

**** GENERAL CONDITIONS ****

NOTE THAT THESE SPECIFICATIONS APPLY TO WORK UNDER THE BASE BID AND ADDITIVE ALTERNATE #1 SCOPES. SEE NOTES ON THIS SHEET AND FOLLOWING SHEETS FOR DELINEATION OF SCOPE.

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 ENGINEER 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.

**** 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 APPROVED 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.

PIPE CLAMPS – TWO-PIECE PIPE CLAMP DESIGNED TO SUPPORT PIPE TIGHT TO STRUT. B-LINE B20## OR EQUAL. ZINC-PLATED CARBON STEEL.

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 – CUSTOM FIT THERMAL INSULATION PADS, DISTRIBUTION INTERNATIONAL OR EQUAL. HOT FACE LAYER: STAINLESS STEEL MESH. INNER LAYER: 1" THICK CERAMIC BLANKET, 2000°F MIN. SERVICE RATING, THERMAL CERAMICS KAOWOOL OR EQUAL. MID LAYER: 2" THICK HIGH TEMP FIBERGLASS BLANKET, 1000°F MIN. SERVICE RATING, JOHNS-MANVILLE HTB SPIN-GLAS OR EQUAL. OUTER LAYER: PLAIN WEAVE CARMELIZED FIBERGLASS FABRIC, 170Z WEIGHT, .028" THICKNESS, 1000°F MIN. SERVICE RATING, ALPHA-MARITEX STYLE 2025/9383 OR EQUAL. PROVIDE ALL STAINLESS STEEL CLOSURE SYSTEM INCLUDING LACING ANCHORS, WASHERS AND WIRE.

**** PAINTING AND MARKING ****

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 CONCRETE FLOOR TO MATCH ORIGINAL AS INDICATED.

**** EXHAUST AND CRANKCASE VENTILATION PIPING ****

EXHAUST PIPING – ASTM A53B SCHEDULE 40 BLACK STEEL PIPE WITH BUTT WELD FITTINGS AND JOINTS. PROVIDE ANSI 150# FLAT FACED FLANGES FOR CONNECTION TO ENGINE FLEX AND MUFFLER. INSTALL HIGH TEMPERATURE FULL FACE GASKETS, FRENZELIT NOVATEC 925F OR APPROVED EQUAL.

CRANK VENT PIPING – TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS. ALL JOINTS SOLDERED WITH 95/5 TIN/ANTIMONY SOLDER OR SILVER SOLDER.

CRANK VENT HOSE – HEAVY DUTY OIL RESISTANT PVC SUCTION HOSE. TIGERFLEX ORV OR APPROVED EQUAL. INSTALL ON BARBED HOSE (KING) NIPPLES AND FASTEN WITH LINED STAINLESS STEEL T-BOLT CLAMPS, NYCO SUPRA W2 OR APPROVED EQUAL.

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

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

**** GLYCOL PIPING, VALVES, AND SPECIALTIES ****

GLYCOL PIPING – COPPER TUBE AND FITTINGS AS INDICATED ON DRAWINGS AND SPECIFIED BELOW. PROVIDE FLEXIBLE HOSE FOR CONNECTION TO ALL ENGINES. WIRE BRUSH ALL THREADED PIPE ENDS, COVER MALE THREADS WITH TEFLON TAPE AND COAT FEMALE THREADS WITH TEFLON PASTE PRIOR TO ASSEMBLY. HYDROSTATICALLY TEST ALL PIPING AT 100 PSIG MIN. 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.

COPPER PIPING – TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS UNLESS SPECIFICALLY INDICATED OTHERWISE. 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 150# BRONZE COMPANION FLANGES WITH FULL FACED 1/8" THICK NITRILE RUBBER GASKETS FOR TRANSITION TO STEEL PIPING OR FLANGED VALVES AND EQUIPMENT.

ENGINE COOLANT HOSES (FINAL) – SIZE AS INDICATED ON DRAWINGS. WIRE REINFORCED CORRUGATED SILICONE HOSE, PARKER 6621, TUSIL RADFLEX, OR APPROVED EQUAL. INSTALL WITH STAINLESS STEEL T-BOLT CLAMPS, NYCO MIKALOR SUPRA W2 OR APPROVED EQUAL.

BUTTERFLY VALVES – LUG STYLE DUCTILE OR CAST IRON BODY, ANSI 150# FLANGE PATTERN ENDS, STAINLESS STEEL STEM WITH BRONZE BUSHING, BRONZE DISC, EPDM SEATS, LOCKING HANDLE. MILWAUKEE ML-233E, BRAY SERIES 31, OR APPROVED EQUAL.

BALL VALVES – THREADED OR SOLDER END BRONZE BODY, CHROME PLATED BRONZE OR BRASS BALL, TFE OR VITON PACKING AND SEAT RING, MIN. 200 PSIG WOG RATING. APOLLO, JOMAR, OR MILWAUKEE (DOMESTIC), NO OTHER SUBSTITUTES. ON 2" AND SMALLER VALVES PROVIDE FULL PORT BALL. ON VALVES LARGER THAN 2" PROVIDE LARGE PORT BALL.

BALANCING COCK – SOLDER END BRONZE BODY, CALIBRATED SCALE, FIELD ADJUSTABLE MEMORY STOP, SIZE AS INDICATED. ARMSTRONG CBV OR APPROVED EQUAL.

SWING CHECK VALVES – THREADED OR SOLDER END BRONZE BODY, SWING CHECK STYLE, MIN. 200 PSIG WOG RATING. APOLLO OR MILWAUKEE (DOMESTIC) OR APPROVED EQUAL.

DRAIN VALVES – BRONZE BODY, 1/2" OR 3/4" SIZE AND SOLDER CUP OR MPT CONNECTION TO MATCH ASSOCIATED PIPE, 3/4" MALE HOSE END WITH CAP AND JACK CHAIN. FNW 426D, 426F, 427D, OR 427F, OR APPROVED EQUAL.

GAUGE COCK – BRASS BODY, MPT BY FPT ENDS, T-HANDLE. LEGEND VALVE ITEM 101-531 (1/4") OR ITEM 101-532 (3/8"), OR APPROVEDEQUAL. 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 MIN. CAPACITY, SETPOINT AS INDICATED. WATTS 174A OR APPROVED EQUAL.

LIQUID LEVEL SIGHT GAUGE – BOROSILICATE GLASS TUBE, ALUMINUM BODY, BUNA N SEALS, 1/2" MPT CONNECTIONS, 9" CENTERS. LUBE DEVICES G607-09-A-1-4 OR APPROVED 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-25-02-L-A-080, 0-15 PSI, OR APPROVED EQUAL.

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, DUAL SCALE (F/C) 20-240F RANGE. TRERICE B836-02-05, OR APPROVED EQUAL. PROVIDE WITH 3/4"NPT BRASS THERMOWELL.

**** SYSTEM STARTUP ****

ENGINE COOLANT PIPING – AFTER PRESSURE TESTING AND FLUSHING, REFILL SYSTEM WITH GLYCOL SOLUTION SALVAGED DURING DEMOLITION.

CALIBRATE ALL THERMOMETERS USING A BOILING WATER BATH.

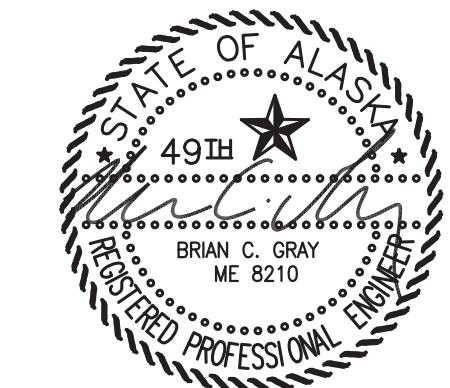
AS COOLING SYSTEM COMES UP TO NORMAL OPERATING TEMP. VERIFY OPERATION OF THERMOSTATIC VALVE. SET RADIATOR AQUASTATS TO SPECIFIED TEMPERATURES AND TEST LEAD AND LAG FUNCTION BY SHUTTING OFF LEAD RADIATOR. VERIFY OPERATING SETPOINTS BY READING THERMOMETERS IN PIPING MAINS.



SCHEDULE OF DRAWINGS:	
M1	MECHANICAL SPECIFICATIONS & SCHEDULES
M2	MECHANICAL DEMOLITION & NEW WORK PLANS
M3	ELEVATIONS & DETAILS
M4	GEN #3 SECTION & DETAILS
M5	PIPING ISOMETRICS & DETAILS
M6	GEN #3 ENGINE GENERATOR ASSEMBLY DETAILS
M7	PIPING DETAILS & GEN #3 TEMPORARY COOLANT CONNECTIONS

MECHANICAL EQUIPMENT SCHEDULE (OWNER FURNISHED OR ADDITIVE ALTERNATE #1 AS INDICATED)		
EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.		
R-1 (EXISTING)	EXISTING RADIATOR	VERTICAL CORE, 2-1/2" MALE THREAD CONNECTIONS, 2 HP, 208 V, 3 PH. YOUNG RADIATOR PART #332515.
R-2 (OWNER FURNISHED)	NEW GLYCOL RADIATOR	SINGLE PASS, 4 ROW, VERTICAL CORE, 3" FLANGED CONNECTIONS, EXPANDED METAL GUARD, HEMPEL 134US EPOXY-ESTER COATING. 6000 BTU/MIN AT 77°F AMBIENT, 50 GPM 50% ETHYLENE GLYCOL AT 192F IN, 0.25 PSI MAX GLYCOL PRESSURE DROP. 3 HP, 208 V, 3 PH MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO. DIESEL RADIATOR PART #DR3490 OR APPROVED EQUAL.
TV-1 (OWNER FURNISHED)	THERMOSTATIC VALVE	3" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS, 170F NOMINAL TEMPERATURE. FPE #A3010-170 OR APPROVED EQUAL.
P-HR1 (ADD ALT#1)	HEAT RECOVERY	28 GPM AT 10' TDH, 1/6HP, 115V, 1Ø. GRUNDFOS UPS 50-75F OR APPROVED EQUAL. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.
P-EB1 (ADD ALT#1)	ELECTRIC BOILER CIRC.	20 GPM AT 16' TDH, 1/6HP, 115V, 1Ø. GRUNDFOS UPS 50-75F OR APPROVED EQUAL. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.

VALVE TAG SCHEDULE (PROVIDE UNDER ADDITIVE ALTERNATE #1)	
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 APPROVED EQUAL.	
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"
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 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.	

ISSUED FOR
CONSTRUCTION
JUNE 2018



 ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: MECHANICAL SPECIFICATIONS & SCHEDULES		
 P.O. 111405, Anchorage, AK 99511 (907)349-0100	DRAWN BY: JTD DESIGNED BY: BCG FILE NAME: CLAGDERA M1-7 PROJECT NUMBER:	SCALE: NO SCALE DATE: 6/5/18 SHEET: M1 OF 7

DEMOLITION GENERAL NOTES:

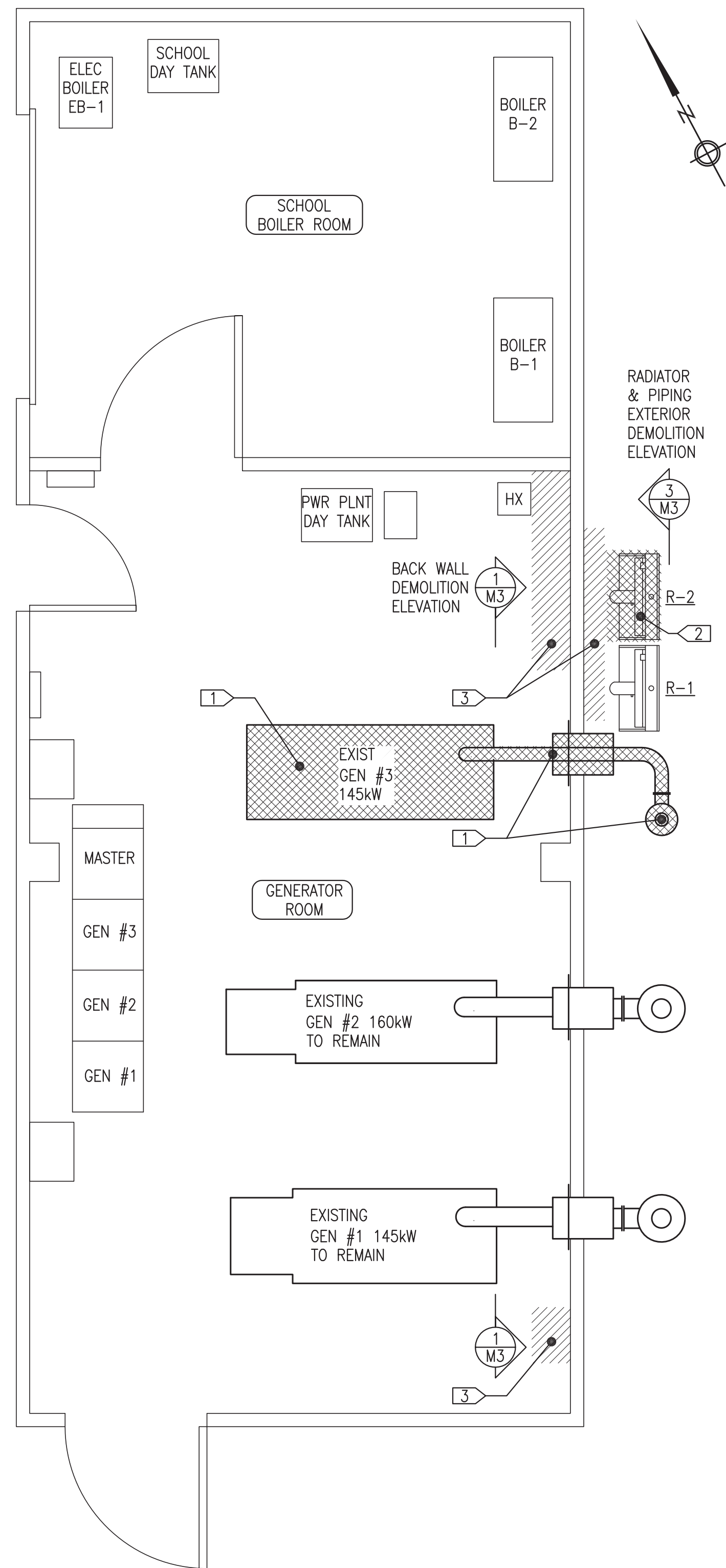
- EXISTING EQUIPMENT AND PIPING TO BE REMOVED INDICATED BY DOUBLE HATCH FOR INTERIM AND SINGLE HATCH FOR FINAL DEMOLITION.
- TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO GENERATION EQUIPMENT BEING REMOVED DURING DEMOLITION EXCEPT RENDER EXISTING GEN #3 ENGINE BLOCK UNUSABLE (SEE GENERAL NOTE 4). PRIOR TO REMOVING FROM PLANT TARP GENERATOR AND SEAL ALL EXPOSED CONNECTIONS. TURN ALL REMOVED EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION.
- DRAIN BLOCK AND HOSE CONNECTIONS PRIOR TO GENERATOR DEMOLITION OR REMOVAL FROM SERVICE. SAVE GLYCOL AND DIESEL FUEL FOR RE-USE IN NEW SYSTEMS. TURN USED OIL OVER TO THE UTILITY FOR FINAL DISPOSITION.
- ENGINE BLOCK FOR GENSET #3 MUST BE RENDERED UNUSABLE BY CUTTING A MINIMUM 3"x3" HOLE IN ENGINE CRANK CASE. PROVIDE PHOTOGRAPHIC DOCUMENTATION OF HOLE AND ASSOCIATED ENGINE NAMEPLATE.
- DRAIN PORTIONS OF EXISTING GLYCOL COOLING SYSTEM AS REQUIRED. SALVAGE ALL GLYCOL IN CLEAN CONTAINERS FOR REUSE IN NEW SYSTEM.
- SEE ELECTRICAL PLANS FOR ADDITIONAL DEMOLITION.

DEMOLITION SPECIFIC NOTES (BY OTHERS):

- REMOVE ENTIRE GENSET #3 AND EXHAUST SYSTEM INCLUDING PIPING, WALL THIMBLE, & SILENCER.
- REMOVE RADIATOR R-2 ENTIRELY INCLUDING PORTION OF STEEL RADIATOR STAND BELOW. SEE DEMOLITION DETAIL 3/M3.

DEMOLITION SPECIFIC NOTES (ADDITIVE ALTERNATE #1):

- SEE DEMOLITION ELEVATIONS SHEET M3 FOR EXISTING INTERIOR ENGINE COOLANT AND EXTERIOR RADIATOR PIPING TO BE DEMOLISHED THESE AREAS.



1
M2 DEMOLITION PLAN
3/8"=1'-0"

NEW WORK GENERAL NOTES:

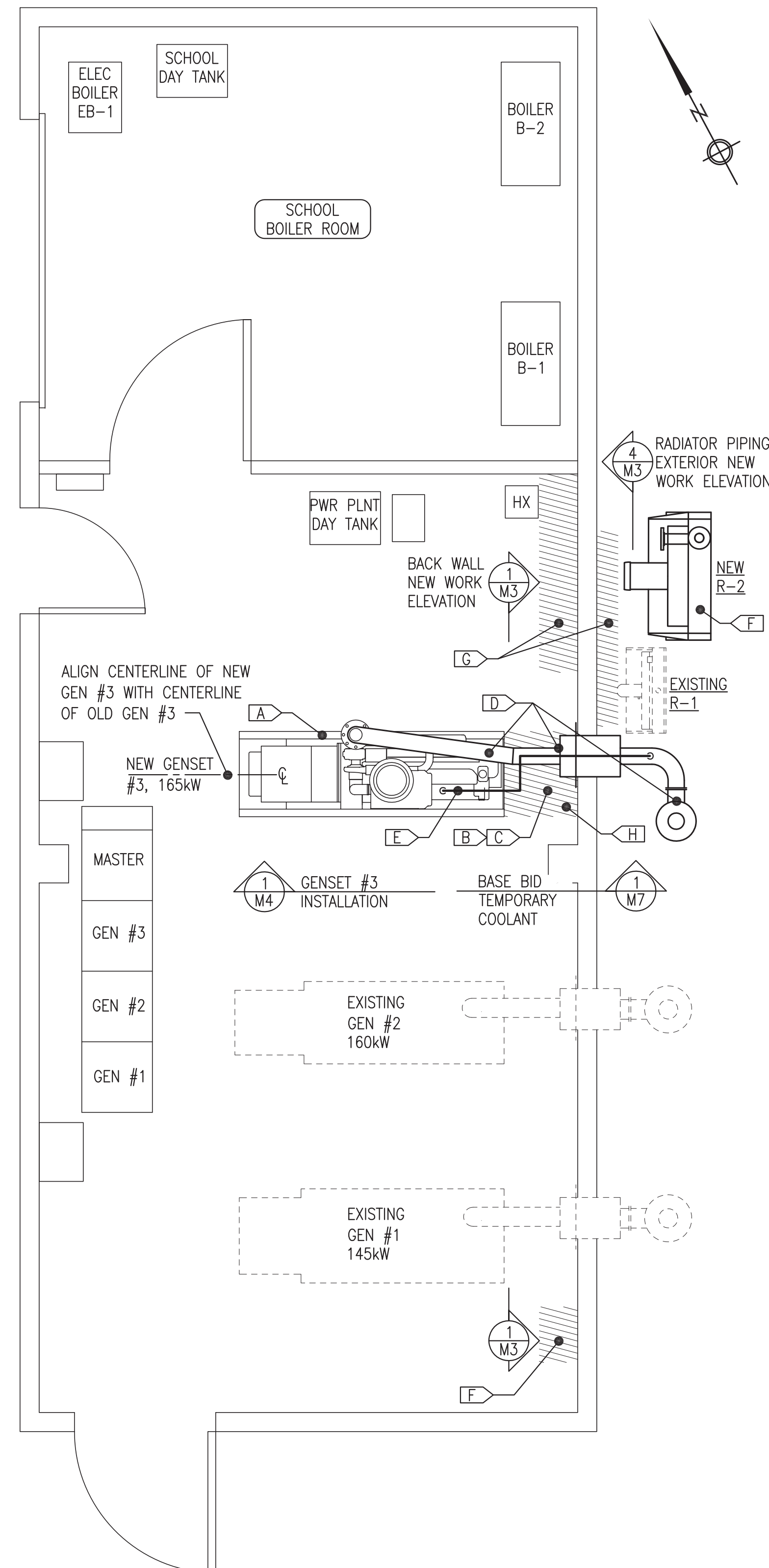
- EXISTING EQUIPMENT AND PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
- NEW EQUIPMENT AND PIPING TO BE INSTALLED SHOWN WITH DARK SOLID LINES.

NEW WORK SPECIFIC NOTES (BASE BID):

- INSTALL NEW GENSET #3, SEE SHEET M4.
- TEMPORARILY CONNECT GEN #3 TO NEW RADIATOR R-2, SEE DETAIL 1/M7.
- CONNECT GEN #3 NEW FUEL HOSES SUPPLIED WITH GENSET TO EXISTING FUEL VALVES.
- INSTALL NEW WALL THIMBLE IN EXISTING OPENING, INSTALL NEW SILENCER ON EXISTING RACK, AND INSTALL NEW 5" SCH 40 STEEL EXHAUST PIPE. SEE SHEET M4.
- INSTALL NEW 1" COPPER CRANK VENT PIPING SYSTEM ON GEN #3. SEE SHEET M4.
- INSTALL NEW RADIATOR R-2. SEE DETAIL 4/M3 FOR INSTALLATION DETAILS AND DELINEATION OF WORK.

NEW WORK SPECIFIC NOTES (ADDITIVE ALTERNATE #1):

- INSTALL NEW INTERIOR ENGINE COOLANT AND EXTERIOR RADIATOR PIPING. SEE SHEET M3.
- MODIFY GEN #3 COOLANT CONNECTIONS AND INSTALL NEW COOLANT HOSES, SEE DETAILS 3/M5 AND 4/M5.



2
M2 NEW WORK PLAN
3/8"=1'-0"

PROJECT DESCRIPTION

- THE PURPOSE OF THIS PROJECT IS TO INSTALL A NEW ELECTRONICALLY CONTROLLED DIESEL ENGINE-GENERATOR SET (GENSET) CAPABLE OF MEETING THE PEAK COMMUNITY ELECTRIC LOAD.
- THE EXISTING GENSET #3 WILL BE REMOVED AND REPLACED WITH A NEW COMPLETE GENSET WITH A TIER 2 MARINE ENGINE. THE ORIGINAL GENSET #3 ENGINE WILL BE RENDERED UNUSABLE.
- IN ADDITION TO THE GENSET REPLACEMENT, MODIFICATIONS WILL BE MADE TO THE PLANT AS INDICATED ON THE DRAWINGS TO ENSURE THE COOLING AND EXHAUST SYSTEMS ARE ADEQUATE FOR THE NEW MARINE ENGINE.

PROJECT SEQUENCE NOTES

THE CHIGNIK LAGOON ELECTRIC UTILITY PROVIDES PRIMARY POWER FOR THE COMMUNITY USING A COMBINATION OF A HYDRO POWER PLANT AND A DIESEL POWER PLANT. AT TIMES THE HYDRO GENERATOR IS ABLE TO PROVIDE ALL POWER FOR THE COMMUNITY; HOWEVER, THE DIESEL PLANT NEEDS TO BE AVAILABLE TO TAKE OVER AT ANY TIME. THIS PROJECT WILL REQUIRE TAKING THE DIESEL PLANT OFF LINE FOR BRIEF PERIODS. ALL OUTAGES MUST BE SCHEDULED IN ADVANCE WITH THE VILLAGE COUNCIL AND KEPT TO A MINIMUM.

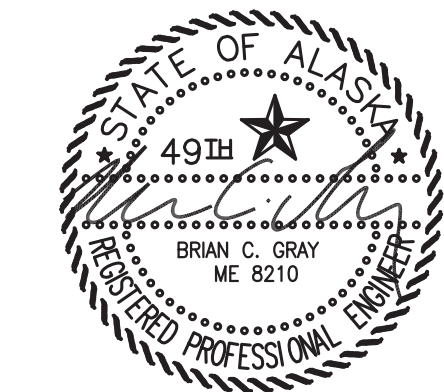
IN ORDER TO LIMIT TIME THAT DIESEL GENERATION IS NOT AVAILABLE AND TO MEET FUNDING DEADLINES, THE DESIGN HAS BEEN ORGANIZED TO ALLOW WORK TO BE PERFORMED IN THREE PHASES. "WORK BY OTHERS" WILL BE PERFORMED BY THE UTILITY PRIOR TO AUGUST 15, 2018. "BASE BID" WORK TO BE COMPLETED FIRST TO ALLOW NEW GENSET #3 TO BE FULLY OPERATIONAL ON A TEMPORARY STAND-ALONE COOLANT SYSTEM. "ADDITIVE ALTERNATE #1" WORK TO BE PERFORMED AFTER COMPLETION OF THE BASE BID WORK. NOTE THAT THE WORK SEQUENCE IS PROVIDED FOR GENERAL GUIDANCE. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE FINAL SCHEDULING AND COORDINATION OF WORK TO ENSURE PRIME POWER SERVICE IS MAINTAINED WITH MINIMAL INTERRUPTIONS.

"DEMOLITION WORK BY OTHERS" SHOWN HEREIN INCLUDES:
 1. DEMOLITION OF EXISTING GENSET #3 & EXHAUST SYSTEM.
 2. DEMOLITION OF EXISTING RADIATOR R-2.

"BASE BID" WORK SHOWN HEREIN INCLUDES:
 3. INSTALLATION OF NEW GENSET #3 WITH NEW EXHAUST & CRANK VENT.
 4. INSTALLATION OF NEW GEN #3 CONTROL WIRING, SEE ELECTRICAL.
 5. MODIFICATIONS OF SWITCHGEAR, SEE ELECTRICAL.
 6. INSTALLATION OF NEW RADIATOR R-2.
 7. INSTALLATION OF NEW EXPANSION TANK ET-1.
 8. TEMPORARY HOSE CONNECTION OF GEN #3 TO NEW R-2 & NEW ET-1.
 9. TESTING NEW GEN #3 & PLACING IN SERVICE ON TEMPORARY COOLANT.

"ADDITIVE ALTERNATE #1" WORK SHOWN HEREIN INCLUDES:
 10. DEMOLITION OF PORTIONS OF INTERIOR & EXTERIOR COOLANT PIPING.
 11. INSTALLATION OF NEW INTERIOR & EXTERIOR PIPING INCLUDING CONNECTIONS TO RADIATOR, HEAT EXCHANGER, & ELECTRIC BOILER.
 12. TESTING OF NEW COOLANT SYSTEM WITH GEN #1 & GEN #2.
 13. CHANGEOVER OF GEN #3 & R-2 FROM TEMPORARY TO PERMANENT.
 14. FINAL TESTING AND COMMISSIONING OF ALL WORK.

ISSUED FOR
CONSTRUCTION
JUNE 2018

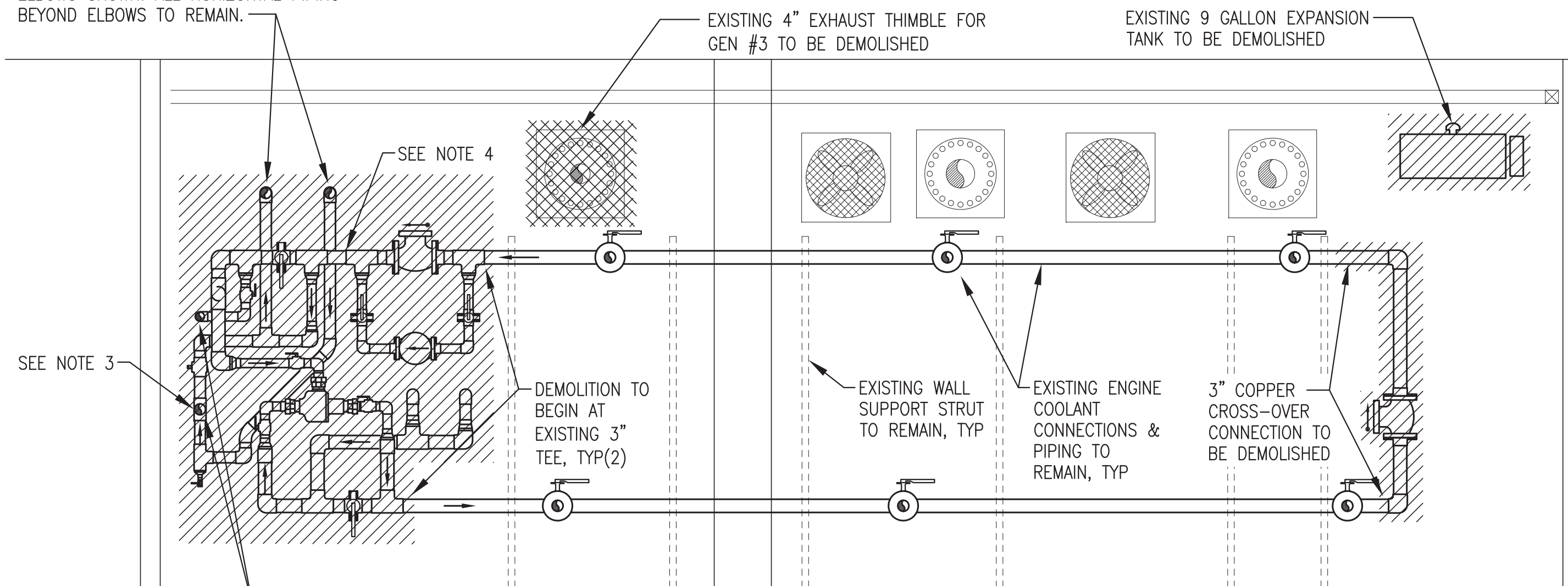


PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: MECHANICAL DEMOLITION & NEW WORK PLANS		
DRAWN BY: JTD	SCALE: NO SCALE	
DESIGNED BY: BCG	DATE: 6/5/18	
FILE NAME: CLAGDERA M1-7	SHEET: M2	OF 7
PROJECT NUMBER:		



EXISTING 2-1/2" ELECTRIC BOILER SUPPLY & RETURN. DEMOLISH 90° ELBOWS & ALL PIPING, VALVES, & DEVICES BELOW SHOWN HATCHED THIS VIEW. DEMOLITION TO STOP AT OR NEAR ELBOWS SHOWN. ALL HORIZONTAL PIPING BEYOND ELBOWS TO REMAIN.

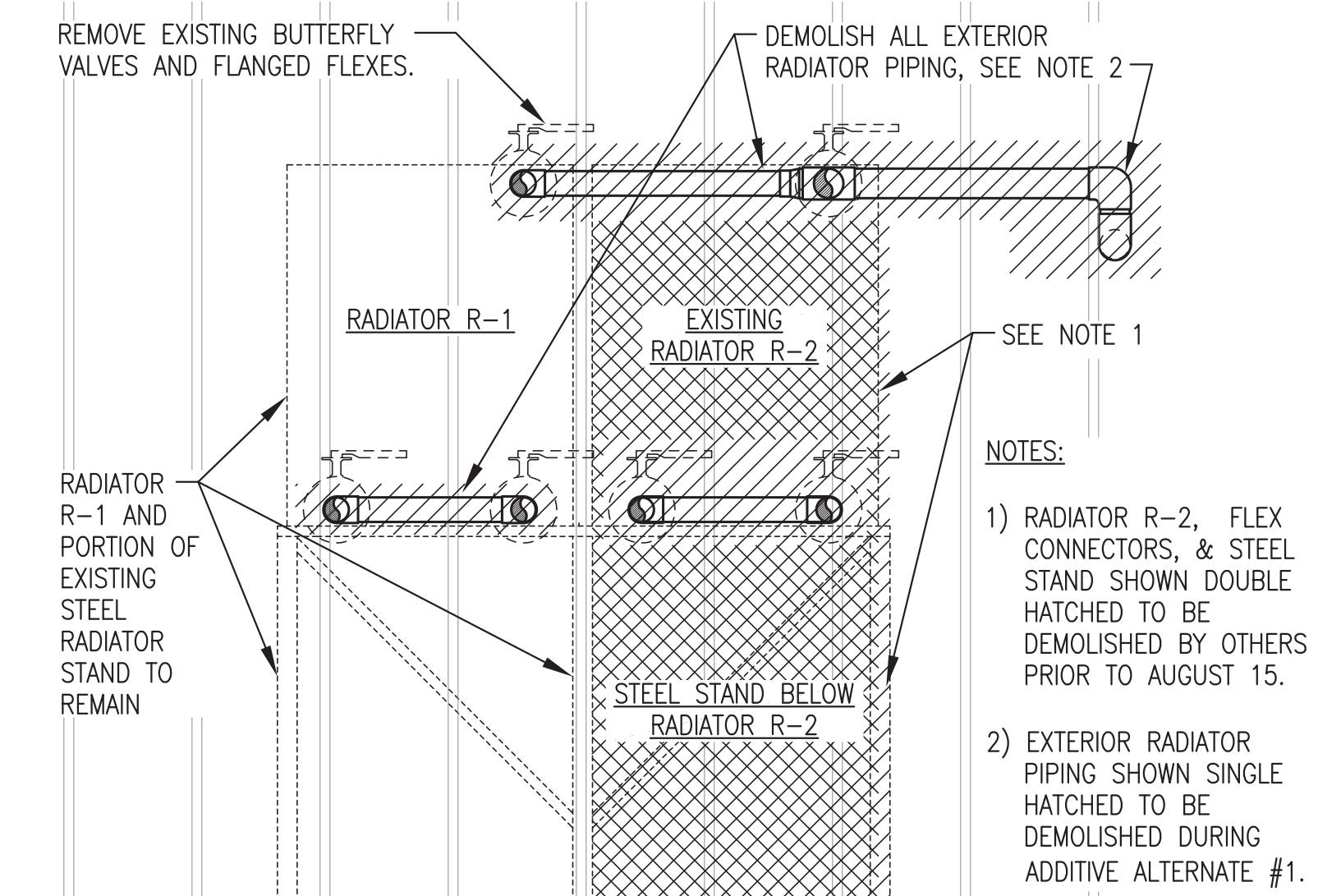
- NOTES:
1. ALL EQUIPMENT SHOWN DOUBLE HATCHED TO BE DEMOLISHED BY OTHERS PRIOR TO AUGUST 15.
 2. ALL PIPING AND EQUIPMENT SHOWN SINGLE HATCHED TO BE REMOVED UNDER ADDITIVE ALTERNATE #1.
 3. TEMPORARILY REMOVE STRAP ON TEMPERATURE SENSOR FROM PIPE AND SECURE FOR REINSTALLATION. SEE PLAN 1/E2.
 4. DEMOLISH FLOW SWITCH. SEE PLAN 1/E2.



DEMOLISH ALL EXISTING HEAT EXCHANGER HOT SIDE (GENERATOR) PIPING SHOWN HATCHED UP TO HX-1 NOZZLES. HX-1 TO REMAIN IN PLACE FOR RECONNECTION TO NEW PIPING. ALL HEAT EXCHANGER COLD SIDE (SCHOOL HEAT RECOVERY) PIPING TO REMAIN AS IS, NOT SHOWN FOR CLARITY.

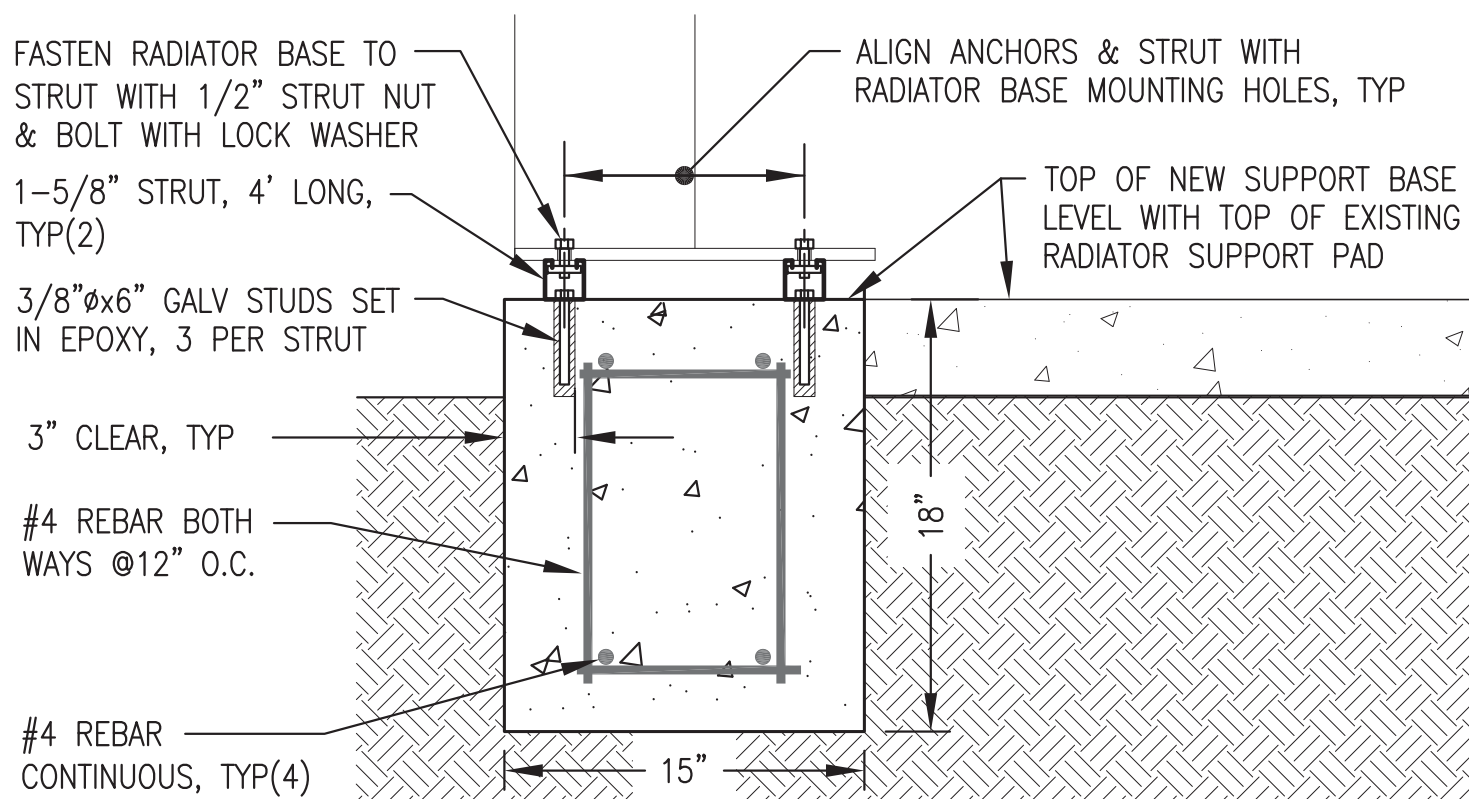
1 BACK WALL INTERIOR DEMOLITION ELEVATION (ADDITIVE ALTERNATE #1 EXCEPT AS NOTED)

M3 1/2"=1'-0"



3 EXTERIOR RADIATOR & PIPING DEMOLITION ELEVATION (ADDITIVE ALTERNATE #1 EXCEPT AS NOTED)

M3 3/4"=1'-0"



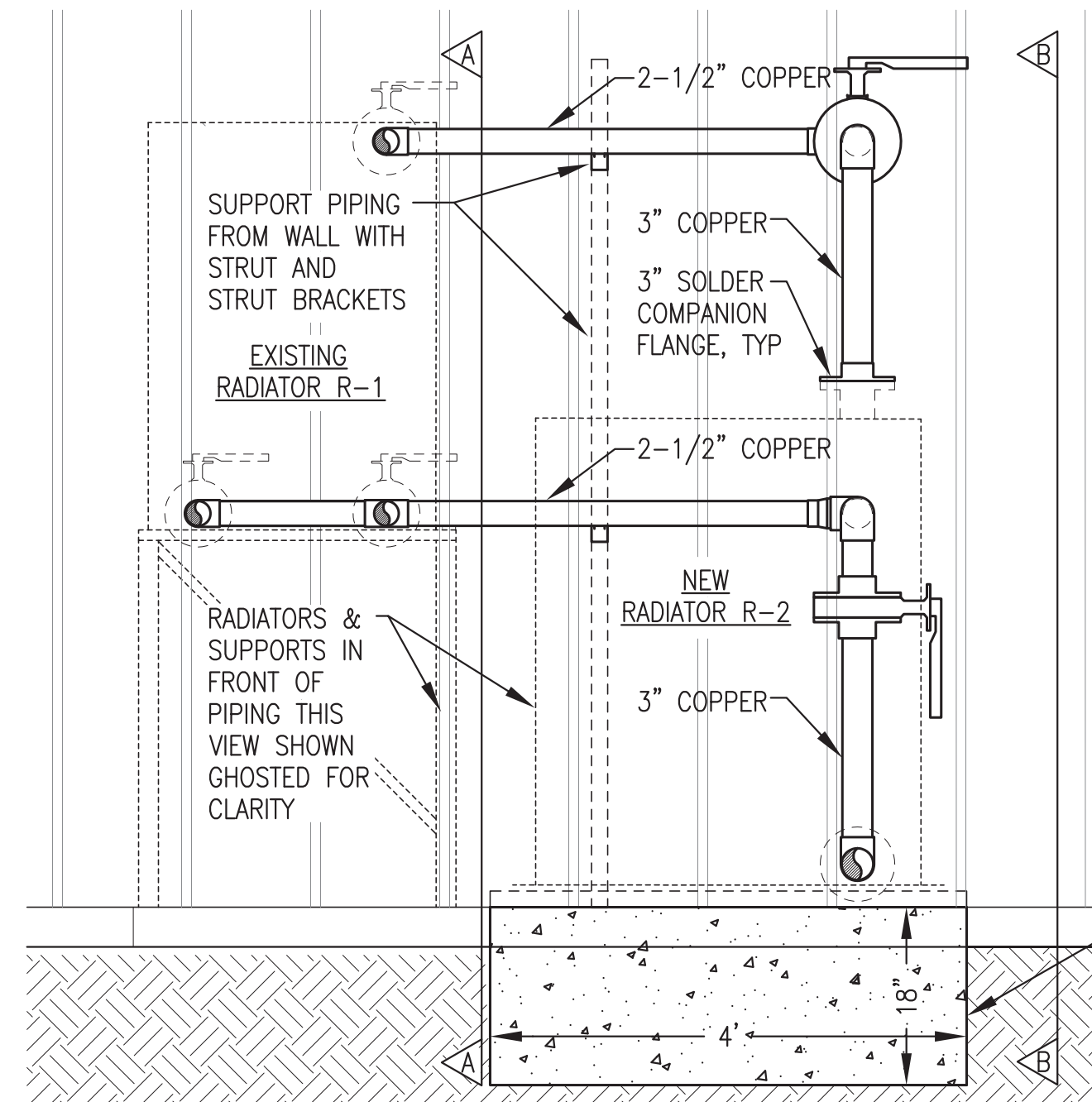
5 RADIATOR R-2 SUPPORT BASE & ANCHOR DETAIL (BASE BID EXCEPT CONCRETE AS NOTED)

M3 NO SCALE

- NOTES:
- 1) CONCRETE SUPPORT BASE (CONCRETE ONLY, NO STRUT) TO BE INSTALLED BY OTHERS PRIOR TO AUGUST 15 AS PART OF R-2 DEMOLITION WORK.
 - 2) EXCAVATE DOWN TO CLEAN GRAVEL FILL AND COMPACT BOTTOM OF EXCAVATION. IF THE REQUIRED EXCAVATION EXCEEDS THE FOOTING DEPTH, BACKFILL WITH COMPACTED STRUCTURAL GRAVEL FILL.

4 RADIATOR & PIPING EXTERIOR NEW WORK ELEVATION & SECTIONS (ADDITIVE ALTERNATE #1 EXCEPT AS NOTED)

M3 3/4"=1'-0"



NOTE: ALL RADIATOR PIPING NOT SHOWN FOR CLARITY, SEE PIPING ISOMETRIC & DETAILS SHEET M5.

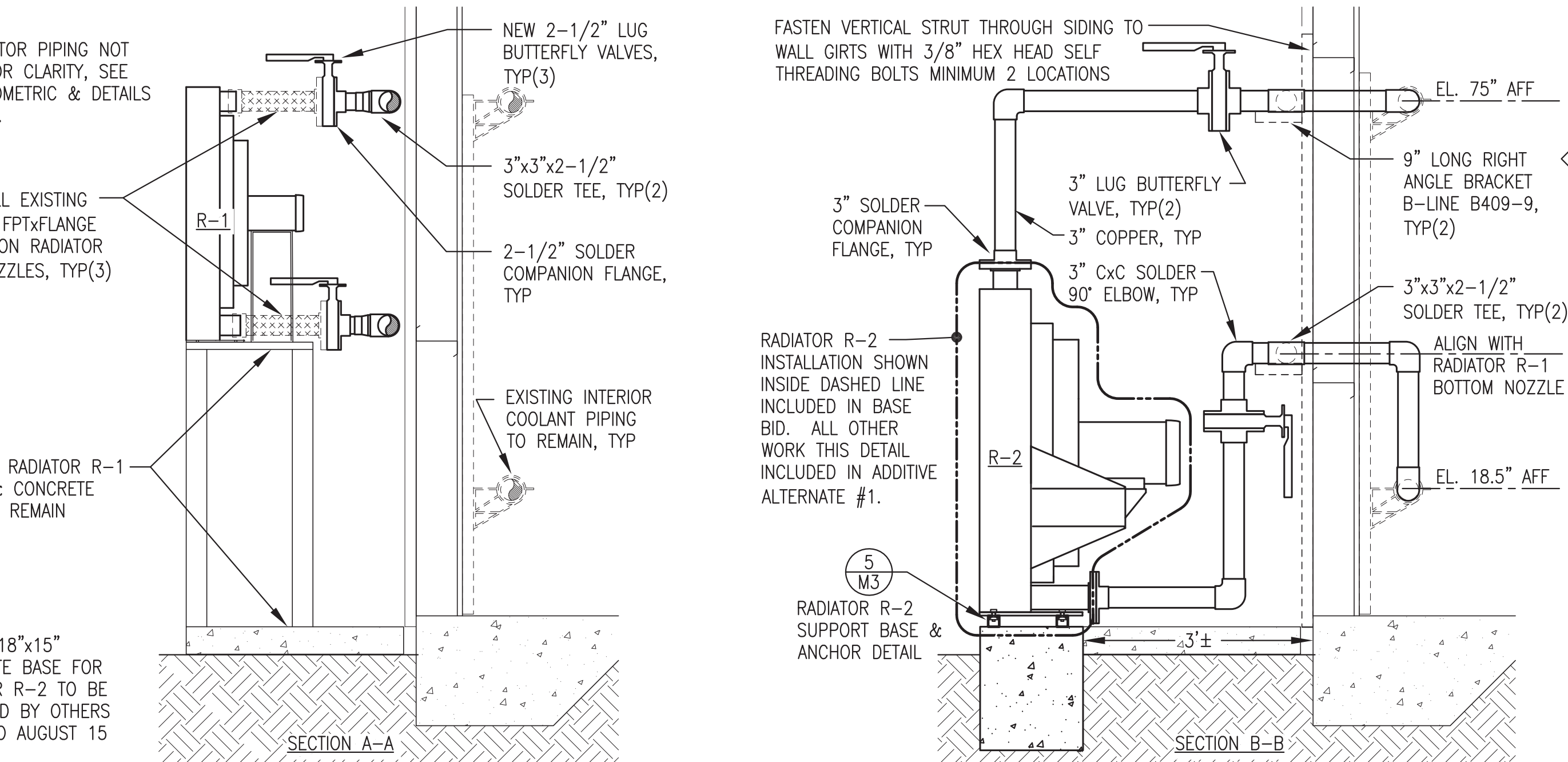
REINSTALL EXISTING 2-1/2" FPTxFLANGE FLEXES ON RADIATOR R-1 NOZZLES, TYP(3)

EXISTING RADIATOR R-1 STAND & CONCRETE BASE TO REMAIN

NEW 4'x18"x15" CONCRETE BASE FOR RADIATOR R-2 TO BE INSTALLED BY OTHERS PRIOR TO AUGUST 15

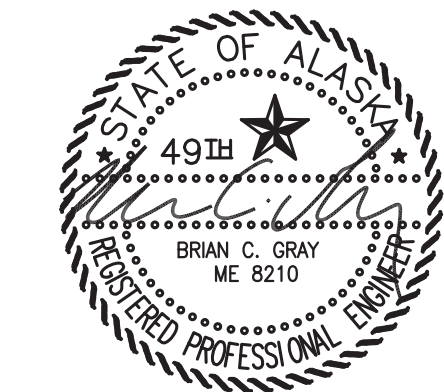
2 BACK WALL INTERIOR NEW WORK ELEVATION (ADDITIVE ALTERNATE #1 EXCEPT AS NOTED)

M3 1/2"=1'-0"

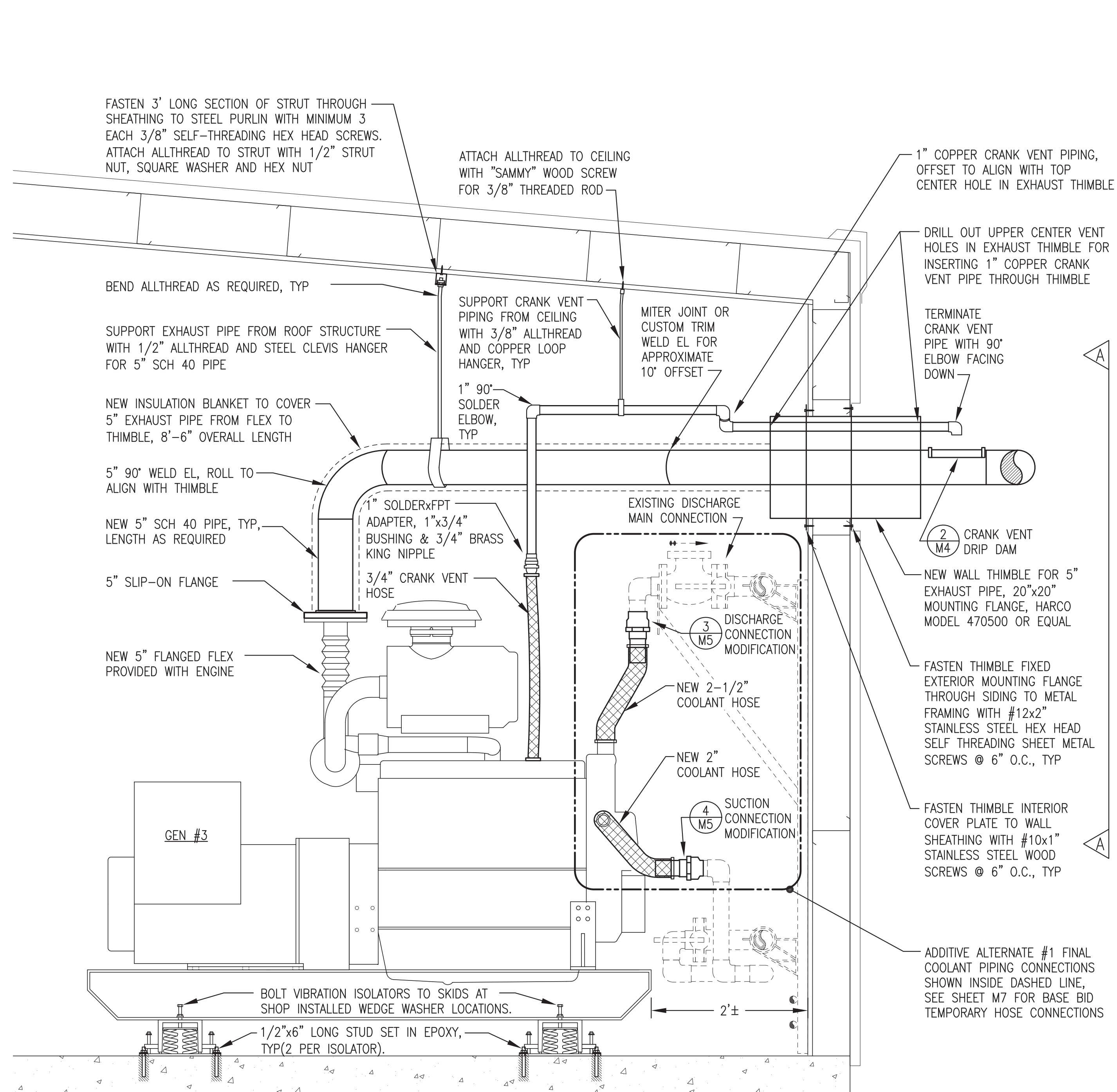


- NOTES:
1. ALL ENGINE NEW COOLANT PIPING & VALVES NOT SHOWN FOR CLARITY, SEE PIPING ISOMETRIC & DETAILS SHEET M5.
 2. EXISTING PIPING TO REMAIN SHOWN WITH LIGHT DASHED LINES. NEW PIPING AND EQUIPMENT SHOWN WITH DARK SOLID LINES.
 3. REINSTALL EXISTING STRAP ON TEMPERATURE SENSOR ON NEW PIPE TO HX. SEE PLAN 2/E2.

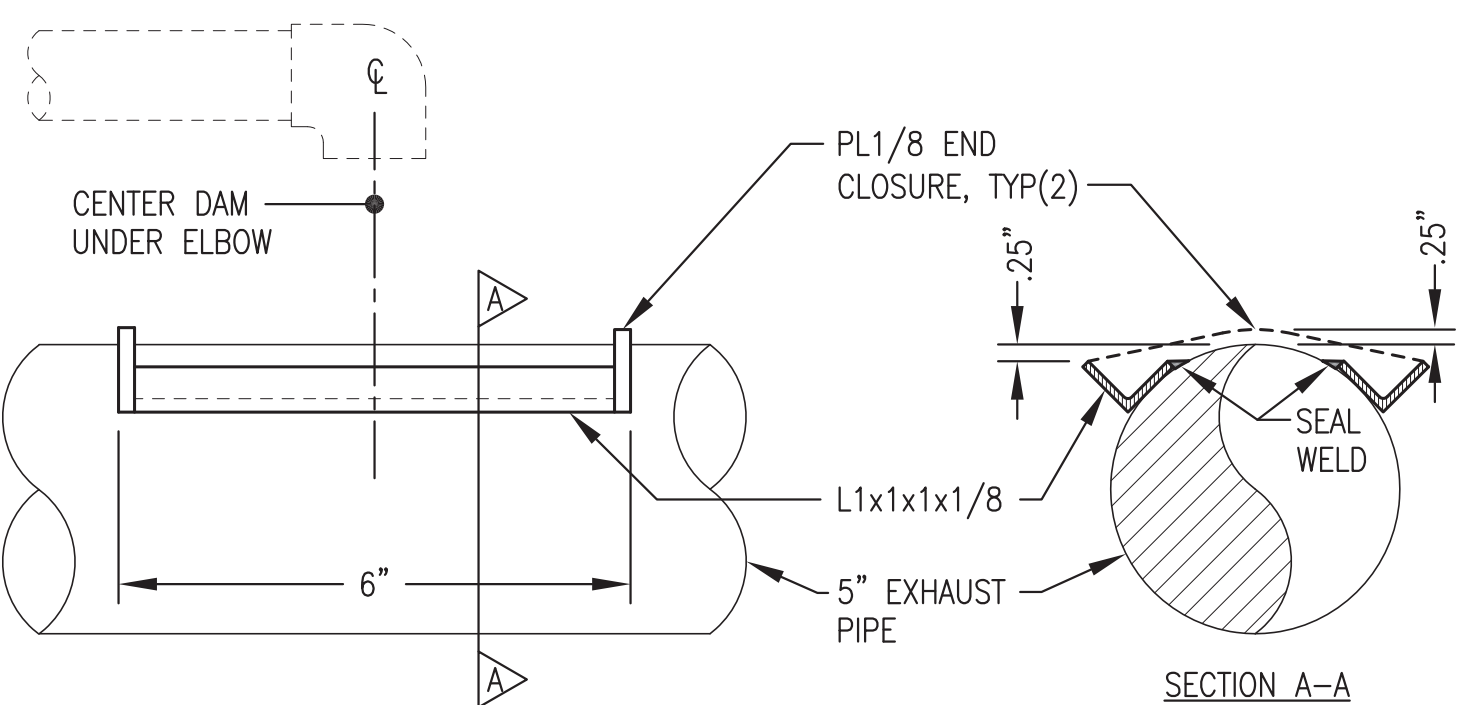
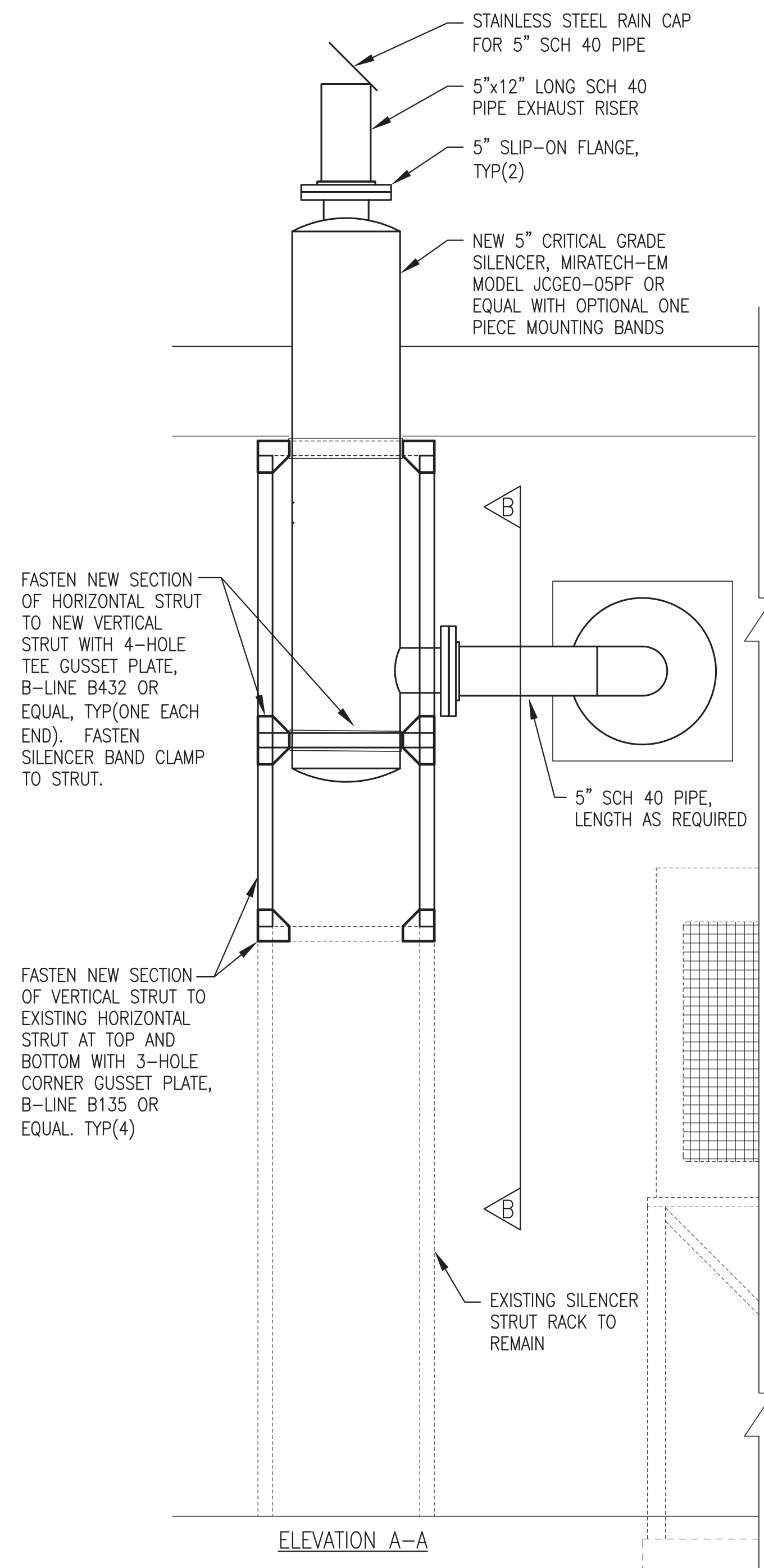
ISSUED FOR CONSTRUCTION
JUNE 2018



PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: ELEVATIONS & DETAILS		
DRAWN BY: JTD	SCALE: NO SCALE	
DESIGNED BY: BCG	DATE: 6/5/18	
FILE NAME: CLAGDERA M1-7	SHEET: M3	OF 7
PROJECT NUMBER:		
P.O. 111405, Anchorage, AK 99511 (907)349-0100		



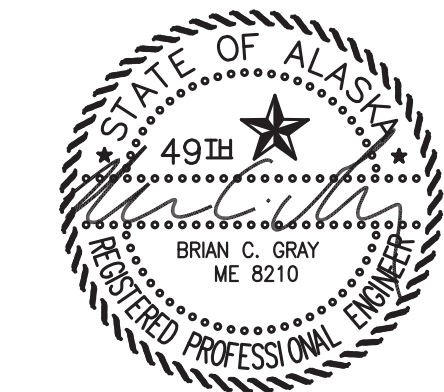
1 NEW GENSET #3 INSTALLATION (BASE BID EXCEPT AS NOTED)
M4 1"=1'-0"



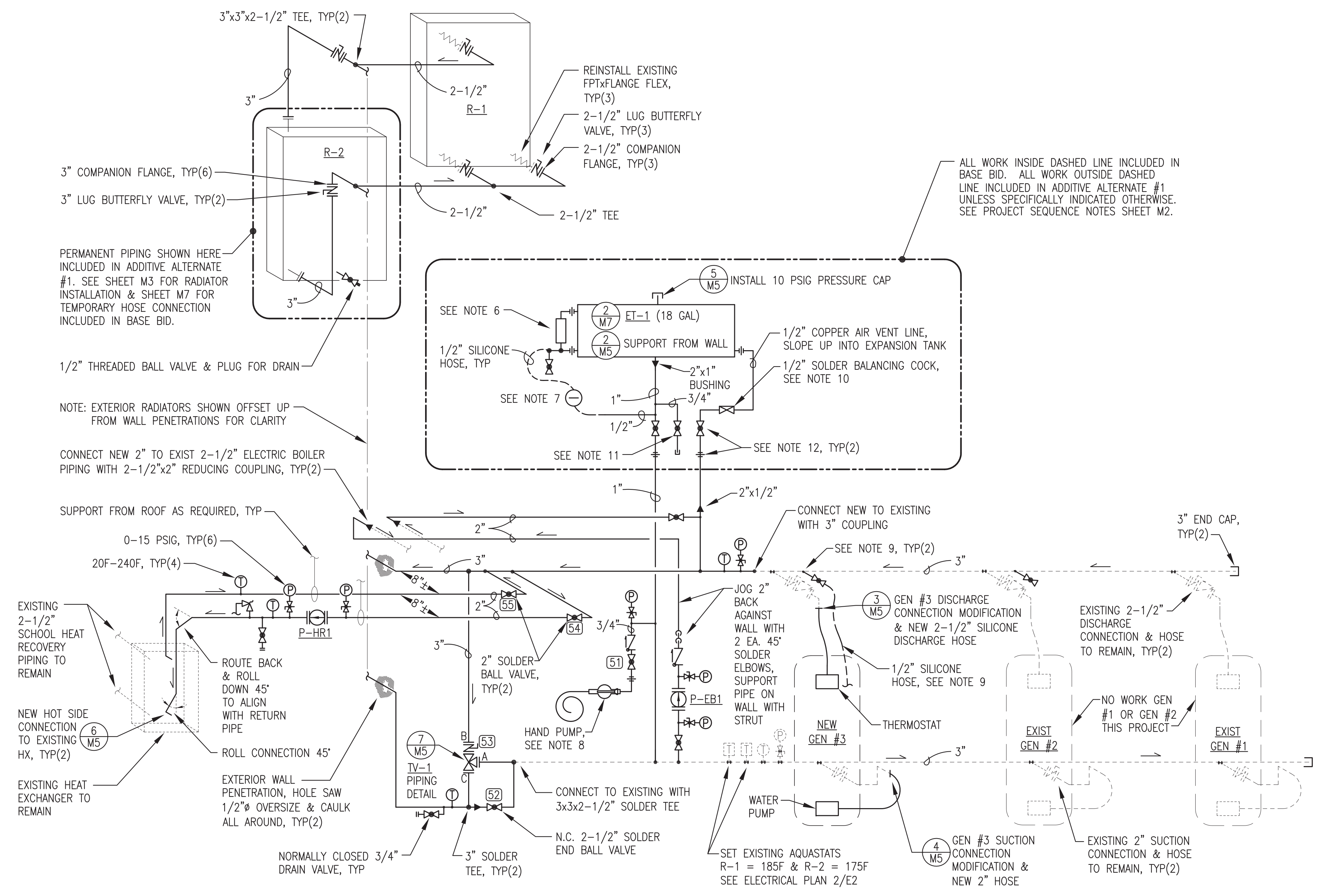
2 CRANKCASE DRIP DAM (BASE BID)
M4 NO SCALE

- GENSET INSTALLATION GENERAL NOTES:**
- EXISTING EQUIPMENT AND PIPING TO REMAIN IN SERVICE SHOWN WITH LIGHT DASHED LINES.
 - NEW EQUIPMENT AND PIPING TO BE INSTALLED SHOWN WITH DARK SOLID LINES.
 - ALL NEW EXHAUST PIPING 5" SCH 40 STEEL WITH WELDED FITTINGS AND FLANGES.
 - ENGINE EXHAUST FLEX, WALL THIMBLE, SILENCER, AND RAIN CAP FURNISHED WITH GENSET.

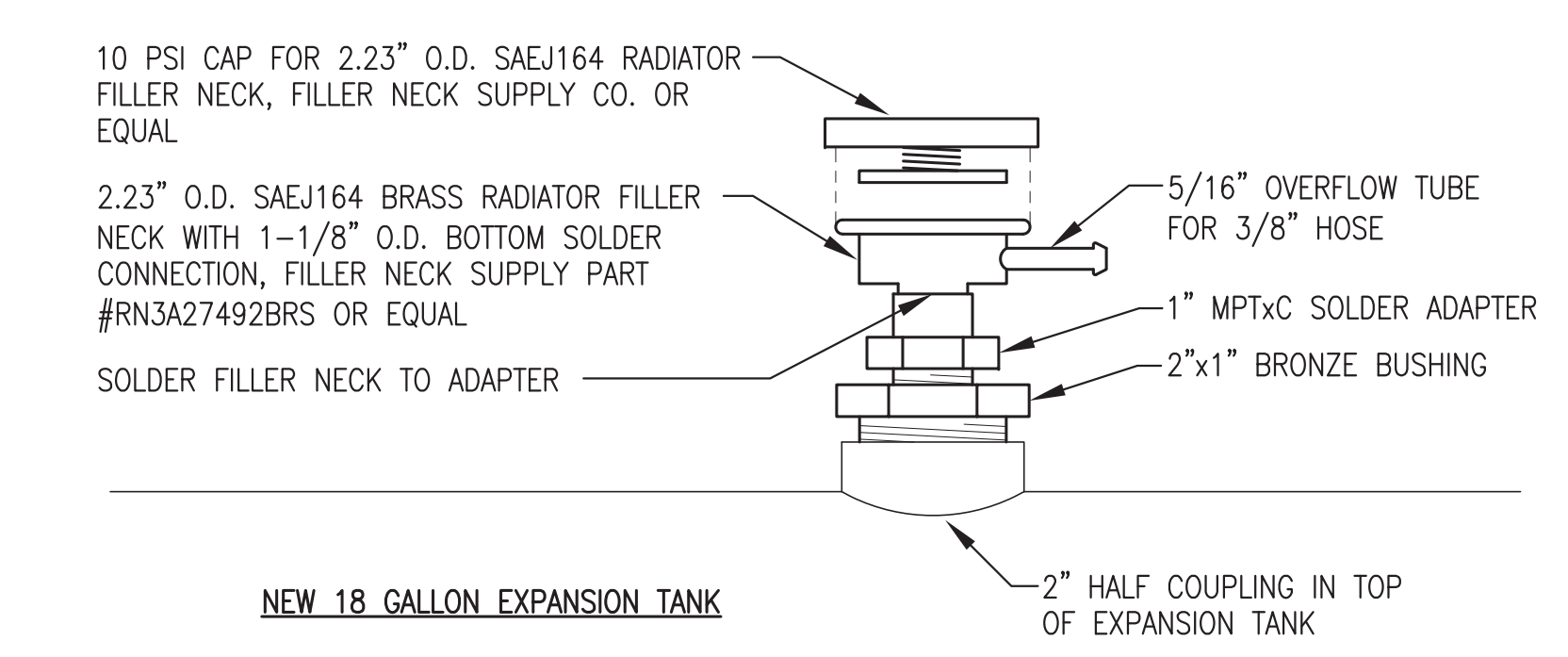
ISSUED FOR CONSTRUCTION
 JUNE 2018



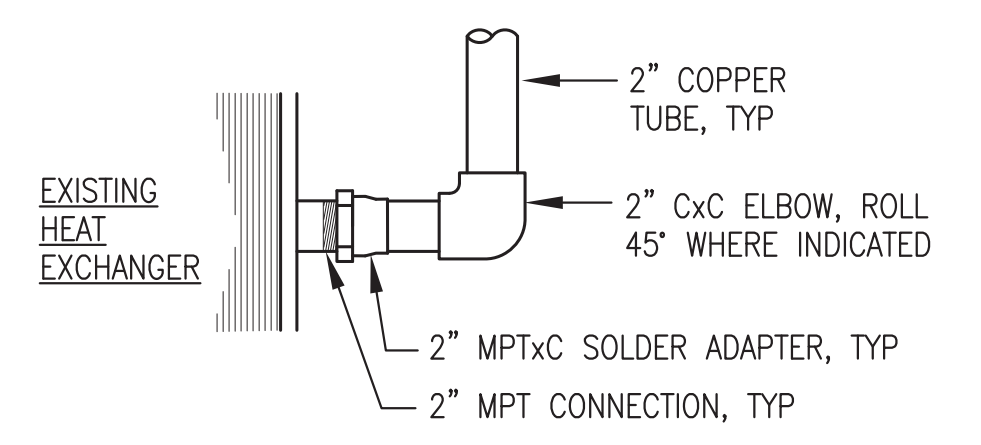
 ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: GEN #3 SECTION & DETAILS		
 Gray Stassel Engineering, Inc. P.O. 111405, Anchorage, AK 99511 (907)349-0100	DRAWN BY: JTD DESIGNED BY: BCG FILE NAME: CLAGDERA M1-7 PROJECT NUMBER:	SCALE: NO SCALE DATE: 6/5/18 SHEET: M4 OF 7



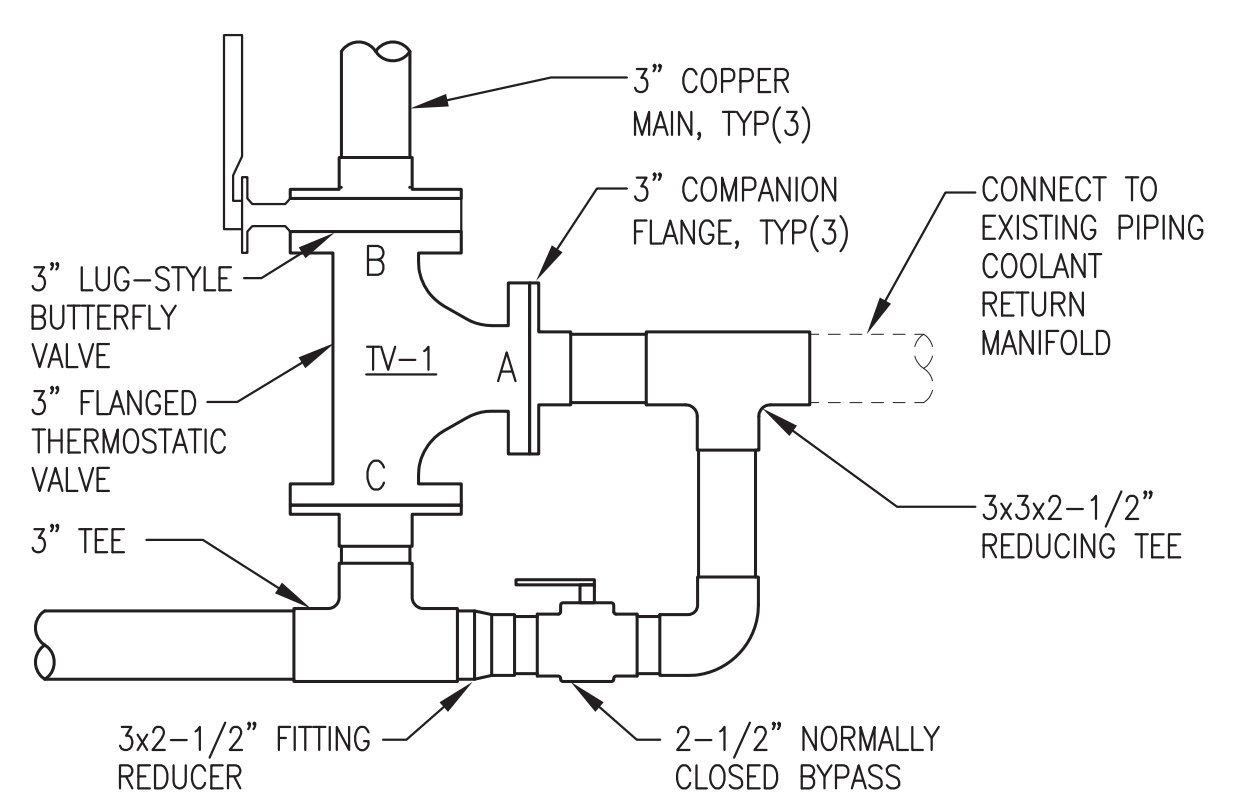
1 COOLING SYSTEM PIPING ISOMETRIC (ADDITIVE ALTERNATE #1 EXCEPT AS NOTED)
M5 NO SCALE



5 RADIATOR PRESSURE CAP INSTALLATION (BASE BID)
M5 NO SCALE



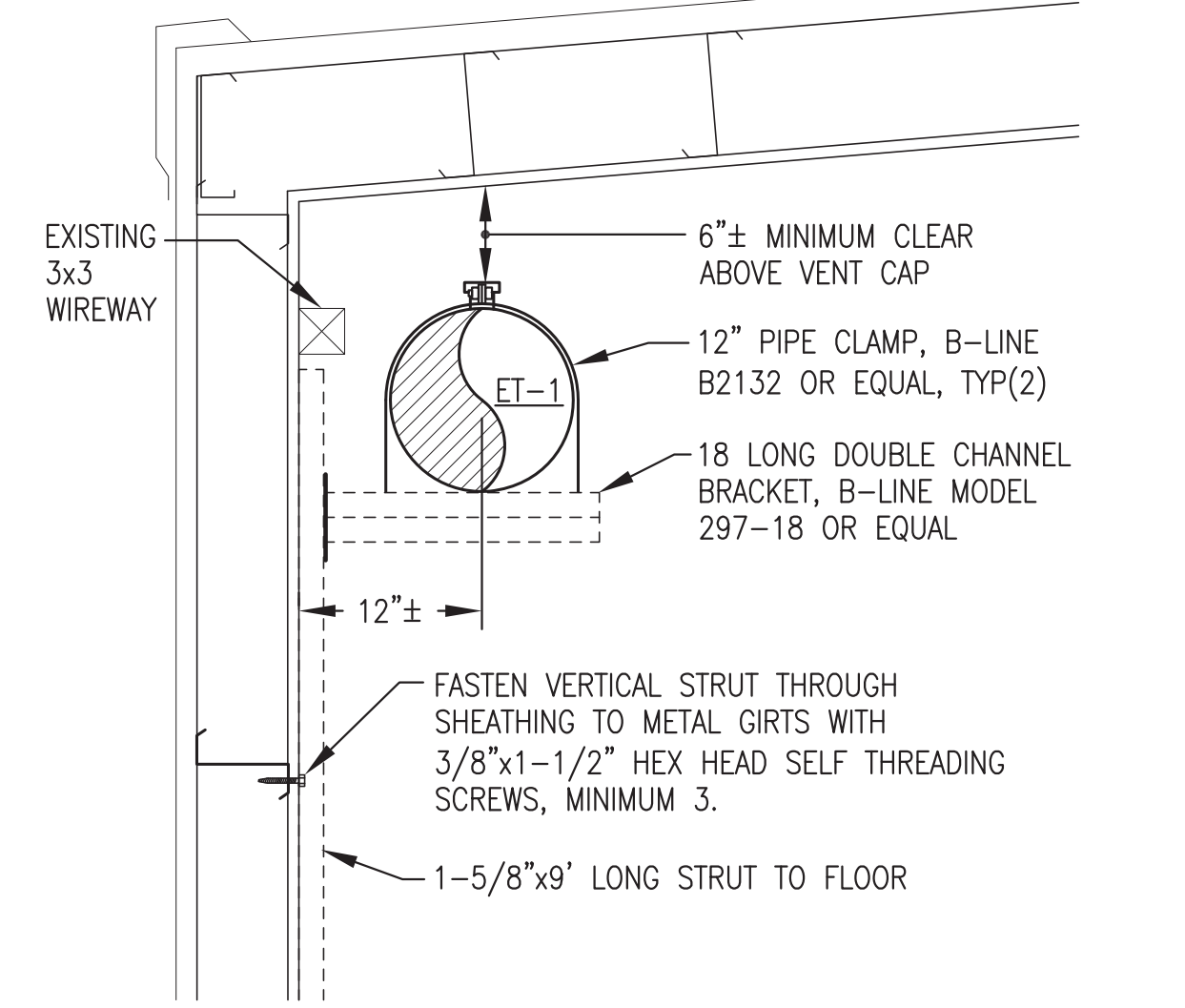
6 HX PIPING CONNECTION (ADD ALT#1)
M5 NO SCALE



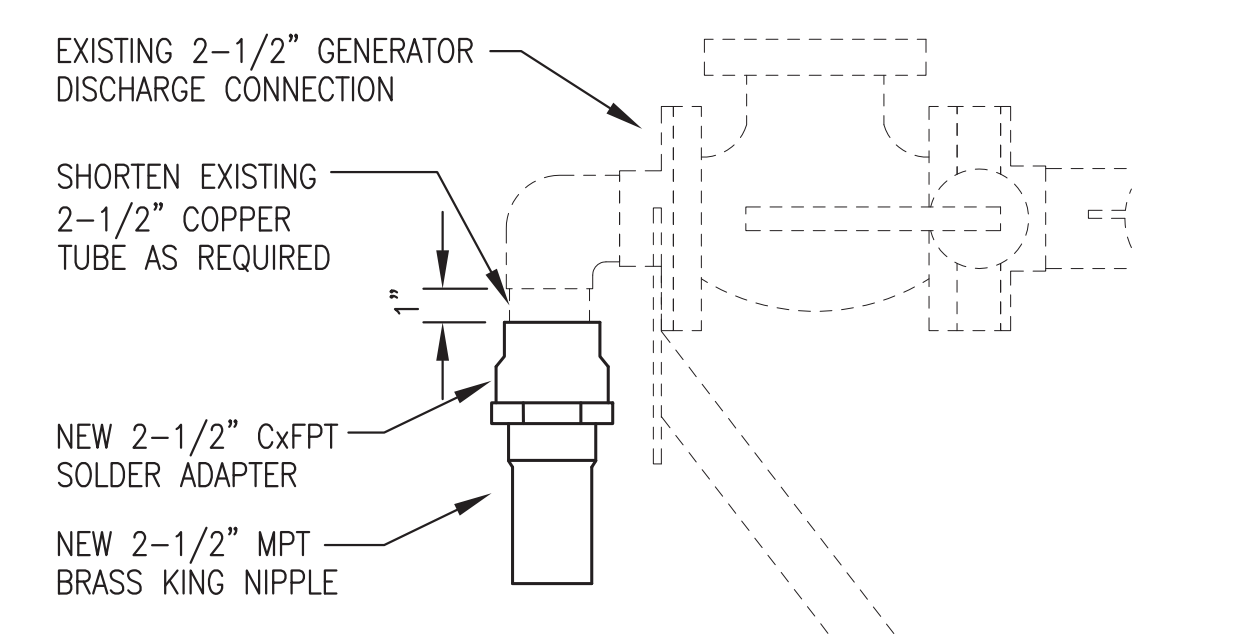
7 TV-1 INSTALLATION (ADD ALT#1)
M5 NO SCALE

PIPING NOTES:

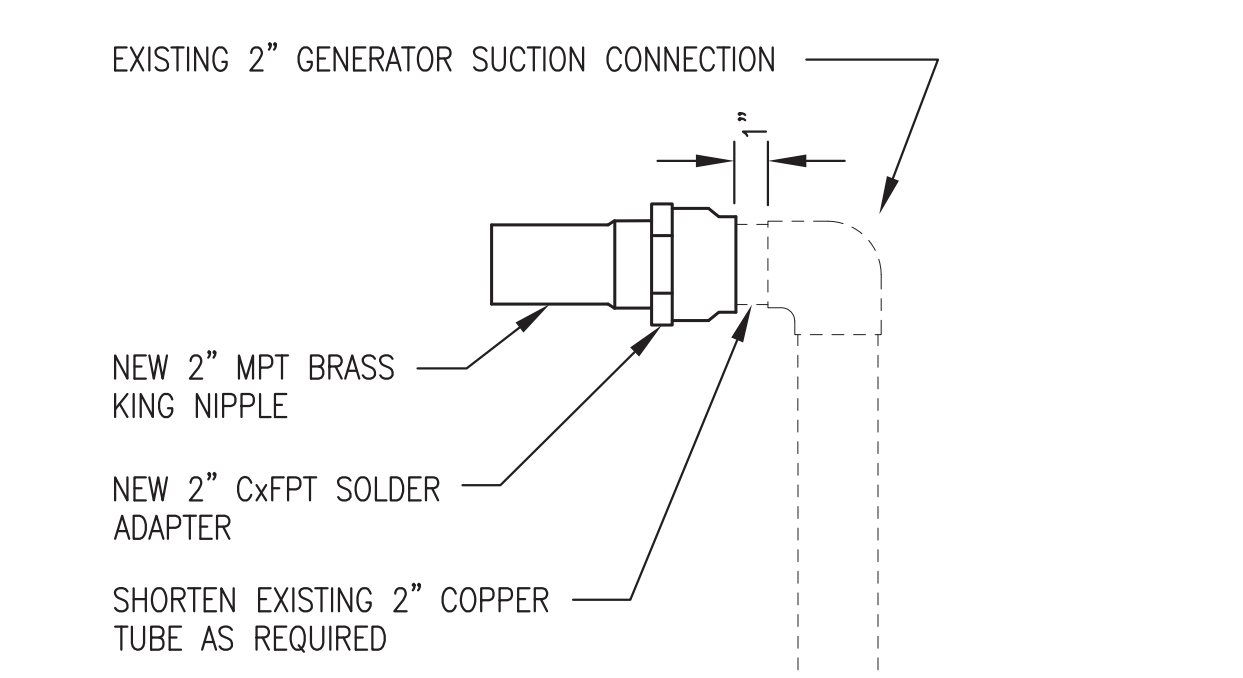
- ALL EXISTING PIPING, FITTINGS & EQUIPMENT TO REMAIN SHOWN WITH LIGHT DASHED LINES. ALL NEW PIPING, FITTINGS & EQUIPMENT SHOWN WITH DARK SOLID LINES.
- ALL PIPING SHOWN THIS ISOMETRIC TYPE "L" COPPER WITH SOLDER JOINTS, SIZE AS INDICATED. ALL FLANGES ANSI 150# PATTERN BRONZE COMPANION WITH SOLDER ENDS.
- UNLESS SPECIFIED OTHERWISE MAKE ALL CONNECTIONS FOR INSTRUMENTATION, VENTS, AND BLEED LINES WITH 1" T-DRILL TAP AND 3/4" CxFPT ADAPTER, SEE DETAIL 3/M7. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS WITH T-DRILL TAP AS REQUIRED UNLESS INDICATED OTHERWISE.
- ALL PRESSURE GAUGES 0-15 PSIG. ALL THERMOMETERS 20-240F.
- UPON COMPLETION OF FABRICATION VALVE OFF ENGINES, RADIATOR, HEAT EXCHANGER, AND ELECTRIC BOILER. FLUSH INTERIOR OF PIPING TO REMOVE ALL DEBRIS AND RESIDUE.
- INSTALL 9" LONG COOLANT SITE GAUGE ON 1/2" TEES, INSTALL 1/2" THREADED BALL VALVE WITH PLUG IN BOTTOM FOR DRAIN.
- INSTALL NEW LOW COOLANT ALARM SWITCH PROVIDED WITH GEN #3. MOUNT WITH SWITCH POINT ELEVATION LEVEL WITHIN 12" OF BOTTOM OF TANK. CONNECT TO HOSE WITH 1/2"NPTx5/8" BARB
- INSTALL GLYCOL FILL HAND PUMP AFTER DEMOLITION OF OLD COOLANT SYSTEM. MOUNT BACK PLATE SECURELY TO WALL ON STRUT. ROUTE SUCTION HOSE TO REACH PAIL ON FLOOR.
- INSTALL 3/4" BRANCH CONNECTION FOR ENGINE VENT & PRE-HEAT WITH 3/4" SOLDER MPT ADAPTER & THREADED BALL VALVE. ON GEN #3 INSTALL 3/4"MPTx5/8" HOSE BARB BRASS KING NIPPLE & ROUTE 1/2" SILICONE HOSE TO ENGINE HIGH POINT VENT. ON GEN #2 INSTALL 3/4" PLUG IN VALVE.
- SET BALANCING COCK TO APPROXIMATELY 80% CLOSED FOR MINIMUM FLOW & LOCK OR REMOVE HANDLE.
- SOLDER BALL VALVE FOR BASE BID CONNECTION OF EXPANSION TANK PIPING TO GEN #3 TEMPORARY COOLANT HOSE VENT, SEE SHEET M7. CAP PIPING, CLOSE VALVE AND REMOVE VALVE HANDLE UNDER ADDITIVE ALTERNATE #1.
- SOLDER BALL VALVE AND UNION FOR TEMPORARY CONNECTION OF BASE BID PIPING AND PERMANENT FINAL PIPING. OPEN VALVE AND REMOVE VALVE HANDLE UNDER ADDITIVE ALTERNATE #1.



2 EXP TANK ET-1 SUPPORT (BASE BID)
M5 NO SCALE



3 DISCHARGE CONNECTION MODIFICATION (ADD ALT#1)
M5 NO SCALE

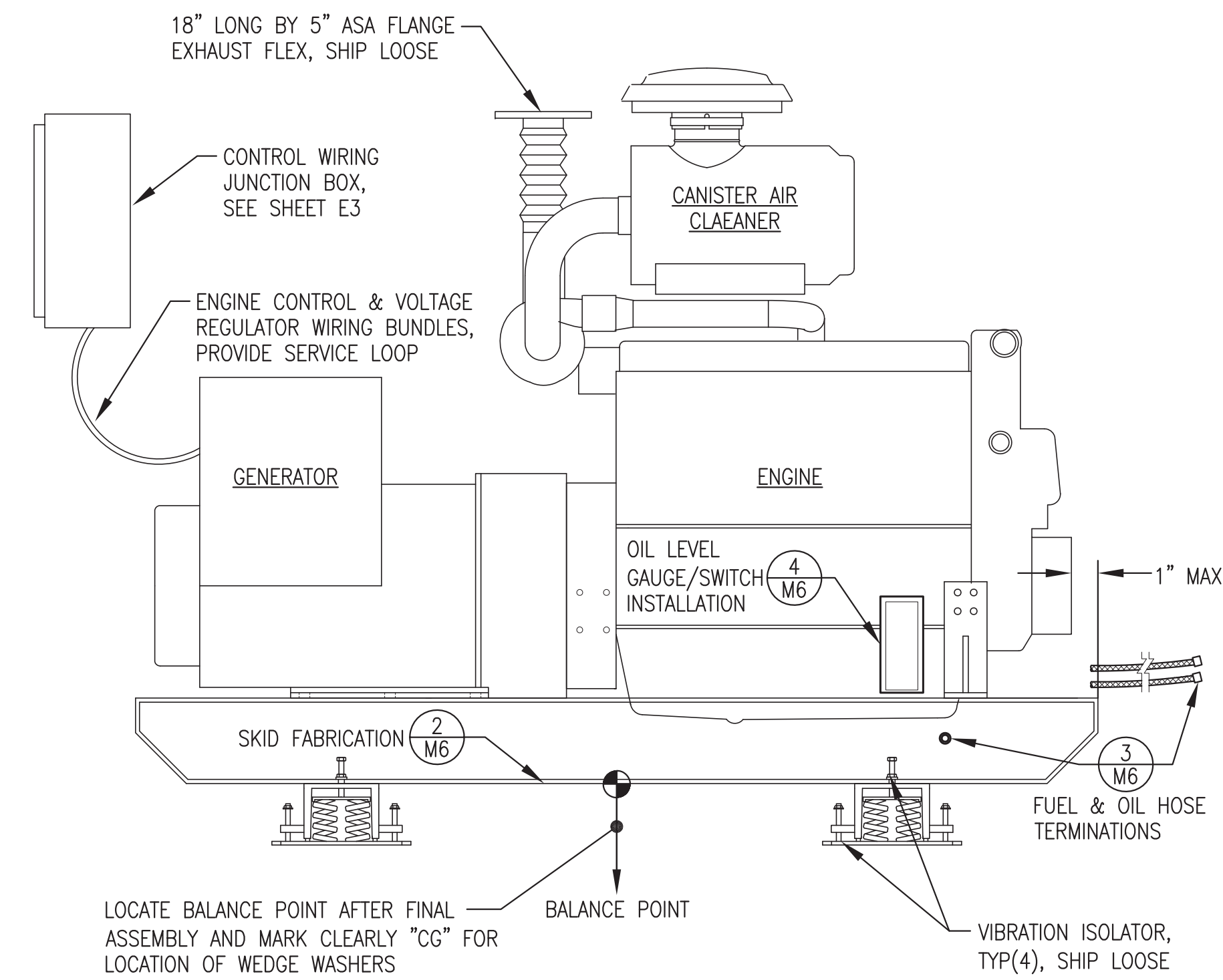


4 SUCTION CONNECTION MODIFICATION (ADD ALT#1)
M5 NO SCALE

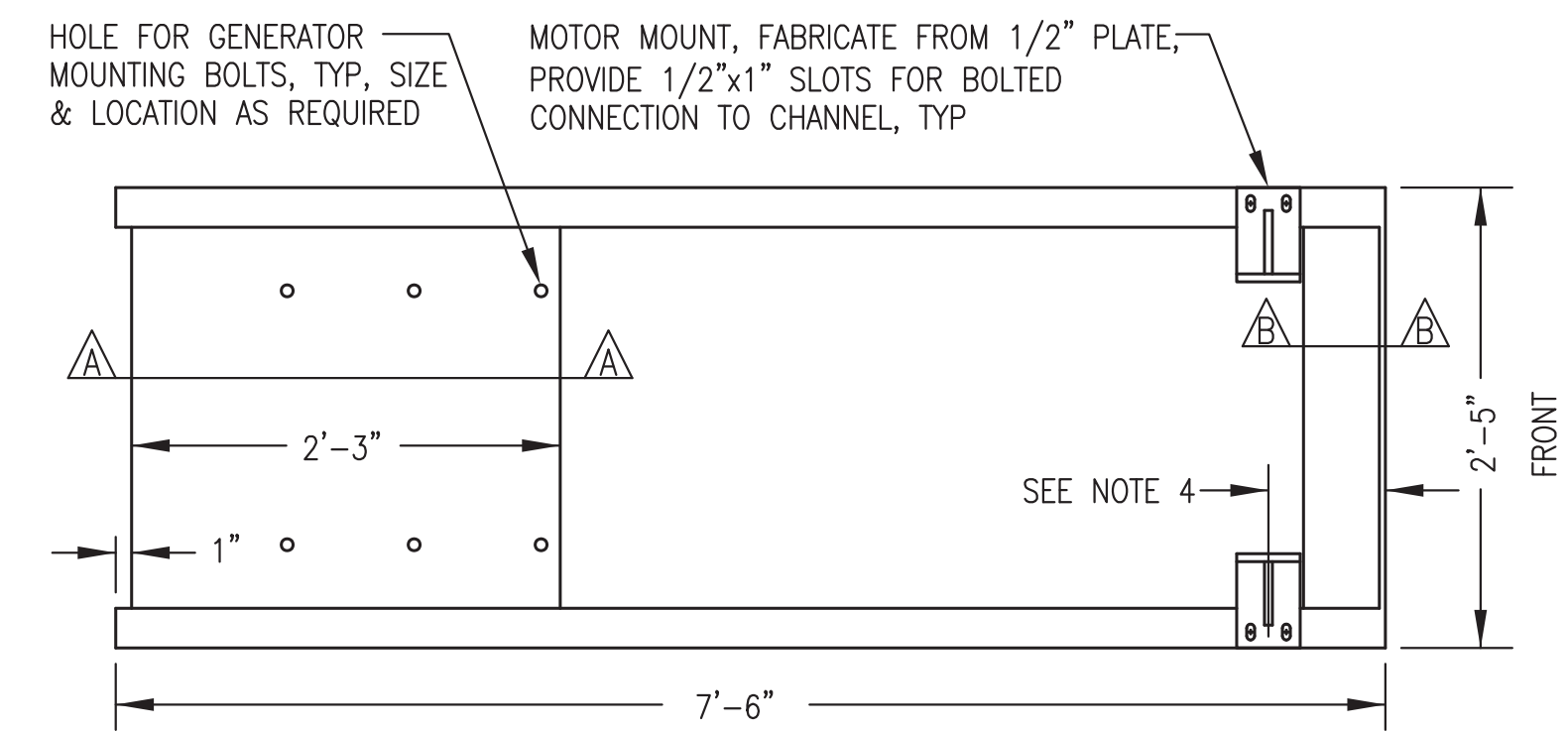
ISSUED FOR CONSTRUCTION
JUNE 2018



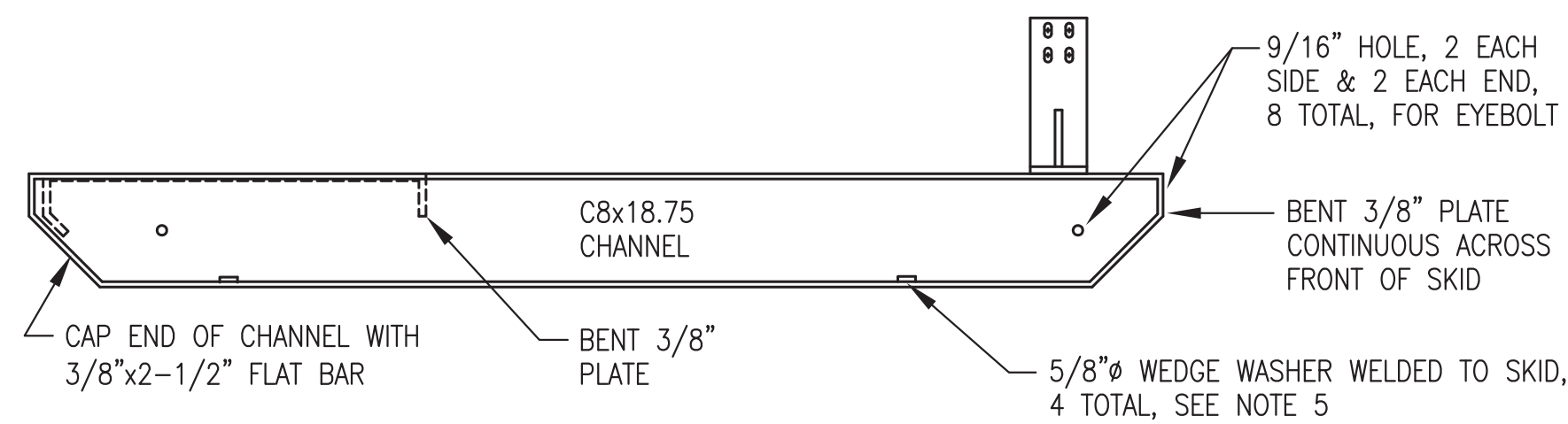
ALASKA ENERGY AUTHORITY	
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE	
TITLE: PIPING ISOMETRICS AND DETAILS	
	DRAWN BY: JTD DESIGNED BY: BCG FILE NAME: CLAGDERA M1-7 PROJECT NUMBER:
SCALE: NO SCALE	DATE: 6/5/18
SHEET: M5	OF 7



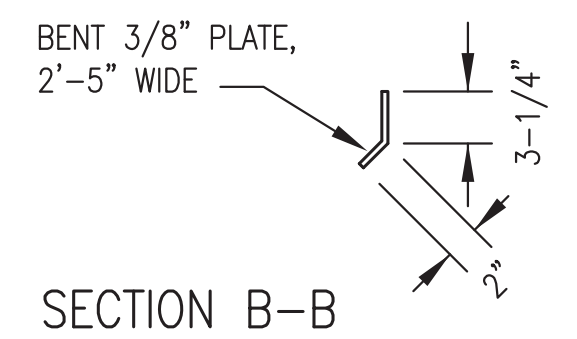
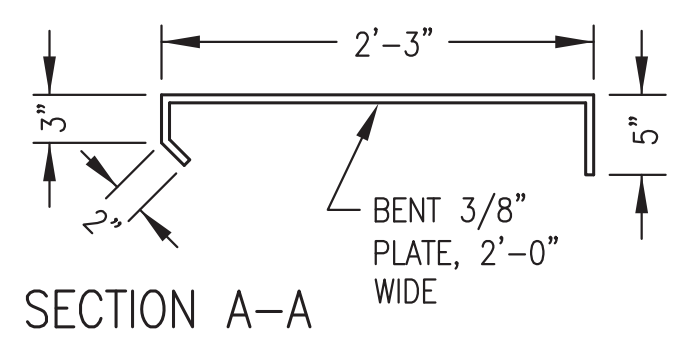
1 GENERATOR ASSEMBLY
M6 NO SCALE



PLAN (TOP) VIEW



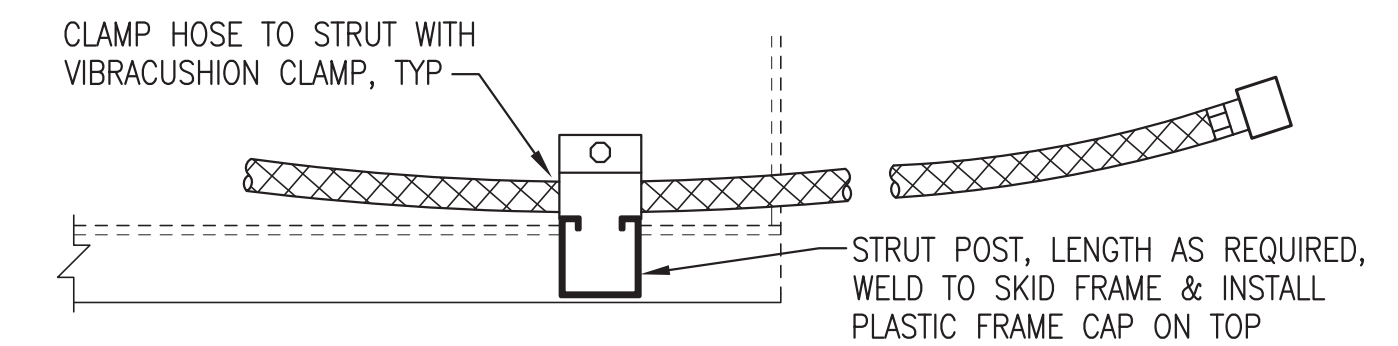
ELEVATION (SIDE) VIEW



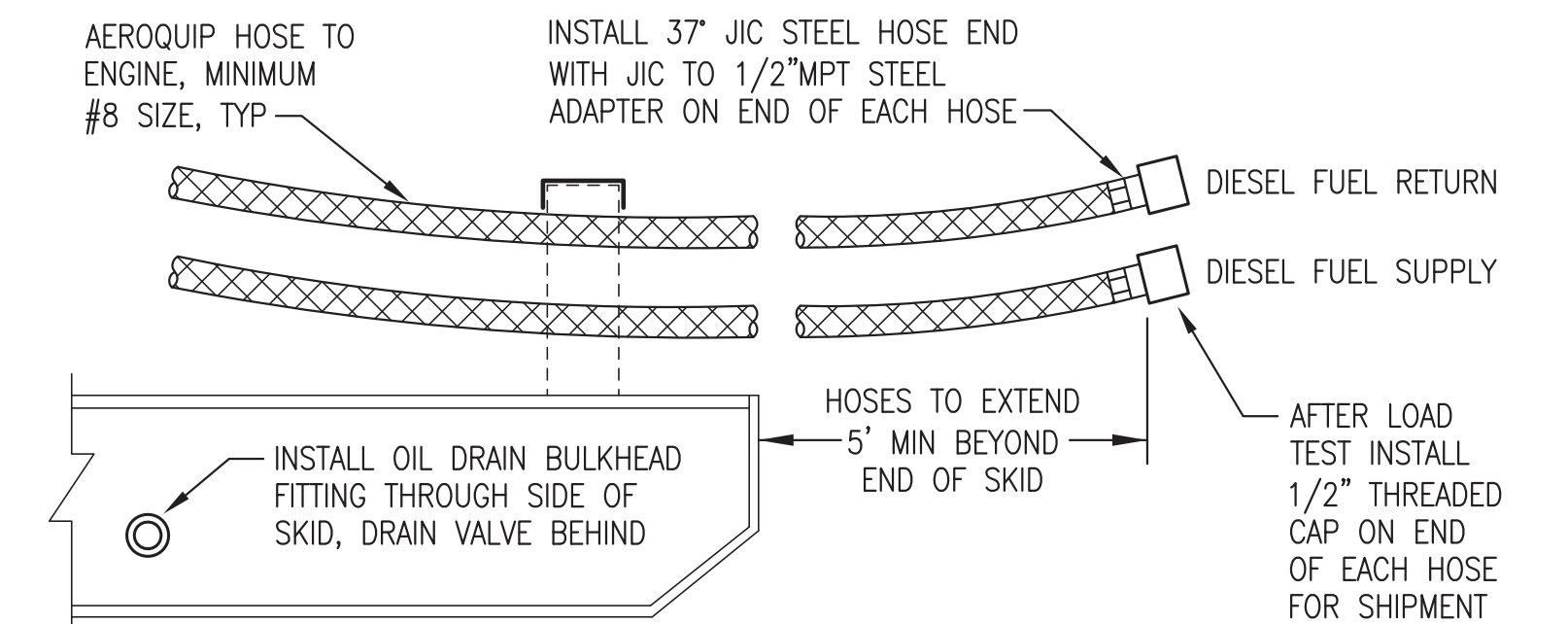
NOTES:

- 1) FABRICATE FROM ASTM A-36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN. CONTINUOUSLY WELDED PLATE SECTIONS MAY BE SUBSTITUTED FOR BENT PLATE.
- 2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL-PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
- 3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE-GENERATOR.
- 4) PLACE ENGINE ON SKID SO THAT THE EXTREME FRONT FACE (INCLUDING GUARD) IS WITHIN 1" OF THE FRONT TO THE SKID.
- 5) LOCATE WEDGE WASHERS EQUAL DISTANCE FROM BALANCE POINT, 12" MIN AND 20" MAXIMUM FROM ENDS OF SKIDS.

2 JOHN DEERE 6081AFM75 SKID DESIGN
M6 NO SCALE

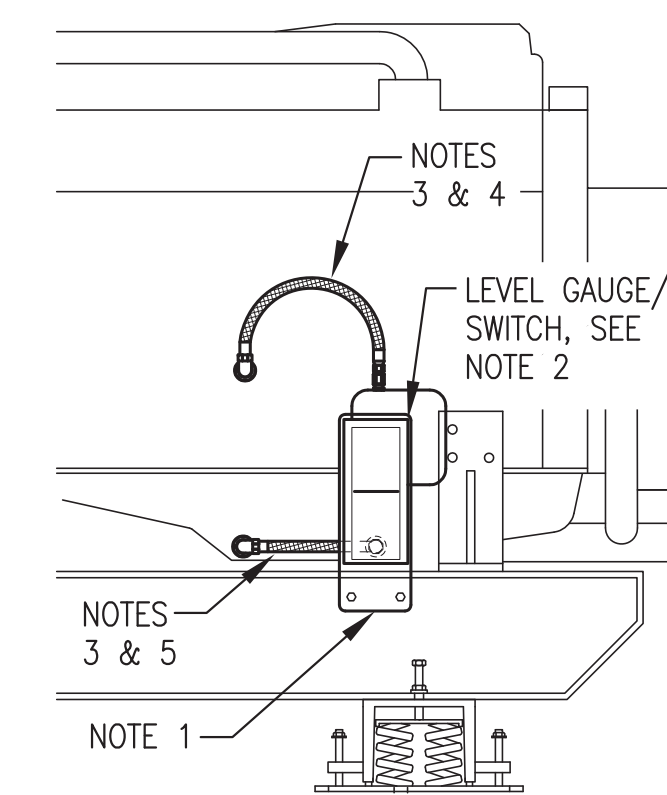


PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW

3 FUEL & OIL HOSE TERMINATIONS
M6 NO SCALE



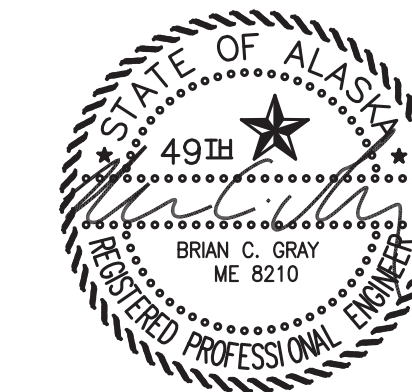
NOTES:

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

4 OIL LEVEL GAUGE/SWITCH INSTALLATION
M6 NO SCALE

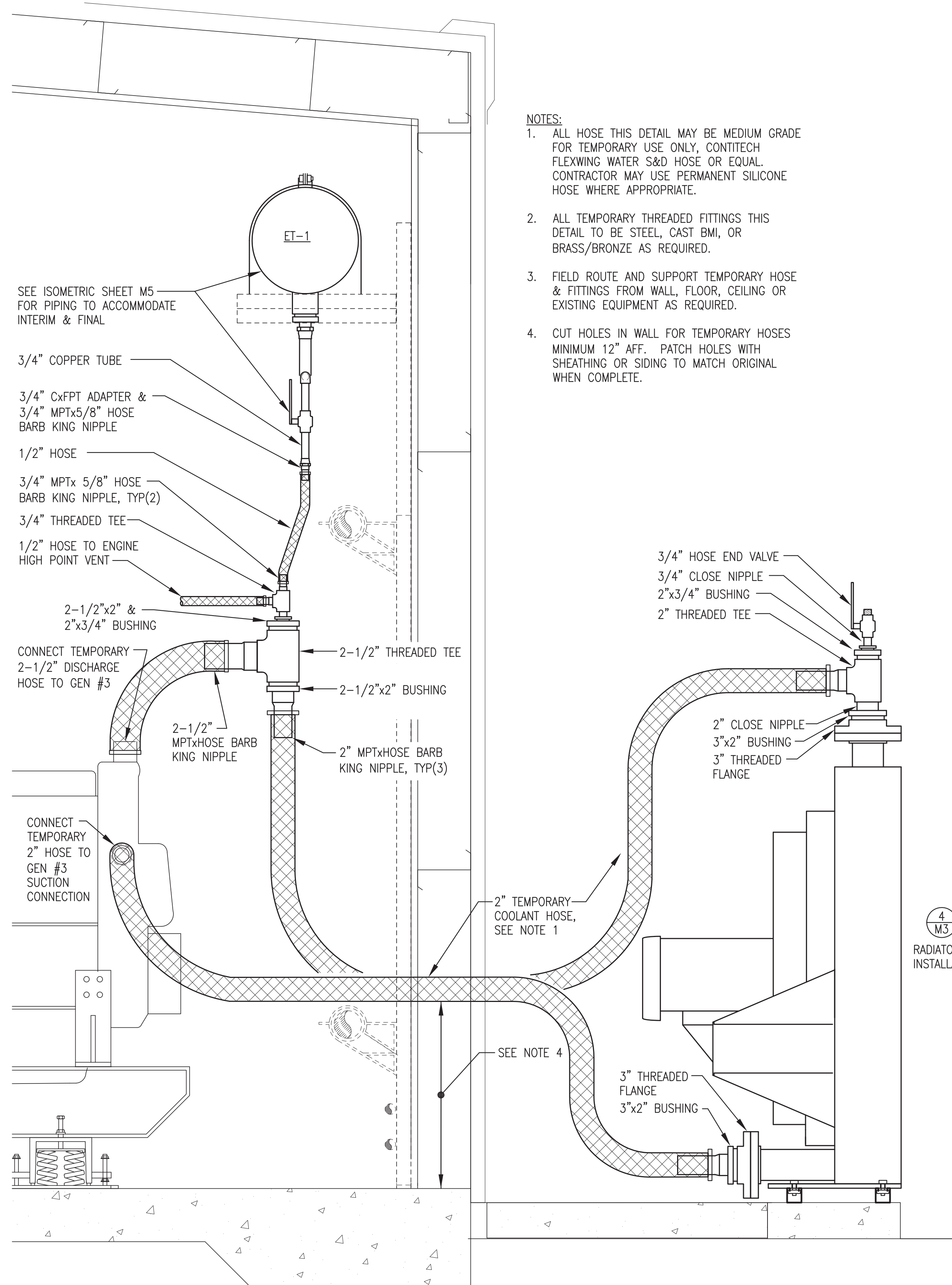
NOTE: ALL WORK THIS SHEET FURNISHED AS PART OF THE OWNER FURNISHED ENGINE-GENERATOR.

ISSUED FOR CONSTRUCTION
JUNE 2018



PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE	
TITLE: GEN #3 ENGINE GENERATOR ASSEMBLY DETAILS	
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/5/18
FILE NAME: CLAGDERA M1-7	SHEET: M6 OF 7
PROJECT NUMBER:	

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



- NOTES:**
1. ALL HOSE THIS DETAIL MAY BE MEDIUM GRADE FOR TEMPORARY USE ONLY, CONTITECH FLEXWING WATER S&D HOSE OR EQUAL. CONTRACTOR MAY USE PERMANENT SILICONE HOSE WHERE APPROPRIATE.
 2. ALL TEMPORARY THREADED FITTINGS THIS DETAIL TO BE STEEL, CAST BMI, OR BRASS/BRONZE AS REQUIRED.
 3. FIELD ROUTE AND SUPPORT TEMPORARY HOSE & FITTINGS FROM WALL, FLOOR, CEILING OR EXISTING EQUIPMENT AS REQUIRED.
 4. CUT HOLES IN WALL FOR TEMPORARY HOSES MINIMUM 12" AFF. PATCH HOLES WITH SHEATHING OR SIDING TO MATCH ORIGINAL WHEN COMPLETE.

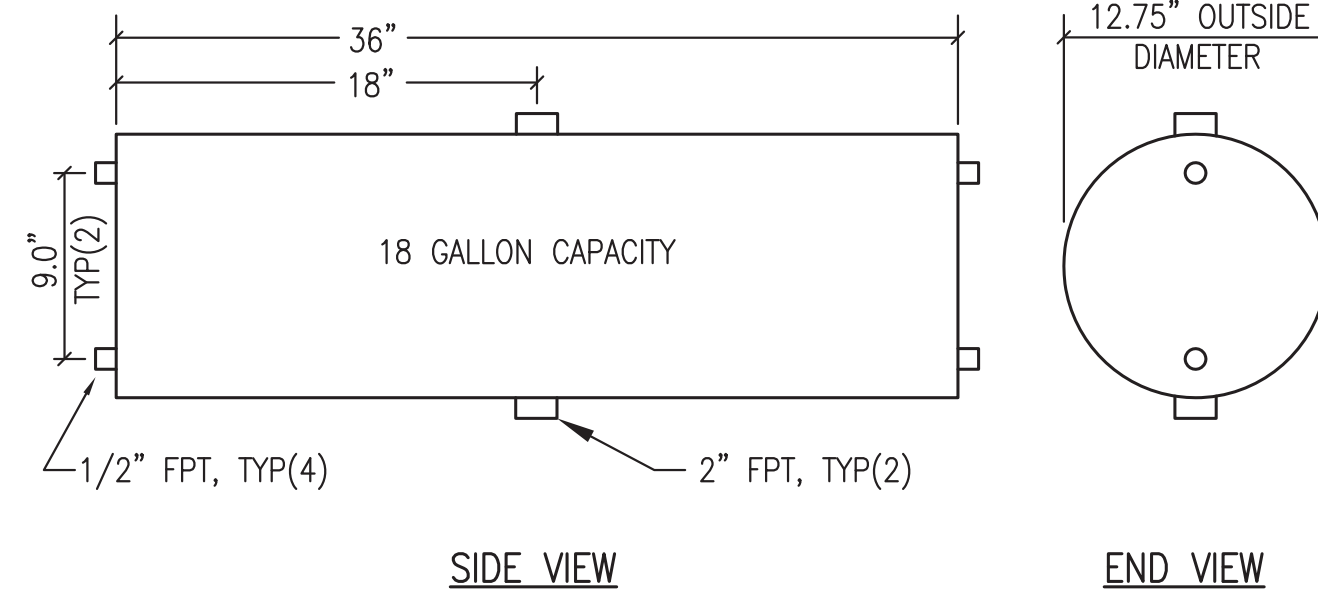
SEE ISOMETRIC SHEET M5 FOR PIPING TO ACCOMMODATE INTERIM & FINAL

- 3/4" COPPER TUBE
- 3/4" CxFPT ADAPTER & 3/4" MPTx5/8" HOSE BARB KING NIPPLE
- 1/2" HOSE
- 3/4" MPTx 5/8" HOSE BARB KING NIPPLE, TYP(2)
- 3/4" THREADED TEE
- 1/2" HOSE TO ENGINE HIGH POINT VENT
- 2-1/2"x2" & 2"x3/4" BUSHING
- CONNECT TEMPORARY 2-1/2" DISCHARGE HOSE TO GEN #3
- 2-1/2" THREADED TEE
- 2-1/2"x2" BUSHING
- 2-1/2" MPTxHOSE BARB KING NIPPLE
- 2" MPTxHOSE BARB KING NIPPLE, TYP(3)
- CONNECT TEMPORARY 2" HOSE TO GEN #3 SUCTION CONNECTION
- 2" TEMPORARY COOLANT HOSE, SEE NOTE 1
- SEE NOTE 4
- 3" THREADED FLANGE
- 3"x2" BUSHING

- 3/4" HOSE END VALVE
- 3/4" CLOSE NIPPLE
- 2"x3/4" BUSHING
- 2" THREADED TEE
- 2" CLOSE NIPPLE
- 3"x2" BUSHING
- 3" THREADED FLANGE

4
M3
NO SCALE
RADIATOR R-2 INSTALLATION

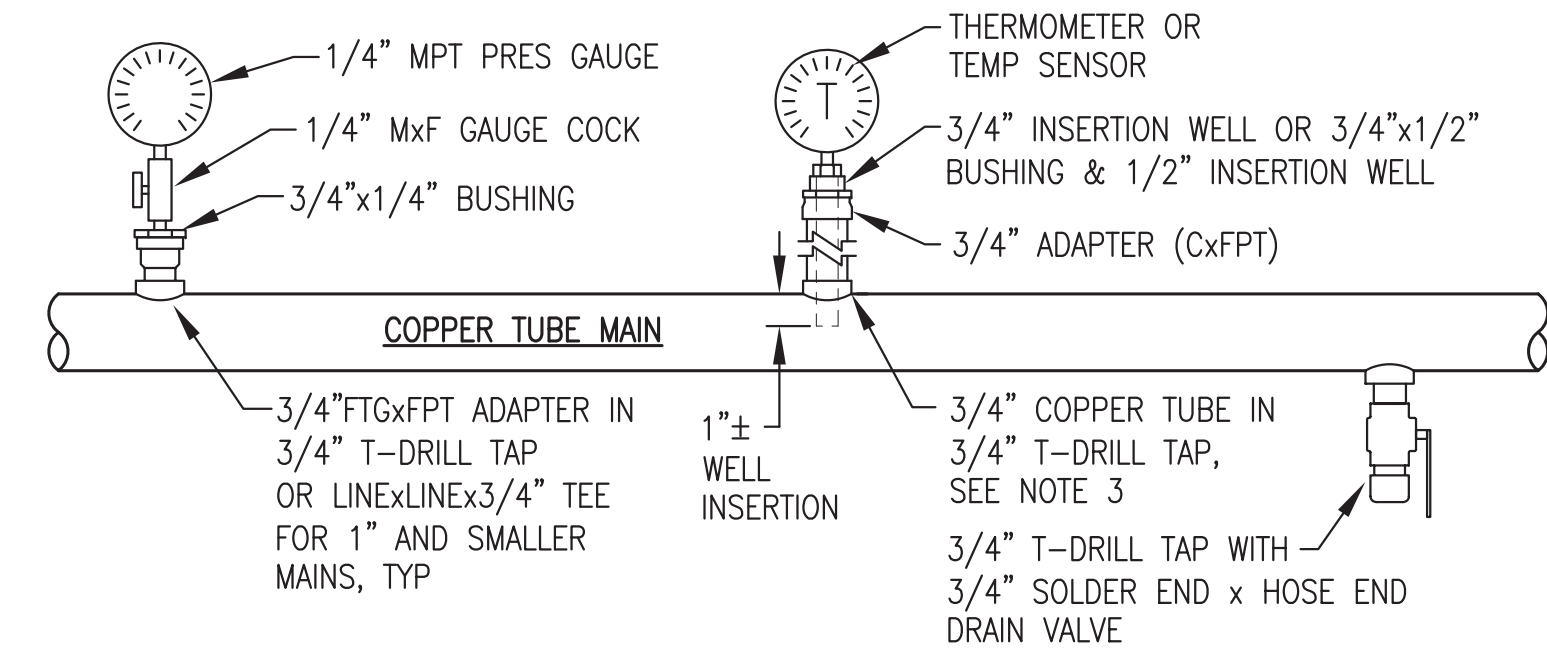
1
M7
NO SCALE
NEW GENSET #3 INTERIM STAND ALONE COOLANT CONNECTION (BASE BID)



- EXPANSION TANK GENERAL NOTES:**
- 1) FABRICATE SINGLE WALL NOMINAL 18 GALLON CAPACITY GLYCOL EXPANSION TANK
 - 2) FABRICATE SHELL FROM MINIMUM 10 GAUGE ASTM A-36 PLATE STEEL ROLLED AND WELDED OR SCHEDULE 5 LIGHTWALL ASTM A53 STEEL PIPE. FABRICATE HEADS FROM 3/16" THICK ASTM A-36 PLATE STEEL. MAKE ALL JOINTS WITH CONTINUOUS FULL-PENETRATION WELDS.
 - 3) PROVIDE WITH ALL OPENINGS INDICATED USING MINIMUM 3000# FORGED STEEL PIPE HALF COUPLINGS IN ACCORDANCE WITH U.L 142 FIGURE 7.1 #2.
 - 4) PRESSURE TEST COMPLETED ASSEMBLY TO 15 PSIG MINIMUM.
 - 5) UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PRIME AND COVER WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
 - 6) UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS, AIR DRY INTERIOR, AND SEAL ALL TANK OPENINGS WITH PLASTIC PLUGS.

2
M7
NO SCALE
GLYCOL EXPANSION TANK ET-1 FABRICATION (BASE BID)

- NOTES:**
- 1) USE T-DRILL TAPS AS SHOWN FOR INSTRUMENT INSTALLATIONS IN 1-1/4" AND LARGER COPPER MAINS. USE LINE SIZE TEE FITTINGS FOR INSTALLING INSTRUMENTATION IN 1" AND SMALLER MAINS. ADJUST ADAPTER AND BUSHING SIZES TO MATCH TEES.
 - 2) TEMPERATURE SENSOR INSTALLATION SIMILAR TO THERMOMETER EXCEPT USE 3/4"x1/2" BUSHING AND 1/2" INSERTION WELL.
 - 3) FOR MAINS SMALLER THAN 2" AND FOR EXTRA LONG INSERTION WELLS, USE COPPER TUBE RISER AS SHOWN, LENGTH AS REQUIRED FOR WELL INSERTION DEPTH INTO MAIN. FOR ALL OTHER INSERTION WELL INSTALLATIONS OMIT RISER AND INSERT 3/4" FTGxFPT ADAPTER INTO T-DRILL TAP.



3
M7
NO SCALE
TYPICAL INSTRUMENT INSTALLATION (ADDITIVE ALTERNATE #1)

ISSUED FOR CONSTRUCTION
JUNE 2018



ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: PIPING DETAILS & GEN #3 TEMPORARY COOLANT CONNECTIONS		
DRAWN BY: JTD	SCALE: NO SCALE	
DESIGNED BY: BCG	DATE: 6/5/18	
FILE NAME: CLAGDERA M1-7	SHEET: M7	OF 7
PROJECT NUMBER:		
Gray Stassel Engineering, Inc. P.O. 111405, Anchorage, AK 99511 (907)349-0100		

**** GENERAL CONDITIONS ****

NOTE THAT THESE SPECIFICATIONS APPLY TO WORK UNDER THE BASE BID AND ADDITIVE ALTERNATE #1 SCOPES. SEE NOTES ON OTHER SHEETS FOR DELINEATION OF SCOPE.

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 EQUIPMENT ****

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 .

**** CONDUCTORS ****

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

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.

GROUNDING – PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE CLASS B CONCENTRIC STRANDED, SOFT-DRAWN COPPER OF THE SIZES INDICATED ON THE DRAWINGS. EQUIPMENT GROUNDING CONDUCTORS FOR THE GENERATOR LEADS SHALL BE TYPE VW-1 AS SPECIFIED FOR GENERATOR LEADS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

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

480-VOLT POWER CONDUCTORS (FOR GEN #4 ONLY IF THREE-PHASE CONVERSION COMPLETE)

- PHASE A – BROWN
- PHASE B – ORANGE
- PHASE C – YELLOW
- NEUTRAL – WHITE WITH YELLOW STRIPE

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.

SCHEDULE OF DRAWINGS:

- E1 ELECTRICAL SPECIFICATIONS & SCHEDULES
- E2 DEMOLITION & NEW WORK PLANS
- E3 DETAILS
- E4 DIESEL PLANT SWITCHGEAR ONE LINE DIAGRAM
- E5 GEN #3 SWITCHGEAR CONTROL MODIFICATIONS
- E6 GEN #3 ENGINE CONTROL WIRING JUNCTION BOX

ELECTRICAL EQUIPMENT SCHEDULE

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

1	SMALL MOTOR DISCONNECT	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP. HUBBELL 1221-PL OR APPROVED EQUAL. INSTALL IN 4"x4" STEEL BOX WITH INDUSTRIAL RAISED FACE STEEL COVER.
2	PUMP CONTROL RELAY	ENCLOSED POWER RELAY, 20A, 1HP RATED CONTACT, SPDT, 24VAC COIL, NEMA 1 ENCLOSURE, RED LED PILOT LIGHT. FUNCTIONAL DEVICES RIB2401B OR APPROVED EQUAL.

REFERENCE DRAWINGS BY OTHERS:

1005-2 GEN #3 THREE LINE DIAGRAM

1005-4 GEN #3 CONTROL LADDER

11-1447-1 LOAD DEMAND PANEL

ISSUED FOR
CONSTRUCTION
JUNE 2018



ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: ELECTRICAL SPECIFICATIONS & SCHEDULES		
	DRAWN BY: JTD	SCALE: NO SCALE
	DESIGNED BY: CWV/BCG	DATE: 6/5/18
FILE NAME: CLAGDERA E1-6	SHEET: E1	OF 6
P.O. 111405, Anchorage, AK 99511 (907)349-0100		

DEMOLITION GENERAL NOTES:

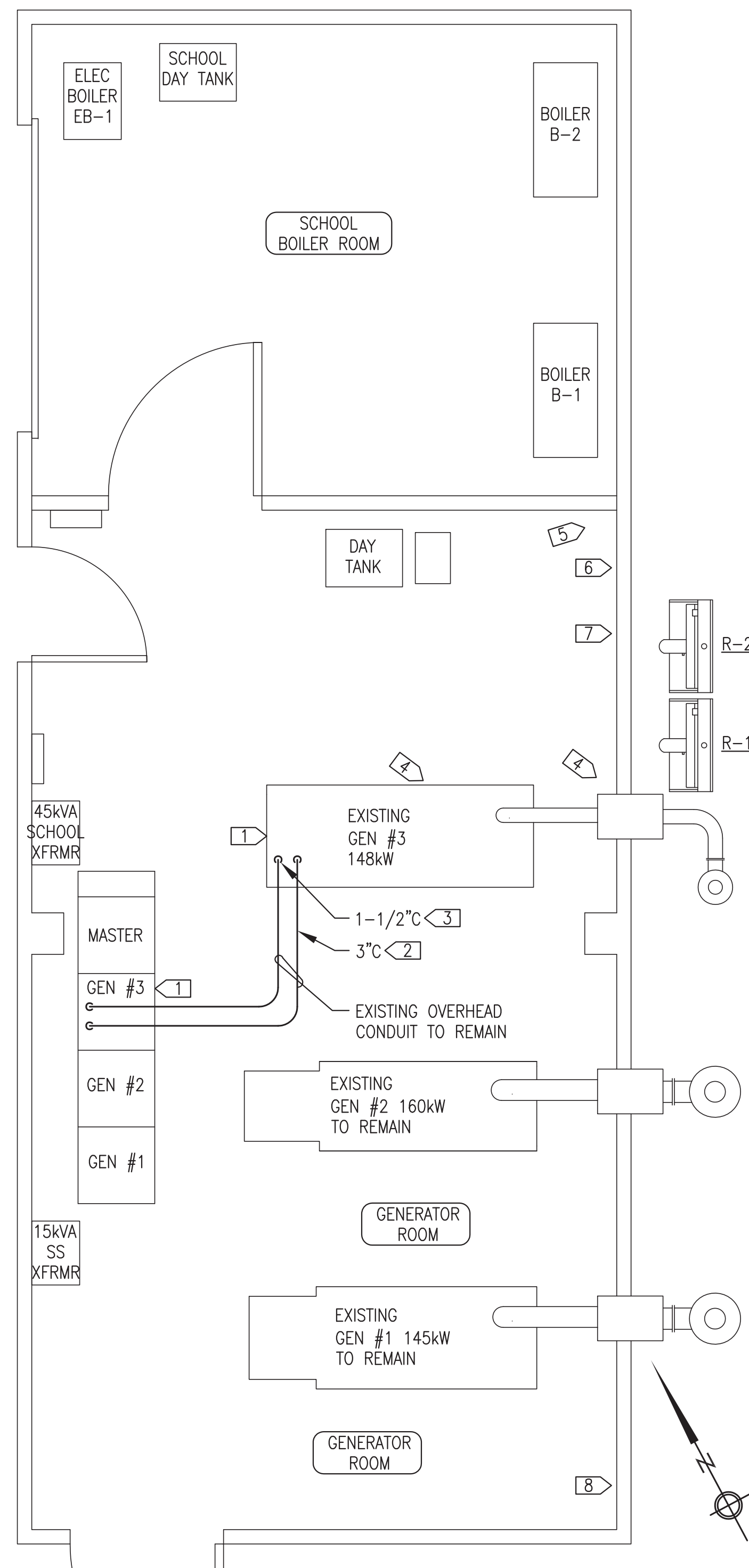
- 1) ALL EXISTING ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR DEMOLITION.
- 2) ENSURE ALL EQUIPMENT AND CIRCUITS TO BE REMOVED ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL AFFECTED CIRCUIT BREAKERS AND DISCONNECTS.
- 3) TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO ELECTRICAL CONDUCTOR BEING REMOVED DURING DEMOLITION. STORE ALL REMOVED CONDUCTOR, CONDUIT, & FITTINGS FOR POSSIBLE REUSE. TURN ALL REMOVED EQUIPMENT OVER TO THE UTILITY FOR FINAL DISPOSITION IF NOT REUSED.
- 4) SEE MECHANICAL PLANS FOR ADDITIONAL DEMOLITION.

DEMOLITION SPECIFIC NOTES (BY OTHERS):

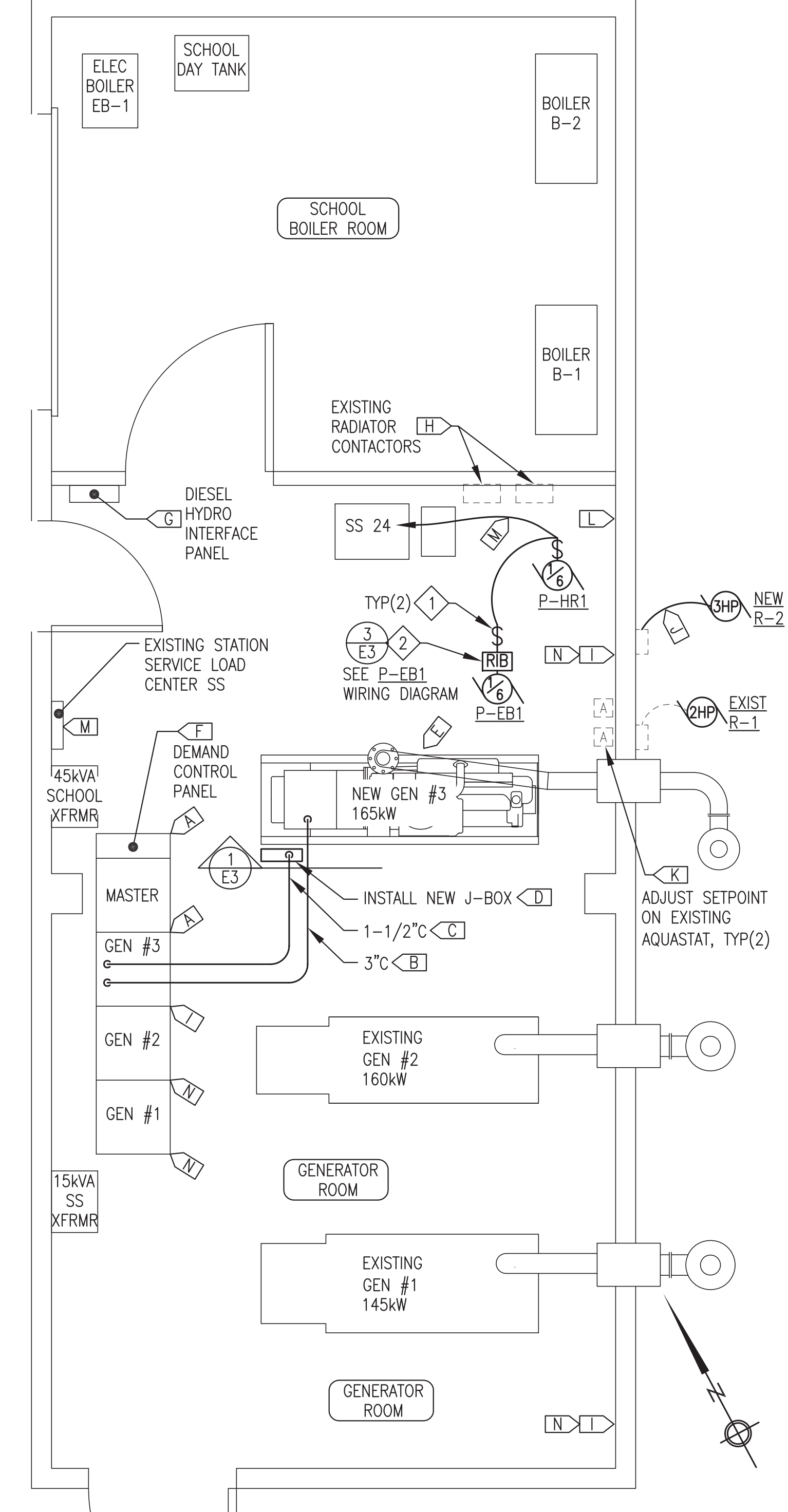
- NOTE THAT TASKS 1-4 WILL BE PERFORMED BY OTHERS PRIOR TO AUGUST 15.
- 1) OPEN & LOCK OUT GEN#3 CIRCUIT BREAKER PRIOR TO DEMOLISHING GENSET.
 - 2) DISCONNECT GEN #3 POWER CONDUCTORS AND 3" LIQUID TIGHT FLEX FROM GENSET. TEMPORARILY COIL CONDUCTORS AND PROTECT FOR RECONNECTION.
 - 3) DISCONNECT GEN #3 CONTROL CONDUCTORS AND 1-1/2" LIQUID TIGHT FLEX FROM GENSET. TEMPORARILY COIL CONDUCTORS AND PROTECT FOR RECONNECTION.
 - 4) REMOVE GEN #3 BATTERY AND CABLES.

DEMOLITION SPECIFIC NOTES (ADD. ALT. #1):

- NOTE THAT TASKS 5-8 ARE INCLUDED UNDER ADDITIVE ALTERNATE #1.
- 5) TEMPORARILY REMOVE STRAP ON TEMPERATURE SENSOR FROM PIPE AND SECURE FOR REINSTALLATION. SEE NEW WORK NOTE L AND ELEVATION 1/M.3.
 - 6) DEMOLISH FLOW SWITCH AND ALARM LIGHT AND REMOVE CONDUCTORS BACK TO POWER SOURCE. SEE ELEVATION 1/M.3.
 - 7) EXIST BOOSTER PUMP TO BE DEMOLISHED, SEE ELEVATION 1/M.3. DEMOLISH ELECTRICAL BACK TO NEAREST JUNCTION BOX, COIL AND TAPE CONDUCTORS FOR CONNECTION TO NEW PUMPS. VERIFY THAT CIRCUIT IS #24. SEE NEW WORK NOTE M.
 - 8) DURING FINAL DEMOLITION REMOVE LOW COOLANT SWITCH WHEN OLD EXPANSION TANK IS DEMOLISHED, SEE MECHANICAL.



1
E2 DEMOLITION PLAN
3/8"=1'-0"



2
E2 NEW WORK PLAN
3/8"=1'-0"

PROJECT SEQUENCE NOTES

THE CHIGNIK LAGOON ELECTRIC UTILITY PROVIDES PRIMARY POWER FOR THE COMMUNITY USING A COMBINATION OF A HYDRO POWER PLANT AND A DIESEL POWER PLANT. AT TIMES THE HYDRO GENERATOR IS ABLE TO PROVIDE ALL POWER FOR THE COMMUNITY; HOWEVER, THE DIESEL PLANT NEEDS TO BE AVAILABLE TO TAKE OVER AT ANY TIME. THIS PROJECT WILL REQUIRE TAKING THE DIESEL PLANT OFF LINE FOR BRIEF PERIODS. ALL OUTAGES MUST BE SCHEDULED IN ADVANCE WITH THE VILLAGE COUNCIL AND KEPT TO A MINIMUM.

IN ORDER TO LIMIT TIME THAT DIESEL GENERATION IS NOT AVAILABLE AND TO MEET FUNDING DEADLINES, THE DESIGN HAS BEEN ORGANIZED TO ALLOW WORK TO BE PERFORMED IN THREE PHASES. "WORK BY OTHERS" WILL BE PERFORMED BY THE UTILITY PRIOR TO AUGUST 15, 2018. "BASE BID" WORK TO BE COMPLETED FIRST TO ALLOW NEW GENSET #3 TO BE FULLY OPERATIONAL ON A TEMPORARY STAND-ALONE COOLANT SYSTEM. "ADDITIVE ALTERNATE #1" WORK TO BE PERFORMED AFTER COMPLETION OF THE BASE BID WORK. NOTE THAT THE WORK SEQUENCE IS PROVIDED FOR GENERAL GUIDANCE. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE FINAL SCHEDULING AND COORDINATION OF WORK TO ENSURE PRIME POWER SERVICE IS MAINTAINED WITH MINIMAL INTERRUPTIONS.

"WORK BY OTHERS" SHOWN HEREIN INCLUDES:
1. DEMOLITION OF EXISTING GENSET #3.

"BASE BID" WORK SHOWN HEREIN INCLUDES:
2. ALL SWITCHGEAR MODIFICATIONS.
3. ALL POWER AND CONTROL WIRING FOR NEW GENSET #3 INSTALLATION.
4. CAPACITY SETTING REVISION FOR GEN #3 IN DEMAND CONTROL AND HYDRO INTERFACE PANELS.
5. WIRING FOR NEW RADIATOR R-2.

"ADDITIVE ALTERNATE #1" WORK SHOWN HEREIN INCLUDES:
6. DEMOLITION OF PUMP POWER AND PIPING INSTRUMENTATION AS NOTED.
7. WIRING FOR NEW PUMPS P-HR1 & P-EB1 AND OTHER PIPING CONTROLS AS NOTED.

NEW WORK SPECIFIC NOTES (BASE BID):

- A) PERFORM MINOR MODIFICATIONS TO SWITCHGEAR AS INDICATED ON SHEETS E4 AND E5 AND ATTACHED DEMAND PANEL REVISION DRAWING.
- B) ADJUST 3" LIQUID TIGHT FLEX RISER LENGTH AS REQUIRED FOR CONNECTION TO NEW GENERATOR ENCLOSURE AND RECONNECT EXISTING POWER CABLES TO NEW GENERATOR.
- C) REMOVE EXIST MAG PICKUP CONDUCTORS (305 & 306) AND PULL IN 2 EACH #18 SHIELDED PAIRS FOR SPEED BIAS AND FOR NEW MAG PICKUP. TERMINATE NEW AND EXISTING CONDUCTORS IN NEW J-BOX AS INDICATED ON SHEET E6.
- D) MOUNT NEW J-BOX FURNISHED WITH NEW GEN #3 ON STRUT RACK, SEE ELEVATION 1/E3. MODIFY EXISTING 1-1/2" CONDUIT AND/OR LT FLEX AS REQUIRED TO CONNECT NEW J-BOX.
- E) INSTALL NEW BATTERY AND CABLES FURNISHED WITH NEW GEN #3.
- F) PROGRAM DEMAND CONTROL PANEL FOR NEW GEN #3 165kW RATING.
- G) PROGRAM DIESEL HYDRO INTERFACE PANEL FOR NEW GEN #3 165kW RATING.
- H) IN EXISTING R-2 CONTACTOR REPLACE HEATER TO ACCOMMODATE NEW 3 HP MOTOR. CONTACTOR IS AN ALLEN BRADLEY NEMA 1, PART # 509-BAD, SERIES B. INSTALL 11.7A RATED HEATER, PART # W54.
- I) INSTALL NEW COOLANT LEVEL SWITCH WITH NEW EXPANSION TANK, SEE MECHANICAL. UNDER BASE BID CONNECT TO GEN #3 CONTROLS IN SWITCHGEAR AND LEAVE GEN #1 AND #2 CONNECTED TO OLD SWITCH.
- J) INSTALL NEW 1/2" LT FLEX WITH 3#12 & #12G FROM DISCONNECT TO NEW RADIATOR R-2.
- K) SET EXISTING AQUASTATS TO 185F FOR R-1 AND 175F FOR R-2.

NEW WORK SPECIFIC NOTES (ADDITIVE ALTERNATE #1):

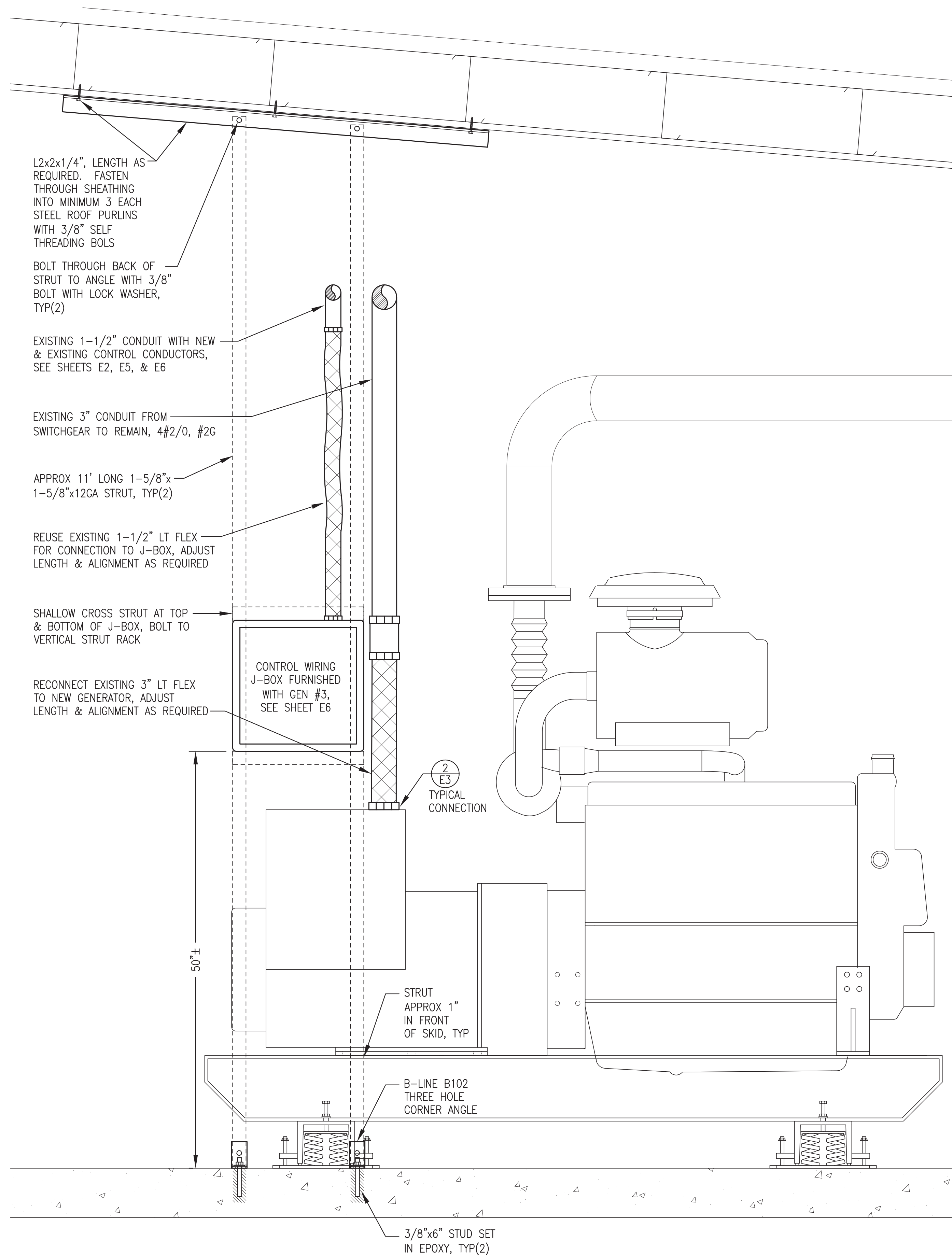
- L) EXISTING STRAP ON TEMPERATURE SENSOR TO BE REINSTALLED ON NEW PIPE. SEE DEMOLITION NOTE 5 AND ELEVATION 2/M.3.
- M) CONNECT NEW PUMPS TO EXISTING CIRCUIT #24, SEE DEMOLITION NOTE 7. PROVIDE NEW CONDUIT AND #12 CONDUCTORS AS REQUIRED. MOUNT NEW DISCONNECTS ON WALL NEAR EACH PUMP. MAKE FINAL CONNECTION TO PUMPS WITH 1/2" LT FLEX, 2#12 & #12G.
- N) REMOVE OLD COOLANT LEVEL SWITCH AND CONNECT NEW SWITCH ON ET-1 TO GEN #1 AND #2 CONTROLS IN SWITCHGEAR, SEE DEMOLITION NOTE 8.

SYMBOL LEGEND		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 CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.	#	ELECTRICAL ITEM SEE EQUIPMENT SCHEDULE
			MOTOR (HORESPOWER INDICATED)
			LINE VOLTAGE THERMOSTAT
			SNAP SWITCH/ SMALL MOTOR DISCONNECT
			GROUND

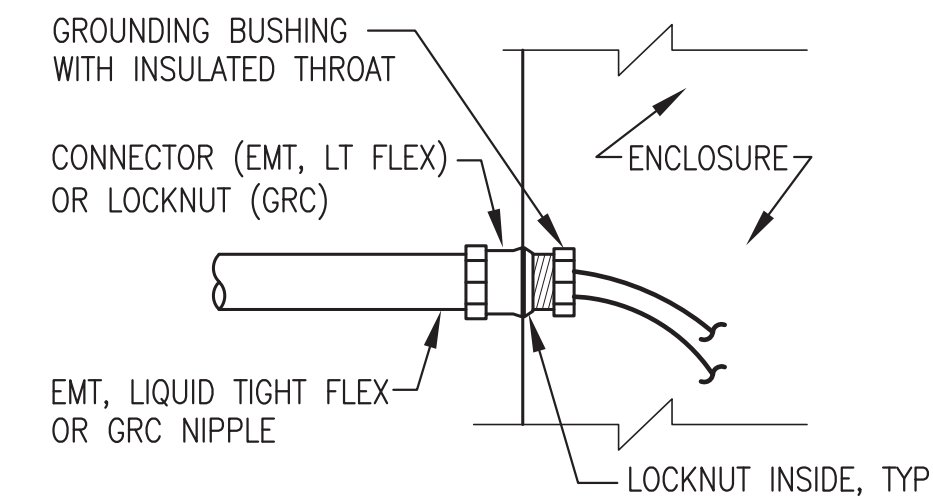
ISSUED FOR
CONSTRUCTION
JUNE 2018



PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: DEMOLITION & NEW WORK PLANS		
 P.O. 111405, Anchorage, AK 99511 (907)349-0100	DRAWN BY: JTD DESIGNED BY: CWV/BCG FILE NAME: CLAGDERA E1-6 PROJECT NUMBER:	SCALE: NO SCALE DATE: 6/5/18 SHEET: E2 OF 6



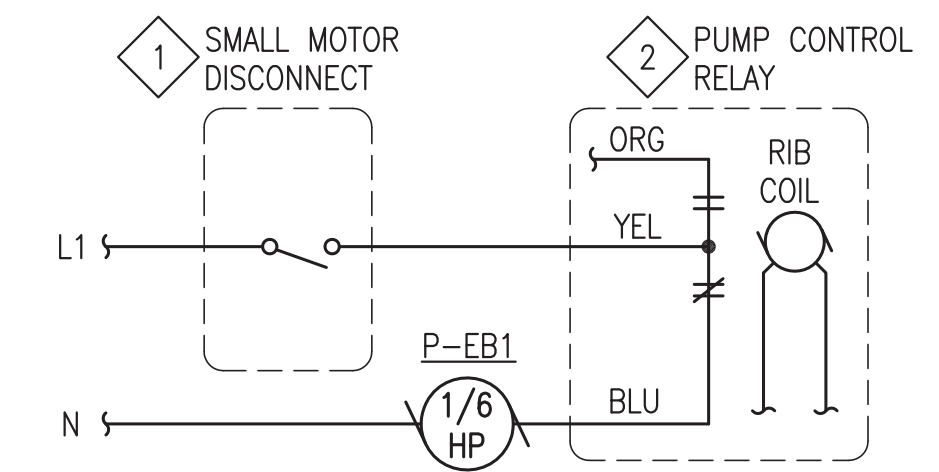
1
E3
NEW GEN #3 INSTALLATION
1-1/2"=1'-0"



2
E3
TYP ENCLOSURE CONNECTION
NO SCALE

NOTES:

- 1) RELAY PROVIDED FOR FUTURE AUTOMATIC CONTROL OF PUMP RUN. CONNECT PUMP THROUGH N.C. CONTACT AS SHOWN FOR MANUAL CONTROL. FUTURE CONTROL WORK TO BE PERFORMED BY OTHERS.
- 2) MOUNT RELAY ON SIDE OF 4S BOX WITH BLANK COVER ADJACENT TO DISCONNECT SWITCH.
- 3) TAPE ENDS AND COIL ALL UNUSED RELAY LEAD WIRES IN 4S BOX.

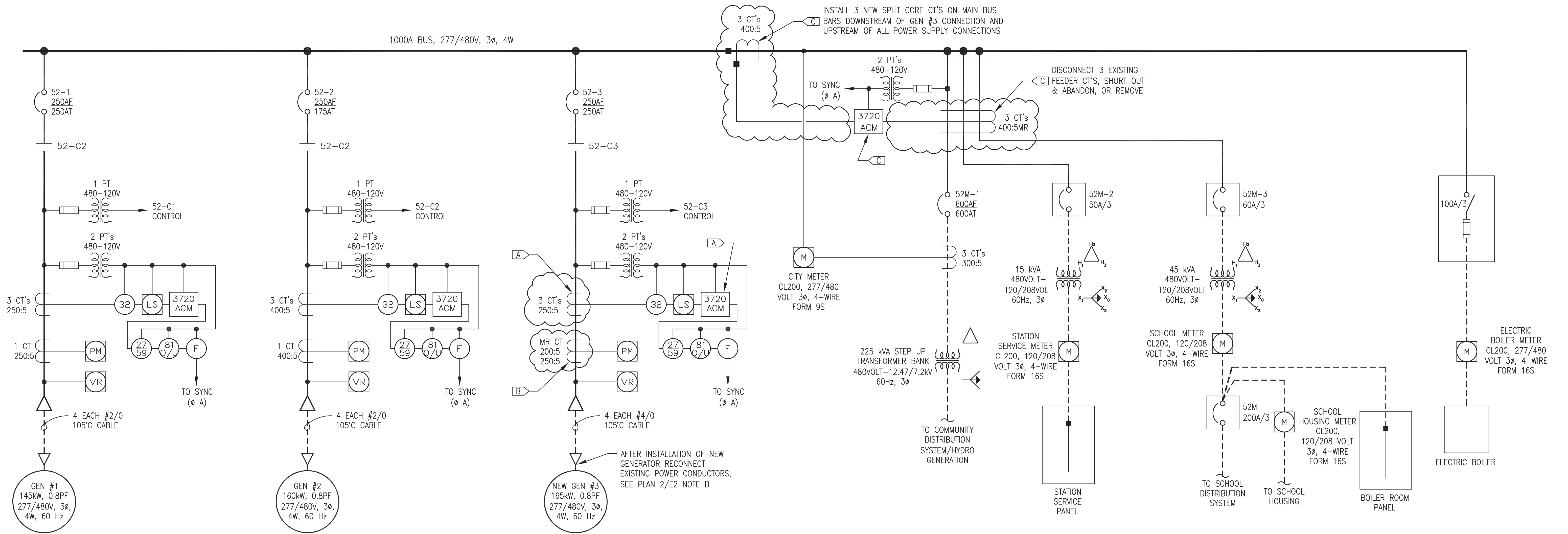


3
E3
PUMP P-EB1 WIRING DIAGRAM (ADD. ALT. #1)
NO SCALE

ISSUED FOR
CONSTRUCTION
JUNE 2018



ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: DETAILS		
DRAWN BY: JTD	SCALE: NO SCALE	
DESIGNED BY: CWV/BCG	DATE: 6/5/18	
FILE NAME: CLAGDERA E1-6	SHEET: E3	OF 6
PROJECT NUMBER:		
P.O. 111405, Anchorage, AK 99511 (907)349-0100		



1 DIESEL PLANT SWITCHGEAR ONE-LINE DIAGRAM
E4 NO SCALE

GEN #3 POWER CONDUCTORS LOOPED THROUGH CT TWO TIMES, TYP(3) [A] [B]

DISCONNECT FEEDER CT'S FROM BUS METER, SHORT OUT & ABANDON IN PLACE OR REMOVE [C]



GEN #3 CONTACTOR & BREAKER [A]

INSTALL NEW SPLIT CORE CT'S ON BUS BARS BEHIND ISOLATION BARRIER PANEL [C]

2 DIESEL PLANT SWITCHGEAR GEN #3 & FEEDER SECTION PHOTO
E4 NO SCALE

SWITCHGEAR REVISION GENERAL NOTES:

- 1) ALL EXISTING ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED TO BE MODIFIED. SEE CLOUDED AREAS AND SPECIFIC NOTES.
- 2) MODIFICATIONS TO SWITCHGEAR WILL REQUIRE A SCHEDULED OUTAGE. COORDINATE OUTAGE WITH VILLAGE COUNCIL AND SCHOOL.
- 3) FOLLOW PROPER LOCKOUT/TAG OUT PROCEDURES TO ENSURE PERSONNEL SAFETY.

SWITCHGEAR REVISION SPECIFIC NOTES:

- [A] EXISTING POWER CONDUCTORS ARE LOOPED TO PROVIDE TWO PASSES THROUGH THE CT'S. REMOVE ONE LOOP SO THAT THERE IS ONLY A SINGLE PASS THROUGH EACH CT FOR NEW 165kW GEN #3. ACM METER 3720 FOR GEN #3 IS CURRENTLY SET FOR 125A. REPROGRAM TO MATCH CORRECTED 250A RATIO.
- [B] EXISTING MULTI-RATIO DROOP CT IS PRESENTLY CONNECTED FOR 200:5. RECONNECT FOR 250:5 RATIO.
- [C] DISCONNECT 3 EACH EXISTING FEEDER MULTI-RATIO CT'S FROM 3720 BUS METER, REMOVE CT'S OR SHORT OUT AND ABANDON IN PLACE AS APPROPRIATE. INSTALL 3 EACH NEW CT'S ON BUS AS INDICATED AND CONNECT TO 3720 BUS METER. VERIFY BUS METER IS CORRECTLY SET TO MATCH RATIO OF NEW CT'S.

SWITCHGEAR DEVICE SCHEDULE

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

CT	DIESEL BUS METER CURRENT TRANSFORMERS	SPLIT CORE CURRENT TRANSFORMER FOR INSTALLATION OVER EXISTING BUS BARS. CIRCULAR SHAPE WITH MINIMUM 4" INSIDE DIAMETER AND OUTSIDE DIMENSIONS NOT EXCEEDING 7" DIAMETER BY 2" WIDE. 400:5 RATIO, 2VA BURDEN CAPACITY, 3% ACCURACY. FLEX-CORE FCL 400/5-4 OR APPROVED EQUAL.
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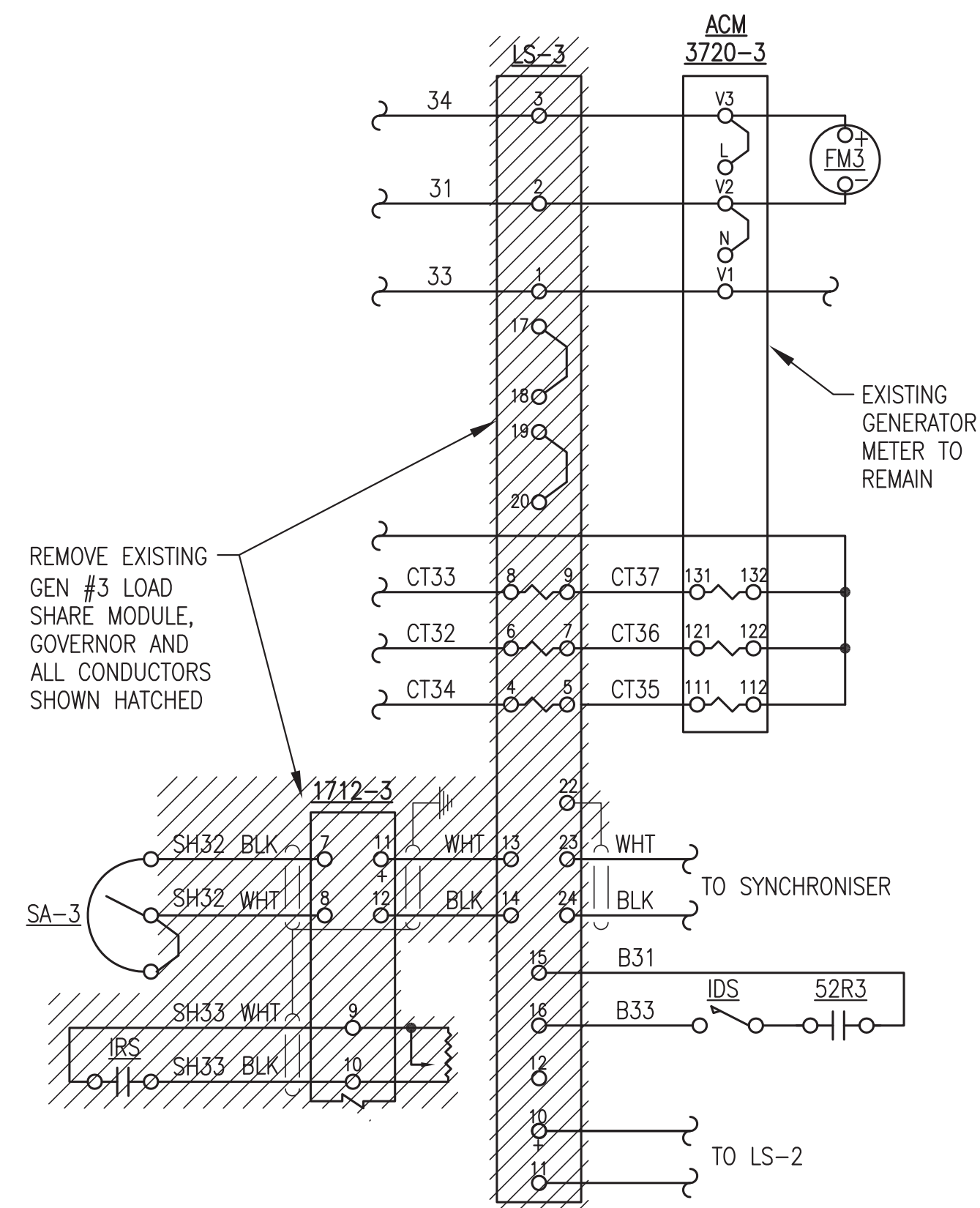
NOTE: SEE ATTACHED ORIGINAL SWITCHGEAR DRAWINGS FOR REFERENCE.

ISSUED FOR CONSTRUCTION
JUNE 2018

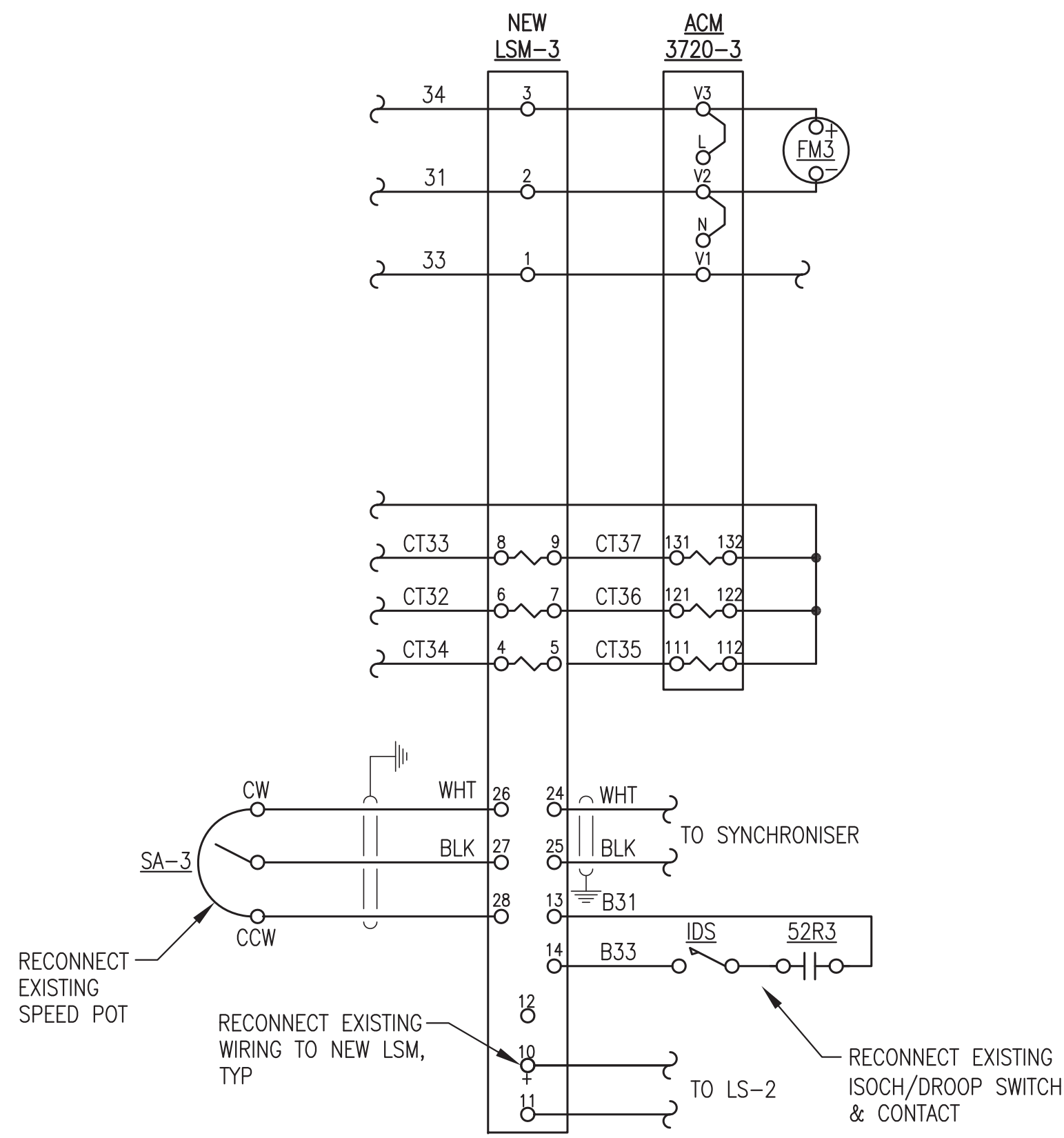


PROJECT:	CHIGNIK LAGOON POWER PLANT DERA UPGRADE	
TITLE:	DIESEL PLANT SWITCHGEAR ONE LINE DIAGRAM	
DRAWN BY:	JTD	SCALE: NO SCALE
DESIGNED BY:	CWV/BCG	DATE: 6/5/18
FILE NAME:	CLAGDERA E1-6	SHEET: E4 OF 6
PROJECT NUMBER:		

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

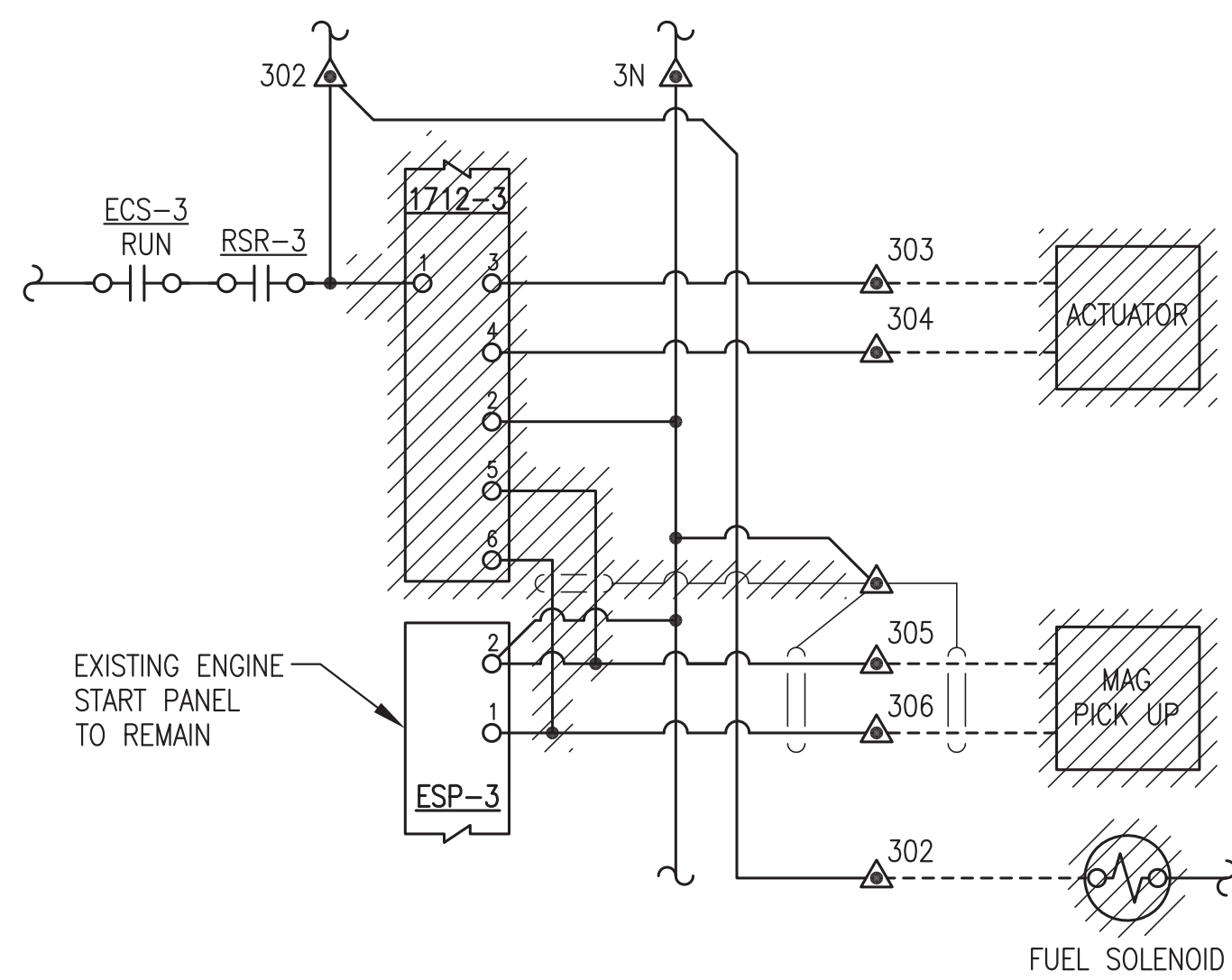


1 GEN #3 SWITCHGEAR AC CONTROL 3-LINE DEMOLITION
E5 NO SCALE

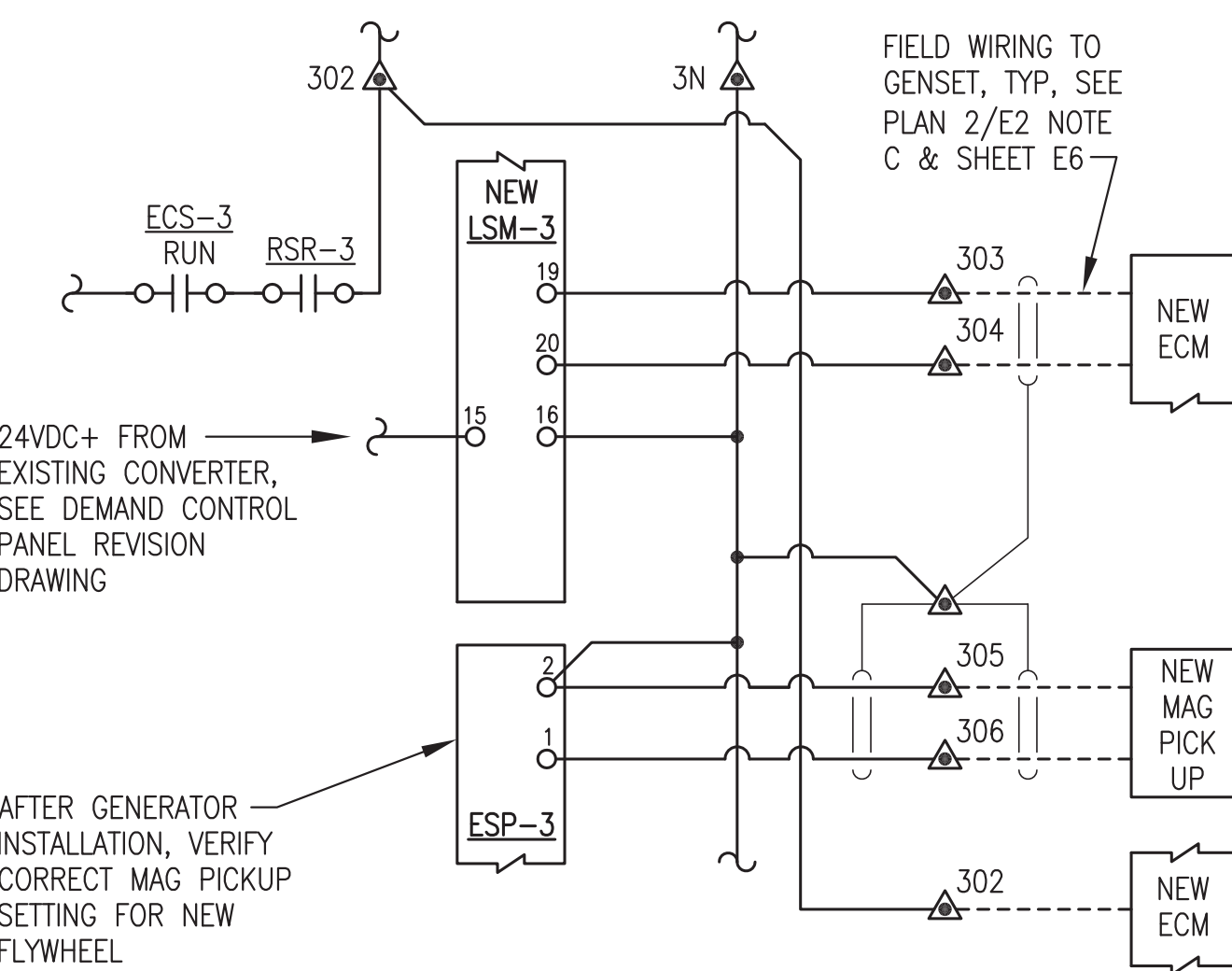


2 GEN #3 SWITCHGEAR AC CONTROL 3-LINE NEW WORK
E5 NO SCALE

SWITCHGEAR DEVICE SCHEDULE		
EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.		
LSM-3	GEN #3 LOAD SHARE MODULE	LOAD SHARING MODULE TO PROVIDE ISOCHRONOUS AND DROOP LOAD-SHARING CAPABILITY FOR ENGINES WITH 0-5 VDC THROTTLE SIGNAL IN GENERATOR SET APPLICATIONS. COMPATIBLE WITH WOODWARD SPM-A SYNCHRONIZER, CONTROL POWER INPUT 18-32 VDC, LINE TO LINE INPUTS 110-240 VAC. WOODWARD 9907-252 OR APPROVED EQUAL.



3 GEN #3 SWITCHGEAR DC CONTROL LADDER DEMOLITION
E5 NO SCALE



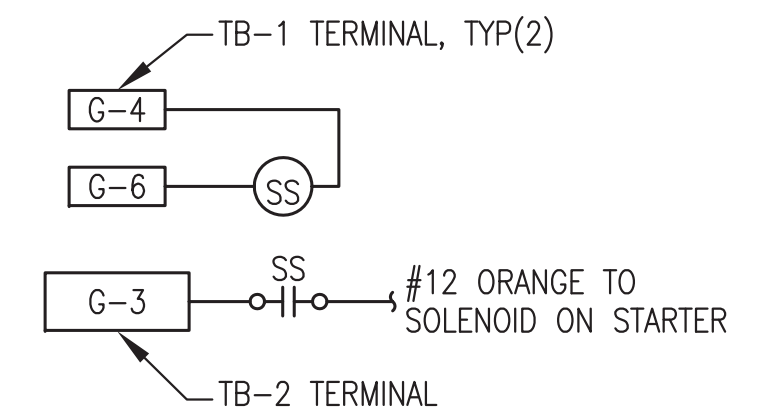
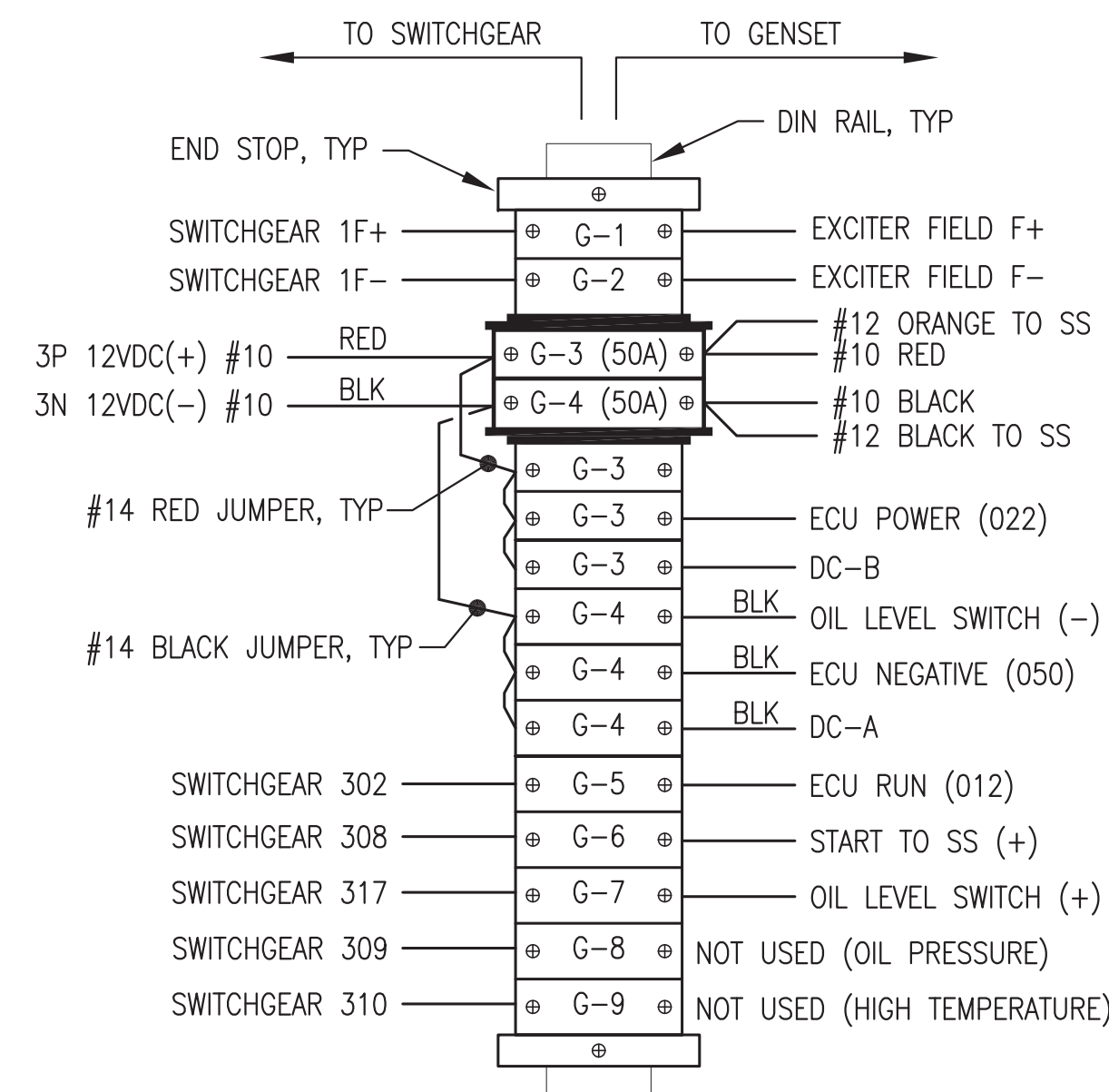
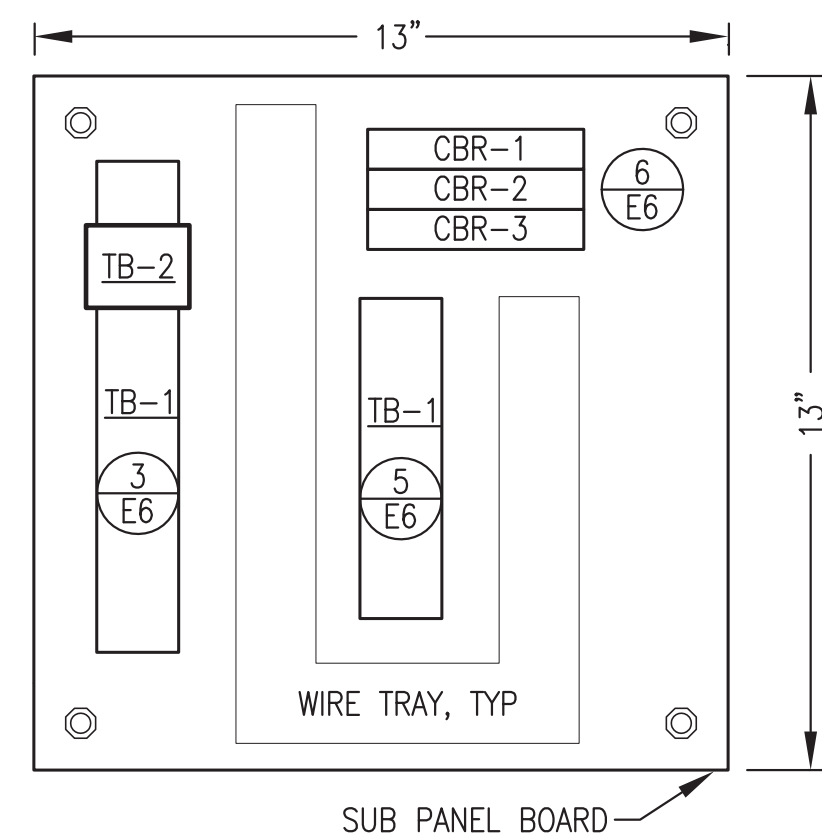
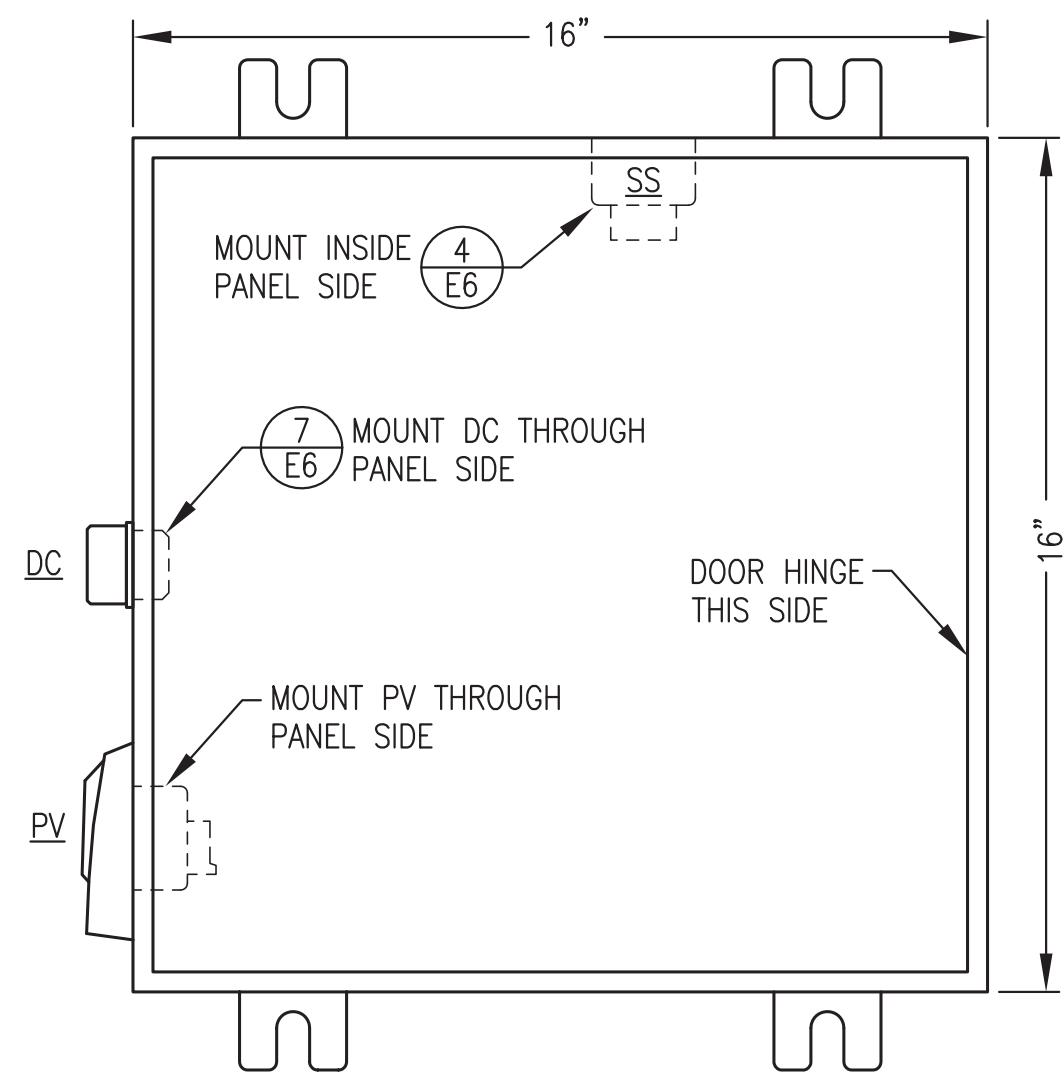
4 GEN #3 SWITCHGEAR DC CONTROL LADDER NEW WORK
E5 NO SCALE

NOTE: SEE ATTACHED ORIGINAL SWITCHGEAR DRAWINGS AND DEMAND CONTROL PANEL DRAWING FOR REFERENCE.

ISSUED FOR CONSTRUCTION
JUNE 2018



 ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: GEN #3 SWITCHGEAR CONTROL MODIFICATIONS		
 Gray Stassel Engineering, Inc. P.O. 111405, Anchorage, AK 99511 (907)349-0100	DRAWN BY: JTD DESIGNED BY: CWV/BCG FILE NAME: CLAGDERA E1-6 PROJECT NUMBER:	SCALE: NO SCALE DATE: 6/5/18 SHEET: E5 OF 6

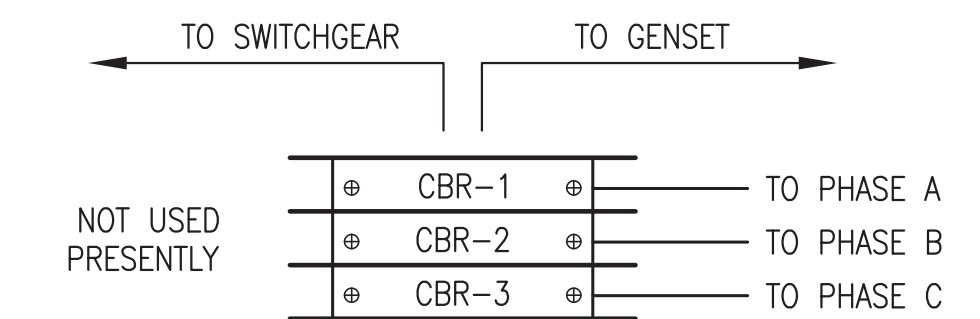


1 JUNCTION BOX FRONT PANEL LAYOUT
E6 NO SCALE

2 JUNCTION BOX SUB PANEL LAYOUT
E6 NO SCALE

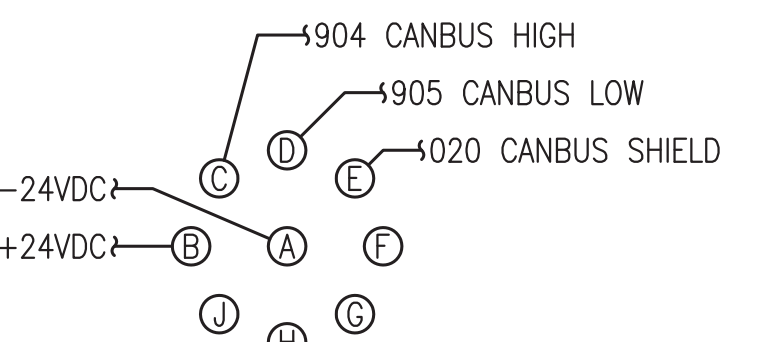
3 TERMINAL STRIP CONNECTIONS
E3 NO SCALE

4 STARTER AUX SOLENOID SS WIRING
E6 NO SCALE



5 VOLTAGE SENSING CIRCUIT BREAKERS
E6 NO SCALE

6 VOLTAGE SENSING CIRCUIT BREAKERS
E6 NO SCALE



7 DIAGNOSTIC CONNECTOR WIRING
E6 NO SCALE

BILL OF MATERIALS			
TAG	MANUFACTURER	MODEL	DESCRIPTION
ENCLOSURE	HOFFMAN	A16H16ALP	16x16x6" NEMA 12 BACK PANEL
CBR	ALLEN-BRADLEY	1489-M1C010	RAIL MOUNT BREAKER, 277V, 1-POLE, 1A
DC	DEUTSCH	HD10-9-1939P	DIAGNOSTIC CONNECTOR, 9-PIN, CAN-BUS
	DEUTSCH	HD18-009	CONNECTOR STRAIN RELIEF
	DEUTSCH	HDC16-9	CONNECTOR PROTECTIVE DUST CAP
	DEUTSCH	HD10-9-GKT	CONNECTOR GASKET
	DEUTSCH	JDLO62397	CONNECTOR LANYARD
PV	MURPHY	PV101-C-MSTD	POWER VIEW W/HARNESS
R1	ALLEN-BRADLEY	700HAB2Z24	DPDT RELAY, 24VDC COIL
	ALLEN-BRADLEY	700HN101	8 PIN SOCKET BASE
SS	CATERPILLAR	9X-8112	STARTER AUXILIARY SOLENOID, 12V
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK

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

SHOP FABRICATION NOTES:

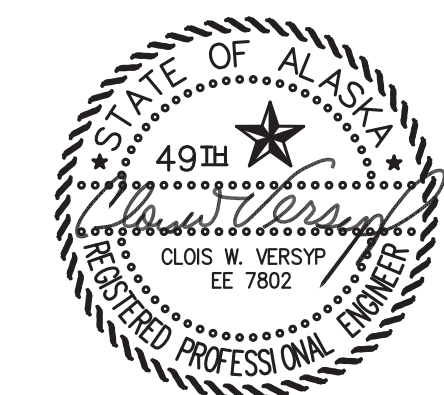
- 1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
- 2) INSTALL IN A NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL, AND HINGED LOCKABLE DOOR.
- 3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE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

FIELD INSTALLATION NOTES:

- 1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE NUMBER OF THE ASSOCIATED HOME RUN LANDING ON TERMINAL IN THE CONTROL PANEL.
- 2) ON SHIELDED CONDUCTORS FROM SWITCHGEAR GROUND ALL SHIELD DRAIN WIRES TO LUGS AT GENERATOR END ONLY.

NOTE: THIS PANEL FURNISHED AS PART OF THE OWNER FURNISHED ENGINE-GENERATOR.

ISSUED FOR CONSTRUCTION
JUNE 2018



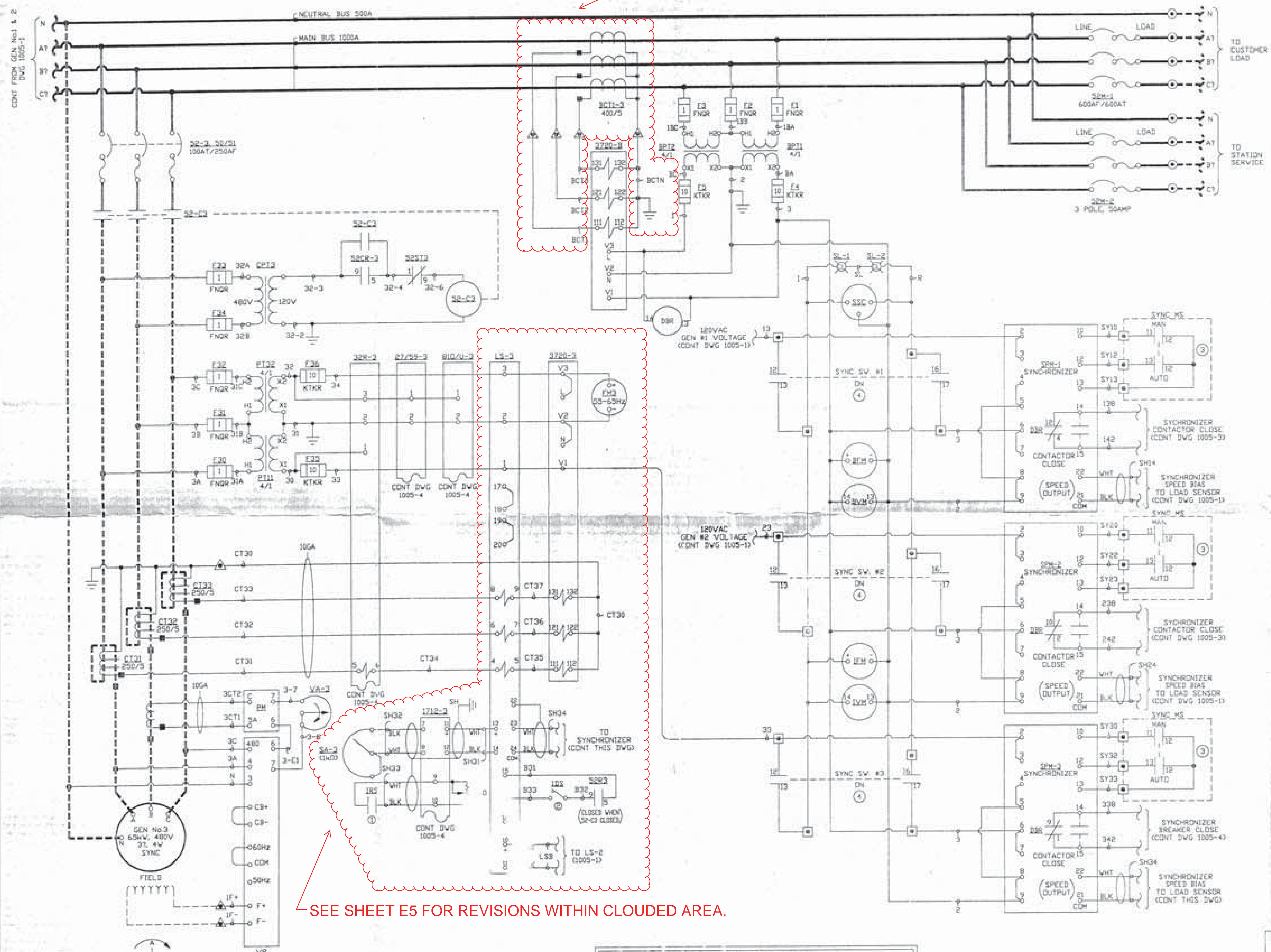
 ALASKA ENERGY AUTHORITY		
PROJECT: CHIGNIK LAGOON POWER PLANT DERA UPGRADE		
TITLE: GEN #3 ENGINE CONTROL WIRING JUNCTION BOX		
 Gray Stassel Engineering, Inc. P.O. 111405, Anchorage, AK 99511 (907)349-0100	DRAWN BY: JTD DESIGNED BY: CWV/BCG FILE NAME: CLAGDERA E1-6 PROJECT NUMBER:	SCALE: NO SCALE DATE: 6/5/18 SHEET: E6 OF 6

DISCONNECT THE 3 EXISTING CT'S AND SHORT OR ABANDON.
INSTALL 3 NEW SPLIT CORE CT'S AS SHOWN ON SHEET E4.

REVISIONS		
LTR	DESCRIPTION	DATE

NOTES	
①	IDLE - OPEN, RATED - CLOSED
②	ISOCH - CLOSED, DROOP - OPEN
③	SYNC MS LOCATED GEN DOORS
④	SSW LOCATED GEN DOORS
▲	CONTROL TERMINAL BLOCK
---	FIELD WIRING

DEVICE LEGEND	
1712	- GOVERNOR
27/59	- UNDER/OVER VOLTAGE
32R	- REVERSE POWER RELAY
3720	- COMBINED VOLT/AMP/KW METER
52	- CIRCUIT BREAKER
52-C	- CONTACTOR
52M	- MAIN DIST. CIRCUIT BREAKER
52CR	- CONTACTOR CLOSE RELAY
52COS	- CONTACTOR OPERATOR SWITCH
52R	- CONTACTOR RELAY
52ST	- CONTACTOR TRIP RELAY
B10/U	- OVER/UNDER FREQUENCY
BCT	- BUS CURRENT TRANSFORMERS
BFM	- BUS FREQUENCY METER
BPT	- BUS POTENTIAL TRANSFORMERS
BVM	- BUS VOLTMETER
CPT	- CONTRL. POWER TRANSFORMER
CT	- CURRENT TRANSFORMER
ECS	- ENGINE CONTROL SWITCH
F	- FUSE
FM	- FREQUENCY METER
IDS	- ISOCH/DROOP SWITCH
IFM	- INCOMING FREQUENCY METER
IRS	- IDLE/RATED SWITCH
IVM	- INCOMING VOLTMETER
PM	- PARALLEL MODULE
PT	- POTENTIAL TRANSFORMER
SH	- SHIELD
SL	- SYNC LIGHT
SPM	- SYNCHRONIZER
SSC	- SYNCHROSCOPE
SA	- SPEED ADJUST
SYNC MS	- SYNC MODE SWITCH
VA	- VOLTAGE ADJUST
VR	- VOLTAGE REGULATOR



SEE SHEET E5 FOR REVISIONS WITHIN CLOUDED AREA.

DRAWING LIST	
1005-1	- GEN No.1 & 2 THREE LINE DIAGRAM
1005-2	- SYNC SCHEME & GEN No.3 THREE LINE
1005-3	- GEN #1 & 2 12VDC CONTROL LADDERS
1005-4	- GEN #3 12VDC CONTROL LADDER
1005-5	- PANEL LAYOUT/DIMENSIONAL
1005-M	- MATERIAL LIST

EMERSON POWER PRODUCTS

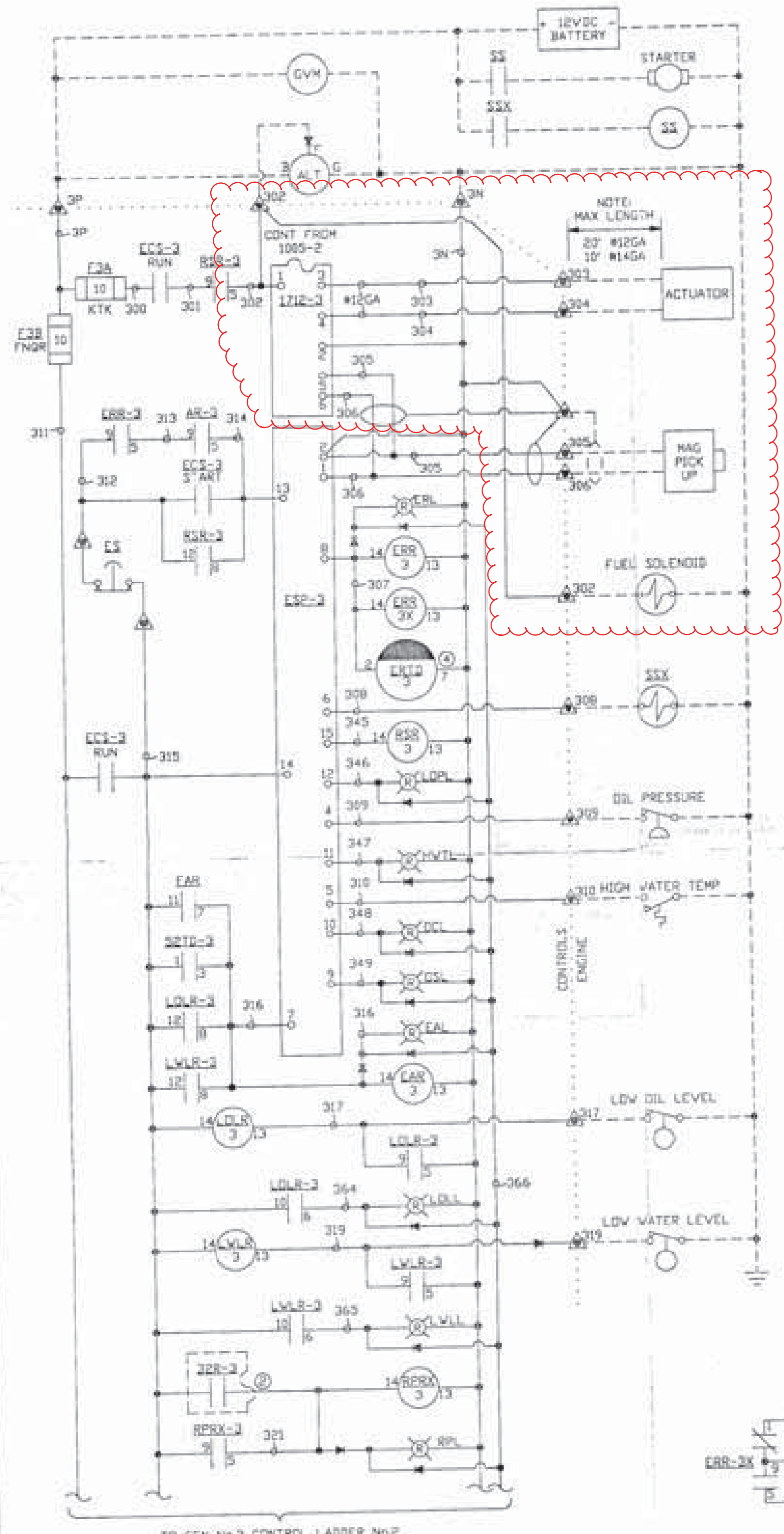
VILLAGE OF CHIGNIK LAGOON
THREE GENERATOR PARALLELING PANEL W/AUTO
GEN No.3 & SYNC SCHEME THREE LINE

DATE: 10/31/95
ENGINEER: D.DAVIS
DRAFTER: DRF

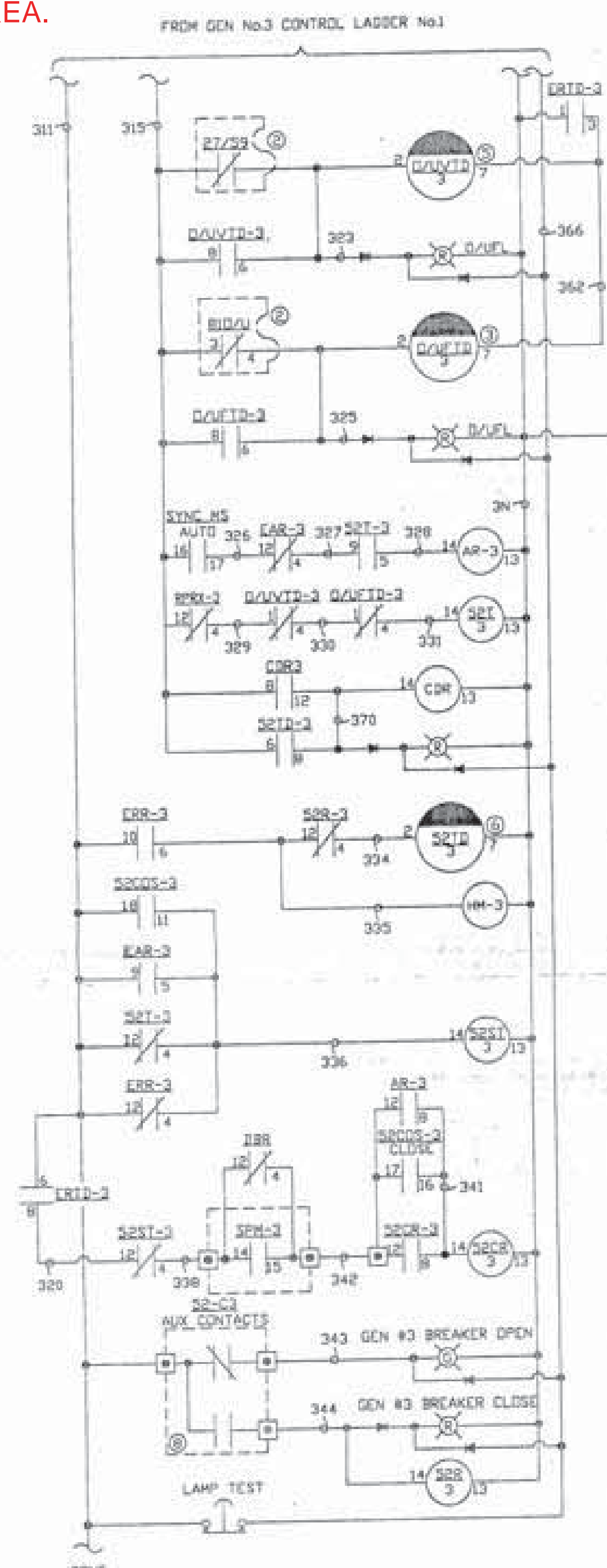
JOB NO: 1005 SCALE: N/A DRAWING NO: 1005-2 REV:

REVISIONS		
LTR	DESCRIPTION	DATE

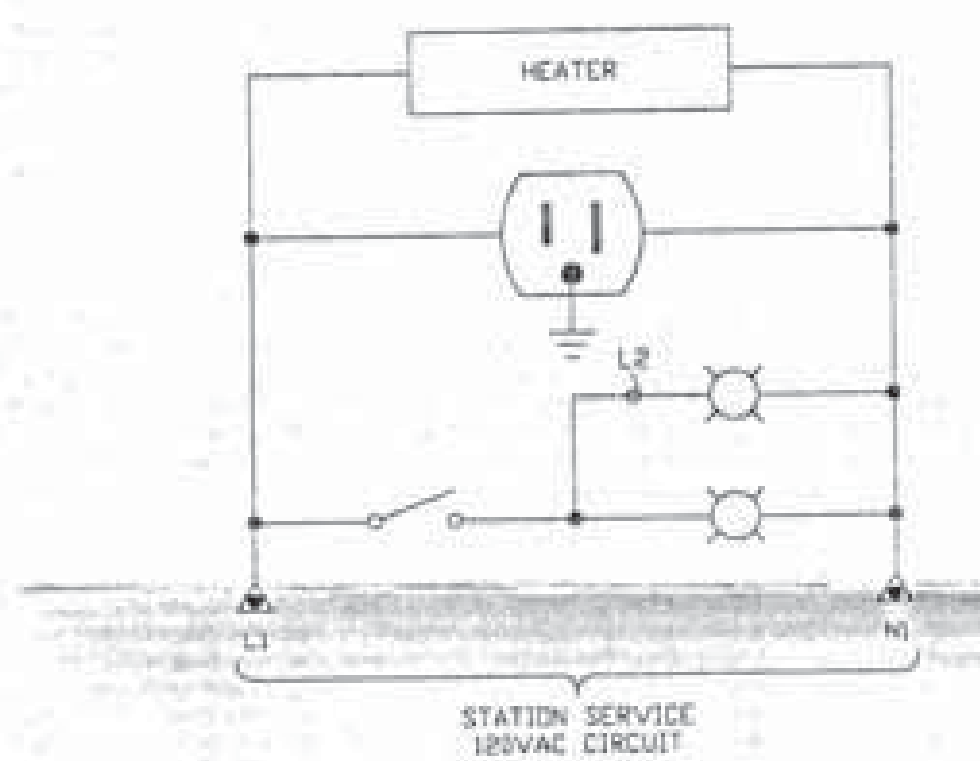
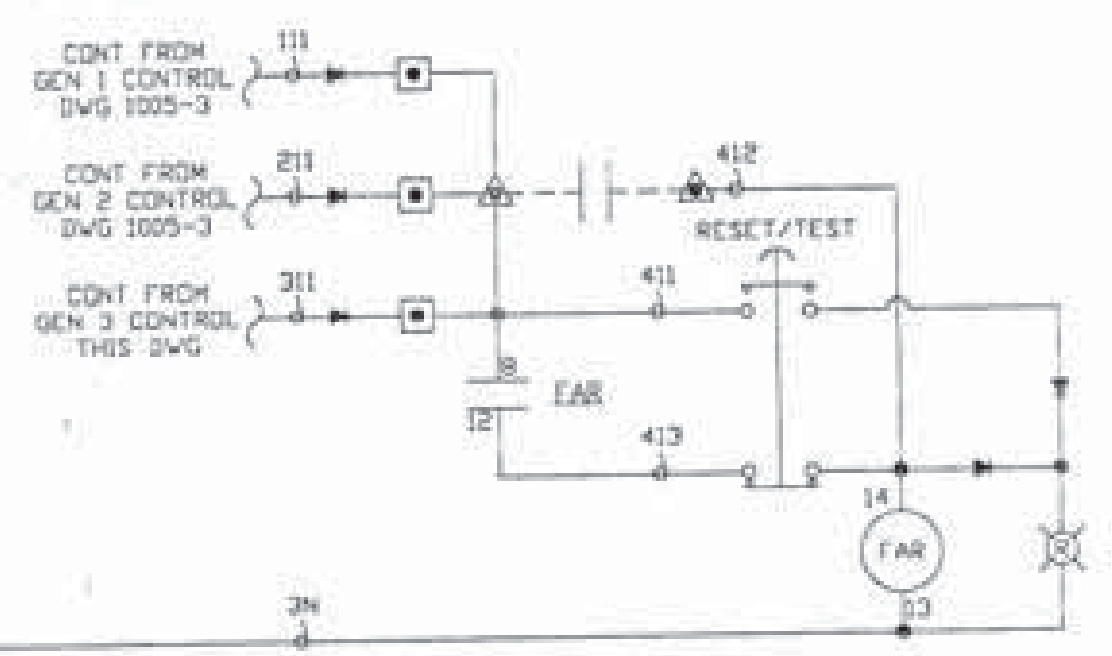
SEE SHEET E5 FOR REVISIONS WITHIN CLOUDED AREA.



GEN No.3 CONTROL LADDER No.1



GEN No.3 CONTROL LADDER No.2

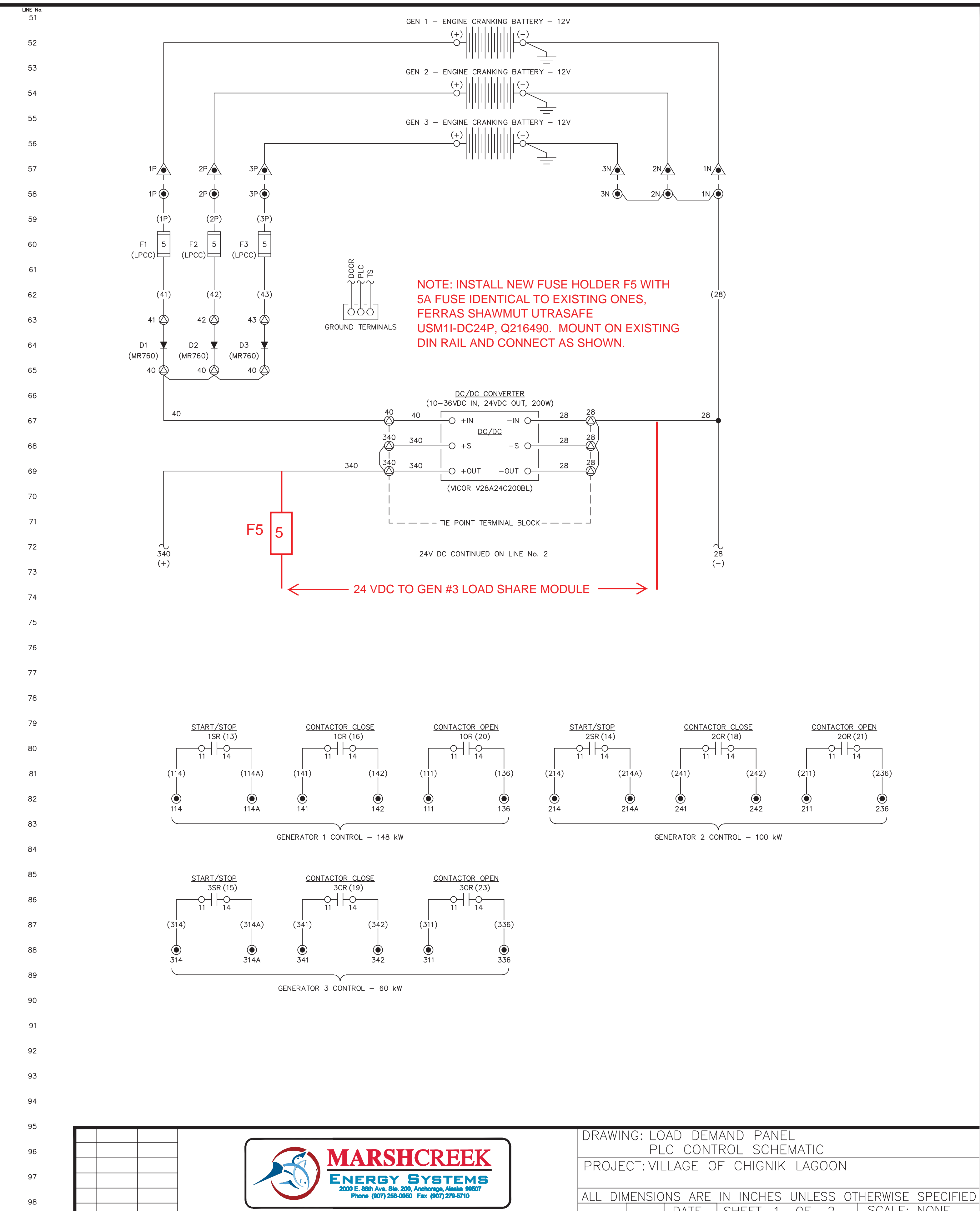
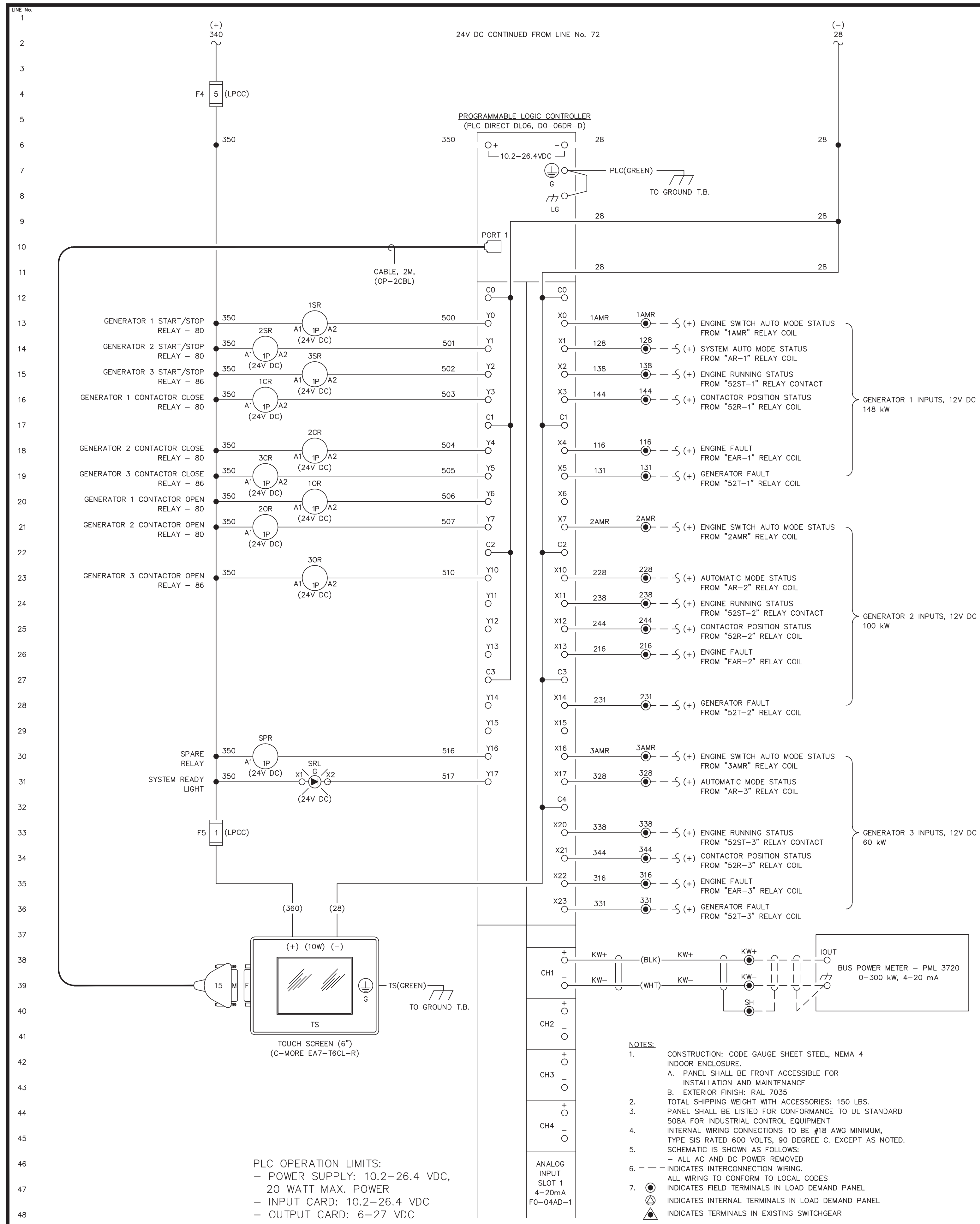


DEVICE LEGEND	
1712	- GOVERNOR
27	- UNDER VOLTAGE RELAY
32R	- REVERSE POWER RELAY
32	- CIRCUIT BREAKER
52CR	- CONTACTOR CLOSE RELAY
52CDS	- CONTACTOR OPERATOR SWITCH
52R	- CONTACTOR RELAY
52ST	- CONTACTOR TRIP RELAY
52T	- CONTACTOR ALARM RELAY
52TD	- CONTACTOR TIME DELAY
S9	- OVER VOLTAGE RELAY
S1U	- OVER FREQUENCY RELAY
ALT	- ALTERNATOR
AR	- AUTO RELAY
ASR	- AUTO START RELAY
CDL	- COOL DOWN LIGHT
CDR	- COOL DOWN RELAY
EAL	- ENGINE ALARM LIGHT
EAR	- ENGINE ALARM RELAY
ECS	- ENGINE CONTROL SWITCH
ERR	- ENGINE RUN RELAY
ESP	- ENGINE START PANEL
F	- FUSE
GVM	- GENERATOR VOLTMETER
HM	- HOURMETER
HWTL	- HIGH WATER TEMP LIGHT
LDLL	- LOW OIL LEVEL LIGHT
LDLR	- LOW OIL LEVEL RELAY
LDPL	- LOW OIL PRESSURE LIGHT
LWLL	- LOW WATER LEVEL LIGHT
LWLR	- LOW WATER LEVEL RELAY
DCL	- OVER CRANK LIGHT
DSL	- OVER SPEED LIGHT
O/UFL	- OVER/UNDER FREQUENCY LIGHT
O/UFR	- OVER/UNDER FREQUENCY RELAY
O/UFTD	- OVER/UNDER FREQUENCY TIME DELAY
O/UVTD	- OVER/UNDER VOLTAGE TIME DELAY
O/UVL	- OVER/UNDER VOLTAGE LIGHT
O/UVR	- OVER/UNDER VOLTAGE RELAY
RPL	- REVERSE POWER LIGHT
RPRX	- REVERSE POWER AUX RELAY
RSR	- RACK SOLENOID RELAY
SPM	- SYNCHRONIZER
SS	- STARTER SOLENOID
SXX	- START SOLENOID SLAVE RELAY

DRAWING LIST	
1005-1	- GEN No.1 & 2 THREE LINE DIAGRAM
1005-2	- SYNC SCHEME & GEN No.3 THREE LINE
1005-3	- GEN 1 & 2 12VDC CONTROL LADDERS
1005-4	- GEN 3 12VDC CONTROL LADDER
1005-5	- PANEL LAYOUT/DIMENSIONAL
1005-M	- MATERIAL LIST

NOTES	
①	- CONT FROM DWG 1005-1
②	- CONT FROM DWG 1005-2
③	- O/UFTD SET FOR 5 SEC. DELAY ON MAKE
④	- ERTD SET FOR 5 SEC. DELAY ON MAKE
⑤	- O/UVTD SET FOR 5 SEC. DELAY ON MAKE
⑥	- S2TD SET FOR 3 MIN. DELAY ON MAKE
⑦	- LOCATED IN GENERATOR MAIN BREAKER
⑧	- LOCATED IN CONTACTOR C3
▲	- ENGINE INTERCONNECT TERMINAL BLOCK
■	- CONTROL TERMINAL BLOCK
---	- ENGINE/GEN WIRING

EMERSON POWER PRODUCTS		
	VILLAGE OF CHIGNIK LAGOON THREE GENERATOR PARALLELING PANEL W/AUTO GEN #3 CONTROL LADDER	
DATE: 10/31/95	SCALE: N/A	DRAWING NO: 1005-4
ENGINEER: D.DAVIS		REV:
DRAFTER: CRF		
JOB NO: 1005		



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DRAWING: LOAD DEMAND PANEL
PLC CONTROL SCHEMATIC
PROJECT: VILLAGE OF CHIGNIK LAGOON

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

DESIGNED	DMJ	DATE	02-01-11	SHEET	1 OF 2	SCALE:	NONE
CHECKED	BMB	DATE	02-01-11	DRAWING NO.	11-1447-1		
DRAFTED	DMJ	DATE	02-01-11	REV.	-		

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