEE SHEET E2 FOR MODIFICATIONS TO EXISTING WIRE TRAY AND CONDUMEX DUCT.
- 2 SEE NEW WORK
- 3 REMOVE EXISTING VDO OIL PRESSURE AND JACKET WATER TEMPERATURE SENDING UNITS FOR REPLACEMENT WITH NEW UNITS COMPATIBLE WITH XM-500 IN SWITCHGEAR.
- 4 > REMOVE EXISTING SWITCHGEAR COMPONENTS AND WIRING AS REQUIRED FOR UPGRADES. SEE SHEET E4.
- A1> REMOVE EXISTING FAILED GEN#2 BATTERY CHARGER. EXISTING BATTERIES, 120VAC CONDUCTORS, AND 24VDC CONDUCTORS TO REMAIN.
- A2> SEE NEW WORK NOTES.
- A3> REMOVE EXISTING DEVICENET I/O SYSTEM FROM SWITCHGEAR, SEE SPECIFICATIONS.

NEW WORK GENERAL NOTES:

FAULT

RELAYS

_ _ _ _ _ _ _

GEN #2

GEN #3

ļ----

VFD's

 \vdash - - - -

GEN #4

FEEDERS

 \vdash \bot \bot

| MASTER | <A3

r - + - - - - - -

-) SEE MECHANICAL PLANS FOR ADDITIONAL NEW WORK.
-) EXISTING EQUIPMENT TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES. NEW EQUIPMENT TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
- 3) OUTLINE OF MAJOR NEW WORK TASKS SHOWN ONLY THIS SHEET. SEE NEW WORK PLANS, ELEVATIONS, AND DETAILS SHEETS E2-E4 FOR ADDITIONAL DETAILS.

NEW WORK SPECIFIC NOTES:

GEN#3 NEW

1 > INSTALL OWNER FURNISHED GEN#3, SEE MECHANICAL. PROVIDE NEW LT FLEX CONDUIT AND RE-CONNECT EXISTING POWER CONDUCTORS TO NEW GENERATOR USING EXISTING LUGS. PROVIDE NEW LT FLEX CONDUIT WITH NEW INTERCONNECT CONDUCTORS FROM J-BOX TO NEW GENERATOR. SEE SHEET E2 FOR DETAIL.

| | - -

2 INSTALL OWNER FURNISHED CAC-3, SEE MECHANICAL. PROVIDE NEW LT FLEX CONDUIT WITH NEW CONDUCTORS FROM EXISTING DISCONNECT TO CAC-3 MOTOR.

75kW 3

<u>GEN#2</u> 75kW

OWNER FURNISHED

<u>GEN#3</u> 75kW

GEN#3 NEW

GROUNDING $\frac{3}{\sqrt{52}}$

3 PROVIDE NEW TWO-WIRE UNGROUNDED OIL PRESSURE AND JACKET WATER TEMPERATURE SENDING UNITS: 0-100 PSI RANGE, 1/8" NPT CONNECTION, MURPHY ES2P-100 P/N: 05701858 AND 100-250F RANGE, 1/2" NPT CONNECTION, MURPHY ES2T-250-1/2 P/N: 10702013, OR APPROVED EQUAL

TITLE:

- 4 PROVIDE NEW SWITCHGEAR COMPONENTS AND WIRING AS REQUIRED FOR UPGRADES. SEE SHEET E4 AND SPECIFICATIONS.
- A1> PROVIDE NEW GEN#2 BATTERY CHARGER AND RECONNECT TO EXISTING 120VAC AND 24VDC CONDUCTORS.
- A2> PROVIDE NEW SCADA SYSTEM ON SWITCHGEAR, SEE SPECIFICATIONS.
- A3> PROVIDE NEW POINT I/O SYSTEM IN SWITCHGEAR, SEE SPECIFICATIONS.

1 DEMOLITION PLAN

\NEW WORK PLAN $E1 \int 1/4^n = 1' - 0^n$

ELECTRICAL CONDUCTOR SCHEDULE				ELECTRICAL CONDUCTOR GENERAL NOTES
SERVICE/FUNCTION	DESCRIPTION	MFR.	SPECIFIC NOTES:	1) GROUNDING — PROVIDE A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT
GENERAL USE CONDUCTORS				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
SHIELDED/TWISTED INSTRUMENT CONDUCTORS			GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.	ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. 2) COLOR CODING FOR NO. 6 AWG AND SMALLER CONDUCTORS SHALL BE BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION.
COLOR CODING — UNLESS SPECIFICALLY INDICATED OTHERWISE COLOR CODE CONDUCTORS AS FOLLOWS:				3) COLOR CODING FOR CONDUCTORS LARGER THAN NO. 6, SHALL BE BY:
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 A - BLACK PHASE B - RED PHASE C - BLUE NEUTRAL - WHITE		CONTROL & INSTRUMENT CONDUCTOR COLOR CODED PER MANUFACTURER'S STANDARD	A) CONTINUOUS COLOR EMBEDDED IN THE INSULATION, OR B) BLACK CABLE WITH SCOTCH 35 OR APPROVED EQUAL MARKING (PHASE) TAPE. AT EVERY ACCESSIBLE LOCATION A MINIMUM 3" LONG SECTION OF CONDUCTOR SHALL BE SPIRAL WRAPPED. NOTE THAT PHASE TAPE MAY NOT BE USED ON COLORED CABLE, BLACK CABLE ONLY.	



大 49世 ***

CLOIS W. VERSYP



OWNER 2 FURNISHED

লাইটিঃ DISCONNECT

CAC-4 2HP

<u>CAC-3</u> 2HP

-3/4"LT FLEX, 3#12,

#12G FROM EXISTING

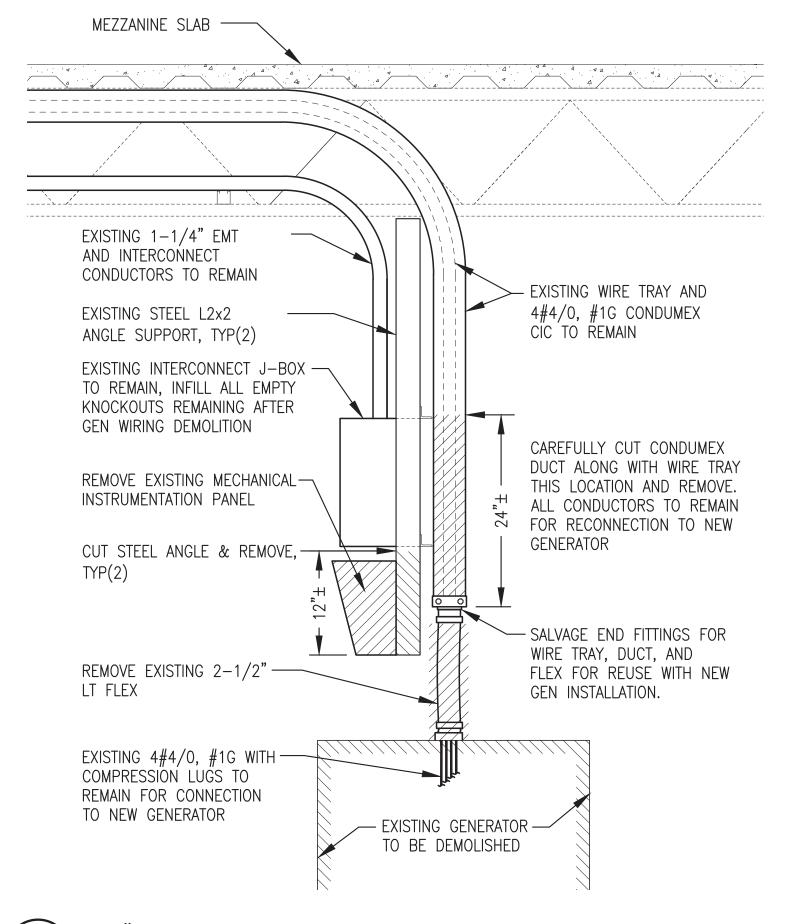
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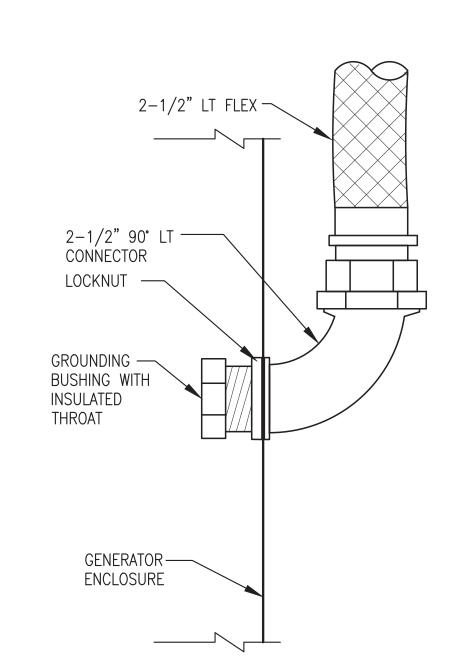
DEMOLITION & NEW WORK PLANS



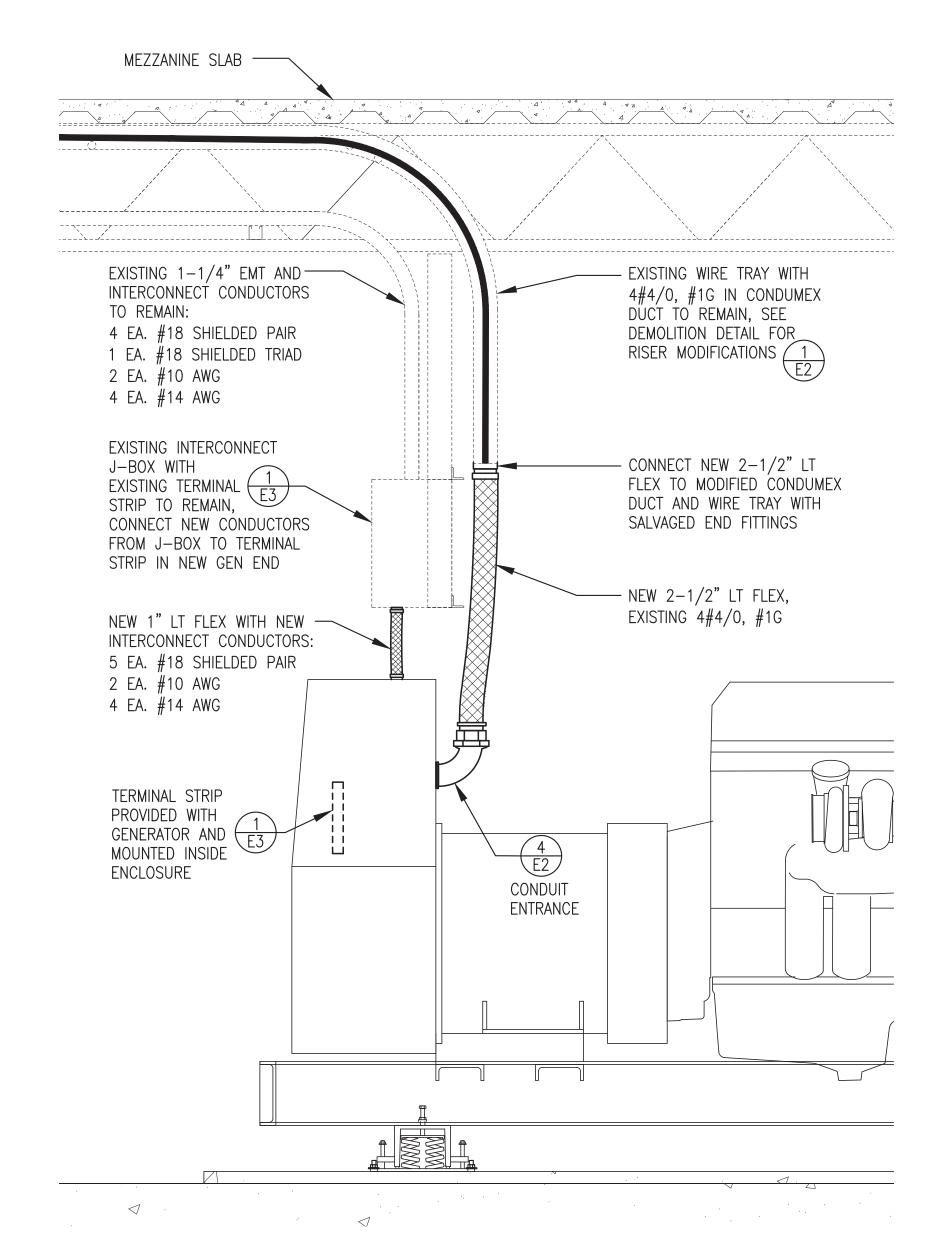
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 5/13/24
FILE NAME: AVTEC24 E1-E4	SHEET:
PROJECT NUMBER:	E 1



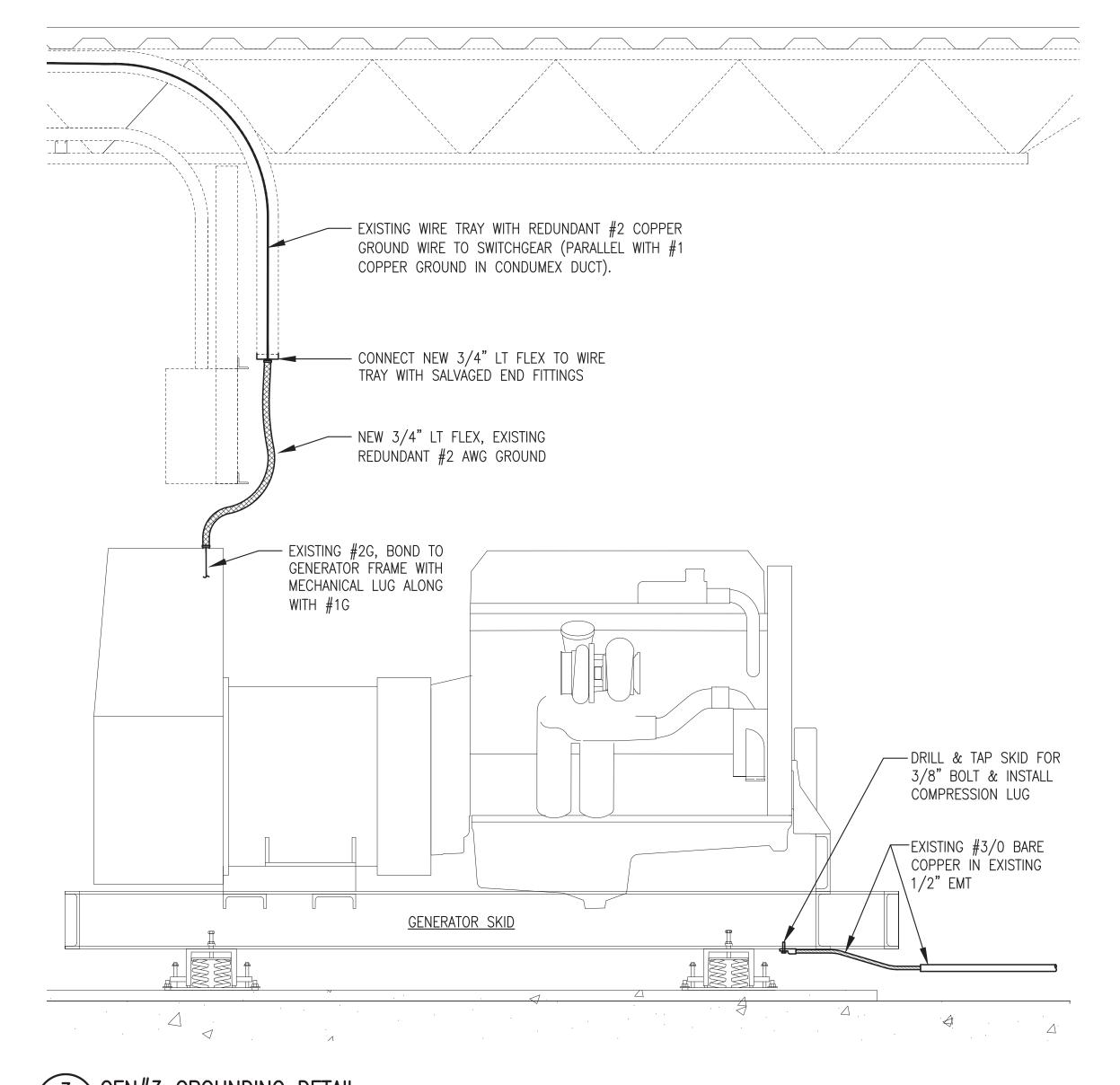
1 GEN#3 FEEDER RISER DEMOLITION E2 1"=1'-0"



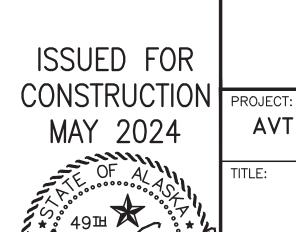
4 GEN#3 CONDUIT ENTRANCE
E2 NO SCALE



2 GEN#3 WIRING ELEVATION E2 1"=1'-0"



3 GEN#3 GROUNDING DETAIL E2 1"=1'-0"





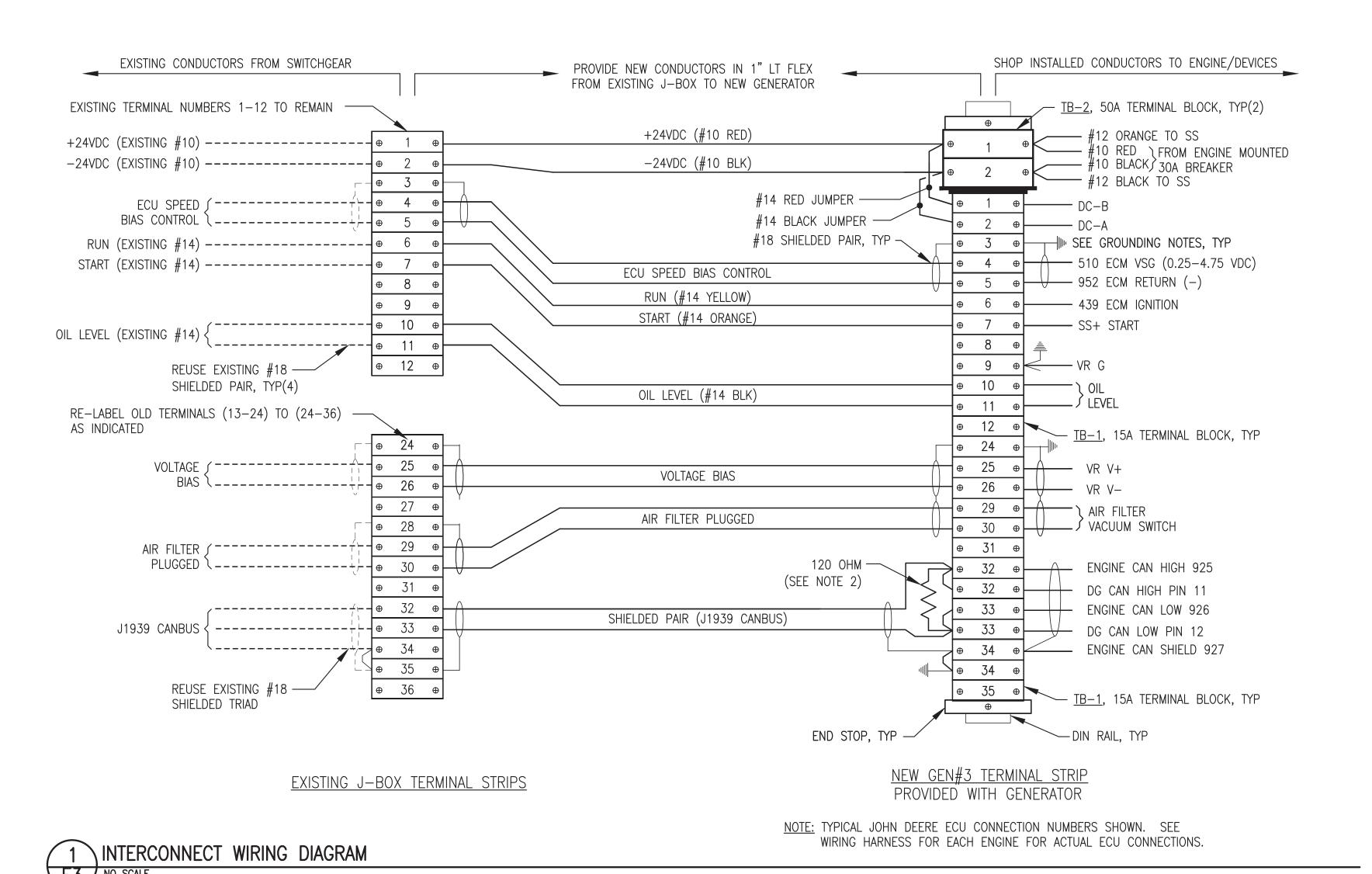
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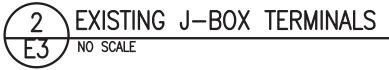
AVTEC POWER PLANT TRAINING FACILITY 2024 UPGRADE

GEN#3 INSTALLATION DETAILS



DRAWN BY: JTD	SCALE: NO SCALE	
DESIGNED BY: CWV/BCG	DATE: 5/13/24	
FILE NAME: AVTEC24 E1-E4	SHEET:	OF
PROJECT NUMBER:	E2	4





EXISTING CONDUCTORS FROM SWITCHGEAR TO BE

REUSED AND/OR REASSIGNED AS INDICATED, TYP

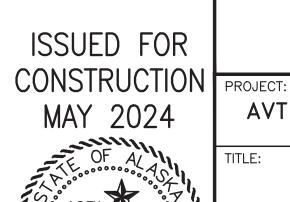
MOVE TERMINALS 1-12
AS FAR LEFT AS POSSIBLE
TO PROVIDE ADDITIONAL
SPACE ON LEFT SIDE OF

EXISTING CONDUCTORS TO

BE DEMOLISHED WITH OLD

GENERATOR, TYP

TERMINALS 24-36.





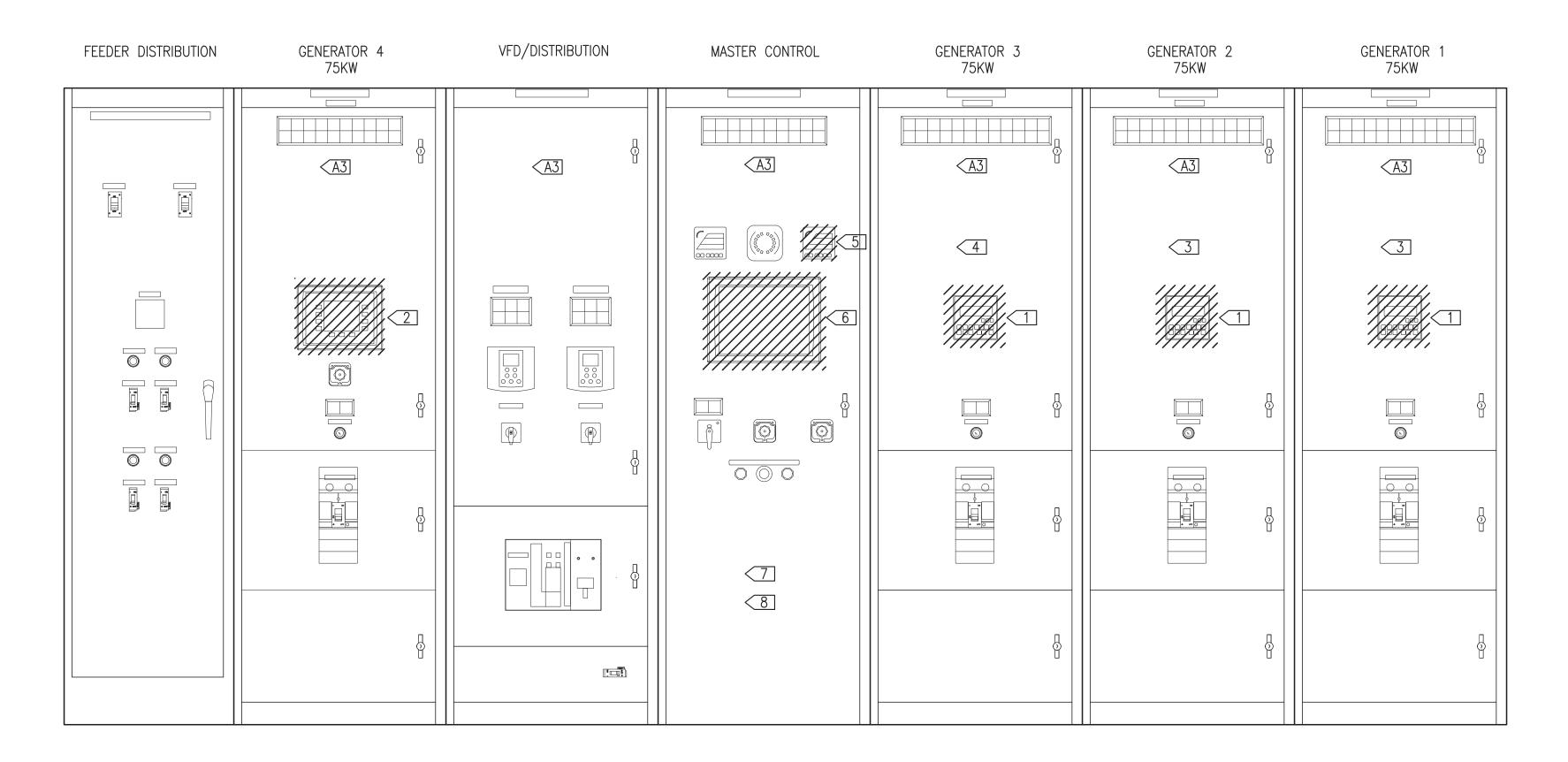
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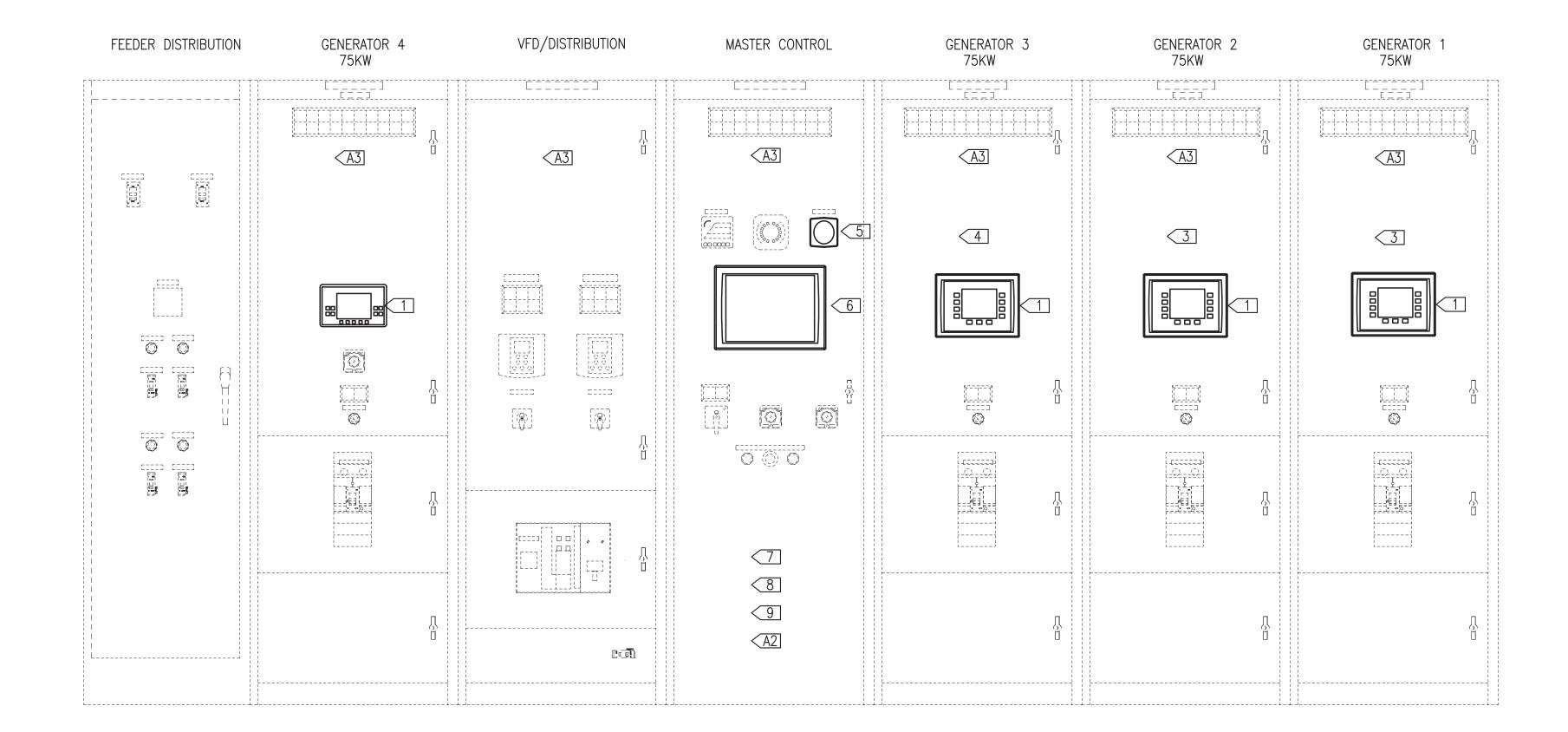
GEN#3 INTERCONNECT WIRING DIAGRAM



DRAWN BY:	JTD	SCALE:	NO SCALE
DESIGNED BY:	CWV/BCG	DATE:	5/13/24
FILE NAME: A	VTEC24 E1-E4	SHEET	:
PROJECT NUME	BER:	<u> </u>	



1 SWITCHGEAR DEMOLITION ELEVATION E4 NO SCALE



2 SWITCHGEAR NEW WORK ELEVATION E4 NO SCALE

SWITCHGEAR MODIFICATION GENERAL NOTES:

- 1) THIS DRAWING ONLY SHOWS A HIGH LEVEL OVERVIEW OF SWITCHGEAAR MODIFICATIONS. SEE SPECIFICATIONS FOR DETAIL ON NEW EQUIPMENT, DEVICES, WIRING, PROGRAMMING, ETC.
- 2) ALL SWITCHGEAR ENCLOSURES, BUSWORK, WIRING, AND DEVICES TO REMAIN UNLESS SPECIFICALLY INDICATED FOR REMOVAL OR REPLACEMENT. EXISTING EQUIPMENT AND DEVICES TO BE REMOVED INDICATED BY HATCHING DEMOLITION ELEVATION.
- 3) EXISTING EQUIPMENT AND DEVICES TO REMAIN INDICATED BY LIGHT DASHED LINES ON NEW WORK ELEVATION.
- 4) 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.
- 5) SEE SHEET E3 FOR NEW GEN#3 ENGINE-GENERATOR INTERCONNECT WIRING.

SWITCHGEAR MODIFICATION SPECIFIC NOTES:

- 1> REMOVE EXISTING GEN#1, GEN#2, AND GEN#3 GCP CONTROLLER AND REPLACE WITH NEW EASYGEN CONTROLLER.
- 2 REMOVE EXISTING GEN#4 EASYGEN CONTROLLER AND REPLACE WITH NEW COMAP CONTROLLER. PROVIDE BEZEL OR COVER PLATE AS REQUIRED TO INFILL LARGER CUTOUT FROM OLD EASYGEN.
- 3 ON GEN#1 AND GEN#2 PROVIDE NEW XM500 I/O MODULE FOR INTERFACE WITH NEW ENGINE SENSORS.
- 4 ON GEN#3 REMOVE EXISTING WOODWARD 8290 SPEED CONTROLLER AND RECONNECT FOR ELECTRONIC CONTROL.
- 5 REMOVE EXISTING MASTER SECTION SATEC BUS METER AND REPLACE WITH NEW SHARK BUS METER. PROVIDE BEZEL OR COVER PLATE AS REQUIRED TO INFILL LARGER CUTOUT FROM OLD METER.
- 6 REMOVE EXISTING MASTER SECTION OPERATOR INTERFACE UNIT (OIU) AND REPLACE WITH NEW MODEL.
- 7> REMOVE EXISTING MASTER SECTION DATA SERVER AND REPLACE WITH NEW.
- 18 > REMOVE EXISTING MASTER SECTION PLC AND REPLACE WITH NEW.
- 9 > PROVIDE DIODE BRIDGE AND WIRING FOR ENGINE BATTERY BACKUP 24VDC CONTROL POWER.
- A2> PROVIDE NEW IGNITION SCADA SOFTWARE ON NEW PLC.
- A3> REMOVE ALL EXISTING DEVICENET COMMUNICATION MODULES AND REPLACE WITH NEW POINT I/O ETHERNET COMMUNICATION MODULES IN GENERATOR, MASTER, AND VFD/DISTRIBUTION SECTIONS.



CLOIS W. VERSYP



ALASKA ENERGY AUTHORITY

AVTEC POWER PLANT TRAINING FACILITY 2024 UPGRADE

SWITCHGEAR MODIFICATIONS



FRONT ELE	VATIONS & NOTES		
	DRAWN BY: JTD	SCALE:	NO SCALE
	DESIGNED BY: CWV/BCG	DATE:	5/13/24
eering, Inc.	FILE NAME: AVTEC24 E1-E4	SHEET	: OF
99511 (907)349-0100	PROJECT NUMBER:	E4	4

LEGEN	ID
M	BUTTERFLY VALVE
	BALL VALVE
1	CHECK VALVE
	HOSE END DRAIN VALVE
⋈	GAUGE COCK
Ů	AUTOMATIC AIR VENT
\bigcirc	THERMOMETER
\mathbb{P}	PRESSURE GAUGE
	TEMPERATURE SENSOR
$\sim\sim$	FLEXIBLE CONNECTOR
$\dashv\vdash$	FLANGED JOINT
	UNION
о —	ELBOW TURNED UP
с <u>.</u>	ELBOW TURNED DOWN
—	PIPING CONNECTION (TEE)
—	CHANGE OF PIPE SIZE
	DIRECTION OF FLOW

ABBF	REVIATIONS
ø	DIAMETER (PHASE)
Α	AMPS
AFF	ABOVE FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
DFR	DIESEL FUEL RETURN
DFS	DIESEL FUEL SUPPLY
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
ECR	ENGINE COOLANT RETURN
ECS	ENGINE COOLANT SUPPLY
FPT	FEMALE PIPE THREAD
GA	GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
GRC	GALVANIZED RIGID CONDUIT
HP	HORSEPOWER
HRR	HEAT RECOVERY RETURN
HRS	HEAT RECOVERY SUPPLY
ID	INSIDE DIAMETER
KW	KILOWATT
LT	LIQUID TIGHT
LWT	LEAVING WATER TEMPERATURE MAXIMUM
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM
MPT	MALE PIPE THREAD
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OC	ON CENTER
OD OD	OUTSIDE DIAMETER
PRV	PRESSURE RELIEF VALVE

PSI POUNDS/PER SQUARE INCH

TDH TOTAL DEVELOPED HEAD

WPD WATER PRESSURE DROP

PSID PSI DIFFERENTIAL

UOR USED OIL RETURN

PSIG PSI GAUGE

SCH SCHEDULE

TYP TYPICAL

V VOLTS W WATTS

WG WATER GAUGE

ENGINE	COOLANT EQ	UIPMENT SCHEDULE
R-1	ENGINE COOLANT RADIATOR	SINGLE PASS, VERTICAL CORE, 3" FLANGED CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 3 HP, 208V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO. AEA CUSTOM MODIFIED YOUNG RADIATOR SN# 3000428
HRS-1	HEAT RECOVERY DUMP LOAD RADIATOR	SINGLE PASS, VERTICAL CORE, 2" FLANGED CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 2 HP, 208V, 3 PH, MOTOR. AEA CUSTOM MODIFIED YOUNG RADIATOR.
CAC-3	GEN #3 CHARGE AIR COOLER	SINGLE PASS, VERTICAL ALUMINUM CORE, 4" FLANGED TOP CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 2 HP, 208V, 3 PH, MOTOR. AEA CUSTOM MODIFIED GENERAL THERMODYNAMICS PART # 4507 TBAR C4C W/STEEL(B)[L/X].
CAC-4	GEN #4 CHARGE AIR COOLER	SINGLE PASS, VERTICAL ALUMINUM CORE, 3" FLANGED TOP CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 2 HP, 208V, 3 PH MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO. AEA CUSTOM MODIFIED DIESEL RADIATOR PART # DR3150-40.
TV-1	COOLANT THERMOSTATIC VALVE	2-1/2" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS, 185F NOMINAL TEMPERATURE, AMOT 2-1/2BOCF18001.
HX-1	POWER PLANT HEAT EXCH.	316 SS PLATES, ALL BRAZED CONSTRUCTION, 1-1/2" NPT PORTS, 120 MBH MIN CAPACITY. AMERIDEX SL-70-70 OR EQUAL. PRIMARY: 20 GPM 195F EWT (50% ETHYLENE) 1.7 PSI MAX WPD, SECONDARY: 20 GPM 177F LWT (50% PROPYLENE) 1.7 PSI MAX WPD
ET-1	COOLANT EXP. TANK	EXISTING 33 GALLON CAPACITY STEEL TANK
ET-2	HEAT RECOV. EXP. TANK	BLADDER TYPE EXPANSION TANK, 4.4 GALLON TANK VOL, 100 PSIG WORKING PRESSURE, 12 PSIG PRE-CHARGE. AMTROL EX-30 OR EQUAL.
P-HR1 P-HR2	HEAT RECOV. PRIM & SEC CIRC PUMPS	20 GPM AT 9' TDH, 1/12HP, 115V, 1ø. GRUNDFOS UP 26-64F, NO SUBSTITUTES, WITH GASKETS, & BOLTS.

FUEL/	FUEL/OIL EQUIPMENT SCHEDULE		
P-DF1	DAY TANK FILL PUMP	EXISTING 3/8" OBERDORFER 991-32	
P-U01	USED OIL DRAIN PUMP	EXISTING 3/8" OBERDORFER 991-G1	
HAND PUMP	GLYCOL & DIESEL	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE. GPI MODEL HP-100 NO SUBSTITUTES.	

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

10"x14"x0.08" ALUMINUM, 3/16" HOLES IN ALL FOUR CORNERS. WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, COLOR AS INDICATED, ONE SIDE ONLY. DECALS SIMILAR, NO ALUMINUM BACK PLATE. WARNING LITES OR EQUAL.

WARNING SIGNS - RED LETTERS ON WHITE BACKGROUND.

- 1 "DANGER FLAMMABLE, NO SMOKING" (3" HIGH 1/2" STROKE LETTERS-24"x18")
- 2 "ATTACH STATIC WIRE AND VERIFY TANK CAPACITY PRIOR TO FILLING TANK"
- 10 "CAUTION: THIS UNIT STARTS AUTOMATICALLY, LOCK & TAG OUT PRIOR TO SERVICE"
- 11 "DANGER HIGH VOLTAGE, AUTHORIZED PERSONNEL ONLY"
- 12 "CAUTION HEARING & EYE PROTECTION REQUIRED"
- 13 "FUEL OIL DAY TANK ALARM"
- 14 "IN CASE OF FUEL SPILL CALL DEC 1-800-478-9300"
- 15) not used

INFORMATIONAL PLACARDS - BLACK LETTERS ON WHITE BACKGROUND.

- 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 AT INTERMEDIATE TANK USING A WRENCH
 - 3) OPEN NORMALLY CLOSED VALVE BY HAND PUMP
 - 4) OPERATE HAND PUMP WHILE MONITORING LEVEL GAUGE"
- 4) OPERATE HAND PUMP WHILE MONITORING LEVEL
- [17] "TO CHANGE ENGINE OIL:
 - 1) LOCK & TAG GENERATOR OUT OF SERVICE
 - 2) OPEN NORMALLY CLOSED DRAIN VALVE AT GEN
 - 3) TURN ON PUMP TIMER & PUMP OUT ENGINE OIL
 - 4) CHANGE FILTER
 - 5) CLOSE DRAIN VALVE & REFILL ENGINE
 - 6) RUN ENGINE, SHUT OFF, & CHECK DIPSTICK
 - 7) TOP OFF & PLACE ENGINE BACK IN SERVICE"
- 18 not used
- 19 TANK IS EQUIPPED WITH FILL LIMITER TO SHUT OFF FUEL AT 3'-5" "

INSTALLATION — SECURE EACH SIGN TO WALL OR DOORS WITH STAINLESS STEEL SCREWS.

NOTE: SEE FIRE SUPPRESSION PLANS AND SPECIFICATIONS FOR ADDITIONAL PLACARDS TO BE PROVIDED WITH FIRE SUPPRESSION SYSTEM. INSTALL ALL SIGNS AS INDICATED.

PIPE/TUBING STRUT CLAMP SCHEDULE PIPE/TUBE CLAMP # PIPE/TUBE CLAMP # NOTES: I) ALL CLAMP NUMBERS 1/2" COPPER BVT062 1-1/2" STEEL B2012 ARE B-LINE. EQUIVALENT 3/4" COPPER EQUALS ACCEPTABLE. 2" STEEL BVT087 1" COPPER 2-1/2" STEEL BVT112 B2014 2) ALL COPPER TUBE CLAMPS TO BE 1-1/2" COPPER BVT162 3" STEEL CUSHIONED, 1/2 STEEL B2008 3" O.D. TUBE B2045 VIBRA-CLAMP. 3/4" STEEL 4" O.D. TUBE B2009 B2016 ALL STEEL PIPE AND 1" STEEL TUBE CLAMPS NOT B2010 5" O.D. TUBE B2018 CUSHIONED. 1-1/4" STEEL B2011

VALVE TAG SCHEDULE:

VALVE 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.

GREEN (DIESEL FUEL)

- 21 "NORMALLY OPEN, CLOSE ONLY FOR EMERGENCIES & TEMPORARY MAINTENANCE OF DAY TANK & DEVICES"
- (22) "NORMALLY CLOSED, OPEN ONLY FOR HAND PRIMING DAY TANK"
- $\overline{23}$ not used
- [24] "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ENGINE"

BROWN (USED OIL)

[41] "NORMALLY CLOSED, OPEN ONLY FOR ENGINE OIL CHANGE"

PINK (COOLING/ETHYLENE GLYCOL)

- (51) "NORMALLY CLOSED, OPEN ONLY FOR ADDING COOLANT ETHYLENE GLYCOL ONLY"
- (52) "NORMALLY CLOSED, OPEN ONLY ON HIGH COOLANT TEMPERATURE ALARM"
- [53] "NORMALLY OPEN, CLOSE ONLY ON HIGH COOLANT TEMPERATURE ALARM"
- (54) "NORMALLY OPEN, HEAT RECOVERY SUPPLY"
- 55 "NORMALLY OPEN, HEAT RECOVERY RETURN"

ORANGE (HEAT RECOVERY/PROPYLENE GLYCOL)

(61) "NORMALLY CLOSED. OPEN ONLY FOR ADDING FLUID - PROPYLENE GLYCOL ONLY"

INSTALLATION — SECURE EACH TAG TIGHT TO VALVE, PIPE, OR DEVICE WITH STAINLESS STEEL CABLE TIES OR SAFETY WIRE THROUGH ALL FOUR CORNERS OR FASTEN TO ADJACENT WALL OR SECTION OF STRUT WITH SCREWS.

NOTE: FOR ALL VALVES NOT INDICATED WITH A SPECIFIC FUNCTION TAG PROVIDE 1-1/2"Ø BRASS TAG LABELED "N.O." FOR NORMALLY OPEN VALVES AND 1"Ø BRASS TAG LABELED "N.C." FOR NORMALLY CLOSED VALVES. SECURE TAGS TO VALVE OR ADJACENT PIPE WITH BEADED BRASS CHAIN.

SCHEDULE OF DRAWINGS

MECHANICAL DRAWINGS

- M1 LEGENDS & SCHEDULES
- M1.2 EXTERIOR EQUIPMENT PAD PLANS & DETAILS
- M1.3 EXTERIOR EQUIPMENT SHELTER PLAN & DETAILS
- MECHANICAL SPECIFICATIONS
- M3.1 DEMOLITION & NEW WORK PLANS
- M3.2 EQUIPMENT LAYOUT SECTIONS & ELEVATIONS
- M4 COOLANT & HEAT RECOVERY PIPING PLAN & ISOMETRICS
- M5.1 FUEL PIPING PLAN & DETAILS
- M5.2 FUEL SYSTEM & USED OIL PLAN, PIPING DIAGRAM & DETAILS
- M5.3 FUEL TANK FABRICATION DETAILS
- M5.4 FUEL TANK & ACCESSORIES SPECIFICATIONS
- M6.1 EXHAUST, CHARGE AIR TUBING & CRANK VENT PLAN & DETAILS
- M6.2 EXHAUST & CHARGE AIR TUBING DETAILS



AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITI F:

RECORD DRAWING

THESE DRAWINGS HAVE BEEN PREPARED FROM INFORMATION PROVIDED BY OTHERS & OBSERVATIONS OF THE UNDERSIGNED.

THERE IS NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.

Mulin

DATE: 2-12-16

LEGENDS & SCHEDULES



DRAWN BY: JTD SCALE: NO SCALE

DESIGNED BY: BCG

FILE NAME: AVTEC M1-M6

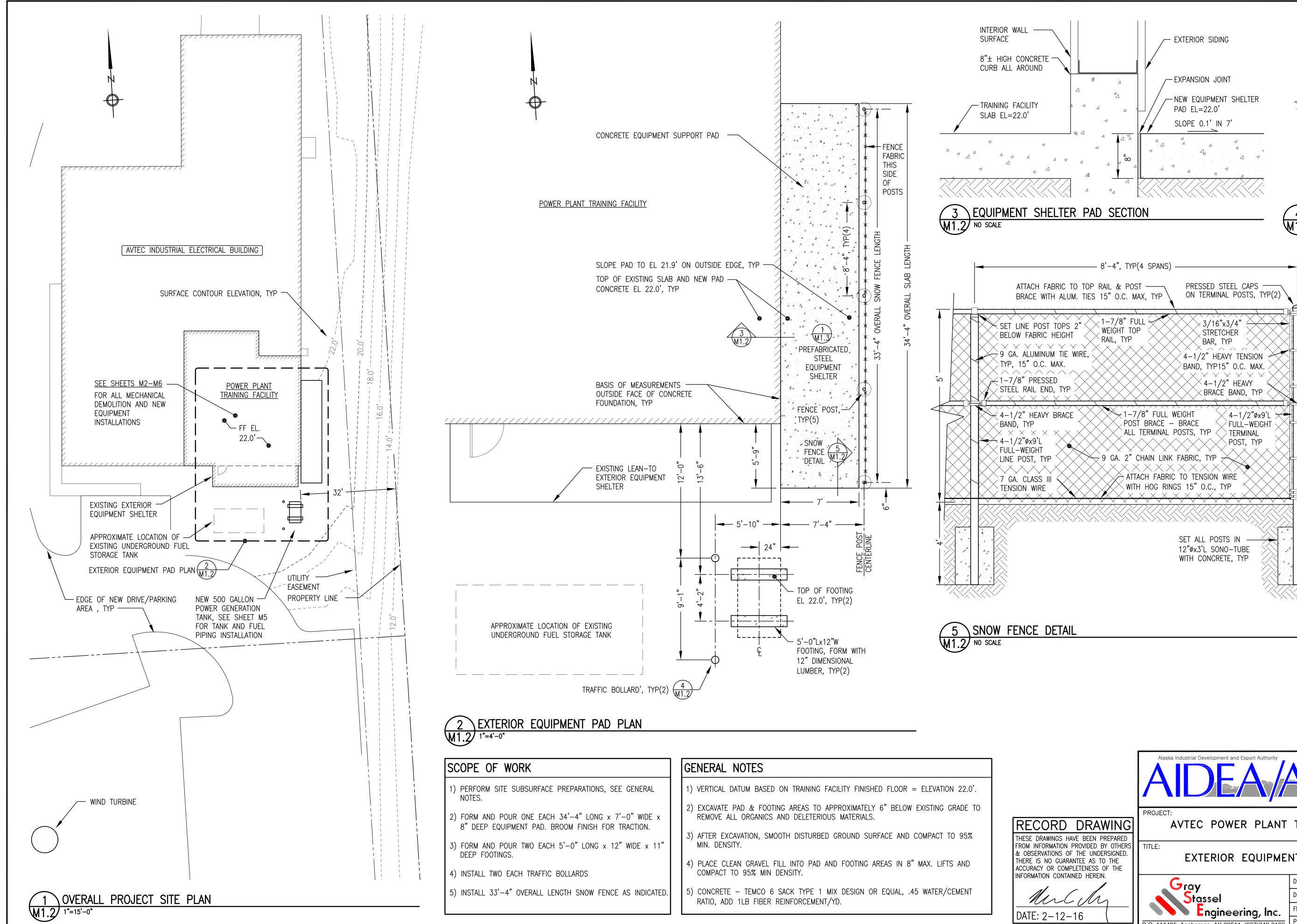
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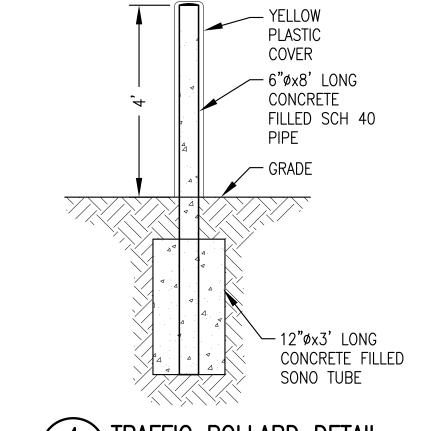
SCALE: NO SCALE

DATE: 6/23/15

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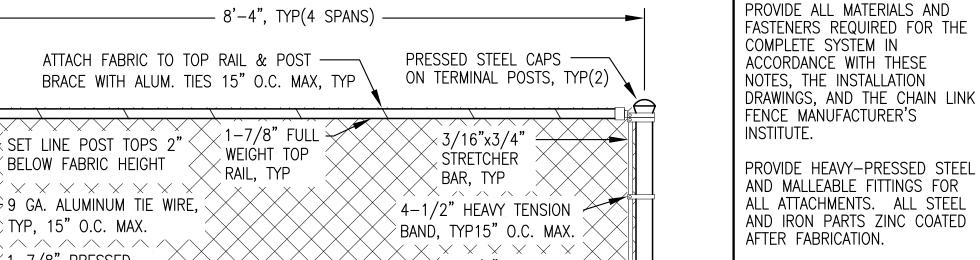
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4 TRAFFIC BOLLARD DETAIL

FENCING NOTES:



INSTALL FENCE IN A WORKMAN-LIKE MANNER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES. POSTS SHALL BE SET VERTICAL AND OF EQUAL HEIGHT. PASS TOP RAIL THROUGH LINE POST TOPS AND JOIN RAIL SECTIONS WITH SLEEVE COUPLINGS. FASTEN TOP RAIL TO TERMINAL POSTS WITH PRESSED STEEL FITTINGS. STRETCH FABRIC TAUT AND SECURELY FASTEN TO TERMINAL POSTS WITH STRETCHER BARS AND FABRIC BANDS AT 15" MAXIMUM INTERVALS. USE CONTINUOUS LENGTHS OF ENSION WIRE BETWEEN TERMINAL POSTS. APPLY SUFFICIENT TENSION TO AVOID SAG BETWEEN POSTS AND TERMINATE TENSION WIRE AT EACH TERMINAL POST. FASTEN FABRIC AT MAXIMUM 15" INTERVALS TO LINE POSTS AND TOP RAIL WITH TIES, AND TO BOTTOM TENSION WIRE WITH HOG RINGS.

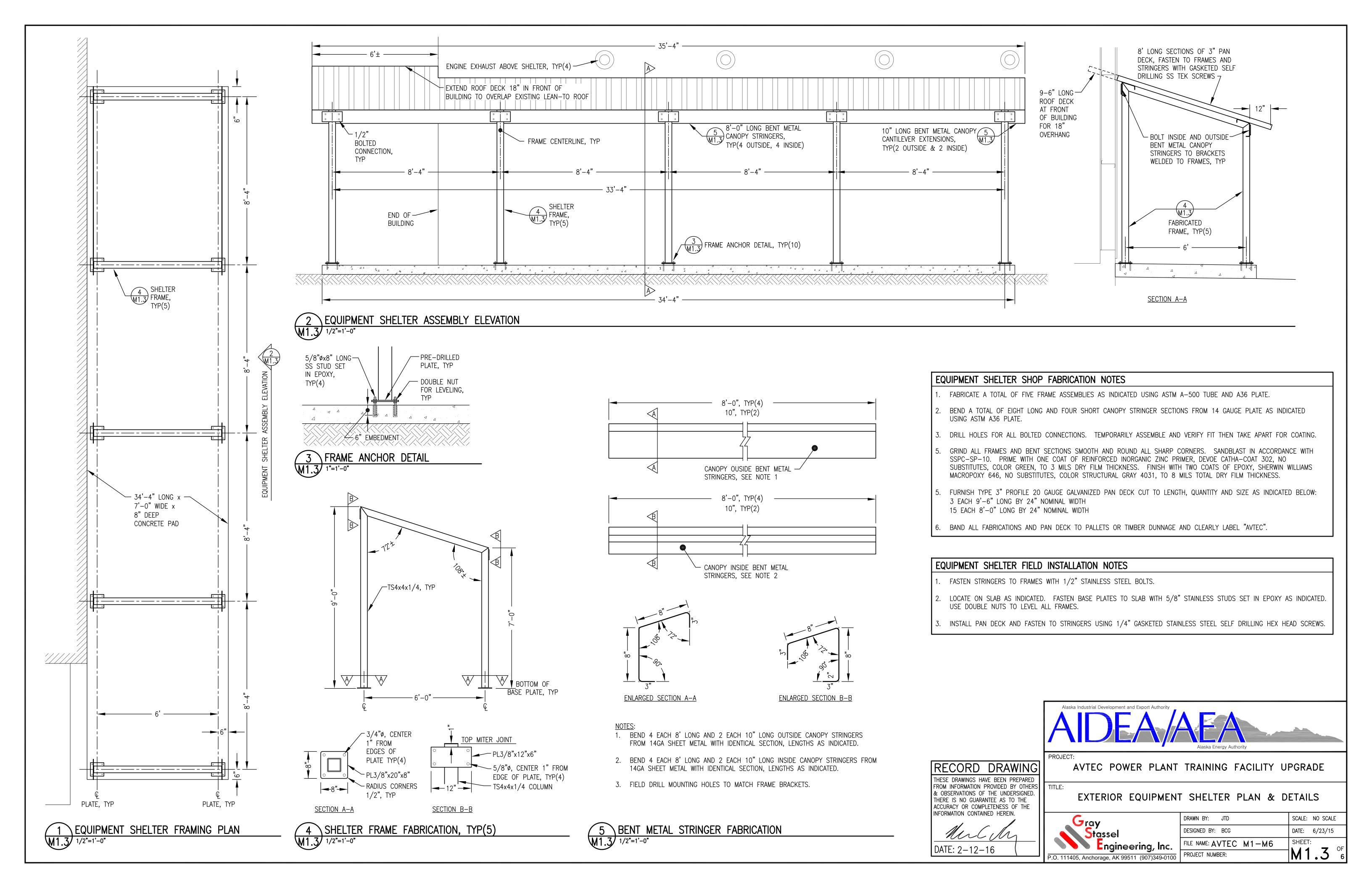


AVTEC POWER PLANT TRAINING FACILITY UPGRADE

EXTERIOR EQUIPMENT PAD PLANS & DETAILS



DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET:
PROJECT NUMBER:	M1.2



** GENERAL CONDITIONS **

PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF THE INTERNATIONAL FIRE CODE AND THE INTERNATIONAL BUILDING CODE INCLUDING STATE OF ALASKA AMENDMENTS. COMPLY WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.

THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.

ALL EQUIPMENT AND MATERIALS SHOWN ARE EXISTING UNLESS SPECIFICALLY INDICATED AS NEW. WHERE ADDITIONAL OR REPLACEMENT ITEMS ARE REQUIRED, PROVIDE LIKE ITEMS BY THE SAME MANUFACTURER TO THE MAXIMUM EXTENT PRACTICAL. INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS, UNLESS INDICATED OTHERWISE.

PROTECT ALL MATERIALS AND EQUIPMENT DURING THE ENTIRE DURATION OF CONSTRUCTION WORK AGAINST CONTAMINATION OR DAMAGE. REPLACE OR REPAIR TO ORIGINAL MANUFACTURED CONDITION ANY ITEMS DAMAGED DURING CONSTRUCTION. IMMEDIATELY REPORT TO THE ENGINEER ANY ITEMS FOUND DAMAGED PRIOR TO COMMENCING CONSTRUCTION.

PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN SAID WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

DO NOT CUT. DRILL. OR NOTCH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. MINIMIZE PENETRATIONS AND DISRUPTION OF BUILDING FEATURES. WHERE PREVIOUSLY COMPLETED BUILDING SURFACES OR OTHER FEATURES MUST BE CUT. PENETRATED, OR OTHERWISE ALTERED, SUCH WORK SHALL BE CAREFULLY LAID OUT AND PATCHED TO ORIGINAL CONDITION. SEAL ALL EXTERIOR FLOOR AND WALL PENETRATIONS AS INDICATED.

CONTACT THE ENGINEER ONE-WEEK PRIOR TO COMPLETION OF ALL WORK TO SCHEDULE A SUBSTANTIAL COMPLETION INSPECTION. THE ENGINEER WILL GENERATE A PUNCH LIST OF CORRECTIVE ACTION ITEMS DURING THE INSPECTION. WORK WILL NOT BE CONSIDERED COMPLETE UNTIL ALL CORRECTIVE ACTION ITEMS IN THE ENGINEERS PUNCH LIST HAVE BEEN SATISFACTORILY COMPLETED AND PHOTOGRAPHIC OR OTHER POSITIVE DOCUMENTATION HAS BEEN PROVIDED TO THE ENGINEER.

PROVIDE ONE SET OF DRAWINGS CLEARLY MARKED UP WITH ALL AS-BUILT INFORMATION TO THE FNGINEER WITHIN TWO WEEKS OF COMPLETION.

** SPECIAL CONDITIONS **

ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK, BURN, ROTATING FANS, PULLEYS, BELTS, HOT MANIFOLDS, NOISE, ETC. ASSOCIATED WITH WORKING NEAR POWER GENERATION AND CONTROL EQUIPMENT.

DE-ENERGIZE ALL CIRCUITS AND EQUIPMENT PRIOR TO BEGINNING WORK.

** SUPPORTS AND FASTENERS **

SUPPORT PIPING AND EQUIPMENT AS SHOWN ON PLANS USING SPECIFIED SUPPORTS AND FASTENERS. IF NOT DETAILED ON PLANS. SUPPORT FROM STRUCTURAL MEMBERS WITH PIPE HANGERS. CLAMPS. OR PIPE STRAPS SPECIFICALLY INTENDED FOR THE APPLICATION. DO NOT SUPPORT PIPING FROM CONNECTIONS TO EQUIPMENT. INDEPENDENTLY SUPPORT PUMPS AND EQUIPMENT.

STRUCTURAL STEEL - MISCELLANEOUS SHAPES AND PLATE ASTM A-36. RECTANGULAR TUBING ASTM A-500 GRADE B. STRUCTURAL PIPE ASTM A-53 OR ASTM A-106B. PAINT AS INDICATED.

STRUT - COLD FORMED MILD STEEL CHANNEL STRUT, PRE-GALVANIZED FINISH AND SLOTTED BACK UNLESS SPECIFICALLY INDICATED OTHERWISE. STANDARD STRUT - 12 GA. 1-5/8" x 1-5/8", B-LINE B22-SH-GALV OR EQUAL. DOUBLE STRUT - 12 GA, 1-5/8" x 3-1/4", B-LINE B22A-SH-GALV OR EQUAL. SHALLOW STRUT - 14 GA, 1-5/8" x 13/16". B-LINE B54-SH-GALV OR EQUAL. WHERE STRUT IS WELDED TO TANKS OR STRUCTURES PROVIDE PLAIN (UN-FINISHED BLACK) SOLID BACK STRUT - 12 GAUGE, 1-5/8" x 1-5/8", B-LINE B22-PLN OR EQUAL.

FITTINGS AND ACCESSORIES - PROVIDE FITTINGS, BRACKETS, CHANNEL NUTS, AND ACCESSORIES DESIGNED SPECIFICALLY FOR USE WITH SPECIFIED CHANNEL STRUT. GALVANIZED OR ZINC-PLATED CARBON STEEL EXCEPT FOR EXTERIOR INSTALLATIONS TYPE 304 STAINLESS STEEL IF AVAILABLE.

PIPE CLAMPS - TWO-PIECE PIPE CLAMP DESIGNED TO SUPPORT PIPE TIGHT TO STRUT. B-LINE B20## OR EQUAL. ZINC-PLATED CARBON STEEL INSTALL RUBBER ISOLATION STRIP, B-LINE VIBRA CUSHION OR EQUAL, ON COPPER TUBING AND WHERE INDICATED.

PIPE STRAPS - CARBON STEEL TWO-HOLE PIPE STRAP. B-LINE B2400 OR EQUAL.

FASTENERS - ALL INTERIOR BOLTS, NUTS, AND WASHERS ZINC-PLATED CARBON STEEL. ALL EXTERIOR BOLTS, NUTS, AND WASHERS TYPE 304 OR 301 STAINLESS STEEL.

** INSULATION **

EXHAUST INSULATION - INSULATE EXHAUST PIPES WHERE INDICATED. INSTALL 1-1/2" PRE-FORMED RIGID MINERAL WOOL PIPE INSULATION. ROXUL TECHTON 1200 OR EQUAL. COVER WITH ALUMINUM JACKET.

JACKET - EXTERIOR GRADE EMBOSSED FINISH 0.016" THICK ALUMINUM JACKETING WITH PRE-FORMED ALUMINUM FITTING COVERS, PABCO OR EQUAL.

CHARGE AIR TUBING - INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO FLEX AT WALL THIMBLE. WRAP WITH ASBESTOS FREE SILICA BASED YARN TAPE, LEWCO FT60 OR EQUAL, 3" WIDE. SPIRAL WRAP WITH 50% OVERLAP AND SECURE ENDS WITH HOSE CLAMPS.

** PAINTING AND MARKING **

PAINT ALL EXTERIOR EXHAUST PIPES WITH HIGH TEMPERATURE INERT MULTIPOLYMERIC COATING. WIRE BRUSH TO NEAR WHITE METAL AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF HI-TEMP COATINGS 1027, NO SUBSTITUTES, COLOR BLACK.

PAINT ALL OTHER CARBON STEEL PIPE WITH DIRECT TO METAL ALKYD ENAMEL. WIRE BRUSH AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF SHERWIN WILLIAMS DTM. NO SUBSTITUTES. COLOR STRUCTURAL GRAY 4031.

PAINT ALL STEEL FABRICATIONS. SANDBLAST OR WIRE BRUSH TO BARE METAL AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF SELF PRIMING EPOXY. SHERWIN WILLIAMS MACROPOXY 646. NO SUBSTITUTES. COLOR STRUCTURAL GRAY 4031.

TOUCH UP - FINISH ALL CUT ENDS AND DAMAGED SURFACES OF GALVANIZED AND ZINC PLATED SUPPORTS AND FASTENERS WITH SPRAY ON COLD GALVANIZING COMPOUND, ZRC OR EQUAL. TOUCH UP PAINT ON FABRICATED ITEMS TO MATCH ORIGINAL.

ON COOLANT, HEAT RECOVERY, USED OIL, AND DIESEL FUEL PIPING INSTALL FLOW ARROWS WITH SAME COLOR SCHEME AS VALVE TAGS (SEE VALVE TAG SCHEDULE). SELF ADHESIVE SETON ARROWS ON A ROLL OR EQUAL. ON INSULATED PIPING INSTALL FLOW ARROWS OVER

** DIESEL FUEL AND LUBE OIL PIPING AND VALVES **

OIL PIPING (DFR, DFS, UOR) - ASTM A106B SCHEDULE 80 SEAMLESS BLACK STEEL PIPE. BUTT WELD JOINTS FOR ALL PIPE 2" DIAMETER AND LARGER. SOCKET WELD OR THREADED JOINTS FOR ALL PIPING SMALLER THAN 2" DIAMETER WITH MINIMUM 3000# FORGED STEEL FITTINGS. PERFORM PIPE WELDING WITH EXPERIENCED WELDER WITH CURRENT API OR EQUIVALENT CERTIFICATION FOR PIPE WELDING IN ALL POSITIONS.

PROVIDE SPIRAL WOUND METALLIC GASKETS AND COAT WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLING FLANGED JOINTS. REAM THREADED PIPE ENDS AND THOROUGHLY COAT MALE PIPE ENDS WITH HERCULES GRIPP PIPE JOINT COMPOUND PRIOR TO ASSEMBLING. TEST ALL FUEL OIL PIPING JOINTS WITH MINIMUM 50 PSIG AIR, WITH EACH JOINT SOAKED WITH A FOAMING SOAPY WATER SOLUTION, AND VISUALLY INSPECT EACH JOINT FOR LEAKS.

SMALL HOSES - FUEL RATED HOSE, EATON WEATHERHEAD H569 OR EQUAL. SIZE AS INDICATED ON DRAWINGS. PROVIDE RE-USABLE PLATED STEEL JIC SWIVEL ENDS, STRAIGHT OR 90° AS REQUIRED, WITH NPT ADAPTERS.

FLANGED BALL VALVES - REDUCED PORT CARBON STEEL UNI-BODY, ANSI 150# RF FLANGED ENDS, STAINLESS STEEL BALL AND TRIM, LOCKABLE HANDLE, 150 PSIG MINIMUM WORKING PRESSURE. PBV OR APOLLO, NO OTHER SUBSTITUTES.

THREADED BALL VALVES - CARBON STEEL BODY, THREADED ENDS, STAINLESS STEEL BALL AND TRIM. PBV OR APOLLO, NO OTHER SUBSTITUTES.

THREADED CHECK VALVES - BRONZE BODY, THREADED ENDS, SWING CHECK STYLE, 150 PSIG MINIMUM WORKING PRESSURE. MILWAUKEE 510-S OR HAMMOND EQUAL. DOMESTIC ONLY.

THREADED PRESSURE RELIEF VALVES - BRONZE BODY, HARD SEAT, MPT INLET X FPT OUTLET, SIZE AND PRESSURE SETTING AS INDICATED, KINGSTON 103SS OR EQUAL.

FUSIBLE LINK VALVES - BRASS BODY, FPT ENDS, 165F FUSIBLE HEAD. FIROMATIC 200F (1/2") OR EQUAL.

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

NORMALLY CLOSED - ASCO CAT. NO. 8210G94, NO SUBSTITUTES. NORMALLY OPEN - ASCO CAT. NO. 8210G34, NO SUBSTITUTES.

ELECTRIC ACTUATOR VALVES — LOW TEMPERATURE ACTUATED BALL VALVE ASSEMBLY RATED TO -50 DEG F. TYPE 304 STAINLESS STEEL FABRICATED COUPLING BRACKET, SHAFT, AND FASTENERS CONFIGURED TO ALLOW WRENCH ACCESS FOR MANUAL OPERATION OF VALVE WITHOUT REMOVING ACTUATOR. DG VALVE, OR EQUAL. LOW TEMP BALL VALVE, 150# RF FLANGED ENDS, NUTRON, NO SUBSTITUTES. 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. RCS, NO SUBSTITUTES.

1" BALL VALVE - 151 IN-LB OPERATING TORQUE @ -50 DEG F. NUTRON MODEL T3-R10R01LZ-06, NO SUBSTITUTES.

1" 120VAC NEMA 7 ACTUATOR - 600 IN-LBS TORQUE, 10 SECOND STROKE TIME, 0.50 LOCKED ROTOR AMPS. RCS MODEL SXR-1023, NO SUBSTITUTES.

** DIESEL FUEL AND LUBE OIL EQUIPMENT AND SPECIALTIES **

THREADED STRAINERS - "Y" TYPE BRONZE BODY, SCREWED ENDS, GASKETED CAP, 20 MESH STAINLESS STEEL SCREEN, 200 PSIG WORKING PRESSURE, MUELLER #351M OR EQUAL.

DAY TANK METER - BRASS BODY AND WORKING CHAMBER, ANODIZED ALUMINUM PISTON, 300 PSIG MAXIMUM OPERATING PRESSURE, 3/4" MPT INLET AND OUTLET, ACCURATE TO +/-1% AT 8 GPH, MAXIMUM CONTINUOUS FLOW OF 265 GPH, O-RINGS AND SEALS COMPATIBLE WITH #1 DIESEL FUEL. ELSTER 20 OR EQUAL.

DAY TANK GAUGE - MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL FUEL, DIE-CAST ZINC HEAD, 1-1/2" MPT CONNECTION, ZINC-PLATED STEEL GUIDE ROD, BRASS CENTER SHAFT, EPOXY COATED CORK FLOAT, HERMETICALLY SEALED SIDE-VIEW DIAL, 25 PSIG MAXIMUM OPERATING PRESSURE, GUIDE ROD (OPERATING) LENGTH AS INDICATED ON DRAWINGS. ROCHESTER MODEL 8660 WITH SIDE-VIEW DIAL #5025S00570.

CLOCK-TYPE LIQUID LEVEL GAUGE - ALUMINUM BODY, 2" MPT CONNECTION, STAINLESS STEEL FLOAT SIZED TO PASS THROUGH 2" BUNG OPENING, CLOCK-STYLE GAUGE WITH READOUT IN FEET AND INCHES UP TO 12 FEET, ACCURATE WITHIN 1/4" OVER FULL SCALE. MORRISON FIGURE 818 OR EQUAL.

PRESSURE/VACUUM WHISTLE VENTS - ALUMINUM BODY AND HOOD, STAINLESS STEEL SCREENS AND FLOAT, BRASS INTERNALS, VITON SEALS. 2" FPT CONNECTION, 8 OZ/SQUARE INCH PRESSURE SETTING. 1 OZ/SQUARE INCH VACUUM SETTING. HIGH INTENSITY WHISTLE ALARM ON RISE OF FLOAT AT ADJUSTABLE LEVEL. MORRISON FIGURE 922 OR EQUAL.

VENT CAPS - ALUMINUM BODY, STAINLESS STEEL SCREEN, FPT CONNECTION, SIZE AS INDICATED. MORRISON FIGURE 155 OR FOUAL.

** GLYCOL PIPING, VALVES, AND SPECIALTIES **

GLYCOL PIPING (COOLANT AND HEAT RECOVERY) - ALL 2-1/2" AND LARGER PIPING SCH 40 STEEL WITH WELDED AND THREADED JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL 2" AND SMALLER PIPE TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.

PROVIDE FLEXIBLE HOSE FOR CONNECTION TO ALL ENGINES. HYDROSTATICALLY TEST ALL PIPING AT 100 PSIG MINIMUM FOR ONE HOUR WITH NO NOTICEABLE WATER LEAKS OR PRESSURE DROP EXCEPT AS CAUSED BY TEMPERATURE CHANGE. ISOLATE ENGINES AND RADIATORS PRIOR TO PRESSURE TESTING. FLUSH PIPING WITH FRESH WATER PRIOR TO PLACING IN SERVICE.

STEEL PIPE - SEE DIESEL FUEL PIPING FOR STEEL PIPE SPECIFICATIONS.

COPPER PIPE - TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS. ALL JOINTS SOLDERED WITH 95/5 TIN/ANTIMONY SOLDER OR SILVER SOLDER EXCEPT ON T-DRILL CONNECTIONS USE COPPER BRAZING ROD. REAM ALL CUT ENDS AND THOROUGHLY CLEAN PIPE ENDS AND FITTINGS PRIOR TO SOLDERING.

PROVIDE ANSI 150# BRONZE COMPANION FLANGES FOR TRANSITION TO STEEL PIPING OR FLANGED VALVES AND EQUIPMENT. INSTALL FULL FACED 1/8" THICK NITRILE RUBBER GASKETS. COAT FLANGE FACES WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLING.

ENGINE COOLANT HOSES - SIZE AS INDICATED ON DRAWINGS. WIRE REINFORCED CORRUGATED RUBBER HOSE, PARKER ####, NO SUBSTITUTES. INSTALL WITH STAINLESS STEEL T-BOLT CLAMPS.

BUTTERFLY VALVES - LUG STYLE DUCTILE IRON BODY, ANSI 150# FLANGE PATTERN ENDS, STAINLESS STEEL STEM WITH BRONZE BUSHING, BRONZE DISC, EPDM SEATS, LOCKING HANDLE. BRAY SERIES 31 OR EQUAL.

BALL VALVES - THREADED OR SOLDER END BRONZE BODY, CHROME PLATED BRONZE OR BRASS BALL, TFE OR VITON PACKING AND SEAT RING, MINIMUM 200 PSIG WOG RATING. DOMESTIC ONLY, HAMMOND OR MILWAUKEE, NO SUBSTITUTES. ON 2" AND SMALLER VALVES PROVIDE FULL PORT BALL. ON VALVES LARGER THAN 2" PROVIDE LARGE PORT BALL.

SWING CHECK VALVES - THREADED OR SOLDER END BRONZE BODY, SWING CHECK STYLE, MINIMUM 200 PSIG WOG RATING. DOMESTIC ONLY, HAMMOND OR MILWAUKEE, NO

DRAIN VALVES - BRONZE BODY, 3/4" FPT BY 3/4" MALE HOSE ENDS WITH CAP AND JACK CHAIN. WATTS B6000CC. OR EQUAL. INSTALL AT ALL DRAIN AND FILL CONNECTIONS AND WHERE INDICATED.

GAUGE COCK - BRASS BODY, MPT BY FPT ENDS, T-HANDLE. LEGEND VALVE ITEM 101-531 (1/4") OR ITEM 101-532 (3/8"), OR EQUAL. INSTALL ON ALL AIR VENTS, PRESSURE GAUGES, SMALL HOSE CONNECTIONS, AND WHERE INDICATED.

PRESSURE RELIEF VALVES - THREADED END BRONZE BODY, NON-FERROUS INTERNAL COMPONENTS, ASME LABELED, 3/4" NPT CONNECTIONS, 500 MBH MINIMUM CAPACITY, SETPOINT AS INDICATED. WATTS 174A OR EQUAL.

GLYCOL FILTER: SCREW-ON CANISTER STYLE FILTER ELEMENT WITH 3/8" NPT CONNECTIONS ON HEAD, WIX #24019 (NAPA 4019) HEAD WITH #24069 (NAPA 4069) ELEMENT.

AUTOMATIC AIR VENTS - BRASS BODY, SELF-CLOSING FLOAT OPERATED VALVE, SCREW ON CAP, 1/4" NPT CONNECTION. MAID-O-MIST AUTO AIR VENT NO. 75 OR EQUAL. PROVIDE WITH BALL VALVE ISOLATION.

EXPANSION TANK CAP -2-1/2 PSIG PRESSURE, 1-1/2 OZ. VACUUM, 2" NPT CONNECTION. CIM-TEK 60001 OR EQUAL.

** INSTRUMENTATION **

PRESSURE GAUGE - 2-1/2" DIAL SIZE, DRY TYPE, STAINLESS STEEL CASE, TUBE, AND SOCKET, 1/4" NPT BOTTOM CONNECTION. TRERICE NO. 700SS-25, NO SUBSTITUTES 0-15 PSI 700SS-25-02-L-A-080 0-100 PSI 700SS-25-02-L-A-110

THERMOMETER - 3" DIAL SIZE BIMETAL TYPE, STAINLESS STEEL CASE AND STEM, 1% OF FULL SCALE ACCURACY, ADJUSTABLE ANGLE AND SWIVEL HEAD, 2-1/2" STEM LENGTH, 20-240F FAHRENHEIT ONLY RANGE. TRERICE B836-02-05F, NO SUBSTITUTES. PROVIDE WITH 3/4"NPT BRASS THERMOWELL.

SEE ELECTRICAL EQUIPMENT SCHEDULE FOR TEMPERATURE AND PRESSURE TRANSMITTERS.

** SYSTEM STARTUP **

PRIOR TO STARTING FUEL AND OIL PUMPS, PRIME CAVITIES WITH LUBE OIL THEN ENERGIZE MOMENTARILY TO VERIFY PROPER ROTATION.

FUEL OIL PIPING - AFTER PRESSURE TESTING PRIME ALL PIPING WITH HAND PRIMING PUMP, FILL FILTERS WITH DIESEL FUEL, AND BLEED OFF AIR PRIOR TO STARTING STARTING PUMPS.

VERIFY OPERATION OF ALL FUEL PUMP CONTROLS INCLUDING TIMER AND LEVEL ALARMS.

ENGINE COOLANT PIPING - AFTER PRESSURE TESTING AND FLUSHING, FILL SYSTEM WITH A SOLUTION OF EXTENDED LIFE ETHYLENE GLYCOL, SHELL ROTELLA ELC, NO SUBSTITUTES, PREMIXED TO A RATIO OF 50% ETHYLENE GLYCOL TO 50% WATER.

HEAT RECOVERY PIPING - AFTER PRESSURE TESTING AND FLUSHING, BLEED AIR RESERVOIR ON EXPANSION TANK AS REQUIRED TO MAINTAIN 10 PSIG RESIDUAL WITH SYSTEM EMPTY. FILL SYSTEM WITH A PRE-MIXED SOLUTION OF HEAVY DUTY (EXTENDED LIFE) 50% PROPYLENE GLYCOL AND 50% WATER, DOWFROST HD, SAFE/T/THERM HD, OR EQUAL. FILL TO 20 PSIG MINIMUM WITH SYSTEM COLD. VENT AIR FROM ALL HIGH POINTS PRIOR TO STARTING CIRCULATING PUMP. CYCLE PUMP ON AND OFF AND VENT HIGH POINTS UNTIL ALL AIR HAS BEEN PURGED FROM PIPING. ADD ADDITIONAL PRE-MIXED GLYCOL SOLUTION AS REQUIRED TO BRING SYSTEM PRESSURE TO 30 PSIG MINIMUM AT EXPANSION TANK AT NORMAL OPERATING TEMPERATURE (180F).

AS COOLING SYSTEM COMES UP TO NORMAL OPERATING TEMPERATURE VERIFY OPERATION OF THERMOSTATIC VALVE. SET VARIABLE FREQUENCY DRIVES TO SPECIFIED TEMPERATURES. VERIFY OPERATING SETPOINTS BY READING THERMOMETERS IN PIPING MAINS.

** SEQUENCE OF OPERATION **

DAY TANK WILL HAVE AUTOMATIC FILL CONTROLS WITH REDUNDANT HIGH AND LOW LEVEL ALARMS AND TIMERS. SEE DAY TANK CONTROL PANEL DRAWINGS FOR DETAILED SEQUENCE.

MOTORIZED AIR INTAKE DAMPER WILL OPEN ANY TIME AN ENGINE IS RUNNING OR THE EXHAUST FAN OPERATES. DAMPER MOTOR WILL BE NORMALLY CLOSED SPRING RETURN AND WILL CLOSE ON LOSS OF POWER IN LESS THAN 30 SECONDS.

EXHAUST FAN EF-1 WILL OPERATE ON A CALL FOR COOLING THROUGH A LINE VOLTAGE THERMOSTAT TO MAINTAIN GENERATING ROOM TEMPERATURE, 75F, ADJUSTABLE.

RADIATOR VARIABLE FREQUENCY DRIVE WILL MODULATE FAN SPEED TO MAINTAIN ENGINE COOLANT RETURN TEMPERATURE OPERATING SETPOINT. FAN WILL OPERATE AT A MINIMUM SPEED OF 10%, ADJUSTABLE. FAN WILL SHUT OFF WHEN ENGINE COOLANT RETURN TEMPERATURE IS BELOW THE MINIMUM SETPOINT. NORMAL OPERATING SETPOINT IS 180F AND MINIMUM SETPOINT IS 20F BELOW OPERATING SETPOINT.

CHARGE AIR COOLER CAC-3 & CAC-4 FANS WILL OPERATE CONTINUOUSLY ANY TIME ASSOCIATED ENGINE RUNS AND STOP WHEN ENGINE STOPS. A VARIABLE FREQUENCY DRIVE ON CAC-4 WILL OPERATE AT FULL SPEED FOR 30 SECONDS UPON STARTUP AND THEN WILL MODULATE FAN SPEED TO MAINTAIN ENGINE INTAKE MANIFOLD AIR TEMPERATURE OPERATING SETPOINT. MINIMUM FAN SPEED = 10%, ADJUSTABLE. SETPOINT = 90F, ADJUSTABLE.

HEAT RECOVERY PUMPS P-HR1 AND P-HR2 AND DUMP LOAD RADIATOR DLR-1 FAN WILL OPERATE UNDER MANUAL CONTROL.

WHEN THE SYSTEM PRESSURE IN THE HEAT RECOVERY PIPING DROPS BELOW 15 PSIG FOR A MINIMUM OF 15 MINUTES, A RED LAMP "HEAT RECOVERY LOSS OF PRESSURE" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE.

WHEN THE HEAT RECOVERY RETURN TEMPERATURE IS EQUAL TO OR GREATER THAN THE HEAT RECOVERY SUPPLY TEMPERATURE FOR A MINIMUM OF 1 HOUR. AN AMBER LAMP "NO LOAD ON HEAT RECOVERY" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE. WHEN THE HEAT RECOVERY SUPPLY TEMPERATURE IS A MINIMUM OF 1°F GREATER THAN THE HEAT RECOVERY RETURN TEMPERATURE THE LAMP WILL TURN OFF.



AVTEC POWER PLANT TRAINING FACILITY UPGRADE

FROM INFORMATION PROVIDED BY OTHERS

MECHANICAL SPECIRFICATIONS



DRAWN BY: JTD SCALE: NO SCALE DESIGNED BY: BCG DATE: 6/23/15 SHEET: FILE NAME: AVTEC M1-M6 M2 PROJECT NUMBER:

Mulin

DATE: 2-12-16

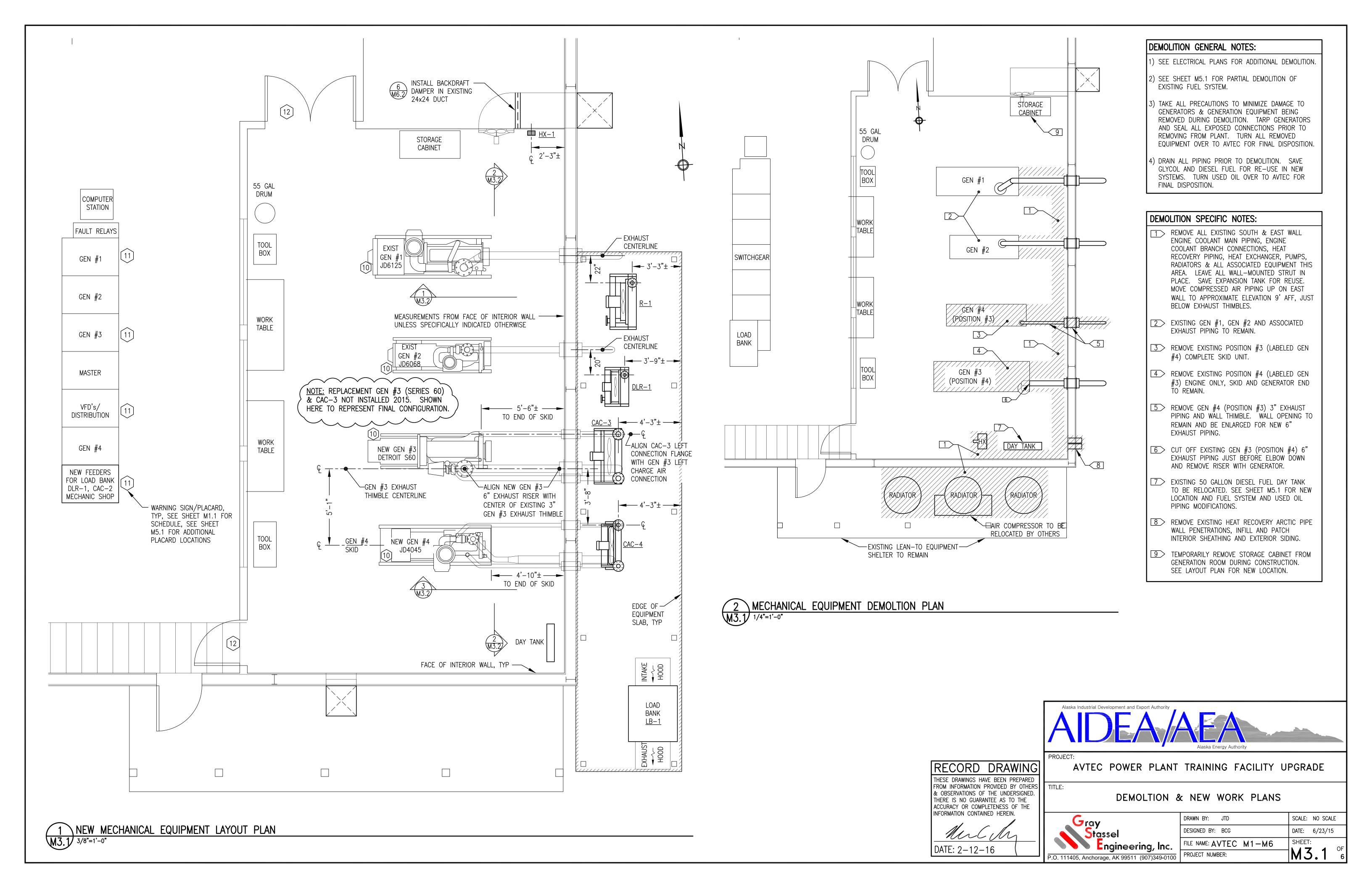
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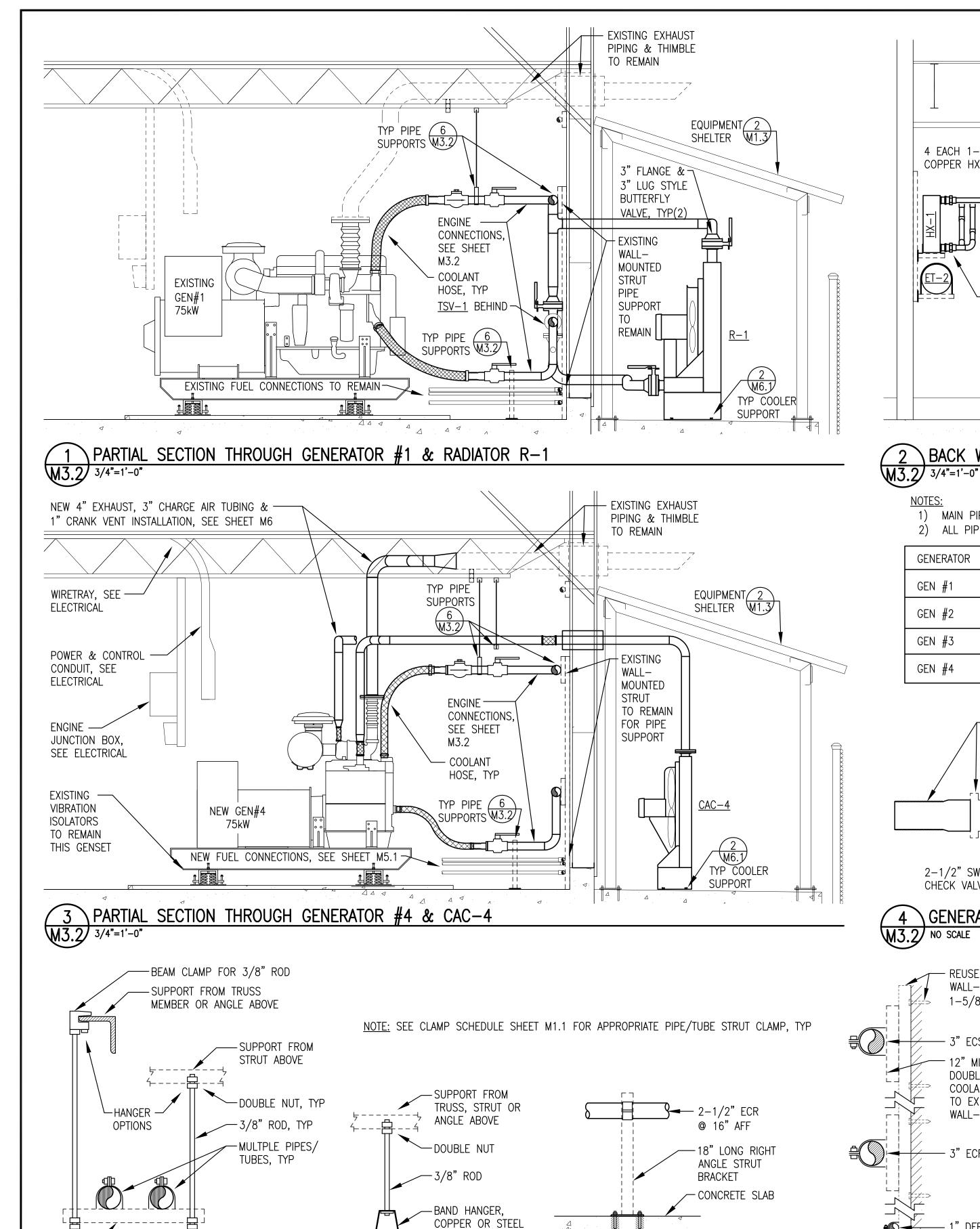
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TO MATCH PIPE/TUBE

-1/2"x6" STUD SET

IN EPOXY, TYP(2)

FLOOR SUPPORT

– SINGLE

OVERHEAD SUPPORT

PIPE/TUBE, TYP

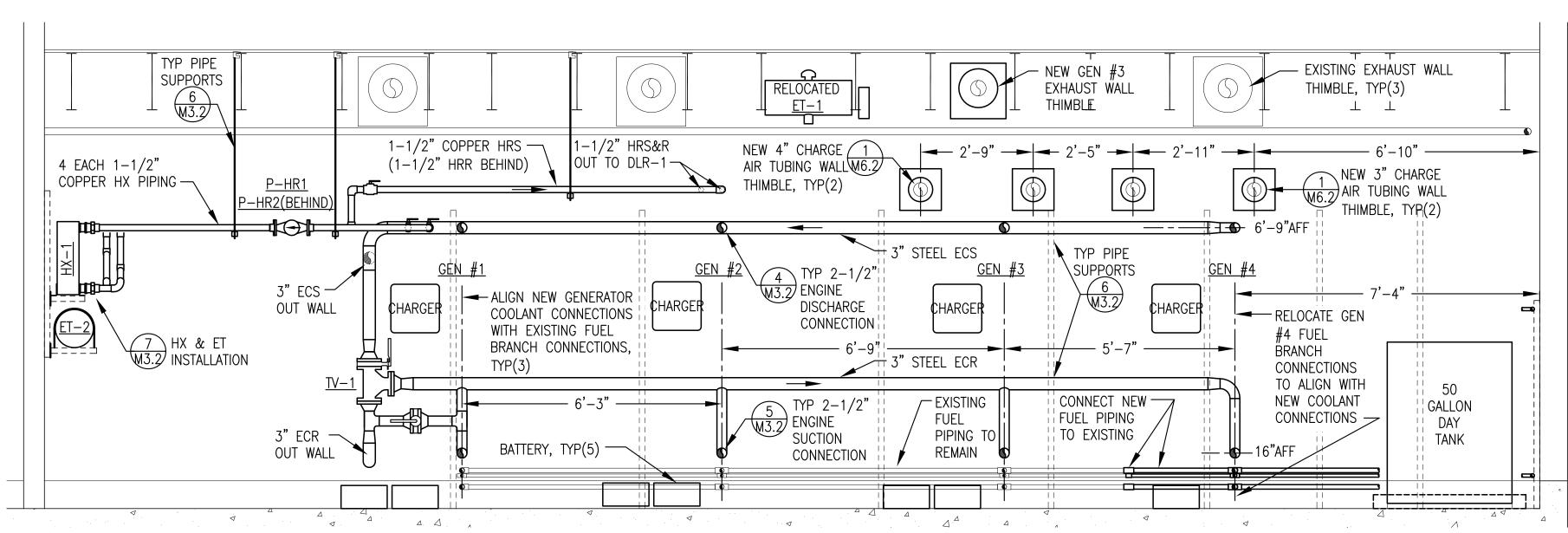
← STANDARD OR DOUBLE STRUT,

TYPICAL PIPE SUPPORTS

LENGTH AS REQUIRED

TRAPEZE SUPPORT

M3.2 NO SCALE



2 BACK WALL ELEVATION

MAIN PIPING 3". ALL MAIN & BRANCH PIPING NOT INSULATED.

GENERATOR DISCHARGE CONNECTIONS

REUSE EXISTING

1-5/8" STRUT.

WALL-MOUNTED VERTICAL

3" ECS @ 81" AFF

12" MINIMUM LENGTH

WALL-MOUNT STRUT, TYP

DOUBLER STRUT AT COOLANT MAINS, BOLT

3" ECR @ 36" AFF

- 1" DFR @ 11" AFF

— 1/2" UOR @ 9" AFF

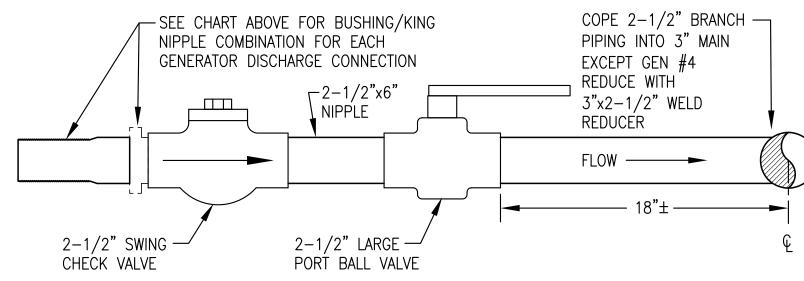
- 1" DFS @ 6" AFF

WALL SUPPORT

TO EXISTING

2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED END.

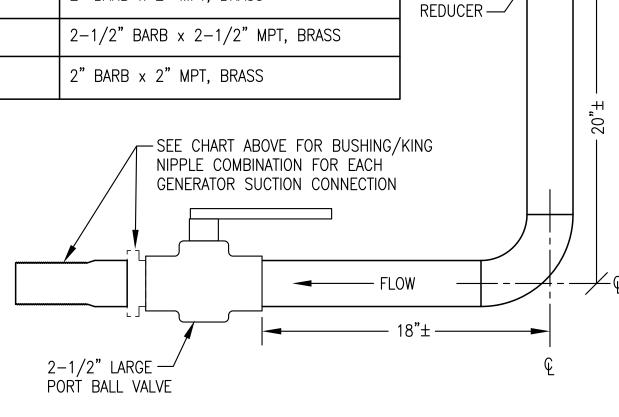
GENERATOR	DISCHARGE BUSHING	DISCHARGE KING NIPPLE
GEN #1	NONE	2-1/2" BARB x 2-1/2" MPT, BRASS
GEN #2	2-1/2"x2"	1-3/4" BARB x 2" MPT, CUSTOM CRIMP, BRASS
GEN #3	NONE	2-1/2" BARB x 2-1/2" MPT, BRASS
GEN #4	NONE	2-3/8" BARB x 2-1/2" MPT, CUSTOM CRIMP, BRASS

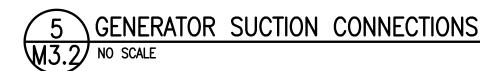


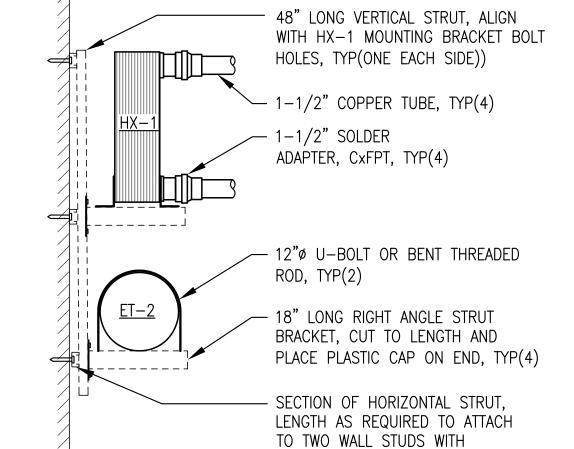
M3.2 NO SCALE

MAIN PIPING 3". ALL MAIN & BRANCH PIPING NOT INSULATED. ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED END.

COPE 2-1/2" BRANCH GENERATOR SUCTION BUSHING SUCTION KING NIPPLE PIPING INTO 3" MAIN EXCEPT GEN #4 3"x2-1/2" REDUCER, GEN #1 3" BARB x 3" MPT, BRASS REDUCE WITH 2-1/2" CLOSE NIPPLE 3"x2-1/2" WELD GEN #2 2" BARB x 2" MPT, BRASS 2-1/2"x2" NONE GEN #3 2-1/2" BARB x 2-1/2" MPT, BRASS 2-1/2"x2" GEN #4 2" BARB x 2" MPT, BRASS







GENERATOR ROOM NORTH WALL

3/8"x3" LAG SCREWS & FENDER

WASHERS, TYP(3)

 $7 \setminus HX-1 \& ET-2 INSTALLATION DETAIL$

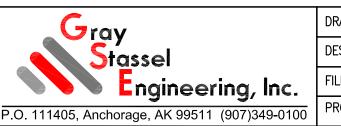
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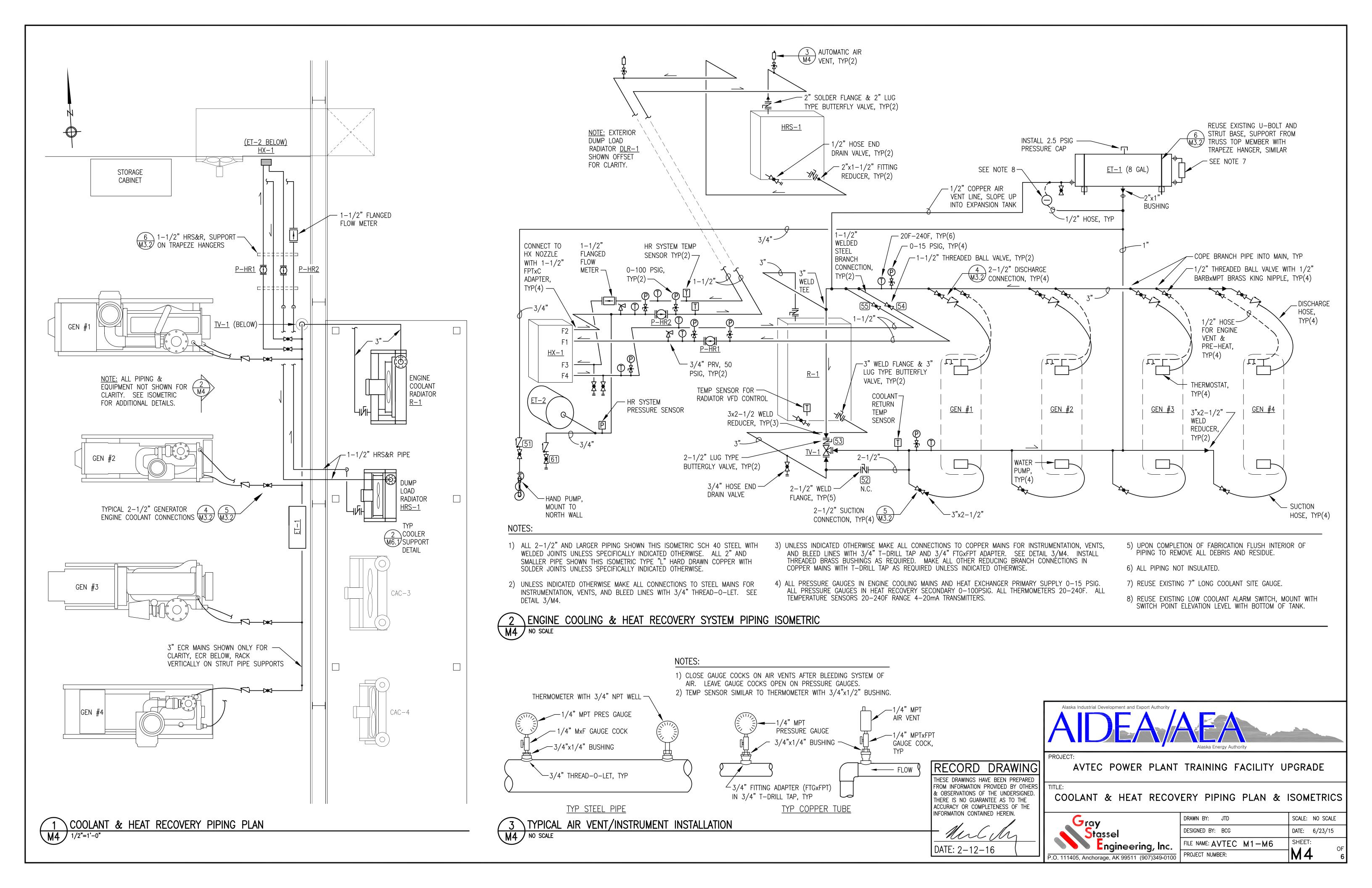


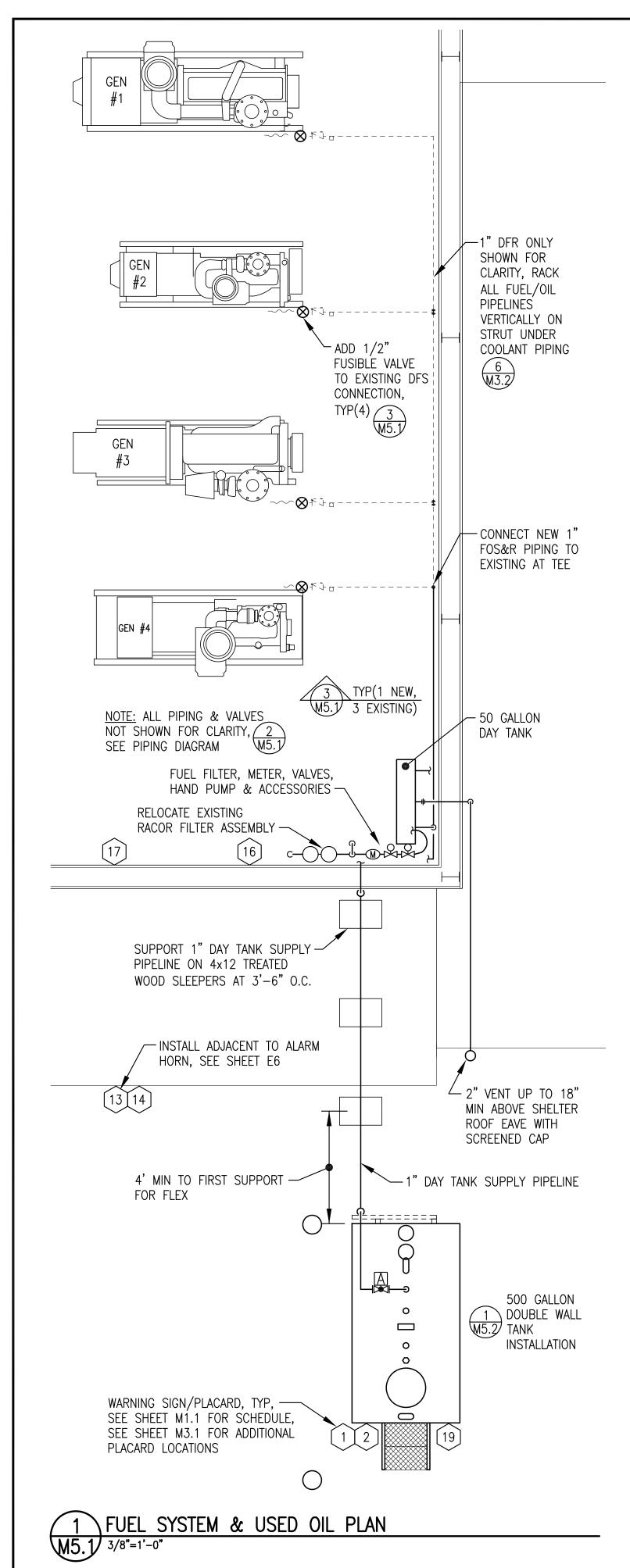
AVTEC POWER PLANT TRAINING FACILITY UPGRADE

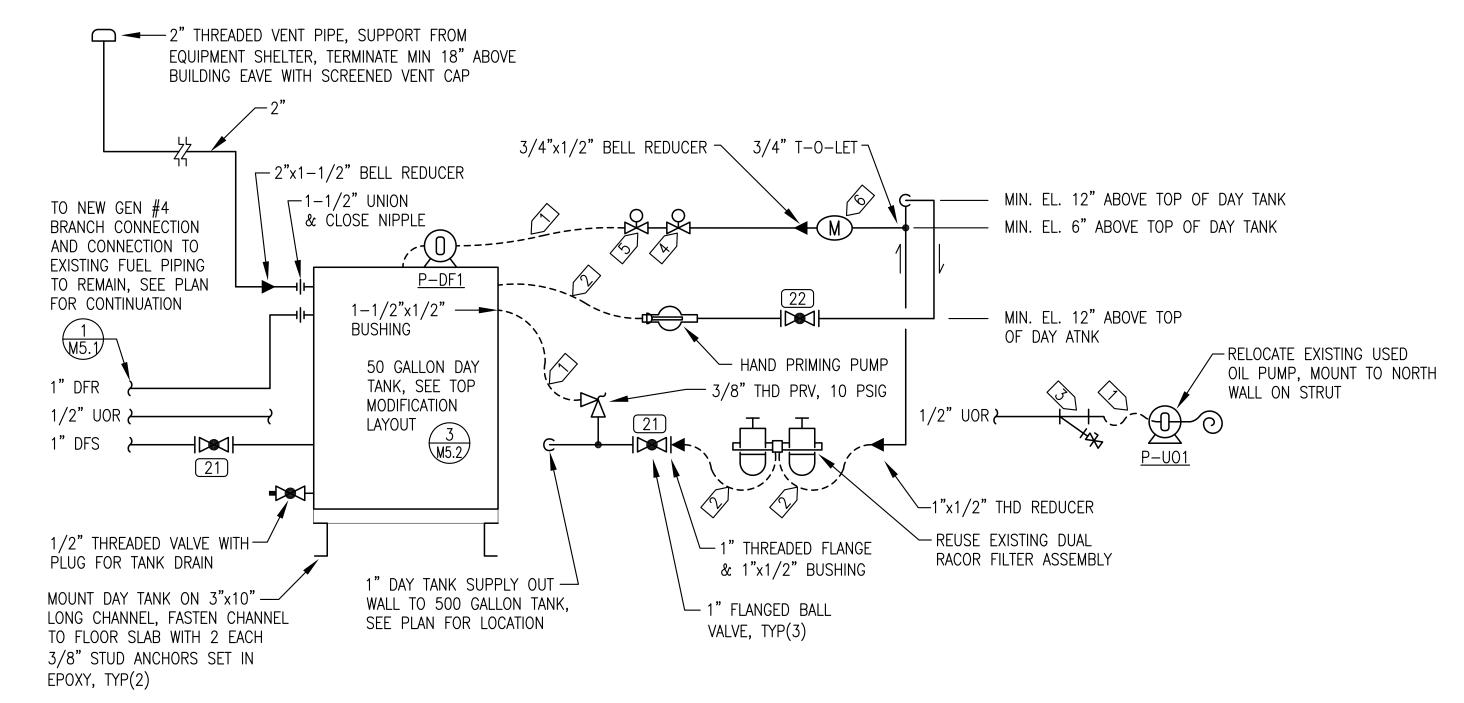
EQUIPMENT LAYOUT SECTIONS & ELEVATIONS



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	DESIGNED BY: BCG	DATE: 6/23/15
	FILE NAME: AVTEC M1-M6	SHEET:
00	PROJECT NUMBER:	M3.2 6







PIPING DIAGRAM GENERAL NOTES:

- 1) MODIFY AND REUSE EXISTING 50 GALLON DAY TANK. SEE SHEET M5.# FOR MODIFICATIONS. PLUG/CAP ALL SPARE OPENINGS.
- 2) ALL DAY TANK SUPPLY, DFS & DFR PIPING 1" WITH SOCKET WELD FITTINGS EXCEPT WHERE INDICATED OTHERWISE. VENT PIPING 2" THREADED.

PIPING DIAGRAM SPECIFIC NOTES:

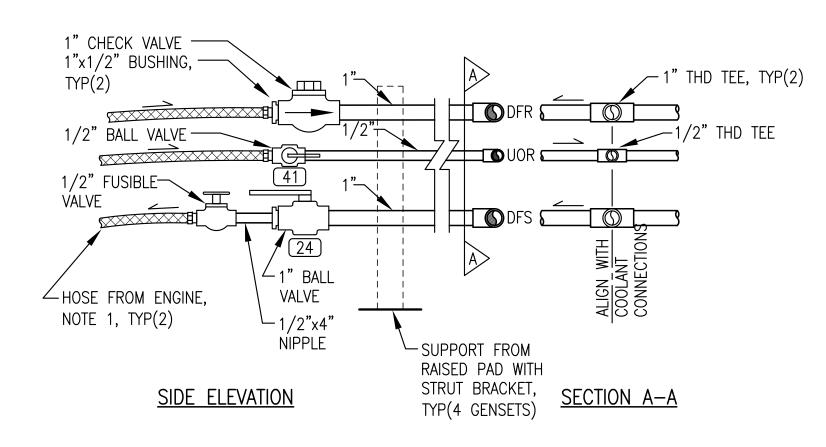
- 1> #10 HOSE WITH 3/8" OR 1/2" NPT SWIVEL ENDS AS REQUIRED.
- 4 > 1/2" NO SOLENOID VALVE.
- 2> #12 HOSE WITH NPT SWIVEL ENDS,
- $\boxed{5}$ 1/2" NC SOLENOID VALVE.
- 1/2", 3/4", OR 1" AS REQUIRED.

3> 1/2" THREADED STRAINER IN 1/2"

UOR WITH GAUGE COCK BLOW DOWN.

6> 3/4" THREADED DAY TANK METER WITH PULSER, SEE SPECIFICATIONS.





- 1. ALL GENERATOR FUEL BRANCH PIPING CONNECTIONS TO REMAIN EXCEPT RELOCATE GEN #4 BRANCH PIPING AND ADD 1/2" FUSIBLE VALVE ON ALL DFS ENGINE CONNECTIONS.
- 2. SALVAGE ALL VALVES AND PIPING ON EXISTING GEN #4 AND REUSE FOR RELOCATED FUEL CONNECTION ON NEW GEN #4.
- 3. AEROQUIP HOSES PROVIDED WITH ENGINE, SIZE VARIES PER ENGINE & PRODUCT. ALL EQUIPPED WITH JIC SWIVELS & 1/2" MPT ADAPTERS. CUT TO LENGTH & RE-INSTALL ENDS.
- 4. ALL PIPING & NIPPLES SCH 80.



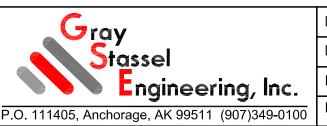


RECORD DRAWING AVTEC POWER PLANT TRAINING FACILITY UPGRADE

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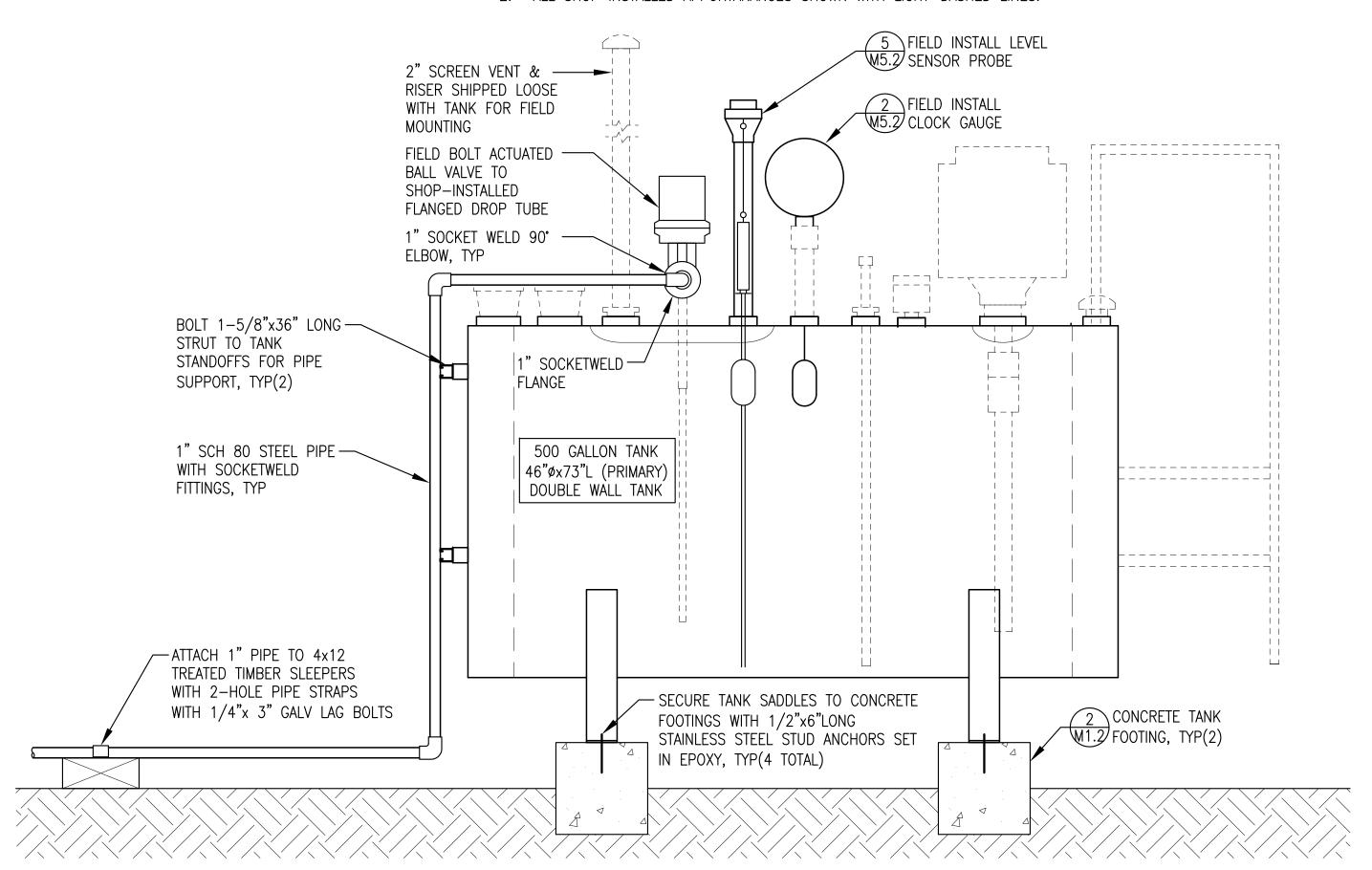
FUEL SYSTEM & USED OIL PLAN, PIPING DIAGRAM & DETAILS



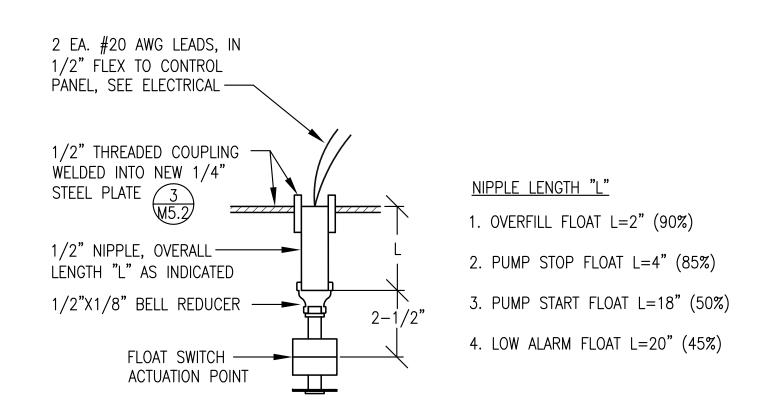
CONAIN & DETAILS	
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET:
PROJECT NUMBER:	M5.1 6

GENERAL NOTES:

- 1. ALL PIPING VALVES, AND APPURTENANCES SHOP INSTALLED EXCEPT WHERE SPECIFICALLY INDICATED AS FIELD INSTALLED.
- 2. ALL SHOP INSTALLED APPURTANANCES SHOWN WITH LIGHT-DASHED LINES.

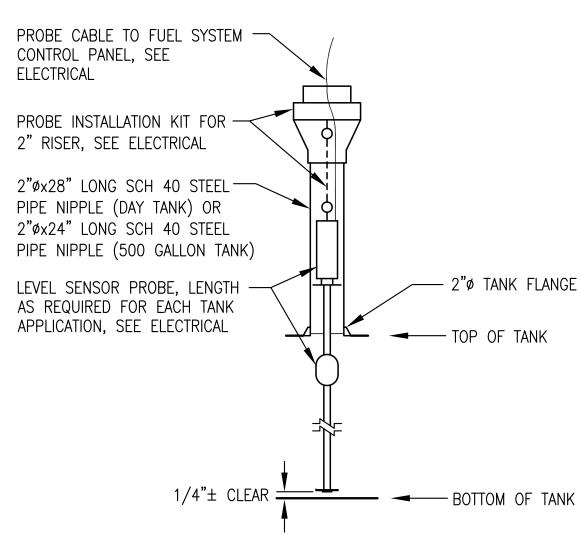


500 GALLON DOUBLE WALL TANK INSTALLATION



NOTE: 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.

\DAY TANK FLOAT SWITCH INSTALLATION

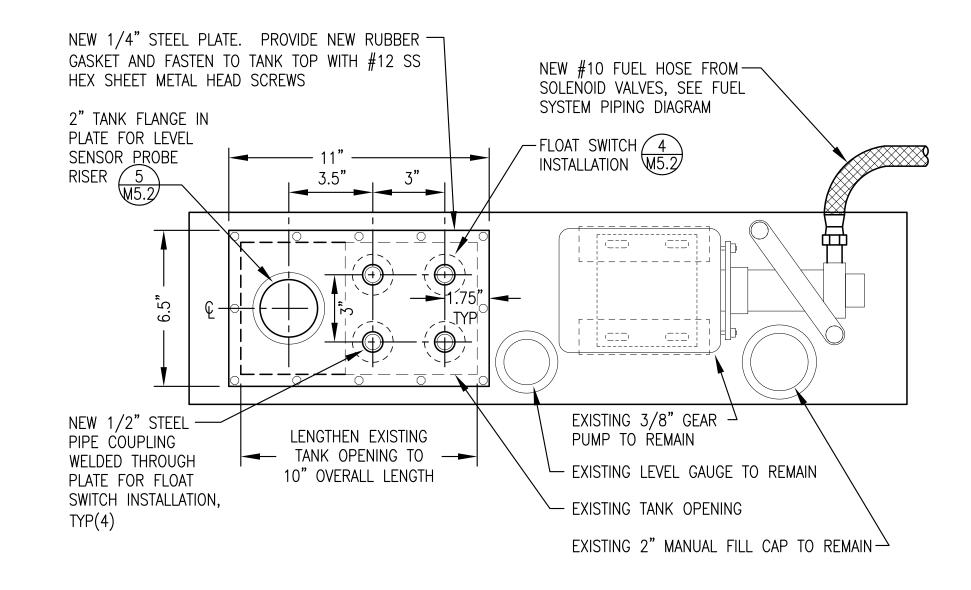


PROBE & ACCESSORIES SPECIFIED ON ELECTRICAL EQUIPMENT SCHEDULE, SEE SHEET E2.

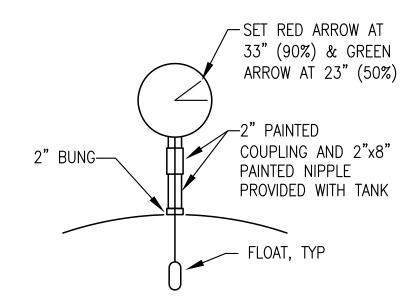
2. FURNISH 53" PROBE FOR 48" DAY TANK AND 46" 500 GALLON TANK.

5 TYPICAL LEVEL SENSOR PROBE INSTALLATION M5.2 NO SCALE

NOTE: REMOVE ALL EXISTING DAY TANK POWER & CONTROL CONDUCTORS, SOLID STATE CONTROL PANEL, FLOAT SWITCHES/SENSORS AND COVER PLATE



TOP OF DAY TANK LAYOUT M5.2 NO SCALE



- 1) FEED FLOAT CABLE THROUGH NIPPLE PRIOR TO
- CONNECTING TO TANK. 2) GREASE FLOAT PRIOR TO INSTALLING IN TANK TO
- PREVENT FREEZING TO BOTTOM. 3) CALIBRATE GAUGE AFTER FILLING TANK AND VERIFY WITH
- MANUAL GAUGING ROD OR TAPE. 4) ENSURE THAT BACK COVER PLATE IS PROPERLY SEALED AFTER REASSEMBLY (ANY LOOSENESS OR RATTLING WHEN TAPPED INDICATES A POOR SEAL).





AVTEC POWER PLANT TRAINING FACILITY UPGRADE

FUEL SYSTEM DETAILS

Uray

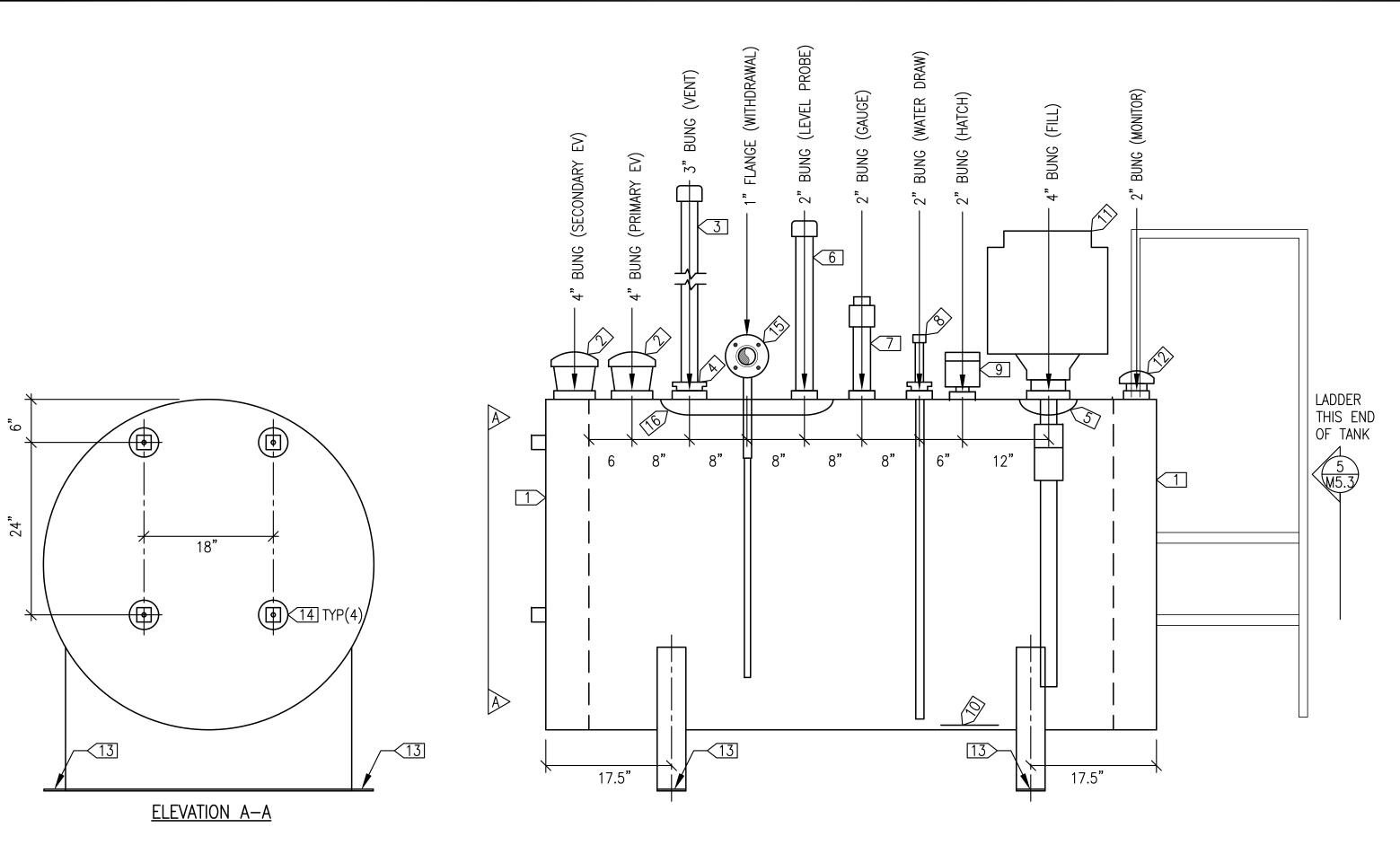
DRAWN BY: JTD SCALE: NO SCALE DESIGNED BY: BCG DATE: 6/23/15 SHEET: FILE NAME: AVTEC M1-M6 M5.2 °6 P.O. 111405, Anchorage, AK 99511 (907)349-0100



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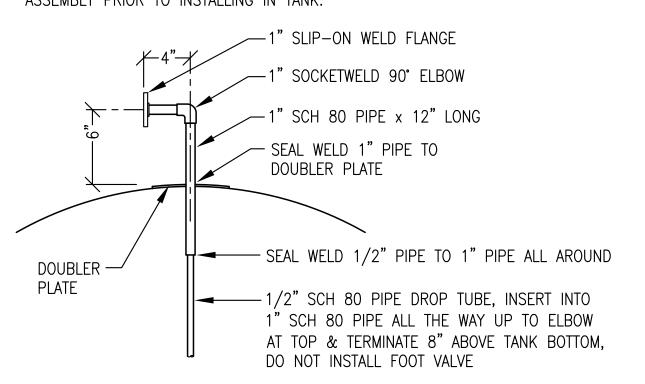
GENERAL NOTES

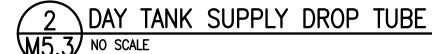
46"ø x 73"L NOMINAL 500 GALLON CAPACITY DOUBLE WALL WELDED STEEL TANK MANUFACTURED & LABELED IN ACCORDANCE WITH U.L. 142.

SPECIFIC NOTES

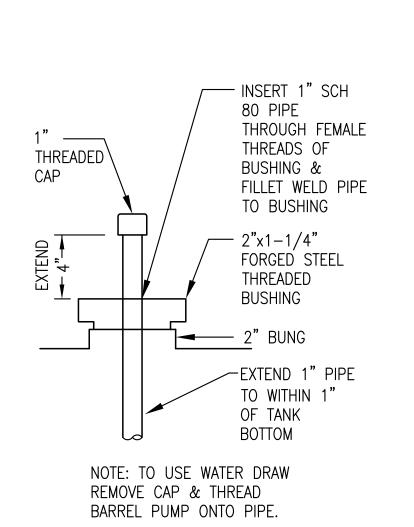
- $1 \rightarrow 4$ " HIGH BLACK LETTERING x1/2" STROKE: "DIESEL 500 GALLONS"
- 2 4" MPT EMERGENCY VENT INSTALLED ON 4" BUNG.
- 3>2"x7'-0" LONG THREADED VENT PIPE, REMOVE AND STRAP TO TANK FOR SHIPPING.
- 4 3"x2" BUSHING ON 3" BUNG, INSTALL 2" SCREEN VENT ON BUSHING AFTER REMOVING PIPE FOR SHIPPING.
- $\boxed{5}$ PROVIDE 1/4"x8" DIAMETER DOUBLER PLATE.
- 6 2"x24" LONG THREADED NIPPLE ON 2" BUNG, INSTALL PIPE CAP.
- $\boxed{7}$ 8" LONG NIPPLE, 2" COUPLING AND 2" PLUG.
- 8 1" WATER DRAW INSTALLED ON 2" BUNG, TERMINATE 1" ABOVE TANK BOTTOM. SEE INSTALLATION DETAIL 3/M5.3.
- 9 Gauge Hatch installed on 2"x4" Nipple.
- $\boxed{10}$ SEAL WELD 1/4"x10"ø STRIKER PLATE TO TANK BOTTOM DIRECTLY BELOW GUAGE HATCH TOP CONNECTION. PLATE TO BE ROLLED TO MATCH DIAMETER OF TANK.
- 11 FILL LIMITER AND ABOVE GROUND TANK SPILL CONTAINMENT MANHOLE INSTALLED ON 4" BUNG, SEE DETAIL 4/M5.3.
- 12 2" SCREEN VENT INSTALLED ON SECONDARY TANK MONITOR BUNG.
- $\boxed{13}$ EXTEND SADDLE BOTTOM PLATE 3" BEYOND EDGE OF SADDLE BOTH SIDES AND DRILL 1" HOLE CENTERED IN EACH TAB, TYP(4 TOTAL).
- 14 WELD STAND OFF TO FACE OF TANK FOR PIPE SUPPORT, SEE DETAIL 6/M5.3, TYP(4 TOTAL).
- 15 DAY TANK SUPPLY DROP TUBE, SEE DETAIL 2/M5.3.
- 16 PROVIDE 1/4"x8"WIDEx24" OVERALL LENGTH DOUBLER PLATE TO REINFORCE THREE BUNGS AS INDICATED. CUT BOTH ENDS TO 4" RADIUS.

NOTE: PRESSURE TEST ENTIRE DROP TUBE ASSEMBLY PRIOR TO INSTALLING IN TANK.

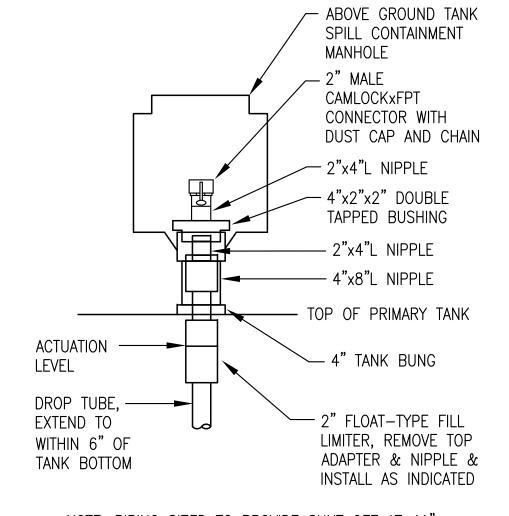




1 \ 500 GALLON DOUBLE WALL TANK ELEVATIONS

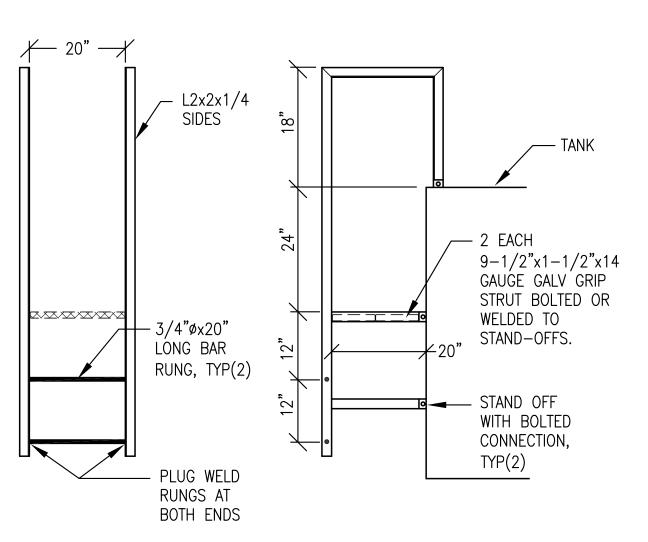


TANK WATER DRAW M5.3 NO SCALE

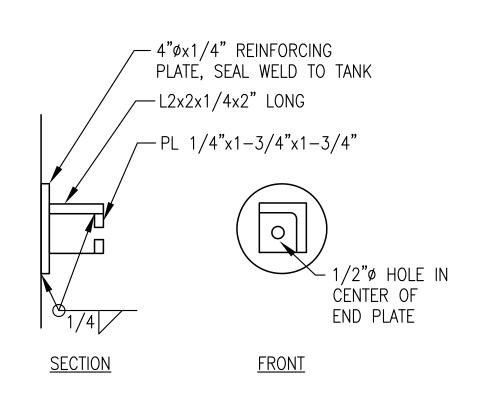


NOTE: PIPING SIZED TO PROVIDE SHUT OFF AT 41" ABOVE TANK BOTTOM (95% CAPACITY). FIELD VERIFY SHUT OFF HEIGHT & ADJUST LINKAGE AS REQUIRED.

4 FILL LIMITER INSTALLATION M5.3 NO SCALE



TANK LADDER DETAILS M5.3 NO SCALE



6 TYP PIPE SUPPORT STAND OFF M5.3 NO SCALE

RECORD DRAWING

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Mulm DATE: 2-12-16



AVTEC POWER PLANT TRAINING FACILITY UPGRADE

FUEL TANK FABRICATION DETAILS



SCALE: NO SCALE DRAWN BY: JTD DESIGNED BY: BCG DATE: 6/23/15 SHEET: FILE NAME: AVTEC M1-M6 M5.3 °6

** GENERAL **

PROVIDE ONE SHOP FABRICATED CARBON STEEL TANK OF TYPE. CONFIGURATION. DIMENSION. AND CAPACITY AS INDICATED.

TANK SHALL BE RATED FOR STORAGE OF DIESEL FUEL AT ATMOSPHERIC PRESSURE OVER A TEMPERATURE RANGE FROM -20F TO +80F. MANUFACTURE IN ACCORDANCE WITH U.L. STANDARD 142 OR EQUIVALENT THIRD PARTY STANDARD AND PROVIDE WITH LABEL IN ACCORDANCE WITH IFC REQUIREMENTS.

PROVIDE COMPLETE TANK ASSEMBLY WITH ALL ACCESSORIES, ATTACHMENTS, LADDERS, SUPPORTS, AND FASTENERS AS INDICATED. ALL BOLTS, NUTS, WASHERS, AND HARDWARE TO BE TYPE 304 OR TYPE 301 STAINLESS STEEL.

LABEL FACES AND ENDS OF TANKS AS INDICATED ON INDIVIDUAL TANK DRAWINGS. LABEL ALL OPENINGS ON TOP OF TANKS WITH MINIMUM 1" HIGH LETTERS INDICATING FUNCTION AS LISTED IN PARENTHESES ON TANK DRAWINGS. PROVIDE PERMANENT BLACK VINYL LETTERS OR STENCIL WITH BLACK POLYURETHANE PAINT.

** SUBMITTALS **

PROVIDE SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO STARTING FABRICATION. SHOP DRAWINGS TO INDICATE COMPLIANCE WITH ALL REQUIREMENTS OF DRAWINGS AND SPECIFICATIONS INCLUDING JOINT TYPE, CONSTRUCTION DETAILS, ATTACHMENTS. SURFACE PREPARATION. PAINTING. LABELING. ETC.

** TANK CONSTRUCTION **

TANK SHELL JOINTS TO BE FULL PENETRATION BUTT WELDS OR DOUBLE WELDED FULL FILLET LAP JOINTS, U.L. 142 FIGURE 6.1 #2 OR #3. HEAD TO SHELL JOINTS TO BE FULL PENETRATION BUTT WELDS OR DOUBLE WELDED FULL FILLET LAP JOINTS, U.L. 142 FIGURE 6.2 #2 OR #6.

PROVIDE WITH INTEGRAL STEEL SADDLES. SADDLES TO BE SEAL WELDED TO TANK — BOLT ON OR STRAP ON SADDLES WILL NOT BE ACCEPTED.

** OPENINGS AND ATTACHMENTS **

PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. OPENINGS INDICATED AS FLANGES SHALL BE ANSI 150# PATTERN FLANGES WITH RAISED FACE. OPENINGS INDICATED AS BUNGS SHALL BE FEMALE PIPE THREAD. PROVIDE 1/4" DOUBLER PLATES WHERE INDICATED.

INSTALL ALL FLANGES AND BUNGS PLUM, LEVEL AND SQUARE TO THE MAIN AXIS OF THE TANK IN ALL THREE PLANES. VERIFY BUNG ORIENTATION WITH PIPE NIPPLE. INSTALL FLANGES WITH BOLT PATTERN SQUARE TO TANK AXIS. PIPING CONNECTIONS MORE THAN ONE DEGREE OUT OF ALIGNMENT SHALL BE CUT OUT AND RE—INSTALLED. VERIFY ALIGNMENT PRIOR TO PAINTING.

ATTACH ALL COMPONENTS PERMANENTLY WELDED TO THE TANKS INCLUDING STAND-OFFS. PROVIDE REINFORCING PLATES ON ALL STAND-OFFS. SEAL WELD ALL NON-STRUCTURAL SEAMS, AND ROUND CORNERS AND SHARP EDGES PRIOR TO SANDBLASTING AND PAINTING. REMOVE ALL DETACHABLE COMPONENTS PRIOR TO SANDBLASTING TANKS.

PROVIDE WITH LADDER ATTACHED TO TANK AS INDICATED. SHOP FABRICATE LADDER; VERIFY FIT; REMOVE; SANDBLAST AND PAINT EQUIVALENT TO TANK PRIOR TO FASTENING TO TANK.

** COATINGS **

SURFACE PREPARATION AND COATING SPECIFICATIONS APPLY TO ALL UN-COATED BLACK STEEL EXTERIOR TANK ASSEMBLY COMPONENTS INCLUDING TANK, PIPE, NIPPLES AND FITTINGS.

SANDBLAST IN ACCORDANCE WITH SSPC-SP-10. PRIME WITHIN 4 HOURS OF SANDBLASTING. PRIME WITH REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA-COAT 302, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. COVER WITH TWO COATS OF EPOXY, DEVOE BAR-RUST 236, TO 10 MILS TOTAL DRY FILM THICKNESS, FIRST COAT GRAY, SECOND COAT WHITE. FINISH WITH ONE COAT OF ALIPHATIC URETHANE ENAMEL, DEVOE DEVTHANE 389, COLOR WHITE, TO 3 MILS DRY FILM THICKNESS. SUBSTITUTIONS OF PAINT WILL NOT BE ACCEPTED. PERFORM ALL PAINTING IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

** PREPARATION FOR SHIPPING **

UPON COMPLETION OF FABRICATION, CLEAN OUT TANK INTERIOR TO REMOVE ALL DEBRIS AND DIRT. SEAL ALL OPENINGS TO PREVENT ENTRANCE OF WATER AND DIRT. BLIND FLANGE ALL FLANGED OPENINGS. PLUG ANY OPEN BUNGS WITH THREADED PIPE PLUGS AND CAP ANY THREADED PIPE ENDS WITH THREADED PIPE CAPS EXCEPT AS NOTED. COAT ALL FLANGE GASKETS, PIPE PLUGS, AND BOLTS WITH ANTI—SIZE COMPOUND PRIOR TO INSTALLATION.

PROVIDE TEMPORARY VENTING TO ALLOW FOR NORMAL INTERNAL EXPANSION AND CONTRACTION DUE TO CHANGES IN TEMPERATURE DURING SHIPPING BY INSTALLING A 2-INCH VENT CAP IN A TOP BUNG IN EACH TANK COMPARTMENT, INCLUDING INTERSTITIAL SPACES.

** PIPE AND FITTINGS **

PIPE - ASTM A106B SCH 80 SFAMLESS CARBON STEEL PIPE.

WELD FITTINGS — BUTT WELD FITTINGS FOR ALL PIPING 2" DIAMETER AND LARGER AND SOCKET WELD FITTINGS FOR ALL PIPING SMALLER THAN 2". ASTM A234 SEAMLESS DOMESTIC BUTT WELD CARBON STEEL FITTINGS. ASTM A105 DOMESTIC FORGED STEEL FLANGES, ANSI 150# RAISED FACE, EXTRA HEAVY/HEAVY BORE ON SCH 80 PIPE. ASTM A105 SOCKET WELD FITTINGS, CLASS 3000 MINIMUM.

NIPPLES - SCH 80, ASTM A53 CARBON STEEL NIPPLES.

FLANGE GASKETS - SPIRAL WOUND METALLIC, LAMONS SPIRASEAL STYLE WR OR EQUAL.

THREADED FITTINGS - ASTM A105 FORGED STEEL FITTINGS, CLASS 3000 MINIMUM, UNLESS SPECIFICALLY NOTED OTHERWISE.

WELDED JOINTS — PERFORM ALL WELDING IN ACCORDANCE WITH ASME SECTION IX AND API 1104 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION. VISUALLY INSPECT WELD JOINTS IN ACCORDANCE WITH API 1104.

THREADED JOINTS - PRIOR TO ASSEMBLY, THOROUGHLY COAT MALE END WITH ANTI-SEIZE COMPOUND.

FLANGED JOINTS - COAT METALLIC GASKETS WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLY.

TESTING — PRIOR TO PAINTING TEST ALL PIPING JOINTS WITH MINIMUM 125 PSIG AIR WITH EACH JOINT SOAKED WITH A FOAMING SOAPY WATER SOLUTION, AND VISUALLY INSPECT EACH JOINT FOR LEAKS. ALL WELDS THAT FAIL INSPECTION SHALL BE CUT OUT, REWELDED AND RETESTED.

** SUPPORTS AND FASTENERS **

FASTENERS - ALL BOLTS, NUTS AND WASHERS, INCLUDING FLANGE BOLT SETS, TO BE TYPE 304 OR TYPE 301 STAINLESS STEEL.

** VALVES **

1" FLANGED BALL VALVES - REDUCED PORT UNI-BODY STYLE, CARBON STEEL, ANSI 150# RF FLANGED ENDS, STAINLESS STEEL BALL AND TRIM, GLASS FILLED TEFLON SEAT, GRAPHITE SEALS, LOCKABLE HANDLE, 150 PSIG MINIMUM WORKING PRESSURE, NACE MR0175 CONFORMANCE, FIRE SAFE PER API 607. PBV C-5410-31-2236-FTNL OR APOLLO EQUAL, NO OTHER SUBSTITUTES.

** TANK AND PIPING SPECIALTIES **

SCREEN VENT CAPS - ALUMINUM BODY, STAINLESS STEEL SCREEN, 2" FPT CONNECTION. MORRISON FIGURE 155 OR EQUAL.

FILL LIMITERS — 2" FPT FLOAT—TYPE MECHANICAL SHUT—OFF VALVE. ALUMINUM BODY, CLOSED CELL BUNA—N FLOAT, BRASS PLUNGER, STAINLESS STEEL TRIM, 100 PSIG SHUT—OFF PRESSURE. MORRISON FIGURE 9095—A OR EQUAL. PROVIDE WITH 2" ALUMINUM DROP TUBE CUT TO LENGTH AT 45 DEGREES AS REQUIRED TO TERMINATE WITHIN 6" ABOVE TANK BOTTOM.

QUICK-CONNECT COUPLINGS - ALUMINUM BODY CAM AND GROOVE FITTING WITH DUST CAP. MALE FITTING WITH FPT CONNECTION, AS SPECIFIED, 150 PSIG MINIMUM WORKING PRESSURE. PT COUPLING, CAM-V-LOK OR EQUAL.

EMERGENCY VENTS — ALUMINUM BODY, CAST IRON COVER, 16 OZ/SQUARE INCH PRESSURE SETTING, 4" SIZE, 119,750 CFH RELIEF CAPACITY AT 2.5 PSIG. MALE THREAD CONNECTION. MORRISON FIGURE 244M OR EQUAL.

GAUGE HATCH - BRASS CAP AND CHAIN, BUNA-N GASKET, 2" FPT CONNECTION. MORRISON FIGURE 307 OR EQUAL.

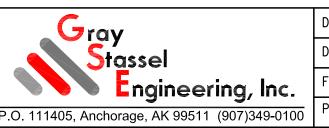
SPILL CONTAINMENT MANHOLE - 7 GALLON CAPACITY, 12 GAUGE STEEL CONTAINER AND HINGED LOCKING COVER, 1/4" STEEL BASE WITH 4" DOUBLE-TAPPED FPT CONNECTION AND BRASS QUICK-DRAIN VALVE, POWDER COATED FINISH. POMECO 211-AST, OR EQUAL.



RECORD DRAWING AVTEC POWER PLANT TRAINING FACILITY UPGRADE

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MNC M DATE: 2-12-16 FUEL TANK & ACCESSORIES SPECIFICATIONS



DRAWN BY: JTD SCALE: NO SCALE

DESIGNED BY: BCG

FILE NAME: AVTEC M1-M6

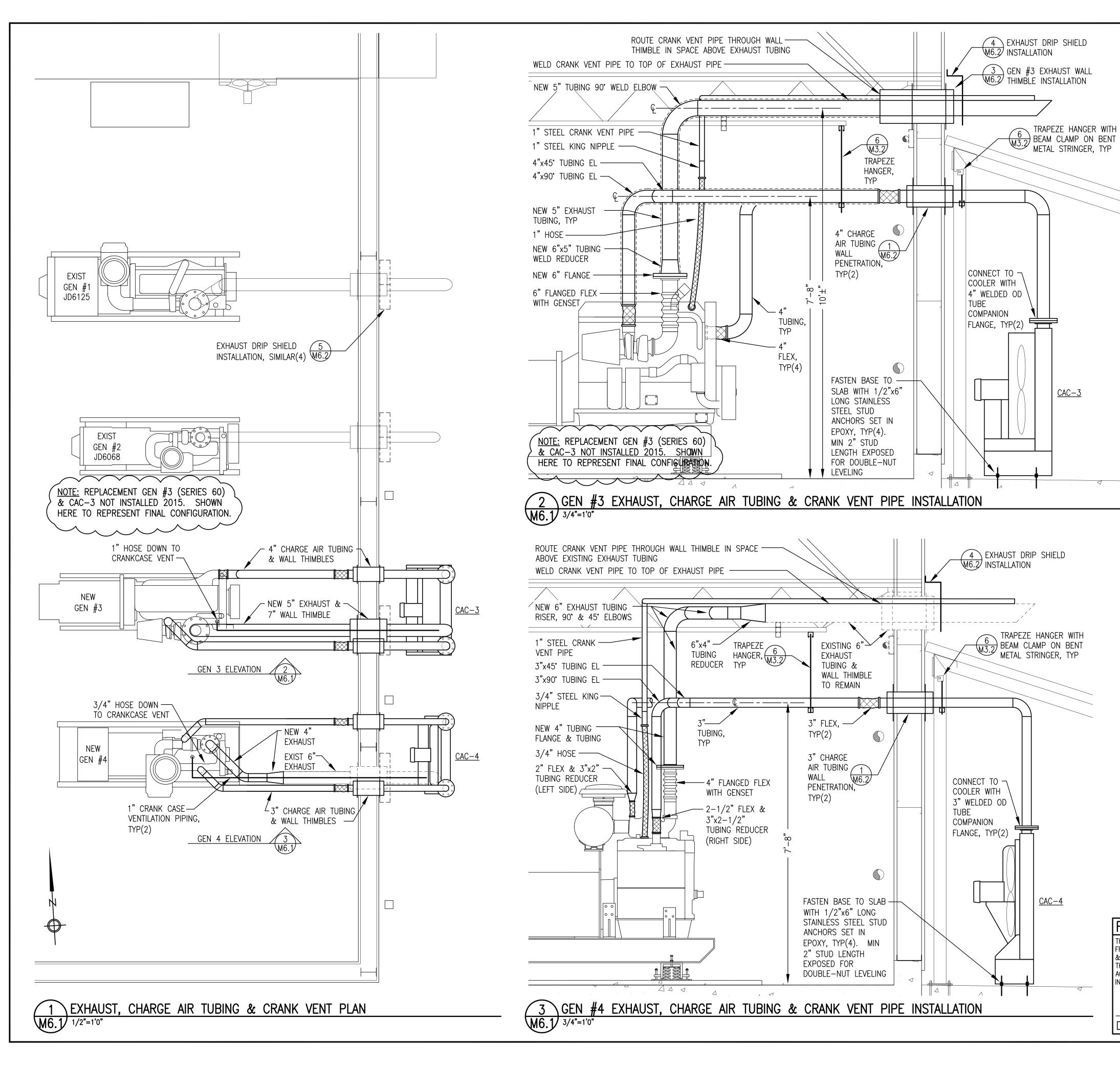
PROJECT NUMBER:

SCALE: NO SCALE

DATE: 6/23/15

SHEET:

M5.4



EXHAUST, CHARGE AIR & CRANK VENT SYSTEMS GENERAL NOTES:

- . ALL EXHAUST PIPE AND CHARGE AIR TUBING TUBING TO BE LIGHT WALL CARBON STEEL O.D. EXHAUST TUBING, SIZE AS INDICATED. ALL ELBOWS TO BE SHORT RADIUS FITTINGS TO MATCH TUBING. ALL JOINTS TO BE WELDED EXCEPT AS INDICATED.
- 2. ALL CRANK VENT PIPING TO SCHEDULE 40 STEEL PIPE WITH BUTT-WELD ELBOWS.
- . ENGINE EXHAUST FLEXES FURNISHED WITH GENERATORS.
- 4. ALL CHARGE AIR TUBING FLEX CONNECTIONS HIGH TEMPERATURE DOUBLE HUMP SILICONE TURBO SLEEVES WITH RINGS, 6" LONG BY DIAMETER INDICATED, TCFA-N##-R6 OR EQUAL. FASTEN WITH STAINLESS STEEL T-BOLT CLAMPS.
- INSULATE INTERIOR ENGINE EXHAUST PIPING WITH 1-1/2" MEDIUM TEMPERATURE INSULATION FROM FLEX TO TO WALL PENETRATION.
- INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO FLEX AT WALL PENETRATION WITH YARN TAPE, SEE SPECIFICATIONS.
- 7. MAKE COOLER CONNECTIONS WITH O.D. TUBE BY ANSI 125# STEEL PLATE FLANGES, G.T. EXHAUST PART #41 OR EQUAL. INSTALL HIGH TEMPERATURE FULL FACE STAINLESS STEEL AND GRAPHITE GASKETS, DURABLA BLACK OR EQUAL.



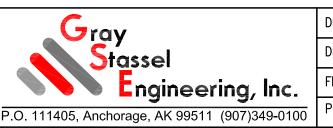
RECORD DRAWING

THESE DRAWINGS HAVE BEEN PREPARED

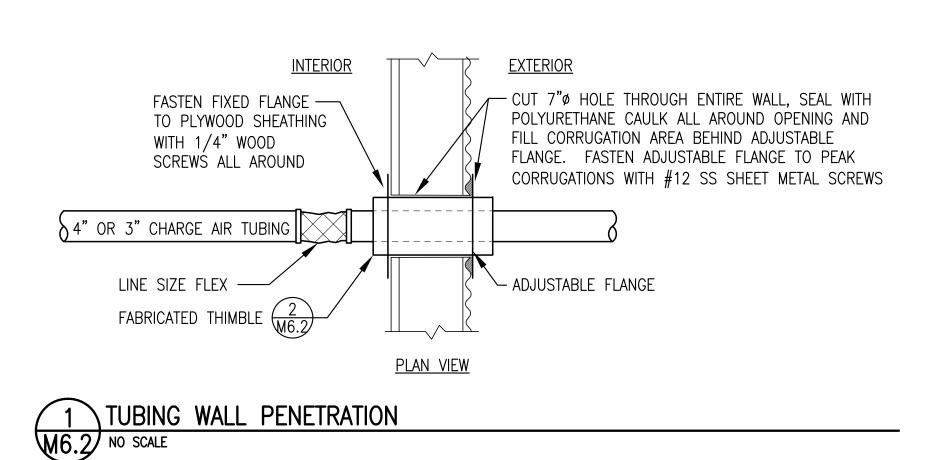
AVTEC POWER PLANT TRAINING FACILITY UPGRADE

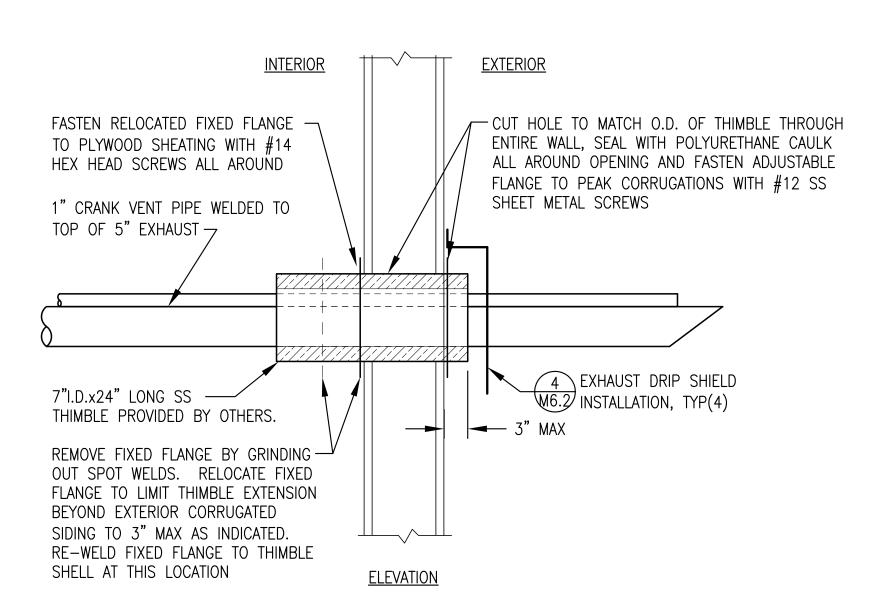
FROM INFORMATION PROVIDED BY OTHERS & OBSERVATIONS OF THE UNDERSIGNED. THERE IS NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.

MuCh DATE: 2-12-16 EXHAUST, CHARGE AIR TUBING & CRANK VENT
PLAN & DETAILS

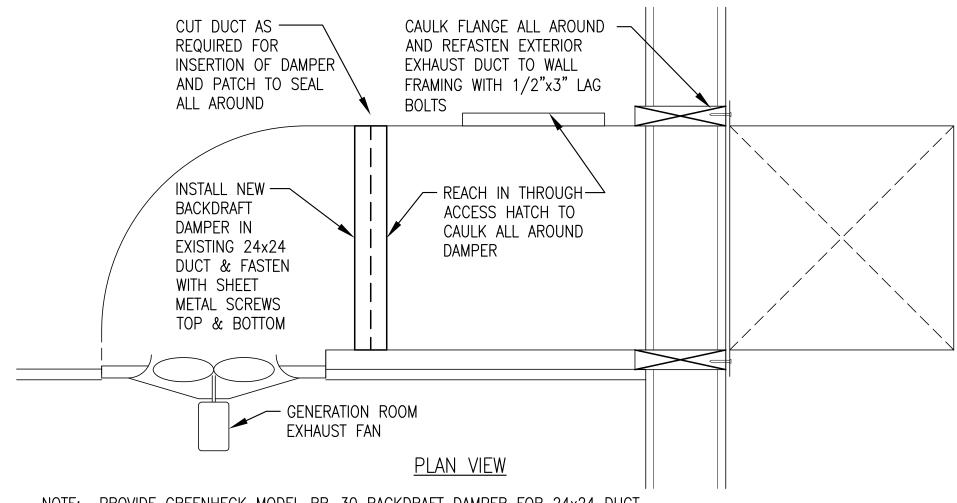


& DETAILS	
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET:
PROJECT NUMBER:	M6.1 6



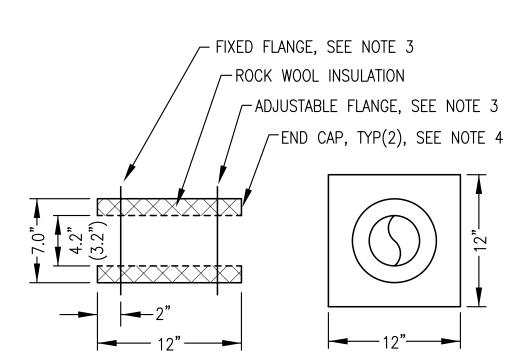






NOTE: PROVIDE GREENHECK MODEL BR-30 BACKDRAFT DAMPER FOR 24x24 DUCT





NOTES:

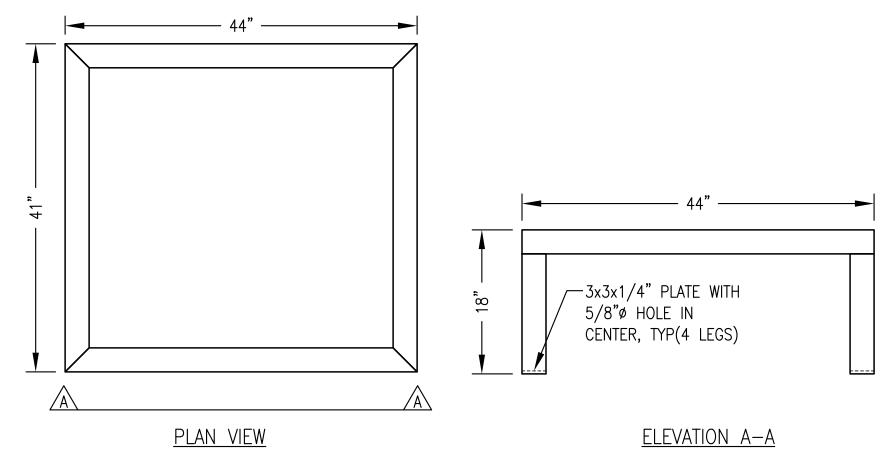
- 1) FABRICATE 2 EACH 4" (4.2"ID) AND 2 EACH 3" (3.2"ID) THIMBLES.
- 2) FABRICATE ENTIRE ASSEMBLY FROM MINIMUM 16 GAUGE TYPE 304 STAINLESS STEEL WITH ALL JOINTS SEAL WELDED.
- 3) FABRICATE TWO IDENTICAL SQUARE FLANGES. SEAL WELD FIXED FLANGE TO OUTER SHELL. ADJUSTABLE FLANGE TO SHIP LOOSE FOR FIELD INSTALLATION.
- 4) SEAL WELD END CAPS TO INNER AND OUTER SHELLS.

' AND 3" CHARGE AIR TUBING THIMBLE FABRICATION

M6.2 NO SCALE

FASTEN THROUGH DRIP SHIELD FLANGE TO PEAK OF METAL SIDING CORRUGATIONS, TYP — SEAL FLANGE TO WALL WITH POLYURETHANE CAULK — EXHAUST WALL — THIMBLE BEHIND & FILL CORRUGATION AREA #14x1-1/4" SS SHEET METAL SCREWS, TYP CENTER DRIP SHIELD
ON EXHAUST PIPE ALUMINUM EXHAUST
DRIP SHIELD
FABRICATION FIELD CUT DRIP SHIELD FRONT PLATE TO EXHAUST TUBING O.D. (ALL GENS) AND CRANK VENT PIPE O.D. (GENS #3&4)

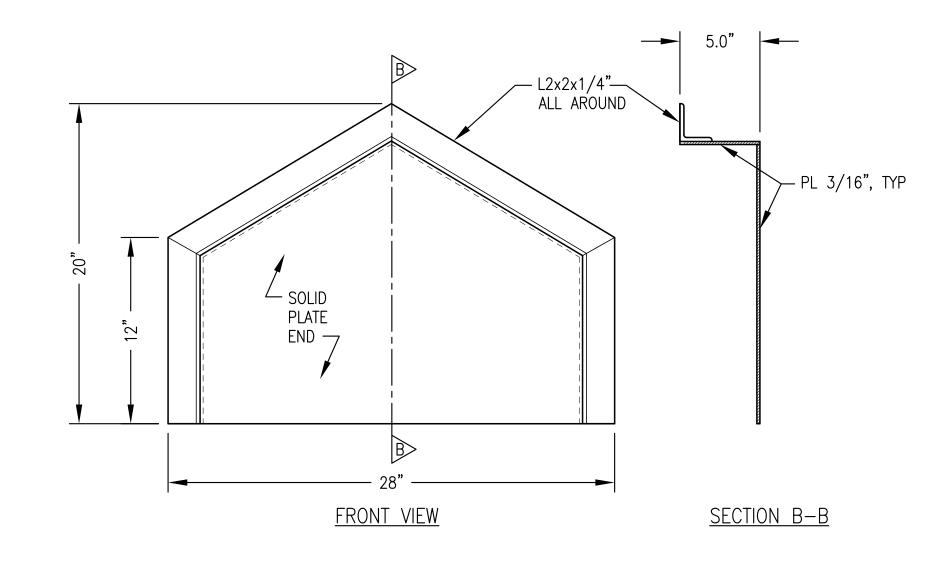




NOTE: FABRICATE ONE SUPPORT BASE FROM 3x3x1/4" TYPE 6061-T6 ALUMINUM ANGLE USING CONTINUOUS SEAL WELDS FOR ALL JOINTS.

7 LOAD BANK LB-1 SUPPORT BASE FABRICATION M6.2 NO SCALE

NOTE: FABRICATE 4 EACH IDENTICAL DRIP SHIELDS FROM TYPE 5052 ALUMINUM PLATE AND TYPE 6061-T6 ALUMINUM ANGLE USING CONTINUOUS SEAL WELDS FOR ALL JOINTS.



5 ALUMINUM EXHAUST DRIP SHIELD FABRICATION



AVTEC POWER PLANT TRAINING FACILITY UPGRADE

RECORD DRAWING

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Mulm DATE: 2-12-16

EXHAUST & CHARGE AIR TUBING DETAILS



DRAWN BY: JTD SCALE: NO SCALE DESIGNED BY: BCG DATE: 6/23/15 SHEET: FILE NAME: AVTEC M1-M6 M6.2 of 6

SCHEDULE OF DRAWINGS

- SPECIFICATIONS, SCHEDULES & DETAILS
- SWITCHGEAR & POWER GENERATION SYSTEM MODIFICATIONS ONE—LINE DIAGRAM
- DEMOLTION PLAN & NOTES
- POWER, FEEDER, & CONTROL PLAN & DETAILS
- POWER, FEEDER, & CONTROL SECTIONS & DETAILS
- POWER, FEEDER, & CONTROL SECTIONS & DETAILS
- STATION SERVICE PLAN & DETAILS
- DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS
- DAY TANK CONTROL PANEL LAYOUT, INSTALLATION & TERMINAL STRIP
- DAY TANK CONTROL PANEL NOTES, SEQUENCE OF OPERATIONS & INTERCONNECT DETAILS

ELECTRICAL SPECIFICATIONS

** GENERAL CONDITIONS **

PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE INCLUDING STATE OF ALASKA AMENDMENTS.

THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.

ALL EQUIPMENT AND MATERIALS SHOWN ARE NEW UNLESS SPECIFICALLY INDICATED AS EXISTING. INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS, UNLESS INDICATED OTHERWISE.

PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN SAID WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

DO NOT CUT, DRILL, OR NOTCH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. MINIMIZE PENETRATIONS AND DISRUPTION OF BUILDING FEATURES.

** SPECIAL CONDITIONS **

ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK, BURN, ROTATING FANS, PULLEYS, BELTS, HOT MANIFOLDS, NOISE, ETC. ASSOCIATED WITH WORKING NEAR POWER GENERATION AND CONTROL EQUIPMENT.

** DEVICES AND FQUIPMENT **

DEVICES - LISTED FOR INTENDED SERVICE. INSTALL ALL DEVICES SUCH THAT MINIMUM REQUIRED ACCESS CLEARANCE IS MAINTAINED.

SUPPORT - INDEPENDENTLY SUPPORT EACH DEVICE FROM BUILDING STRUCTURAL MEMBERS WITH CHANNEL STRUT OR FABRICATED BRACKETS UTILIZING APPROPRIATE FASTENERS. ALL FASTENERS SHALL BE GALVANIZED OR ZINC PLATED

** RACEWAYS **

INTERIOR - ALL INTERIOR LOCATIONS SHALL BE ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR NEMA 1 SCREW COVER WIREWAY AS INDICATED. NOTE THAT EXISTING GENERATOR OVERHEAD CABLE TRAYS WILL BE RE-USED AS INDICATED.

EXTERIOR - ALL EXTERIOR LOCATIONS SHALL BE GALVANIZED RIGID CONDUIT (GRC) EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. PROVIDE LIQUID TIGHT OIL RESISTANT FLEXIBLE CONDUIT WHERE INDICATED AND AS REQUIRED TO ACCOMMODATE MOVEMENT.

TERMINATION - FINAL CONNECTIONS TO DEVICES MAY BE WITH LIQUID TIGHT OIL RESISTANT FLEXIBLE CONDUIT EXCEPT WHERE INDICATED SPECIFICALLY AS LISTED FLEXIBLE CONNECTORS. CONDUITS TERMINATING IN EXTERIOR ENCLOSURES SHALL UTILIZE A WEATHERPROOF CONDUIT HUB. CONDUITS TERMINATING IN INDOOR ENCLOSURES SHALL UTILIZE LOCKNUTS INSIDE AND OUT WITH A METALLIC CONDUIT BUSHING, HUB, OR BOX CONNECTOR INSIDE THE ENCLOSURE.

SUPPORT - SUPPORT CONDUIT FROM BUILDING STRUCTURAL MEMBERS WITH CHANNEL STRUT AND PIPE CLAMPS OR PIPE HANGERS. DO NOT SUPPORT FROM CONNECTIONS TO EQUIPMENT. DO NOT USE PERFORATED STRAPS FOR SUPPORT.

** CONDUCTORS **

GROUNDING - PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY AND DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR UNLESS SPECIFICALLY INDICATED OTHERWISE. EQUIPMENT GROUNDING CONDUCTORS SHALL BE OF CLASS AND SIZE AS INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NEC.

GENERAL USE CONDUCTORS - CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.

GENERATOR FEEDERS — RE-USE/REINSTALL EXISTING 105°C COBRA AND 90°C CONDUMEX CABLE AS INDICATED. TERMINATE AND SPLICE WITH LUGS AND CONNECTORS RATED FOR THE FULL AMPACITY OF THE CABLE AT 90°C MINIMUM.

COLOR CODING — UNLESS SPECIFICALLY INDICATED OTHERWISE CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

120/208-VOLT POWER CONDUCTORS

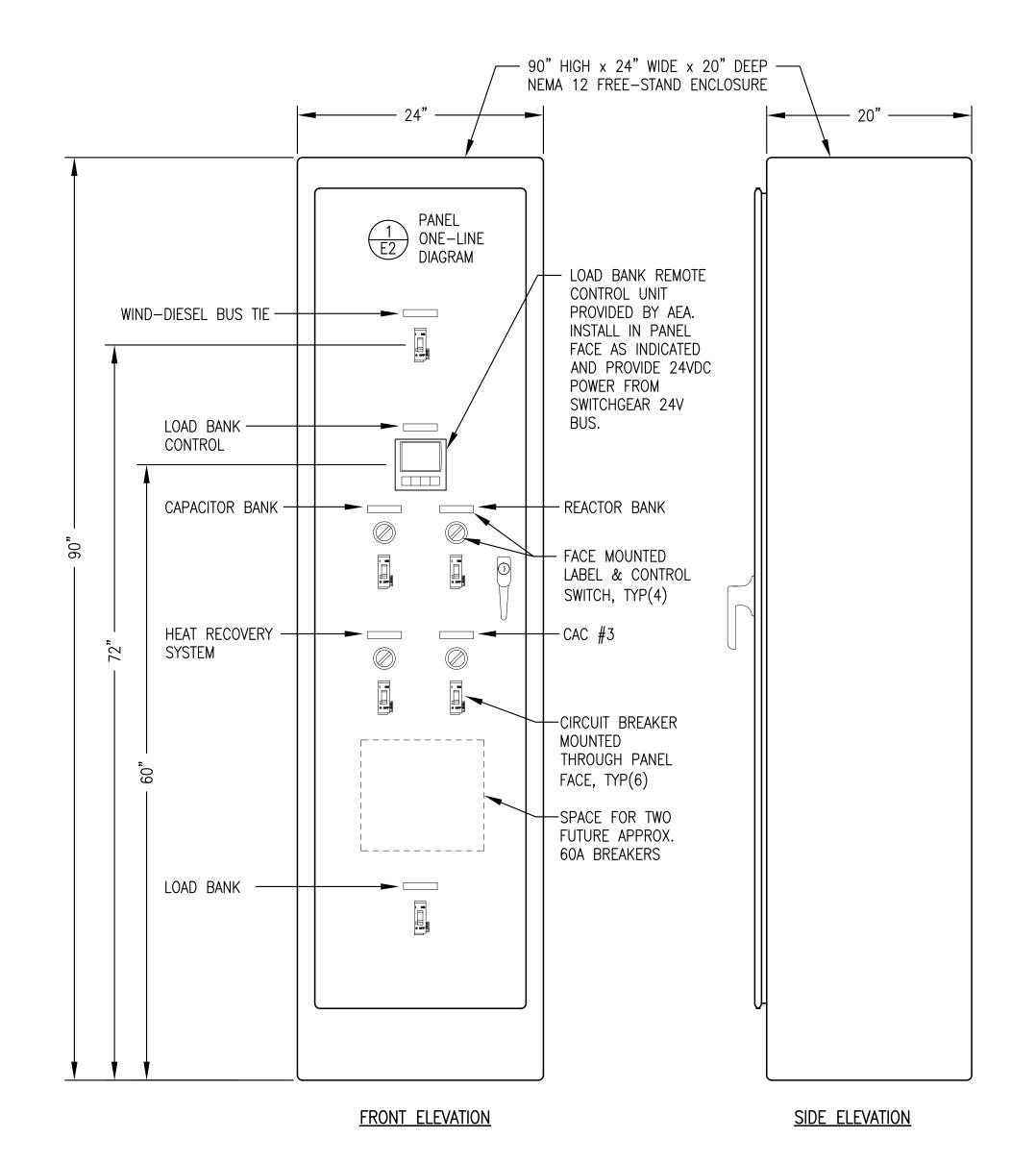
PHASE A - BLACK

PHASE B - RED PHASE C - BLUE

NEUTRAL - WHITE 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 THE CABLE SHALL BE IDENTIFIED AT EVERY ACCESSIBLE LOCATION. PROVIDE A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION.

SHIELDED CONDUCTORS - STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH A STRANDED TINNED COPPER DRAIN WIRE, AND PVC OUTER JACKET. SINGLE PAIR TWISTED #18 AWG, BELDEN #1120A OR EQUAL.

TEM NO.	DESCRIPTION	MANUFACTURER
\bigcirc	MULTI-TONE ALARM WITH STROBE, 115V, NEMA 3R, WEATHER RESISTANT SURFACE MOUNT BELL BOX	WHEELOCK MT4-115-WH-VNS
2	DAY TANK 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
9>	0-5 MINUTE TIMER SWITCH, 120V, 20A, 1HP RATED, INSTALL IN 4"x4" CAST BELL BOX WITH METAL COVER.	INTERMATIC FF5M
11>	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER	HUBBELL 1221-PL
17>	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120 VOLT AC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS	SENS NRG22-20-RCLS
18	TEMPERATURE TRANSMITTER, RTD, 20-240°F RANGE, 4-20mA OUTPUT, 1/2" NPT PIPING CONNECTION, 6mm DIAMETER BY 2.5" LONG STEM, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 800-20/240-1-1-8-8-025-6
19>	PRESSURE TRANSMITTER, 0-60 PSIG RANGE, 4-20mA OUTPUT, 1/4" NPT PIPING CONNECTION, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 100-60-1-1-2-7
20>	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 120/240V, 30A, MIN 3HP RATED	SIEMENS GNF321NR
21>	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 600V, 400A	SIEMENS HNF365R
22>	TOP-MOUNT TANK PROBE WITH INSTALLATION KIT FOR 2" NPT RISER, WATER TIGHT COMPRESSION GLAND FITTING FOR CABLE ENTRANCE. FRANKLIN FUEL SYSTEMS, NO SUBSTITUTES. PROBE AND RISER LENGTH AS INDICATED IN TANK INSTALLATION DETAILS.	4' TANK PROBE: TSP-LL2-53-I FLOAT: INTSP-IDF2 2" FOR DIESE INSTALLATION KIT: TSP-K2A
23>	LOAD BANK LB-1, UL LISTED, FREESTANDING HORIZONTAL AIRFLOW, FORCED AIR COOLED TYPE 3R RESISTIVE LOAD BANK. 100KW, 208V, 3-PHASE, 60HZ. 10-20-20-50KW LOAD STEPS. EXTERNALLY POWERED, 120V-1-60 THERMOSTATICALLY CONTROLLED ANTI CONDENSATION HEATERS IN CONTACTOR SECTION OF LOAD BANK ENCLOSURE. REMOTE INDOOR WALL MOUNT ENCLOSURE WITH MANUALLY OPERATED DIGITAL TOUCH PANEL CONTROLLER (HMI)	SIMPLEX POLARIS PS-100-2083-60-R-M-010
24>	POWER FACTOR CORRECTION FIXED CAPACITOR, RATED 20 kVAR @ 240V (OPERATING 15 kVAR @ 208V), 3 PH, NEMA 1 UNIPAK, STANDARD DUTY ROUND CELL	EATON 20-2-3-PM-U-R-N
25>	POWER FACTOR CORRECTION FIXED REACTOR, IRON CORE, 15KVAR, 208VAC, 3 PHASE, 50AMPS, 15.8 MILLI H INSULATION CLASS, 220C TEMPERATURE RISE.	REX POWER MAGNETICS 50C15800E6-3







AVTEC POWER PLANT TRAINING FACILITY UPGRADE

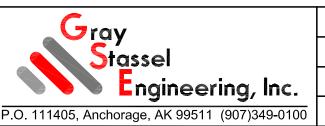
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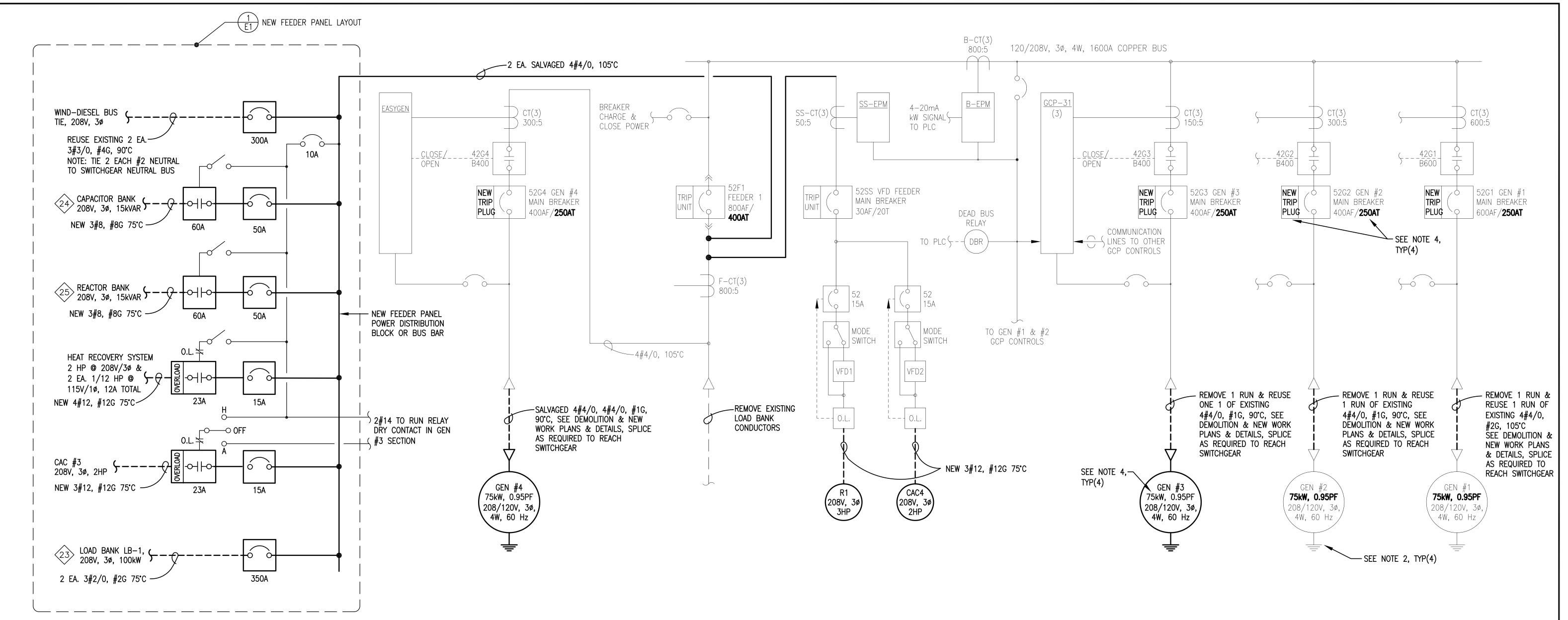
THESE DRAWINGS HAVE BEEN PREPARED

Muly DATE: 2-12-16

SPECIFICATIONS, SCHEDULES & DETAILS



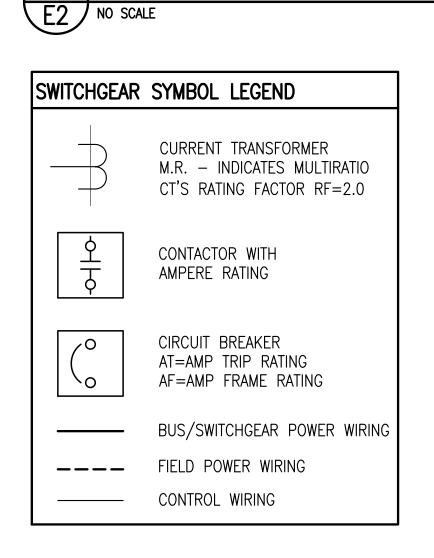
DRAWN BY: JTD SCALE: NO SCALE DESIGNED BY: CWV/BCG DATE: 6/22/15 SHEET: FILE NAME: AVTEC E1-E6 PROJECT NUMBER:



<u>NOTES</u>

- 1. ALL EXISTING/UNMODIFIED DEVICES/WIRING/EQUIPMENT SHOWN LIGHT. ALL NEW/MODIFIED DEVICES/WIRING/EQUIPMENT SHOWN
- 2. ISOLATE EACH GENERATOR NEUTRAL FROM MOUNTING SKID & GENERATOR FRAME. CONNECT NEUTRAL TO THE NEUTRAL BUS AT THE PARALLELING SWITCHGEAR. INDEPENDENTLY GROUND EACH GENERATOR FRAME TO SWITCHGEAR GROUND BUS & PROVIDE SECOND GROUND DIRECTLY TO PLANT GROUND GRID.
- 3. GENERATOR AND LARGE EQUIPMENT POWER CONDUCTORS ARE A COMBINATION OF NEW AND EXISTING. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE.
- 4. REVISE DEMAND CONTROL SETTINGS TO LIMIT ALL GENERATORS TO 75kW REGARDLESS OF ENGINE OR GENERATOR CAPACITY. REPLACE BREAKER TRIP PLUGS AS INDICATED TO MATCH 75kW RATING AND TO OPERATE WITHIN AMPACITY OF EXISTING POWER CONDUCTORS.
- 5. PROVIDE AN AIR INTAKE DAMPER RELAY IN MASTER SECTION TO PROVIDE 120V, 10A POWER FOR OPENING DAMPER WHEN ANY ENGINE STARTS

1 SWITCHGEAR & POWER GENERATION SYSTEM MODIFICATIONS ONE-LINE DIAGRAM





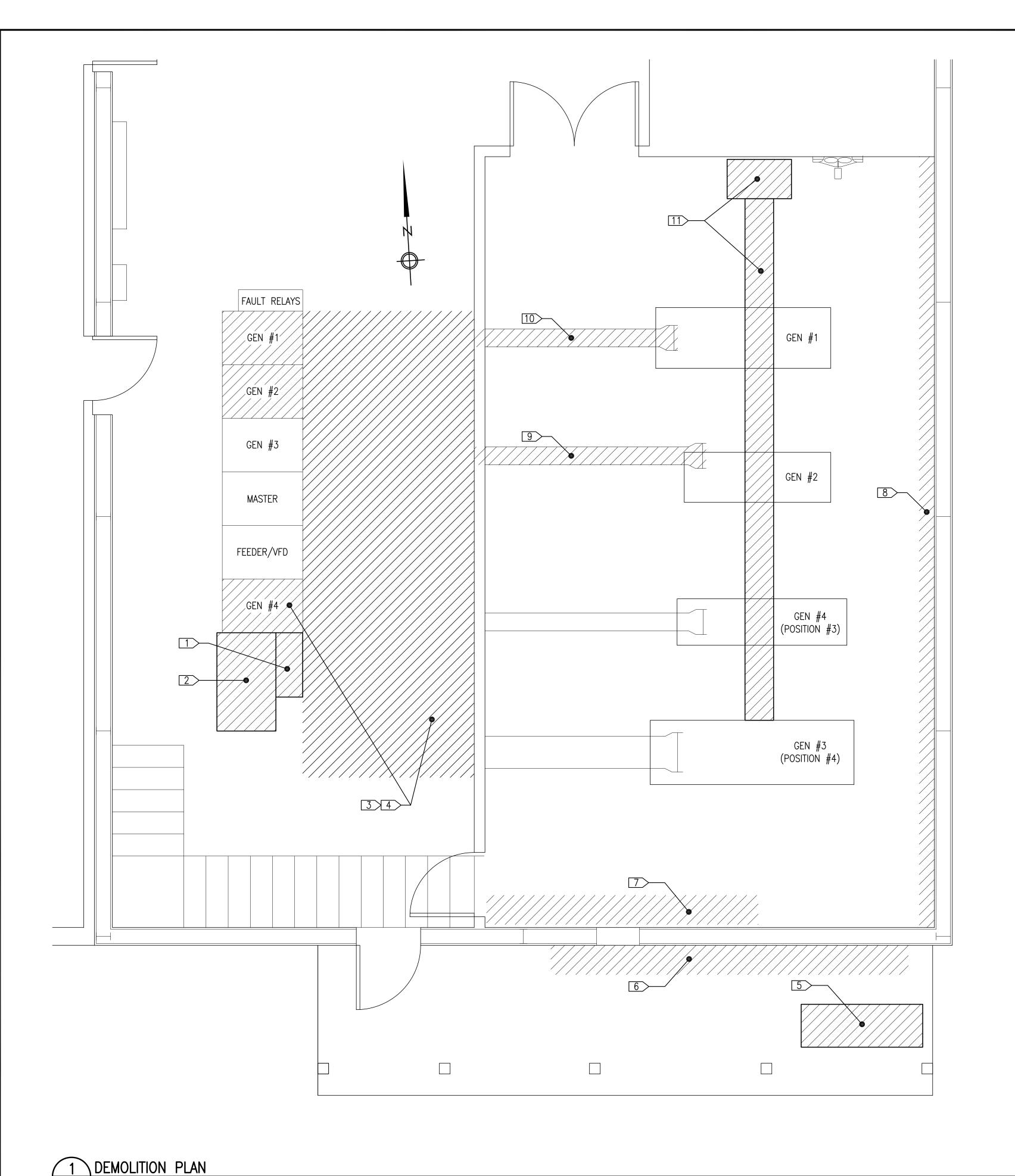
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MuCM DATE: 2-12-16 SWITCHGEAR & POWER GENERATION SYSTEM
MODIFICATIONS ONE—LINE DIAGRAM



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	DRAWN BY: JTD	SCALE:	NO SCALE	
	DESIGNED BY: CWV/BCG	DATE:	6/22/15	
	FILE NAME: AVTEC E1-E6	SHEET	•	ΩF
5	PROJECT NUMBER:	L 2	`	7



DEMOLITION GENERAL NOTES:

- 1) ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR DEMOLITION.
- 2) ENSURE ALL EQUIPMENT AND CIRCUITS ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL CIRCUIT BREAKERS AND DISCONNECTS.
-) TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO ELECTRICAL EQUIPMENT BEING REMOVED DURING DEMOLITION. TARP ALL EQUIPMENT AND SEAL ALL EXPOSED OPENINGS PRIOR TO REMOVING FROM PLANT. STORE ALL REMOVED CONDUCTOR CONDUIT & FITTINGS FOR POSSIBLE REUSE. TURN ALL REMOVED EQUIPMENT OVER TO AVTEC FOR FINAL DISPOSITION IF NOT REUSED.

DEMOLITION SPECIFIC NOTES:

- REMOVE EXISTING POWER SWITCH BOARD ALONG WITH ALL CONDUCTORS EXCEPT MECHANIC SHOP SOUTH FEEDER CONDUIT & CONDUCTORS TO REMAIN FOR RECONNECTION TO NEW PANEL.
- 2 REMOVE EXISTING MAIN LOAD BANK ALONG WITH ALL POWER/CONTROL CONDUCTORS AND FAN DUCTING.
- 3 DISCONNECT GENERATOR POWER & CONTROL CONDUCTORS FROM SWITCHGEAR. CAREFULLY PULL FROM SWITCHGEAR CABINETS, REMOVE FROM EXISTING CONTROL ROOM OVERHEAD CONDUIT/WIRE TRAY AND COIL IN SECURE LOCATION FOR REINSTALLATION AND/OR SALVAGING FOR REUSE ELSEWHERE.
- 4 DEMOLISH ALL OVERHEAD CABLE TRAY AND STRUT THIS AREA UNLESS INDICATED OTHERWISE ON NEW WORK PLAN. CAREFULLY REMOVE LIGHT FIXTURES AND SAVE FOR REUSE. PROVIDE TEMPORARY SUPPORT FOR STATION SERVICE CONDUIT & DEVICES TO REMAIN.
- 5 REMOVE EXISTING EXTERIOR LOAD BANK ALONG WITH ALL POWER/CONTROL CONDUCTORS.
- 6 REMOVE ALL CONDUIT/CONDUCTOR/DEVICES FOR DEMOLISHED EQUIPMENT THIS AREA. SEE MECHANICAL FOR EQUIPMENT DEMOLITION.
- 7> REMOVE ALL ABANDONED PUMP AND DAY TANK CIRCUIT CONDUIT/CONDUCTOR/DEVICES THIS AREA.
- 8 REMOVE CONDUCTOR & CONDUIT FOR EXISTING USED OIL PUMP AND RECEPTACLE CIRCUIT ON EAST WALL AND SAVE FOR FUTURE REUSE.
- 9 REMOVE ONE RUN OF EXISTING CIC (1 EA. CONDUMEX 4-#4/0 TYPE TC WITH #4 TYPE THHN GROUND IN 2" HDPE DUCT). TAKE CARE TO AVOID DAMAGING AND STORE FOR POSSIBLE REUSE. CABLE TRAY AND ONE RUN OF EXISTING CONDUMEX TO REMAIN.
- 10> REMOVE ONE RUN OF EXISTING POWER CONDUCTORS (4 EA. #4/0 COBRA TYPE AWM-I 105° C CABLE AND 1 EA. #2 BARE COPPER GROUND). TAKE CARE TO AVOID DAMAGING AND STORE FOR POSSIBLE REUSE. CABLE TRAY AND ONE EXITING RUN OF POWER CONDUCTORS TO REMAIN.
- 11> DEMOLISH EXISTING BATTERY CHARGING AREA AND OVERHEAD CABLE TRAY. SAVE BATTERIES, CHARGER AND CABLE FOR POSSIBLE FUTURE REUSE.



AVTEC POWER PLANT TRAINING FACILITY UPGRADE

FROM INFORMATION PROVIDED BY OTHERS

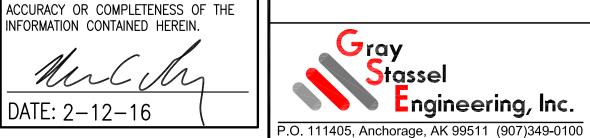
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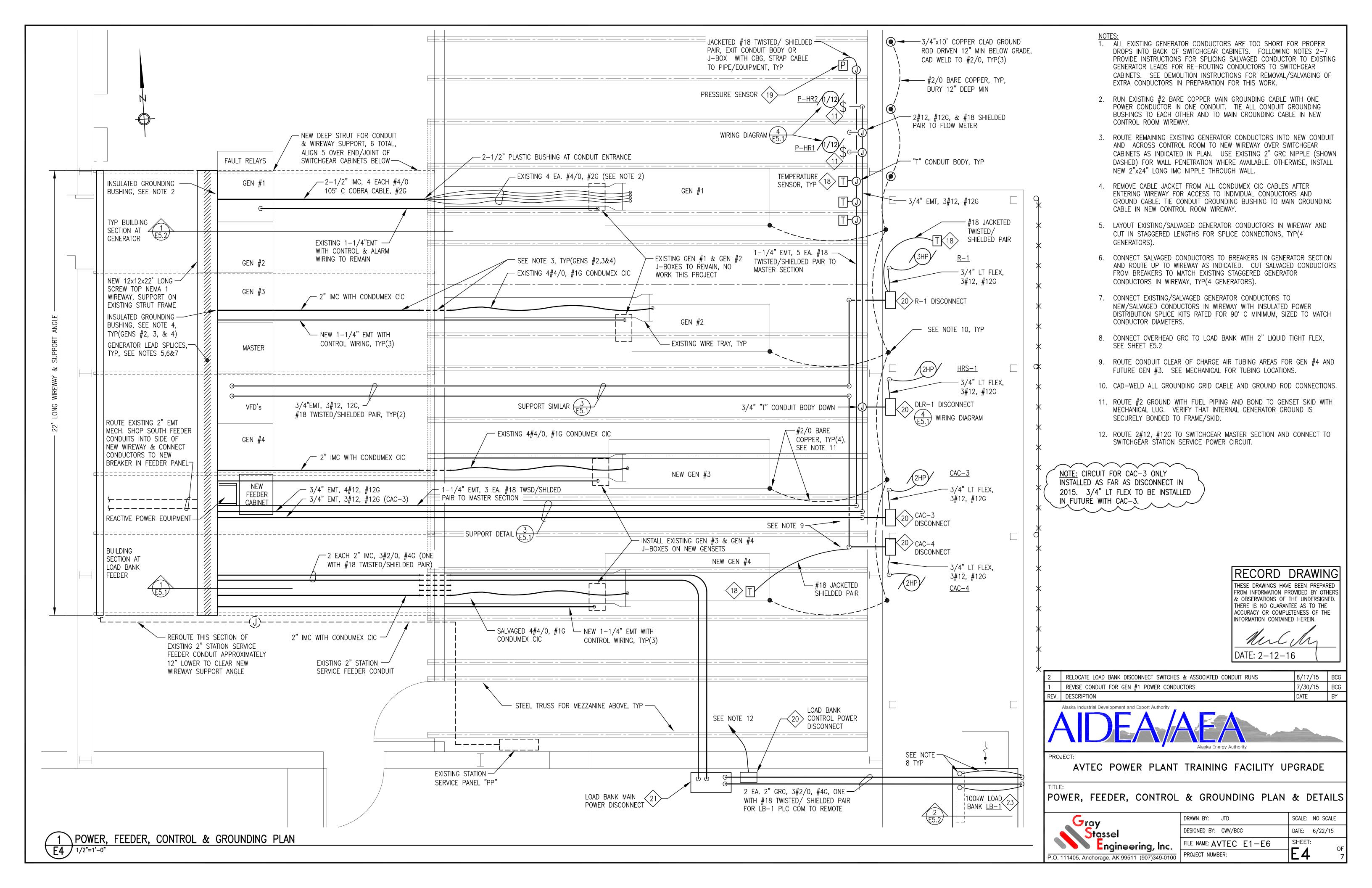
& OBSERVATIONS OF THE UNDERSIGNED.

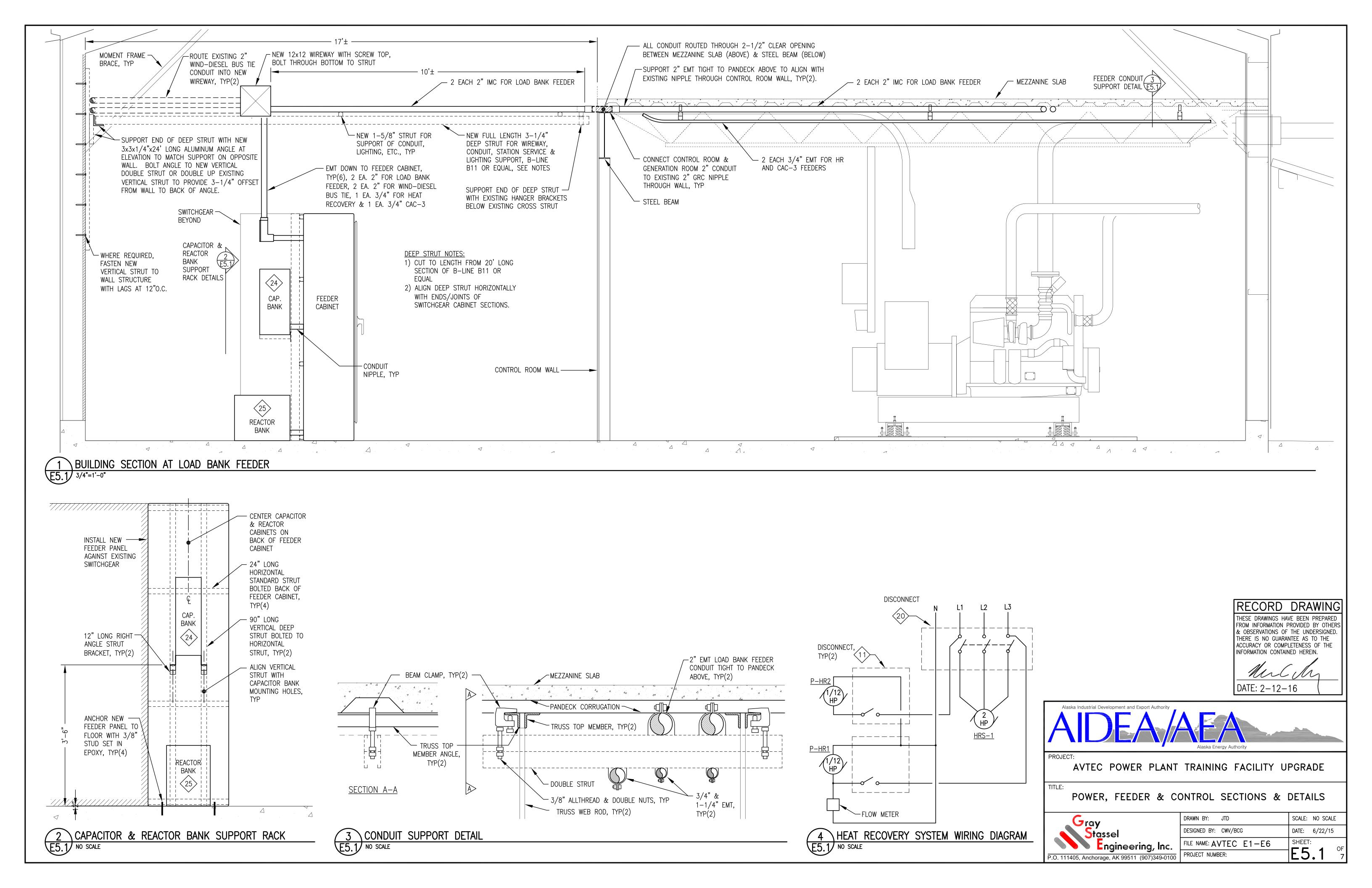
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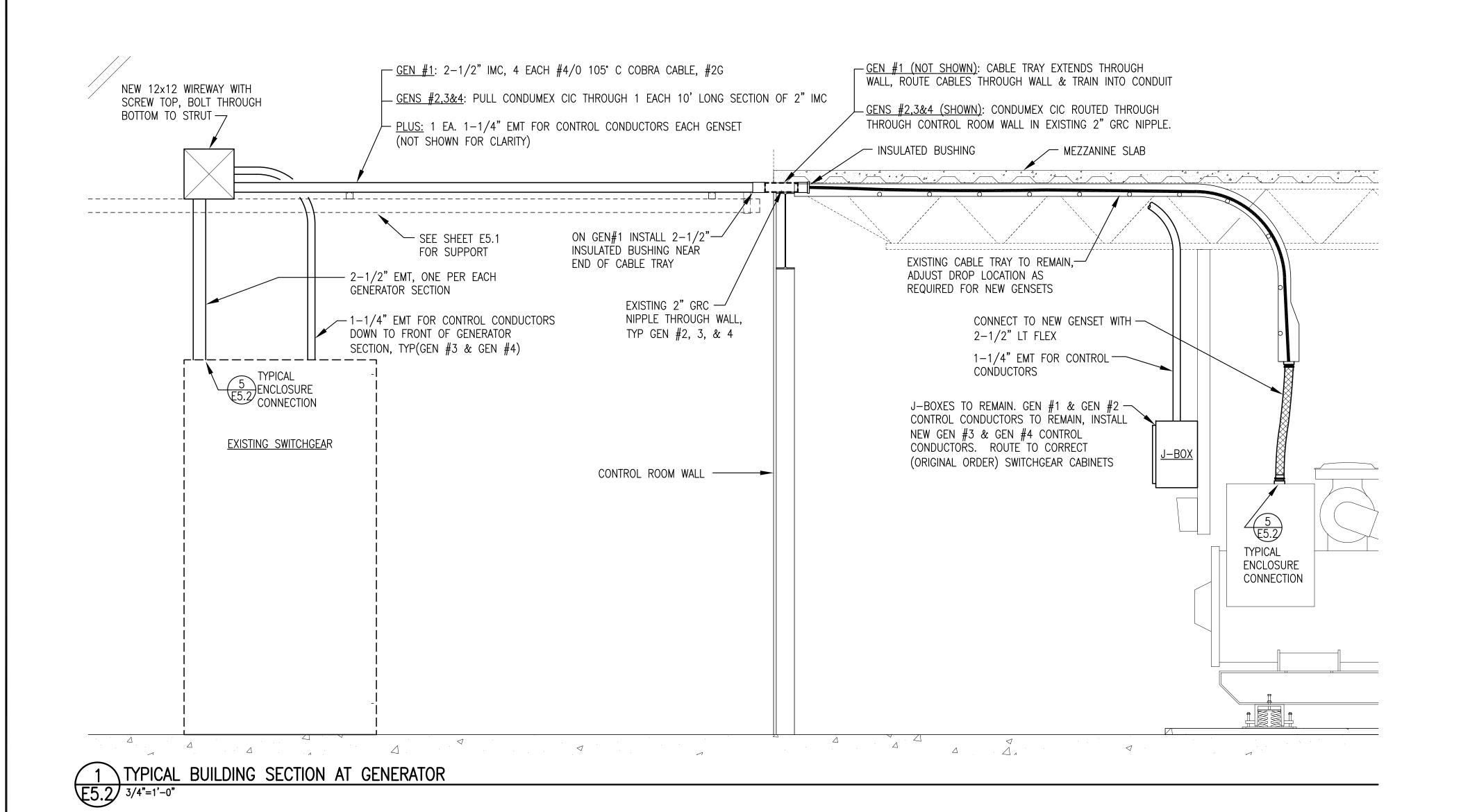
DEMOLITION PLAN & NOTES

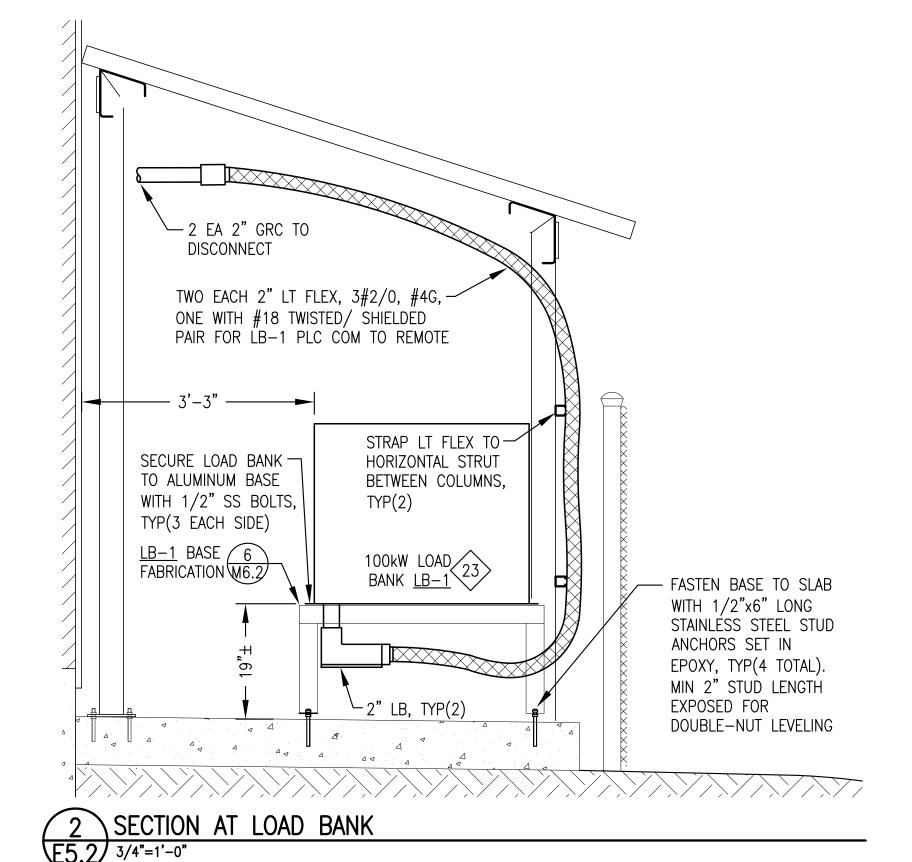


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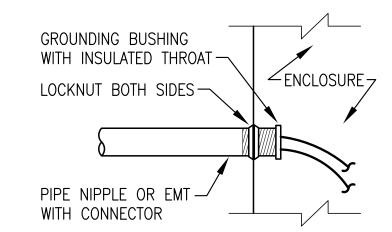




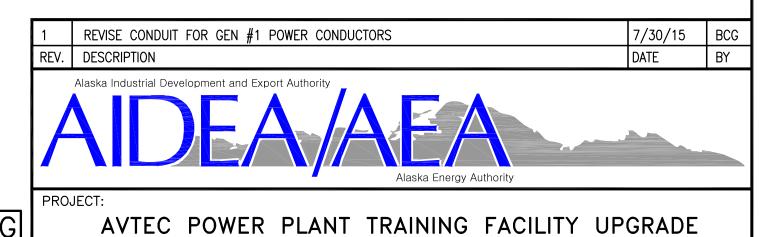




NOTE: THIS DETAIL APPLIES TO ALL CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS. ON GENERATOR ENCLOSURES MAKE ALL CONNECTIONS AS TIGHT AS POSSIBLE.



5 TYP ENCLOSURE CONNECTION E5.2 NO SCALE



RECORD DRAWING

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MuCh DATE: 2-12-16 POWER, FEEDER & CONTROL SECTIONS & DETAILS



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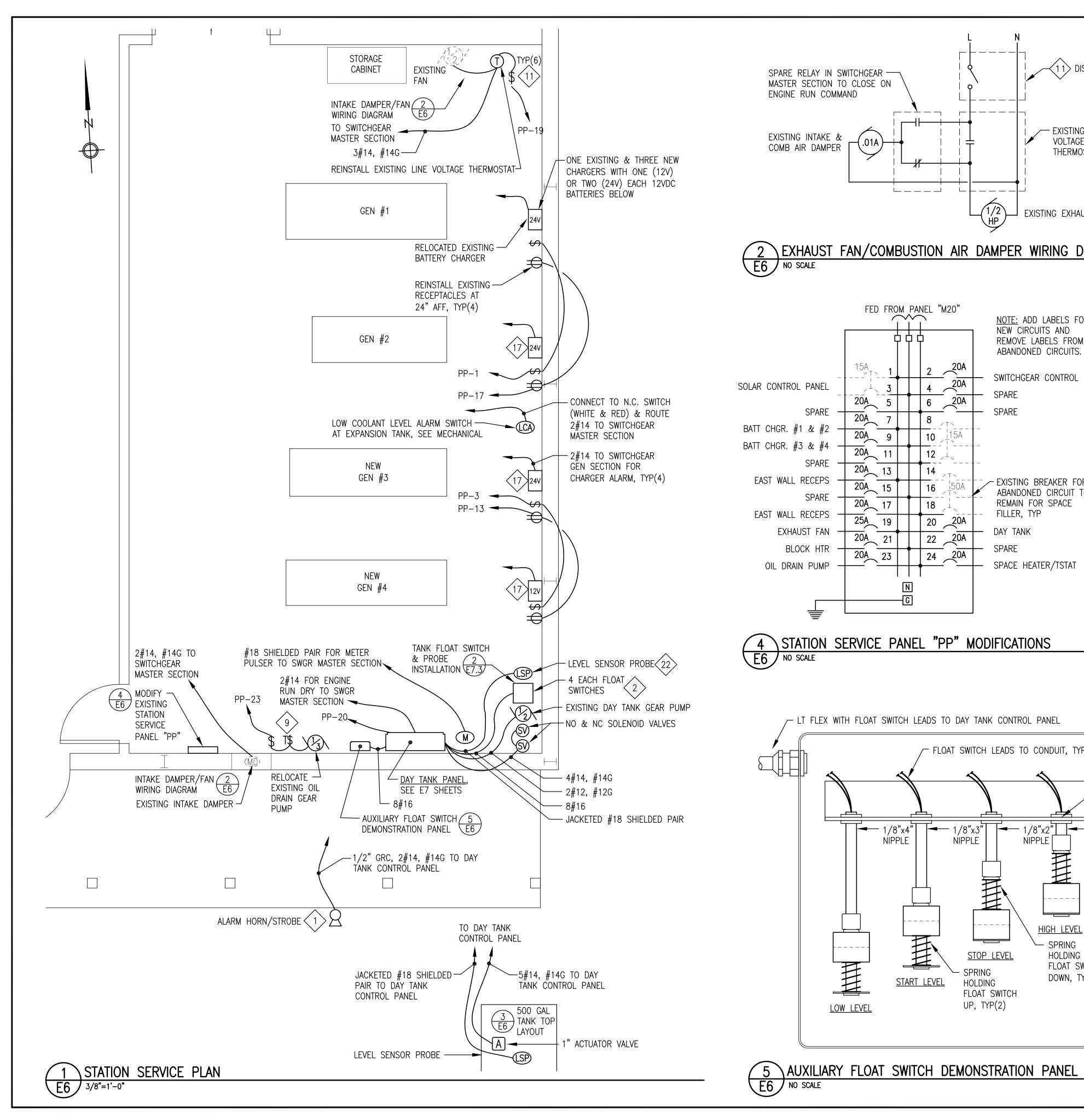
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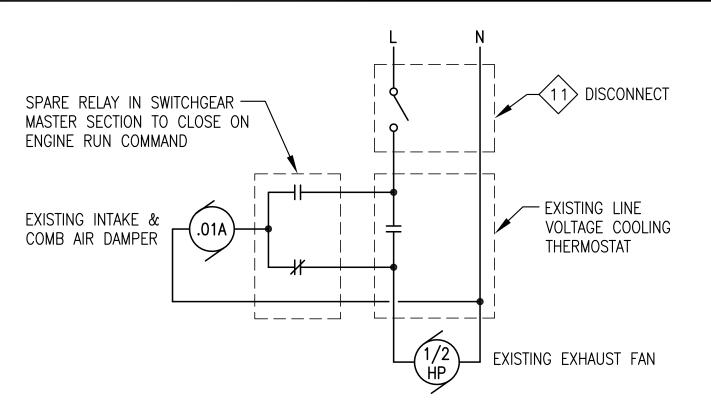
SCALE: NO SCALE

DATE: 6/22/15

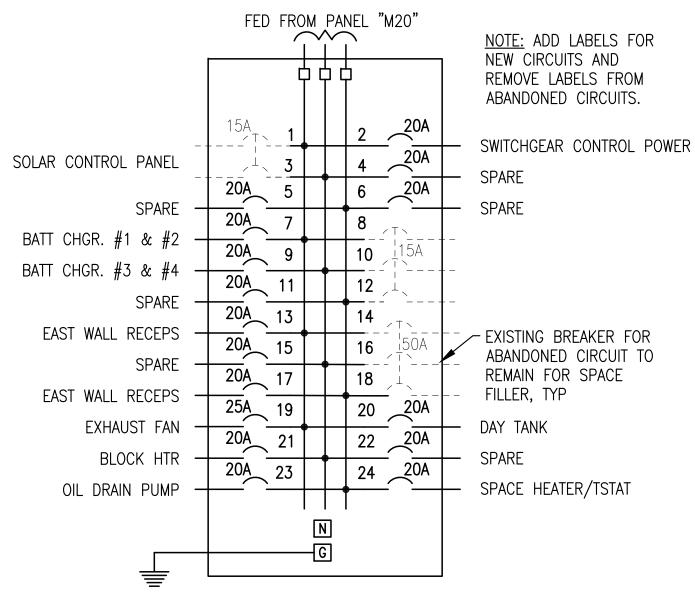
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E5.2



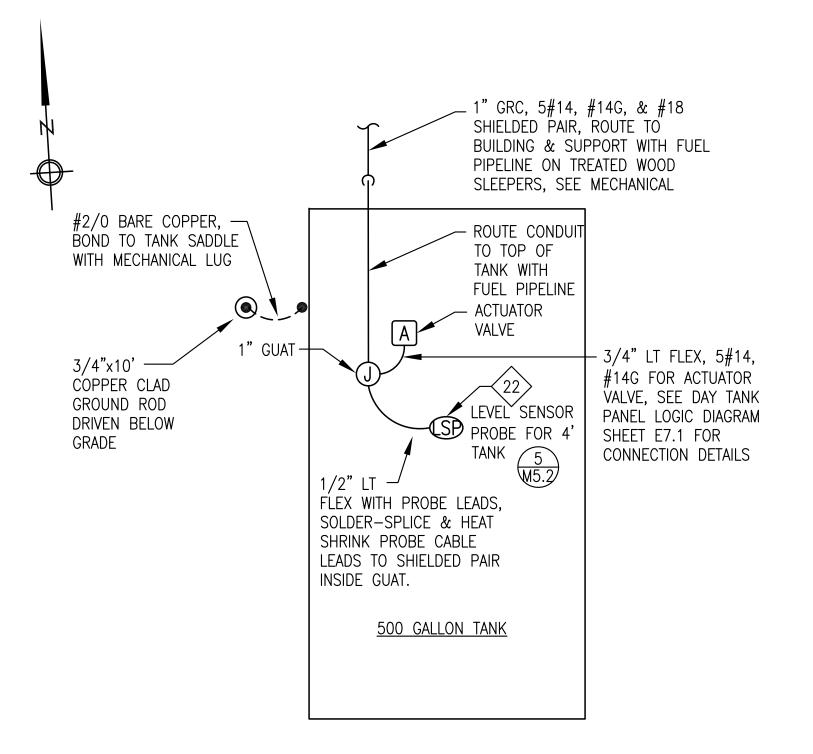


EXHAUST FAN/COMBUSTION AIR DAMPER WIRING DIAGRAM E6 NO SCALE



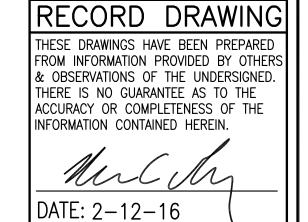
4 STATION SERVICE PANEL "PP" MODIFICATIONS 10 NO SCALE

- LT FLEX WITH FLOAT SWITCH LEADS TO DAY TANK CONTROL PANEL FLOAT SWITCH LEADS TO CONDUIT, TYP(4) - ALUMINUM ANGLE FOR MOUNTING SWITCHES, DRILL FOR 4 EACH 1/8" NIPPLES ├---- 1/8"x3"\ ├**─**─ 1/8"x2"] **─**─ 1/8"x4" 1/8"xCLOSE ŃIPPLE ŃIPPLE NIPPLE (NIPPLE ─ 12x12x6 HINGED COVER NEMA 1 ENCLOSURE HIGH LEVEL SPRING STOP LEVEL HOLDING FLOAT SWITCH DOWN, TYP(2) START LEVEL HOLDING FLOAT SWITCH UP, TYP(2) LOW LEVEL



3 \ 500 GALLON TANK TOP LAYOUT E6 NO SCALE

BUILDING PLANS SYMBOL LEGEND						
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION			
SS-##	HOME RUN TO PANEL & BREAKER(S) INDICATED. SHORT DASH INDICATES HOT CONDUCTOR, LONG DASH INDICATES NEUTRAL CONDUCTOR, CURVED DASH INDICATES GROUND	MD	MOTORIZED DAMPER - SEE MECHANICAL			
1 ★		\bigoplus	125V, 20A, DUPLEX RECEPTACLE			
1	CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.	T	LINE VOLTAGE THERMOSTAT			
	CELEOTOION ITEM CELEOUIDMENT		SNAP SWITCH / SMALL MOTOR DISCONNECT			
#	ELECTRICAL ITEM — SEE EQUIPMENT SCHEDULE ON SHEET E6	T\$	TIMER SWITCH			
1/4/	MOTOR (HORESPOWER INDICATED)	- -	GROUND			





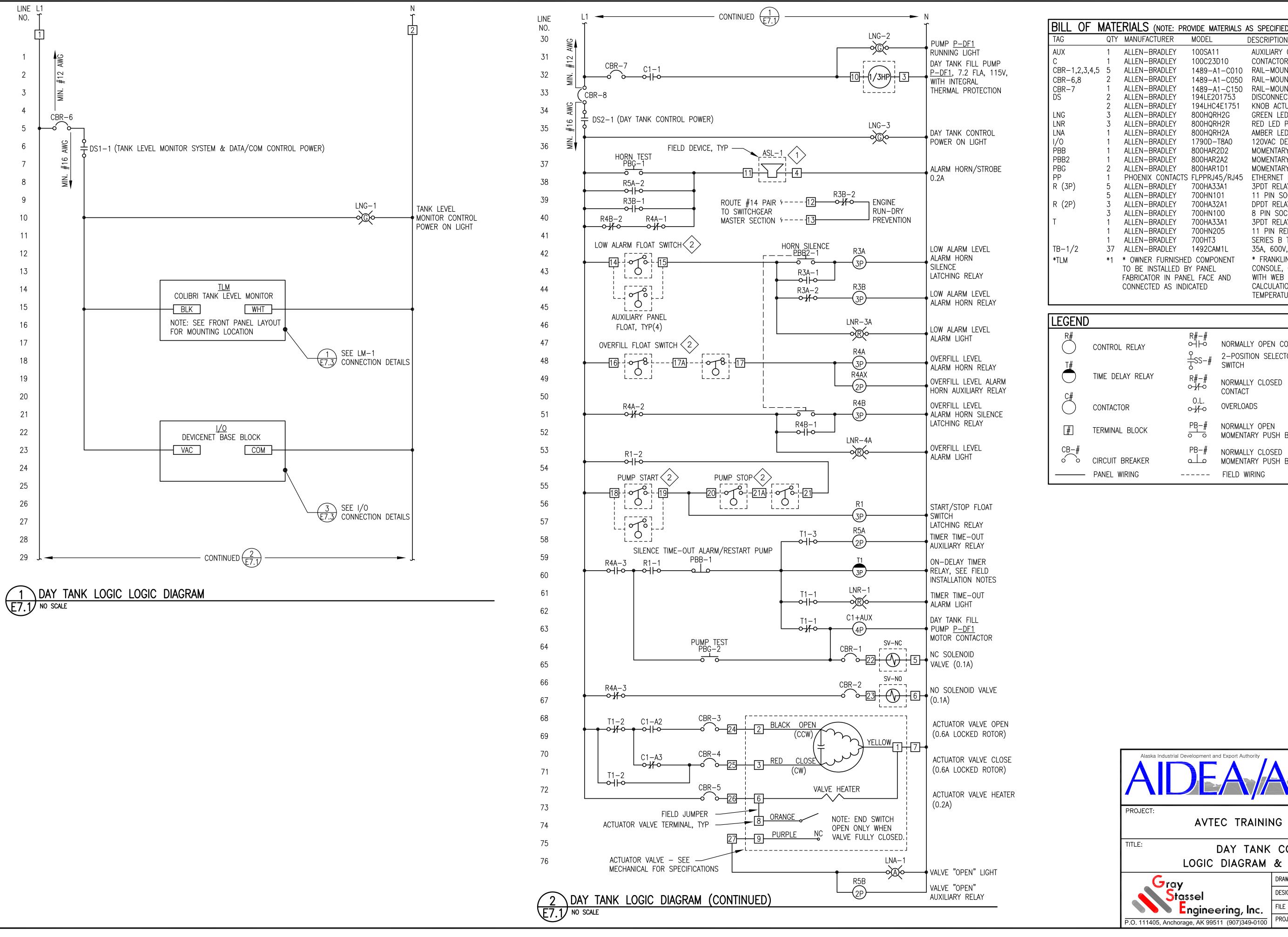
AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE:

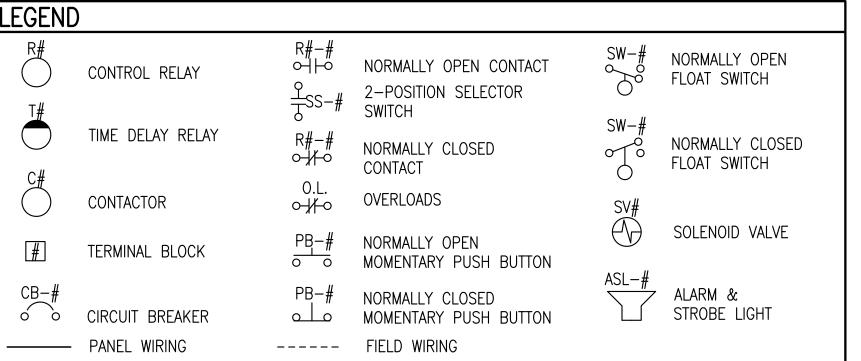
STATION SERVICE PLAN & DETAILS



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	DESIGNED BY: CWV/BCG	DATE: 6/22/15
	FILE NAME: AVTEC E1-E6	SHEET:
5	PROJECT NUMBER:	L6 57



BILL OF N	IATE	RIALS (NOTE: PRO	VIDE MATERIALS	AS SPECIFIED - NO SUBSTITUTIONS ALLOWED)
TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
AUX	1	ALLEN-BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
С	1		100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR-1,2,3,4,5	5	ALLEN-BRADLEY	1489-A1-C010	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 1A
CBR-6,8	2	ALLEN-BRADLEY	1489-A1-C050	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR-7	1	ALLEN-BRADLEY	1489-A1-C150	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 15A
DS	2		194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	2		194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNG	3		800HQRH2G	GREEN LED PILOT LIGHT, 12-130V, NEMA 4X
LNR	3		800HQRH2R	RED LED PILOT LIGHT, 12-130V, NEMA 4X
LNA	1		800HQRH2A	AMBER LED PILOT LIGHT, 12-130V, NEMA 4X
1/0	1		1790D-T8A0	120VAC DEVICENET 8 INPUT BASE TERM. BLOCK
PBB	1		800HAR2D2	MOMENTARY PUSH BUTTON, 1 NC, NEMA 4X, BLACK
PBB2	1		800HAR2A2	MOMENTARY PUSH BUTTON, 2 NO, NEMA 4X, BLACK
PBG	2		800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
PP (7D)	1	PHOENIX CONTACTS	,	ETHERNET PATCH PANEL, RJ45xRJ45, DIN RAIL MOUNT
R (3P)	5 5 3		700HA33A1	3PDT RELAY
D (2D)	ე 7		700HN101	11 PIN SOCKET BASE
R (2P)	ა 3		700HA32A1	DPDT RELAY
l _T	ن 1		700HN100	8 PIN SOCKET BASE 3PDT RELAY
'	1		700HA33A1 700HN205	11 PIN RELAY SOCKET BASE FOR TIMER
	1		700HT3	SERIES B TIMING MODULE
TB-1/2	37		1492CAM1L	35A, 600V, LARGE—HEAD SCREW TERMINALS
1 '				
*TLM	*1	* OWNER FURNISHED		* FRANKLIN/INCON COLIBRI CL6D TANK LEVEL MONITOR CONSOLE, COLOR LCD SCREEN, ETHERNET CONNECTION
		TO BE INSTALLED BY		WITH WEB INTERFACE, PROGRAMMABLE VOLUME
		FABRICATOR IN PANE CONNECTED AS INDIC		CALCULATIONS FOR UP TO SIX TANKS WITH
		COMMECTED AS INDIC	DATED	TEMPERATURE COMPENSATION
				TEIVIT ETVATORE COUNT ENSATION





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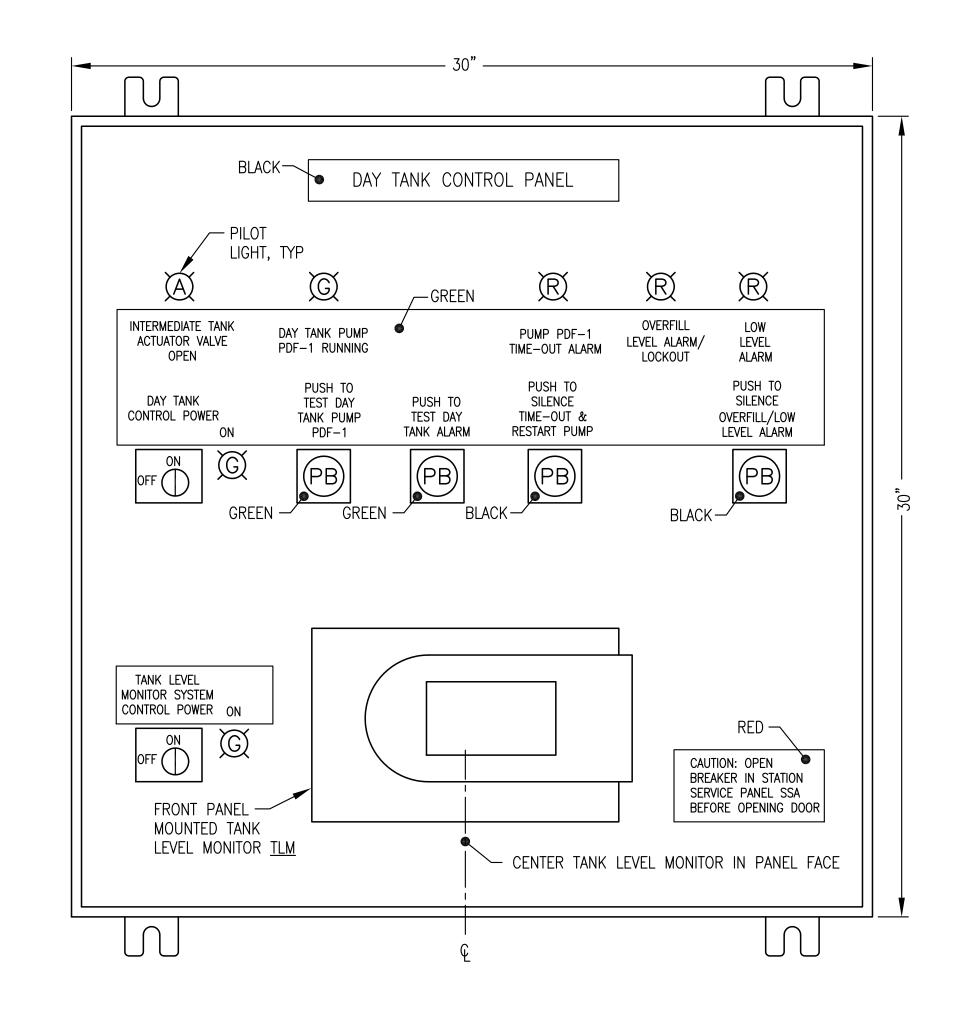
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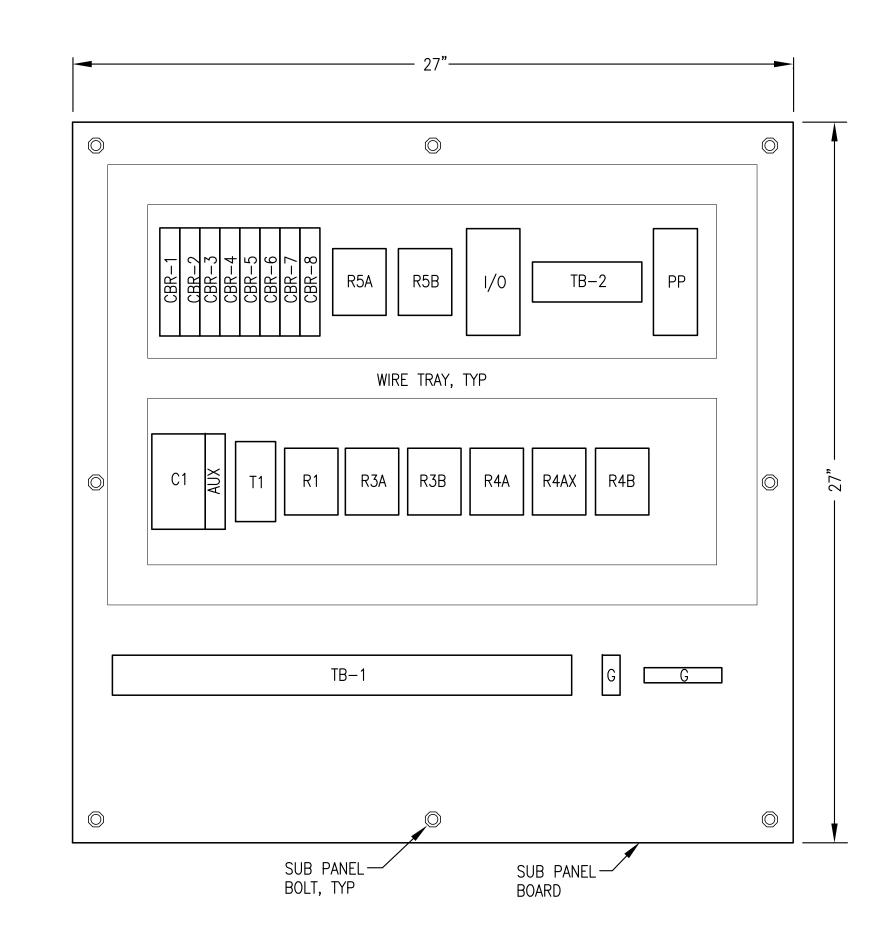


AVTEC TRAINING FACILITY UPGRADE

DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

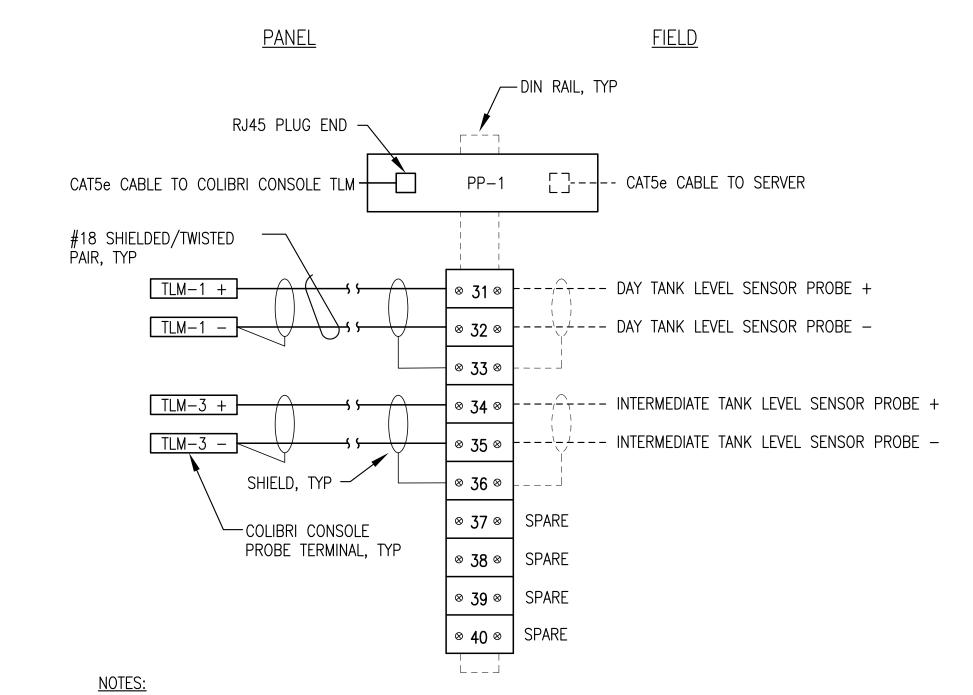
	DRAWN BY: BCG/JTD	SCALE: AS NOTED
	DESIGNED BY: CWV/BCG	DATE: 6/22/15
	FILE NAME: AVTEC E7	SHEET:
<u>5</u>	PROJECT NUMBER:	E/.1 $\frac{1}{7}$



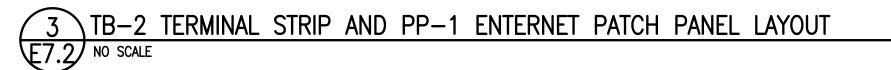


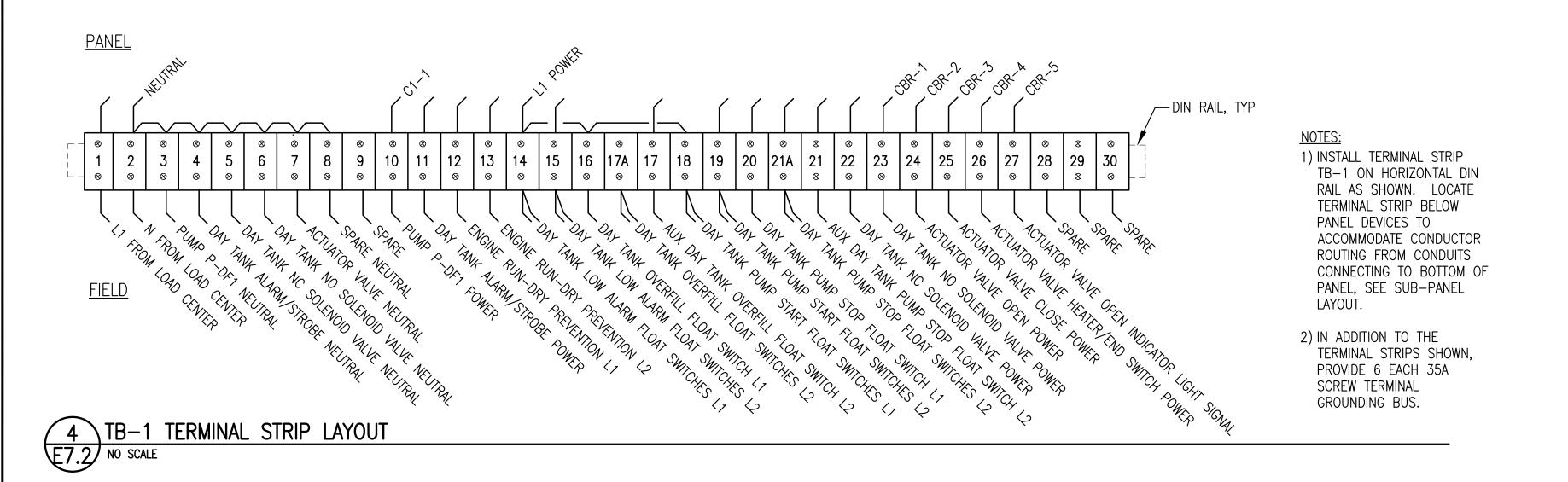






1. INSTALL TERMINAL STRIP TB-2 AND ETHERNET PATCH PANEL PP-1 ON VERTICAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP IN THE UPPER RIGHT CORNER OF PANEL TO ACCOMMODATE CONDUCTOR ENTRY THROUGH RIGHT SIDE OF PANEL, SEE SUB-PANEL LAYOUT.







RECORD DRAWING

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DATE: 2–12–16

DAY TANK CONTROL PANEL LAYOUT, INSTALLATION & TERMINAL STRIP



DRAWN BY: BCG/JTD

DESIGNED BY: CWV/BCG

FILE NAME: AVTEC E7

PROJECT NUMBER:

SCALE: AS NOTED

DATE: 6/22/15

SHEET:

E 7.2

PANEL NOTES:

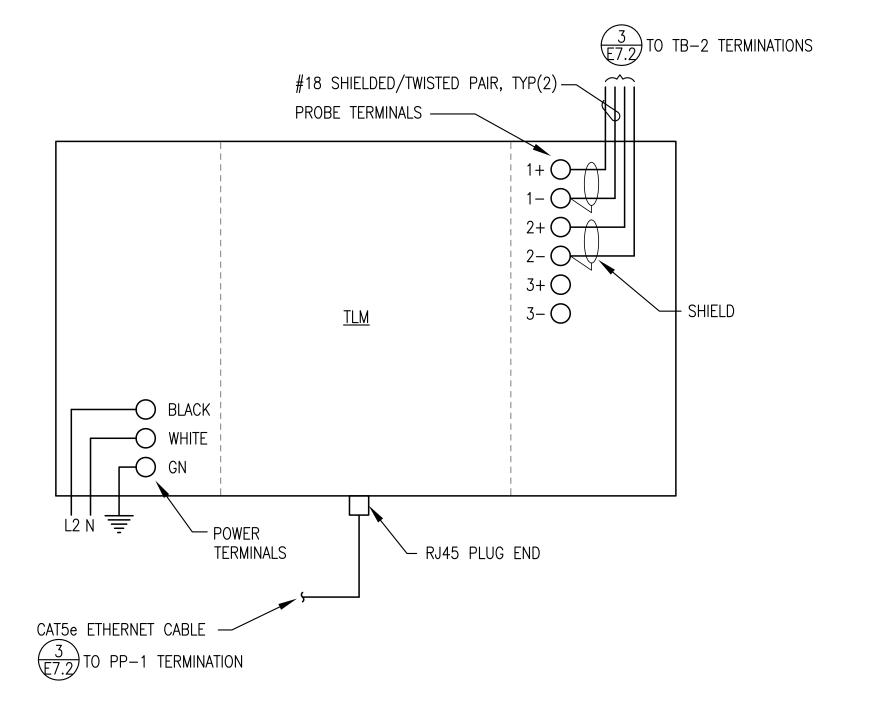
- 1) PROVIDE COMPLETE UL LISTED PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN LOGIC DIAGRAM EXCEPT FOR FIELD DEVICES. FIELD DEVICES ARE INDICATED WITH DASHED OUTLINE. INSTALL IN A 30"TALL×30"WIDE×8"DEEP NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK. SEE SHEET E7 FOR PANEL LAYOUT DETAILS.
- 2) USE MIN #12 WIRE FOR ALL CIRCUITS UP TO FIRST IN-LINE PANEL BREAKERS (FOR 20A FEED). USE MIN #16 AWG ON ALL 5 AMP CIRCUITS AND MIN #14 AWG WIRE ON ALL 15A CIRCUITS. FOR ALL JUMPERS THAT RUN CONTINUOUSLY (ONE-PIECE WIRE) BETWEEN THE DESIGNATED BEGINNING AND ENDING POINTS, TAG EACH END WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS). FOR ALL JUMPERS THAT RUN DISCONTINUOUSLY (MULTIPLE WIRES) BETWEEN THE DESIGNATED BEGINNING AND ENDING POINTS, TAG WITH A COMMON JUMPER NUMBER. TAG ALL NEUTRALS WITH A COMMON JUMPER NUMBER. PROVIDE AN AS-BUILT LOGIC WIRING DIAGRAM THAT INCLUDES ALL ASSIGNED JUMPER TAGS.
- 3) LABEL ALL PANEL DEVICES ON BASE OR BACK PANEL ADJACENT TO ITEM. LABEL REMOTE EQUIPMENT CONNECTIONS AT EACH TERMINAL BLOCK BY THE ITEM TITLE AS SHOWN ON THE FIELD SIDE OF THE TERMINAL STRIP DRAWING. PROVIDE BEVELED EDGE WHITE CORE NAMEPLATES AS SHOWN ON THE PANEL FACE LAYOUT AND SECURE TO PANEL FACE WITH A MINIMUM OF TWO STAINLESS STEEL MOUNTING SCREWS, COLOR AS INDICATED.
- 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 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER. SEE FIELD INSTALLATION NOTE #3.

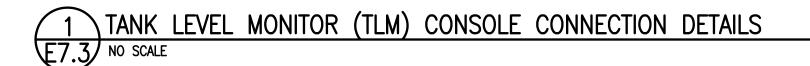
FIELD INSTALLATION NOTES:

- 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, ACTUATOR VALVE, & ALARM HORN #14 AWG. ALL OTHER FIELD WIRING #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS. WHEN NOT IN CONDUIT, MAKE JACKETED COM CABLE ENCLOSURE FNTRIFS WITH CABLE GLAND CONNECTORS.
- 3) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS ON SHEET E2. PROVIDE POWER TO DAY TANK PANEL FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED 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) FILL PUMP CAVITY WITH LUBE OIL PRIOR TO INITIAL OPERATION. VERIFY PROPER ROTATION OF PUMP. PRIME SYSTEM WITH HAND PRIMING PUMP PRIOR TO OPERATING DAY TANK PUMP.
- 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 RELAY TO 30 SECONDS TO VERIFY TIME—OUT AND RESET FUNCTIONS.
- 7) FIELD VERIFY NORMAL FILL CYCLE RUN TIME WITH AVTEC PERSONNEL THEN SET TIMER FOR 125% OF THE NORMAL RUN TIME.

DAY TANK FILL SEQUENCE OF OPERATIONS:

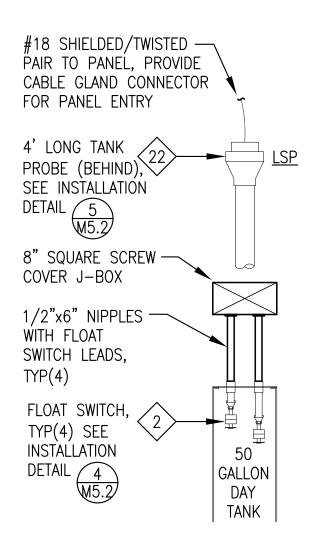
- 1) WHEN THE DAY TANK CIRCUIT BREAKER AND CONTROL POWER SWITCH ARE CLOSED, THE POWER LIGHT IS ON AND POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE HEATER/"OPEN" LIGHT CIRCUIT.
- 2) WHEN THE DAY TANK IS NOT CALLING FOR FUEL, POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE CLOSE CIRCUIT. WHEN THE ACTUATOR 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, THE TIMER IS STARTED, THE N.C. DAY TANK SOLENOID VALVE OPENS, THE REMOTE ACTUATOR VALVE OPENS & THE VALVE "OPEN" LIGHT TURNS ON, THE DAY TANK PUMP IS ENERGIZED, AND THE PUMP "ON" LIGHT TURNS ON. 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 THE TIMER TIMES—OUT, THE TIMER IS RESET, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE—ENERGIZES, AND THE PUMP "ON" LIGHT TURNS OFF.
- 4) TIMER OPERATION IF THE TIMER TIMES—OUT THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE—ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE "TIME—OUT" ALARM LIGHT TURNS ON, AND THE TIME—OUT 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 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 "OVERFILL LEVEL" ALARM LIGHT TURNS ON, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE—ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, AND THE ALARM HORN SOUNDS. PRESSING THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "OVERFILL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL FALLS BELOW THE "OVERFILL" FLOAT SWITCH, THE "OVERFILL LEVEL" ALARM LIGHT TURNS OFF, THE N.O. DAY TANK SOLENOID VALVE OPENS AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED). WHEN THE FUEL LEVEL REACHES THE "PUMP START" FLOAT SWITCH, THE NORMAL FILL OPERATION IS REPEATED.
- 6) LOW FUEL LEVEL IF THE FUEL LEVEL FALLS BELOW THE "LOW ALARM" FLOAT SWITCH, THE "LOW FUEL LEVEL" ALARM LIGHT TURNS ON, THE ENGINE RUN—DRY PREVENTION DRY CONTACT OPENS, AND THE ALARM HORN SOUNDS. THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "LOW FUEL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL RISES ABOVE THE "LOW ALARM" FLOAT SWITCH THE "LOW FUEL LEVEL" ALARM LIGHT TURNS OFF, THE ENGINE RUN—DRY PREVENTION DRY CONTACT CLOSES, AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED).
- 7) PUMP & HORN TEST MOMENTARY CONTACT BUTTONS ARE PROVIDED TO TEST FUNCTION OF THE DAY TANK PUMP AND ALARM HORN. PRESSING THE "PUSH TO TEST DAY TANK PUMP" BUTTON STARTS THE TIMER, MOMENTARILY OPENS THE N.C. DAY TANK SOLENOID VALVE & ACTUATED BALL VALVE, ENERGIZES THE DAY TANK PUMP, AND TURNS ON THE DAY TANK PUMP "RUNNING" LIGHT. THE "PUSH TO TEST DAY TANK PUMP" BUTTON IS LOCKED OUT IF THE DAY TANK IS AT THE OVERFILL LEVEL. PRESSING THE "PUSH TO TEST DAY TANK ALARM" BUTTON MOMENTARILY ENERGIZES THE ALARM HORN/STROBE.

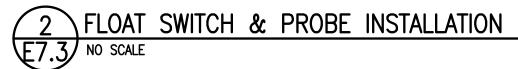


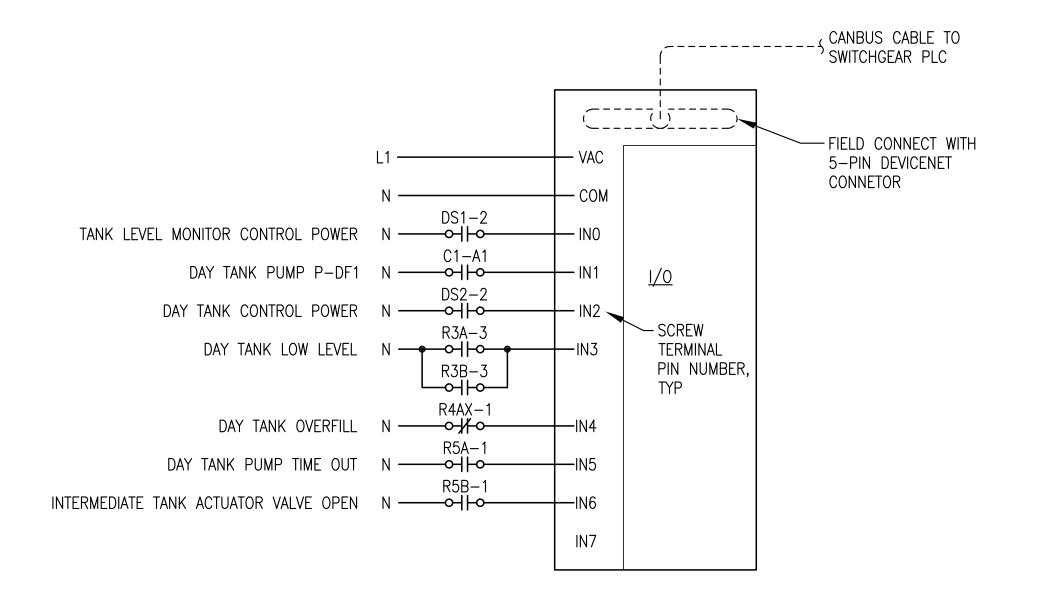


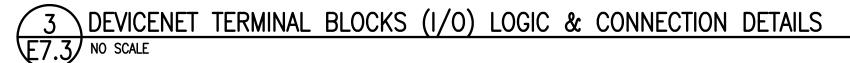
NOTES:

- DAY TANK GEAR PUMP AND SOLENOID VALVE CONNECTIONS NOT SHOWN THIS DETAIL FOR CLARITY. SEE STATION SERVICE PLAN FOR CONDUCTORS AND CONDUIT ROUTING FOR ALL ASSOCIATED DAY TANK DEVICES FROM REMOTE WALL—MOUNTED DAY TANK CONTROL PANEL.
- 2. SEE MECHANICAL FOR PLAN VIEW OF TOP OF TANK.
- 3. THIS DETAIL IS FOR FIELD INSTALLATION ONLY AND IS NOT PART OF THE PANEL BID.







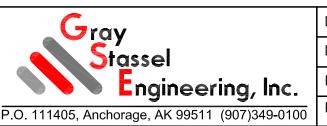




AVTEC TRAINING FACILITY UPGRADE

DAY TANK CONTROL PANEL NOTES,

SEQUENCE OF OPERATIONS & INTERCONNECT DETAILS



RECORD DRAWING

THESE DRAWINGS HAVE BEEN PREPARED FROM INFORMATION PROVIDED BY OTHERS

& OBSERVATIONS OF THE UNDERSIGNED. THERE IS NO GUARANTEE AS TO THE

ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.

Mulm

DATE: 2-12-16

	DRAWN BY: BCG/JTD	SCALE: AS NOTED
	DESIGNED BY: CWV/BCG	DATE: 6/22/15
	FILE NAME: AVTEC E7	SHEET:
5	PROJECT NUMBER:	E/.3 5

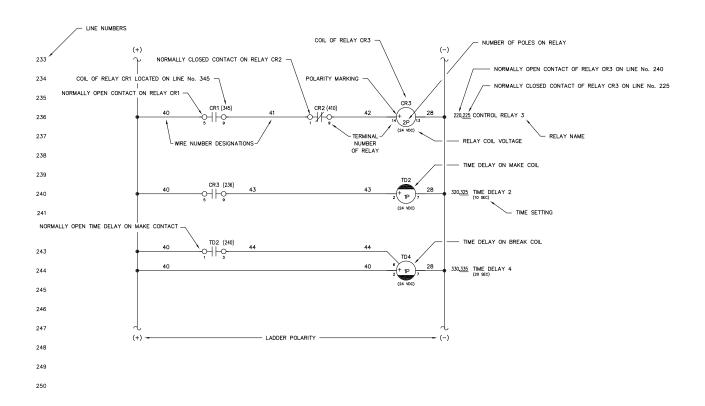




ENGINEERED & MANUFACTURED BY

AVTEC POWER PLANT TRAINING FACILITY UPGRADE, FINAL SET ALASKA ENERGY AUTHORITY PURCHASE ORDER No. PO008815 CONTROLLED POWER, INC. JOB No. 8272F

<u>DRAWING No.</u> 8272F-2101-D	<u>Drawing title</u> Cover sheet	<u>DRAWING No.</u> 8272F-5310-D	<u>Drawing title</u> Generator 4 dc control, schematic diagram
8272F-3101-D	SCHEMATIC LEGEND AND NOTES	8272F-5311-D	GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM
8272F-4101-D	GENERATOR SWITCHGEAR ELEVATION VIEW, OUTLINE DIAGRAM	8272F-5312-D	GENERATOR 4 DC CONTROL, SCHEMATIC DIAGRAM
8272F-4201-D	GENERATOR SWITCHGEAR PLAN VIEW, OUTLINE DIAGRAM	8272F-5313-D	MASTER DC CONTROL, SCHEMATIC DIAGRAM
8272F-5101-D	GENERATOR SINGLE LINE, SCHEMATIC DIAGRAM	8272F-5314-D	MASTER DC CONTROL, SCHEMATIC DIAGRAM
8272F-5102-D	FEEDER DISTRIBUTION PANEL SINGLE LINE, SCHEMATIC DIAGRAM	8272F-5315-D	MASTER DC CONTROL, SCHEMATIC DIAGRAM
8272F-5201-D	GENERATOR 1 AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5316-D	VFD DC CONTROL, SCHEMATIC DIAGRAM
8272F-5202-D	GENERATOR 2 AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5317-D	VFD DC CONTROL, SCHEMATIC DIAGRAM
8272F-5203-D	GENERATOR 3 AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5318-D	FEEDER PANEL AC & DC CONTROL, SCHEMATIC DIAGRAM
8272F-5204-D	GENERATOR 4 AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5401-D	FEEDER BREAKER CONTROL, SCHEMATIC DIAGRAM
8272F-5205-D	MASTER AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5501-D	PLC COMMUNICATION, SCHEMATIC DIAGRAM
8272F-5206-D	VFD AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5502-D	PLC COMMUNICATION, SCHEMATIC DIAGRAM
8272F-5207-D	FEEDER PANEL AC THREE LINE, SCHEMATIC DIAGRAM	8272F-5503-D	PLC COMMUNICATION, SCHEMATIC DIAGRAM
8272F-5301-D	GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM	8272F-5601-D	COMMUNICATION NETWORK SINGLE LINE DIAGRAM
8272F-5302-D	GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM	8272F-5602-D	COMMUNICATION NETWORK SCHEMATIC DIAGRAM
8272F-5303-D	GENERATOR 1 DC CONTROL, SCHEMATIC DIAGRAM	8272F-5701-D	HEATER, LIGHTING & FAN CONTROL, SCHEMATIC DIAGRAM
8272F-5304-D	GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM	8272F-6101-D	CONTROL SWITCH TARGET DIAGRAM
8272F-5305-D	GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM	8272F-6201-D	NAMEPLATE ENGRAVING SCHEDULE, FABRICATION DIAGRAM
8272F-5306-D	GENERATOR 2 DC CONTROL, SCHEMATIC DIAGRAM	8272F-6202-D	ANNUNCIATOR WINDOW, FABRICATION DIAGRAM
8272F-5307-D	GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM	8272F-6203-D	NAMEPLATE ENGRAVING SCHEDULE, FABRICATION DIAGRAM
8272F-5308-D	GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM	8272F-7101-D	INTERCONNECTION DIAGRAM
8272F-5309-D	GENERATOR 3 DC CONTROL, SCHEMATIC DIAGRAM	8272F-7102-D	INTERCONNECTION DIAGRAM



NOTES:

1. SCHEMATIC IS SHOWN AS FOLLOWS:

- ALL AC AND DC POWER REMOVED

- ALL CIRCUIT BREAKERS IN THE OPEN/RESET POSITION

- ALL MODE SWITCHES IN THE "OPE" POSITION

- ALL EMERGENCY STOP SWITCHES IN THE "NORMAL" POSITION

- ALL PRESSURE SWITCHES SHOWN WITHOUT FLUID PRESSURE PRESENT

- ALL LEWER SWITCHES SHOWN WITHOUT FLUID PRESSURE PRESENT

- ALL TEMPERATURE SWITCHES SHOWN AT AMBIENT

2. INDICATES IFELD TERMINALS IN GENERATOR CONTROL SECTION.

3. INDICATES INTERCONNECT TERMINALS IN MASTER SECTION.

5. INDICATES INTERCONNECT TERMINALS IN WASTER SECTION.

6. INDICATES INTERCONNECT TERMINALS IN WORD SECTION.

7. INDICATES INTERCONNECT TERMINALS IN WORD SECTION.

8. INDICATES INTERCONNECT TERMINALS IN WORD SECTION.

9. INDICATES FIELD TERMINALS IN YOUNG SECTION.

9. INDICATES FIELD TERMINALS IN YOUNG SECTION.

9. INDICATES FIELD TERMINALS IN YOUNG SECTION.

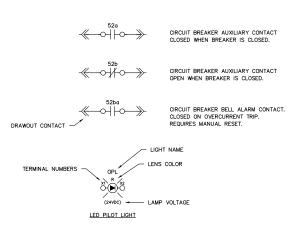
9. INDICATES FIELD TERMINALS IN SOUND SECTION.

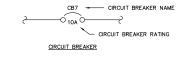
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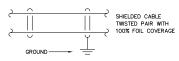
9. INDICATES FIELD TERMINALS IN A 14 AWG, 600 VOLT, TYPE SIS EXCEPT AS NOTED

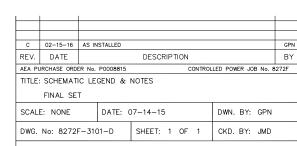
10. SHELDED MIRING TO BE NO. 18 AWG, 300 VOLT, TWISTED LINE WITH 100% FOIL COVERAGE

11. ALL DIODES ARE 1N4007 EXCEPT AS NOTED









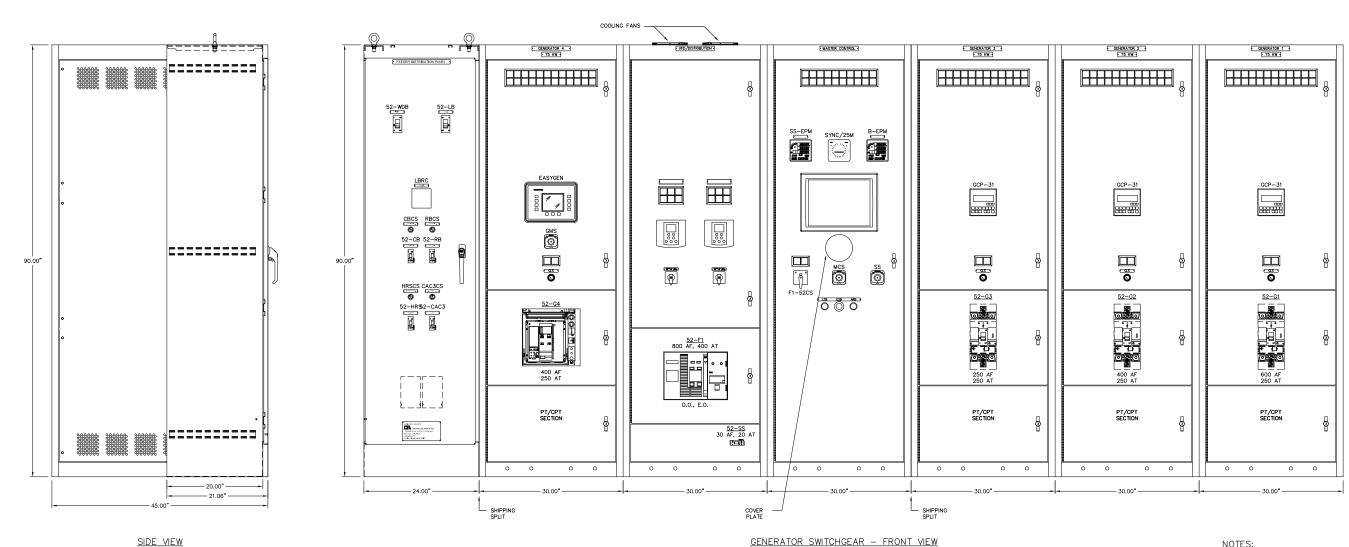






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GENERATOR SWITCHGEAR - FRONT VIEW NOTES: 120/208V, 1600A, COPPER BUS, 3ø, 4W 65 KAIC 1. SINGLE SHIPPING SPLIT.

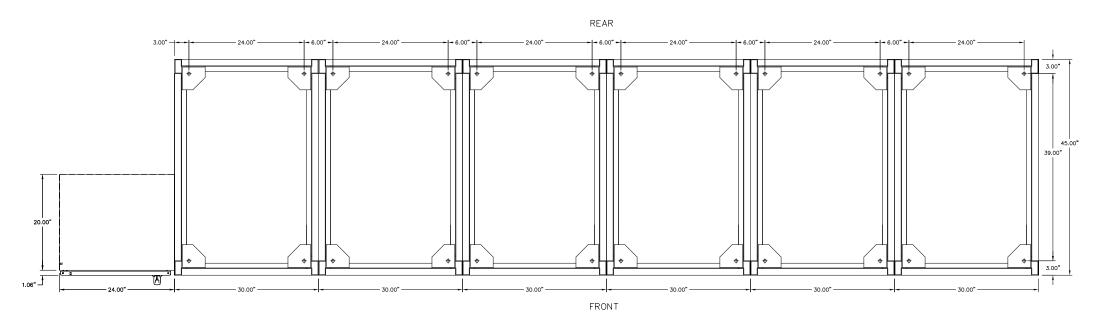
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С	02-15-16	AS IN	AS INSTALLED							GPN
REV.	DATE		DESCRIPTION						BY	
AEA PU	AEA PURCHASE ORDER No. P0008815 CONTROLLED POWER JOB No. 8							3272F		
TITLE: GENERATOR SWITCHGEAR ELEVATION VIEW, OUTLINE DIAGRAM										
	FINAL SET									
SCALE: NONE DATE: C				07-14-15				DWN. BY:	GPN	
DWG.	DWG. No: 8272F-4101-D				1	OF	1	CKD. BY:	JMD	
JOB	JOB: AVTEC POWER PLANT TRAINING FACILITY LIPGRADE									

JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE









GENERATOR SWITCHGEAR - PLAN VIEW

NOTES: 1. EACH SECTION SHIPPED INDIVIDUALLY.

С	02-15-16	AS IN	AS INSTALLED					
REV.	DATE		DESCRIPTION					BY
AEA PL	IRCHASE ORD	ER No.	P0008815		C	ONTROL	LED POWER JOB N	o. 8272F
TITLE:	GENERAT	OR SI	MITCHGEA	R PLAN VI	W, OL	JTLINE	DIAGRAM	
	FINAL SE	Т						
SCALE: NONE DATE: C			07-14-15			DWN. BY: GPN		
DWG. No: 8272F-4201-D			SHEET: 1	OF	1	CKD. BY: JM	1D	
JOB:	AVTEC PO	WER F	PLANT TR	AINING FAC	CILITY	UPGR	ADE	



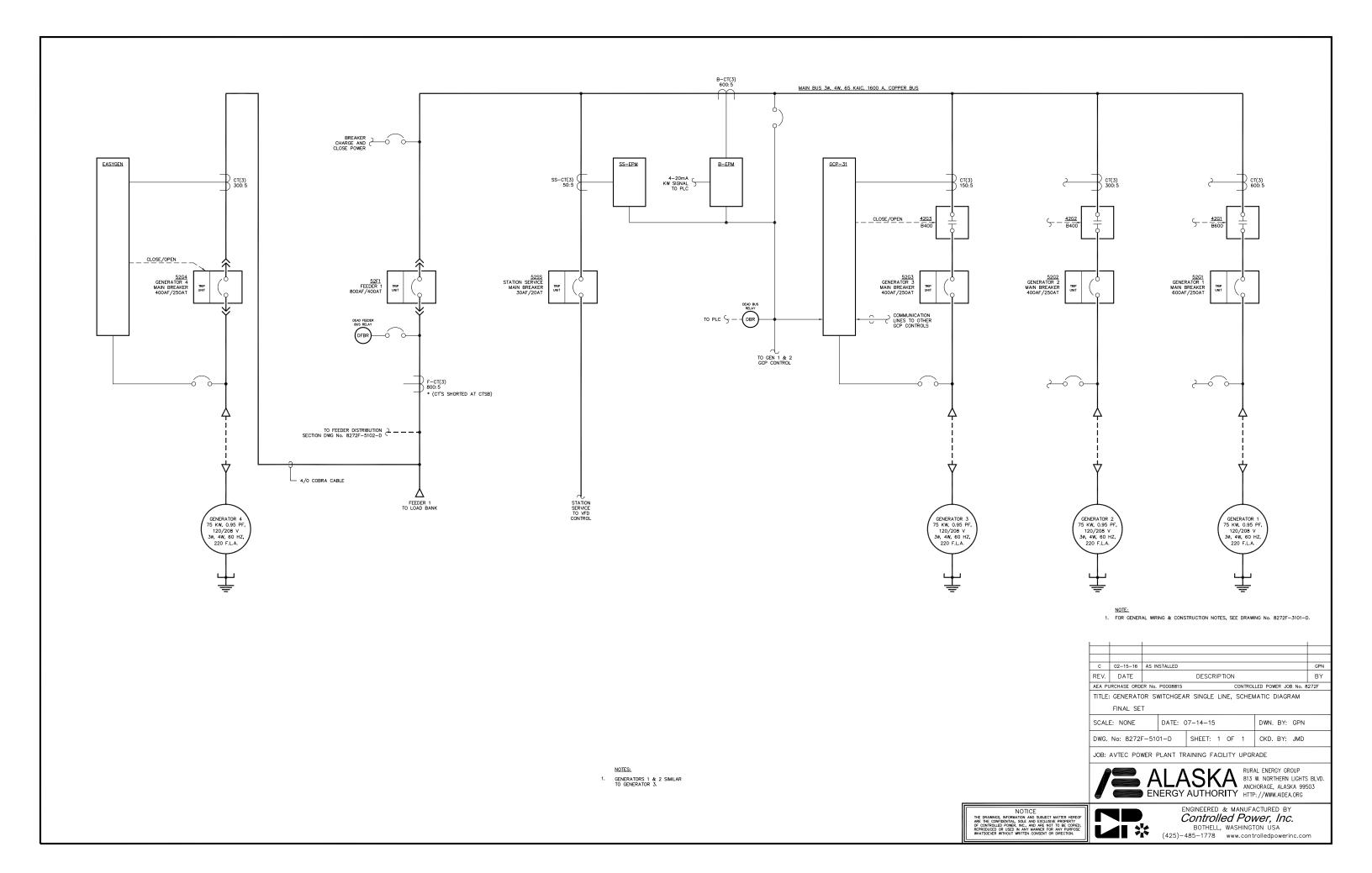


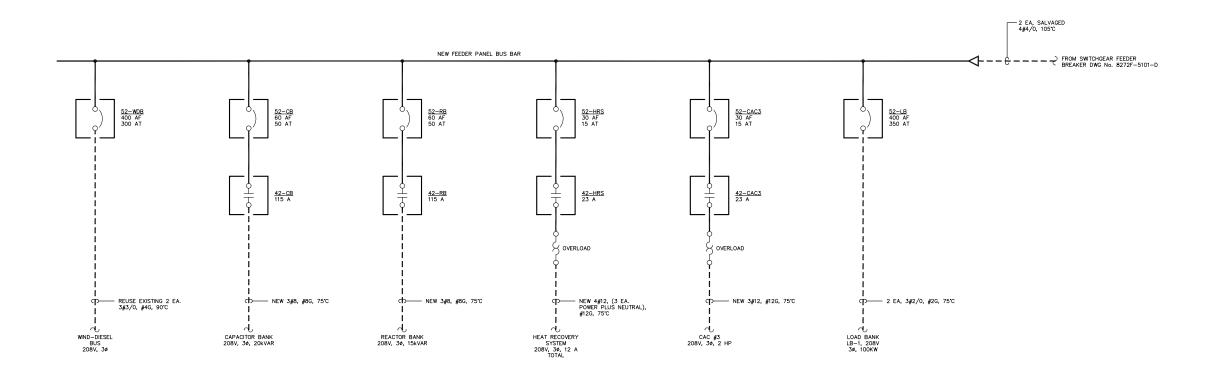
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C 02-15-16 AS INSTALLED

AEA PURCHASE ORDER No. PO008815

REV. DATE

SCALE: NONE

ALASKA RURAL ENERGY GROUP
813 W. NORTHERN LIGHTS BLVD.
ANCHORAGE, ALASKA 99503
HTTP://www.aidea.org ENGINEERED & MANUFACTURED BY Controlled Power, Inc.

CONTROLLED POWER JOB No. 8272F

DWN. BY: GPN

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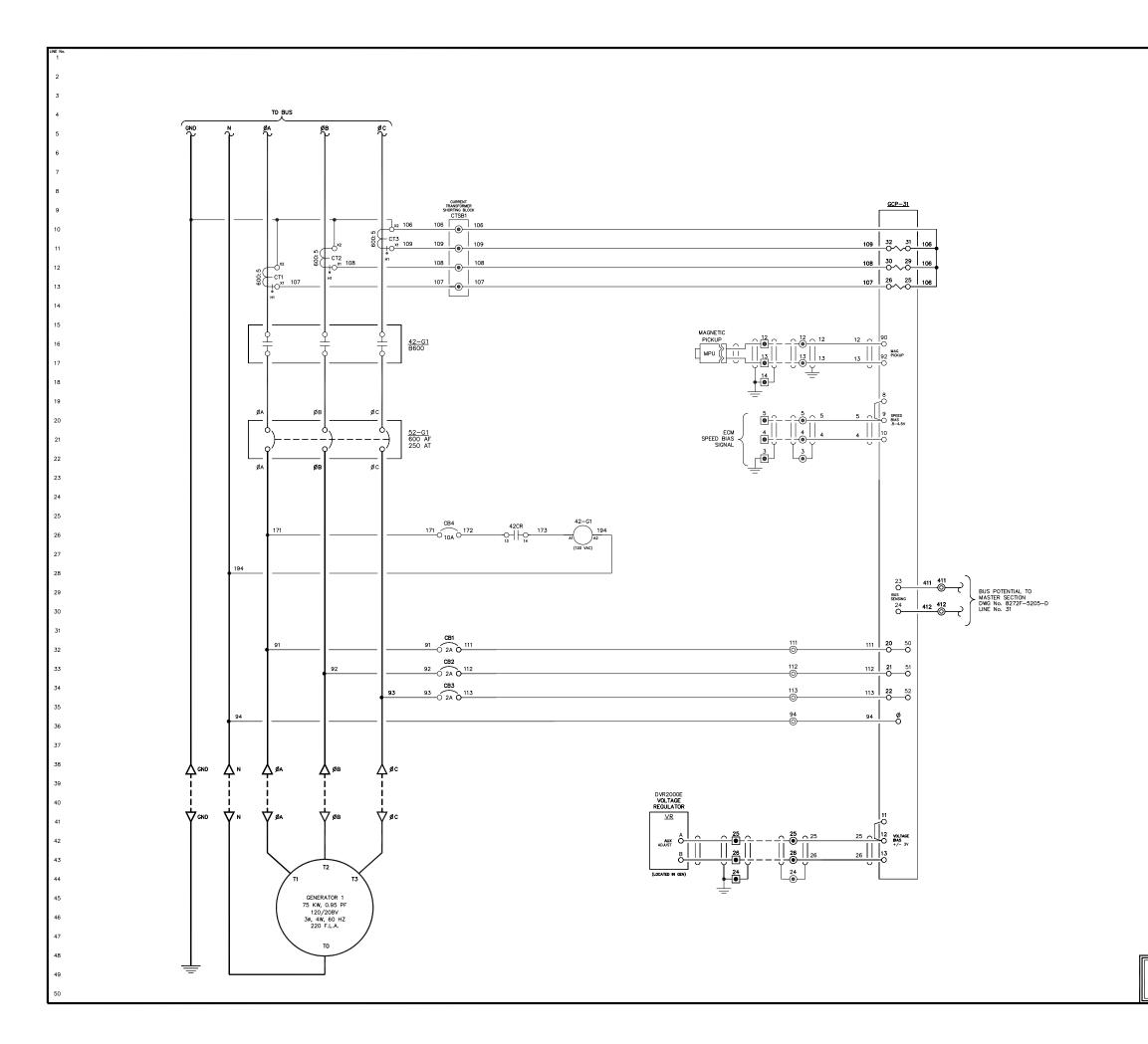
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TITLE: FEEDER DISTRIBUTION PANEL SINGLE LINE, SCHEMATIC DIAGRAM

DWG. No: 8272F-5102-D | SHEET: 1 OF 1 | CKD. BY: JMD

DATE: 05-26-15

JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE



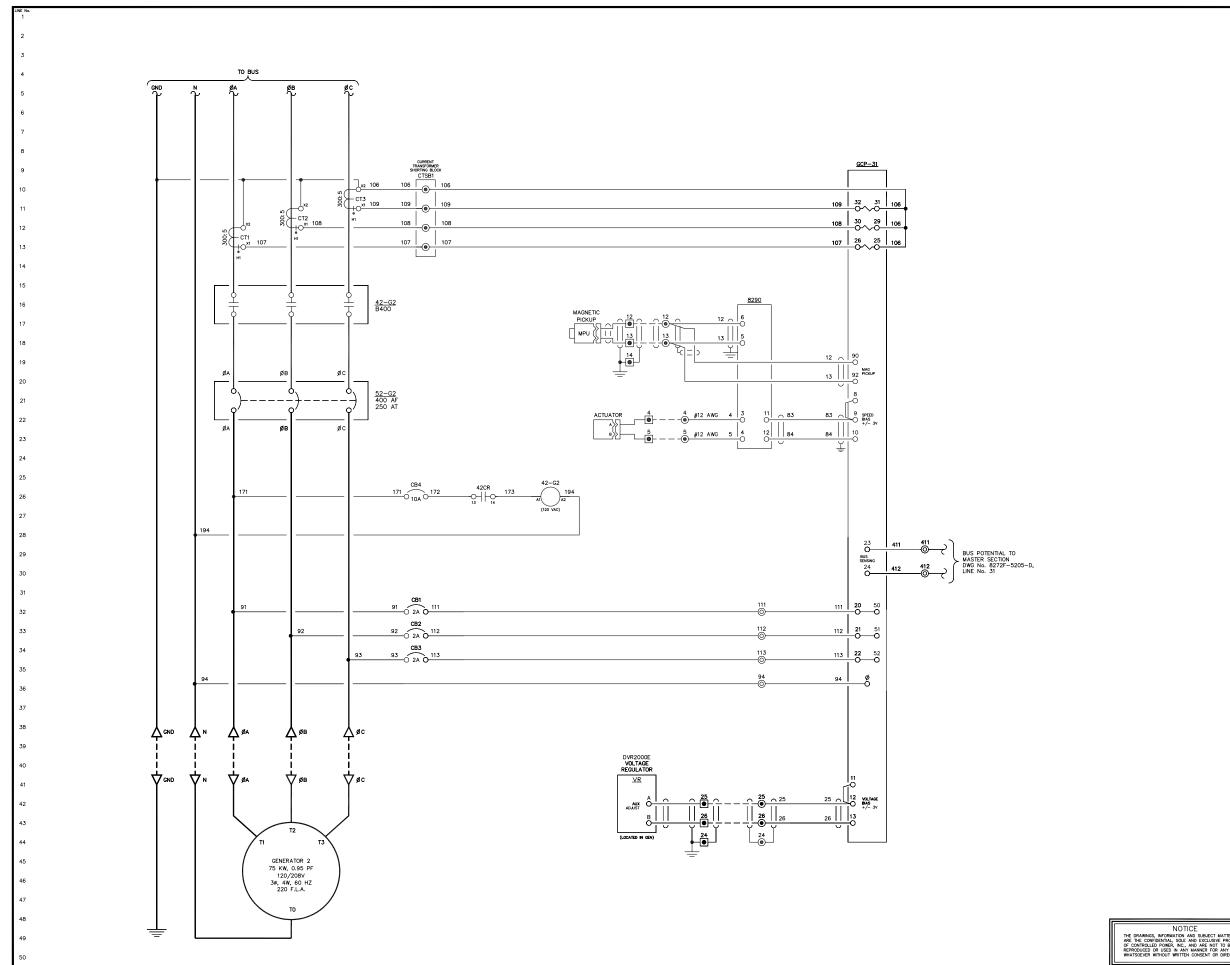
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REV.	DATE			DESCRI	PTION			BY	
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TITLE:	: GENERAT	OR 1	AC THRE	E LINE, SC	CHEMA	TIC DI	AGRAM		
	FINAL SE	Т							
SCAL	E: NONE		DATE: 0	07-14-15			DWN. BY: GPN		
DWG.	No: 8272	F-520	01-D	SHEET:	1 OF	1	CKD. BY: JMD		

JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE





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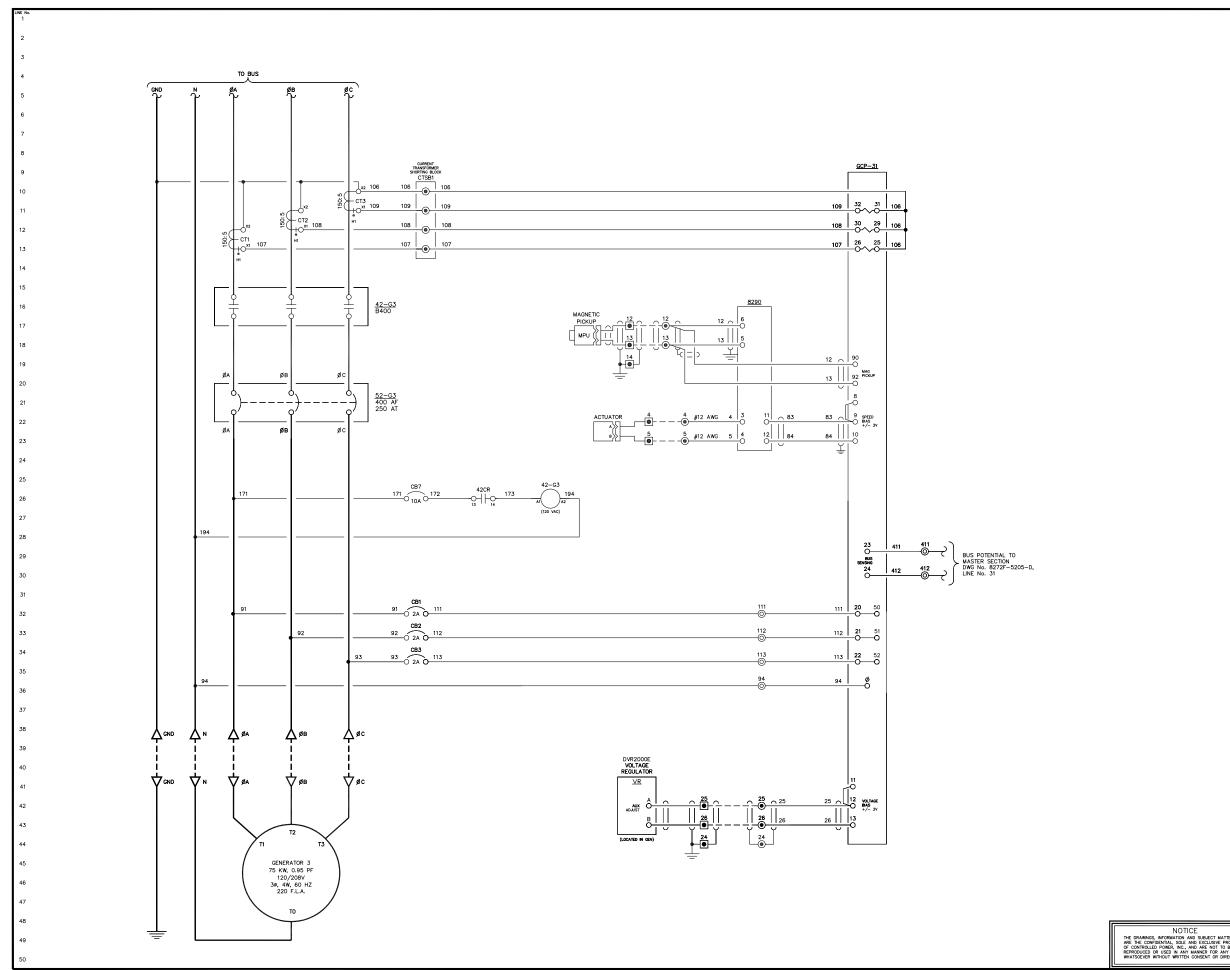


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TITLE: GENERATOR 2 AC THREE LINE, SCHEMATIC DIAGRAM								
	FINAL SE	Т						
SCALE: NONE DATE: 07-14-15 DWN. BY: GPN								
DWG. No: 8272F-5202-D SHEET: 1 OF 1 CKD. BY: JMD								
JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE								





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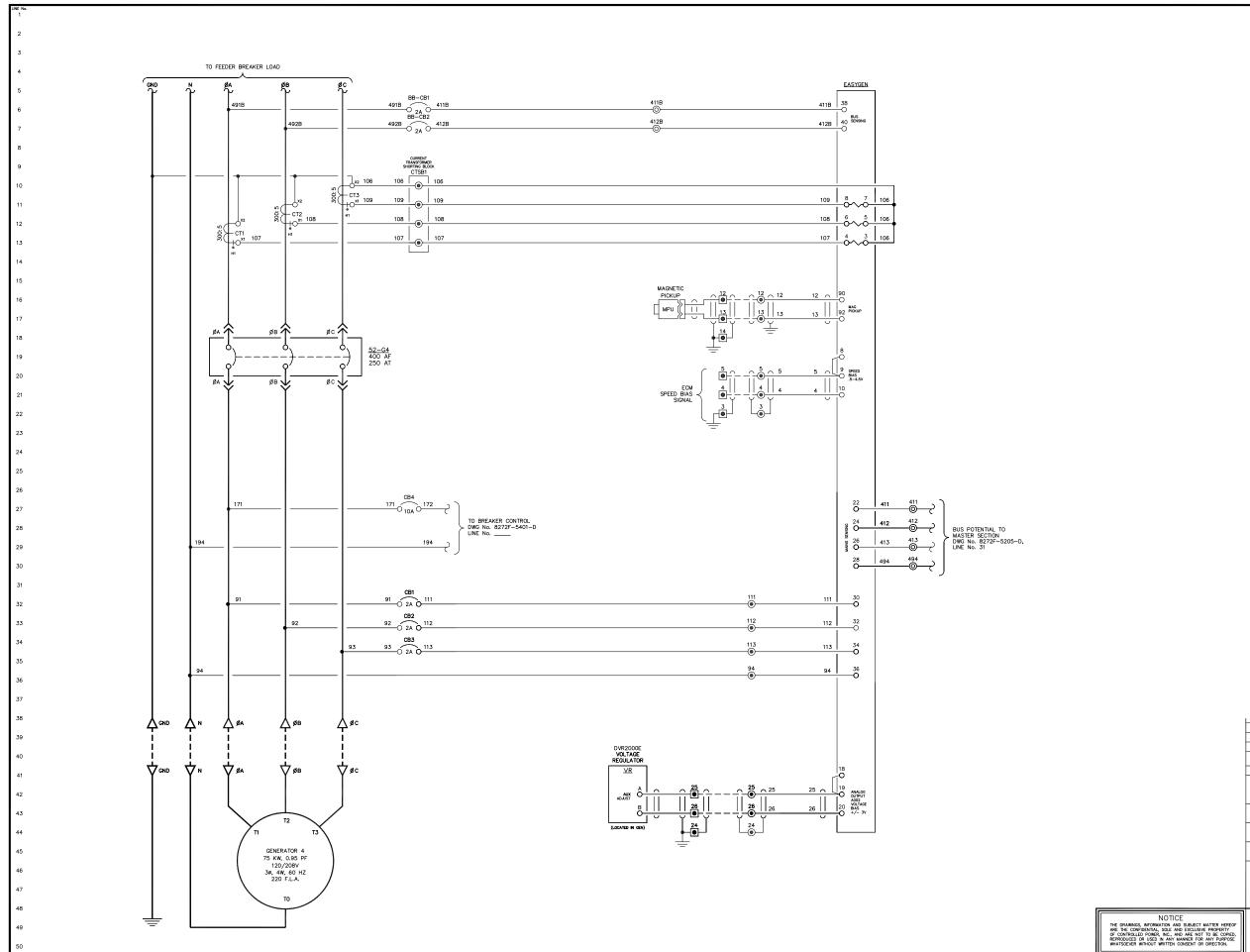
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REV.	DATE		DESCRIPTION						
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TITLE:	TITLE: GENERATOR 3 AC THREE LINE, SCHEMATIC DIAGRAM								
	FINAL SE	Т							
SCAL	E: NONE		DATE: 0	7-14-15	ò			DWN. BY: GPN	
DWG.	No: 8272	SHEET:	1	OF	1	CKD. BY: JMD			

JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE





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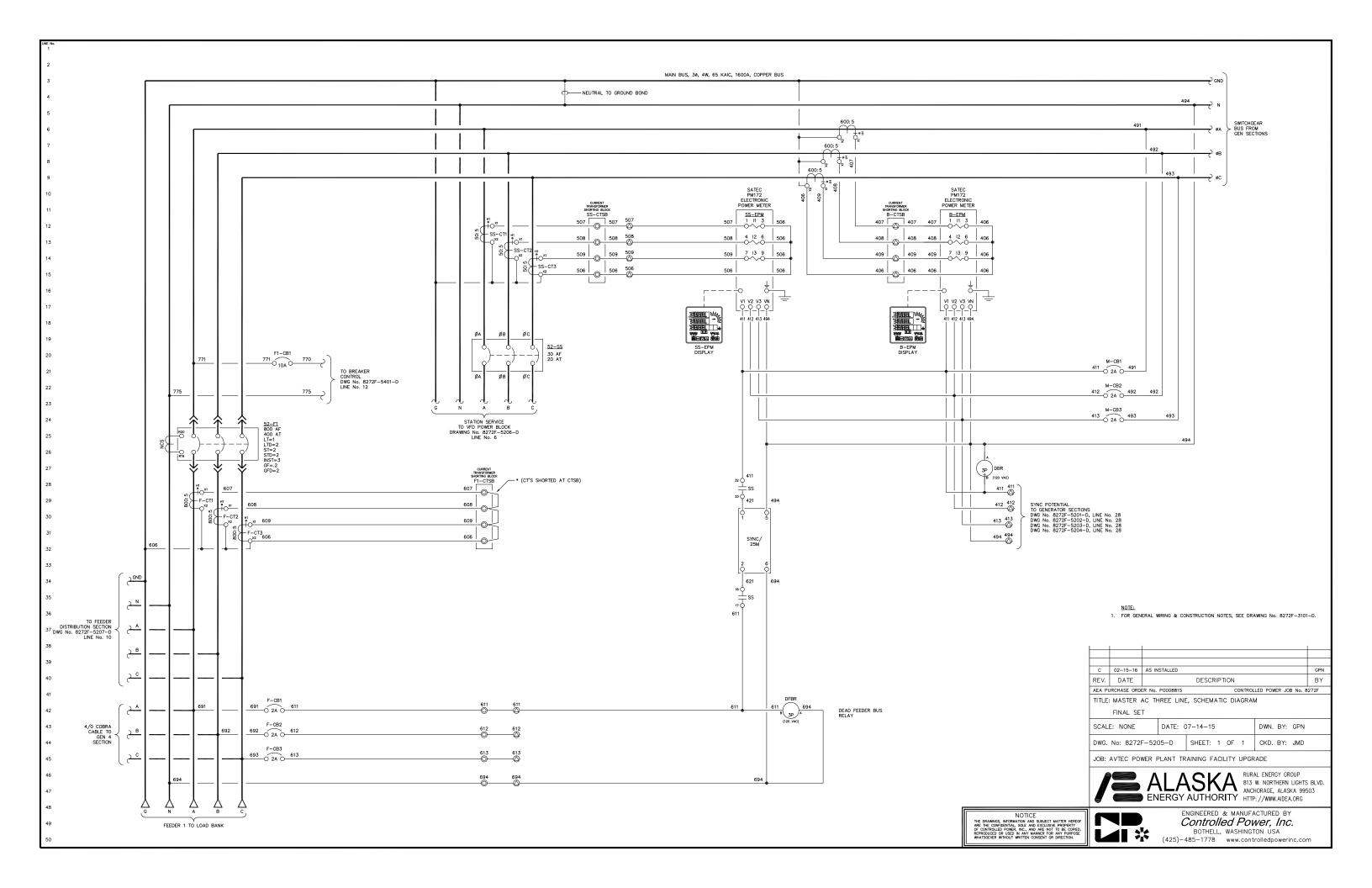
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	FINAL SE	Т								
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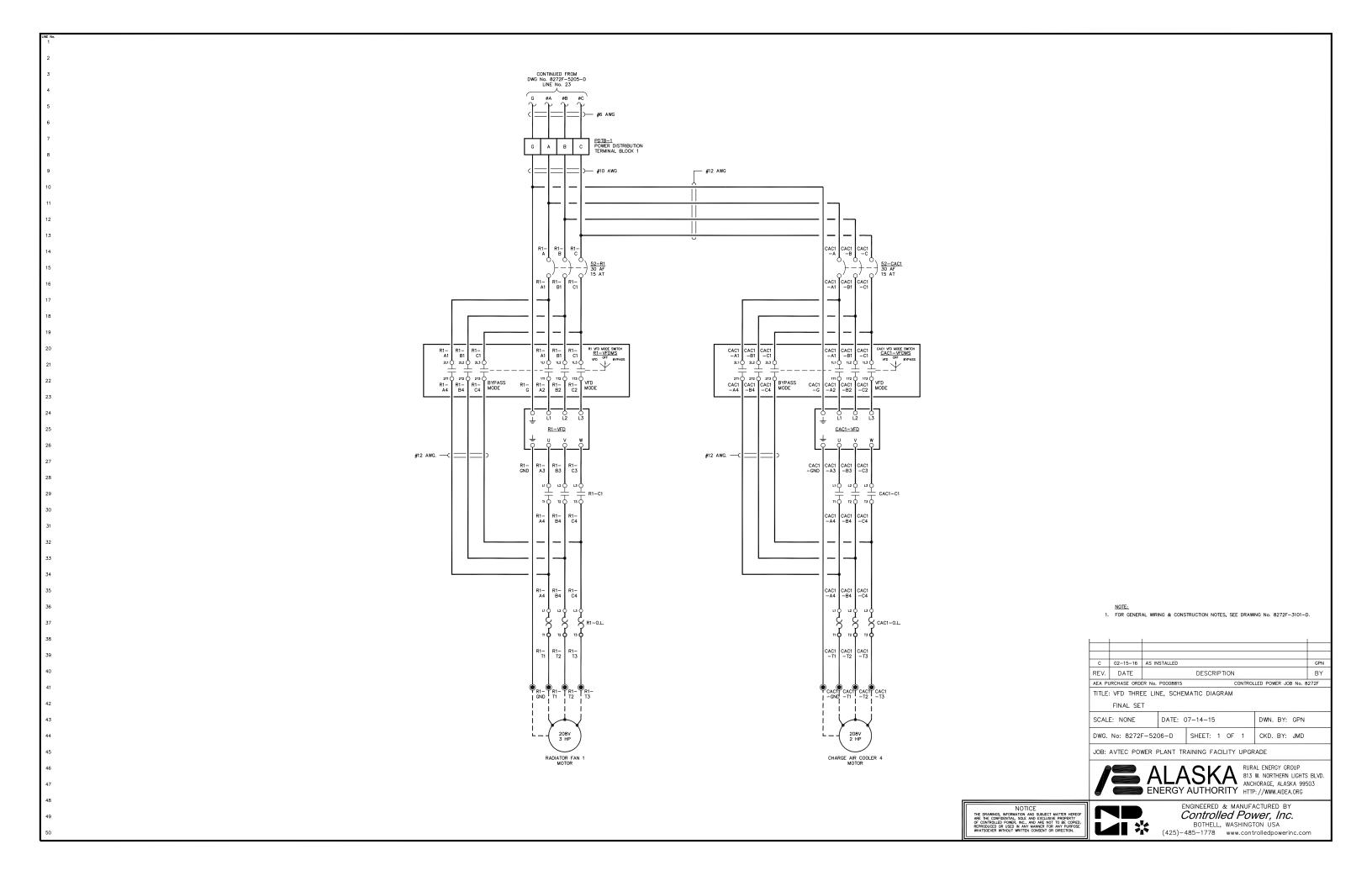
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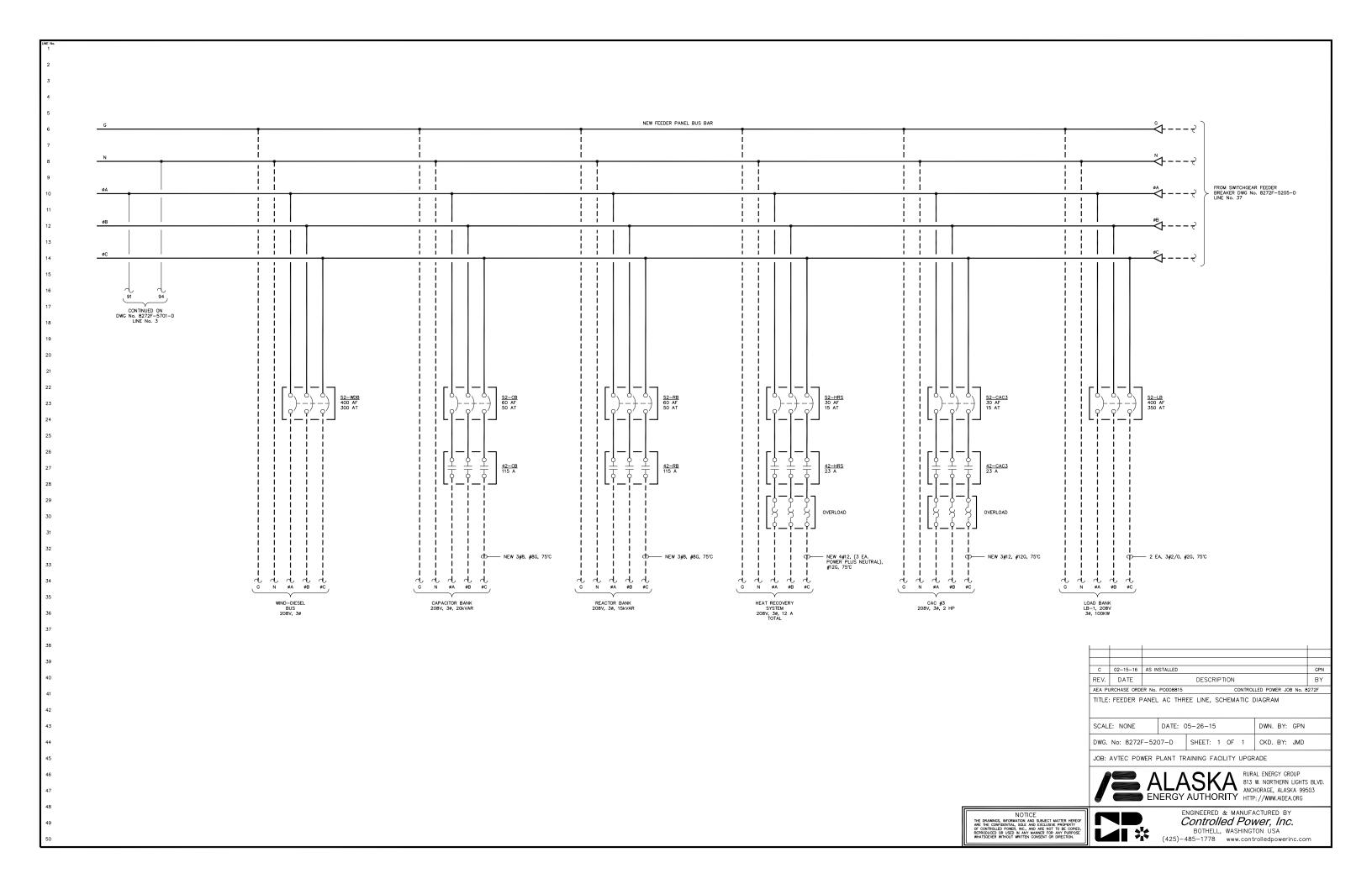


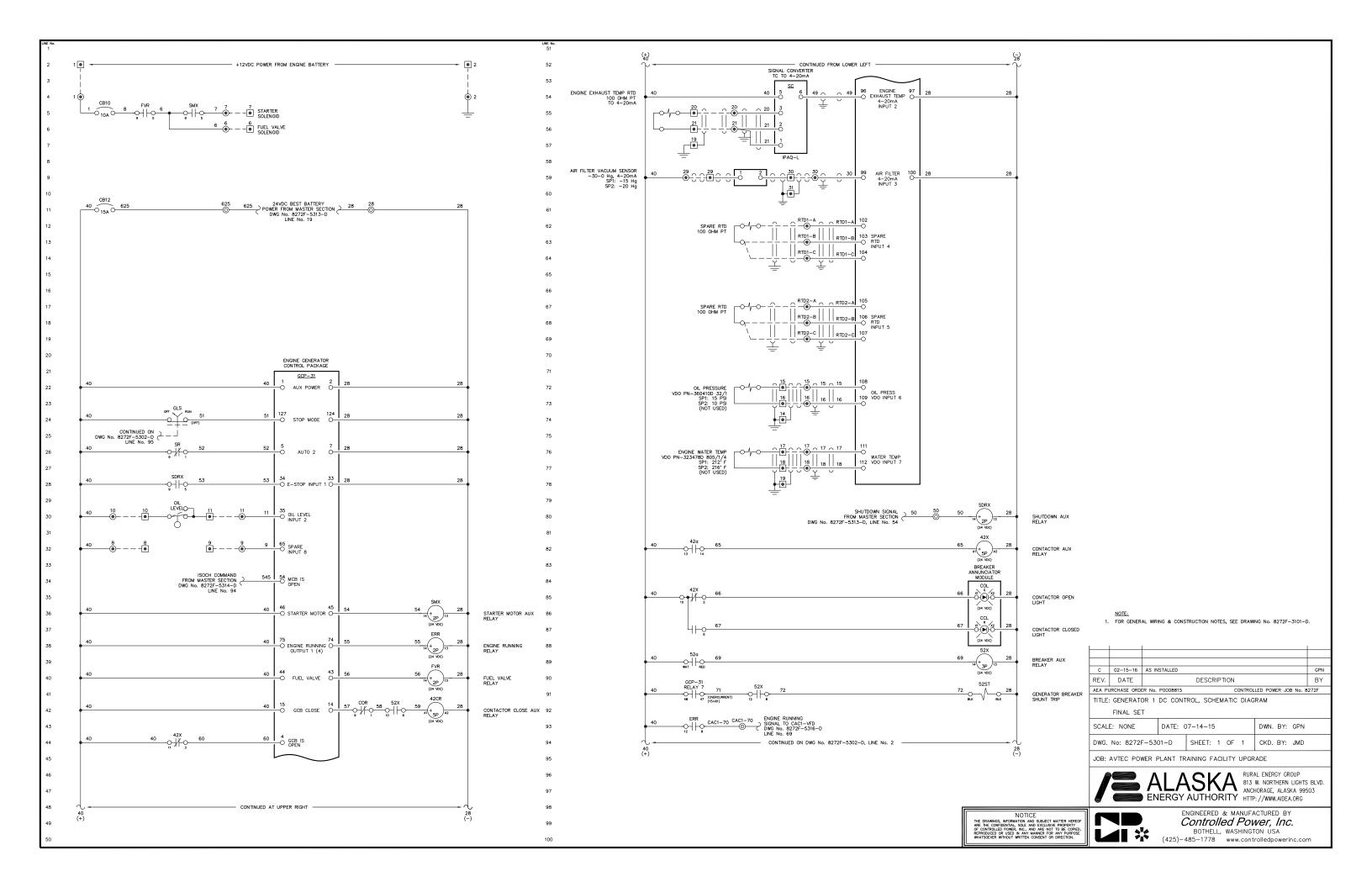


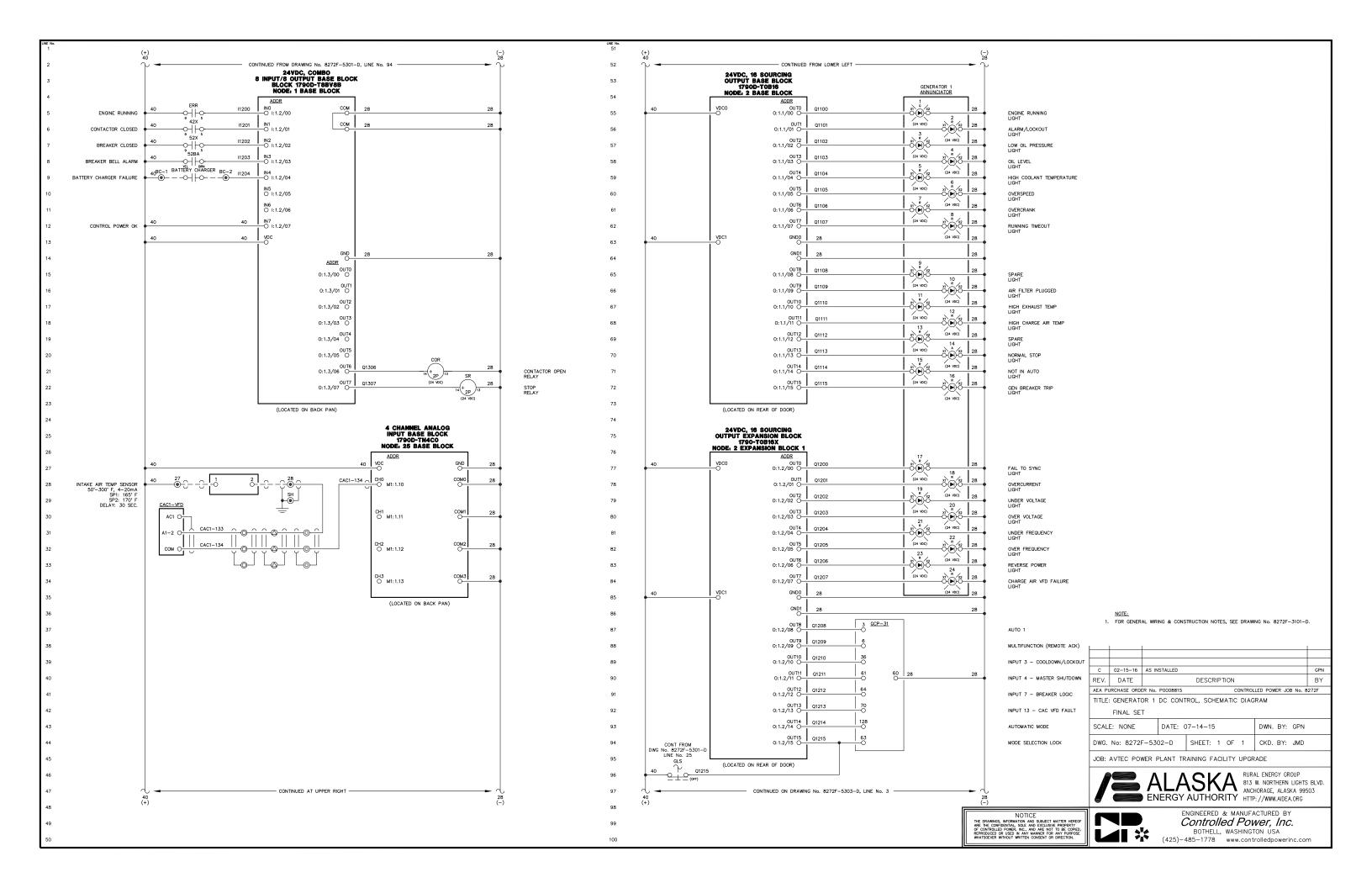
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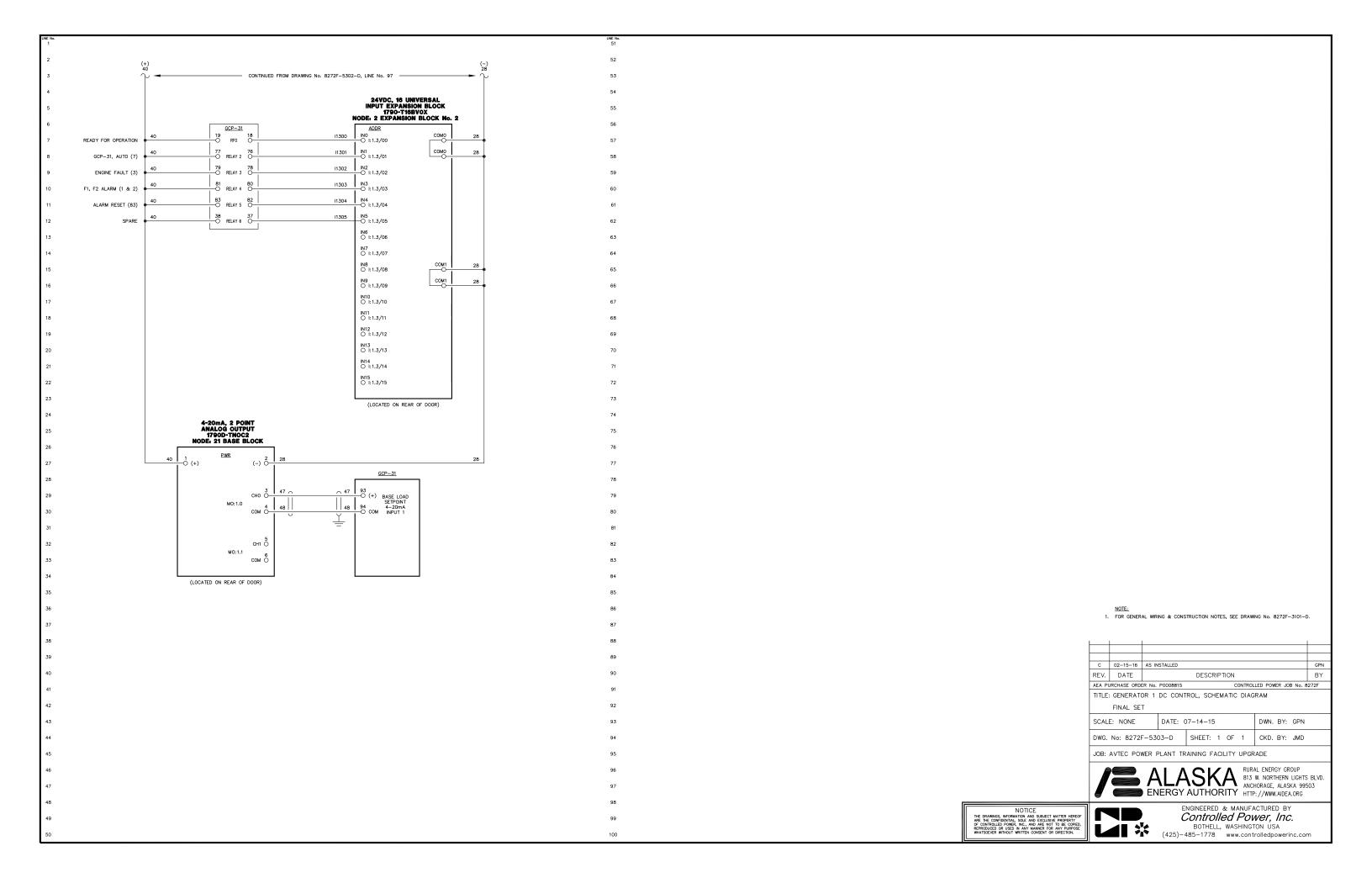


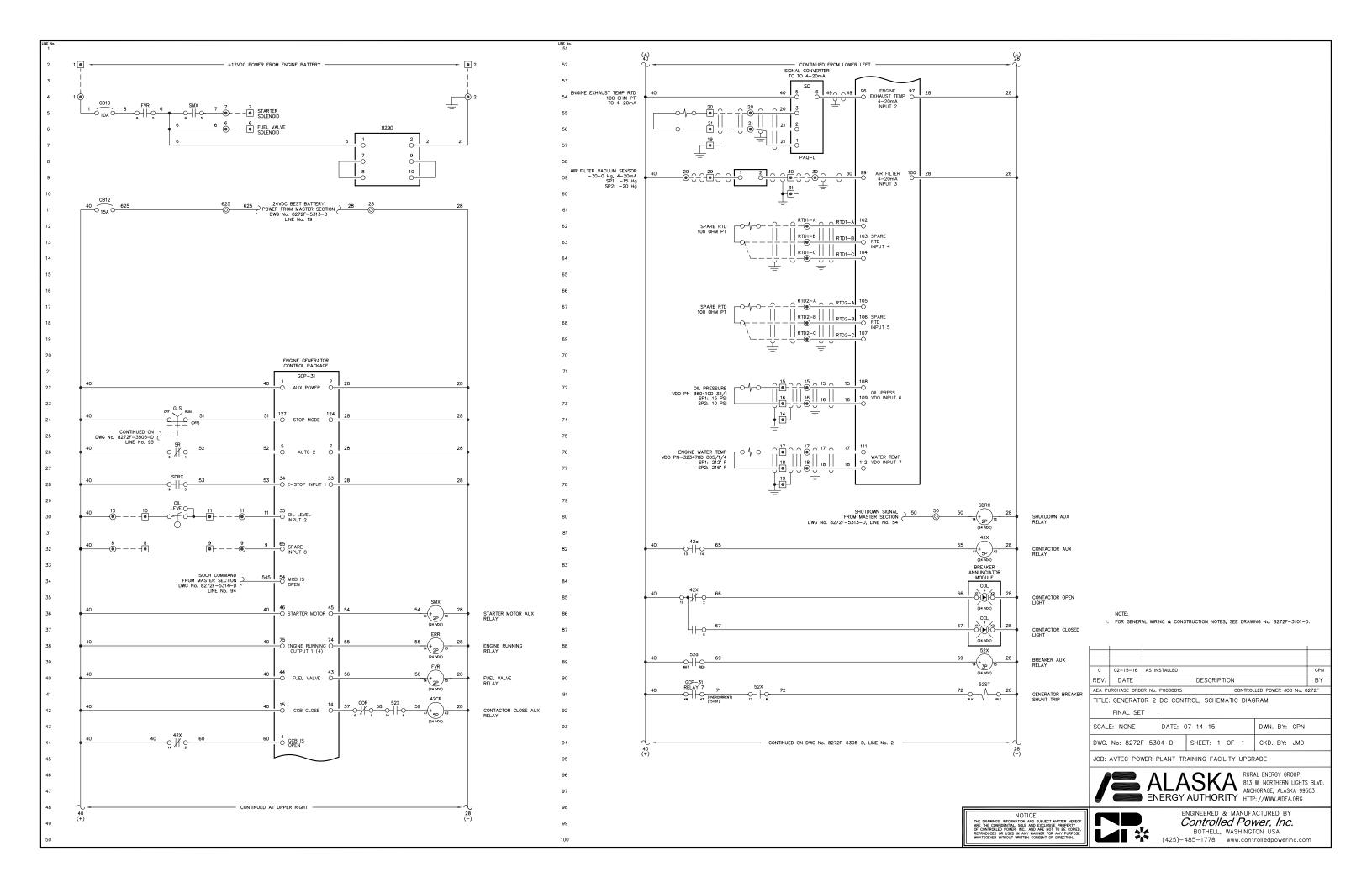


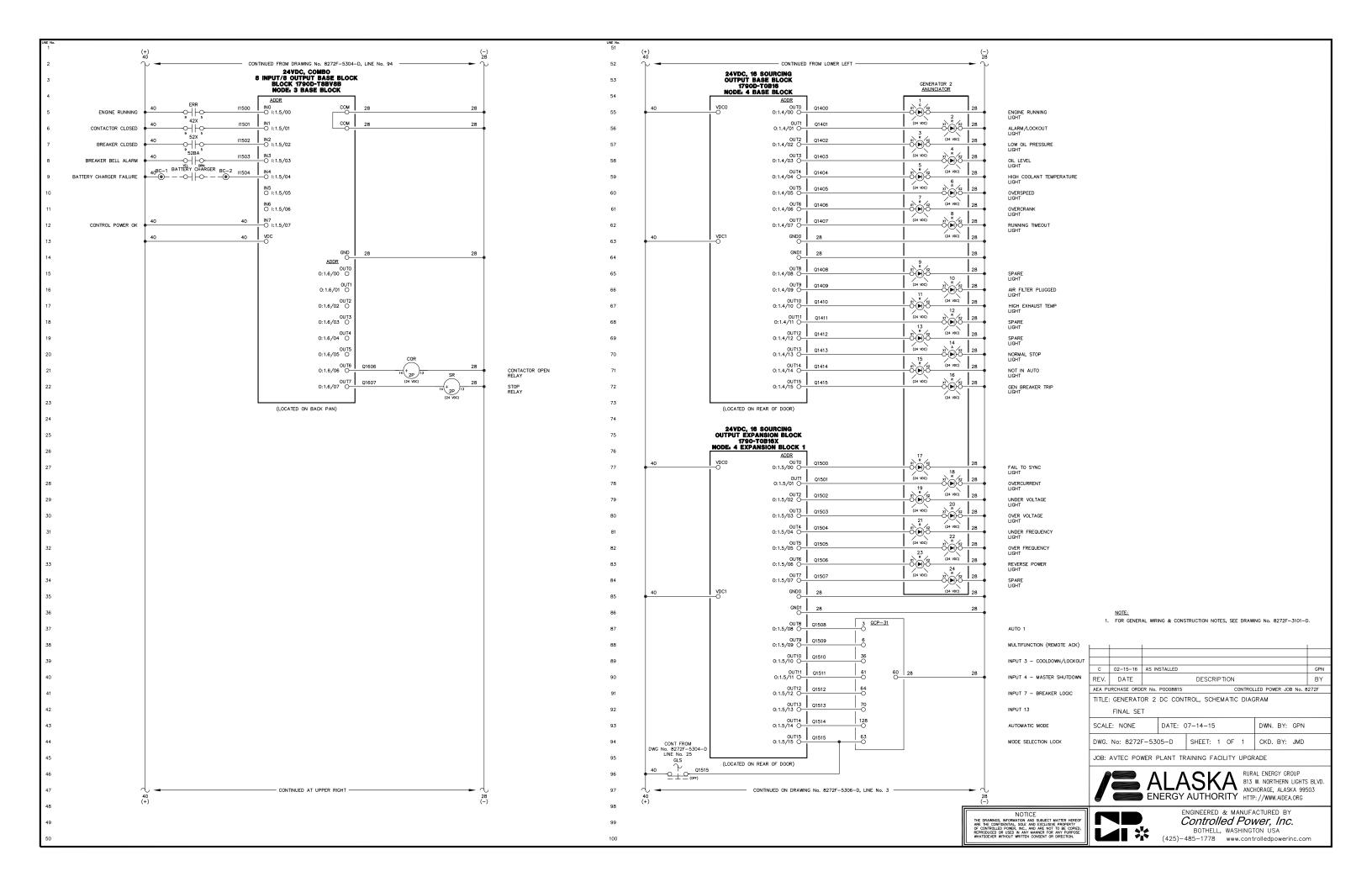


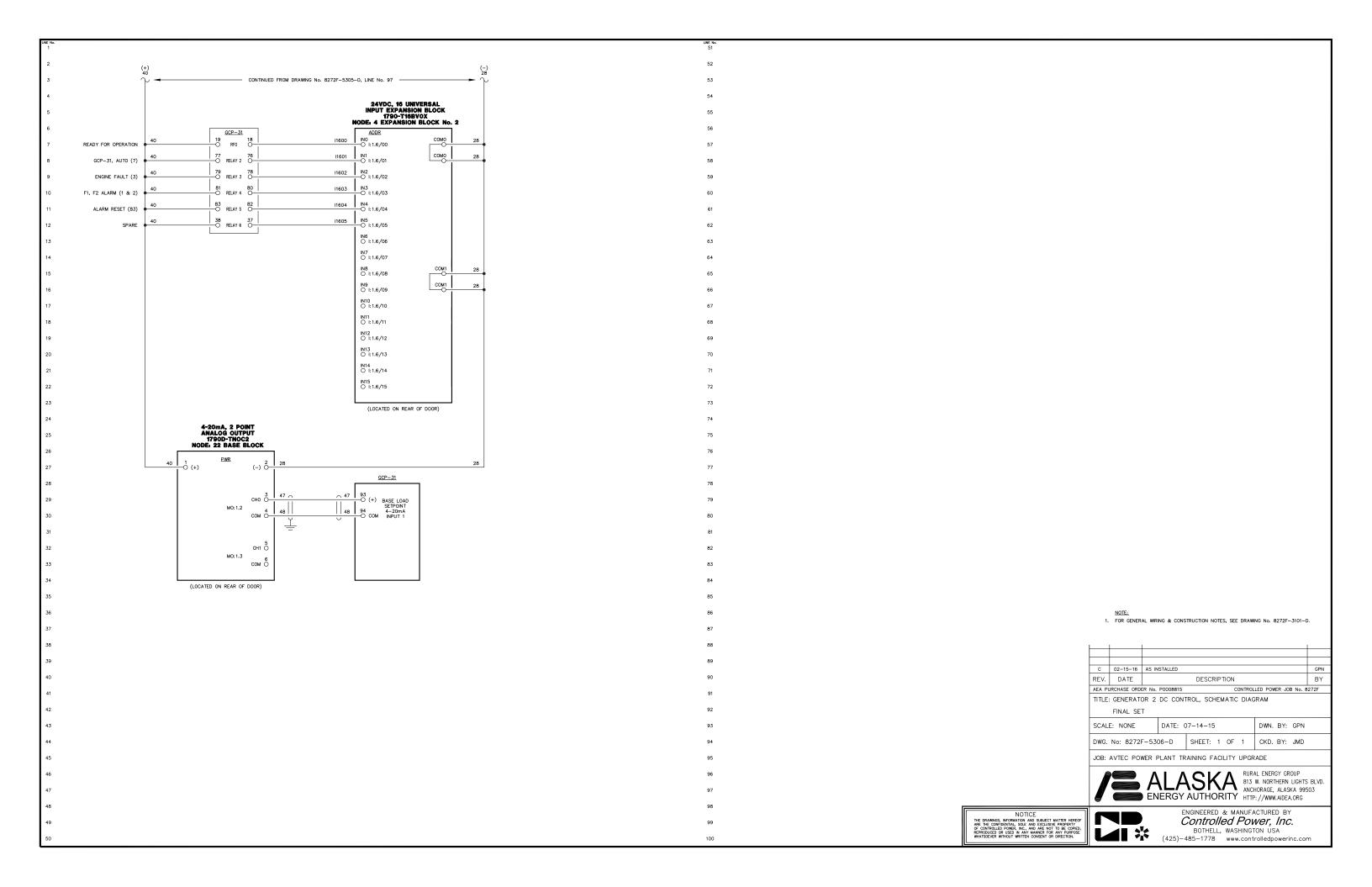


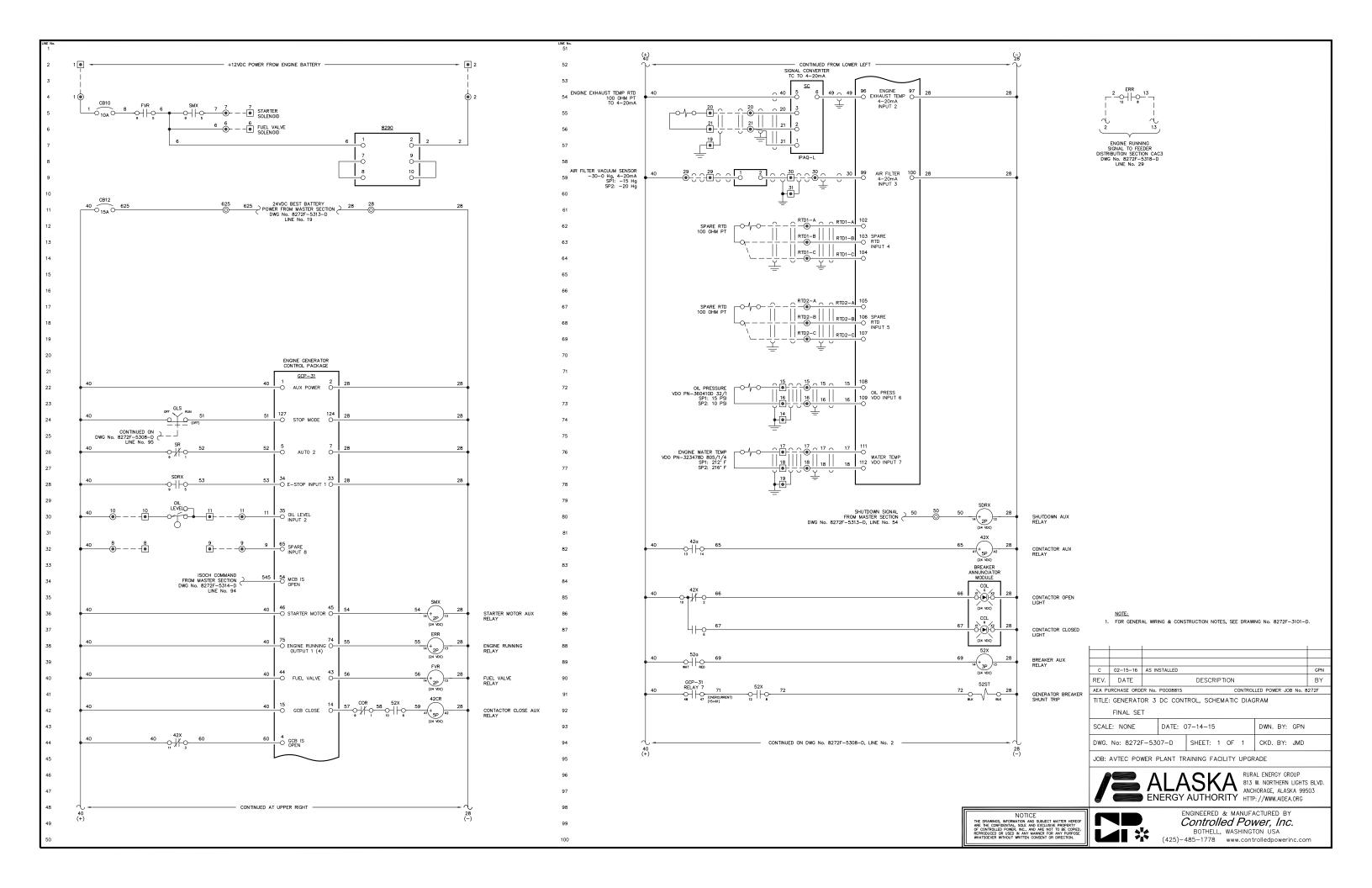


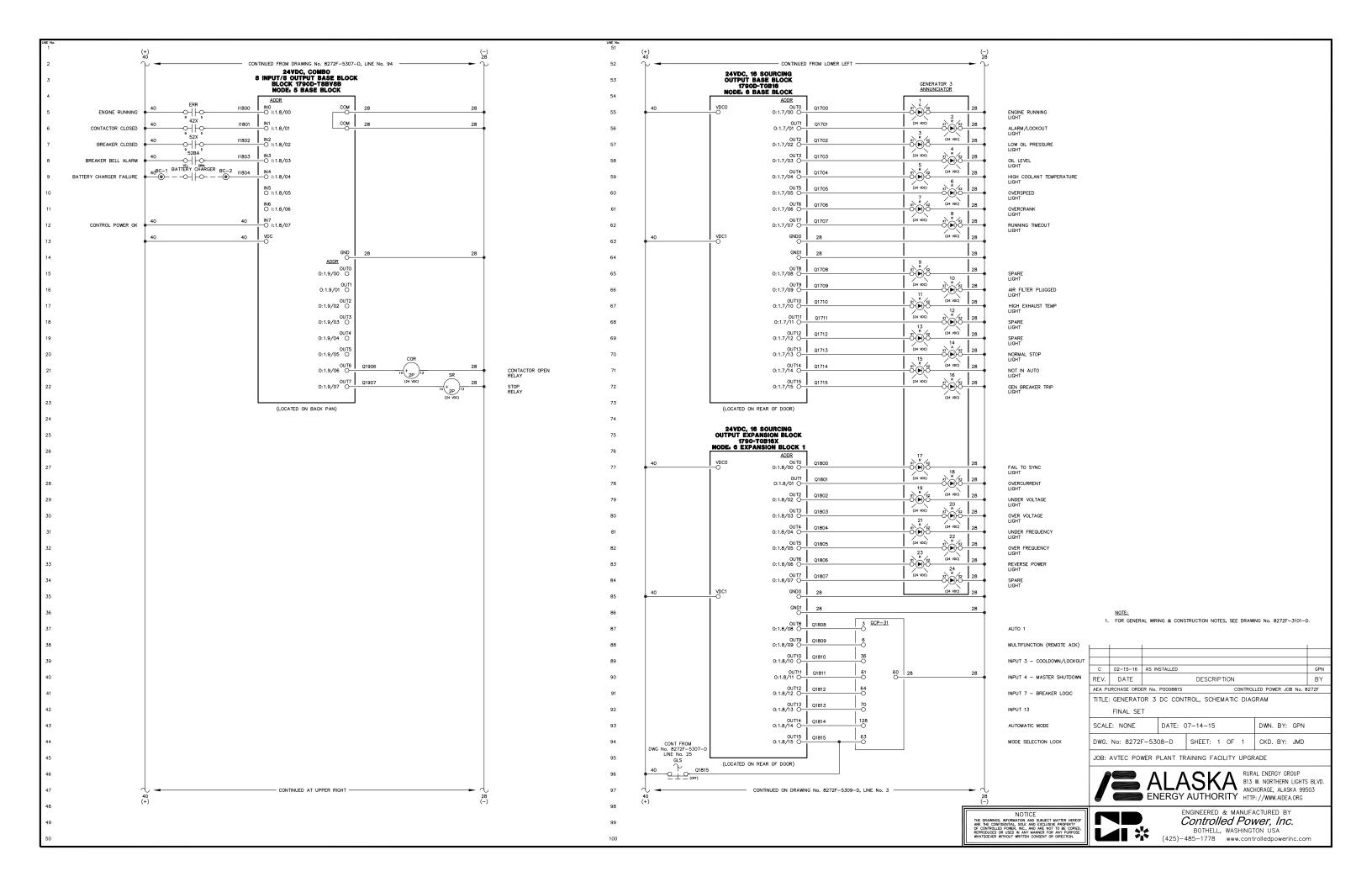


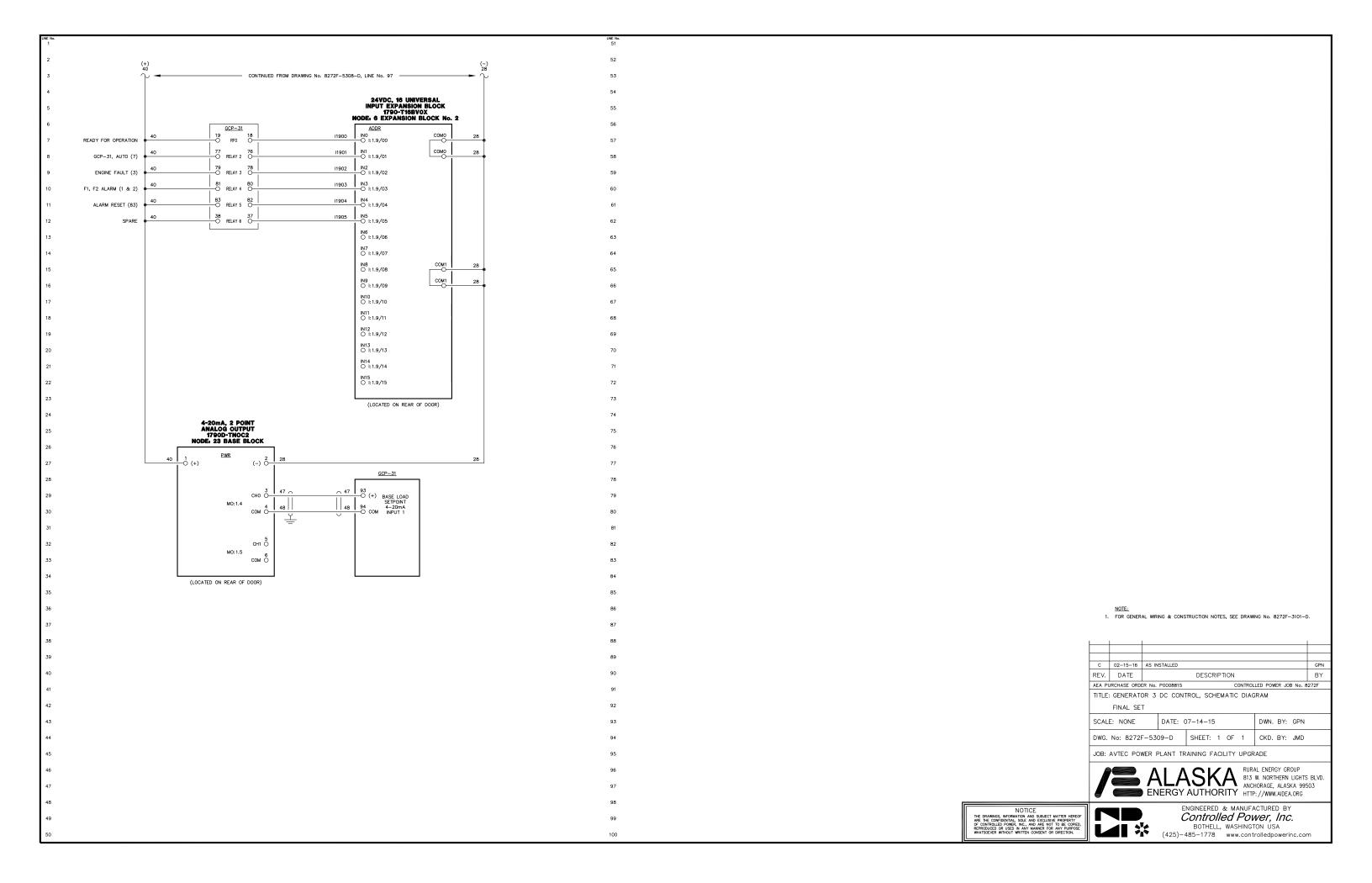


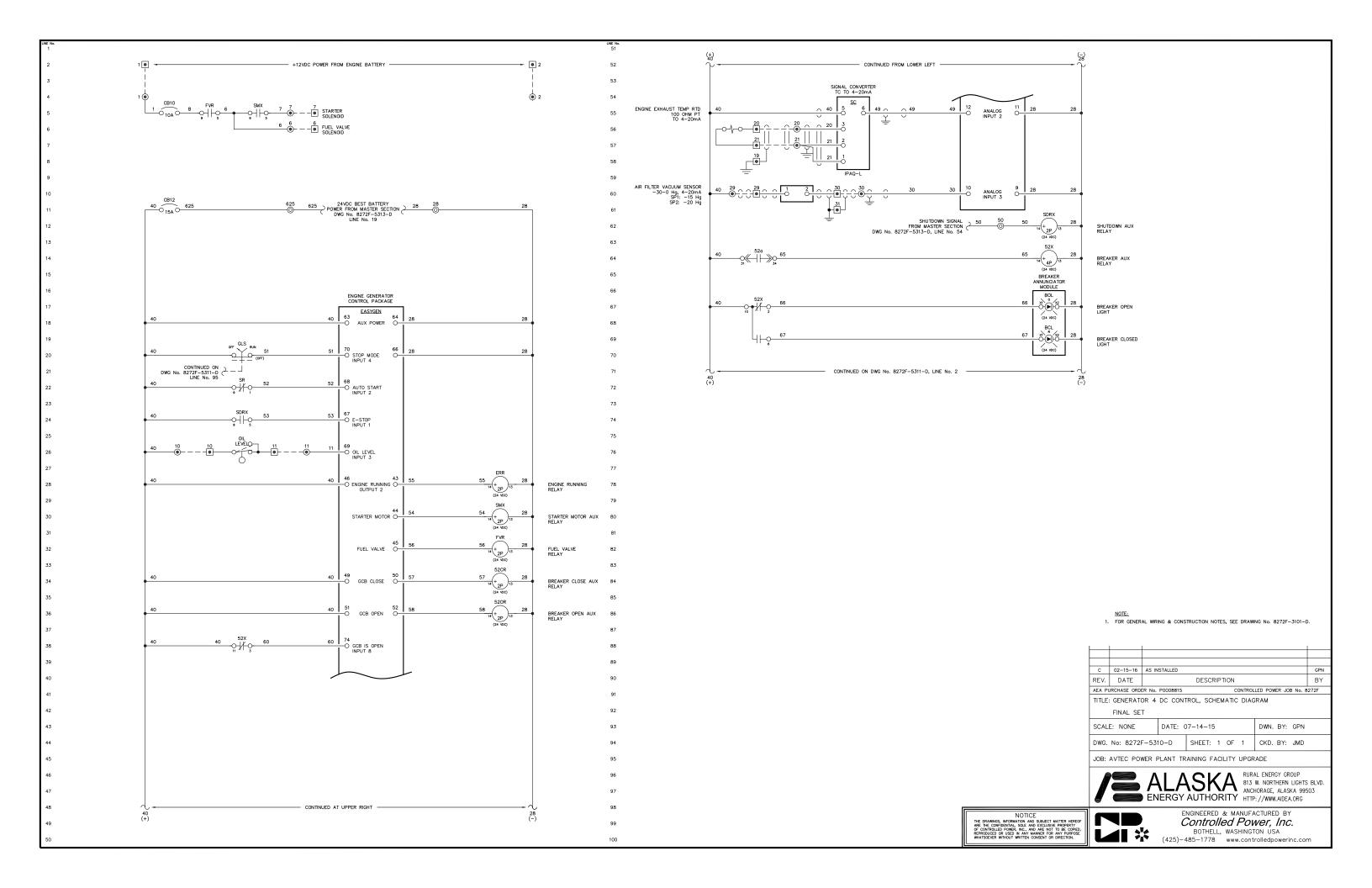


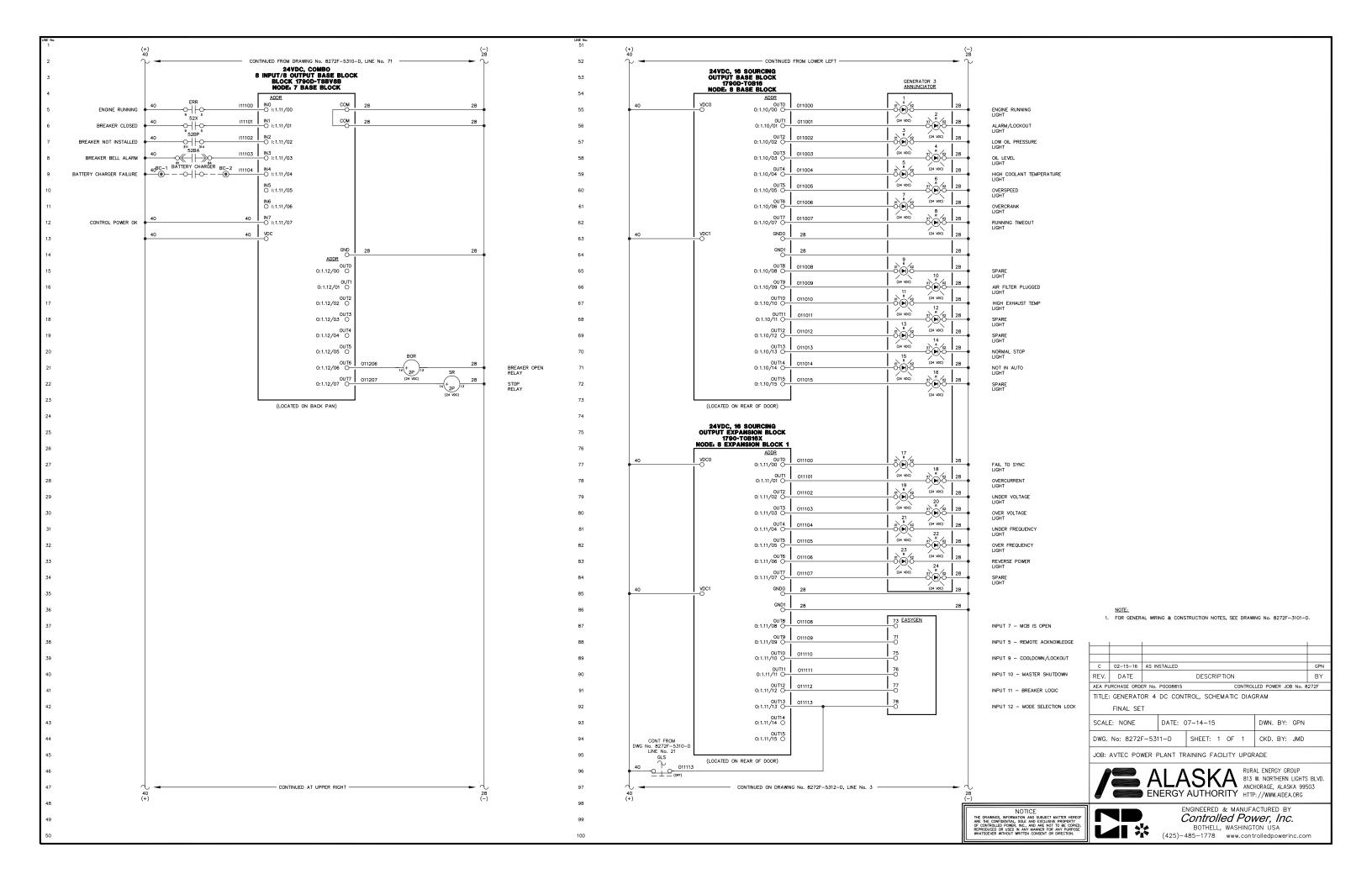


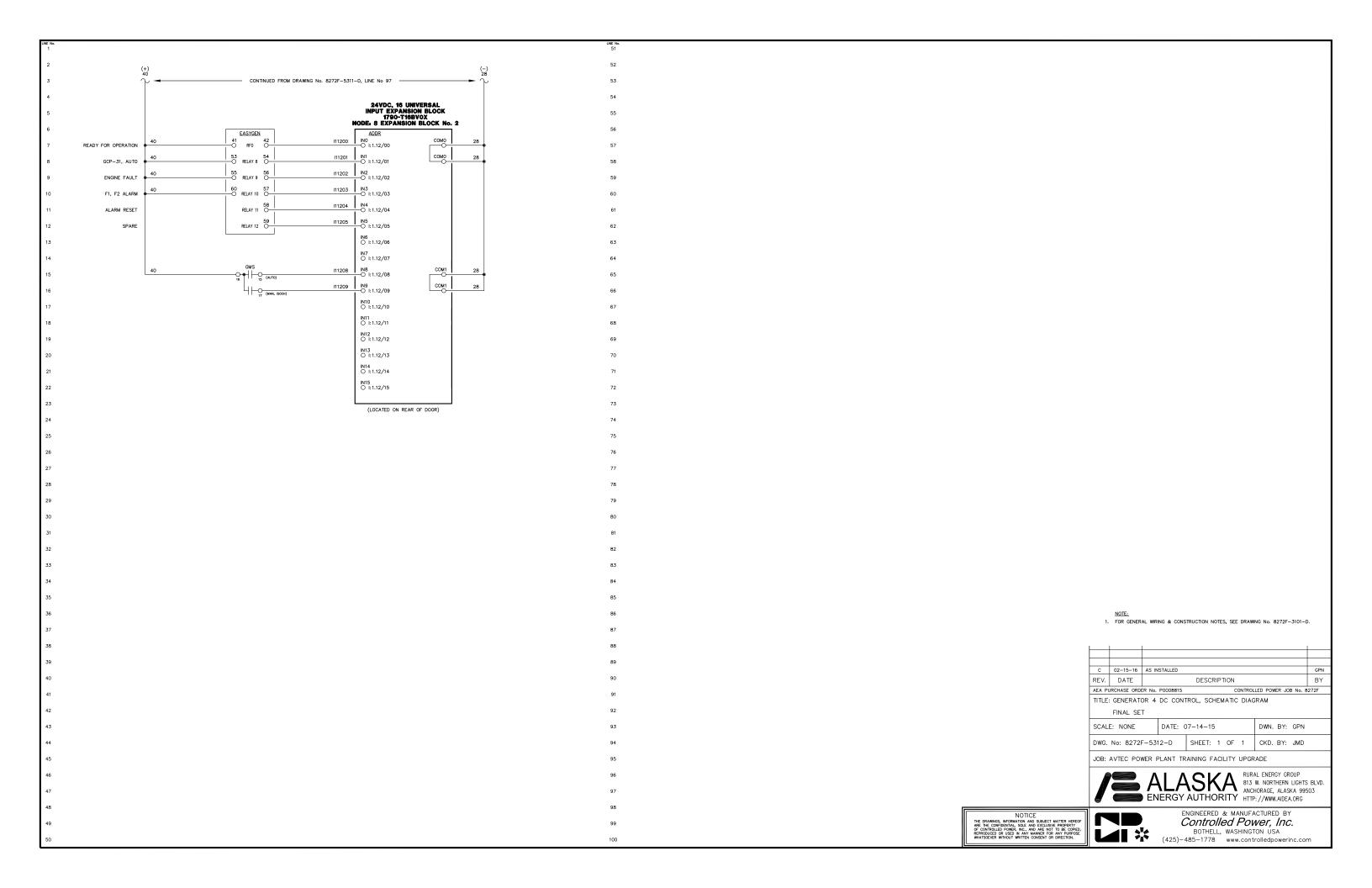


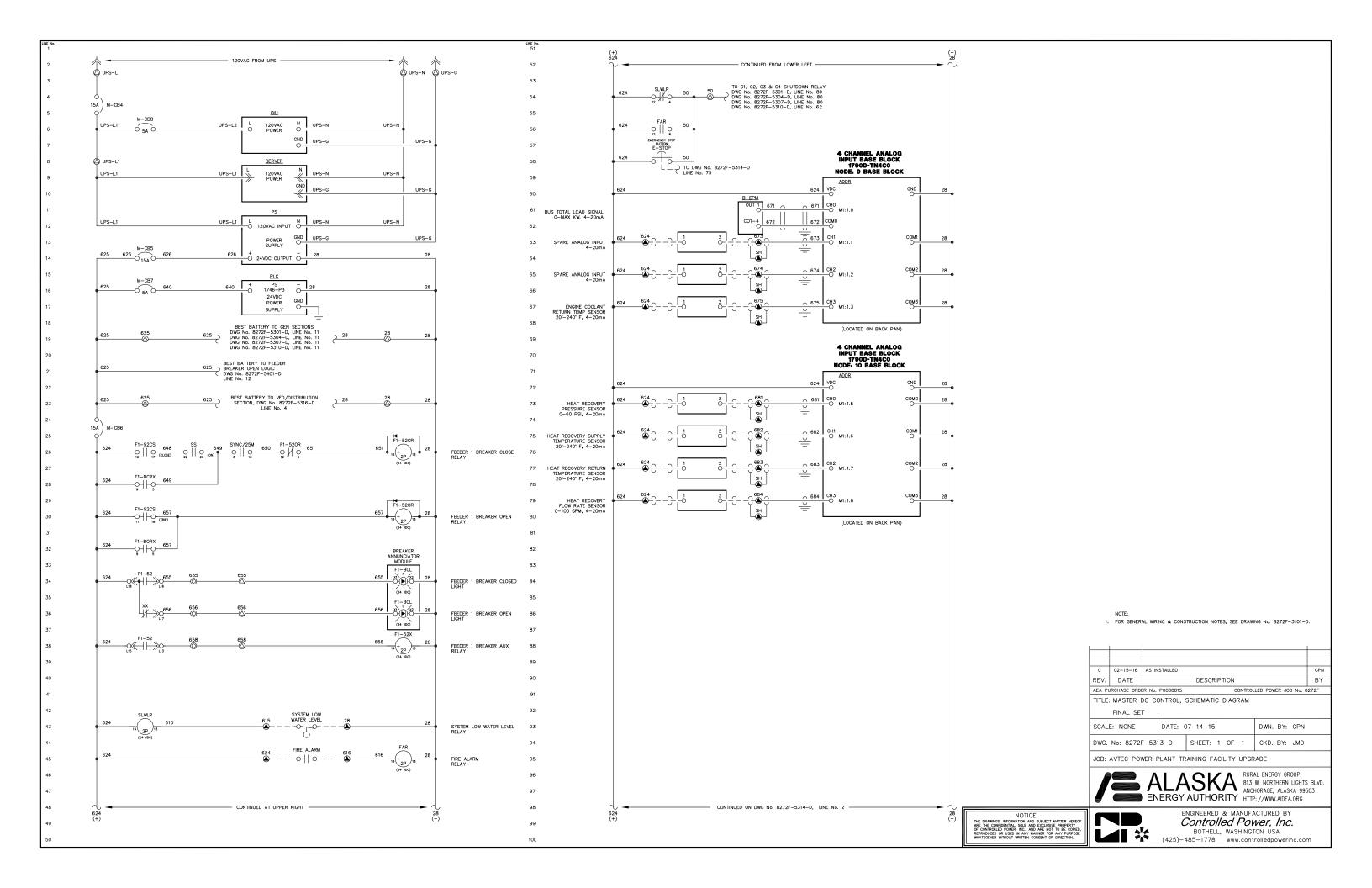


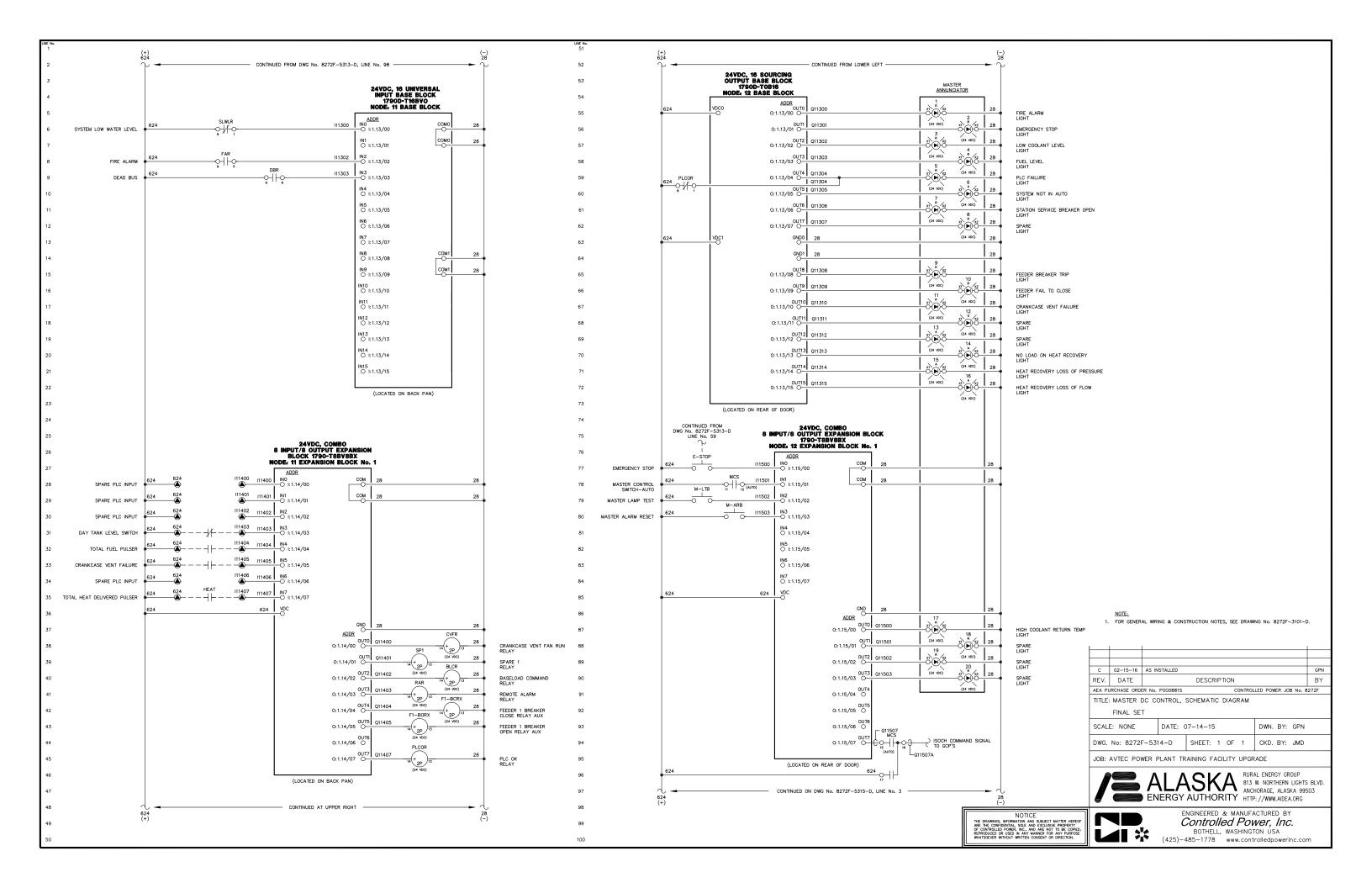


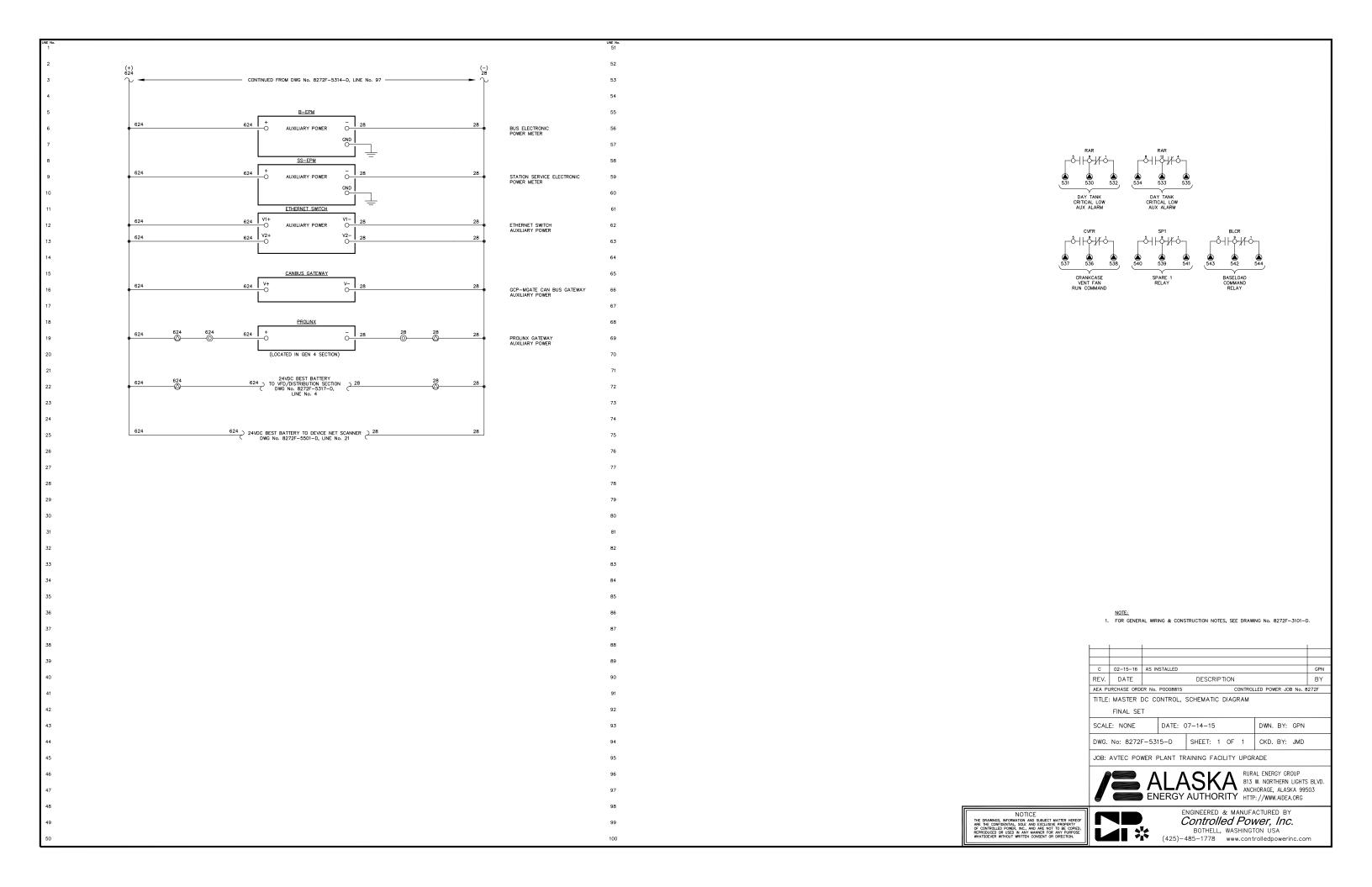


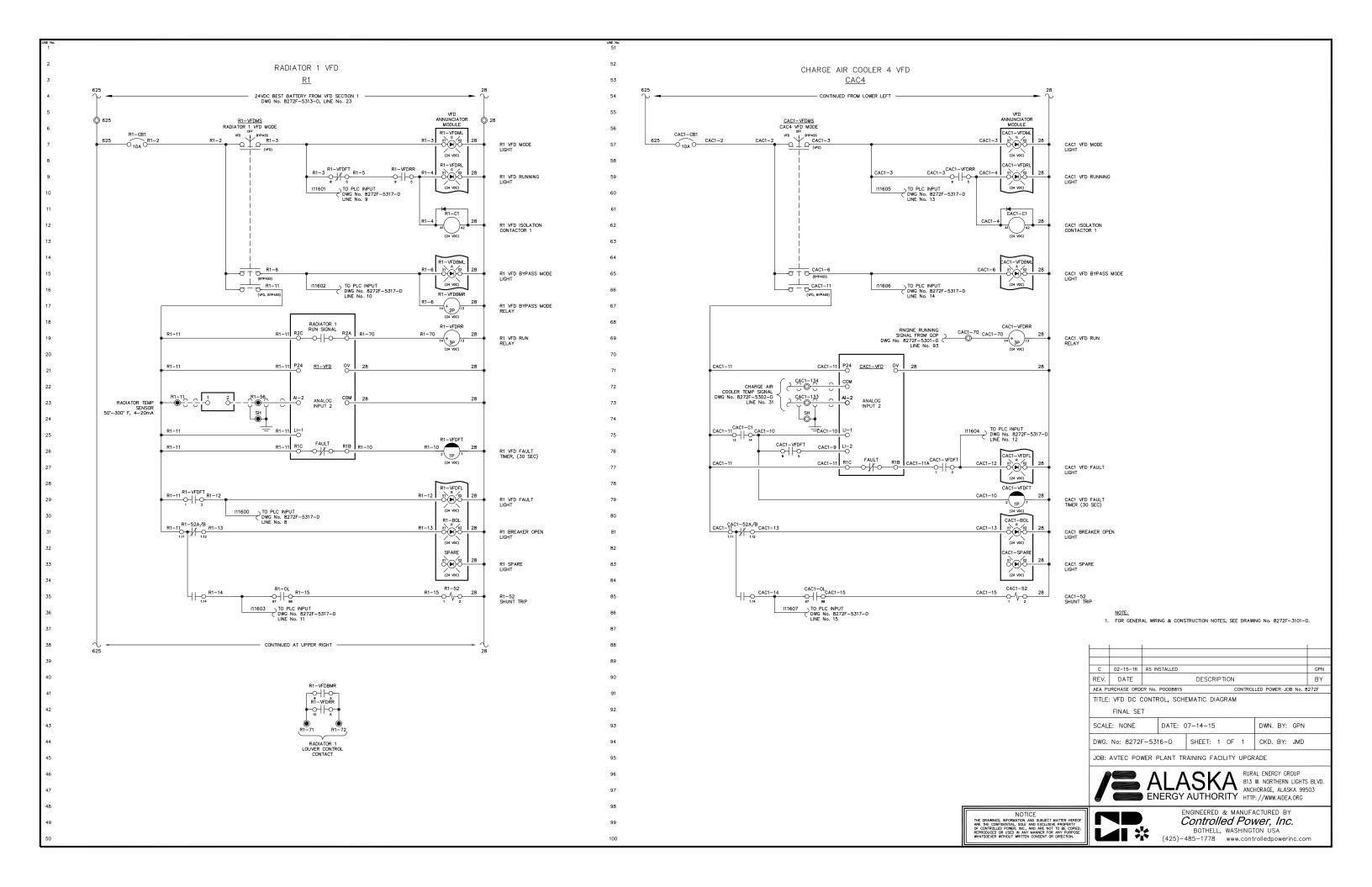


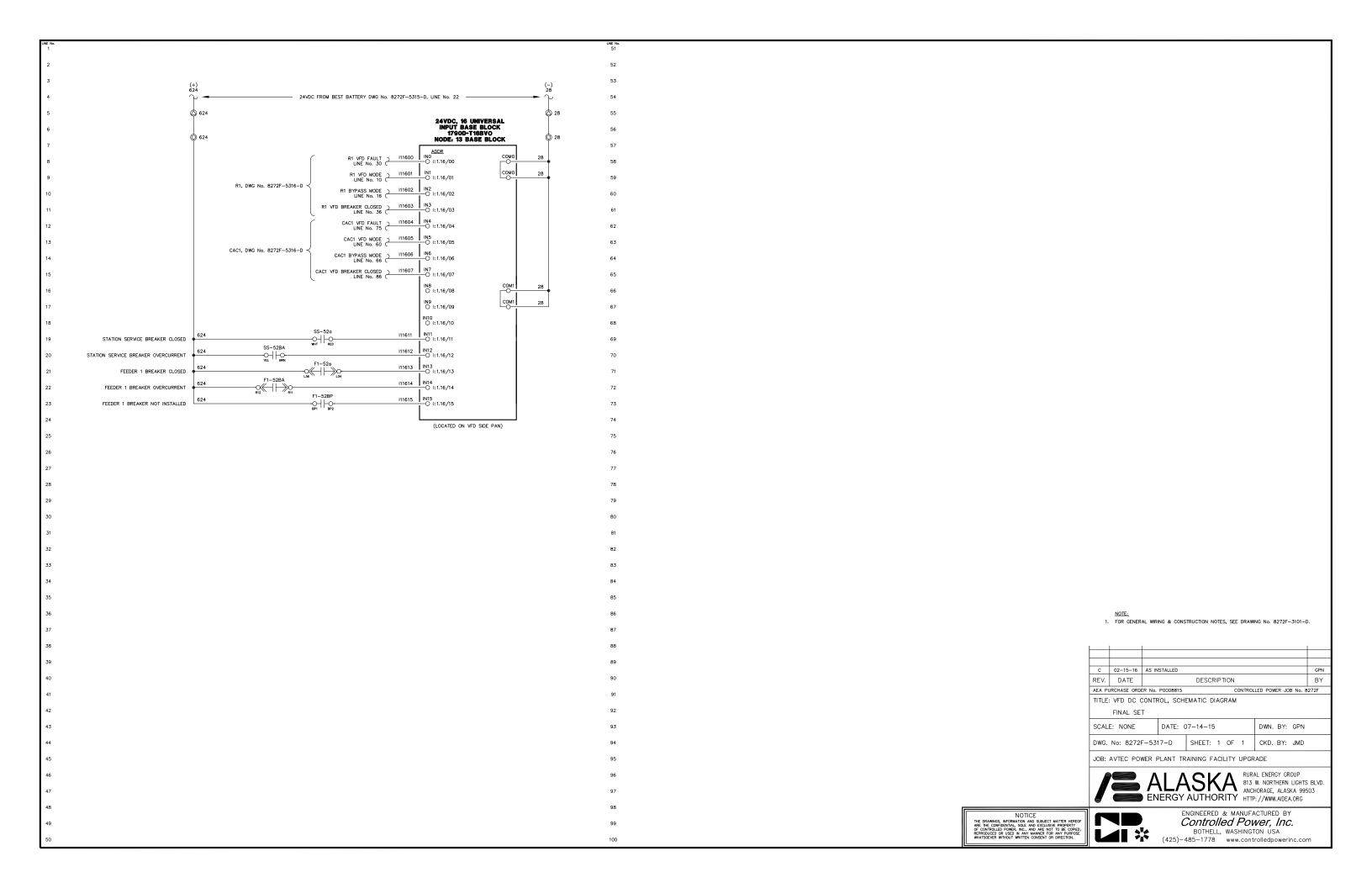


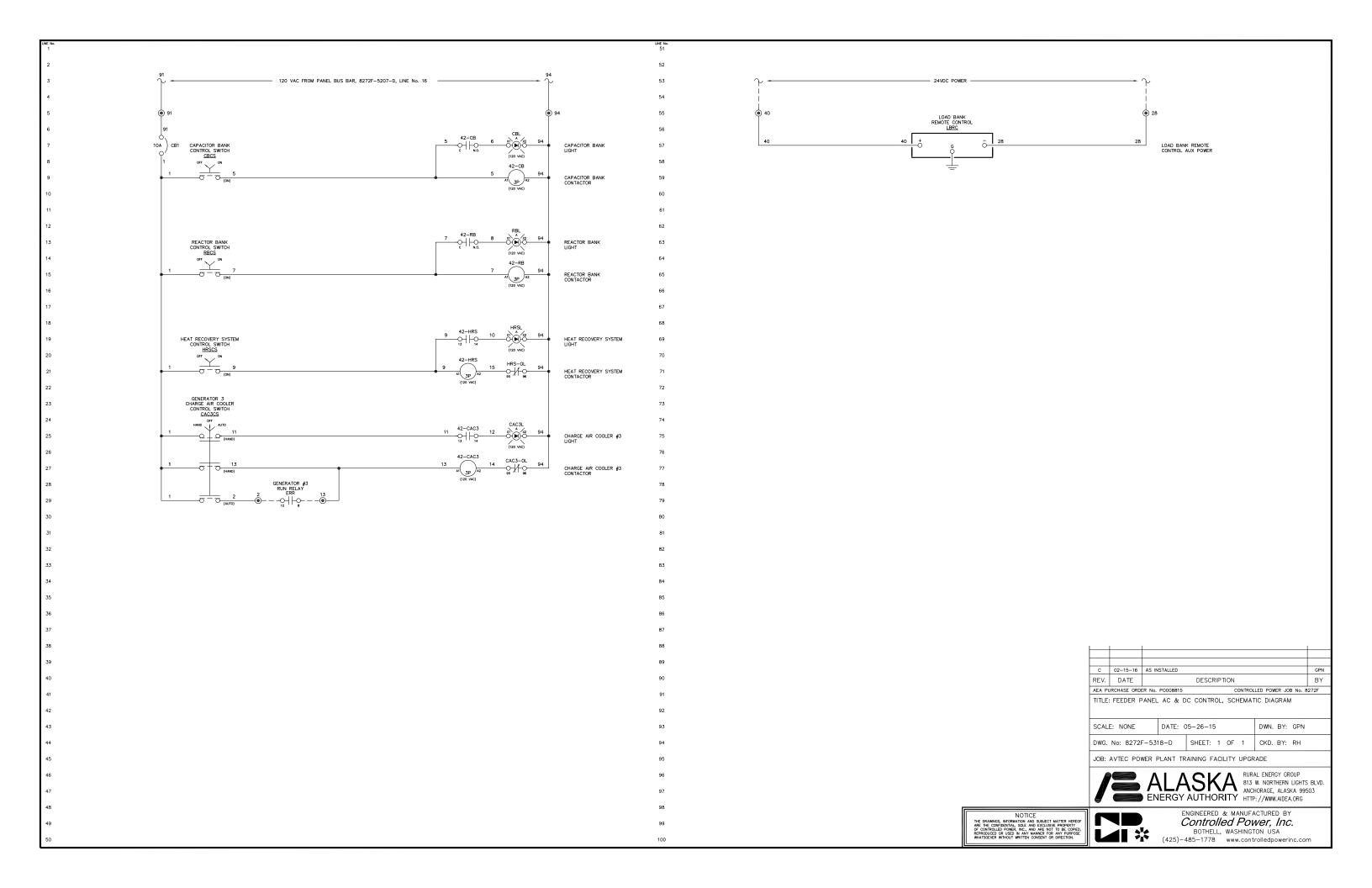


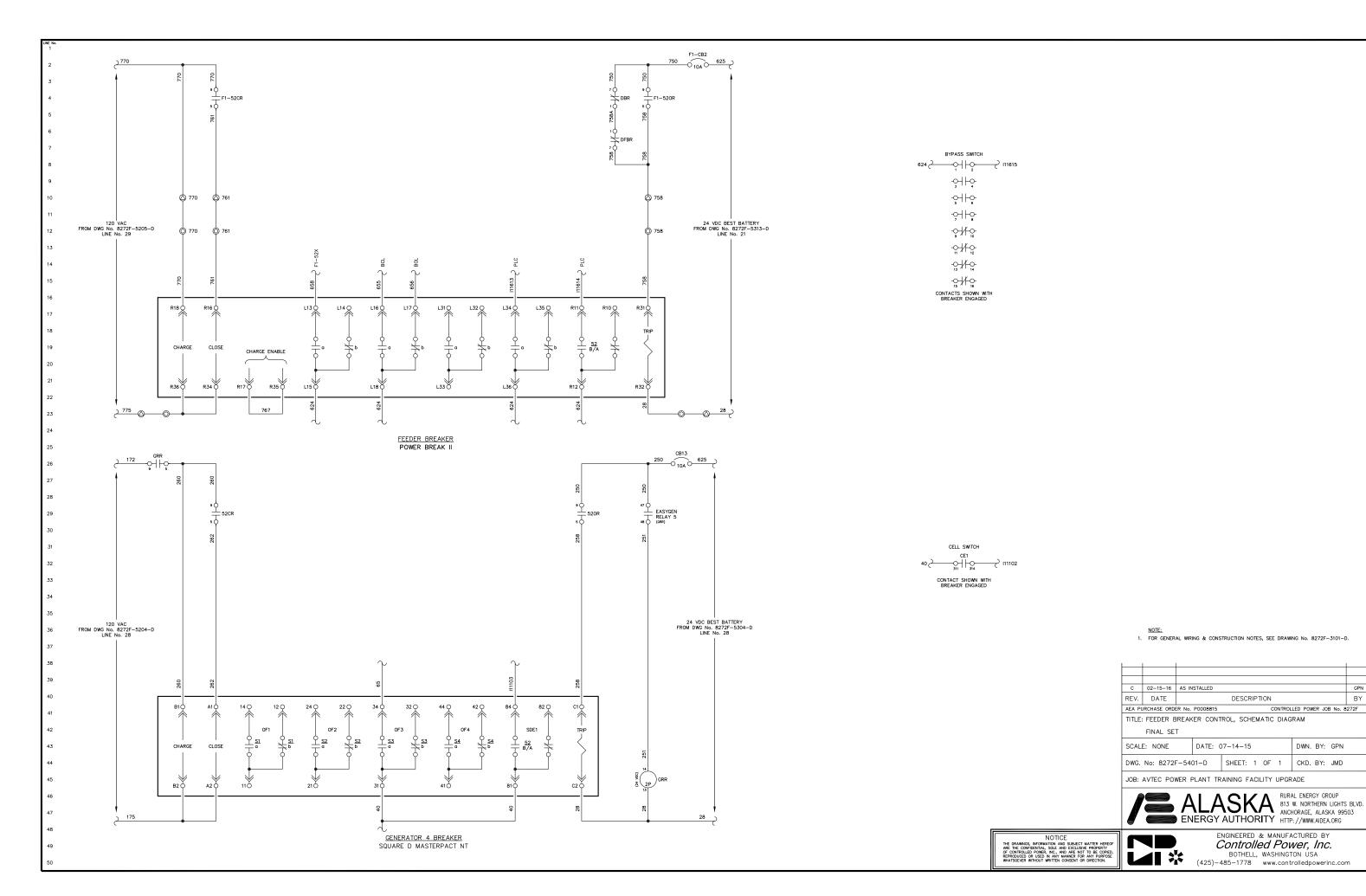












DESCRIPTION

ENGINEERED & MANUFACTURED BY Controlled Power, Inc.

BOTHELL, WASHINGTON USA

BY

CONTROLLED POWER JOB No. 8272F

DWN. BY: GPN

PRIMARY PLC A-B MODEL SLC 500 SLOT 0 SLOT 1 SLOT 2 SLOT 3 SLOT 4 SLOT 5 SLOT 6 LOCATED IN PRIMARY PLC DEVICE NET CARD SLOT 1 TERMINATING RESISTOR 120 OHM AC_VNB_LASE.
AC_PNT_NO
AC_ (1) RED (MAIN PLC) BELDEN —/ 3084A TO ETHERNET
SWITCH
DWG No. 8272F-5601-D
LINE No. 4
PORT 5

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 8272F-3101-D.

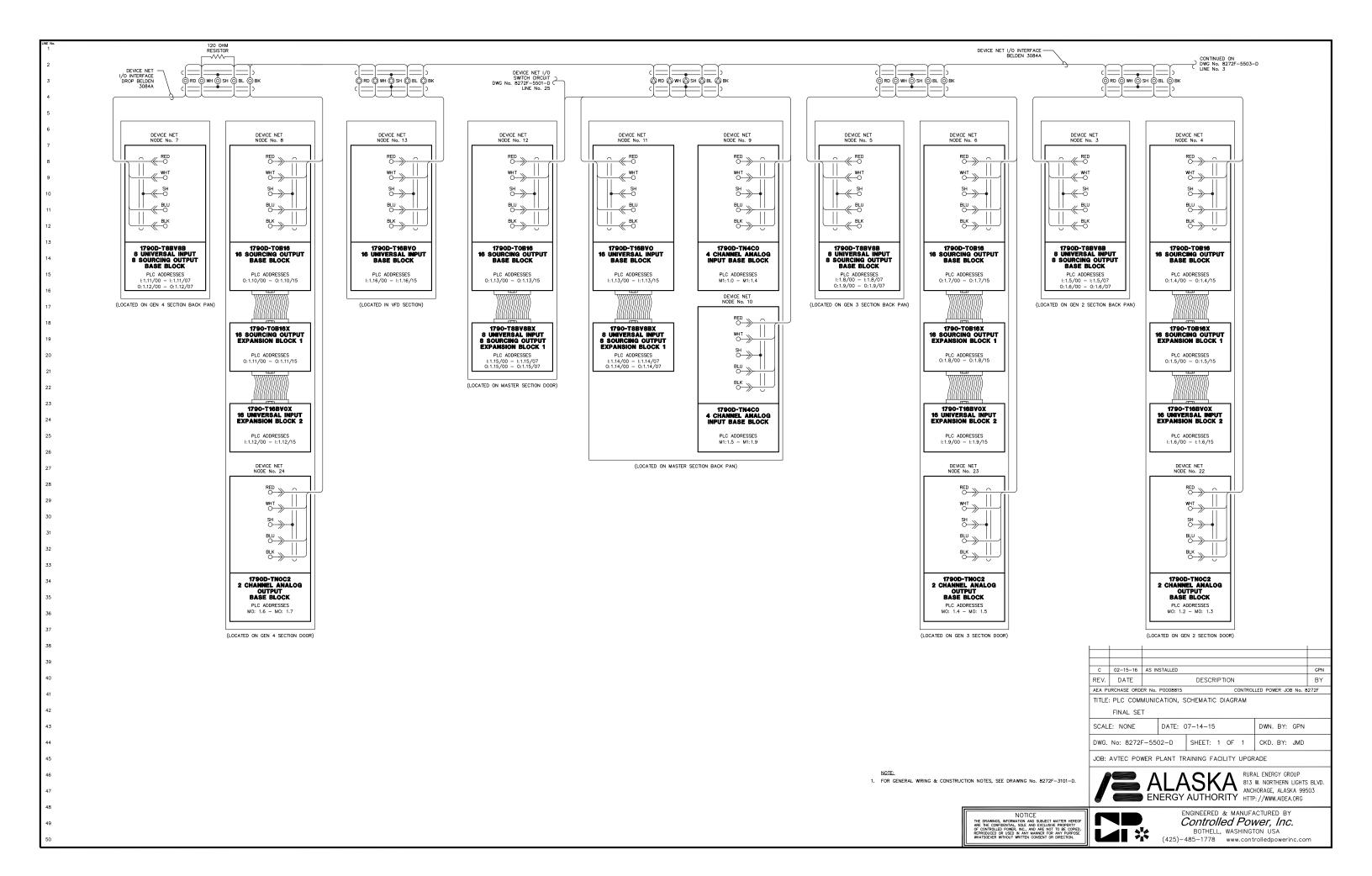
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REV.	REV. DATE DESCRIPTION							BY	
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TITLE:	TITLE: PLC COMMUNICATION, SCHEMATIC DIAGRAM								
	FINAL SE	T							
SCALE: NONE DATE: 07-14-15 DWN. BY: GPN									
DWG. No: 8272F-5501-D SHEET: 1 OF 1 CKD. BY: JMD									
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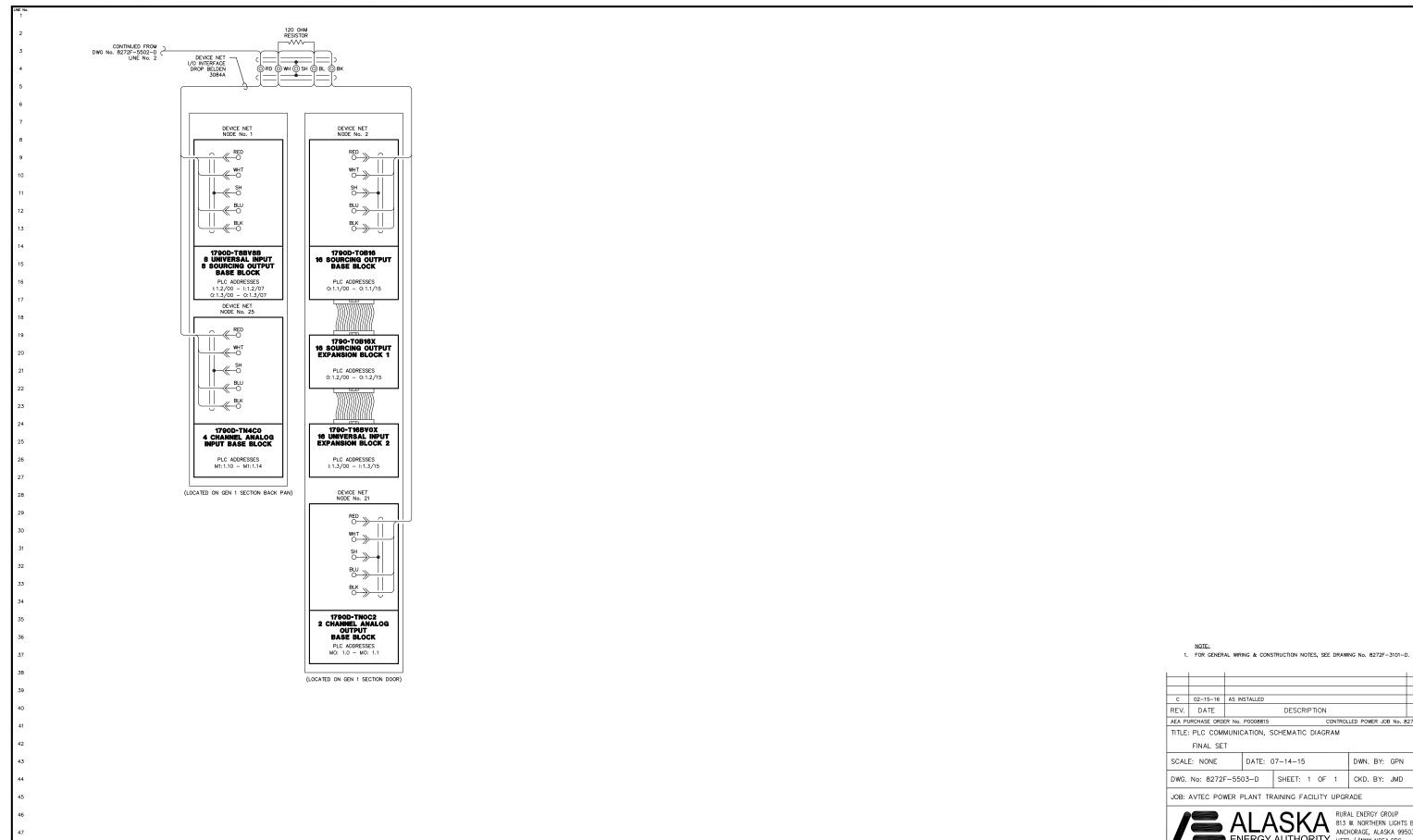
JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE





ENGINEERED & MANUFACTURED BY Controlled Power, Inc.





AEA PURCHASE ORDER No. P0008815 CONTROLLED POWER JOB No. 8272F

TITLE: PLC COMMUNICATION, SCHEMATIC DIAGRAM

DATE: 07-14-15 DWN. BY: GPN

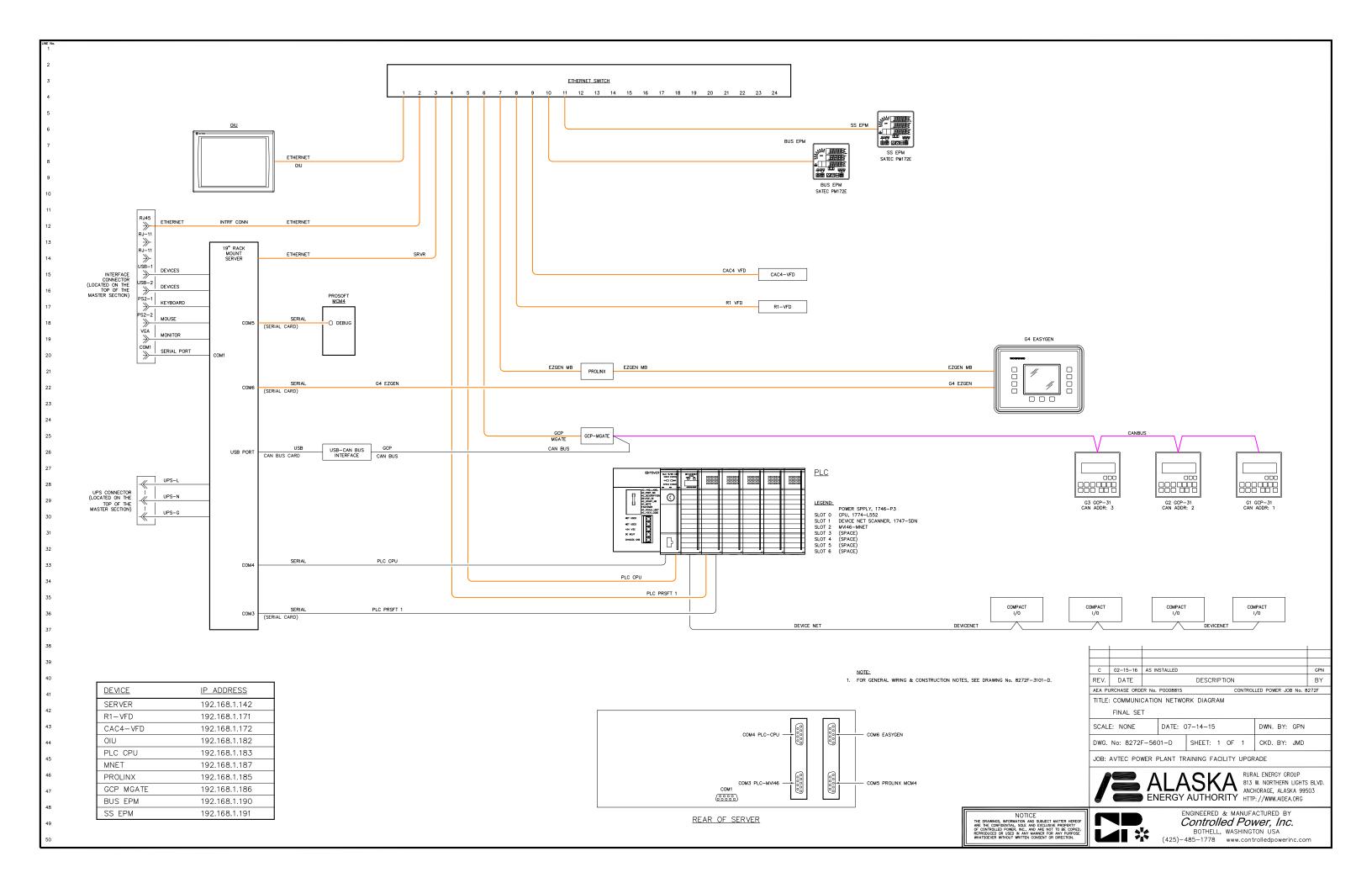
DWG. No: 8272F-5503-D | SHEET: 1 OF 1 | CKD. BY: JMD

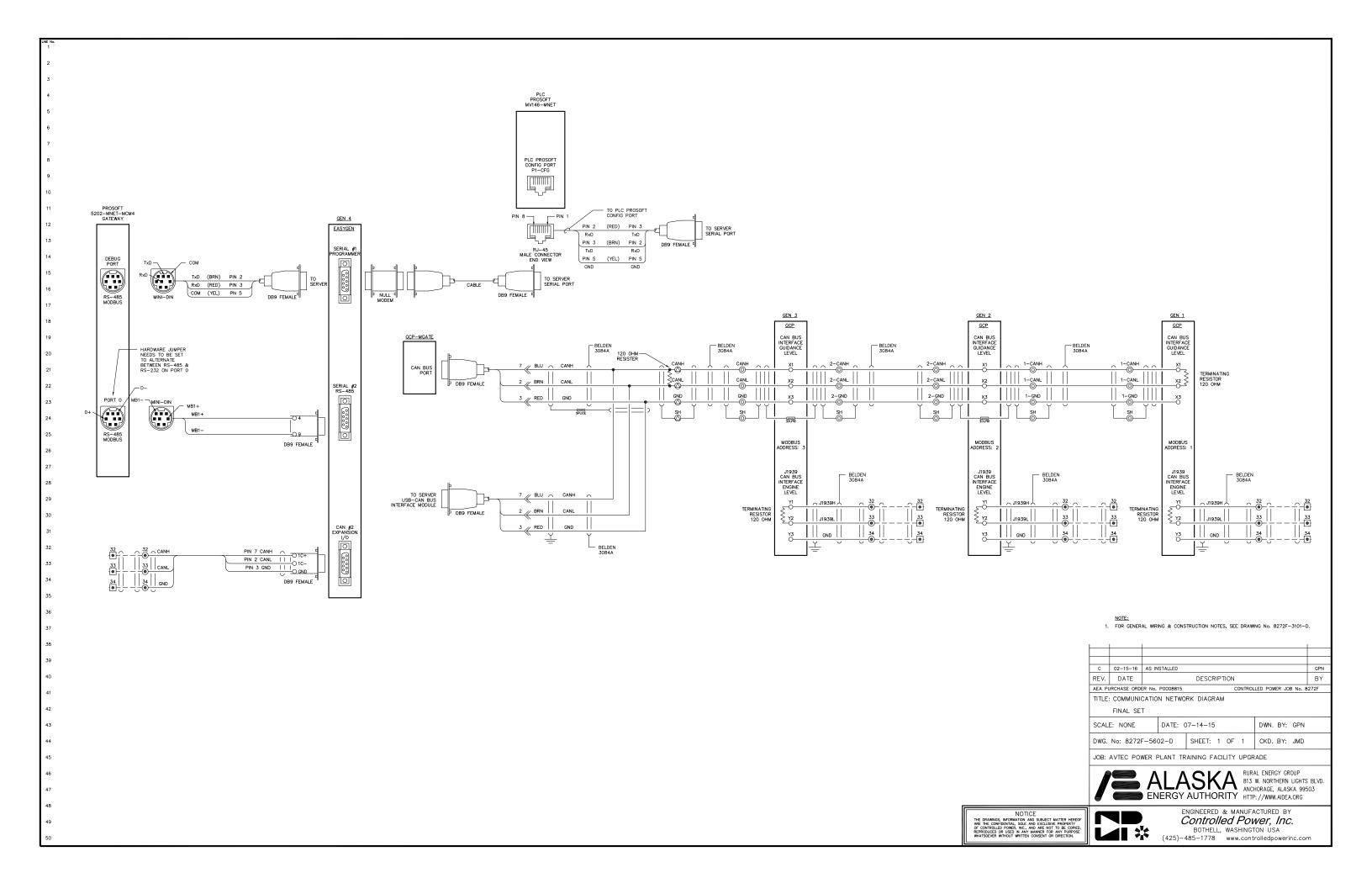


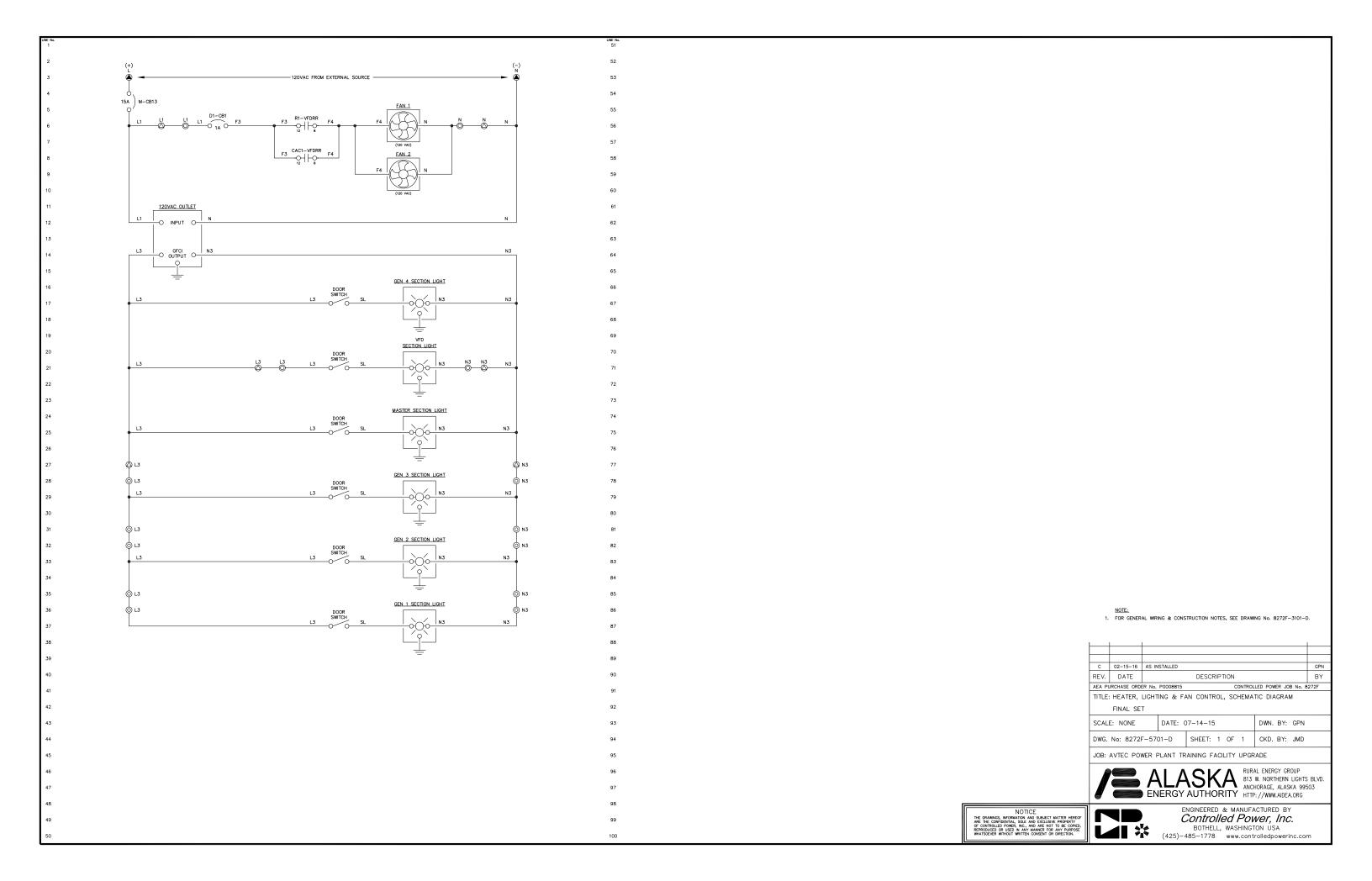
BY

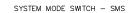


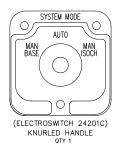
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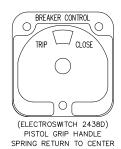






_				
	CONTACTS		PC	S.
DECK		MAN BASE	AUTO	MAN ISOCH
			×	Г
	12 OHH HO 13			×
	40 0 II H→ 15		X	
,	16 OH HO 17			X
	11 0 18	X		
	" ¹¹ ⊢ 12		×	
	15 0 14	X		
	₁₂ ਨਂ 14 10 16		×	

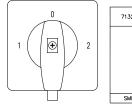
BREAKER CONTROL SWITCH - 52CS



$\overline{\mathbf{x}}$	CONTACTS	F	9 0S	
DECK		TRIP	NORM.	150 10
Γ.	11 어⊢⊢⊢0 18	Χ		
'	16 어├├ 17			×

VARIABLE FREQUENCY DRIVE SWITCH - VFDS



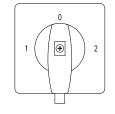


71322		44	34	1L1	1L2	1L3	2L1	2L2	2L3	53	63	
71522				L								
					$\overline{1}$		\neg					
						1	- 1	\neg				
	_					T	1	Т	7			_
	POSITION	11'	1	<i>'1</i>	Ί.	`/	١.	١.	١.	11	7.	POSITION
	<u>s</u>				- /	- /	1	1	1	١\	\	<u> </u>
	ã	1	1		ſ		ì	1	1	1)	ã
		43	33	171	1T2	1T3	2T1	2T2	213	54	64	1
SMD	1	M	ID			713	300			,	ИΕ	2
	_									-		_

3 POS MAINTAINED

VARIABLE FREQUENCY DRIVE SWITCH - VFDS





71322		44	34	1L1	1L2 	1L3 	2L1	2L2	2L3	53	63	$\ \ $
	POSITION	1	33		/ / 1T2	1173			2T3	\ \ \ 54	64	POSITION
SMD	1	м	ID			713	300			1	Æ	2

3 POS MAINTAINED

GENERATOR LOCKOUT SWITCH - GLS GENERATOR LOCKOUT FOR SERVICE OFF RUN

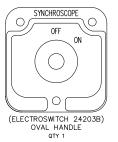






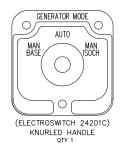
KEY OPERATED 2 POS MAINTAINED QTY 4

SYNCHROSCOPE SWITCH TARGET - SS



	CONTACTS	P	os
DECK		OFF	N
	11 0 12	X	
1	12 0		×
'	15 0 ├─ ├─ 16	Χ	
	16 0		×
	21 0-1-1-0 22	×	
2	22		×
_	25 0 - 0 26	×	
	26 0 - 27		×
	31 0		
3	32 ○ ├ ├ ├ 33	X	
٦	35 ○ ├─ ├○ 36		×
	36 0	X	

GENERATOR MODE SWITCH - GMS



	CONTACTS		PC	S.
DECK		MAN BASE	AUTO	MAN ISOCH
	40 0 II HH 11		X	
	12 01 13			X
	15 O II H 15		Χ	
1	16 OH HO 17			X
Ι'		X		
	11 01 12		×	
	15 0 14	X		
\Box	12 04 Hg HP 16		X	

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 8272F-3101-D.

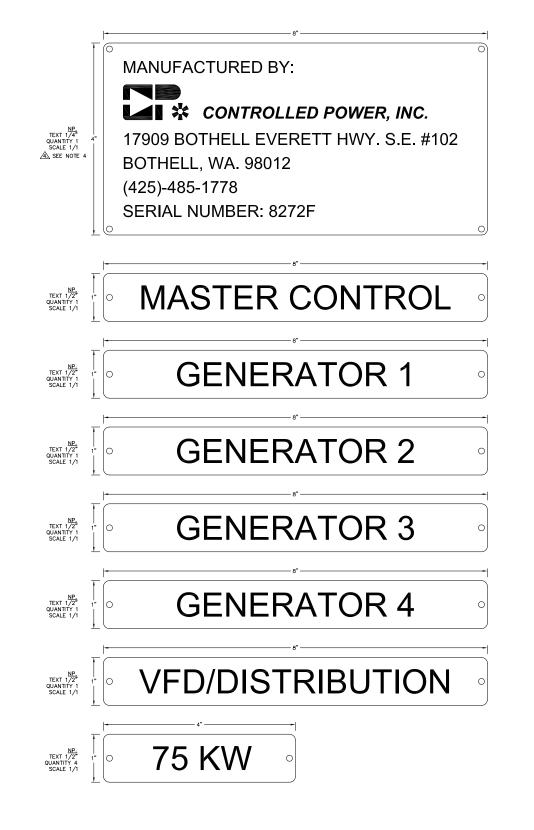
С	02-15-16	AS IN	S INSTALLED						
REV.	DATE			DESCR	(IPT	ION			BY
AEA PURCHASE ORDER No. P0008815 CONTROLLED POWER JOB No. 82									8272F
TITLE: CONTROL SWITCH TARGET DIAGRAM									
	FINAL SE	Т							
SCALE: NONE DATE: 07-14-15 DWN. BY: GPN									
DWG. No: 8272F-6101-D SHEET: 1 OF 1 CKD. BY: JMD									
				•				•	

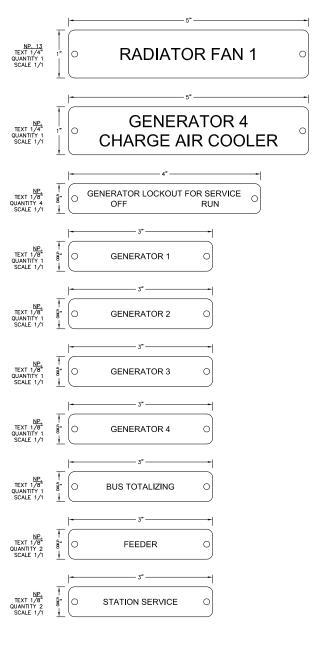
JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

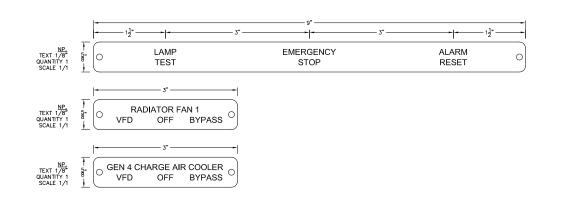




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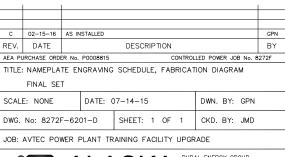




NOTES

- 1. ALL NAMEPLATES SHALL BE BLACK FACE WITH WHITE LETTERS EXCEPT AS NOTED.
- 2. ALL NAMEPLATES SHALL HAVE PRESSURE SENSITIVE ADHESIVE ON BACK, 100 % COVERAGE.
- 3. ALL NAMEPLATES SHALL HAVE MOUNTING HOLES DRILLED AS INDICATED.

A INDICATES THAT NAMEPLATE SHALL BE BRUSHED ALUMINUM WITH BLACK ENGRAVED LETTERS.



O" 1" 2" ALASKA RURAL ENERGY GROUP
813 W. NORTHERN LIGHTS BLVD.
ANCHORAGE, ALASKA 99503

SCALE: 1"= 1"

ENERGY AUTHORITY

http://www.addea.org

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REPRODUCED OR USED IN ANY MANNER FOR ANY PURPOSE

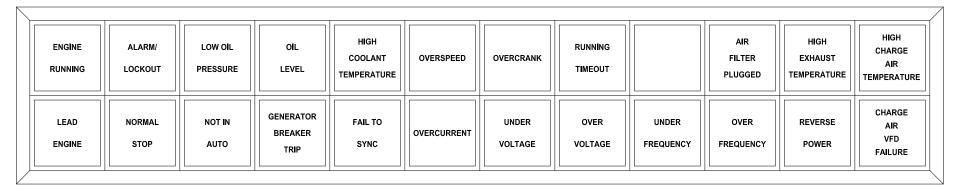


ENERGY AUTHORITY ANCHORAGE, ALASKA 99503

HTTP://WWW.AIDEA.ORG

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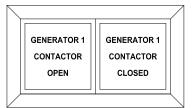


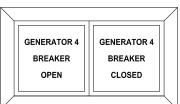
VFD VFD BYPASS MODE RUNNING MODE VFD VFD BREAKER FAULT OPEN

GENERATOR 1 & 2 ANNUNCIATOR

ENGINE RUNNING	ALARM LOCKOUT	LOW OIL PRESSURE	OIL LEVEL	HIGH WATER TEMPERATURE	OVERSPEED	OVERCRANK	RUNNING TIMEOUT		AIR FILTER PLUGGED	HIGH EXHAUST TEMPERATURE	HIGH CHARGE AIR TEMPERATURE
LEAD ENGINE	NORMAL STOP	NOT IN	GENERATOR BREAKER TRIP	FAIL TO SYNC	OVERCURRENT	UNDER VOLTAGE	OVER VOLTAGE	UNDER	OVER FREQUENCY	REVERSE POWER	CHARGE AIR VFD FAILURE

VFD ANNUNCIATOR



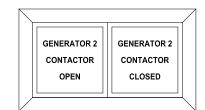


GEN 4 BREAKER ANNUNCIATOR

GENERATOR 3 ANNUNCIATOR

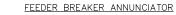
ENGINE RUNNING	ALARM	LOW OIL PRESSURE	OIL LEVEL	HIGH WATER TEMPERATURE	OVERSPEED	OVERCRANK	RUNNING TIMEOUT		AIR FILTER PLUGGED	HIGH EXHAUST TEMPERATURE	HIGH CHARGE AIR TEMPERATURE
LEAD ENGINE	NORMAL STOP	NOT IN		FAIL TO SYNC	OVERCURRENT	UNDER	OVER VOLTAGE	UNDER	OVER FREQUENCY	REVERSE POWER	CHARGE AIR VFD FAILURE

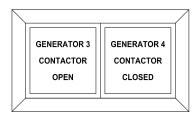
GEN 1 BREAKER ANNUNCIATOR





GEN 2 BREAKER ANNUNCIATOR





GEN 3 BREAKER ANNUNCIATOR

	1									1
С	02-15-16	AS IN	ISTALLED							GP
REV.	DATE		DESCRIPTION							
AEA PURCHASE ORDER No. P0008815 CONTROLLED POWER JOB No. 82									8272F	
TITLE: ANNUNCIATOR WINDOWS, FABRICATION DIAGRAM										
	FINAL SE	Т								
SCAL	E: NONE	07-14-15 DWN. BY: GPN						1		
DWG.	No: 8272	F-62	02-D	SHEET:	1	OF	1	CKD. BY:	JMD)
JOB:	AVTEC PO	WER F	PLANT TR	AINING F	ACII	LITY	UPGR	ADE		
_		Λ	Ι Λ		_	Λ	RUR	AL ENERGY (ROUP	

SCALE: 1"= 1"

(425)-485-1778 www.controlledpowerinc.com

ALASKA 813 W. NORTHERN LIGHTS BLVD.
ANCHORAGE, ALASKA 99503
HTTP://www.aidea.org ENGINEERED & MANUFACTURED BY Controlled Power, Inc.

GENERATOR 4 ANNUNCIATOR

FIRE ALARM	EMERGENCY STOP	LOW COOLANT LEVEL	FUEL LEVEL	PLC FAILURE	SYSTEM NOT IN AUTO	STATION SERVICE BREAKER OPEN	FEEDER BREAKER TRIP	FEEDER BREAKER FAIL TO CLOSE
CRANKCASE VENT FAILURE			NO LOAD ON HEAT RECOVERY	HEAT RECOVERY LOSS OF PRESSURE	HEAT RECOVERY LOSS OF FLOW	HIGH COOLANT RETURN TEMP		



FEEDER DISTRIBUTION PANEL

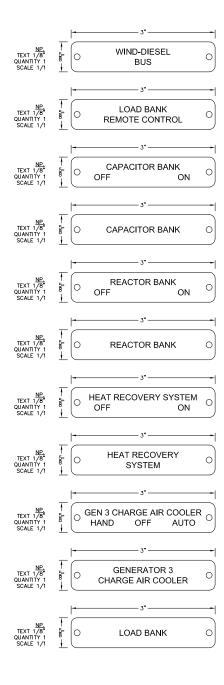


MANUFACTURED BY:

CONTROLLED POWER, INC.

17909 BOTHELL EVERETT HWY. S.E. BOTHELL, WA. 98012 (425)-485-1778

SERIAL NUMBER: 6797



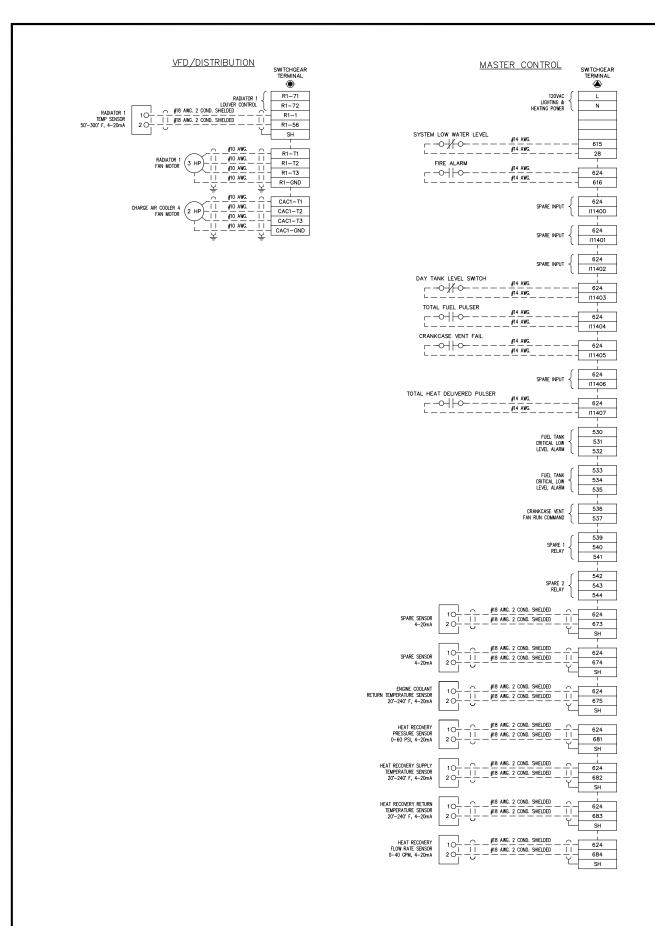
- ALL NAMEPLATES SHALL BE BLACK FACE WITH WHITE LETTERS EXCEPT AS NOTED. 2. ALL NAMEPLATES SHALL HAVE PRESSURE SENSITIVE ADHESIVE ON BACK, 100 % COVERAGE.
- ALL NAMEPLATES SHALL HAVE MOUNTING HOLES DRILLED AS INDICATED.
- \triangle INDICATES THAT NAMEPLATE SHALL BE BRUSHED ALUMINUM WITH BLACK ENGRAVED LETTERS.

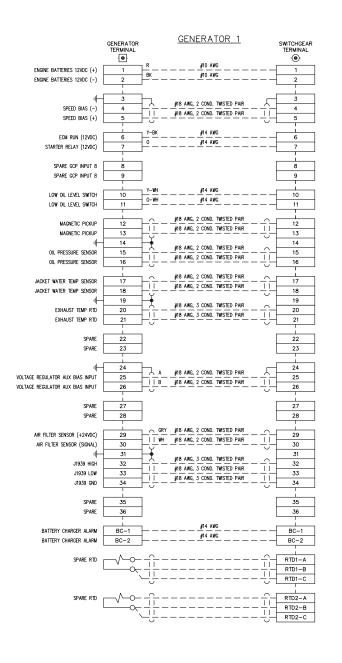
										I	
С	02-15-16	AS IN	S INSTALLED								
REV.	DATE		DESCRIPTION							BY	
AEA PL	AEA PURCHASE ORDER No. P0008815 CONTROLLED POWER JOB No. 82										
TITLE:	: NAMEPLA	TE EN	IGRAVING	SCHEDU	LE,	FAB	RICAT	ION DIAGRA	М		
SCAL	E: 1/1	05-26-15	5			DWN. BY:	GPN				
DWG.	No: 8272	SHEET:	1	OF	1	CKD. BY:	JMD				
JOB:	JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE										



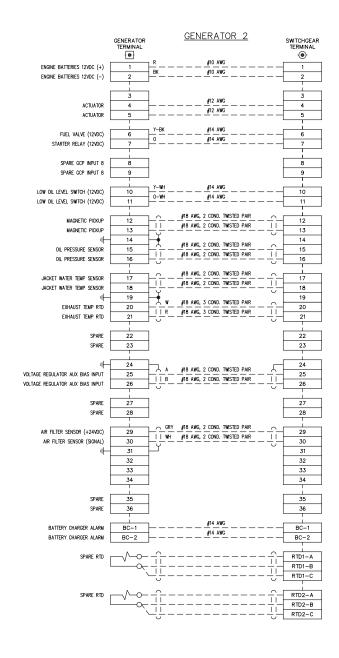


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* ALL FIELD WIRING GOES THROUGH THE SIMULATOR PANEL LOCATED ON THE END OF THE SWITCHGEAR.



1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 8272F-3101-D.

C 02-15-16 AS INSTALLED REV. DATE DESCRIPTION BY CONTROLLED POWER JOB No. 8272F AEA PURCHASE ORDER No. P0008815 TITLE: INTERCONNECTION DIAGRAM FINAL SET

SCALE: NONE DATE: 07-14-15

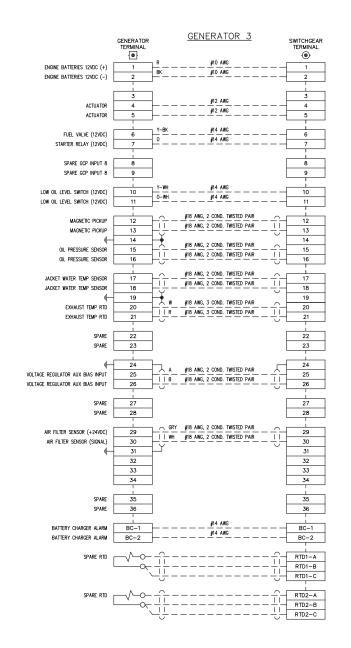
DWG. No: 8272F-7101-D | SHEET: 1 OF 1 CKD. BY: JMD JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

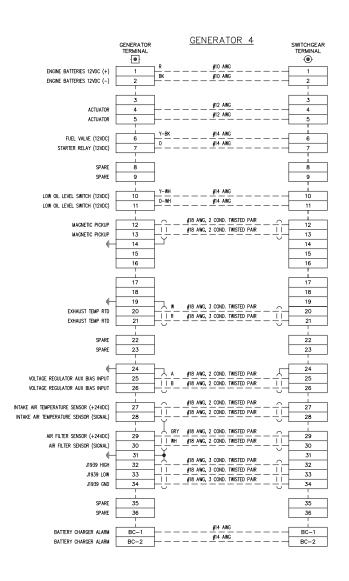


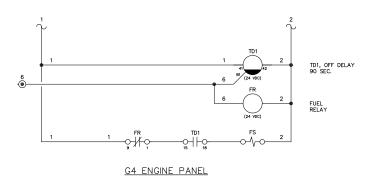
DWN. BY: GPN

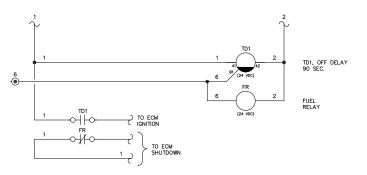


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G1 ENGINE PANEL

* ALL FIELD WIRING GOES THROUGH THE SIMULATOR PANEL LOCATED ON THE END OF THE SWITCHGEAR.

1. FOR GENERAL WIRING & CONSTRUCTION NOTES, SEE DRAWING No. 8272F-3101-D.

	1	ı							1		
С	02-15-16	AS IN	ISTALLED						GPN		
REV.	DATE		DESCRIPTION								
AEA PL	JRCHASE ORD	ER No.	P0008815			С	ONTROL	LED POWER JOB No.	8272F		
TITLE	TITLE: INTERCONNECTION DIAGRAM										
	FINAL SET										
SCAL	E: NONE	DATE: 0	7-14-15	DWN. BY: GPN	I						
DWG.	No: 8272	02-D	SHEET:	1	OF	1	CKD. BY: JMD				
JOB	AVTEC PO	WFR I	PLANT TR	AINING F	A CII	ITY	UPGR	ADF			

JOB: AVTEC POWER PLANT TRAINING FACILITY UPGRADE





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