CLARK'S POINT & PORT HEIDEN RURAL POWER SYSTEM UPGRADE PROJECTS
ITB 19041 - MODULAR POWER PLANT ASSEMBLY

CLARK'S POINT MODULAR POWER PLANT ASSEMBLY DESIGN DRAWINGS

M1.1	MECHANICAL LEGEND, SCHEDULES, & SEQUENCE OF OPERATIONS
M1.2	WARNING SIGN & FIRE EXTINGUISHER PLAN, SIGN & VALVE TAG SCHEDULES
M2.1	MECHANICAL PENETRATIONS PLAN, ELEVATION, & DETAILS
M2.2	MECHANICAL SUPPORT PLANS & DETAILS
M2.3	RADIATOR SUPPORT PLAN & DETAILS
M2.4	MECHANICAL SUPPORT HORIZONTAL WALL STRUT INSTALLATION
M2.5	MECHANICAL SUPPORT VERTICAL WALL STRUT INSTALLATION
M3.1	EQUIPMENT LAYOUT PLAN, SECTIONS, & DETAILS
M3.2	WALL ELEVATIONS & PIPING DETAILS
M3.3	GENERATOR FABRICATION DETAILS
M3.4	GLYCOL STORAGE & EXPANSION TANK FABRICATION
M4.1	COOLANT & HEAT RECOVERY PIPING PLAN & DETAILS
M4.2	COOLANT & HEAT RECOVERY ISOMETRICS & DETAILS
M5.1	DIESEL FUEL & USED OIL PIPING PLAN, DIAGRAM, & DETAILS
M5.2	DIESEL FUEL & USED OIL PIPING ELEVATIONS & DETAILS
M5.3	200 GALLON DAY TANK FABRICATION
M5.4	USED OIL BLENDER FILTER BANK LAYOUT & CONFIGURATION
M5.5	USED OIL BLENDER TYPICAL FILTER HOUSING DETAILS
M5.6	USED OIL BLENDER 25 GALLON HOPPER FABRICATION
M6	EXHAUST & CRANK VENT PLAN & DETAILS
M7.1	VENTILATION PLAN & DETAILS
M7.2	SHEET METAL FABRICATION DETAILS
FS1	FIRE SUPPRESSION SYSTEM PLAN, SECTION, LEGEND, & NOTES
E1.1	ELECTRICAL LEGENDS & SCHEDULES
E3.1	WIREWAY PLAN, MODULE SECTION, & DETAILS
E3.2	ELEVATIONS & DETAILS
E3.3	ELEVATIONS & DETAILS
E4.1	RECEPTACLE & LIGHTING PLANS & STATION SERVICE PANEL
E4.2	STATION SERVICE PLAN, DETAILS, & PANEL
E5	INSTRUMENTATION & DATA PLANS & DETAILS
E6.1	SWITCHGEAR ENCLOSURE LAYOUT
E6.2	SWITCHGEAR ONE-LINE & SCHEMATICS
E6.3	24VDC ENGINE WIRING JUNCTION BOX
E6.4	BOILER SCR PANEL 3-LINE & SCHEMATICS
E7.1	FUEL SYSTEM CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS
E7.2	FUEL SYSTEM CONTROL PANEL LAYOUT & TERMINAL STRIPS
E7.3	FUEL SYSTEM CONTROL PANEL SEQUENCE OF OPERATION & DETAILS
A1	FLOOR PLAN, REFLECTED CEILING PLAN, CODE ANALYSIS, & GENERAL NOTES
A2	INTERIOR ELEVATIONS & DOOR/WINDOW DETAILS

PORT HEIDEN MODULAR POWER PLANT ASSEMBLY DESIGN DRAWINGS

M1.1	MECHANICAL LEGEND, SCHEDULES, & SEQUENCE OF OPERATIONS
M1.2	WARNING SIGN & FIRE EXTINGUISHER PLAN, SIGN & VALVE TAG SCHEDULES
M2.1	MECHANICAL PENETRATIONS PLAN, ELEVATION, & DETAILS
M2.2	MECHANICAL SUPPORT PLANS & DETAILS
M2.3	RADIATOR SUPPORT PLAN & DETAILS
M2.4	MECHANICAL SUPPORT HORIZONTAL WALL STRUT INSTALLATION
M2.5	MECHANICAL SUPPORT VERTICAL WALL STRUT INSTALLATION
M3.1	EQUIPMENT LAYOUT PLAN, SECTIONS, & DETAILS
M3.2	WALL ELEVATIONS & PIPING DETAILS
M3.3	GENERATOR FABRICATION DETAILS
M3.4	GLYCOL STORAGE & EXPANSION TANK FABRICATION
M4.1	COOLANT & HEAT RECOVERY PIPING PLAN & DETAILS
M4.2	COOLANT & HEAT RECOVERY ISOMETRICS & DETAILS
M5.1	DIESEL FUEL & USED OIL PIPING PLAN, DIAGRAM, & DETAILS
M5.2	DIESEL FUEL & USED OIL PIPING ELEVATIONS & DETAILS
M5.3	200 GALLON DAY TANK FABRICATION
M6	EXHAUST & CRANK VENT PLAN & DETAILS
M7.1	VENTILATION PLAN & DETAILS
M7.2	SHEET METAL FABRICATION DETAILS
FS1	FIRE SUPPRESSION SYSTEM PLAN, SECTION, LEGEND, & NOTES
E1.1	ELECTRICAL LEGENDS & SCHEDULES
E3.1	WIREWAY PLAN, MODULE SECTION, & DETAILS
E3.2	ELEVATIONS & DETAILS
E3.3	ELEVATIONS & DETAILS
E4.1	RECEPTACLE & LIGHTING PLANS & STATION SERVICE PANEL
E4.2	STATION SERVICE PLAN, DETAILS, & PANEL
E5	INSTRUMENTATION & DATA PLANS & DETAILS
E6.1	SWITCHGEAR ENCLOSURE LAYOUT
E6.2	SWITCHGEAR ONE-LINE & SCHEMATICS
E6.3	24VDC ENGINE WIRING JUNCTION BOX
E7.1	DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS
E7.2	DAY TANK CONTROL PANEL LAYOUT & TERMINAL STRIPS
E7.3	DAY TANK CONTROL PANEL SEQUENCE OF OPERATION & DETAILS
A1	FLOOR PLAN, REFLECTED CEILING PLAN, CODE ANALYSIS, & GENERAL NOTES
A2	INTERIOR ELEVATIONS & DOOR/WINDOW DETAILS

OWNER FURNISHED MODULE STRUCTURE APPROVED SHOP DRAWINGS

E1	BASE FRAMING PLAN
E2	CEILING FRAMING PLAN
E3	EXTERIOR ELEVATIONS
E4	FLOOR PLAN
E5	DECK & CEILING PLATES
E6	RADIATOR SUPPORTS & STAIR FRAMING PLANS
D1	BASE BEAM DETAILS
D2	WALL FRAMING DETAILS
D3	CEILING TUBE DETAILS
D4	MISCELLANEOUS DETAILS
D5	STAIR ASSEMBLY DETAILS

NOTE: ONE SET OF SHOP DRAWINGS PROVIDED. THE TWO MODULE STRUCTURES ARE IDENTICAL EXCEPT AS NOTED ON SHEET E4.

ALASKA ENERGY AUTHORITY

PROJECT: CLARK'S POINT & PORT HEIDEN RURAL POWER SYSTEM UPGRADE PROJECTS

TITLE: MODULAR POWER PLANT ASSEMBLY SCHEDULE OF DRAWINGS

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DRAWN BY: BCG | SCALE: NO SCALE
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: CKPT&PTH G1 | SHEET: G1 OF 1
PROJECT NUMBER:

LEGEND

- DIRECTION OF FLOW
- CHANGE OF PIPE SIZE
- PIPING CONNECTION (TEE)
- ELBOW TURNED DOWN
- ELBOW TURNED UP
- FLANGED JOINT
- UNION
- FLEXIBLE CONNECTOR
- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- HOSE END DRAIN VALVE
- GAUGE COCK
- AUTOMATIC AIR VENT
- (T) THERMOMETER
- (P) PRESSURE GAUGE
- (TT) TEMPERATURE TRANSMITTER
- (PT) PRESSURE TRANSMITTER
- (FM) FLOW METER
- (FS) FLOAT SWITCH
- (LCA) LOW COOLANT ALARM
- (TLM) TANK LEVEL MONITOR
- (LSP) LEVEL SENSOR PROBE
- (GLS) GLYCOL LEVEL SENSOR

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

EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS (APPLIES TO ALL SCHEDULES):
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.

ENGINE COOLING SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
R-1 R-2	GLYCOL RADIATOR	SINGLE PASS, 4 ROW, VERTICAL CORE, 3" FLANGED CONNECTIONS, GALVANIZED COATING, EXPANDED METAL GUARD. 6,000 BTU/MIN AT 77°F AMBIENT, 50 GPM 50% ETHYLENE GLYCOL AT 192F IN, 0.22 PSI MAX GLYCOL PRESSURE DROP. 3 HP, 460 V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO.	DIESEL RADIATOR PART NO. DR3490
TV-1	COOLANT THERMOSTATIC VALVE	3" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS – 185F NOMINAL TEMPERATURE	FPE PART NO. A3010-185
TV-2	HEAT RECOV. THERMOSTATIC VALVE	2-1/2" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS, 185F NOMINAL TEMPERATURE,	FPE PART NO. A2510-185
ET-1	GEN COOLANT EXPANSION TANK	24 GALLON CAPACITY TANK, 12.75" O.D x 48" LONG FABRICATED STEEL TANK, SEE FABRICATION DETAIL	CUSTOM FABRICATION
HP-EC	ENGINE COOLANT FILL HAND PUMP	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100
G-EC	ENGINE COOLANT GLYCOL TANK LEVEL GAUGE	MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL, 25 PSIG MAX OPERATING PRESSURE, 35" LIQUID COLUMN PLUS 4" RISER.	ROCHESTER MODEL 8660

HEAT RECOVERY & PLANT HEATING EQUIPMENT SCHEDULE:

HX-1	POWER PLANT HEAT EXCHANGER	316 SS PLATES, BRAZED CONST. 2.5" NPT, 150 MBH MIN CAPACITY. PRIMARY: 35 GPM 195F EWT (50% ETHYLENE) 1.2 PSI MAX WPD, SECONDARY: 35 GPM 185F LWT (50% PROPYLENE) 1.2 PSI MAX WPD	AMERIDEX SL-140-50
P-HR1	CONTROL ROOM HEAT	1 GPM AT 18' TDH, 1/25HP, 115V, 1ø. PROVIDE WITH 3/4" SOLDER COMPANION SHUT OFF FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 15-58FC, SPEED 3
P-HR2A	HEAT RECOV. PRIMARY	35 GPM AT 7' TDH, 1/6HP, 115V, 1ø. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 50-75F
P-HR2B	HEAT RECOV. SECONDARY	35 GPM AT 17' TDH, 1/2HP, 115V, 1ø. PROVIDE WITH 1-1/4" SOLDER COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 32-80/2 SPEED 3
CUH-1	CONTROL ROOM HEAT	FLOOR MOUNTED HOT WATER CABINET UNIT HEATER, 18 MBH AT 1 GPM 180F EWT & 60F EAT.	TOYOTOMI HC-20
ET-2	HEAT RECOV. EXP. TANK	BLADDER TYPE EXPANSION TANK, 44 GALLON TANK, 22 GALLON ACCEPTANCE VOL, 125 PSIG WORKING PRESSURE, 12 PSIG PRE-CHARGE.	AMTROL AX-80
P-EB1	ELECTRIC BOILER CIRC.	11 GPM AT 8' TDH, 1/25HP, 115V, 1ø. PROVIDE WITH 1-1/4" SOLDER COMPANION SHUT OFF FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 15-58F SPEED 3
EB-1	ELECTRIC BOILER	CLEAN WATER CIRCULATION HEATER. 5" FLANGED PIPE BODY, 2" MPT PIPING CONNECTIONS, 24KW CAPACITY, 6 ELEMENTS, 4 KW EACH, 480V DELTA WITH GENERAL PURPOSE TERMINAL ENCLOSURE.	CHROMALOX NWH-06-024P-E1

VENTILATION EQUIPMENT SCHEDULE:

EF-1 EF-2	GENERATION ROOM EXHAUST FANS	DIRECT DRIVE 14"ø PROPELLER SIDEWALL EXHAUST FAN, 2,100 CFM AT 0.375" SP, 1,750 RPM. FURNISH WITH SPECIAL 1/2 HP, 115 V, 1 PH VARIGREEN MOTOR WITH OPTIONAL 0-10V LEADS	GREENHECK SE1-14-436-VG (1/2 HP)
EF-1 EF-2 COMB.	FAN & INTAKE DAMPERS	OPPOSED BLADE LOW-LEAKAGE CONTROL DAMPER, GALVANIZED STEEL CONSTRUCTION, 304 STAINLESS STEEL BEARINGS AND JAMB SEALS, EPDM BLADE SEALS.	GREENHECK VCD-23
(MD)	MOTORIZED DAMPER ACTUATOR	120V SPRING RETURN ACTUATOR	BELIMO AF-BUP

FUEL SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
P-DF1	DAY TANK FILL PUMP	ROTARY GEAR PUMP, 1/2" FPT INLET AND OUTLET, DUCTILE IRON CONSTRUCTION WITH STAINLESS STEEL SHAFT, BUNA-N LIP SEAL, CARBON BEARINGS, DIRECT FLEX COUPLED TO 1725 RPM ODP THERMALLY PROTECTED, AUTO RESET MOTOR, 1/3 HP, 115 V, 1 PH, 60 HZ, 4.0 GPM @ 20 PSID.	OBERDORFER C992M3E5QF50
P-DF2 P-UO1	DIESEL CIRC, & USED OIL DRAIN PUMPS	ROTARY GEAR PUMP, 1/2" FPT INLET AND OUTLET, BRONZE CONSTRUCTION WITH SS SHAFTS, BUNA-N SEAL, CARBON BEARINGS, DIRECT FLEX COUPLED TO 1150 RPM ODP THERMALLY PROTECTED, AUTO RESET MOTOR, 1/2 HP, 115 V, 1 PH, 60 HZ, 6.6 GPM @ 20 PSID. PROVIDE WITH 40 PSID INTERNAL PRV.	OBERDORFER N994RH-J46
P-UO2	USED OIL INJECTION PUMP	ROTARY GEAR PUMP GEAR PUMP – 1.2 GPH @ 15 PSID, 1/8" FPT INLET AND OUTLET, PEEK GEARS, PTFE SEALS, MAGNETICALLY COUPLED TO 1725 RPM TEFC THERMALLY PROTECTED AUTO RESET MOTOR, 1/4 HP, 115 V, 1 PH, 60 HZ. FURNISH WITH BASE MOUNT S56C FRAME INDUSTRIAL MOTOR.	MICROPUMP GA-V21.J8FS.A PUMP WITH #81518 ADAPTER & BALDOR CFDL3504M MOTOR
HP-DT	DAY TANK FILL HAND PUMP	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100
G-DT	DAY TANK LEVEL GAUGE	MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL, 25 PSIG MAX OPERATING PRESSURE, 35" LIQUID COLUMN PLUS 4" RISER.	ROCHESTER MODEL 8660
M-DT	DAY TANK METER	STEEL BODY, 1" ANSI 300# FLANGED ENDS, 20-800 GPH FLOW RANGE, O-RINGS AND SEALS COMPATIBLE WITH #1 DIESEL, DIRECT READ 6-DIGIT REGISTER TO 0.1 GAL, DRY CONTACT PULSER.	ISTEC CONTOIL 9226-F
F-DT	DAY TANK FILTER	10 MICRON FILTER FOR DIESEL FUEL, CLEAR BOWL WITH BOTTOM DRAIN VALVE, 150 PSIG MAXIMUM OPERATING PRESSURE, 25 GPM MAXIMUM FLOW. REPLACE FPT HEAD ASSEMBLY WITH CUSTOM FABRICATED STEEL HEAD WITH ANSI 150# FLANGED ENDS. FURNISH COMPLETE WITH WRENCH AND 5 SPARE FILTER ELEMENTS.	SUPERIOR MACHINE & WELDING HEAD WITH GOLDEN ROD NO. 495-4 BOWL, 491 WRENCH, 470-5 ELEMENTS
F-UOB	USED OIL BLENDER FILTER	CUSTOM FABRICATED FILTER BANK. FURNISH WITH TWO STAGE ELEMENTS: 10 MICRON HYDROSORB II FILTER 2 MICRON PARTICULATE FILTER PROVIDE 3 OF EACH ELEMENT TYPE	CIM-TEK #300342 CIM-TEK #30066

PIPE/TUBING STRUT CLAMP SCHEDULE

PIPE/TUBE	CLAMP #	PIPE/TUBE	CLAMP #
1/2" COPPER	BVT062	1/2" STEEL	B2008
3/4" COPPER	BVT087	3/4" STEEL	B2009
1" COPPER	BVT112	1" STEEL	B2010
1-1/4" COPPER	BVT125	1-1/4" STEEL	B2011
1-1/2" COPPER	BVT162	1-1/2" STEEL	B2012
2" COPPER	BVT212	2" STEEL	B2013
2-1/2" COPPER	BVT262	2-1/2" STEEL	B2014
3" COPPER	BVT312	3" STEEL	B2015
4" COPPER	BVT412	4" STEEL	B2017

NOTES:
1) ALL CLAMP NUMBERS ARE B-LINE. EQUIVALENT EQUALS ACCEPTABLE.
2) ALL COPPER TUBE CLAMPS TO BE CUSHIONED, VIBRA-CLAMP.
3) ALL STEEL PIPE CLAMPS NOT CUSHIONED. USE FOR ALL STEEL PIPE AND RIGID CONDUIT.
4) SEE PLANS, ELEVATIONS, ISOMETRICS, AND DETAILS FOR ACTUAL PIPE SIZES.

INSTRUMENTATION: SEE ELECTRICAL INSTRUMENTATION SCHEDULE ON SHEET E1.1 FOR INSTRUMENTATION DEVICES SHOWN ON THE MECHANICAL DRAWINGS.

SEQUENCE OF OPERATIONS

DAY TANK WILL HAVE AUTOMATIC FILL CONTROLS WITH REDUNDANT HIGH AND LOW LEVEL ALARMS AND TIMERS. USED OIL/DIESEL FUEL BLENDER WILL RUN ANY TIME DAY TANK FILL PUMP RUNS. SEE FUEL SYSTEM CONTROL PANEL DRAWINGS FOR DETAILED SEQUENCE.

ALL DAMPER MOTORS WILL BE NORMALLY CLOSED SPRING RETURN AND WILL CLOSE ON LOSS OF POWER (FIRE ALARM) IN LESS THAN 30 SECONDS. VENTILATION AIR INTAKE AND EXHAUST MOTORIZED DAMPERS WILL OPEN ANY TIME ASSOCIATED EXHAUST FAN OPERATES. THE COMBUSTION AIR INTAKE MOTORIZED DAMPER WILL BE OPEN ANY TIME PLANT OPERATES (STATION SERVICE POWER ON).

EXHAUST FANS EF-1 AND EF-2 WILL OPERATE ON A CALL FOR COOLING THROUGH A 24VAC DIGITAL MODULATING THERMOSTAT. THE THERMOSTAT WILL PROVIDE A 0-10V SIGNAL TO MODULATE THE FAN SPEED AS REQUIRED TO MAINTAIN GENERATING ROOM TEMPERATURE, 75F, ADJUSTABLE.

CABINET UNIT HEATER CUH-1 AND CIRCULATING PUMP P-HR1 WILL OPERATE ON A CALL FOR HEATING THROUGH THE INTERNAL CUH CONTROLS TO MAINTAIN CONTROL ROOM TEMPERATURE, 65F, ADJUSTABLE.

RADIATOR FAN MOTORS WILL OPERATE UNDER VARIABLE FREQUENCEY DRIVE (VFD) CONTROL. WHEN THE COOLANT RETURN TEMP REACHES THE WAKE UP SETPOINT THE MOTOR WILL START AT MINIMUM SPEED AND RAMP UP TO THE REQUIRED SPEED. USING PID CONTROL, THE VFD WILL MODULATE THE FAN SPEED AS REQUIRED TO MAINTAIN COOLANT RETURN TEMP AT THE PID REFERENCE SETPOINT. AS THE COOLANT RETURN TEMP RISES, THE VFD WILL INCREASE THE SPEED OF THE FAN MOTOR UP TO 100%. ONCE THE FAN REACHES THE MINIMUM SPEED, THE VFD WILL MAINTAIN THAT SPEED UNTIL THE LOW SPEED TIME OUT EXPIRES. WHEN THE LOW SPEED TIME OUT EXPIRES THE MOTOR WILL STOP. THE MOTOR WILL REMAIN OFF UNTIL THE COOLANT RETURN TEMP RISES TO THE WAKE UP SETPOINT. THE INITIAL OPERATING SETTINGS SHALL BE SET TO THE FOLLOWING VALUES AND SHALL BE ADJUSTABLE:
170F = PID REFERENCE TEMPERATURE 160F = WAKE UP TEMPERATURE
0.93 = PROPORTIONAL GAIN 0.3 = INTEGRAL GAIN 0 = DERIVATIVE
6 HZ = MINIMUM SPEED 60 SEC = LOW SPEED TIME OUT

HEAT RECOVERY PUMPS P-HR2A AND P-HR2B WILL OPERATE CONTINUOUSLY UNDER MANUAL CONTROL.

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

WHEN THE HEAT RECOVERY RETURN TEMP. IS EQUAL TO OR GREATER THAN THE HEAT RECOVERY SUPPLY TEMP. FOR 60 MINUTES, AN AMBER LAMP "NO LOAD ON HEAT RECOVERY" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE. WHEN THE HEAT RECOVERY SUPPLY TEMP. IS A MIN. OF 1°F GREATER THAN THE HEAT RECOVERY RETURN TEMP. THE LAMP WILL TURN OFF.

WHEN THE FLOW RATE IN THE HEAT RECOVERY PIPING FALLS BELOW 10 GPM FOR 15 MINUTES, A RED LAMP "HEAT RECOVERY LOSS OF FLOW" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE.

ELECTRIC BOILER PUMP P-EB1 WILL OPERATE CONTINUOUSLY UNDER MANUAL CONTROL. PUMP SHALL RUN ANYTIME THE REMOTE ELECTRIC WIND POWER GENERATORS ARE AVAILABLE TO RUN.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

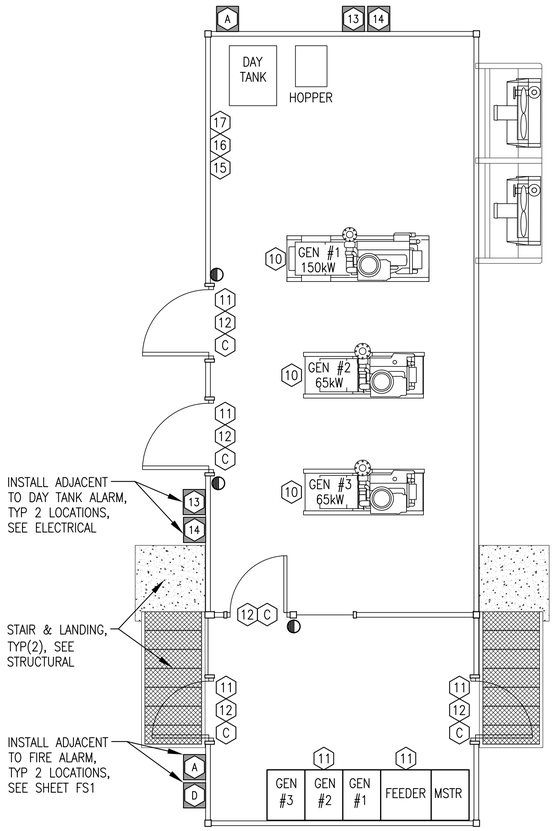
DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
MECHANICAL LEGENDS, SHEDULES & SEQUENCE OF OPERATIONS

M1.1

SHEET OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019



1 M1.2 POWER PLANT WARNING SIGN/PLACARD & FIRE EXTINGUISHER PLAN
1/4"=1'-0"

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

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

(#) DECALS – DECALS TO BE WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, ONE SIDE ONLY, SELF ADHESIVE BACK. NOMINAL 10"x14" SIZE UNLESS INDICATED OTHERWISE OR REQUIRED TO BE LARGER FOR SPECIFIED LETTER SIZE. WARNING LITES OR EQUAL. INSTALL ON FACE OF DOORS OR ELECTRICAL ENCLOSURES WHERE INDICATED. CLEAN SURFACES AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

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

WARNING SIGNS – RED LETTERING ON WHITE BACKGROUND.

(A) "FIRE ALARM"

(C) "CAUTION, ROOM PROTECTED BY WATER MIST FIRE PROTECTION SYSTEM, IN CASE OF FIRE KEEP DOOR CLOSED AND DO NOT ENTER"

(D) "FLASHING LIGHT MEANS FIRE SUPPRESSION AGENT HAS DISCHARGED"

(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 SPILL CALL DEC 1-800-478-9300"

INFORMATIONAL PLACARDS – BLACK LETTERING ON WHITE BACKGROUND.

(15) "CHECK INTERMEDIATE TANK LEVEL DAILY, FILL WHEN BELOW 4'-0"

(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"

(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 & PLACE OLD ONE IN HOPPER
5) CLOSE DRAIN VALVE & REFILL ENGINE
6) RUN ENGINE, SHUT OFF, & CHECK DIPSTICK
7) TOP OFF & PLACE ENGINE BACK IN SERVICE"

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 APPROVED EQUAL.
NOTE: PROVIDE TAGS NOTED AS DECALS WITHOUT ALUMINUM BACKING PLATE.

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"
(23) "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF BLENDER"
(24) "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ENGINE"

BROWN (USED OIL)

(41) "NORMALLY CLOSED, OPEN ONLY FOR ENGINE OIL CHANGE"
(42) "BLENDER FILTER #1, 10 MICRON HYDROSORB" (DECAL)
(43) "BLENDER FILTER #2, 2 MICRON PARTICULATE" (DECAL)

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"
(62) "NORMALLY OPEN, HEAT RECOVERY SUPPLY"
(63) "NORMALLY OPEN, HEAT RECOVERY RETURN"
(64) "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF SYSTEM"

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.

NOTES:
1) SEE DRAWINGS THAT FOLLOW FOR LOCATIONS OF ALL SPECIFIC FUNCTION TAGS.
2) 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.

MODULE SHOP/ON-SITE NOTES:

1) FURNISH AND INSTALL ALL DECALS, SIGN BOARDS. AND FIRE EXTINGUISHERS AS PART OF THE MODULE SHOP FABRICATION WORK.

2) FURNISH AND INSTALL ALL VALVE TAGS AS PART OF THE MODULE SHOP FABRICATION WORK.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

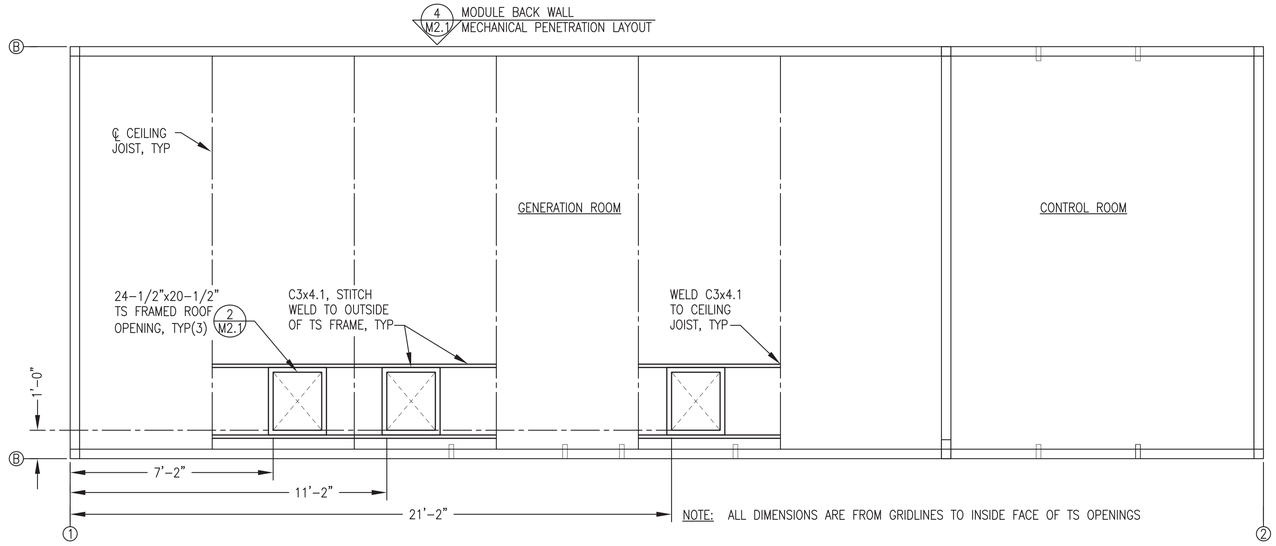
DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
WARNING SIGN & FIRE EXTINGUISHER PLAN, SIGN & VALVE TAG SCHEDULES

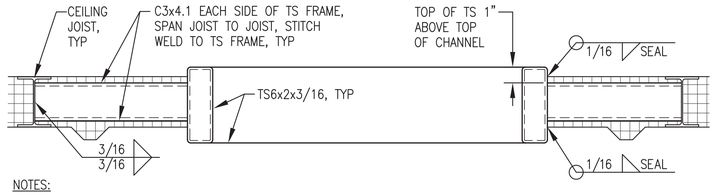
M1.2

SHEET | OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019



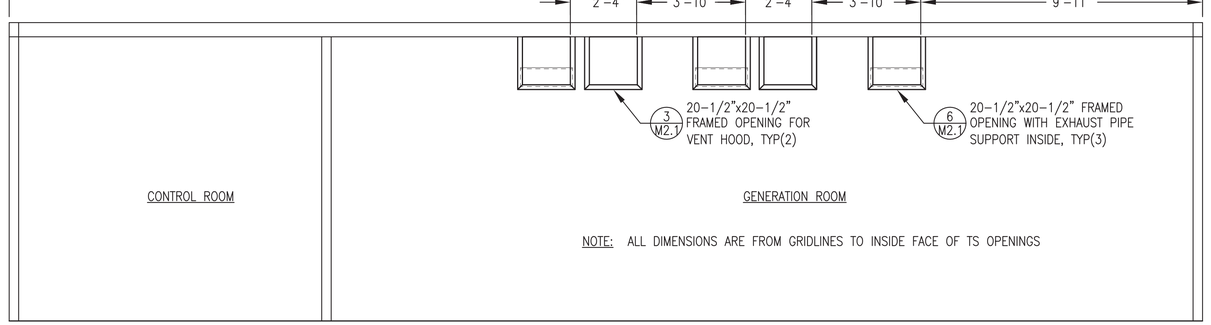
1 M2.1 MODULE MECHANICAL ROOF PENETRATION PLAN
3/8"=1'-0"



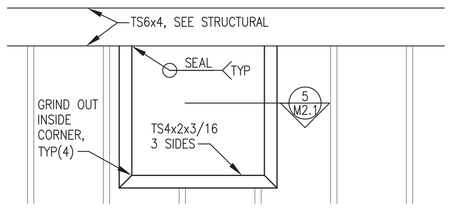
NOTES:

1) FABRICATE FRAMED OPENING WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED ON PLANS.
3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.

2 M2.1 TYPICAL ROOF OPENING DETAIL
2"=1'-0"



4 M2.1 MODULE MECHANICAL WALL PENETRATIONS AT GRID A – EXTERIOR ELEVATION
1/2"=1'-0"

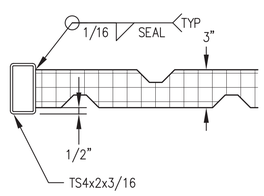


NOTE: SEE ELEVATION FOR INSIDE CLEAR OPENING SIZE.

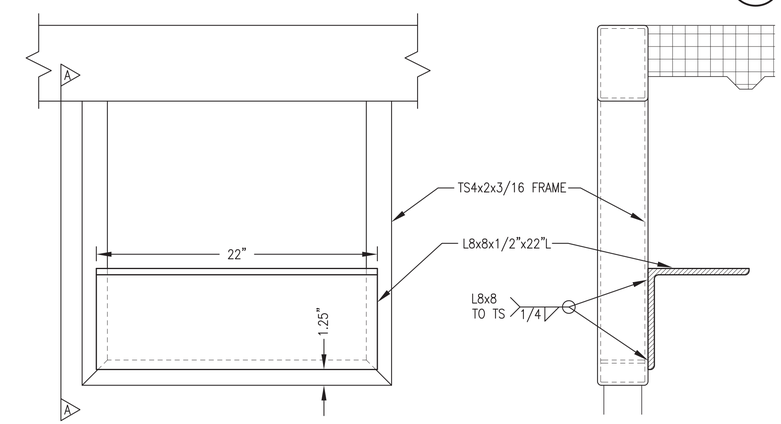
3 M2.1 TYPICAL WALL OPENING – ELEVATION
1"=1'-0"

NOTES:

1) FABRICATE FRAMED OPENING WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED ON ELEVATIONS.
3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.



5 M2.1 TYPICAL SECTION THROUGH WALL OPENING
2"=1'-0"



6 M2.1 EXHAUST PIPE SUPPORT AT FRAMED OPENING
2"=1'-0"

NOTE: THIS DRAWING SHOWS WORK THAT WAS PERFORMED BY OTHERS AS PART OF THE FABRICATION OF THE OWNER FURNISHED MODULE STRUCTURE AND IS PROVIDED FOR REFERENCE ONLY. SEE OWNER FURNISHED MODULE SHOP DRAWINGS FOR ADDITIONAL DETAIL.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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VERIFY SCALES
0 1"
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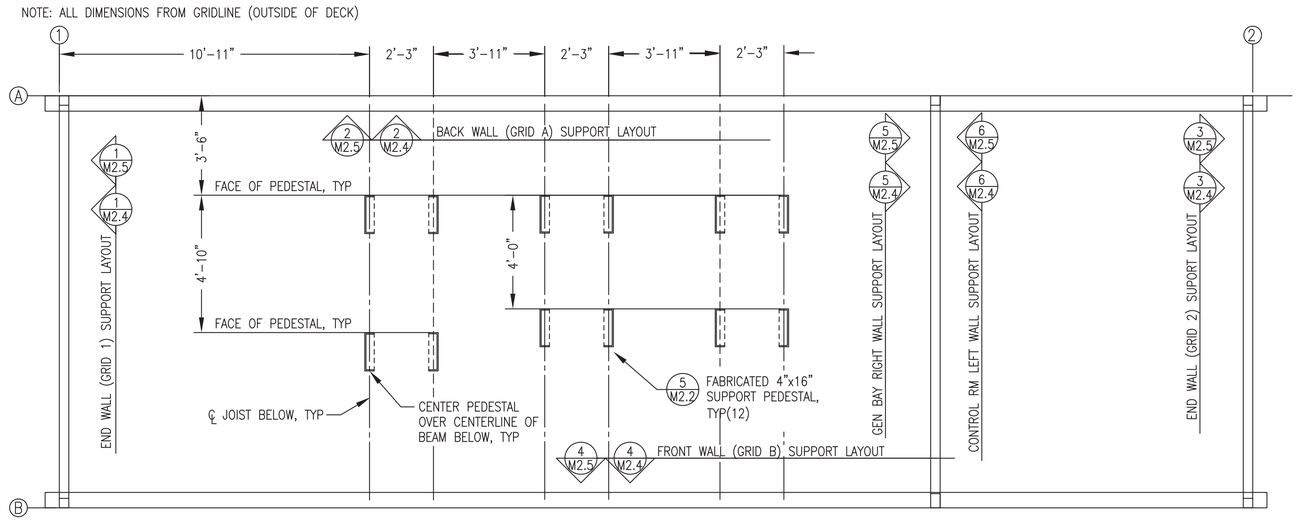
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

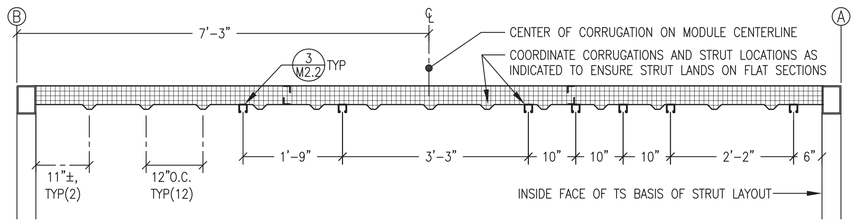
DRAWING TITLE:
MECHANICAL PENETRATIONS PLAN, ELEVATION, & DETAILS

M2.1

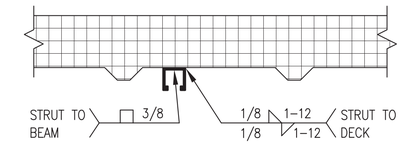
SHEET OF 7



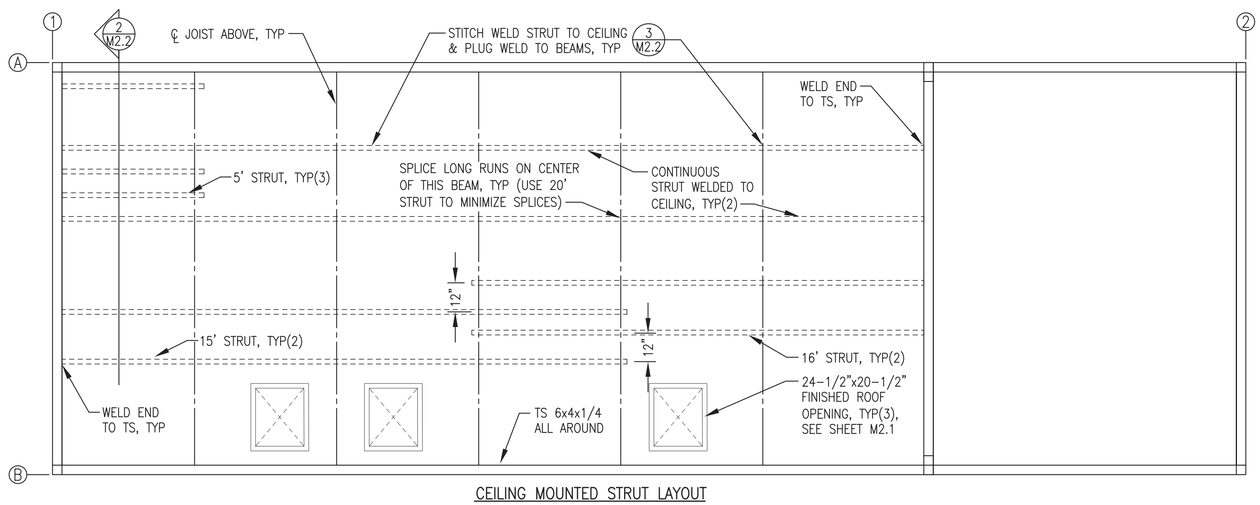
1 M2.2 MODULE MECHANICAL SUPPORT PLAN
3/8"=1'-0"



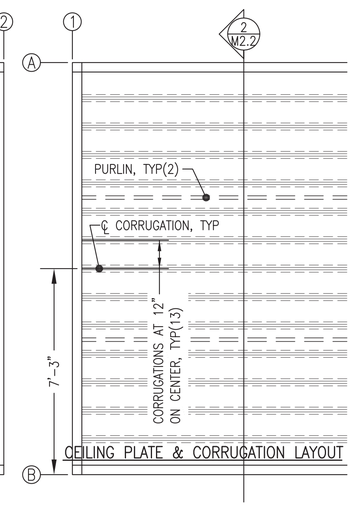
2 M2.2 SECTION THROUGH CEILING – CORRUGATION & STRUT LAYOUT
3/4"=1'-0"

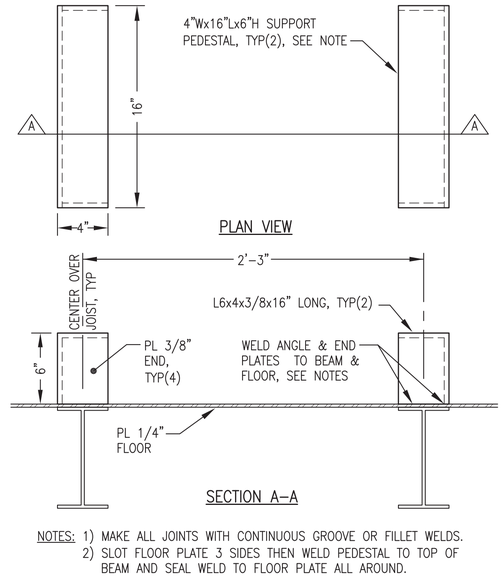


3 M2.2 STRUT ATTACHMENT TO CEILING
NO SCALE



4 M2.2 CEILING STRUT SUPPORT LAYOUT PLAN
3/8"=1'-0"





NOTES: 1) MAKE ALL JOINTS WITH CONTINUOUS GROOVE OR FILLET WELDS.
2) SLOT FLOOR PLATE 3 SIDES THEN WELD PEDESTAL TO TOP OF BEAM AND SEAL WELD TO FLOOR PLATE ALL AROUND.

5 M2.2 SUPPORT PEDESTAL FABRICATION
2"=1'-0"

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GENERAL NOTES:

1) FABRICATE PEDESTALS FROM ASTM A36 ANGLE AND PLATES AS SHOWN.
2) ALL STRUT 12 GAUGE 1-5/8"x1-5/8" SOLID BACK PLAIN (UNFINISHED). B-LINE B22-PLN OR EQUAL. PURCHASE IN 20' LENGTHS TO MINIMIZE SPLICES.
3) INSTALL ALL SUPPORTS INDICATED AND GRIND SMOOTH PRIOR TO SANDBLASTING MODULE. SANDBLAST AND PAINT ALL SUPPORTS THIS SHEET EQUIVALENT TO MODULE INTERIOR. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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

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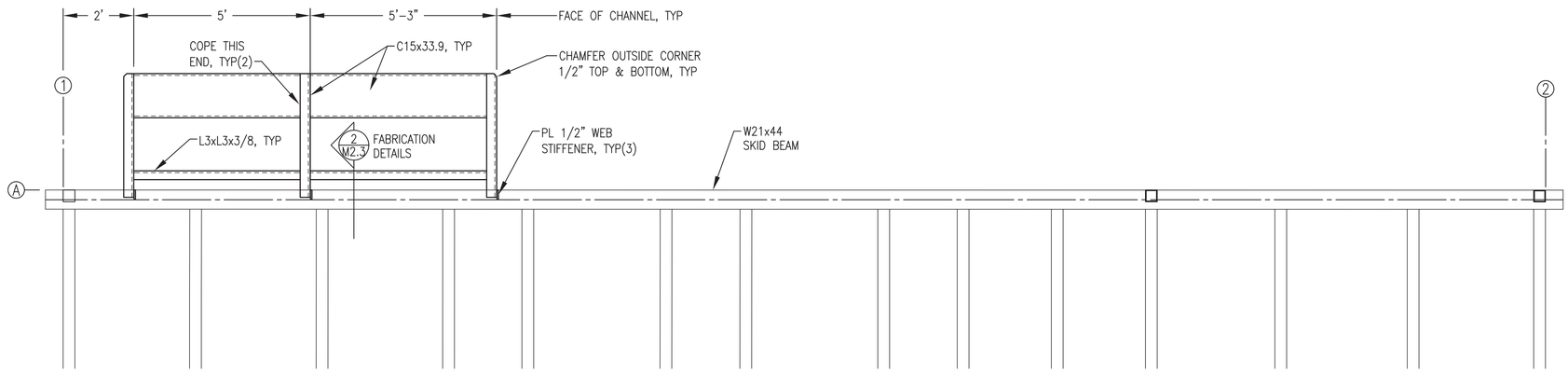
CHECKED BY: BCG
JOB NUMBER:

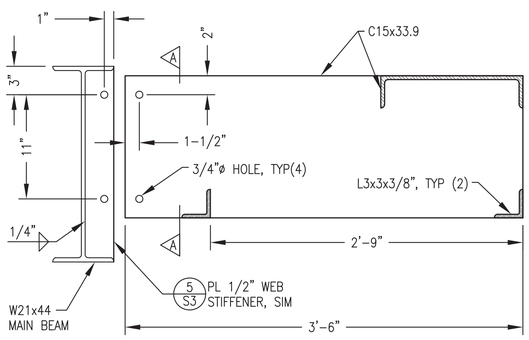
DRAWING TITLE:
MECHANICAL SUPPORT PLANS & DETAILS

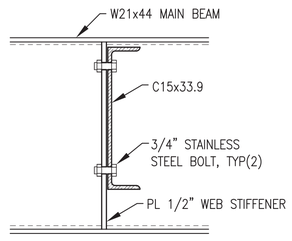
M2.2
SHEET OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019



1 M2.3 RADIATOR SUPPORT PLAN
1/2"=1'-0"





SECTION A-A

SUPPORT FABRICATION NOTES:

1) FABRICATE SUPPORT FROM ASTM A36 ANGLE & CHANNEL AS SHOWN.
2) RACK ALL SUPPORT BRACKETS LEVEL & PERPENDICULAR TO SKID WITH CONNECTIONS BOLTED TIGHT PRIOR TO WELDING.
3) UPON COMPLETION OF WELDING ROUND CORNERS AND GRIND EDGES SMOOTH.
4) PRIOR TO SANDBLASTING MODULE REMOVE SUPPORTS THEN SANDBLAST AND PAINT EQUIVALENT TO MODULE EXTERIOR WALLS. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.

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2 M2.3 RADIATOR SUPPORT FABRICATION
1-1/2"=1'-0"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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STATE OF ALASKA 49TH
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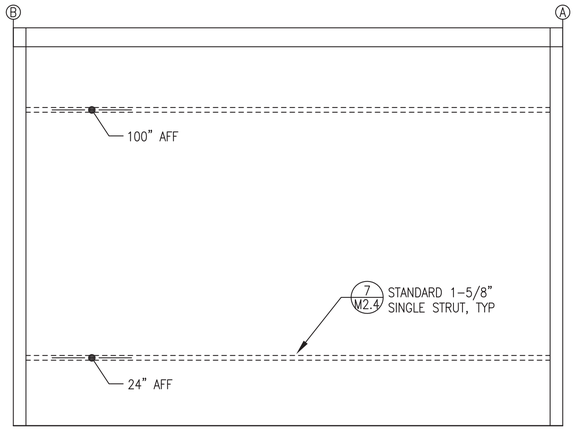
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

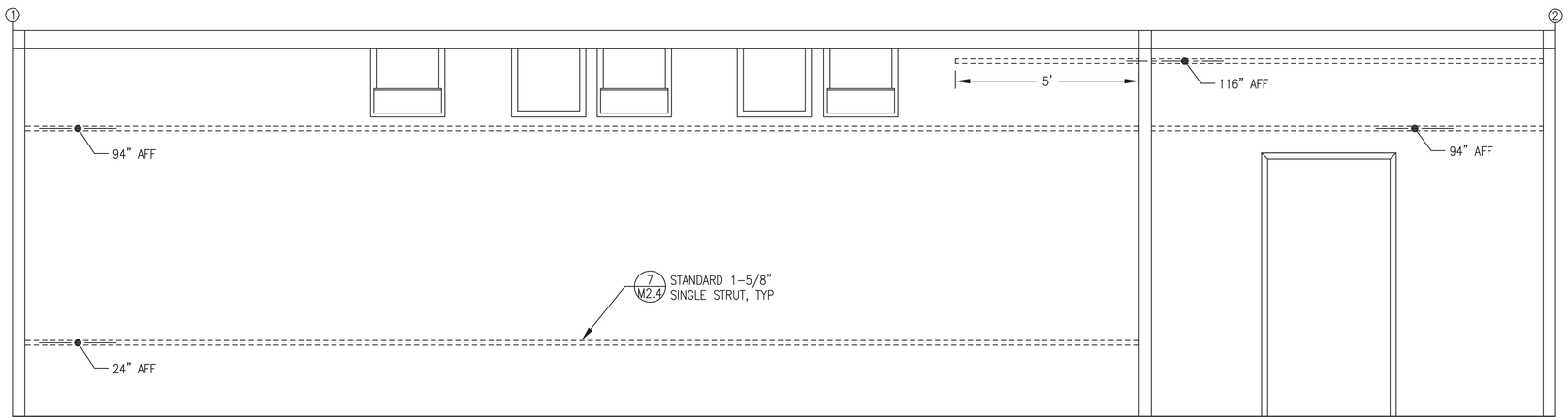
DRAWING TITLE:
RADIATOR SUPPORT PLAN & DETAILS

M2.3

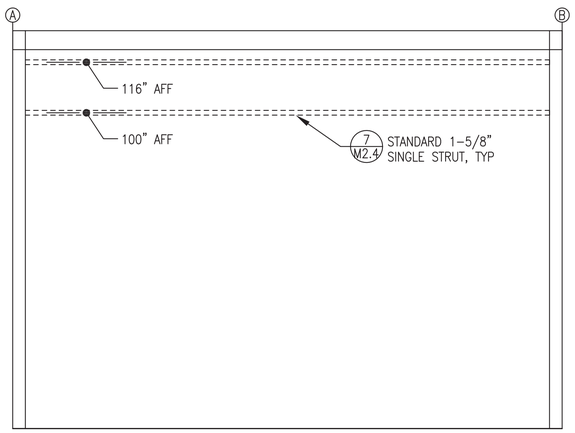
SHEET OF 7



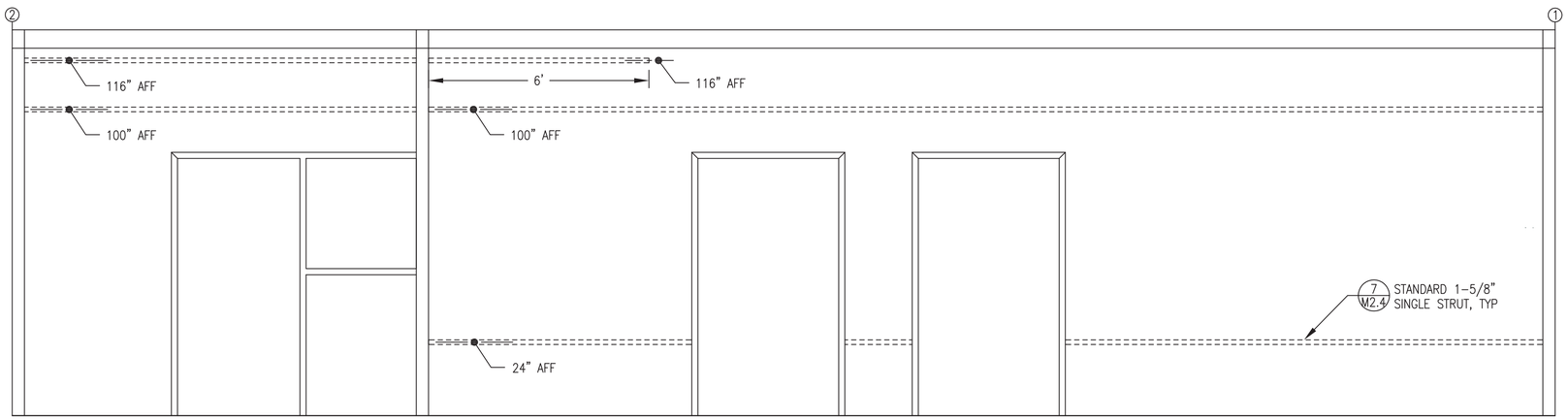
1 M2.4 END WALL (GRID 1) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



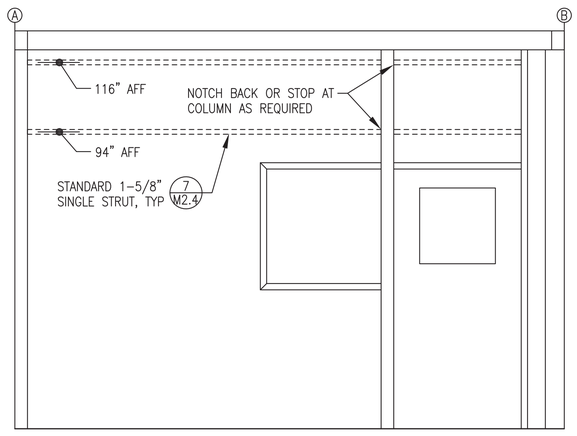
2 M2.4 BACK WALL (GRID A) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



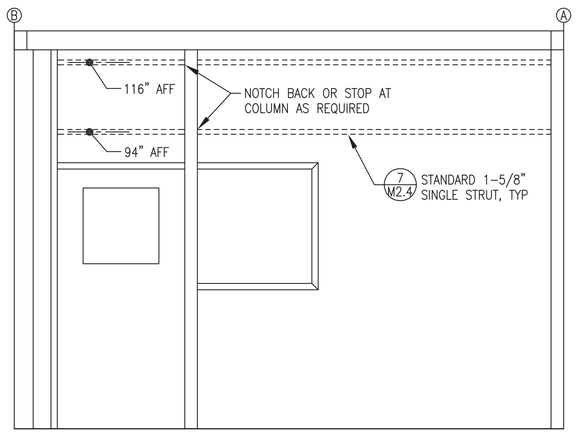
3 M2.4 END WALL (GRID 2) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



4 M2.4 FRONT WALL (GRID B) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



5 M2.4 GEN BAY RIGHT WALL HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



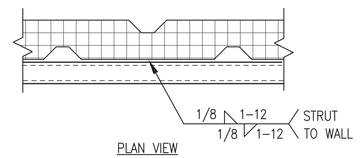
6 M2.4 CONTROL ROOM LEFT WALL HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"

HORIZONTAL WALL STRUT INSTALLATION NOTES:

1) ALL LOCATIONS ARE CENTERLINE OF STRUT ABOVE FINISHED FLOOR (AFF).

2) ALL STRUT SHALL BE 12 GAUGE, 1-5/8" x 1-5/8", PLAIN (UN-FINISHED BLACK) WITH SOLID BACK, B-LINE B22-PLN OR EQUAL.

3) PRIOR TO PAINTING MODULE, WELD ALL HORIZONTAL STRUT SECTIONS TO WALLS AS SHOWN. SANDBLAST AND PAINT STRUT WITH MODULE INTERIOR WALLS. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.



7 M2.4 HORIZONTAL WALL STRUT ATTACHMENT
NO SCALE

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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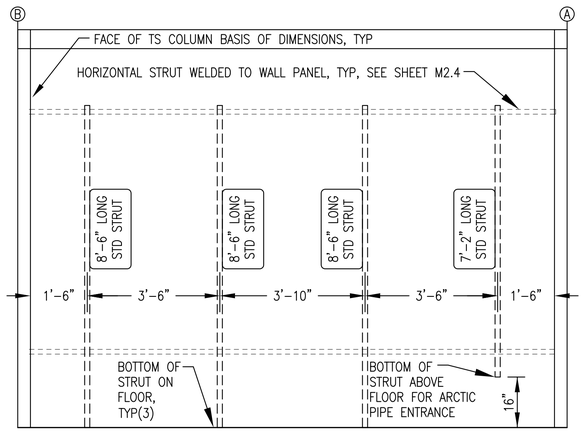
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

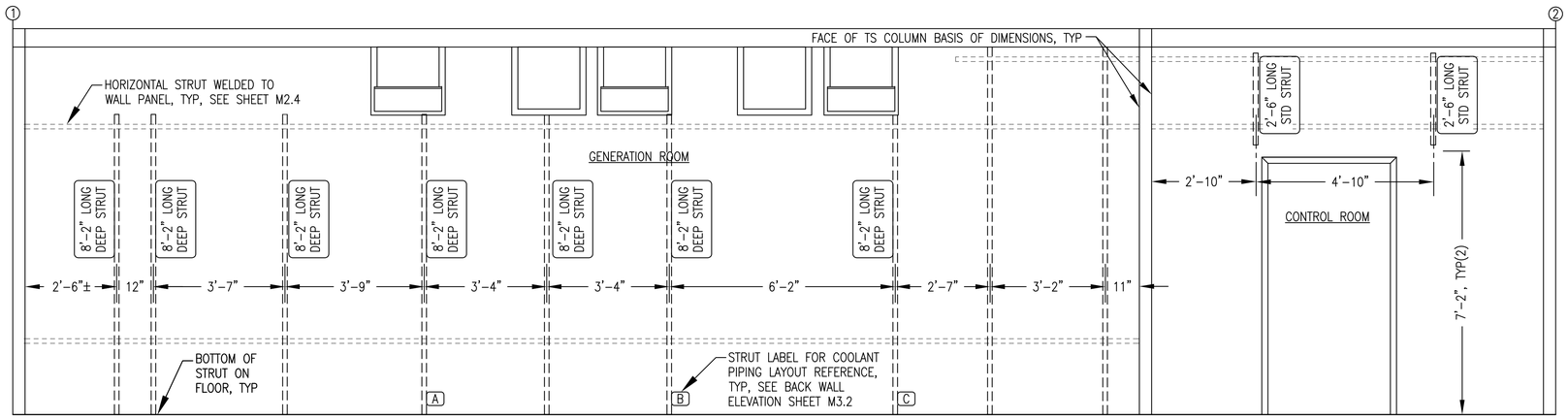
DRAWING TITLE:
MECHANICAL SUPPORT HORIZONTAL WALL STRUT INSTALLATION

M2.4

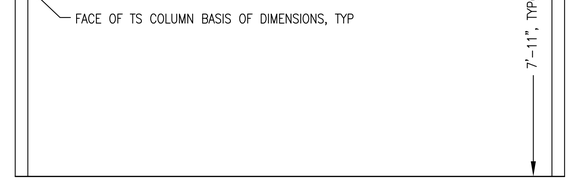
SHEET OF 7



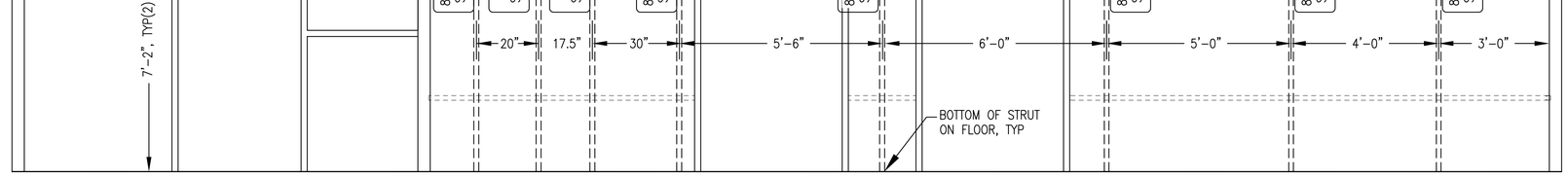
1 M2.5 END WALL (GRID 1) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



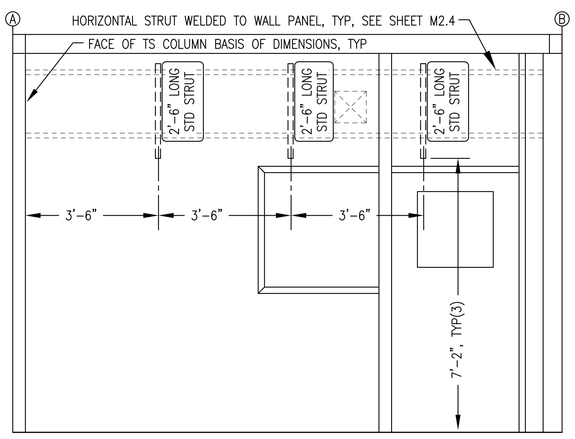
2 M2.5 BACK WALL (GRID A) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



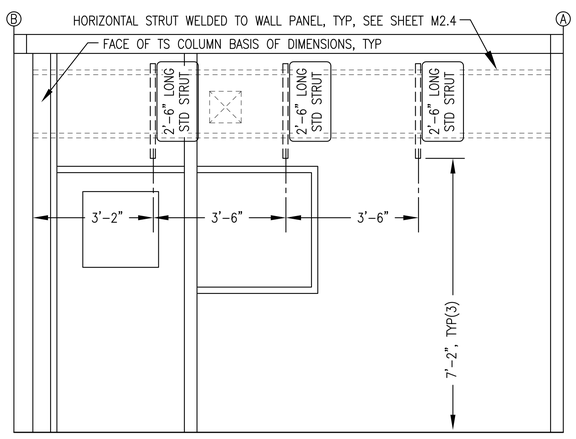
3 M2.5 END WALL (GRID 2) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



4 M2.5 FRONT WALL (GRID B) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



5 M2.5 GEN BAY RIGHT WALL VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



6 M2.5 CONTROL ROOM LEFT WALL VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"

VERTICAL WALL STRUT INSTALLATION NOTES:

1) ALL HORIZONTAL LOCATIONS ARE CENTERLINE OF STRUT FROM FACE OF TS COLUMNS. ALL VERTICAL LOCATIONS ARE END OF STRUT ABOVE FINISHED FLOOR.

2) ALL STRUT SHALL BE 12 GAUGE, PRE-GALVANIZED FINISH WITH SLOTTED BACK.
"STD" DESIGNATES STANDARD 1-5/8" x 1-5/8" SINGLE STRUT, B-LINE B22-SH-GALV OR EQUAL.
"DEEP" DESIGNATES 3-1/4" x 1-5/8" SINGLE STRUT, B-LINE B11-SH-GALV OR EQUAL.

3) FASTEN ALL VERTICAL STRUT SECTIONS TO HORIZONTAL STRUT WITH 1/2"x1" ALLEN HEAD CAP SCREWS & STRUT NUTS.

4) ONLY MAJOR WALL MOUNTED EQUIPMENT SUPPORT STRUT SHOWN THIS SHEET. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR OTHER EQUIPMENT, PIPING, AND WIREWAY STRUT SUPPORT DETAILS.

ISSUED FOR CONSTRUCTION JANUARY 2019

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CLARKS POINT, ALASKA

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VERIFY SCALES
0 ——— 1"
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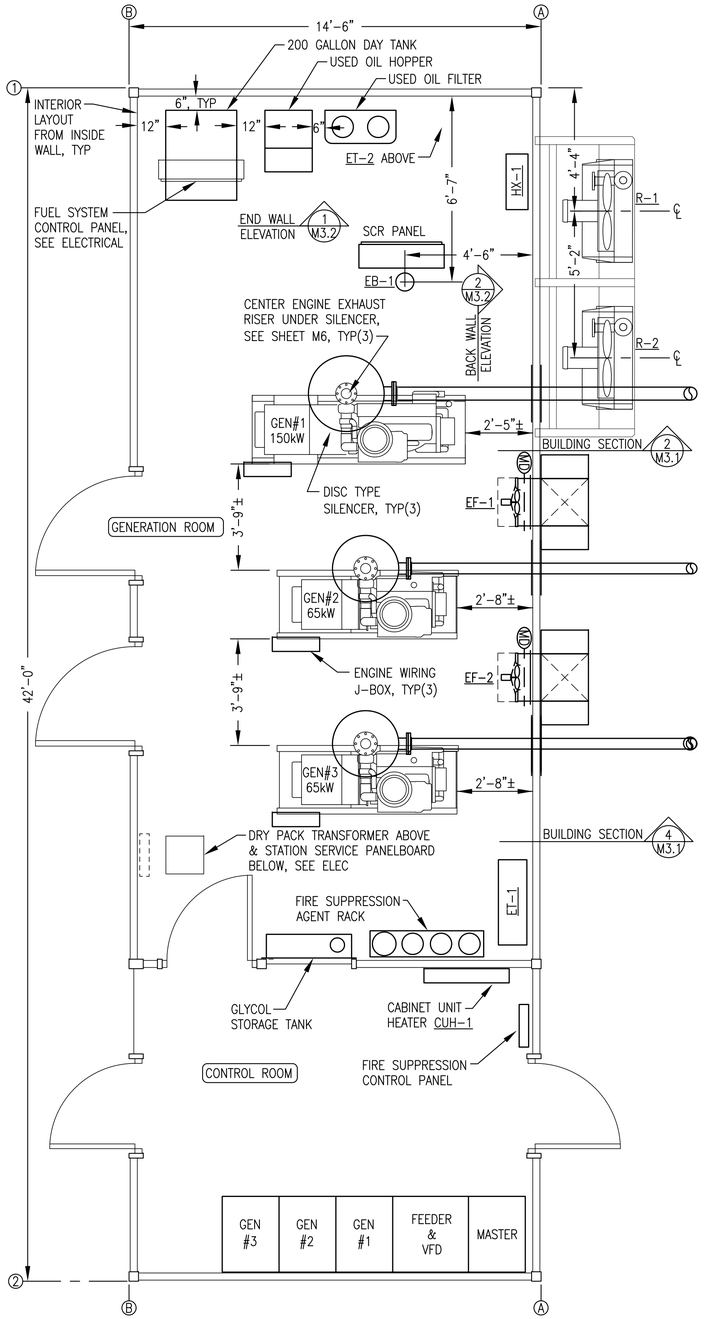
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

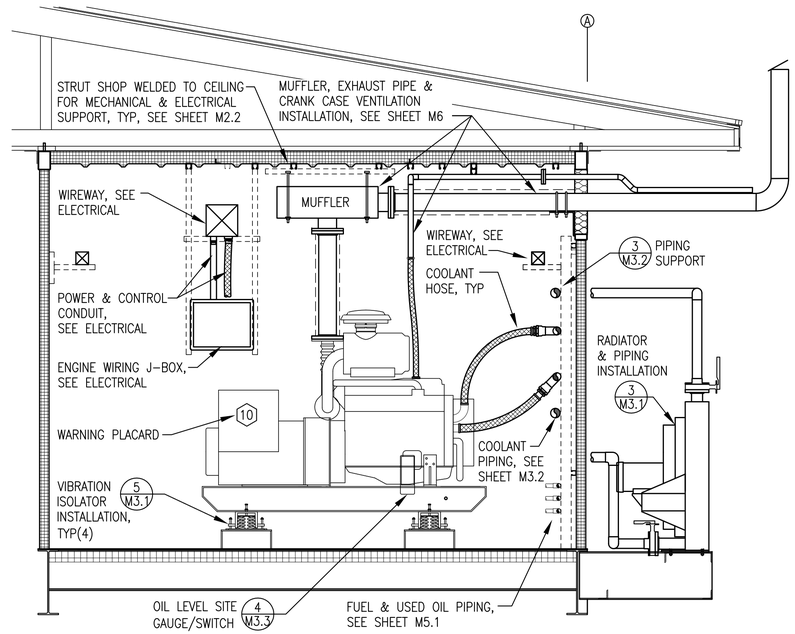
DRAWING TITLE:
MECHANICAL SUPPORT
VERTICAL WALL STRUT
INSTALLATION

M2.5

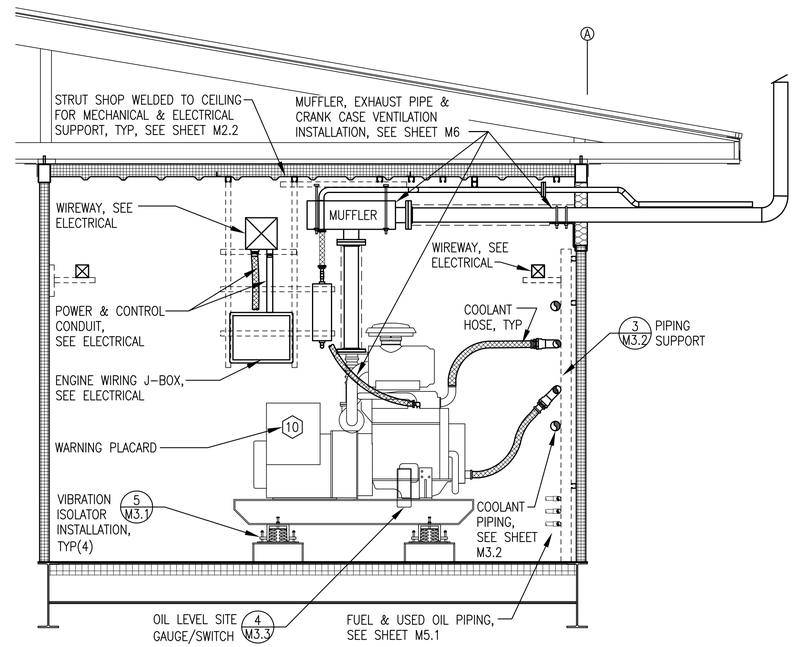
SHEET | OF 7



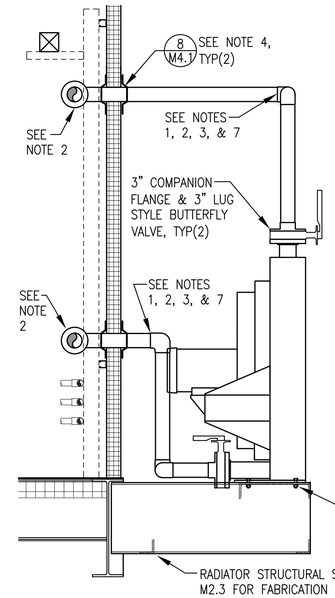
1/M3.1 EQUIPMENT LAYOUT PLAN
3/8"=1'-0"



2/M3.1 BUILDING SECTION/GENERATOR #1/#2 INSTALLATION
1/2"=1'-0"



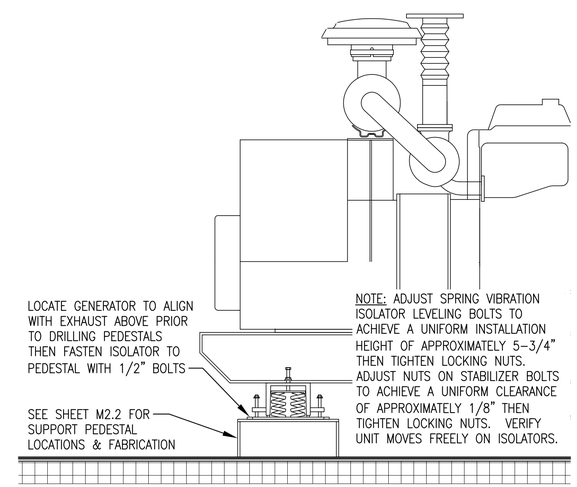
4/M3.1 BUILDING SECTION/GENERATOR #3 INSTALLATION
1/2"=1'-0"



3/M3.1 RADIATOR & PIPING INSTALLATION
3/4"=1'-0"

MODULE SHOP/ON-SITE NOTES:

1) DURING SHOP FABRICATION DRY FIT PIPE INTO TEE/EL & USE HOSE FOR TEMPORARY SEAL DURING TESTING.
2) AFTER TESTING REMOVE HOSE & TAKE APART FLANGE AT BUTTERFLY VALVE. REMOVE PIPE & STORE IN MODULE. SEAL WALL PENETRATION FOR SHIPPING.
3) IN FIELD REINSTALL PIPE THROUGH WALL & SOLDER TO EL.
4) IN SHOP HOLE SAW 1"ø OVERSIZE OPENING. AFTER FINAL FIELD ASSEMBLY FLASH & SEAL PENETRATION IN ACCORDANCE WITH DETAIL.
5) DURING SHOP FABRICATION BOLT RADIATOR SUPPORT TO MODULE & RADIATORS TO SUPPORTS.
6) AFTER TESTING REMOVE RADIATOR SUPPORT ASSEMBLY COMPLETE WITH RADIATORS & PIPING MANIFOLD. PACKAGE FOR SHIPPING.
7) IN FIELD BOLT RADIATOR ASSEMBLY TO MODULE, REINSTALL PIPING SECTIONS, & MAKE FINAL SOLDER CONNECTION TO ELS.



5/M3.1 VIBRATION ISOATOR INSTALLATION
1"=1'-0"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

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STATE OF ALASKA 49TH
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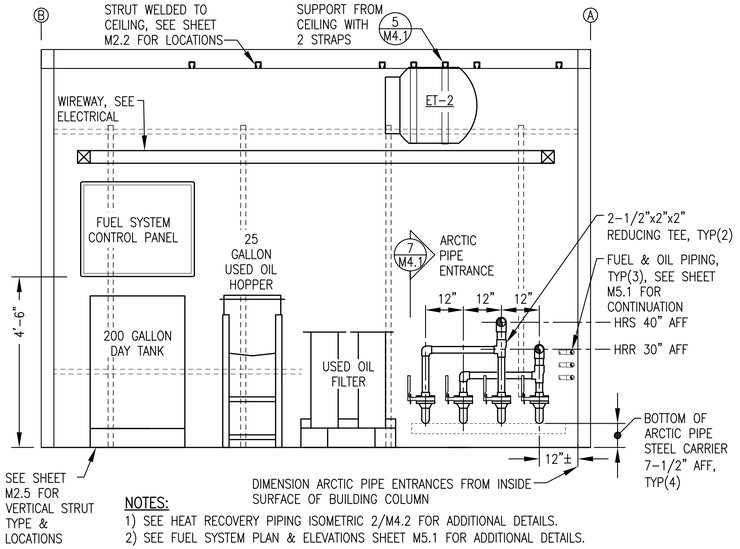
DRAWING TITLE:
EQUIPMENT LAYOUT PLAN, SECTIONS, & DETAILS

M3.1

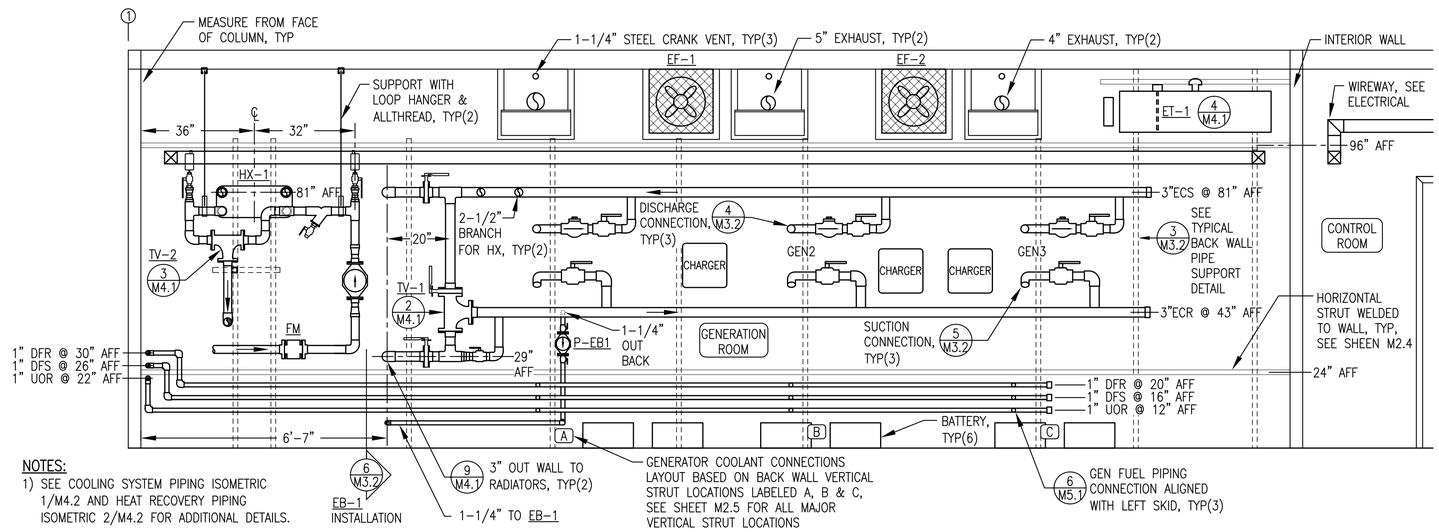
SHEET | OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019



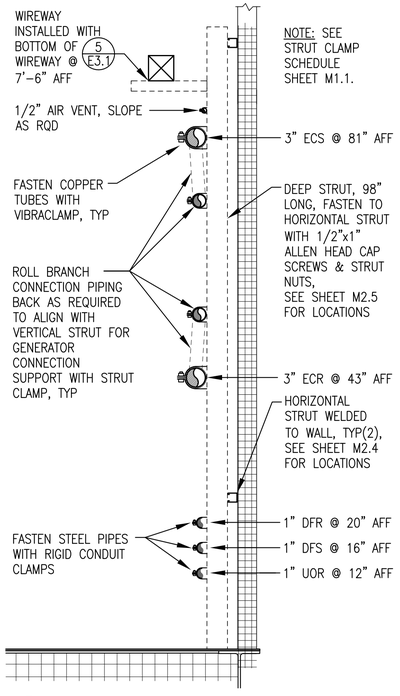
NOTES:
1) SEE HEAT RECOVERY PIPING ISOMETRIC 2/M4.2 FOR ADDITIONAL DETAILS.
2) SEE FUEL SYSTEM PLAN & ELEVATIONS SHEET M5.1 FOR ADDITIONAL DETAILS.

1/M3.2 END WALL ELEVATION
1/2"=1'-0"

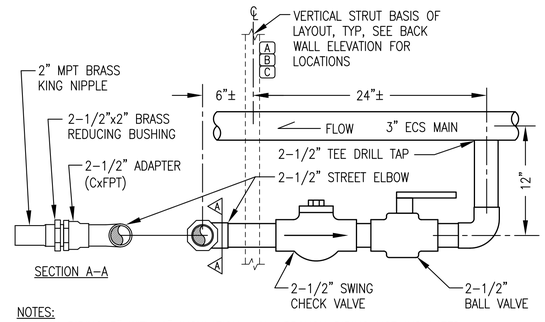


NOTES:
1) SEE COOLING SYSTEM PIPING ISOMETRIC 1/M4.2 AND HEAT RECOVERY PIPING ISOMETRIC 2/M4.2 FOR ADDITIONAL DETAILS.

2/M3.2 BACK WALL ELEVATION
1/2"=1'-0"

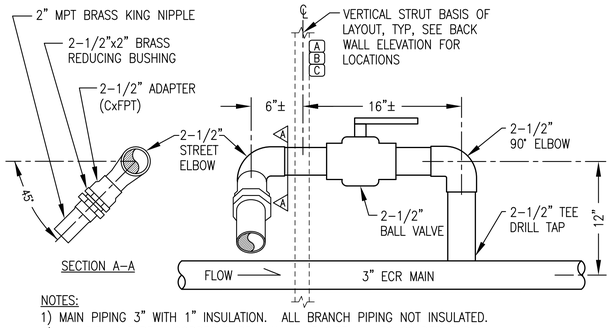


3/M3.2 TYPICAL PIPE SUPPORT AT BACK WALL
1"=1'-0"



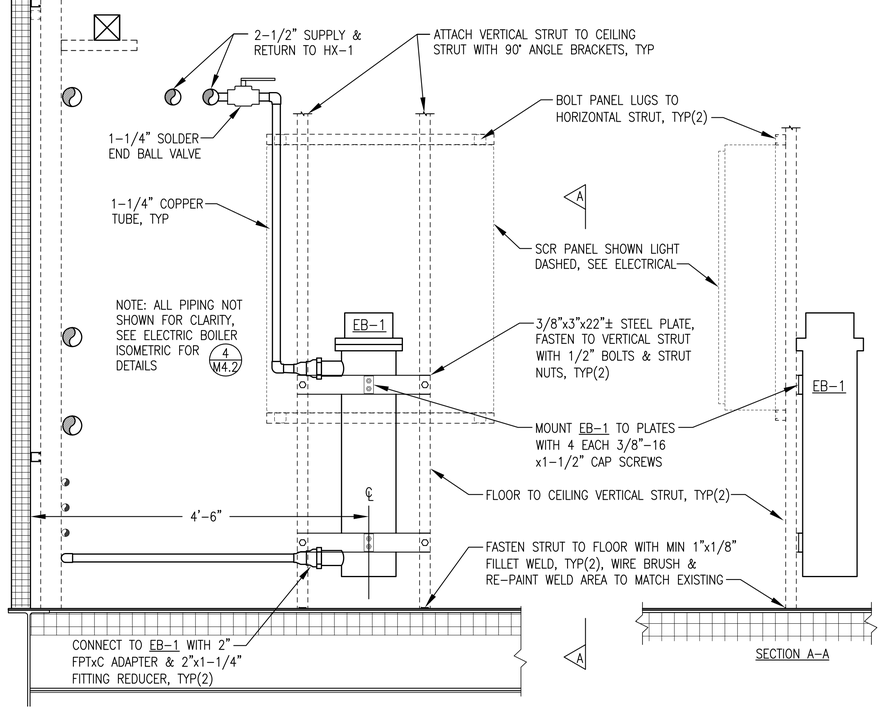
NOTES:
1) MAIN PIPING 3" WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
2) ALL PIPING TYPE L COPPER TUBE. ALL LINE SIZE VALVES SOLDER END.

4/M3.2 TYPICAL GENERATOR DISCHARGE CONNECTION
NO SCALE



NOTES:
1) MAIN PIPING 3" WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
2) ALL PIPING TYPE L COPPER TUBE. ALL LINE SIZE VALVES SOLDER END.

5/M3.2 TYPICAL GENERATOR SUCTION CONNECTION
NO SCALE



6/M3.2 ELECTRIC BOILER INSTALLATION
1"=1'-0"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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ME 8210
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DRAWING TITLE:
WALL ELEVATIONS & PIPING DETAILS

M3.2

SHEET OF 7

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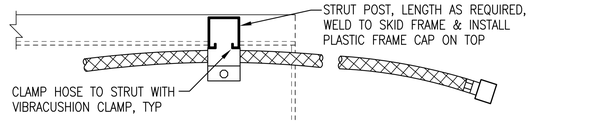
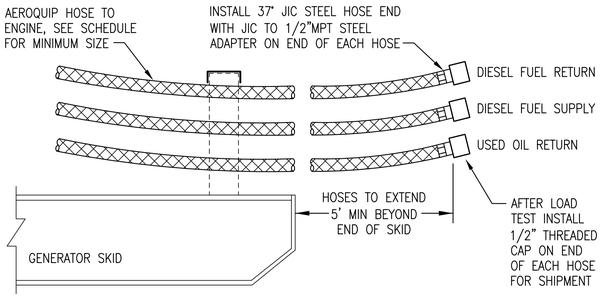


LEFT SKID PLAN (TOP) VIEW

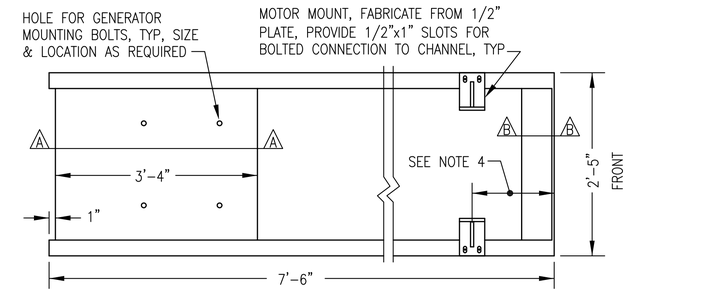


ELEVATION (SIDE) VIEW

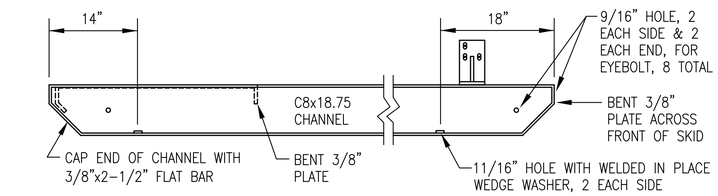
MINIMUM HOSE SIZE SCHEDULE		
FUEL SUPPLY	FUEL RETURN	USED OIL
#8	#8	#10

NOTE:
ON 4045 GROUP HOSES ON LEFT SKID AND ON 6081 GROUP HOSES ON RIGHT SKID AS SHOWN TO COORDINATE WITH COOLANT HOSES.

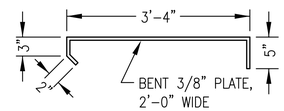
1 M3.3 FUEL & OIL HOSE TERMINATIONS
NO SCALE



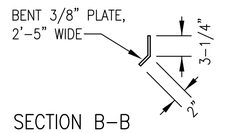
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A

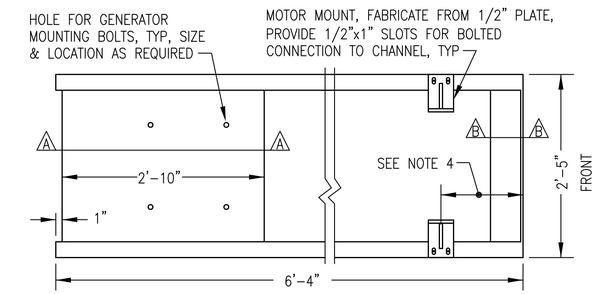


SECTION B–B

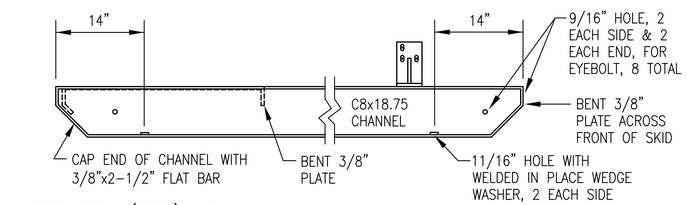
NOTES:

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

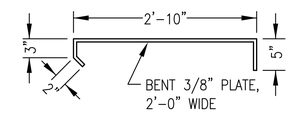
2 M3.3 GENERATOR #1 (JOHN DEERE 6068AFM85) SKID DESIGN
NO SCALE



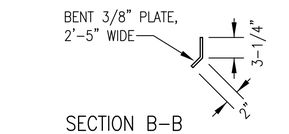
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A

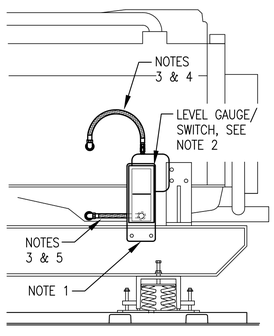


SECTION B–B

NOTES:

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

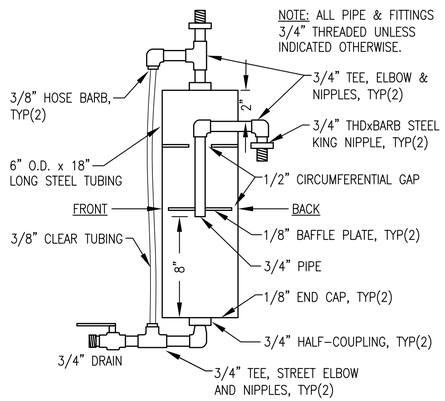
3 M3.3 GENERATOR #2 & #3 (JOHN DEERE 4045FM75) SKID DESIGN
a



NOTES:

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

4 M3.3 TYPICAL OIL LEVEL GAUGE/SWITCH INSTALLATION
NO SCALE



5 M3.3 CONDENSATE TRAP FABRICATION
NO SCALE

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STATE OF ALASKA, AIDEA/AEA
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CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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GENERATOR FABRICATION DETAILS

M3.3

SHEET OF 7

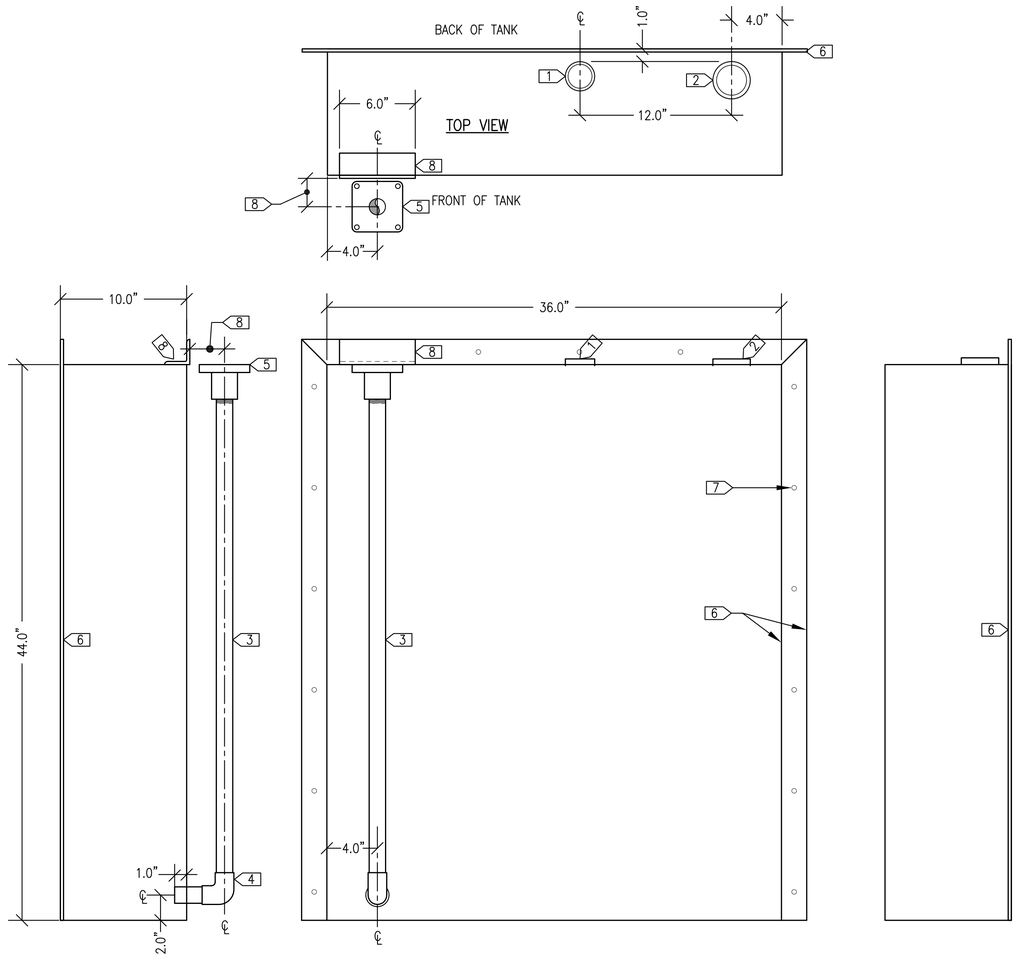
ISSUED FOR CONSTRUCTION JANUARY 2019

GLYCOL TANK SPECIFIC NOTES:

1. 1–1/2" FPT – INSTALL DAY TANK GAUGE G–DT.
2. 2" FPT – INSTALL 2" SCREENED VENT CAP ON 2"x6" NIPPLE.
3. 1" SCHEDULE 80 PIPE WITH THREADED TOP CONNECTION (WITHDRAWAL)
4. 1" SOCKETWELD 90° ELBOW
5. 1" THREADED HAND PUMP ADAPTER FLANGE, TOP OF FLANGE FLUSH WITH TOP OF TANK. INSTALL DAY TANK HAND PUMP HP–DT.
6. 2x1/4" FLAT BAR CONTINUOUS THREE SIDES
7. 3/8" HOLE AT 8" O.C. ALL AROUND
8. L2x2x1/4"x6' LONG. SET FACE TO BOLT TO HAND PUMP.

GLYCOL TANK GENERAL NOTES:

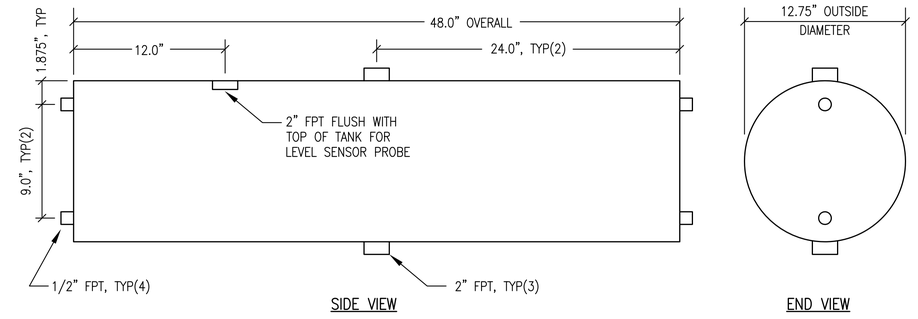
1. FABRICATE SINGLE WALL 60 GALLON NOMINAL CAPACITY GLYCOL TANK.
2. FABRICATE FROM ASTM A–36 STEEL PLATE, 10 GAUGE MINIMUM EXCEPT FOR TOP 3/16" MINIMUM. ALL TANK SEAM JOINTS TO BE FULL CONTINUOUS WELDS.
3. PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. SEAL WELD ALL TANK ATTACHMENTS.
4. ALL FPT OPENINGS TO BE FORGED STEEL HALF COUPLINGS.
5. UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC–SP–6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
6. UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS AND AIR DRY INTERIOR. INSTALL VENT CAP, GAUGE, AND HAND PUMP.



1 M3.4 60 GALLON GLYCOL STORAGE TANK
1"=6"

EXPANSION TANK GENERAL NOTES:

1) FABRICATE SINGLE WALL 24 GALLON NOMINAL 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. PAINT WITH TWO COATS OF 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 M3.4 24 GALLON GLYCOL EXPANSION TANK
1"=6"

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CLARKS POINT, ALASKA

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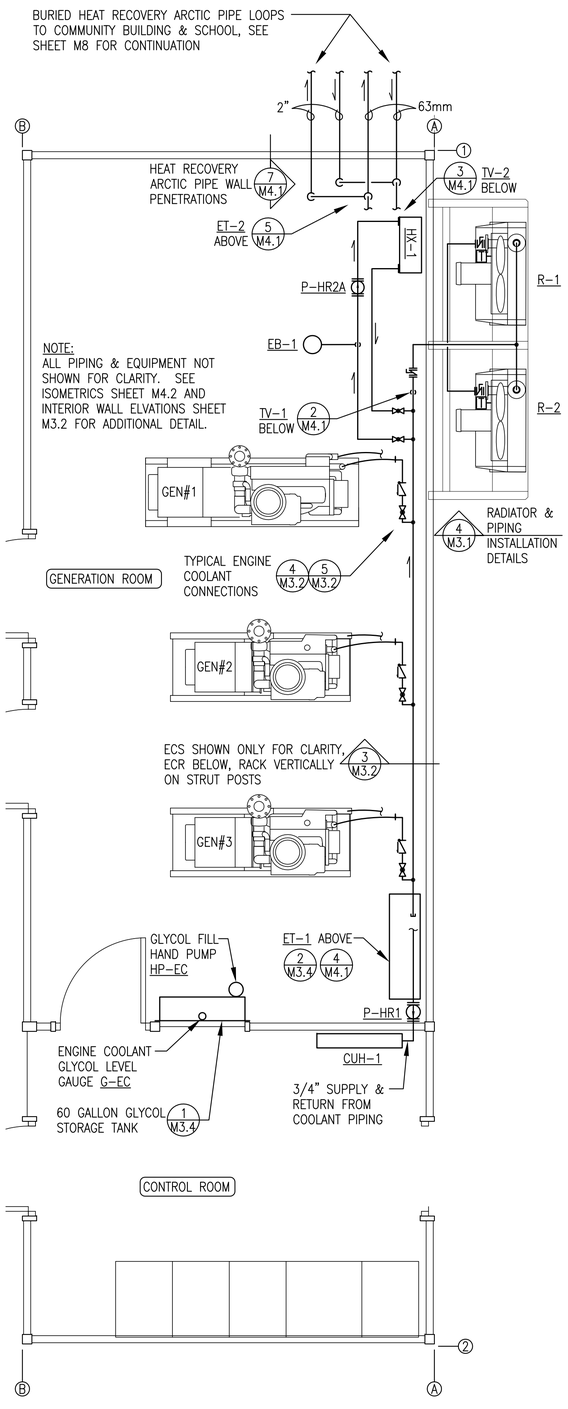
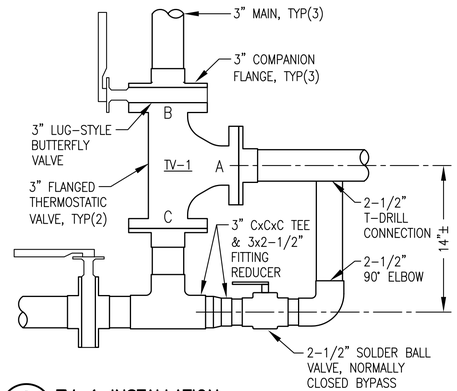
GLYCOL STORAGE & EXPANSION TANK FABRICATION

M3.4

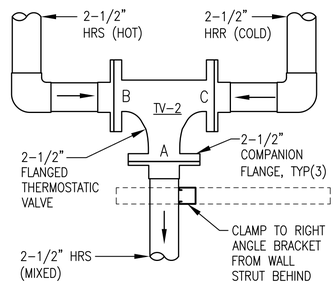
SHEET OF 7



1 M4.1 COOLANT AND HEAT RECOVERY PIPING PLAN
3/8"=1'-0"



2 M4.1 TV-1 INSTALLATION
NO SCALE



3 M4.1 TV-2 INSTALLATION
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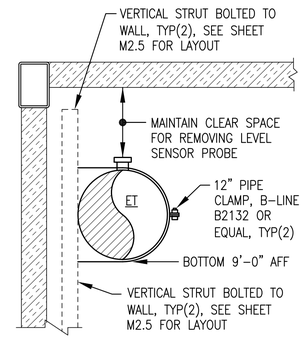
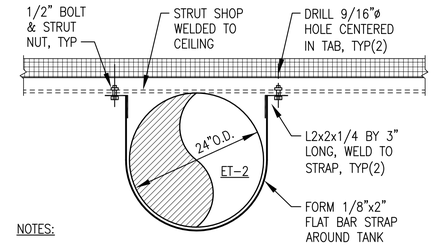


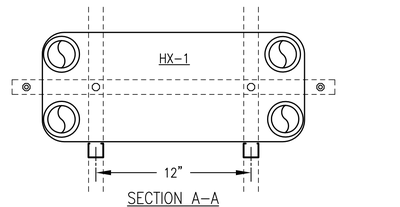
4 M4.1 EXP TANK ET-1 SUPPORT
NO SCALE

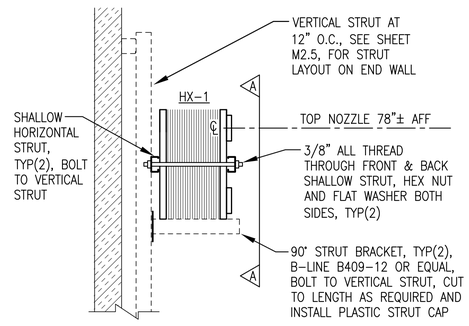


NOTES:
1) SMOOTH EDGES AFTER FABRICATION, WIRE BRUSH, SOLVENT CLEAN, AND PAINT WITH TWO COATS OF DIRECT TO METAL ALKYD ENAMEL, SHERWIN WILLIAMS DTM OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.

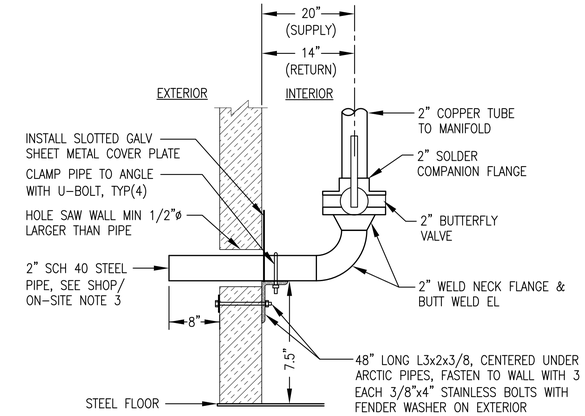
2) ONE STRAP SHOWN. INSTALL FOUR IDENTICAL STRAPS.

5 M4.1 HEAT RECOVERY EXP TANK ET-2 SUPPORT
NO SCALE





6 M4.1 HEAT EXCHANGER SUPPORT FROM WALL
NO SCALE



7 M4.1 HEAT RECOVERY ARCTIC PIPE WALL PENETRATIONS
NO SCALE

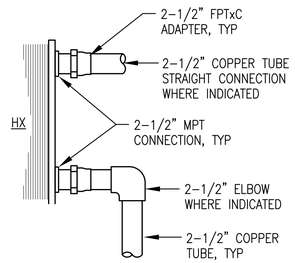
ARCTIC PIPE GENERAL NOTES:
1) SEE ELEVATION 3/M3.2 FOR PENETRATION LOCATIONS.

2) ONE PIPE FOR EACH SIZE SHOWN. PROVIDE TWO IDENTICAL FOR EACH SIZE.

ARCTIC PIPE SHOP/ON-SITE NOTES:
1) SHOP INSTALLATION SHOWN. STUB PIPE 8" MIN BEYOND WALL & TEMPORARILY CONNECT SUPPLY TO RETURN FOR TESTING.

2) AFTER TESTING REMOVE TEMPORARY CONNECTION, BREAK FLANGE JOINT, AND STORE PIPE IN MODULE. PLUG WALL PENETRATION FOR SHIPPING.

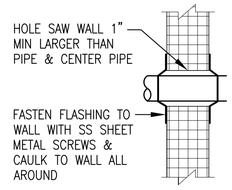
3) AS PART OF ON-SITE INSTALLATION REINSTALL PIPE THROUGH WALL AND CONNECT TO ARCTIC PIPE, SEE SHEET M8.



8 M4.1 HX PIPING CONNECTION
NO SCALE

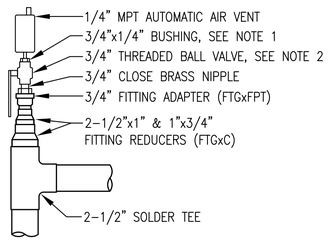
SHOP/ON-SITE NOTES:
1) FLASH OPENINGS AS PART OF ON-SITE WORK.

GENERAL NOTES:
1) THIS DETAIL APPLIES TO ALL PIPE & CONDUIT 2" & LARGER EXCEPT ARCTIC PIPE.
2) FLASH ALL OPENINGS TO EXTERIOR WALL. WHERE ACCESSIBLE ON INTERIOR, INSTALL FLASHING OR CAULK ALL AROUND.



9 M4.1 TYP WALL PENETRATION
NO SCALE

NOTES:
1) ON INITIAL STARTUP INSTALL HOSE ADAPTER IN PLACE OF BUSHING & USE HOSE TO FLUSH & BLEED.
2) AFTER BLEEDING SYSTEM OF AIR INSTALL BUSHING & AIR VENT & CLOSE BALL VALVE.



10 M4.1 TYPICAL AIR VENT INSTALLATION
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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
COOLANT & HEAT RECOVERY PIPING PLAN & DETAILS

M4.1

SHEET OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019

NOTES:

1) ALL PIPING SHOWN THIS ISOMETRIC TYPE "L" COPPER WITH SOLDER JOINTS, 3"ø EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. ALL FLANGES ANSI 150# PATTERN BRONZE COMPANION WITH SOLDER ENDS.

2) MAKE ALL CONNECTIONS FOR INSTRUMENTATION WITH T-DRILL TAP, SEE DETAIL 3/M4.2. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS WITH T-DRILL TAP OR TEE AS REQUIRED.

3) ALL COOLANT PRESSURE GAUGES 0-15 PSIG. ALL THERMOMETERS FAHRENHEIT RANGE.

4) SEE ELECTRICAL INSTRUMENTATION SCHEDULE FOR TEMPERATURE TRANSMITTERS AND OTHER INSTRUMENTATION.

5) UPON COMPLETION OF FABRICATION VALVE OFF CABINET UNIT HEATER AND FLUSH PIPING TO REMOVE ALL DEBRIS, SEE SPECIFICATIONS.

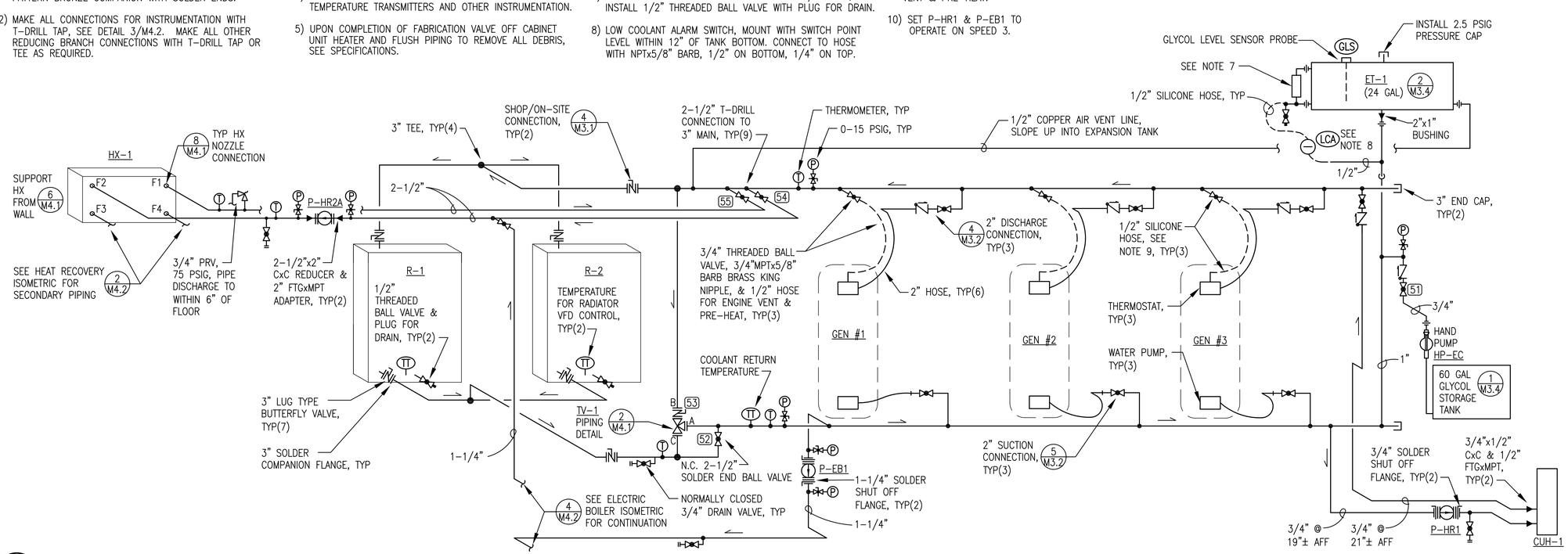
6) INSULATE COOLANT PIPING MAINS FROM GENERATOR VALVES TO RADIATORS. ALL OTHER PIPING NOT INSULATED.

7) INSTALL 9" LONG COOLANT SITE GAUGE ON 1/2" TEES, INSTALL 1/2" THREADED BALL VALVE WITH PLUG FOR DRAIN.

8) LOW COOLANT ALARM SWITCH, MOUNT WITH SWITCH POINT LEVEL WITHIN 12" OF TANK BOTTOM. CONNECT TO HOSE WITH NPTx5/8" BARB, 1/2" ON BOTTOM, 1/4" ON TOP.

9) 3/4" THREADED BALL VALVE, 3/4"MPTx5/8" BARB BRASS KING NIPPLE, & 1/2" HOSE FOR ENGINE VENT & PRE-HEAT.

10) SET P-HR1 & P-EB1 TO OPERATE ON SPEED 3.



1 M4.2 COOLING SYSTEM PIPING ISOMETRIC

NO SCALE

NOTES:

1) ALL PIPING SHOWN THIS ISOMETRIC 2-1/2" TYPE L HARD DRAWN COPPER UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL FLANGES ANSI 150# PATTERN BRONZE COMPANION WITH SOLDER ENDS.

2) UNLESS SPECIFIED OTHERWISE MAKE ALL CONNECTIONS FOR INSTRUMENTATION WITH T-DRILL TAP, SEE DETAIL 3/M4.2. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS WITH T-DRILL TAP AS REQUIRED UNLESS INDICATED OTHERWISE.

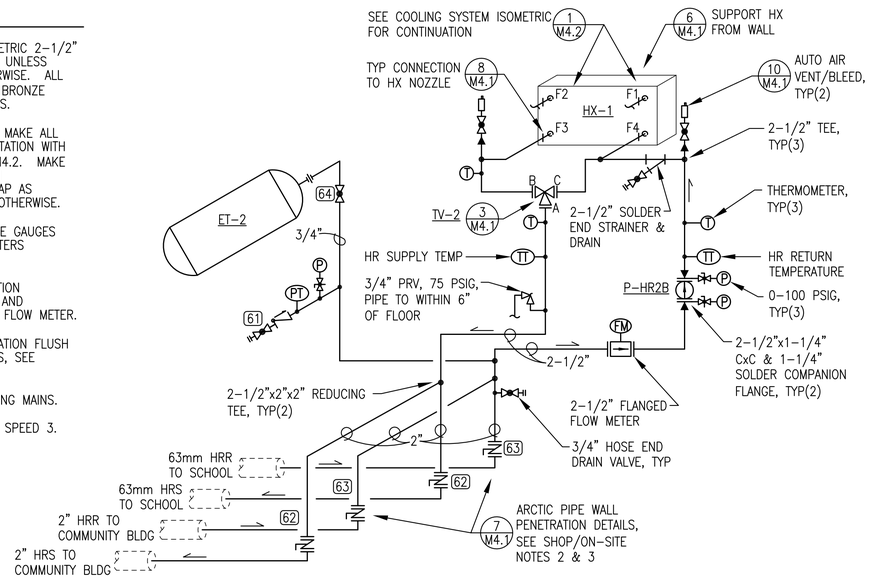
3) ALL HEAT RECOVERY PRESSURE GAUGES 0-100 PSIG. ALL THERMOMETERS FAHRENHEIT RANGE.

4) SEE ELECTRICAL INSTRUMENTATION SCHEDULE FOR TEMPERATURE AND PRESSURE TRANSMITTERS AND FLOW METER.

5) UPON COMPLETION OF FABRICATION FLUSH PIPING TO REMOVE ALL DEBRIS, SEE SPECIFICATIONS.

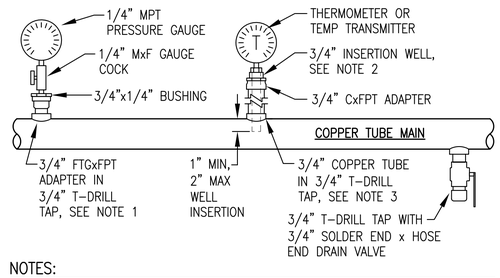
6) INSULATE HEAT RECOVERY PIPING MAINS.

7) SET P-HR2B TO OPERATE ON SPEED 3.



2 M4.2 HEAT RECOVERY SYSTEM PIPING ISOMETRIC

NO SCALE



NOTES:

1) USE T-DRILL TAPS AS SHOWN FOR 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 TRANSMITTER INSTALLATION SIMILAR TO THERMOMETER EXCEPT USE 3/4"x1/2" BUSHING.

3) FOR MAINS SMALLER THAN 2" USE COPPER TUBE RISER AS SHOWN, LENGTH AS REQUIRED FOR 1" TO 2" WELL INSERTION INTO MAIN. FOR LARGER PIPES OMIT RISER AND INSERT 3/4" FTGxFPT ADAPTER INTO T-DRILL TAP.

3 M4.2 TYPICAL INSTRUMENT INSTALLATION

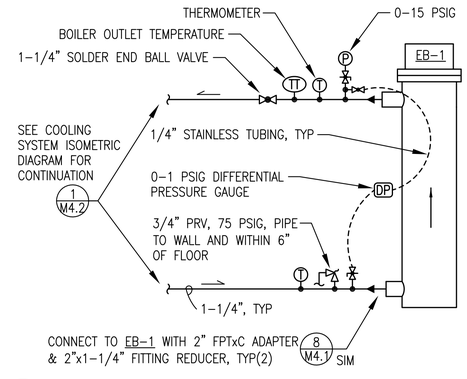
NO SCALE

HYDRONIC PIPING SHOP/ON-SITE NOTES:

1) SEE SPECIFICATION 23 21 13 FOR COOLING AND HEAT RECOVERY PIPING TESTING, FLUSHING, DRAINING, AND FILLING REQUIREMENTS.

2) SEE DETAILS 4/M3.1 AND 7/M4.1 FOR SPECIFIC REQUIREMENTS FOR PIPING THROUGH THE EXTERIOR WALLS.

3) ARCTIC PIPE TO BE INSTALLED AS PART OF THE ON-SITE WORK.



4 M4.2 ELECTRIC BOILER EB-1 PIPING ISOMETRIC

NO SCALE

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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

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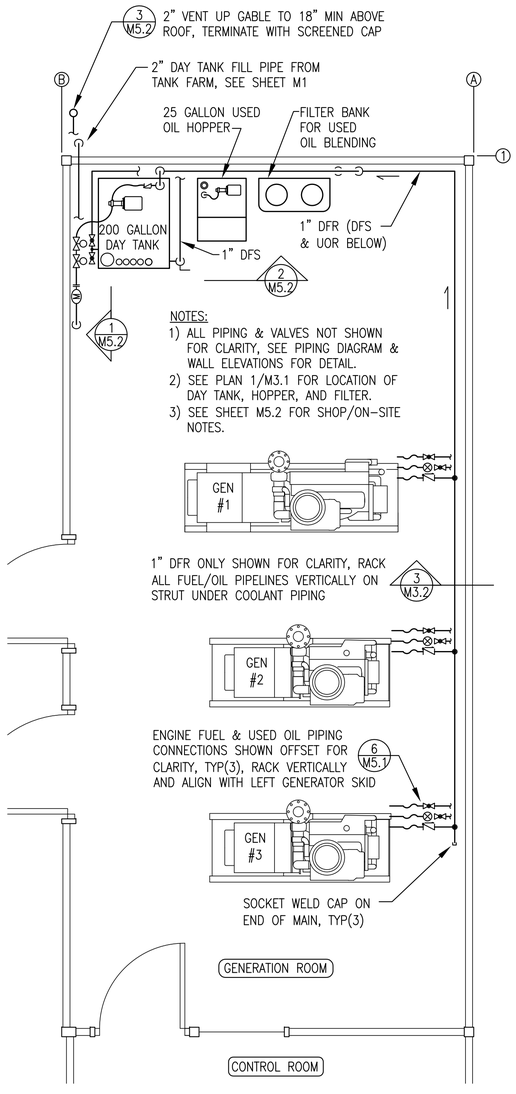
JOB NUMBER:	

DRAWING TITLE:
COOLANT & HEAT RECOVERY ISOMETRICS & DETAILS

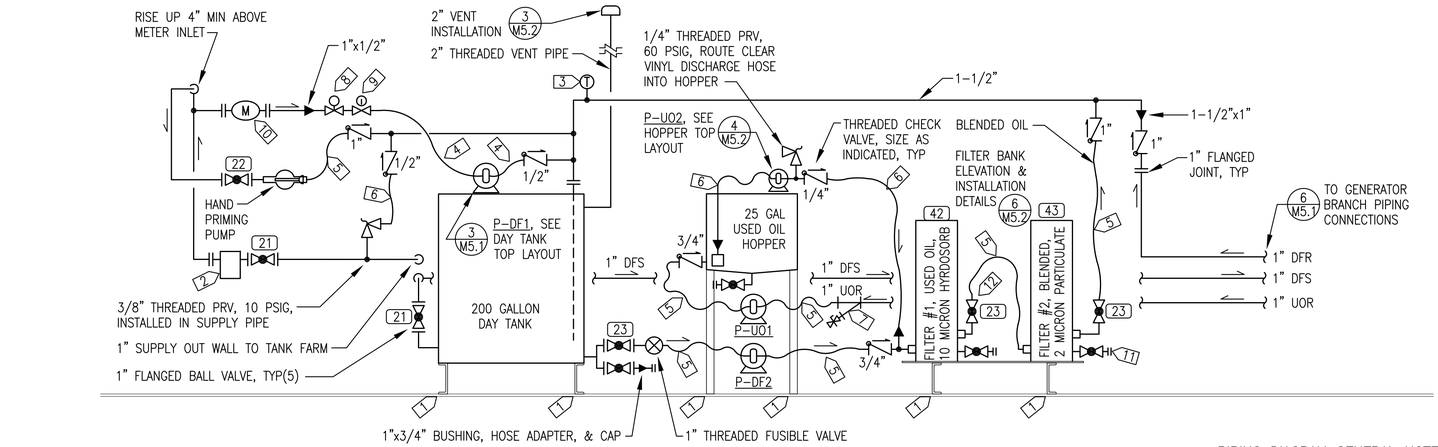
M4.2

SHEET OF 7



1 M5.1 DIESEL FUEL SYSTEM & USED OIL PIPING PLAN

3/8"=1'



PIPING DIAGRAM SPECIFIC NOTES:

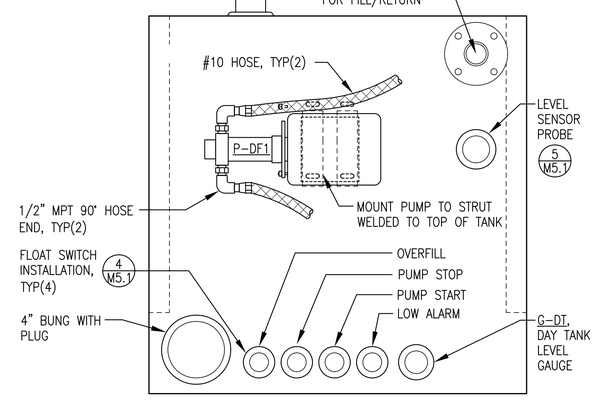
1. FASTEN DEVICE TO FLOOR WITH MIN 1"x3/16" FILLET WELD ALL 4 CORNERS, WIRE BRUSH AND RE-PAINT WELD AREA TO MATCH EXISTING.
2. 1" ANSI 150# FLANGED FILTER F-DT, REMOVE DRAIN VALVE & INSTALL 1/8"MxF DRAIN COCK.
3. THERMOMETER, INSTALL WELL IN 3/4" THREAD-O-LET.
4. #10 HOSE WITH 1/2" OR 3/4" NPT ENDS.
5. #12 HOSE WITH 1/2", 3/4", OR 1" NPT ENDS.
6. #6 HOSE WITH 1/8", 1/4", OR 3/8" NPT ENDS.
7. 1" THREADED STRAINER IN 1" UOR WITH GAUGE COCK BLOW DOWN.
8. 1/2" NO SOLENOID VALVE.
9. 1/2" NC SOLENOID VALVE.
10. METER M-DT EQUIPPED WITH 300# FLANGED ENDS, PROVIDE 1" ANSI 300# FLANGES & GASKETS, SOCKET WELD ON INLET & THREADED ON OUTLET.
11. 3/4" THREADED BALL VALVE WITH HOSE ADAPTER & CAP, TYP(3).
12. 3/4" THREADED BALL VALVE, TYP(2).

PIPING DIAGRAM GENERAL NOTES:

1) FABRICATE DAY TANK, FILTER BANK, & HOPPER IN ACCORDANCE WITH FABRICATION PLANS AND DETAILS.
2) ALL DAY TANK SUPPLY & RETURN PIPING 1" SCH 80 EXCEPT WHERE INDICATED AS 1-1/2". ALL VENT PIPING 2" SCH 40.
3) ALL PIPING JOINTS SOCKET OR BUTT WELD EXCEPT FOR THREADED VENT & CONNECTIONS TO EQUIPMENT & VALVES.
4) ON ALL HOSES INSTALL JICxNPT SWIVEL ENDS, SIZE REQUIRED TO MATCH PIPING OR PUMPS

2 M5.1 DIESEL FUEL & USED OIL PIPING DIAGRAM

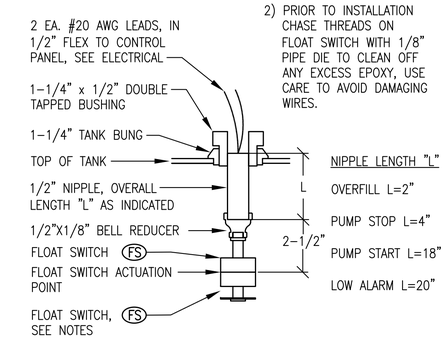
NO SCALE



3 M5.1 TOP OF DAY TANK – PLAN VIEW

NO SCALE

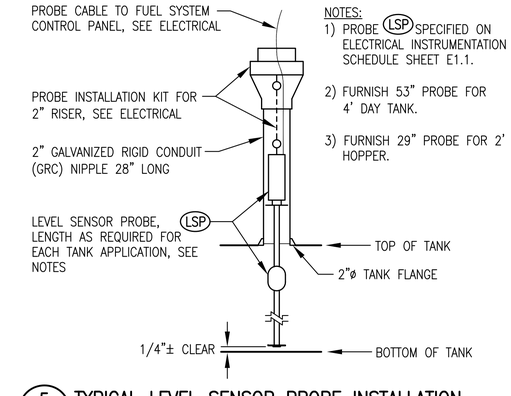
NOTES:
1) FLOAT SWITCH (FS) SPECIFIED ON ELECTRICAL INSTRUMENTATION SCHEDULE SHEET E1.1.
2) PRIOR TO INSTALLATION CHASE THREADS ON FLOAT SWITCH WITH 1/8" PIPE DIE TO CLEAN OFF ANY EXCESS EPOXY, USE CARE TO AVOID DAMAGING WIRES.



4 M5.1 DAY TANK FLOAT SWITCH INSTALLATION

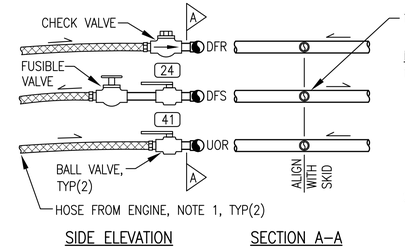
NO SCALE

NOTES:
1) PROBE (LSP) SPECIFIED ON ELECTRICAL INSTRUMENTATION SCHEDULE SHEET E1.1.
2) FURNISH 53" PROBE FOR 4' DAY TANK.
3) FURNISH 29" PROBE FOR 2' HOPPER.



5 M5.1 TYPICAL LEVEL SENSOR PROBE INSTALLATION

NO SCALE



NOTES:
1) HOSES PROVIDED WITH ENGINE, SIZE VARIES PER ENGINE & PRODUCT. ALL EQUIPPED WITH JIC SWIVELS & 1/2" MPT ADAPTERS. CUT TO LENGTH & RE-INSTALL ENDS.
2) ALL PIPING & NIPPLES SCH 80. ALL VALVES 1/2" SIZE, THREADED BODY.

6 M5.1 ENGINE FUEL PIPING CONNECTION

NO SCALE

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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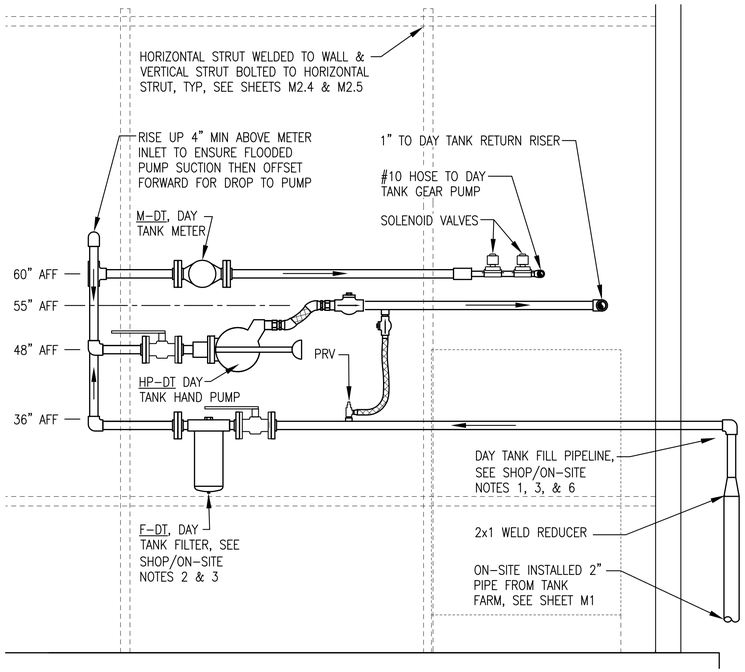
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE:	1/14/19
DRAWN BY:	JTD
CHECKED BY:	BCG
JOB NUMBER:	

DRAWING TITLE:
DIESEL FUEL & USED OIL PIPING PLAN, DIAGRAM & DETAILS

M5.1

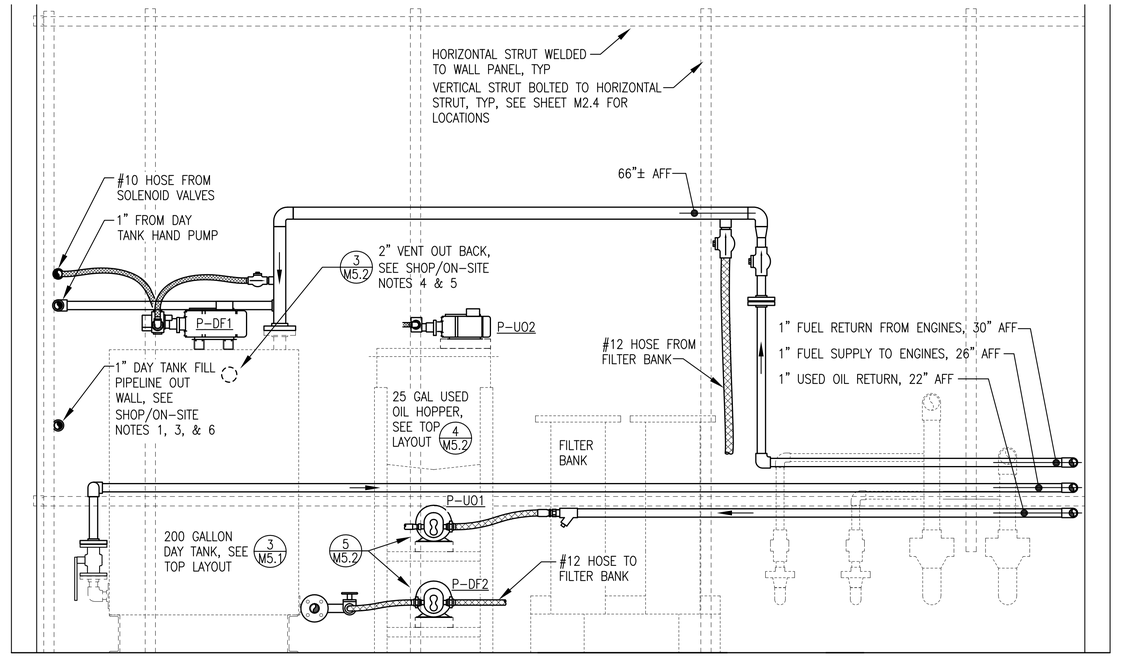
SHEET OF 7



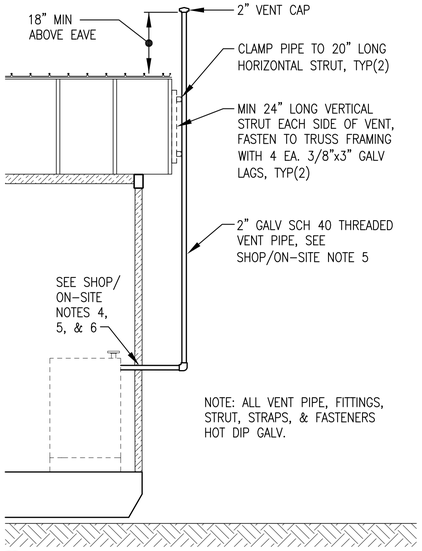
1 M5.1 DIESEL FUEL FRONT WALL ELEVATION
1"=1'

MODULE SHOP/ON-SITE NOTES:

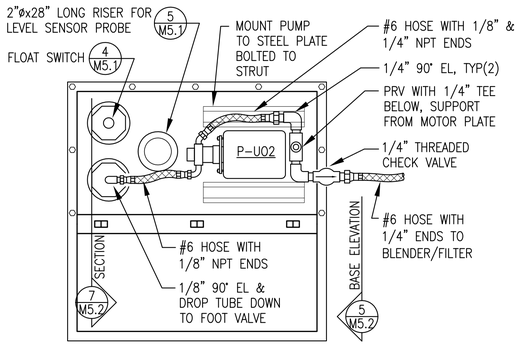
1. DURING SHOP FABRICATION STUB DAY TANK FILL PIPE 8" MIN BEYOND WALL & TERMINATE WITH 1" MALE THREAD FOR TESTING.
2. UPON COMPLETION OF TESTING, DRAIN & REMOVE FILTER & STORE IN MODULE. SLIDE PIPE OVER & SECURE FOR SHIPPING.
3. AS PART OF ON-SITE INSTALLATION REINSTALL FILTER THEN CUT THREADS OFF END OF EXTERIOR PIPE & INSTALL SOCKET WELD ELBOW.
4. DURING SHOP FABRICATION INSTALL TEMPORARY VENT PIPE OUT WALL. REMOVE TEMP PIPE FOR SHIPPING.
5. AS PART OF ON-SITE INSTALLATION INSTALL 2" GALVANIZED THREADED VENT PIPE OUT WALL & UP TO VENT, SEE DETAIL 3/M5.2.
6. DURING SHOP FABRICATION HOLE SAW 1/2"ø OVERSIZE OPENING THEN SEAL FOR SHIPPING AFTER REMOVING PIPE. UPON FINAL ON-SITE ASSEMBLY SEAL 1" PIPE TO EXTERIOR WALL WITH POLYURETHANE CAULKING & INSTALL FLASHING ON 2" VENT, SEE DETAIL 9/M4.1.



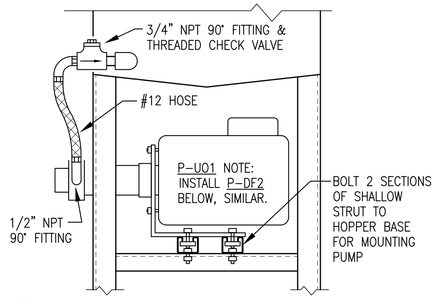
2 M5.2 DIESEL FUEL & USED OIL END WALL ELEVATION
1"=1'



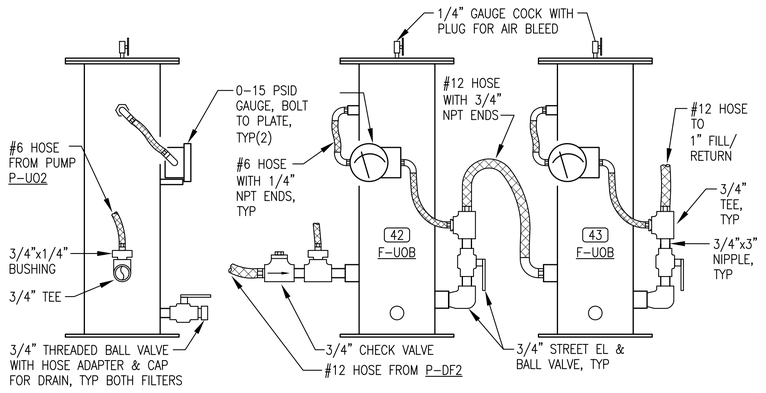
3 M5.2 DAY TANK VENT INSTALLATION
3/8"=1'-0"



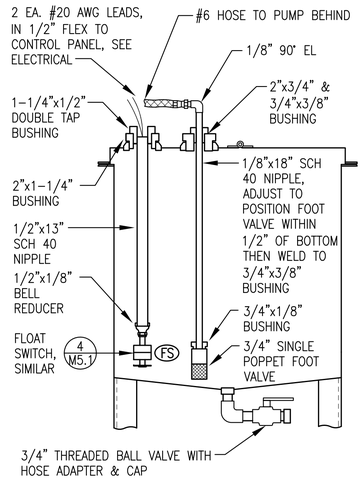
4 M5.2 TOP OF HOPPER – PLAN VIEW
NO SCALE



5 M5.2 HOPPER BASE ELEVATION
NO SCALE



6 M5.2 FILTER BANK ELEVATIONS & INSTALLATION DETAILS
NO SCALE



7 M5.2 SECTION THROUGH HOPPER
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DRAWING TITLE:
DIESEL FUEL & USED OIL PIPING ELEVATIONS & DETAILS

M5.2

SHEET OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019

DAY TANK SPECIFICATIONS:

1) FABRICATE SINGLE WALL 200 GALLON NOMINAL CAPACITY DAY TANK. FABRICATE IN ACCORDANCE WITH UL 142.

2) FABRICATE FROM ASTM A-36 STEEL PLATE, 10 GAUGE MINIMUM EXCEPT FOR TOP 3/16" MINIMUM. ALL TANK SEAM JOINTS TO BE FULL CONTINUOUS WELDS IN ACCORDANCE WITH UL 142 FIGURE 6.5 – #1, #6, #7, OR #8.

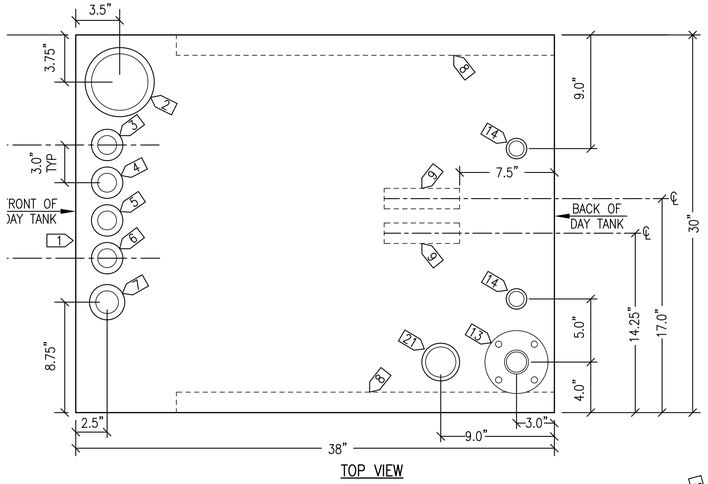
3) PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. ALL STRUT TO BE 1-5/8"x1-5/8"x12 GA SOLID BACK PLAIN (BLACK), B-LINE B22 PLN OR EQUAL. SEAL WELD ALL TANK ATTACHMENTS.

4) INSTALL ALL FPT OPENINGS IN ACCORDANCE WITH UL 142 FIGURE 7.1 – #4 UNLESS INDICATED OTHERWISE. ALL DROP TUBES SCH 40 ASTM A53 STEEL PIPE WITH MPT OR FLANGED END AS INDICATED.

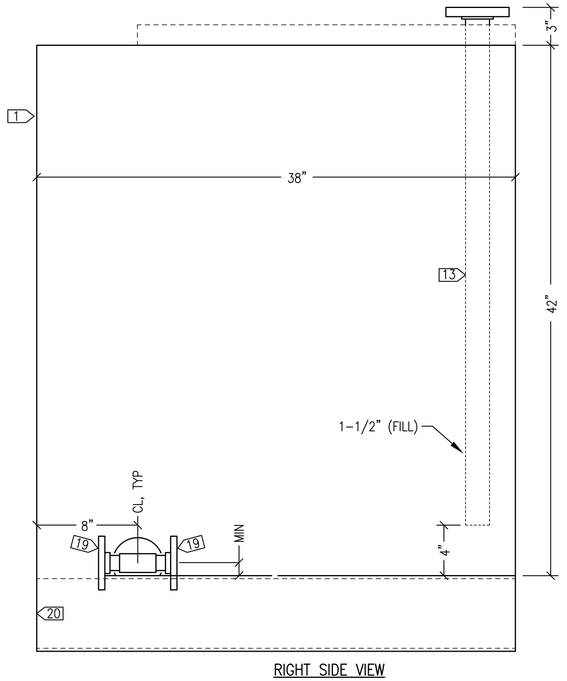
5) UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.

6) LABEL ALL OPENINGS WITH 1/4" BLACK LETTERS INDICATING FUNCTION AS LISTED IN PARENTHESES IN SPECIFIC NOTES.

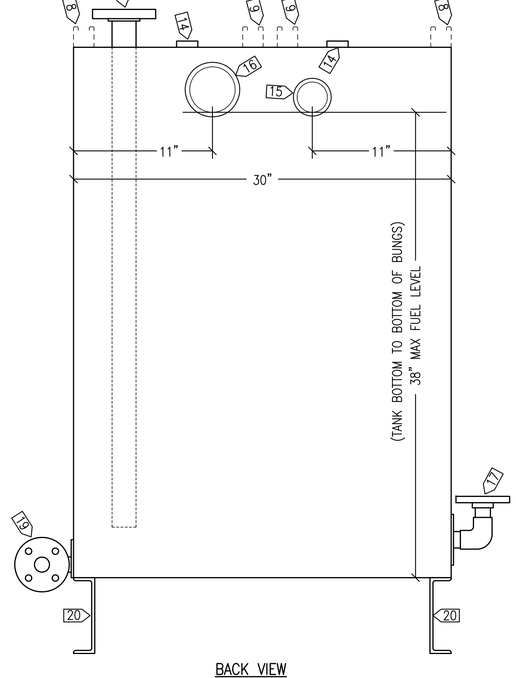
7) UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS AND AIR DRY INTERIOR. SEAL ALL MPT OPENINGS WITH THREADED STEEL CAPS. SEAL FPT TANK OPENINGS WITH THREADED STEEL PIPE PLUGS WHERE INDICATED. INSTALL 1-1/4" VENT CAP WHERE INDICATED. SEAL ALL OTHER FPT OPENINGS WITH PLASTIC OR STEEL PLUGS.



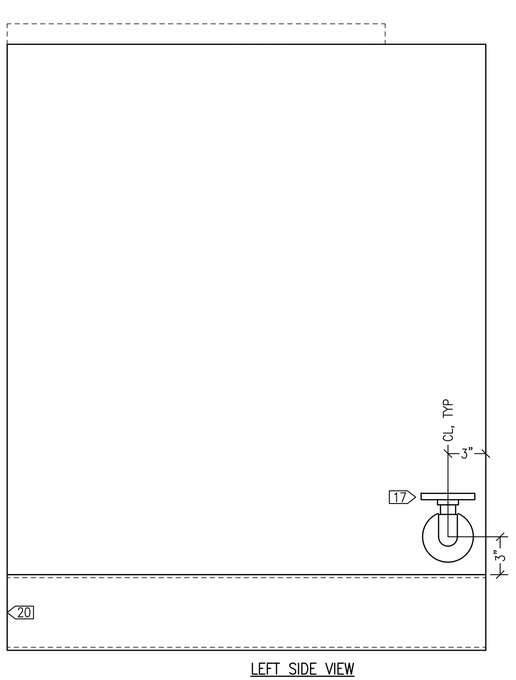
TOP VIEW



RIGHT SIDE VIEW



BACK VIEW

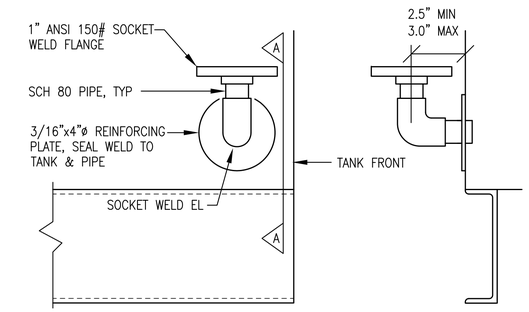


LEFT SIDE VIEW

1 M5.3 200 GALLON SINGLE WALL DAY TANK
1"=6"

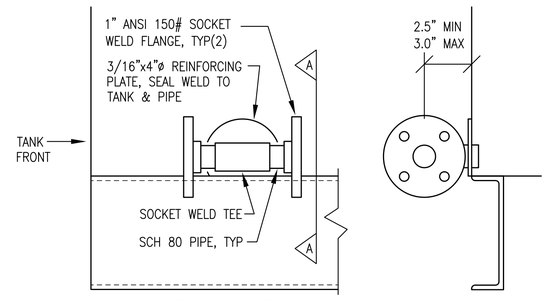
DAY TANK SPECIFIC NOTES:

1. PROVIDE 2" HIGH LETTERING: "DIESEL FUEL 200 GALLONS"
2. 4" FPT (MANUAL FILL) – INSTALL THREADED STEEL PLUG
3. 1-1/4" FPT (OVERFILL) – INSTALL VENT CAP FOR SHIPPING
4. 1-1/4" FPT (PUMP STOP)
5. 1-1/4" FPT (PUMP START)
6. 1-1/4" FPT (LOW ALARM)
7. 1-1/2" FPT (TANK GAUGE)
8. 30"L STRUT, END FLUSH WITH BACK OF TANK
9. 6"L STRUT
10. NOT USED
11. NOT USED
12. NOT USED
13. 1-1/2" SCH 40 DROP TUBE (FILL) WITH 150# FLANGE
14. 1" FPT (SPARE) – INSTALL THREADED STEEL PLUG
15. 2" FPT (VENT)
16. 3" FPT (EMERGENCY VENT) – INSTALL THREADED STEEL PLUG
17. 1" FLANGE (SUPPLY) – SEE DETAIL 2/M5.3
18. NOT USED
19. 1" FLANGE (DRAIN) – SEE DETAIL 3/M5.3
20. C6x8.2, 38" LONG
21. 2" FPT (TANK LEVEL PROBE)



LEFT SIDE ELEVATION SECTION A-A

2 M5.3 1" FLANGED SUPPLY CONNECTION
NO SCALE



RIGHT SIDE ELEVATION SECTION A-A

3 M5.3 1" FLANGED DRAIN CONNECTION
NO SCALE

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 — 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

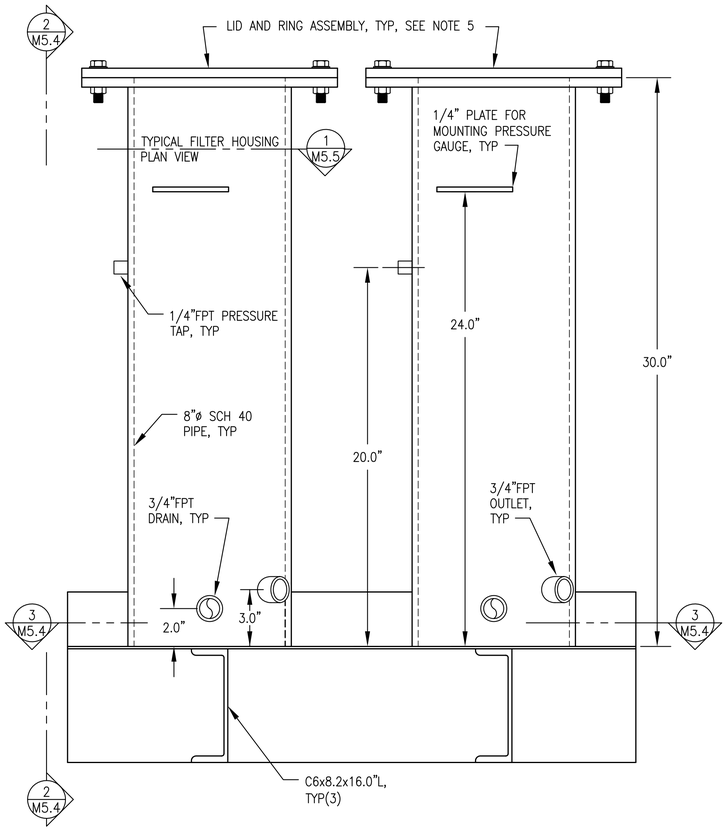
DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
200 GALLON DAY TANK FABRICATION

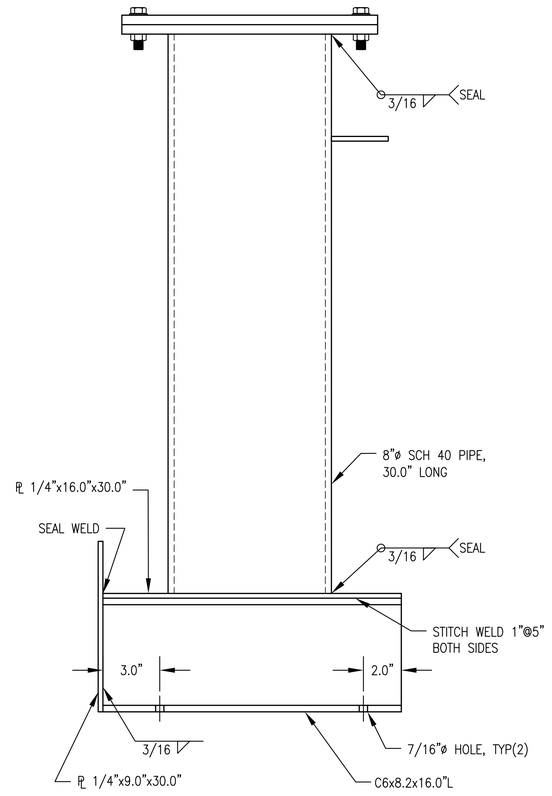
M5.3

SHEET OF 7

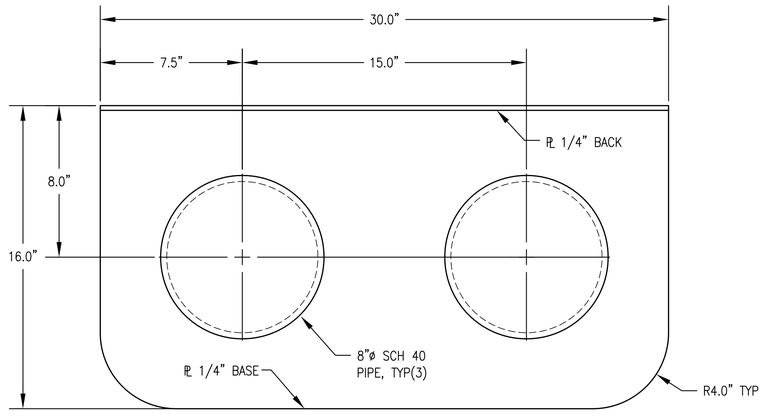
ISSUED FOR CONSTRUCTION JANUARY 2019



1 M5.4 OIL FILTER BANK FRONT ELEVATION
1/4" = 1"



2 M5.4 SECTION THROUGH FILTER & BASE
1/4" = 1"



3 M5.4 OIL FILTER BANK BASE PLAN
1/4" = 1"

FILTER BANK GENERAL NOTES:

1. FABRICATE TWO CHAMBER FILTER BANK AS INDICATED. SEE SHEET M5.5 FOR INTERNAL DETAILS.
2. FABRICATE FROM ASTM A-36 STEEL PLATE AND SHAPES AND ASTM A-53 PIPE. ALL JOINTS TO BE FULL CONTINUOUS SEAL WELDS EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE.
3. PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. INSTALL MINIMUM 3,000# FORGED STEEL HALF COUPLINGS FOR ALL FPT OPENINGS IN ACCORDANCE WITH UL 142 FIGURE 7.1 - #2.
4. UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
5. AFTER PAINTING REMOVE LID, WIRE BRUSH MATING SURFACES OF LID AND RING TO REMOVE ALL PAINT AND POLISH SURFACES SMOOTH. APPLY A LIGHT COAT OF GREASE OR ANTI-SIEZE PASTE TO BOTH FACES PRIOR TO INSTALLING GASKET. INSTALL 13.5" O.D. FULL-FACED 1/4" BUNA-N RUBBER GASKET (ALASKA RUBBER OR EQUAL) ON FILTER LIDS.
6. FURNISH FASTENERS AS INDICATED AND COAT WITH ANTI-SIEZE.
7. PRESSURE TEST EACH FILTER HOUSING ASSEMBLY TO 50 PSIG MINIMUM.
8. UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS, AIR DRY INTERIOR, AND SEAL ALL TANK OPENINGS WITH PLASTIC PLUGS.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
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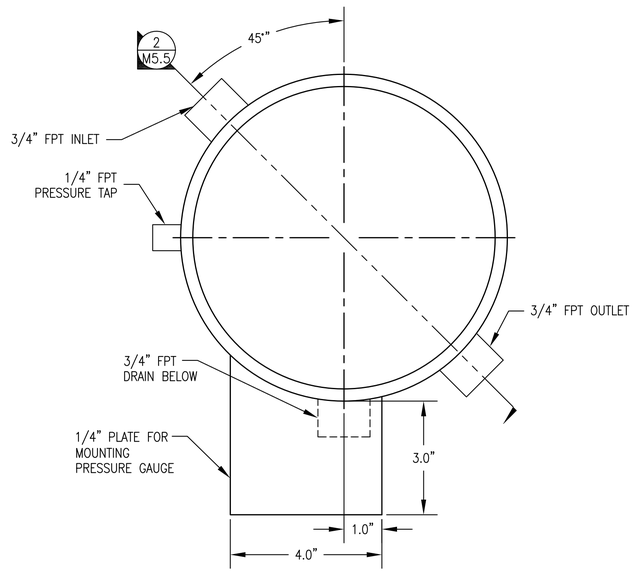
DRAWING TITLE:
USED OIL BLENDER FILTER BANK LAYOUT & CONFIGURATION

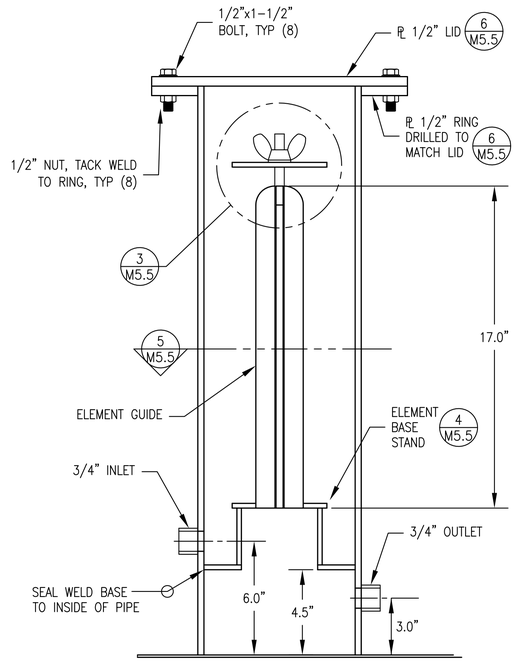
M5.4

SHEET | OF 7

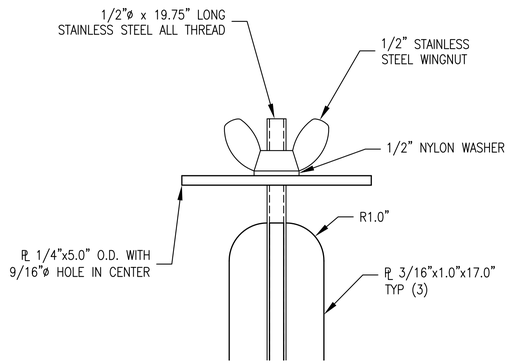
ISSUED FOR CONSTRUCTION JANUARY 2019



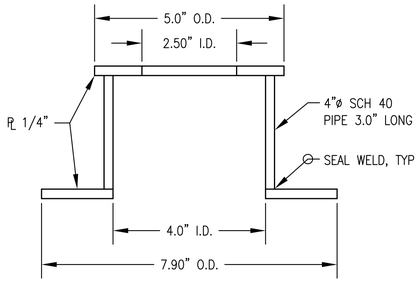
1 M5.5 TYPICAL FILTER HOUSING – PLAN VIEW
1/2" = 1"



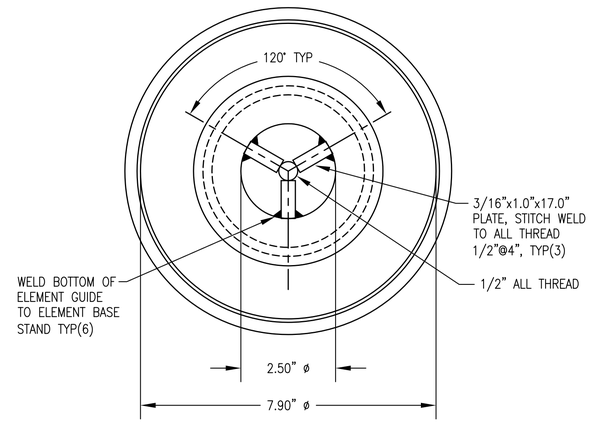
2 M5.5 TYPICAL SECTION THROUGH FILTER HOUSING
1/4" = 1"



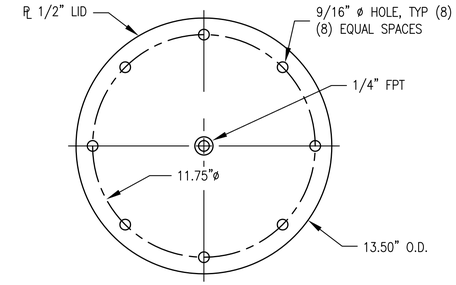
3 M5.5 ELEMENT RETAINER CAP
1/2" = 1"



4 M5.5 ELEMENT BASE STAND
1/2" = 1"



5 M5.5 SECTION THROUGH ELEMENT GUIDE
1/2" = 1"



6 M5.5 LID & MATING RING – PLAN VIEW
1/4" = 1"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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

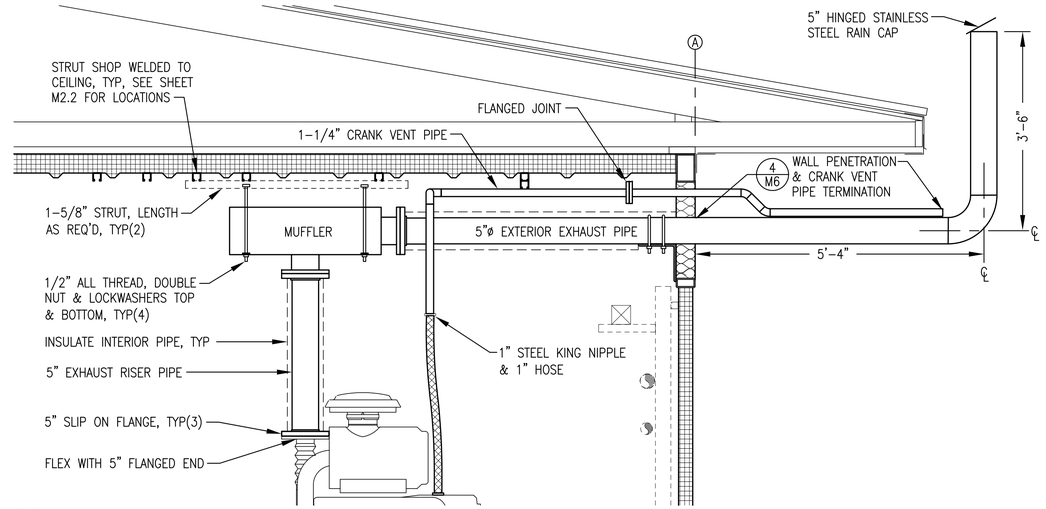
DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
USED OIL BLENDER
TYPICAL FILTER
HOUSING DETAILS

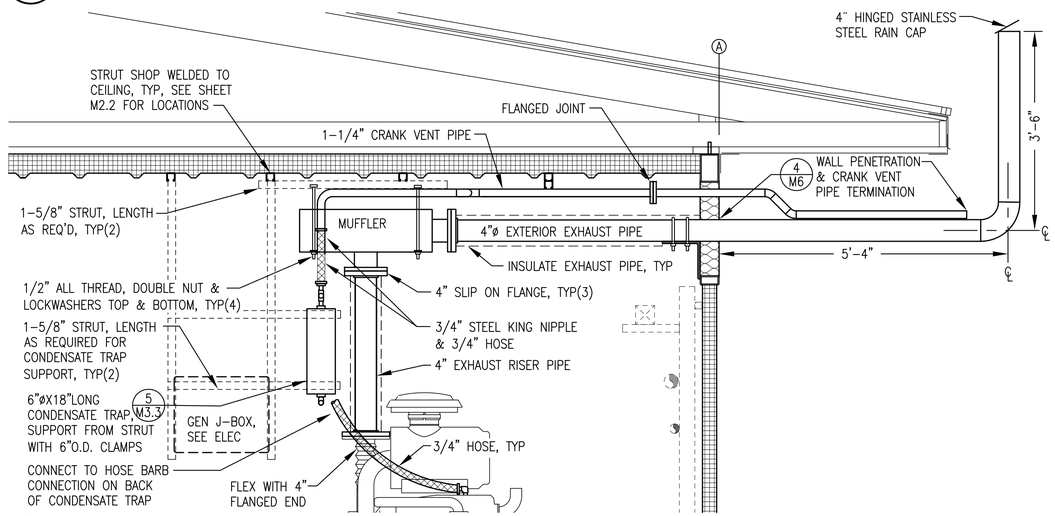
M5.5

SHEET OF 7

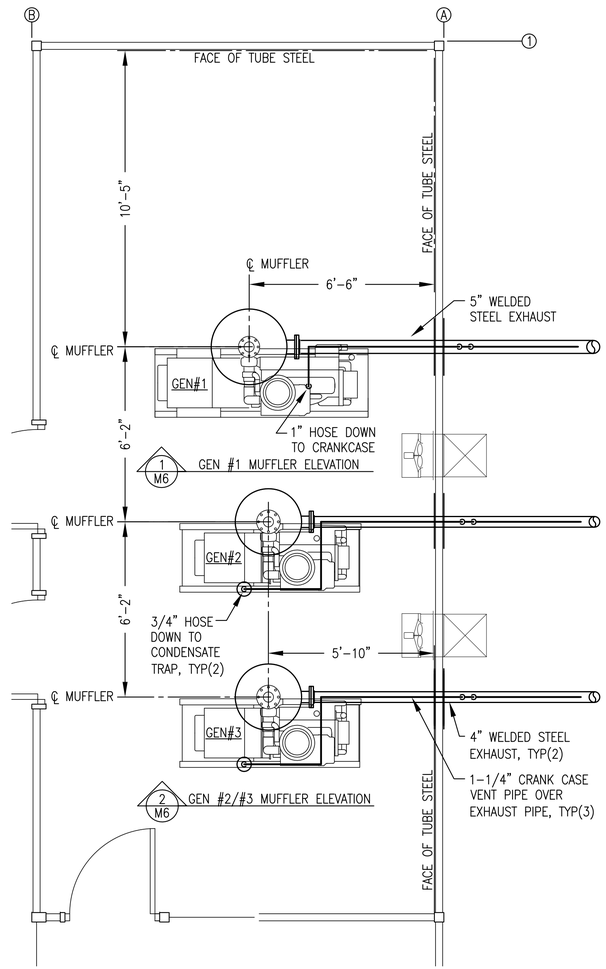
ISSUED FOR CONSTRUCTION JANUARY 2019



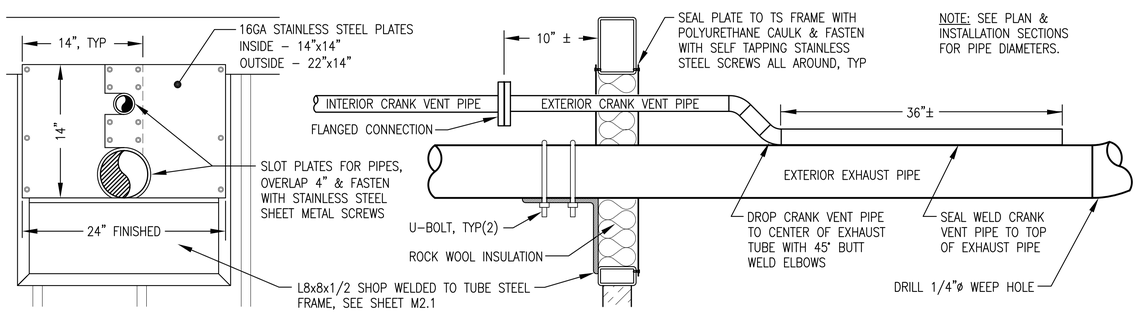
1 M6 GEN #1 MUFFLER, EXHAUST & CRANK VENT PIPE INSTALLATION
3/4"=1'-0"



2 M6 GEN #2/#3 MUFFLER, EXHAUST, CONDENSATE TRAP & CRANK VENT PIPE INSTALLATION
3/4"=1'-0"



3 M6 MUFFLER, EXHAUST & CRANK VENT PIPE PLAN
3/8"=1'-0"



NOTE: SEE PLAN & INSTALLATION SECTIONS FOR PIPE DIAMETERS.

4 M6 WALL PENETRATION & CRANK VENT PIPE TERMINATION
NO SCALE

EXHAUST & CRANK VENT GENERAL NOTES:

1) ALL EXTERIOR EXHAUST PIPE AND FITTINGS (FROM MUFFLER TO RAIN CAP) TYPE 304L STAINLESS STEEL WITH BUTT WELD FITTINGS. INTERIOR EXHAUST PIPE RISER (FROM FLEX TO MUFFLER) CARBON STEEL OR MAY BE STAINLESS AT CONTRACTORS OPTION. ALL FLANGES ANSI 150# FLAT FACED SLIP ON.

2) ALL EXTERIOR CRANK VENT PIPE AND FITTINGS TYPE 304L STAINLESS STEEL WITH BUTT WELD FITTINGS. ALL INTERIOR CRANK VENT PIPE AND FITTINGS CARBON STEEL WITH SOCKET WELD FITTINGS OR MAY BE STAINLESS AT CONTRACTORS OPTION. ALL FLANGES ANSI 150# FLAT FACED SOCKET WELD.

3) ALL EXHAUST FLANGE BOLTS BLACK OR STAINLESS STEEL. COAT WITH HIGH TEMPERATURE ANTI-SIEZE.

EXHAUST & CRANK VENT SHOP/ON-SITE NOTES:

1) SHOP FABRICATE COMPLETE EXHAUST AND CRANK VENT PIPING SYSTEM AS INDICATED.

2) SHOP INSTALL INSULATION FROM FLEX TO MUFFLER. SHOP FIT INSULATION FROM MUFFLER TO WALL, LABEL FOR THE ASSOCIATED GENERATOR AND STORE INSIDE MODULE.

3) SHOP FABRICATE STAINLESS STEEL COVER PLATES BUT DO NOT INSTALL. LABEL COVER PLATES FOR THE ASSOCIATED GENERATOR AND STORE INSIDE MODULE.

4) UPON COMPLETION OF TESTING BREAK EXHAUST FLANGE JOINT ON MUFFLER OUTLET AND CRANK VENT FLANGE JOINT AND REMOVE U-BOLTS. REMOVE PIPING FOR SHIPPING AND TEMPORARILY SEAL WALL PENETRATION.

5) IN FIELD REINSTALL PIPING WITH NEW FLANGE GASKETS. RE-INSTALL PIPING INSULATION. INSULATE WALL PENETRATION, INSTALL COVER PLATES, AND SEAL TO WALL.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 1"
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BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE:	1/14/19
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DRAWING TITLE:
EXHAUST & CRANK VENT PLAN & DETAILS

M6

SHEET | OF 7

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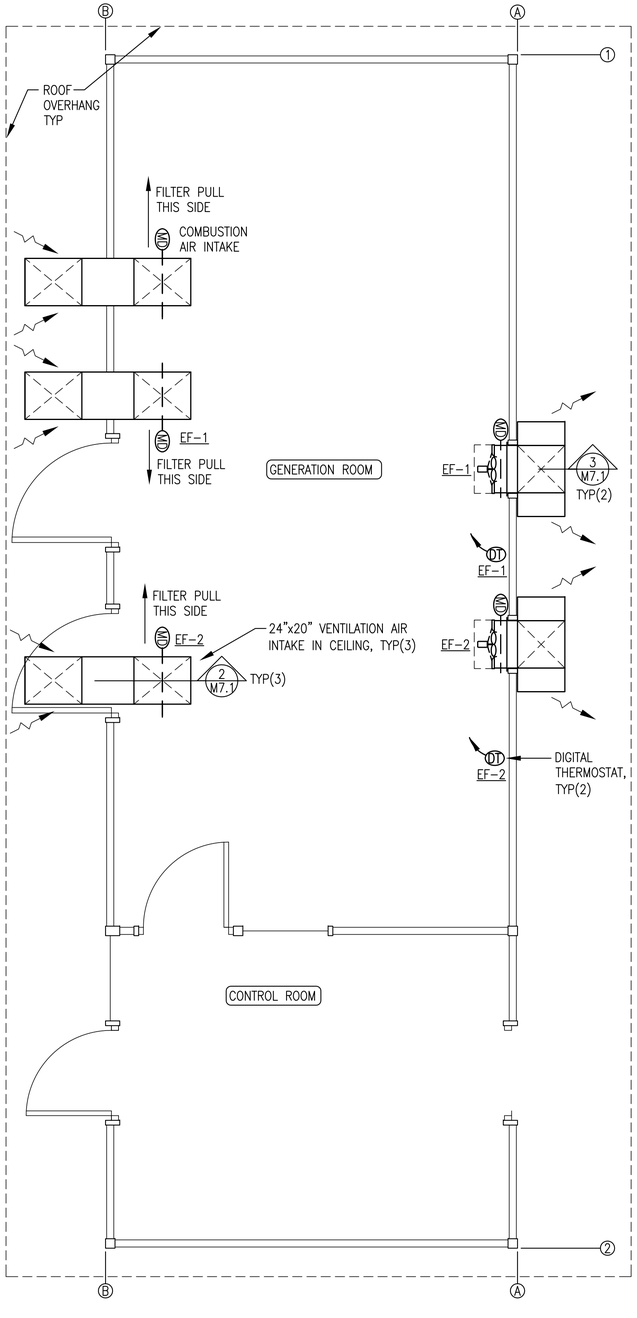
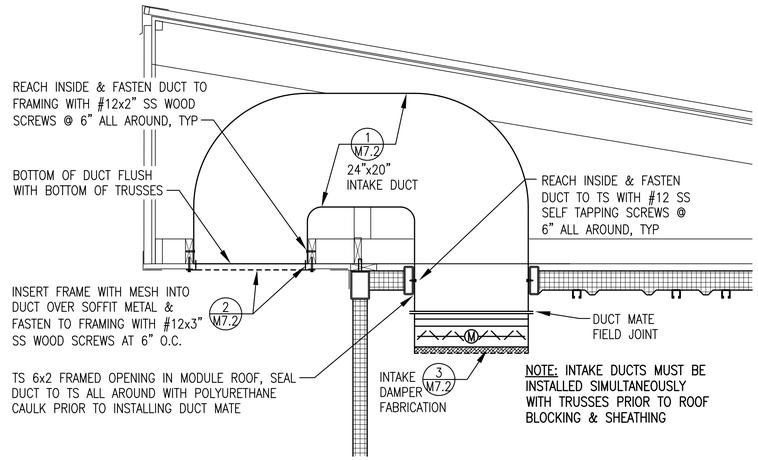
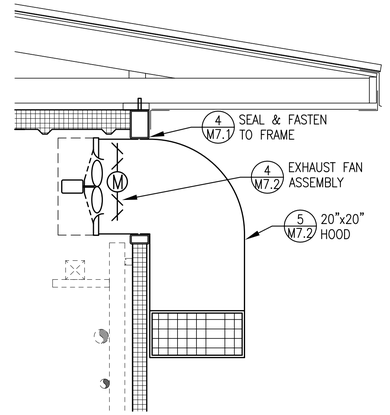


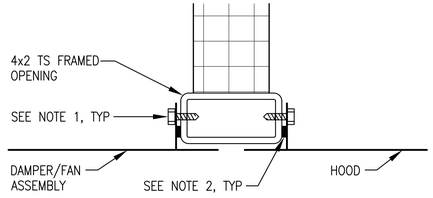
1 M7.1 VENTILATION PLAN
3/8"=1'-0"



2 M7.1 INTAKE DUCT INSTALLATION
3/4"=1'-0"



3 M7.1 EXHAUST FAN INSTALLATION
3/4"=1'-0"



NOTES:

1) FASTEN MOUNTING FLANGE TO TS WITH #12 STAINLESS STEEL SELF TAPPING SCREWS. ON HOODS FASTEN ON TOP AND SIDES ONLY. ON EXHAUST FANS FASTEN ON SIDES ONLY.
2) SEAL MOUNTING FLANGE TO TS WITH CONTINUOUS BEAD OF POLYURETHANE CAULKING ALL AROUND.

4 M7.1 TYPICAL WALL PENETRATION
4"=1'-0"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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

DATE:	1/14/19
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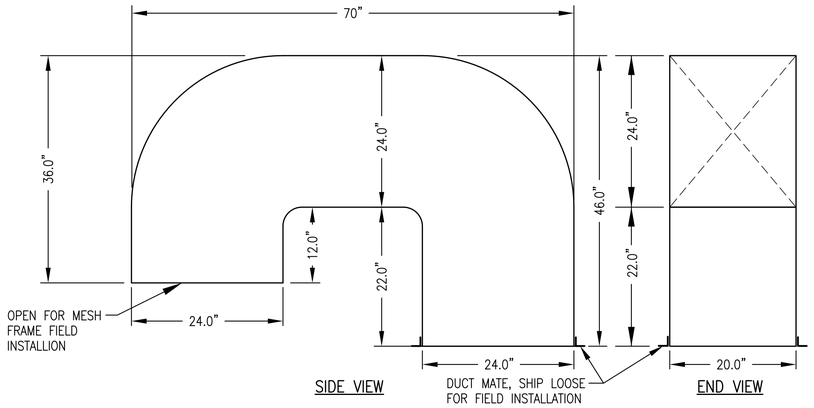
JOB NUMBER:	

DRAWING TITLE:
VENTILATION
PLAN & DETAILS

M7.1

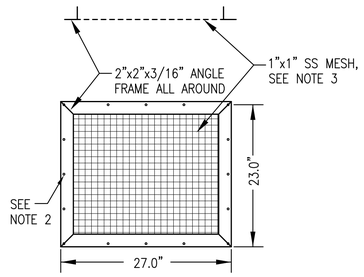
SHEET OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019



NOTE: FABRICATE 3 IDENTICAL DUCTS FROM MIN 18 GAUGE GALV SHEET METAL WITH SEALED MECHANICAL JOINTS OR AT CONTRACTORS OPTION 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

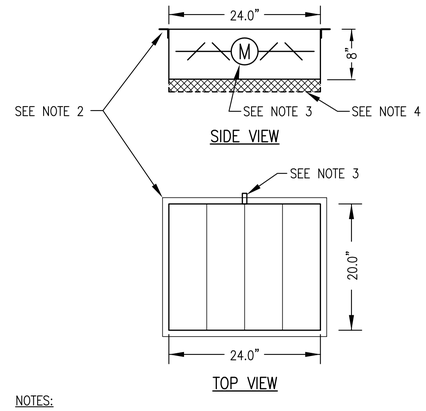
1 M7.2 INTAKE DUCT FABRICATION
1"=1'-0"



NOTES:

1. FABRICATE 3 IDENTICAL AIR INTAKE MESH FRAMES.
2. FABRICATE FRAME FROM 2"x2"x3/16" ALUMINUM ANGLE WITH MITERED AND WELDED CORNERS AND 1/4" HOLES AT 6" O.C. ALL AROUND, 1/2" FROM OUTSIDE EDGE OF FRAME.
3. INSTALL 1"x1" STAINLESS STEEL WIRE MESH IN HEMMED STAINLESS STEEL FRAME AND FASTEN TO ANGLE FRAME WITH STAINLESS STEEL SCREWS ALL AROUND.

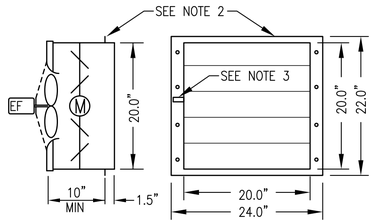
2 M7.2 INTAKE MESH FRAME
1"=1'-0"



NOTES:

1. FABRICATE 3 IDENTICAL VENTILATION INTAKE ASSEMBLIES.
2. SHOP MOUNT DUCTMATE FLANGE.
3. PROVIDE MIN 3" DAMPER ROD EXTENSION ON SIDE INDICATED AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.
4. INSTALL FRAME FOR REMOVABLE 24"x24"x2" FURNACE FILTERS. FABRICATE FROM "C" CHANNEL THREE SIDES WITH LATCHING HINGED COVER ON FOURTH SIDE TO ALLOW FILTERS TO SLIDE OUT. SEE PLAN VIEW FOR DAMPER ACTUATOR AND FILTER PULL ORIENTATION. EXTEND FILTER FRAME 2"± BEYOND DAMPER FRAME EACH WAY ON NARROW DIMENSION.

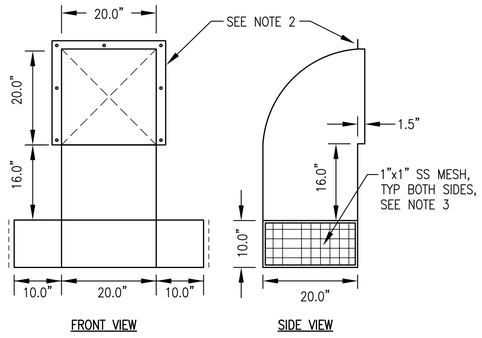
3 M7.2 INTAKE AIR DAMPER FABRICATION
1"=1'-0"



NOTES:

1) FABRICATE 2 IDENTICAL ASSEMBLIES COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.
2) PROVIDE 2" WIDE MOUNTING FLANGE ON SIDES WITH 1/4" HOLES AT 5" O.C. PROVIDE 1" MOUNTING FLANGE ON TOP AND BOTTOM WITHOUT HOLES.
3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON THE LEFT SIDE AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

4 M7.2 EXHAUST FAN ASSEMBLY FABRICATION
1"=1'-0"



NOTES: 1) FABRICATE 2 IDENTICAL HOODS FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES WITH 1/4" HOLES AT 9" O.C.

3) INSTALL 1"x1" STAINLESS STEEL WIRE MESH IN HEMMED STAINLESS STEEL FRAME AND FASTEN TO ANGLE FRAME WITH STAINLESS STEEL SCREWS ALL AROUND.

5 M7.2 EXHAUST HOOD FABRICATION
3/4"=1'-0"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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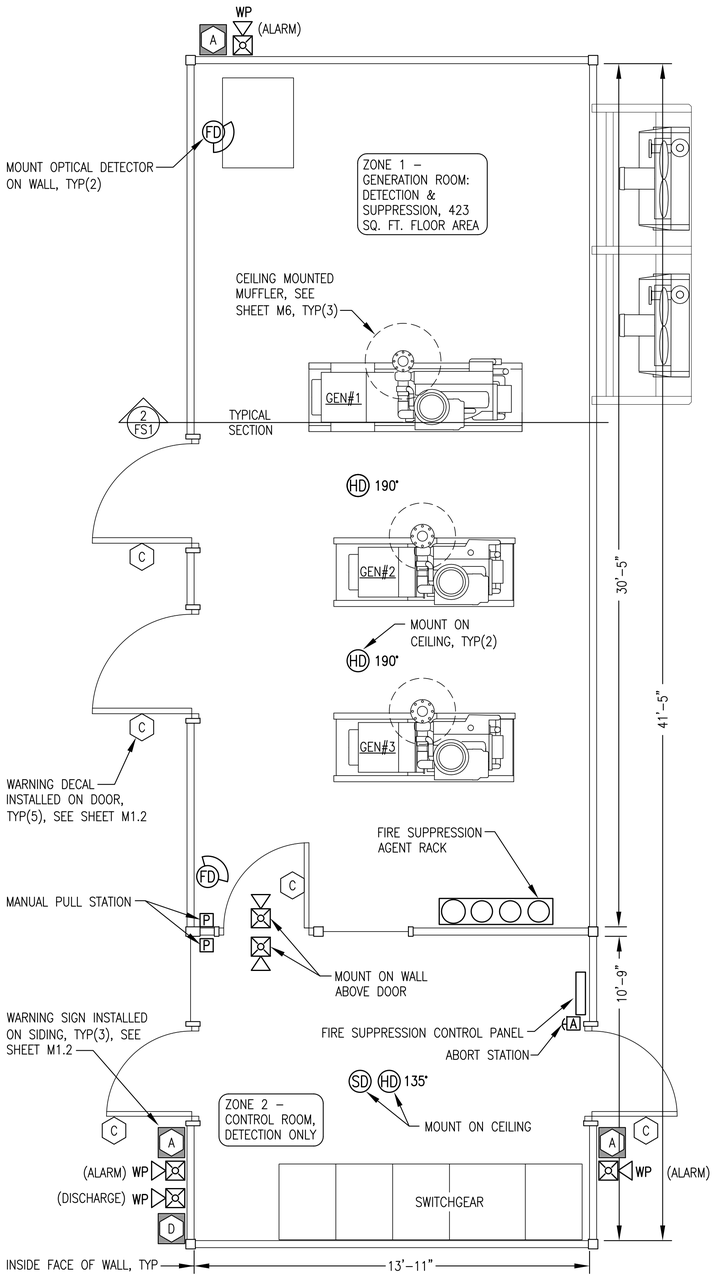
STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

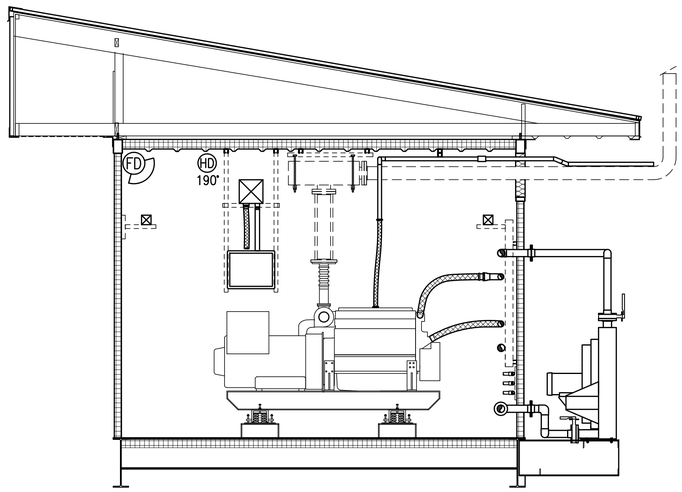
DRAWING TITLE:
VENTILATION FABRICATION DETAILS

M7.2

SHEET | OF 7



1 FS1 FIRE SUPPRESSION SYSTEM PLAN
3/8"=1'–0"



2 FS1 TYPICAL SECTION THROUGH MODULE
3/8"=1'–0"

FIRE SUPPRESSION SYMBOL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
P	MANUAL PULL STATION	HD 135°	NORMAL TEMP. (135°F) DETECTOR
A	ABORT STATION	HD 190°	HIGH TEMP. (190°F) DETECTOR
	INTERIOR ALARM HORN/STROBE	FD	FLAME (OPTICAL) DETECTOR
WP	EXTERIOR ALARM HORN/STROBE	SD	SMOKE (IONIZATION) DETECTOR

FIRE SUPPRESSION PLACARD SCHEDULE	
SYMBOL	DESCRIPTION
A	"FIRE ALARM"
C	"CAUTION, ROOM PROTECTED BY WATER MIST FIRE PROTECTION SYSTEM, IN CASE OF FIRE KEEP DOOR CLOSED AND DO NOT ENTER"
D	"FLASHING LIGHT MEANS FIRE SUPPRESSION AGENT HAS DISCHARGED"

FIRE SUPPRESSION WIRE SCHEDULE			
SYMBOL	CIRCUIT DESCRIPTION	WIRE TYPE	WIRE COLOR
A	24V DC POWER	#14 AWG SOLID	RED & BLACK
B	DETECTION CIRCUITS	#14 AWG SOLID	BLUE & YELLOW
C	ANNUNCIATION ALARM	#14 AWG SOLID	BROWN & ORANGE
D	ANNUNCIATION DISCHARGE	#14 AWG SOLID	WHITE, & GRAY
E	24V DC AUX POWER	#14 AWG SOLID	RED & BLACK WITH GRAY STRIPE

FIRE SUPPRESSION GENERAL NOTES:

1) INTERIOR FINISH OF ALL WALLS, FLOOR, AND CEILING WELDED STEEL PLATE. CEILING HEIGHT IN ALL ROOMS 10'–2" ABOVE FINISHED FLOOR.

2) ALL DOORS SELF–CLOSING WITH GASKETS. ALL BUILDING PIPING AND CONDUIT PENETRATIONS SEALED LIQUID TIGHT. ALL BUILDING DUCT PENETRATIONS EQUIPPED WITH MOTORIZED DAMPERS THAT CLOSE ON GENERATOR SHUT DOWN.

FIRE SUPPRESSION SHOP/ON–SITE NOTES:

1) UPON COMPLETION OF MODULE SHOP TESTING: DISCONNECT BATTERIES. DRAIN ALL WATER OUT OF THE SYSTEM AND BLOW OUT WITH AIR TO PREVENT FREEZE DAMAGE. LEAVE ONE FULLY CHARGED NITROGEN CYLINDER INSTALLED IN THE RACK PLUS ONE LOOSE SHIP FULLY CHARGED SPARE NITROGEN CYLINDER.

2) DURING ON–SITE CONSTRUCTION: FILL BOTTLES WITH CLEAN POTABLE WATER IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. FULLY TEST AND CERTIFY SYSTEM. TRAIN AEA STAFF AND LOCAL OPERATORS.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: BCG
JOB NUMBER:

DRAWING TITLE:
FIRE SUPPRESSION SYSTEM PLAN, SECTION, LEGEND, & NOTES

FS1

SHEET | OF 1

ISSUED FOR CONSTRUCTION JANUARY 2019

BUILDING PLANS SYMBOL LEGEND

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
1/4	MOTOR (HORESPOWER INDICATED)
MD	MOTORIZED DAMPER – SEE MECHANICAL
	125V, 20A, DUPLEX RECEPTACLE
T	LINE VOLTAGE THERMOSTAT
DT	DIGITAL THERMOSTAT, MODULATING
$	SNAP SWITCH / SMALL MOTOR DISCONNECT
T$	TIMER SWITCH
	GROUND

EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS (APPLIES TO ALL SCHEDULES):
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.

ELECTRICAL EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
1	DAY TANK ALARM HORN/STROBE	MULTI-TONE ALARM WITH STROBE, 115V, NEMA 3R, WEATHER RESISTANT SURFACE MOUNT BELL BOX	WHEELOCK MT4-115-WH-VNS
2	DIGITAL THERMOSTAT	MULTIPLE OUTPUT MODULATING DIGITAL THERMOSTAT	HONEYWELL TB7980B
3	LINE VOLTAGE THERMOSTAT	HEATING/COOLING THERMOSTAT, 16 FLA @ 120V, SPDT, 50F TO 80F RANGE.	DAYTON 1UHH2
4	AREA LIGHT	AREA LIGHT, WIDE DISPERSION WALL PACK WITH PHOTO CONTROL. LED, 17.7W, 120-277V DRIVER	HUBBELL NRG-356L-5K-U-PC
5	EMERGENCY LIGHT	WALL MOUNT, WHITE 20 GA STEEL ENCLOSURE, 277/120VAC, 8.4A INPUT, SEALED LEAD-ACID BATTERY, DUAL 5.3W 6VDC LED LAMPS	HUBBEL DUAL-LITE CCU2
6	EMERGENCY/EXIT LIGHT COMBO	WHITE PLASTIC ENCLOSURE, RED EXIT SIGN, 277/120V INPUT, DUAL 1.5W 9.6V LED LAMPS. OPTIONAL HIGH OUTPUT NI-CAD BATTERY	LITHONIA LHQM-LED-R-HO OR EQUAL
7	NOT USED	NOT USED	NOT USED
8	MODULE INTERIOR LIGHTING	SURFACE MOUNTED LED STRIPLIGHT FIXTURE, 48" LONG, 34W, 5000'K WITH SNAP ON FROSTED DIFFUSER	LITHONIA L1N-L48-5000LM-FST
9	TIMER SWITCH	0-5 MINUTE , 120V, 20A, 1HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER.	INTERMATIC FF5M
10	LIGHT SWITCH	SINGLE POLE SNAP SWITCH, 120V, 20A, METAL, 1-1/2HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER, IVORY.	HUBBELL 1221-I
11	1ø SMALL MOTOR DISCONNECT	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	HUBBELL 1221-PL
12	NOT USED	NOT USED	
13	STATION SERVICE TRANSFORMER	DRY TYPE, ENERGY STAR, ENCLOSURE TYPE 3R WITH INTEGRAL WALL MOUNT BRACKETS, 9 kVA, HV 480 DELTA, LV 208Y/120	HAMMOND HPS C3F009KBS WITH NQT6 CASE
14	STATION SERVICE PANELBOARD	COPPER BUS, 3 PHASE, 4 WIRE, 120/208V, 100A, 30 CIRCUITS, BOLT-IN BREAKERS, SURFACE MOUNT, NEMA 1	SIEMENS OR SQUARE D
15	STANDARD RECEPTACLE	SURFACE MOUNT 125V NEMA 5-20R RECEPTACLE. INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	PASS & SEYMOUR 5362W
16	EXTERIOR GFCI RECEPTACLE	125V NEMA 5-20R GFCI RECEPTACLE. MOUNT IN CAST FDA BOX WITH WEATHERPROOF COVER	PASS & SEYMOUR 2095-W
17	BATTERY CHARGER	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120 VAC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS	SENS NRG22-20-RCLS OR CHARLES 93-INCHGR20-A
18	WELDER/COMPR. RECEPTACLE	NEMA 6-30R , BLACK, 250V, 30A, 2 POLE, WITH GROUND. INSTALL IN DEEP 4"x4" STEEL BOX WITH 2.15"ø HOLE METAL COVER	PASS & SEYMOUR 3801
19	NOT USED	NOT USED	NOT USED
20	RADIATOR MOTOR DISCONNECT	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 600V, 30A, MIN 5HP RATED	SIEMENS HNF361R OR SQUARE D HU361R
21	24VAC CONTROL TRANSFORMER	120V PRIMARY, 24V SECONDARY, 75VA OUTPUT, PLATE MOUNT, INSTALL ON 4"x4" PRESSED STEEL BOX	HONEYWELL AT175A1008
22	ENCLOSED POWER RELAY	20A, 1HP RATED CONTACT, SPDT, 24VAC COIL, NEMA 1 ENCLOSURE, RED LED PILOT LIGHT	FUNCTIONAL DEVICES RIB2401B

ELECTRICAL CONDUCTOR SCHEDULE

SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL	NOTES:
GENERATOR LEADS & FEEDERS (480V) & ENGINE STARTER CABLES (24VDC)	HIGH TEMPERATURE, EXTRA FLEXIBLE CABLE, TIN COATED COPPER CONDUCTOR. THERMOSET EPDM INSULATION, UL 3340/3374, MINIMUM 600V, LISTED 150°C FOR NON-FLEXING	COBRA CABLE, BELDEN, OR OMINI	TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT 150°C.
GENERAL USE CONDUCTORS	CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.		
HIGH TEMPERATURE BOILER CONDUCTORS	STRANDED ANNEALED COPPER, NICKEL PLATED, GLASS REINFORCED MICA TAPE INSULATION, FIBERGLASS JACKET, 600V AND 450C RATED.	TEMPCO OR OMINI TYPE MG, UL 5107	USE FOR CONNECTION TO ELECTRIC BOILER ELEMENTS
SHIELDED/TWISTED INSTRUMENT & CONTROL CONDUCTORS	#18 AWG STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE & PVC OUTER JACKET	BELDEN PART #'S SINGLE PAIR: #1120A FOUR PAIR: #1049A SINGLE TRIAD: #1121A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
CANBUS (DEVICENET) COMMUNICATION CONDUCTORS	STRANDED TINNED COPPER CONDUCTORS, 600V PVC/NYLON & FRPP INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH TINNED COPPER BRAID SHIELD & PVC OUTER JACKET	TWO PAIR #16 & #18 BELDEN 7896A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
EHTERNET (CAT5e) COMMUNICATION CONDUCTORS	SOLID BARE COPPER CONDUCTORS, 300V FEP INSULATION & JACKET, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE	FOUR PAIR #24 BELDEN 1585LC	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY. ROUTE ALL CAT5e CABLES IN SEPARATE DEDICATED RACEWAY.

COLOR CODING – UNLESS SPECIFICALLY INDICATED OTHERWISE CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:
- 480-VOLT POWER CONDUCTORS
  - 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
- 24 VOLT DC CONDUCTORS
  - +24VDC – RED or RED WITH GRAY STRIPE
  - -24VDC – BLACK or BLACK WITH GRAY STRIPE
- CONTROL & INSTRUMENT CONDUCTORS
  - COLOR CODED PER MANUFACTURER'S STANDARD

NOTES:
1) FOR NO. 6 AWG AND SMALLER CONDUCTORS COLOR CODING SHALL BE PROVIDED BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION. FOR ALL CONDUCTORS LARGER THAN NO. 6 SCOTCH 35 MARKING TAPE OR EQUIVALENT MAY BE USED TO COLOR CODE THE CABLE. WHERE MARKING TAPE IS USED THE CABLE SHALL BE IDENTIFIED AT EVERY ACCESSIBLE LOCATION. PROVIDE A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION.
2) GROUNDING – PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE CLASS B CONCENTRIC STRANDED, SOFT-DRAWN COPPER OF THE SIZES INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

ELECTRICAL INSTRUMENTATION SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
TT	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
PT	PRESSURE TRANSMITTER	0-60 PSIG RANGE, 4-20mA OUTPUT, 1/4" NPT PIPING CONNECTION, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 100-60-1-1-2-7
FM	HEAT RECOVERY FLOW METER	150# ANSI FLANGED CONNECTION, SIZE AS INDICATED, PTFE LINER, HASTELLOY C ELECTRODES, RATED FOR 210F OPERATION. FURNISH WITH TRANSMITTER FOR DIRECT AND REMOTE MOUNTING, 115/230 VAC, 50/60 HZ, AND NEMA 4X BODY.	SIEMENS SITRANS METER: FM MAGFLO MAG 3100 TRANSMITTER: F M MAGFLO MAG 5000, CODE NO. FDK: 7ME6910, OPTION 1AA10-1AA0
FS	DAY TANK/HOPPER FLOAT SWITCH	VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VASPST NC/NO SWITCH, 1/8" NPT, 1"MAX ø BUNA-N FLOAT FOR S.G=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2
TLM	TANK LEVEL MONITOR PANEL	TANK LEVEL MONITOR CONSOLE FOR UP TO SIX TANKS, COLOR LCD SCREEN, ETHERNET CONNECTION WITH WEB INTERFACE, PROGRAMMABLE VOLUME CALCULATIONS WITH TEMPERATURE COMPENSATION	FRANKLIN/INCON COLIBRI CL6D
LSP	FUEL/OIL TANK LEVEL SENSOR PROBE	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 ON INSTALLATION DETAILS.	4' TANK PROBE: TSP-LL2-53-I 2' TANK PROBE: TSP-LL2-29-I FLOAT: INTSP-IDF2 2" FOR DIESEL INSTALLATION KIT: TSP-K2A
LCA	GLYCOL TANK LOW COOLANT ALARM	LOW COOLANT LEVEL ALARM FLOAT SWITCH, SEE MECHANICAL FOR INSTALLATION DETAILS	MURPHY EL-150-K1
GLS	GLYCOL TANK LEVEL SENSOR PROBE	12" PROBE, 2" NPT TANK CONNECTION, SS FLOAT, 1/4" RESOLUTION, NEMA 4 ENCLOSURE WITH SIGNAL CONDITIONER AND 1/2" NPT CONDUIT CONNECTION	INNOVATIVE COMPONENTS CLM-2012-SS

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

ISSUED FOR CONSTRUCTION JANUARY 2019

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

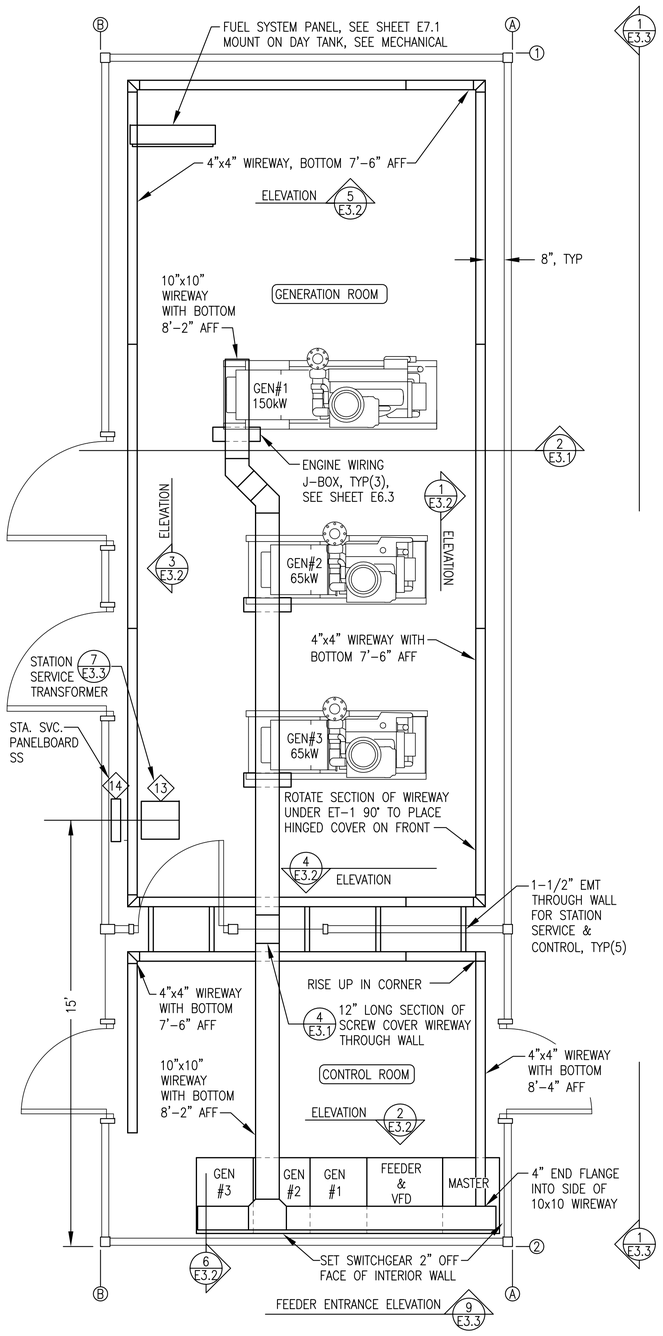
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
ELECTRICAL
LEGENDS & SHEDULES

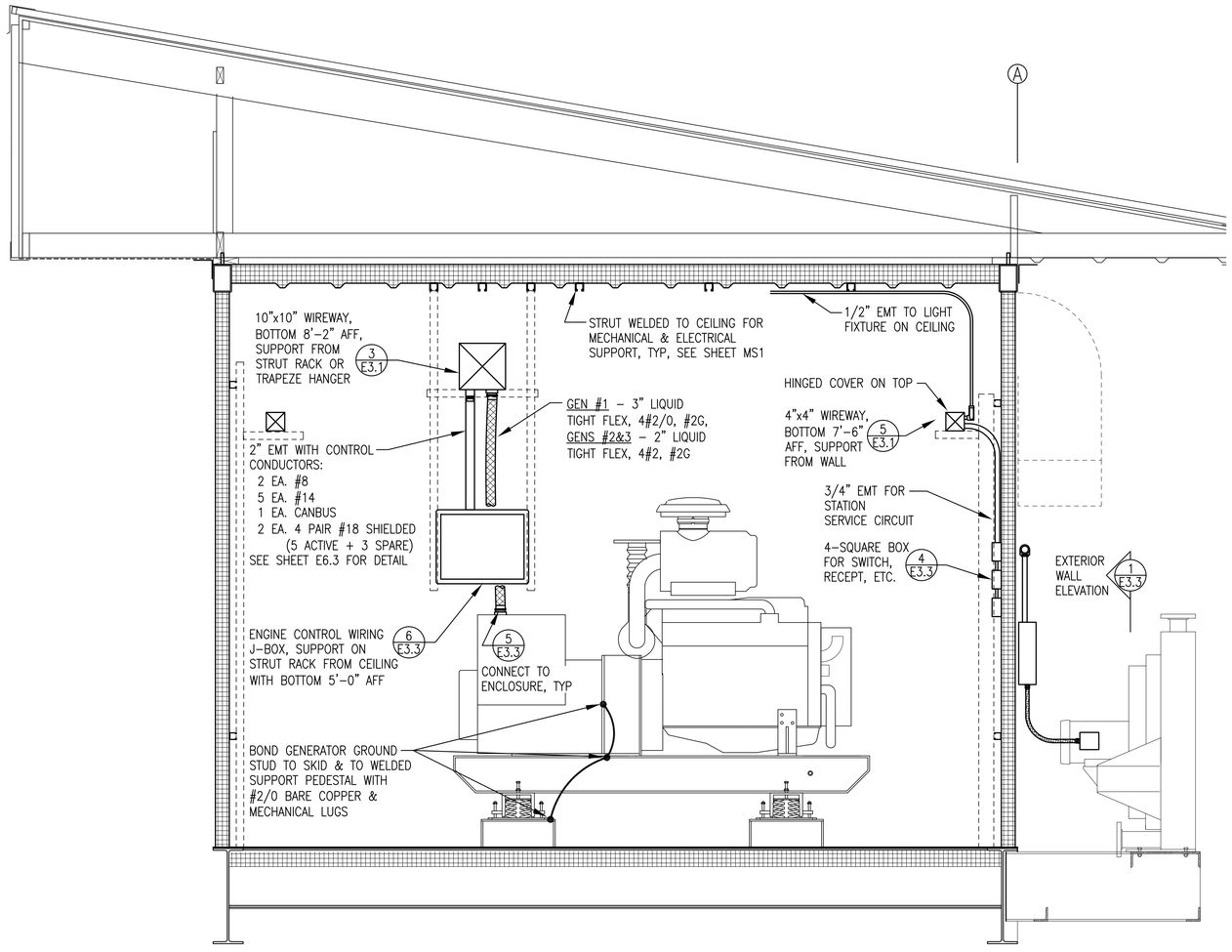
E1.1

SHEET OF 7



1 E3.1 EQUIPMENT LAYOUT & WIREWAY PLAN

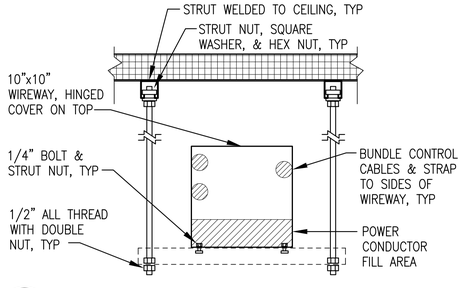
3/8"=1'-0"



2 E3.1 TYPICAL MODULE SECTION

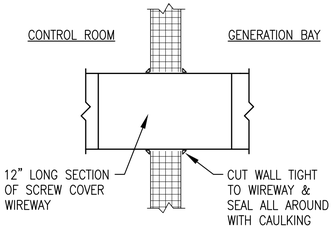
3/4"=1'-0"

NOTES:
1) INSTALL HANGER AT EACH JOINT & AT END.
2) HANGER NOT REQUIRED AT ENGINE J-BOX SUPPORT, SEE DETAIL 4/E4.3.



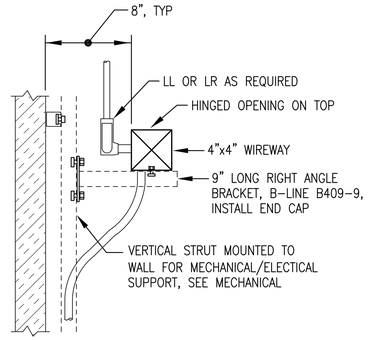
3 E3.1 10" WIREWAY TRAPEZE HANGER

NO SCALE



4 E3.1 WIREWAY WALL PENETRATION

NO SCALE



5 E3.1 4" WIREWAY SUPPORT FROM WALL

NO SCALE

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RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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

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DRAWING TITLE:
WIREWAY PLAN, MODULE SECTION, & DETAILS

E3.1

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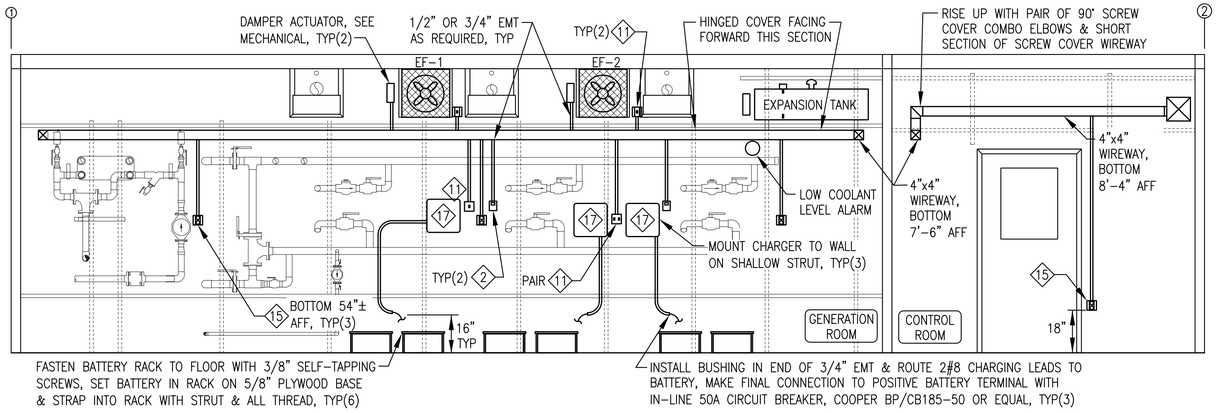
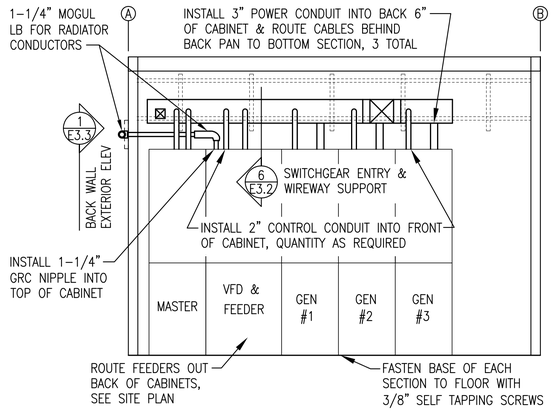
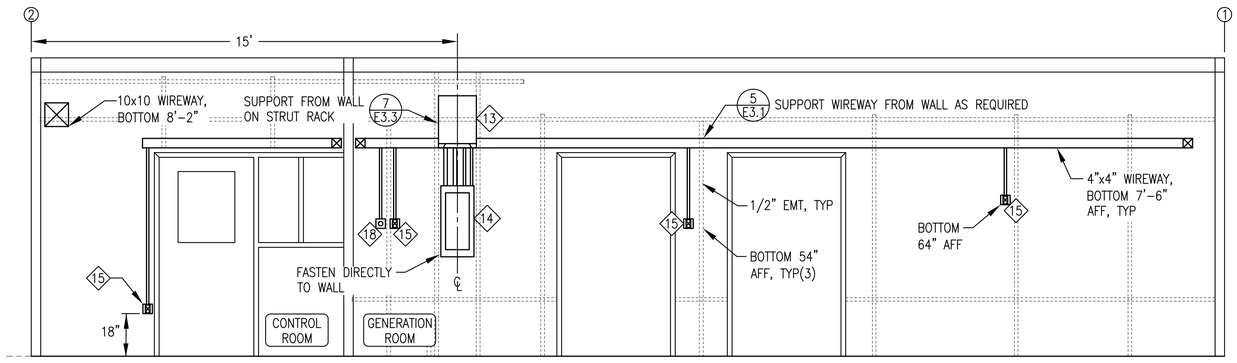


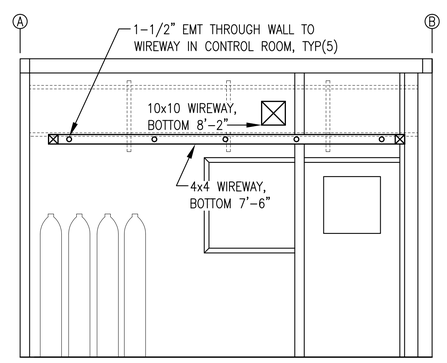
1 E3.2 WALL ELEVATION AT GRID A
3/8"=1'-0"



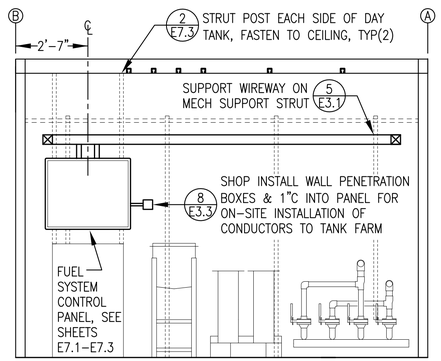
2 E3.2 WALL ELEVATION AT GRID 2
3/8"=1'-0"



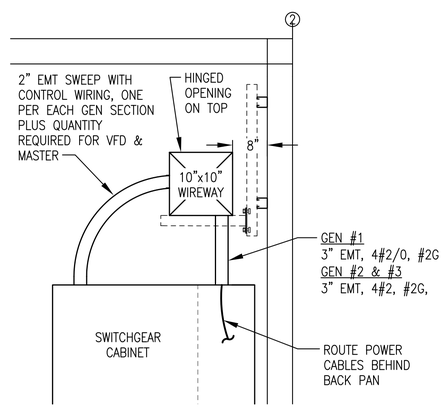
3 E3.2 WALL ELEVATION AT GRID B
3/8"=1'-0"



4 E3.2 INTERIOR WALL ELEVATION
3/8"=1'-0"



5 E3.2 WALL ELEVATION AT GRID 1
3/8"=1'-0"



6 E3.2 SWITCHGEAR ENTRY & WIREWAY SUPPORT
NO SCALE

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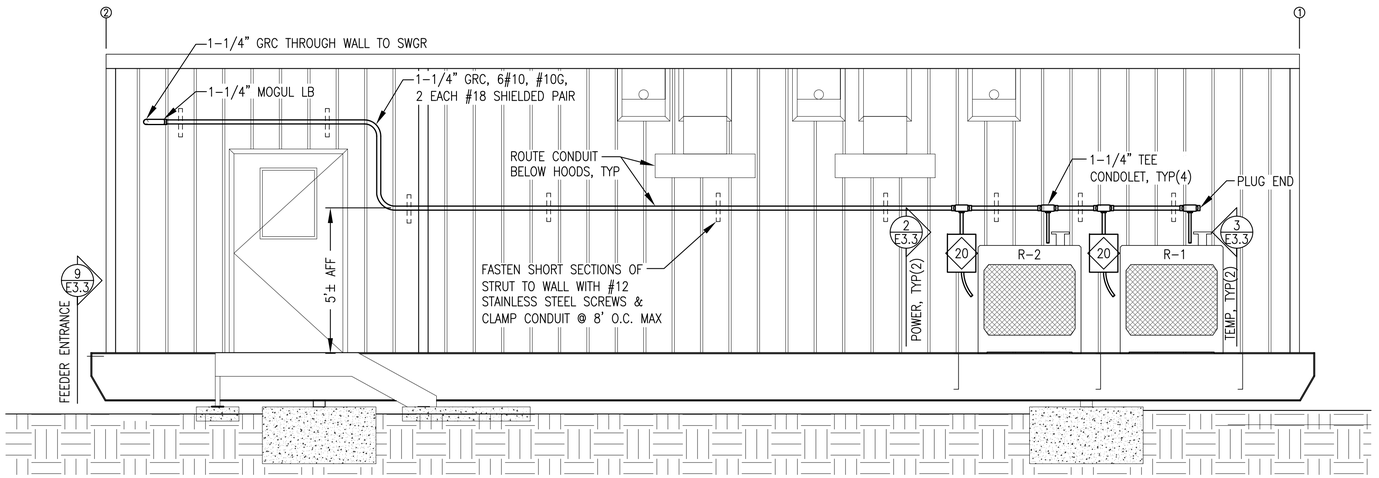
DRAWING TITLE:
ELEVATIONS & DETAILS

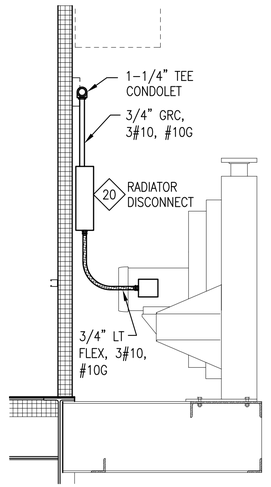
E3.2

SHEET | OF 7

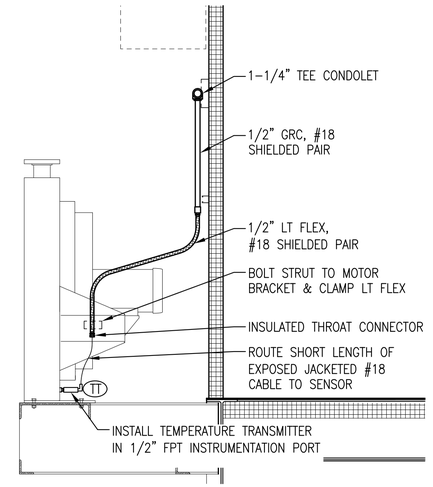
ISSUED FOR CONSTRUCTION JANUARY 2019



1 E3.3 BACK WALL EXTERIOR ELEVATION
3/8"=1'-0"

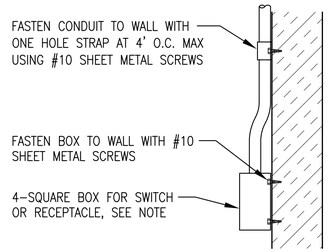


2 E3.3 RADIATOR POWER CONNECTION
3/4"=1'-0"



3 E3.3 RADIATOR TEMPERATURE TRANSMITTER
3/4"=1'-0"

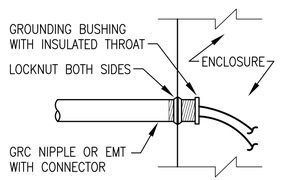
RADIATOR SHOP/ON-SITE NOTES:
1) DURING SHOP FABRICATION INSTALL ALL DEVICES AND RACEWAYS AS INDICATED.
2) AS PART OF ON-SITE WORK, IF RADIATORS ARE REMOVED FOR SHIPPING DISCONNECT LIQUID TIGHT FLEXES AND SEAL ENDS. COIL AND SECURE CONDUCTORS AND FLEXES FOR SHIPPING.
3) AS PART OF ON-SITE WORK REINSTALL AS INDICATED.



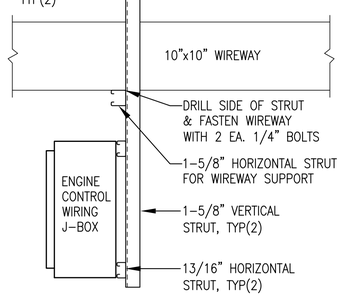
NOTE: INSTALL THERMOSTATS & TIMER SWITCHES IN DEEP SINGLE GANG BELL BOX INSTEAD OF 4-SQUARE BOX.

4 E3.3 TYPICAL INTERIOR DEVICE MOUNTING
NO SCALE

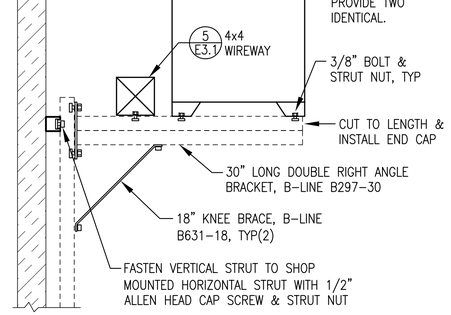
NOTES:
1) THIS DETAIL APPLIES TO CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS.
2) AT A MINIMUM INSTALL GROUNDING BUSHING ON ALL GENERATOR POWER CONDUIT, COMMUNITY FEEDER CONDUIT, STATION SERVICE FEEDERS, AND WHERE OTHERWISE INDICATED OR REQUIRED. BOND GROUNDING BUSHING TO EQUIPMENT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



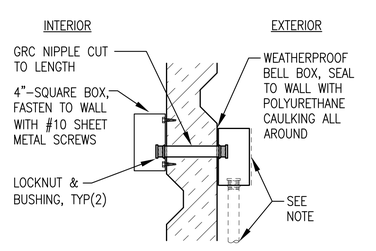
5 E3.3 TYP ENCLOSURE CONNECTION
NO SCALE



6 E3.3 ENGINE WIRING J-BOX SUPPORT
NO SCALE

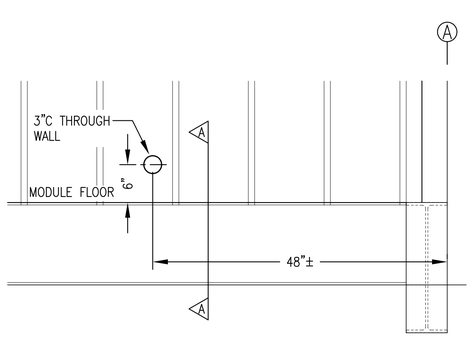


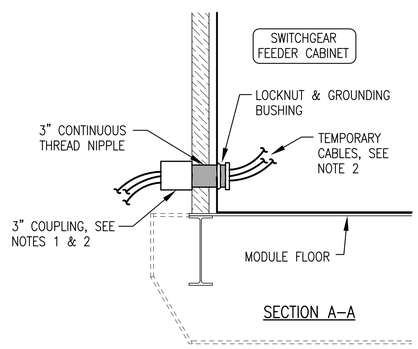
7 E3.3 STATION SERVICE TRANSFORMER SUPPORT
NO SCALE



NOTE: FOR CONDUIT PENETRATIONS WITHOUT BELL BOX SEAL ALL AROUND CONDUIT WITH POLYURETHANE CAULK.

8 E3.3 TYP EXTERIOR WALL-MOUNT DEVICE
NO SCALE





SECTION A-A

FEEDER SHOP/ON-SITE NOTES:
1) DURING SHOP FABRICATION INSTALL WALL PENETRATION AS SHOWN AND SEAL COUPLING TO EXTERIOR WALL WITH POLYURETHANE CAULK ALL AROUND.
2) USE WALL PENETRATION TO ROUTE TEMPORARY CABLES TO LOAD BANK FOR TESTING. AFTER TESTING INSTALL THREADED PLUG IN COUPLING.
3) INSTALL FEEDER TO TRANSFORMER AS PART OF ON-SITE WORK, SEE SHEET E2 FOR CONTINUATION.

9 E3.3 FEEDER ENTRANCE DETAIL
1"=1'-0"

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

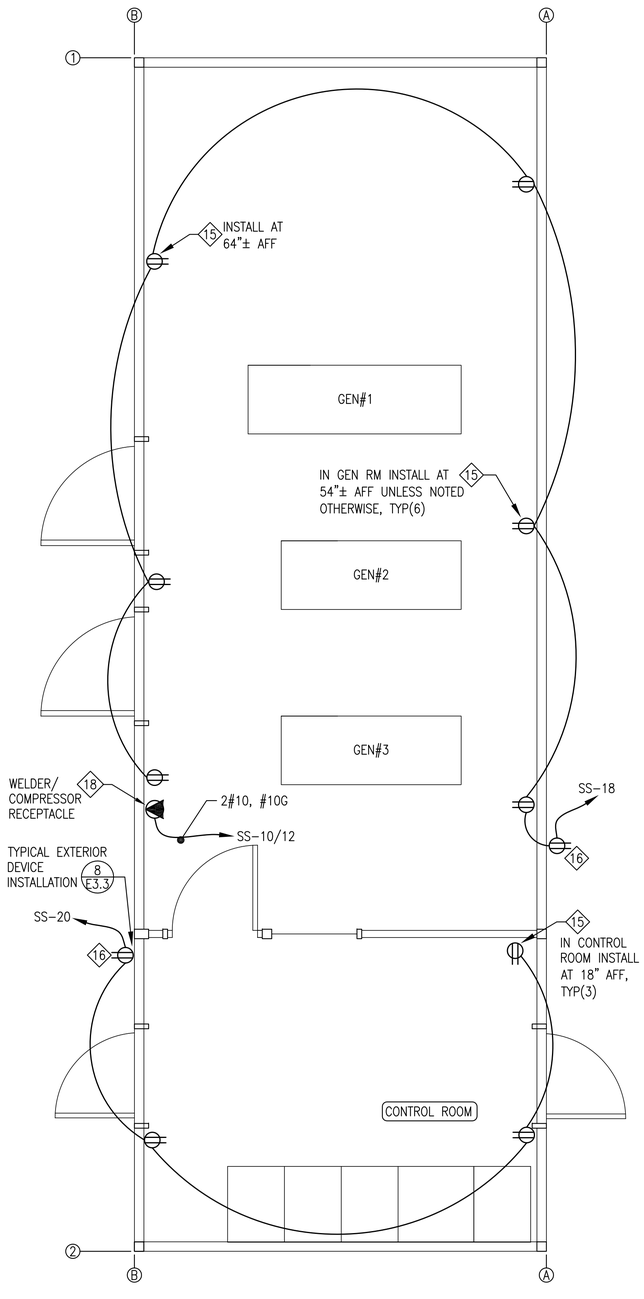
STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
ELEVATIONS & DETAILS

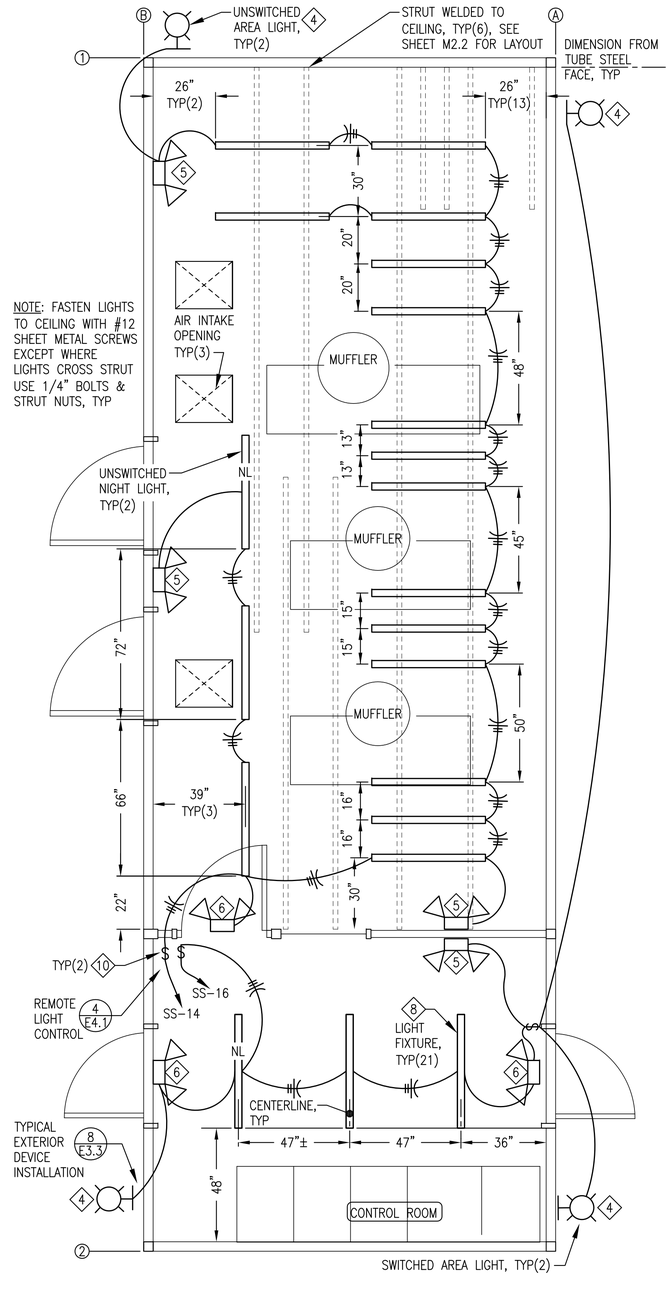
E3.3

SHEET OF 7



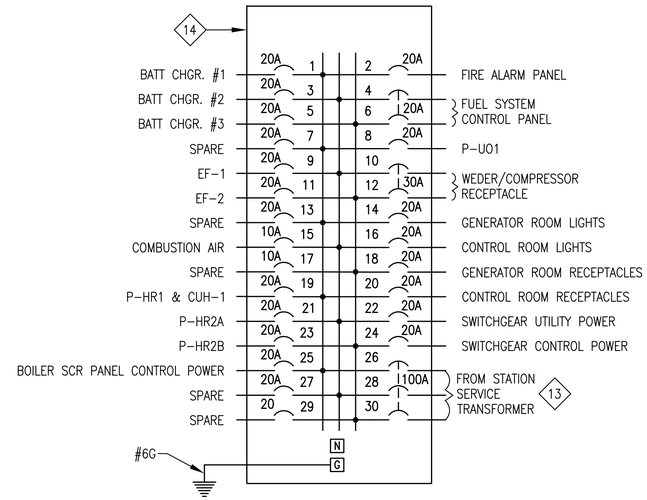
NOTE: ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

1 E4.1 RECEPTACLE PLAN
3/8"=1'-0"

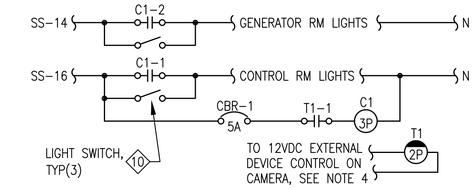


NOTE: ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

2 E4.1 LIGHTING PLAN
3/8"=1'-0"



3 E4.1 STATION SERVICE PANEL "SS"
NO SCALE



NOTES:

1) INSTALL CONTACTOR, TIMER RELAY, AND CIRCUIT BREAKER IN 12"x12"x6" NEMA 1 JUNCTION BOX ON WALL ABOVE LIGHT SWITCHES.
2) ALL LIGHTING CIRCUIT WIRING MIN #12 AWG. ALL 5A CONTROL CIRCUIT WIRING MIN #16AWG.
3) SET TIMER FOR 5 MINUTES, SINGLE SHOT MODE.
4) CONNECT TO CONFIGURABLE OUTPUT PINS ON CAMERA AND PROGRAM TO POWER RELAY ON CAMERA OPERATION.

BILL OF MATERIALS:

CBR1: 5A, 1P, RAIL MOUNT CIRCUIT BREAKER. ALLEN BRADLEY 1489-A1-050.

C1: 23A, 3P CONTACTOR, 120V COIL. ALLEN BRADLEY 100-C23D10.

T1: 10A, DPDT RELAY, 12VDC COIL, WITH SOCKET BASE AND TIMING MODULE. ALLEN BRADLEY 700-HA32Z12 RELAY WITH 700HN204 BASE AND 700HT3 SERIES B TIMING MODULE.

4 E4.1 LIGHTING REMOTE CONTROL SCHEMATIC
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 CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.		125V, 20A, DUPLEX RECEPTACLE
		T	LINE VOLTAGE THERMOSTAT
		DT	DIGITAL THERMOSTAT, MODULATING
#	ELECTRICAL ITEM – SEE EQUIPMENT SCHEDULE ON SHEET E6		SNAP SWITCH / SMALL MOTOR DISCONNECT
1/4	MOTOR (HORESPOWER INDICATED)	T$	TIMER SWITCH
MD	MOTORIZED DAMPER – SEE MECHANICAL		GROUND

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

DATE: 1/14/19
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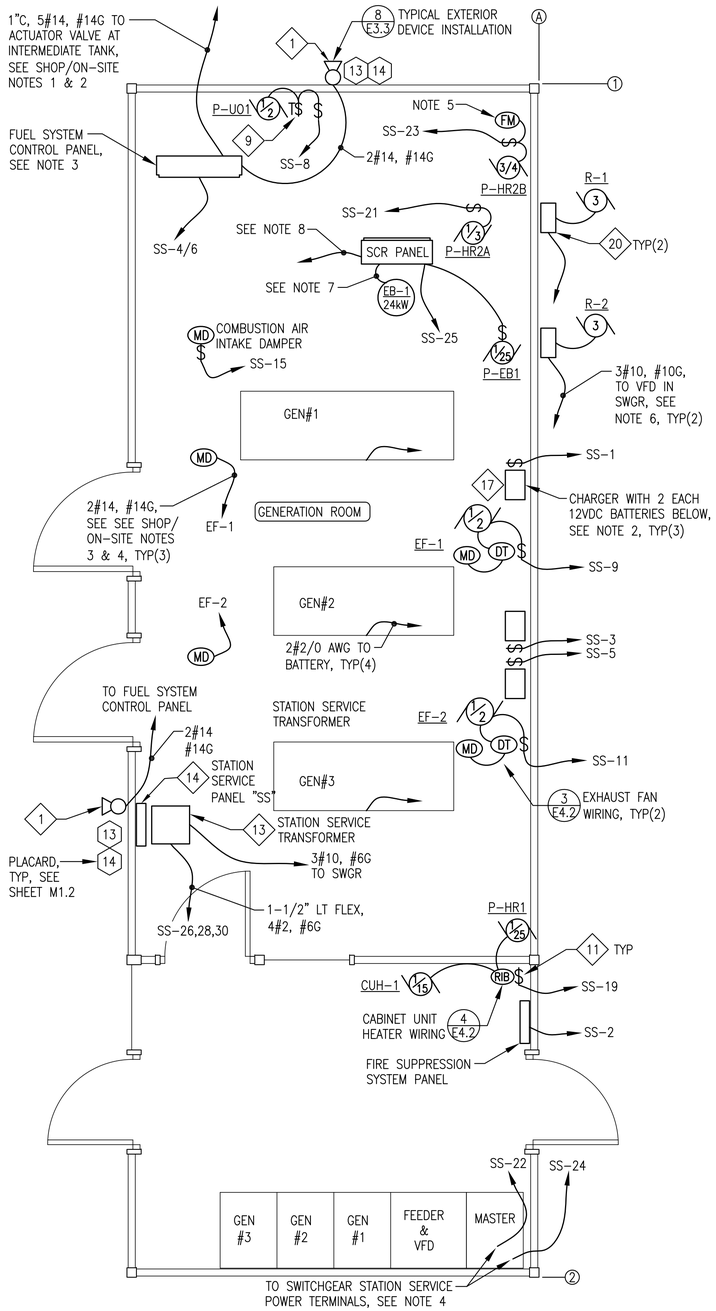
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
RECEPTACLE & LIGHTING PLANS & STATION SERVICE PANEL

E4.1

SHEET OF 7



1 E4.2 STATION SERVICE PLAN
3/8"=1'-0"

STATION SERVICE GENERAL NOTES:

1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

2) MOUNT BATTERY CHARGER TO WALL ON SHALLOW STRUT AND INSTALL BATTERIES ON FLOOR BELOW, SEE ELEVATION 1/E3.2.

3) SEE SHEETS E7.1–E7.3 FOR DAY TANK CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.

4) SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL POWER AND CONTROL WIRING.

5) INSTALL FLOW METER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. PROVIDE POWER FROM P–HR2B DISCONNECT.

6) RADIATOR VFD POWER CONDUCTORS OVERSIZED FOR 80% DE–RATE. DO NOT ROUTE IN WIREWAY. ROUTE IN SEPARATE EXTERIOR CONDUIT, SEE ELEVATION 1/E3.3.

7) 1"C WITH 6#10, #10G, HIGH TEMPERATURE CONDUCTORS FROM BOILER TO SCR PANEL. SEE SHEET E6.4. ROUTE IN SEPARATE CONDUIT, DO NOT ROUTE IN WIREWAY.

8) 3#8, #10G TO BREAKER IN SWITCHGEAR.

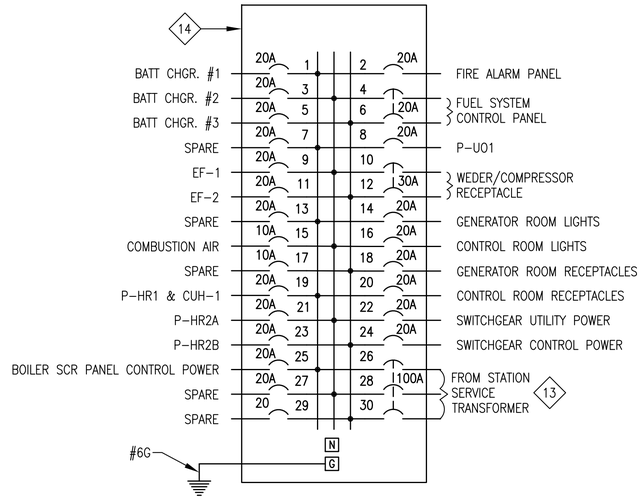
STATION SERVICE SHOP/ON–SITE NOTES:

1) DURING SHOP FABRICATION INSTALL WALL PENETRATION AND CONDUIT INTO DAY TANK PANEL. SEE ELEVATION 5/E3.2.

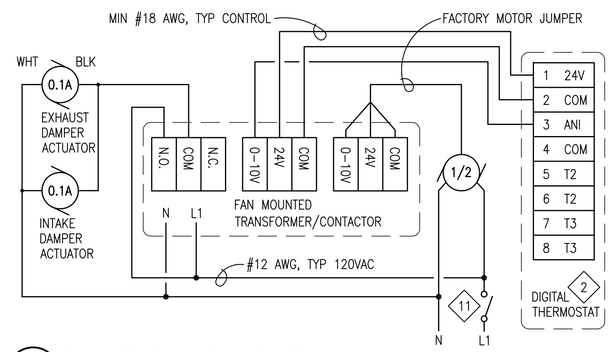
2) AS PART OF ON–SITE WORK INSTALL CONDUIT AND CONDUCTORS TO TANK FARM, SEE SHEET E2.

3) DURING SHOP FABRICATION INSTALL CEILING MOUNTED BOX ADJACENT TO DAMPER ACTUATOR AND TEMPORARILY CONNECT DAMPER TO VERIFY OPERATION.

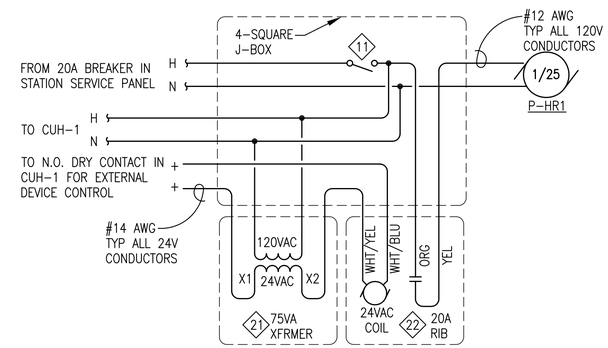
4) AS PART OF ON–SITE WORK INSTALL CONDUIT AND CONDUCTORS TO DAMPER ACTUATOR. SEE SHEET M7.



2 E4.2 STATION SERVICE PANEL "SS"
NO SCALE



3 E4.2 EXHAUST FAN WIRING DIAGRAM
NO SCALE



4 E4.2 CUH–1 WIRING DIAGRAM
NO SCALE

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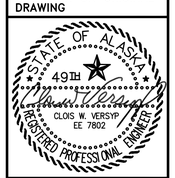
STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING



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JOB NUMBER:

DRAWING TITLE:
STATION SERVICE PLAN, DETAILS, & PANEL

E4.2

SHEET | OF 7

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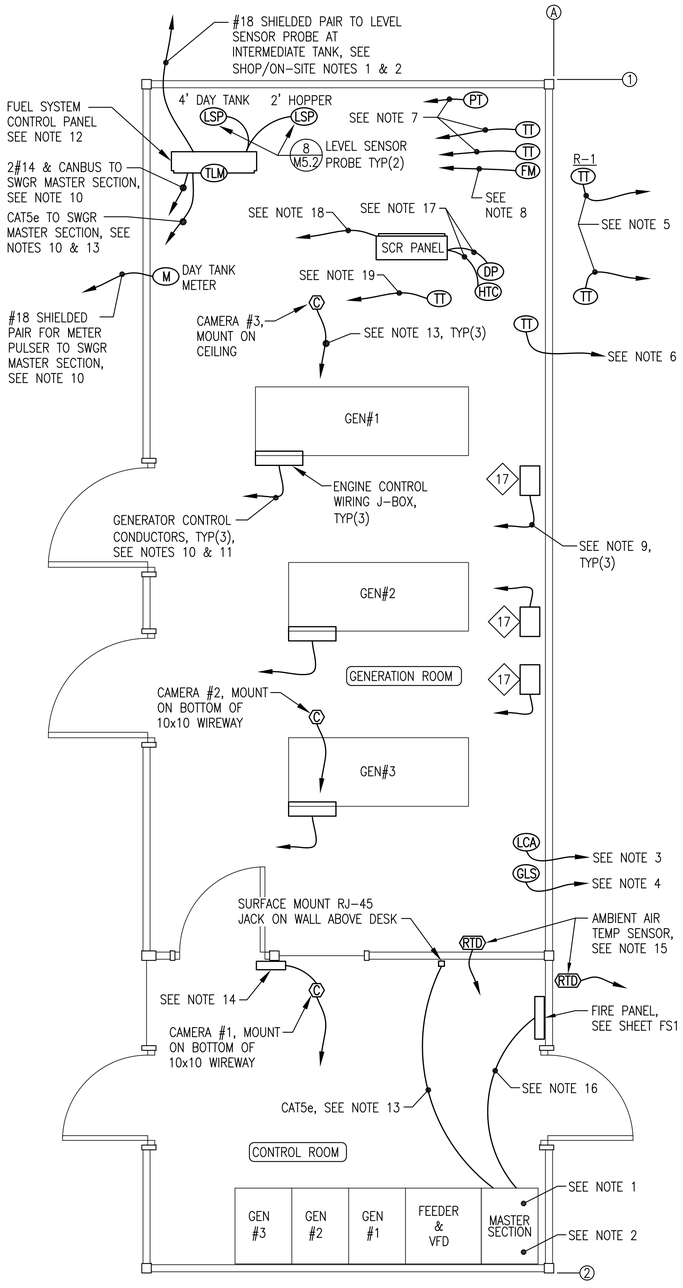


1 E5 INSTRUMENTATION & DATA PLAN
3/8"=1'-0"

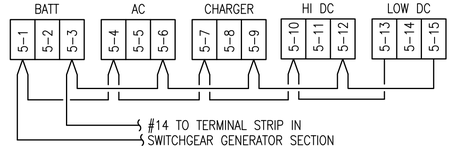
INSTRUMENTATION & DATA PLAN NOTES:

1. INSTALL CAMERA POE+ SWITCH INSIDE MASTER SECTION. CONNECT TO 120VAC CONTROL POWER AND TO ETHERNET SWITCH, SEE NOTE 10.
2. INSTALL ROUTER ON TOP OF MASTER SECTION IN RACK OR CABINET. CONNECT TO 120VAC UPS AND TO ETHERNET SWITCH, SEE NOTE 10.
3. LOW COOLANT LEVEL ALARM SWITCH INSTALLED AT EXPANSION TANK, SEE MECHANICAL. CONNECT TO N.C. SWITCH (WHITE & RED) AND ROUTE 2#14 TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
4. GLYCOL LEVEL SENSOR PROBE INSTALLED IN EXPANSION TANK, SEE MECHANICAL. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR. SEE NOTE 10.
5. INSTALL TEMP TRANSMITTER IN EACH RADIATOR, SEE DETAIL 3/E3.3. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR VFD SECTION, SEE NOTE 10.
6. INSTALL COOLANT RETURN TEMP TRANSMITTER IN PIPING MAIN WHERE SHOWN ON COOLING PIPING ISOMETRIC. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION, SEE NOTE 10.
7. INSTALL TWO TEMP TRANSMITTERS AND ONE PRESSURE TRANSMITTER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC 2/M4.2. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
8. INSTALL FLOW METER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. PROVIDE POWER FROM P-HR2B DISCONNECT. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
9. ROUTE 2#14 FROM BATTERY CHARGER ALARM CONTACTS TO ASSOCIATED SWITCHGEAR GENERATOR SECTION, SEE NOTE 10 AND WIRING DIAGRAM 2/E5.
10. SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL INSTRUMENTATION AND DATA WIRING INCLUDING CONTROL POWER.
11. ROUTE GENERATOR CONTROL CONDUCTORS TO SWITCHGEAR IN 10x10 WIREWAY WITH POWER CONDUCTORS. SEE SHEETS E3.1, E6.3, AND NOTE 10.
12. SEE SHEETS E7.1-E7.3 FOR FUEL SYSTEM CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.
13. ROUTE CAT5e CONDUCTORS FROM EACH CAMERA TO POE+ SWITCH IN MASTER SECTION. ROUTE CAT5e CONDUCTORS FROM FUEL SYSTEM PANEL, FIRE SUPPRESSION PANEL, AND RJ-45 JACK TO ETHERNET SWITCH IN SWITCHGEAR MASTER SECTION. SEE NOTE 10. INSTALL ALL CAT5e CONDUCTORS IN SEPARATE DEDICATED RACEWAYS - DO NOT ROUTE WITH STATION SERVICE OR POWER CONDUCTORS.
14. INSTALL CONTACTOR WITH TIMER RELAY FOR REMOTE LIGHTING CONTROL. OPERATE FROM DRY CONTACT ON CAMERA #1. TIMER TO TURN LIGHTS ON FOR 5 MINUTES EACH TIME CAMERA IS OPERATED. SEE SCHEMATIC 4/E4.1.
15. RTD TEMPERATURE SENSOR PROVIDED WITH SWITCHGEAR. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
16. ROUTE CAT5e FOR DATA AND 2#14 FOR GENERATOR SHUT DOWN FROM FIRE PANEL TO SWITCHGEAR MASTER SECTION, SEE NOTES 10 AND 13.
17. #18 SHIELDED PAIR FROM DIFFERENTIAL PRESSURE SWITCH & HIGH TEMP CUTOUT TO BOILER SCR PANEL. SEE SHEET E6.4.
18. 4 EACH #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION, 3 FOR SWITCH/ALARM INDICATION AND 1 FOR ANALOG SIGNAL. SEE SHEET E6.4.
19. INSTALL BOILER OUTLET TEMP TRANSMITTER IN PIPING WHERE SHOWN ON BOILER PIPING ISOMETRIC 4/M4.2. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION, SEE NOTE 10.

INSTRUMENTATION SHOP/ON-SITE NOTES:

1. DURING SHOP FABRICATION INSTALL WALL PENETRATION AND CONDUIT INTO DAY TANK PANEL. SEE ELEVATION 5/E3.2.
2. AS PART OF ON-SITE WORK INSTALL CONDUIT AND CONDUCTORS TO TANK FARM, SEE SHEET E2.

DATA DEVICE SCHEDULE		
DEVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
ROUTER - HIGH SPEED INTERNET	4-PORT GIGABIT ROUTER, DUAL 2.4 AND 5 GHz WIFI WITH ADJUSTABLE ANTENNAS, 4 GIGABIT LAN, 1 GIGBIT WAN, MINIMUM 256 MB RAM	ASUS RT-N66U OR APPROVED EQUAL
POE+ - POWER OVER ETHERNET CAMERA SWITCH	MINIMUM 4 PORT MANAGED GIGABIT SWITCH, MINIMUM 14 GBPS THROUGHPUT, MINIMUM 30W POWER OVER ETHERNET PER PORT, MINIMUM 130W TOTAL, 120VAC POWER	AXIS T8508 POE+ OR APPROVED EQUAL
CAMERAS	NETWORK CAMERA, HDTV 1080P RESOLUTION, 360 DEGREE PAN, MINIMUM 90 DEGREE TILT, 10X ZOOM, AUTO FOCUS, POWER OVER ETHERNET, WITH PROGRAMMABLE OUTPUT CONNECTIONS FOR EXTERNAL CONTROL OF LIGHTING	AXIS M5525-E PTZ OR APPROVED EQUAL
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.		



NOTE: PRIOR TO ENERGIZING MAKE THE FOLLOWING SETTINGS ON CHARGER:
1) AC LINE VOLTAGE SWITCH TO "115V".
2) AUTO BOOST JUMPER TO "NORM".
3) FLOAT VOLTAGE JUMPER TO "13.50/27.00" (FOR GEL CELL).
4) BATTERY RANGE JUMPER TO "24V".

2 E5 BATTERY CHARGER ALARM WIRING DIAGRAM
NO SCALE

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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0 1"
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STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
DRAWN BY: JTD
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JOB NUMBER:

DRAWING TITLE:
INSTRUMENTATION & DATA PLAN & DETAILS

E5

SHEET OF 7

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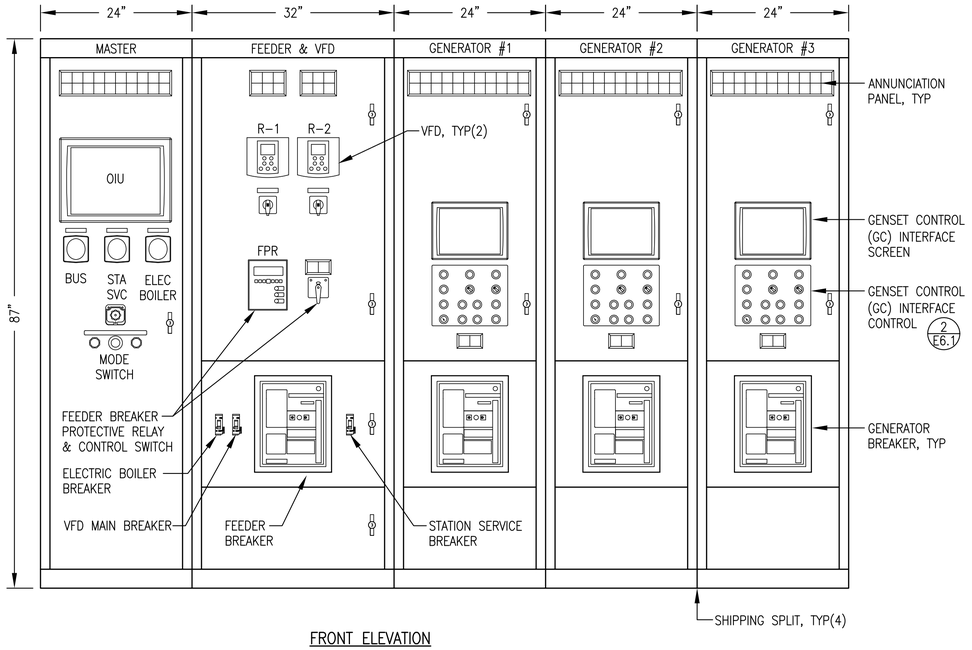
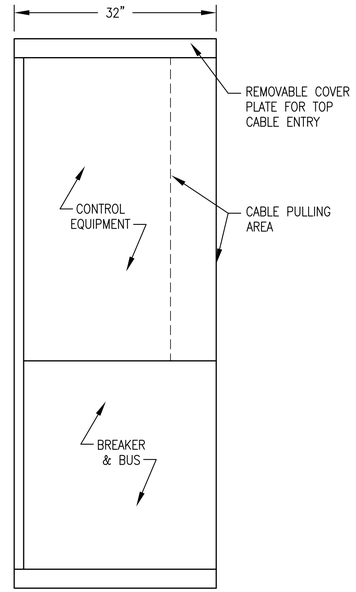


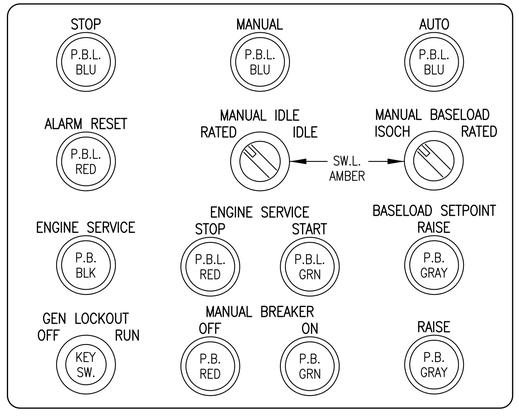
FRONT ELEVATION



TYPICAL CROSS SECTION

1 E6.1 SWITCHGEAR ENCLOSURE LAYOUT

NO SCALE



INTERFACE CONTROLS LEGEND:

P.B.	PUSH BUTTON
P.B.L.	PUSH BUTTON WITH LIGHT
SW.L.	KNOB OPERATED SWITCH WITH LIGHT
KEY SW.	KEY OPERATED LOCKABLE SWITCH

2 E6.1 GENSET CONTROL (GC) INTERFACE CONTROLS

NO SCALE

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STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY: JTD
CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
SWITCHGEAR ENCLOSURE LAYOUT

E6.1

SHEET OF 7

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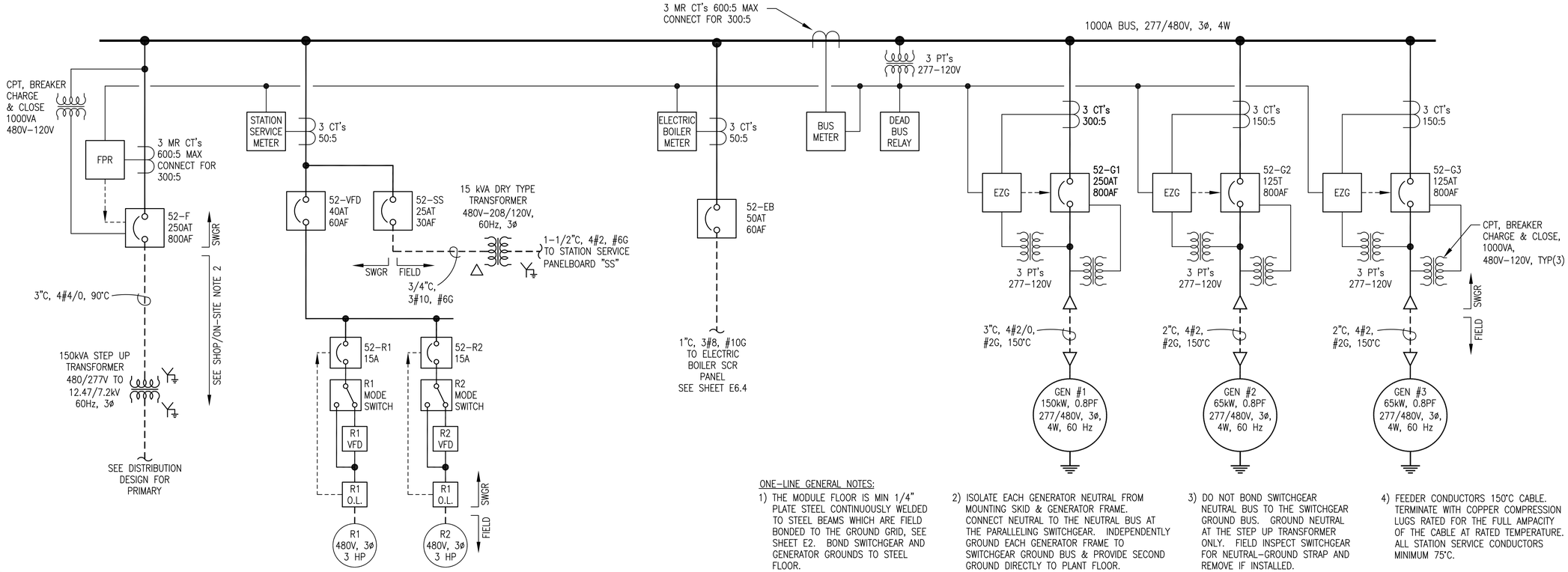


1 E6.2 SWITCHGEAR ONE-LINE DIAGRAM
NO SCALE

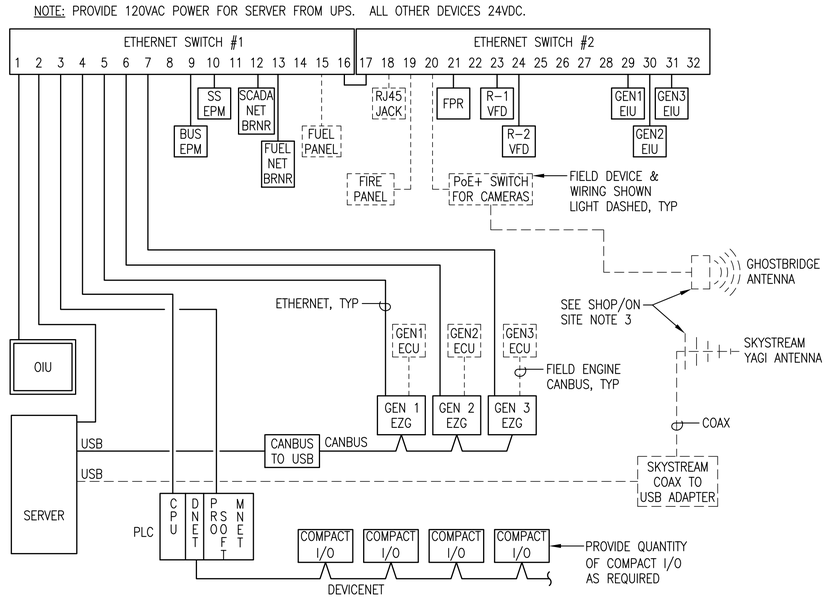
ONE-LINE GENERAL NOTES:

1) THE MODULE FLOOR IS MIN 1/4" PLATE STEEL CONTINUOUSLY WELDED TO STEEL BEAMS WHICH ARE FIELD BONDED TO THE GROUND GRID, SEE SHEET E2. BOND SWITCHGEAR AND GENERATOR GROUNDS TO STEEL FLOOR.

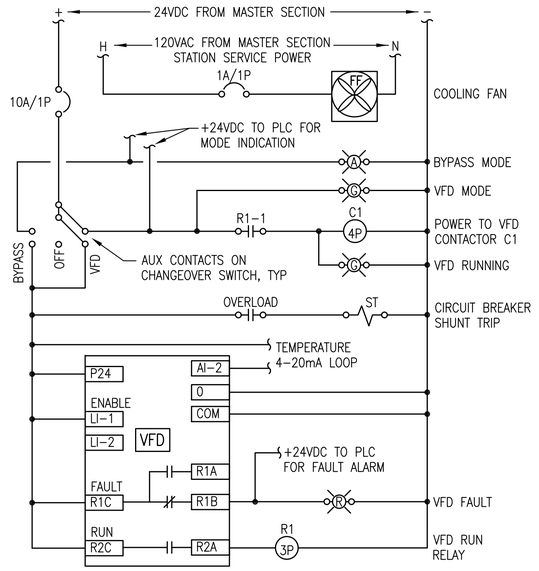
2) ISOLATE EACH GENERATOR NEUTRAL FROM MOUNTING SKID & GENERATOR FRAME. CONNECT NEUTRAL TO THE NEUTRAL BUS AT THE PARALLELING SWITCHGEAR. INDEPENDENTLY GROUND EACH GENERATOR FRAME TO SWITCHGEAR GROUND BUS & PROVIDE SECOND GROUND DIRECTLY TO PLANT FLOOR.

3) DO NOT BOND SWITCHGEAR NEUTRAL BUS TO THE SWITCHGEAR GROUND BUS. GROUND NEUTRAL AT THE STEP UP TRANSFORMER ONLY. FIELD INSPECT SWITCHGEAR FOR NEUTRAL-GROUND STRAP AND REMOVE IF INSTALLED.

4) FEEDER CONDUCTORS 150°C CABLE. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE. ALL STATION SERVICE CONDUCTORS MINIMUM 75°C.



2 E6.2 COMMUNICATION SCHEMATIC
NO SCALE



3 E6.2 TYPICAL RADIATOR VFD LOGIC DIAGRAM
NO SCALE

SWITCHGEAR SYMBOL LEGEND

- TRANSFORMER PT=POTENTIAL XFRMR CPT=CONTROL POWER XFRMR
- CURRENT TRANSFORMER M.R. – INDICATES MULTIRATIO CT'S RATING FACTOR RF=2.0
- CIRCUIT BREAKER AT=AMP TRIP RATING AF=AMP FRAME RATING
- EZG: WOODWARD EASYGEN GENSET CONTROLLER
- FPR: FEEDER PROTECTION RELAY
- SHOP INSTALLED POWER WIRING/BUS
- FIELD INSTALLED POWER WIRING
- SHOP INSTALLED CONTROL WIRING

SWITCHGEAR SHOP/ON-SITE NOTES:

1) DEVICES AND WIRING NOTED AS FIELD ARE EXTERNAL TO THE SWITCHGEAR BUT ARE INCLUDED IN THE MODULE SHOP FABRICATION WORK.

2) THE FEEDER, STEP UP TRANSFORMER, AND DISTRIBUTION ARE TO BE INSTALLED AS PART OF THE ON-SITE WORK AND ARE NOT PART OF THE MODULE SHOP FABRICATION WORK.

3) THE COMMUNICATION DEVICES AND ASSOCIATED WIRING FOR COMMUNICATION WITH THE REMOTE WIND POWER GENERATORS ARE TO BE INSTALLED AS PART OF THE ON-SITE WORK AND ARE NOT PART OF THE MODULE SHOP FABRICATION WORK

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

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CLOS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

DATE: 1/14/19
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JOB NUMBER:

DRAWING TITLE:
SWITCHGEAR
ONE-LINE & SCHEMATICS

E6.2

SHEET OF 7

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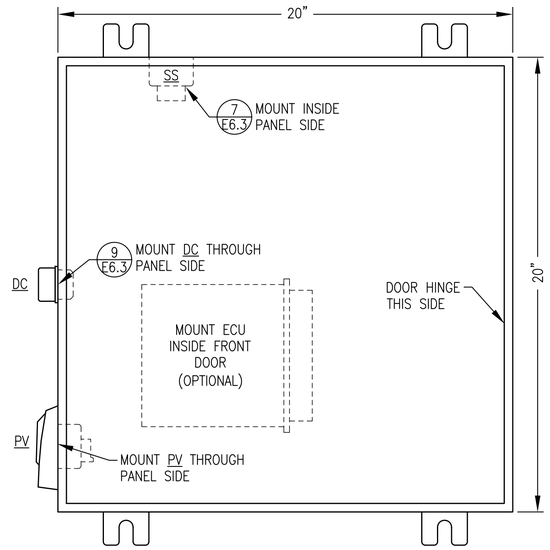
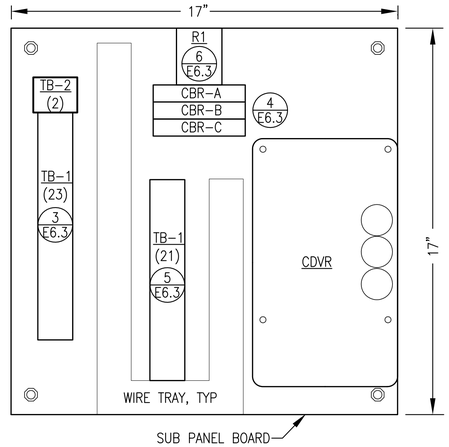
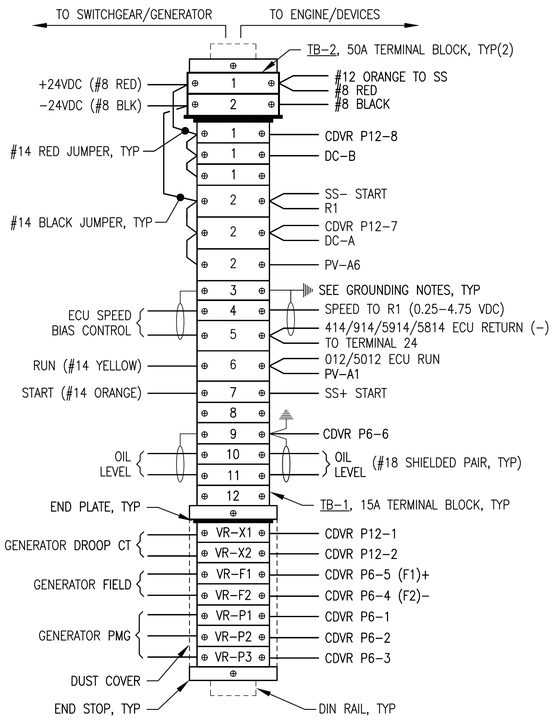


1 E6.3 JUNCTION BOX FRONT PANEL LAYOUT
NO SCALE

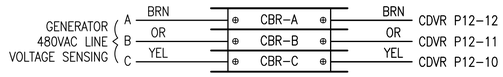


2 E6.3 JUNCTION BOX SUB PANEL LAYOUT
NO SCALE

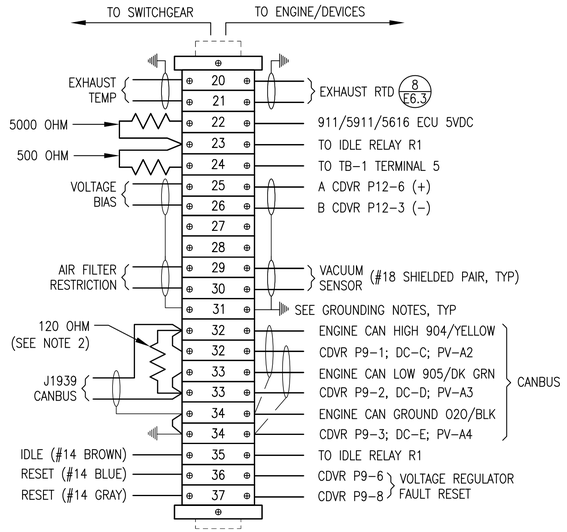


NOTE: TYPICAL JOHN DEERE ECU CONNECTION NUMBERS SHOWN. SEE WIRING HARNESS FOR EACH ENGINE FOR ACTUAL ECU CONNECTIONS.

3 E6.3 TERMINAL STRIP CONNECTIONS
NO SCALE

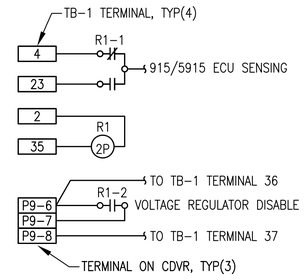


4 E6.3 CIRCUIT BREAKER CONNECTIONS
NO SCALE

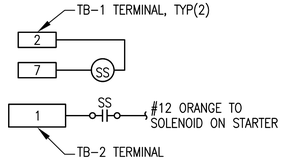


NOTES: 1) ALL RESISTORS 0.25W.
2) REMOVE RESISTOR IF ENGINE WIRING HARNESS HAS 120 OHM END OF LINE RESISTOR.

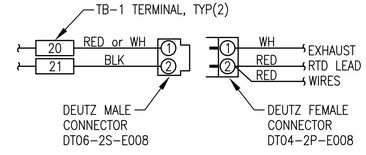
5 E6.3 TERMINAL STRIP CONNECTIONS
NO SCALE



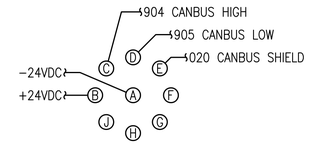
6 E6.3 IDLE RELAY R1 WIRING DIAGRAM
NO SCALE



7 E6.3 STARTER AUX SOLENOID SS WIRING
NO SCALE



8 E6.3 EXHAUST RTD CONNECTOR
NO SCALE



9 E6.3 DIAGNOSTIC CONNECTOR WIRING
NO SCALE

BILL OF MATERIALS

TAG	MANUFACTURER	MODEL	DESCRIPTION
ENCLOSURE	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
CDVR	CATERPILLAR	314-7755	DIGITAL VOLTAGE REGULATOR
	CATERPILLAR	254-1265	HARNESS FOR VOLTAGE REGULATOR
CBR	ALLEN-BRADLEY	1489-M1-C010	RAIL MOUNT CIRCUIT BREAKER, 1-POLE, 1A
DC	JOHN DEERE	57M7919	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	JDL062397	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-8124	STARTER AUXILIARY SOLENOID, 24V
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. SIZE AS INDICATED.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE AS REQUIRED TO MATCH TERMINALS. LABEL ALL TERMINALS EXACTLY AS INDICATED ON THE DETAILS.
4) ALL WIRE #14AWG EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. LABEL BOTH ENDS OF ALL JUMPERS WITH THE ENGINE PANEL TERMINAL NUMBER.
5) PROVIDE MECHANICAL GROUND LUGS FASTENED TO BACK PANEL AND GROUNDED TO ENGINE-GENERATOR. GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.
6) PROVIDE WIRING HARNESSES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN LIQUID TIGHT FLEX OR FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
7) SHOP TEST EACH ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

FIELD INSTALLATION NOTES:

1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE ENGINE PANEL TERMINAL NUMBER.
2) ON SHIELDED CONDUCTORS GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.

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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

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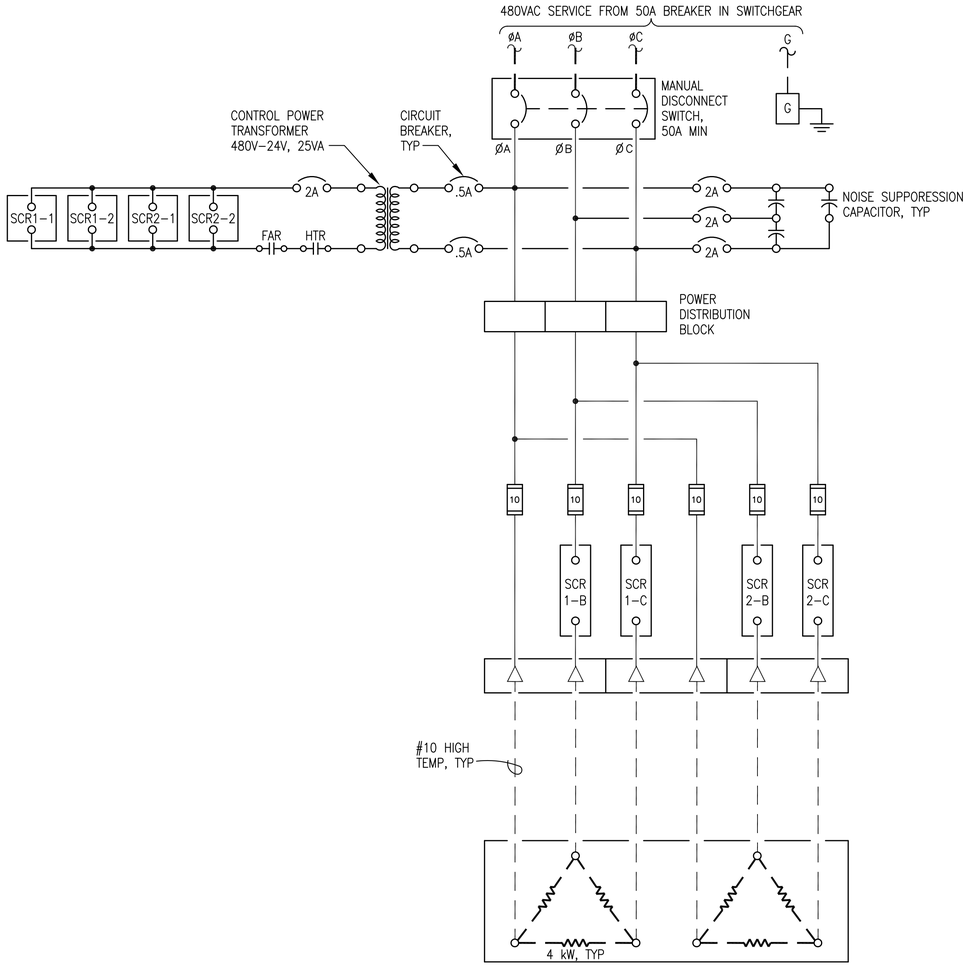
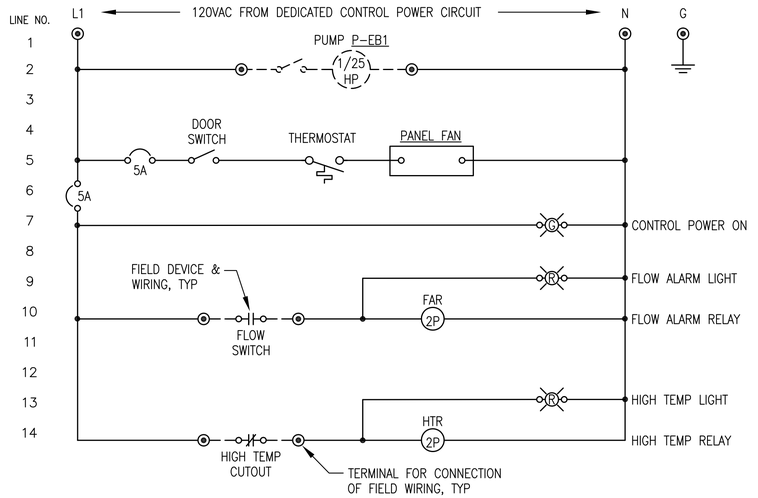
DRAWING TITLE:
24VDC ENGINE WIRING
JUNCTION BOX

E6.3

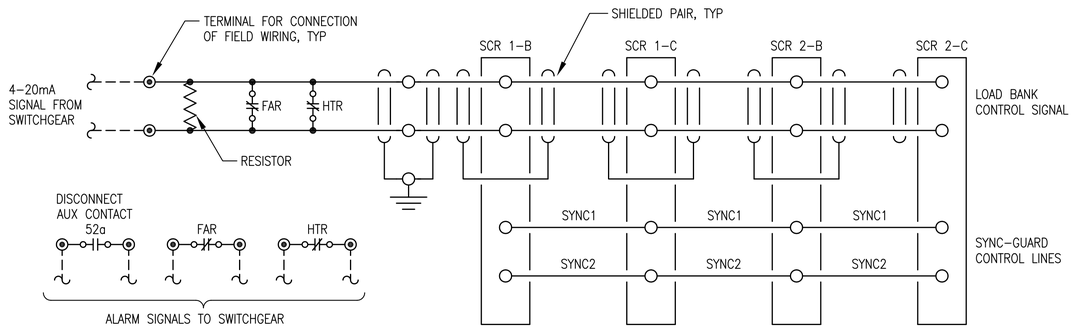
SHEET OF 7



1 E6.4 480VAC POWER 3–LINE DIAGRAM
NO SCALE



2 E6.4 120VAC POWER & CONTROL SCHEMATIC
NO SCALE



3 E6.4 SCR CONTROL & ALARM SCHEMATIC
NO SCALE

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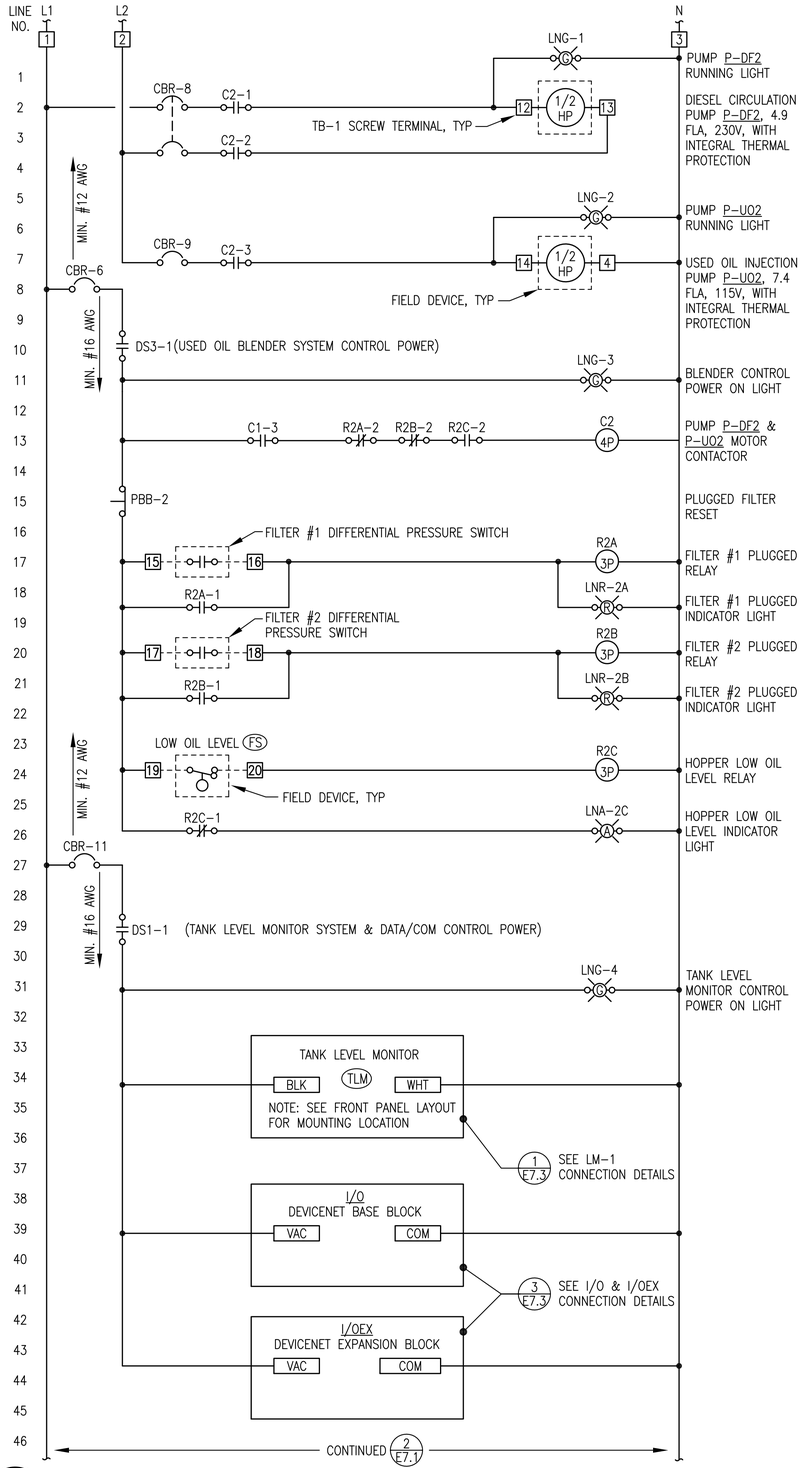
JOB NUMBER:

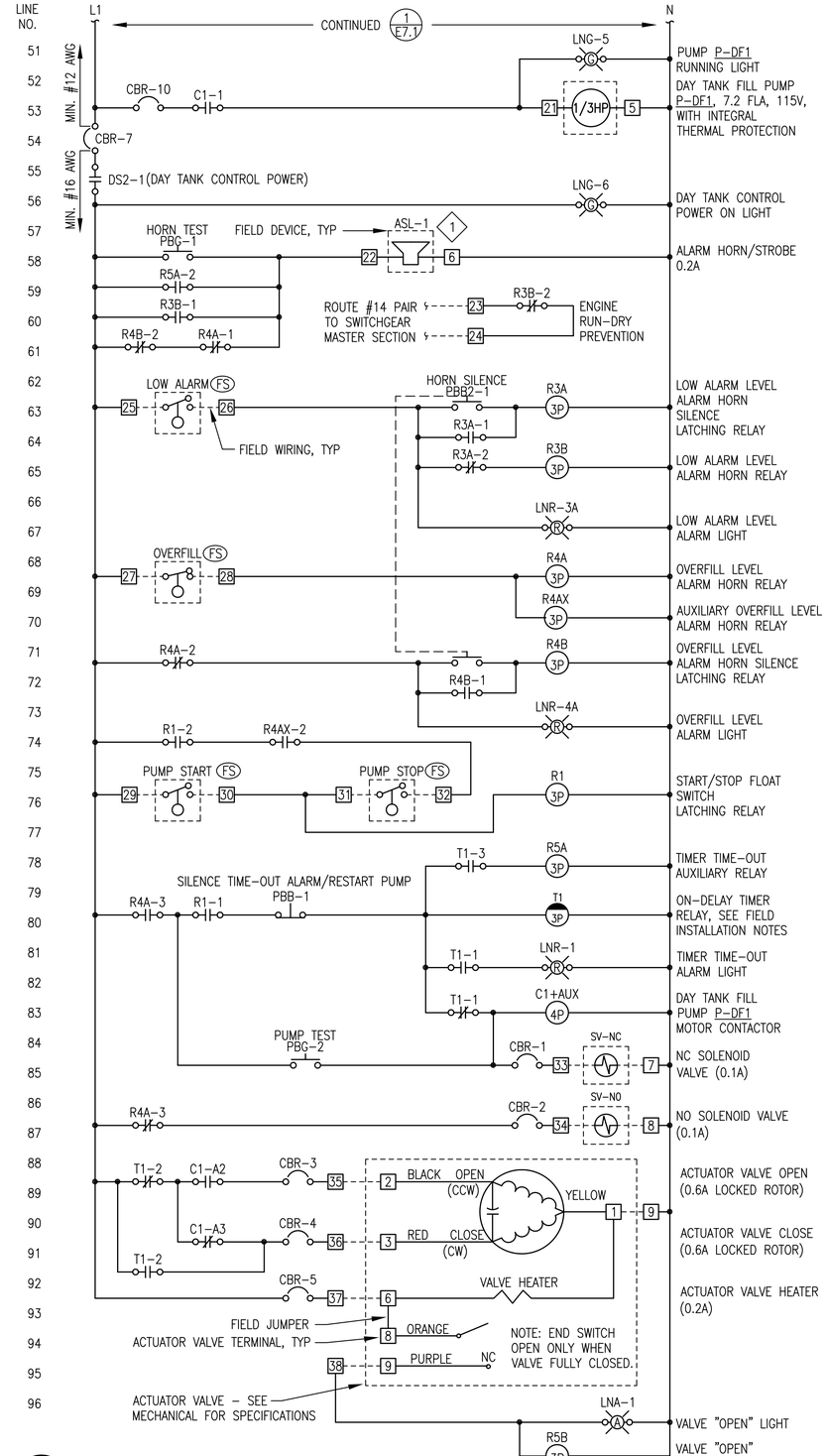
DRAWING TITLE:
BOILER SCR PANEL
3–LINE & SCHEMATICS

E6.4

SHEET OF 7



1 E7.1 USED OIL BLENDER SYSTEM LOGIC DIAGRAM
NO SCALE



2 E7.1 DAY TANK LOGIC DIAGRAM
NO SCALE

BILL OF MATERIALS

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.

TAG	MANUFACTURER	MODEL	DESCRIPTION
AUX	ALLEN-BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
C	ALLEN-BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR-1,2,3,4,5	ALLEN-BRADLEY	1489-M1-C010	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 1A
CBR-6,7,11	ALLEN-BRADLEY	1489-M1-C050	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR-8	ALLEN-BRADLEY	1489-M2-C150	RAIL-MOUNT CIRCUIT BREAKER, 2 POLE, 15A
CBR-9,10	ALLEN-BRADLEY	1489-M1-C150	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 15A
DS	ALLEN-BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	ALLEN-BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNG	ALLEN-BRADLEY	800HQRH2G	GREEN LED PILOT LIGHT, 12-130V, NEMA 4X
LNR	ALLEN-BRADLEY	800HQRH2R	RED LED PILOT LIGHT, 12-130V, NEMA 4X
LNA	ALLEN-BRADLEY	800HQRH2A	AMBER LED PILOT LIGHT, 12-130V, NEMA 4X
I/O	ALLEN-BRADLEY	1790D-T8A0	120VAC DEVICENET 8 INPUT BASE TERM. BLOCK
I/OEX	ALLEN-BRADLEY	1790D-T8A0X	120VAC DEVICENET 8 INPUT EXPANSION TERM. BLOCK
PBB	ALLEN-BRADLEY	800HAR2D2	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, BLACK
PBB2	ALLEN-BRADLEY	800HAR2A2	MOMENTARY PUSH BUTTON, 2 NO, NEMA 4X, BLACK
PBG	ALLEN-BRADLEY	800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
PP	PHOENIX CONTACTS	FLPPRJ45/RJ45	ETHERNET PATCH PANEL, RJ45xRJ45, DIN RAIL MOUNT
R	ALLEN-BRADLEY ALLEN-BRADLEY	700HA33A1 700HN101	3PDT RELAY 11 PIN SOCKET BASE
T	ALLEN-BRADLEY ALLEN-BRADLEY ALLEN-BRADLEY	700HT3 700HA33A1 700HN205	SERIES B TIMING MODULE 3PDT RELAY 11 PIN RELAY SOCKET BASE FOR TIMER
TB-1,2	ALLEN-BRADLEY	1492CAM1L	35A, 600V, LARGE-HEAD SCREW TERMINALS
*(TLM)	TANK LEVEL MONITOR, SEE INSTRUMENTATION SCHEDULE ON E1.1		

LEGEND

	PANEL WIRING		FIELD WIRING
R#	CONTROL RELAY	R#-#	NORMALLY OPEN CONTACT
T#	TIME DELAY RELAY	SS-#	2-POSITION SELECTOR SWITCH
C#	CONTACTOR	R#-#	NORMALLY CLOSED CONTACT
#	TERMINAL BLOCK	O.L.	OVERLOADS
CB-#	CIRCUIT BREAKER	PB-#	NORMALLY OPEN MOMENTARY PUSH BUTTON
SW-#	NORMALLY OPEN FLOAT SWITCH	PB-#	NORMALLY CLOSED MOMENTARY PUSH BUTTON
SW-#	NORMALLY CLOSED FLOAT SWITCH	SV#	SOLENOID VALVE
		ASL-#	ALARM & STROBE LIGHT

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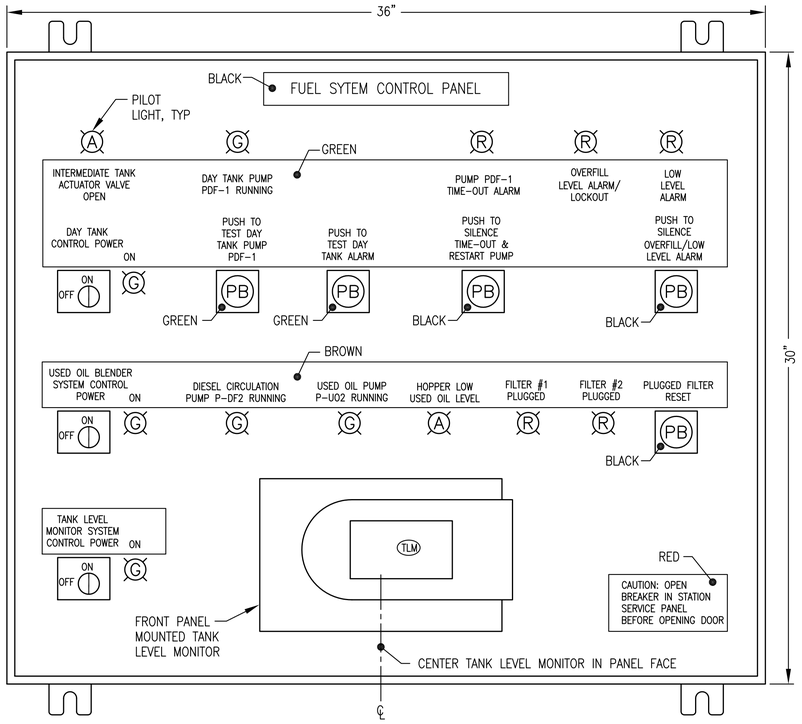
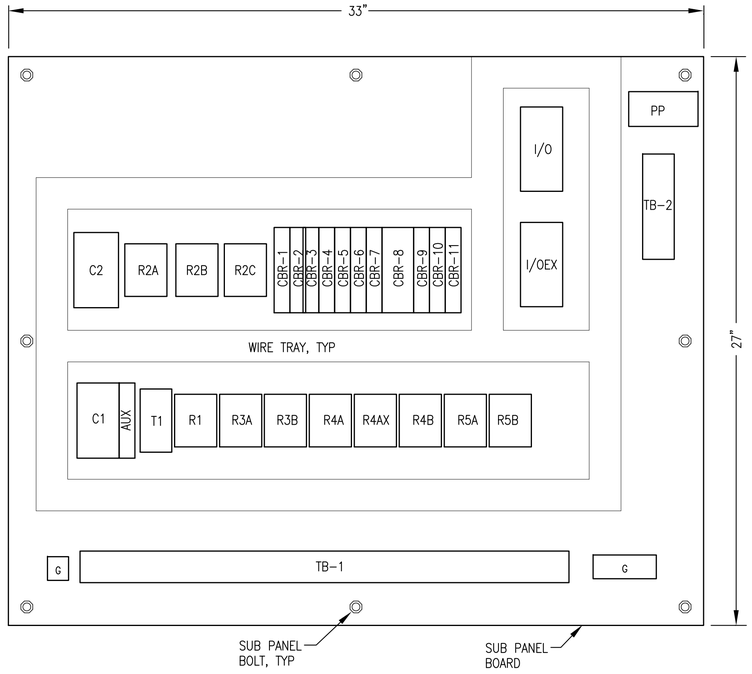
DRAWING TITLE:
FUEL SYSTEM CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

E7.1

SHEET OF 7



1 E7.2 FRONT PANEL LAYOUT
NO SCALE



2 E7.2 SUB PANEL LAYOUT
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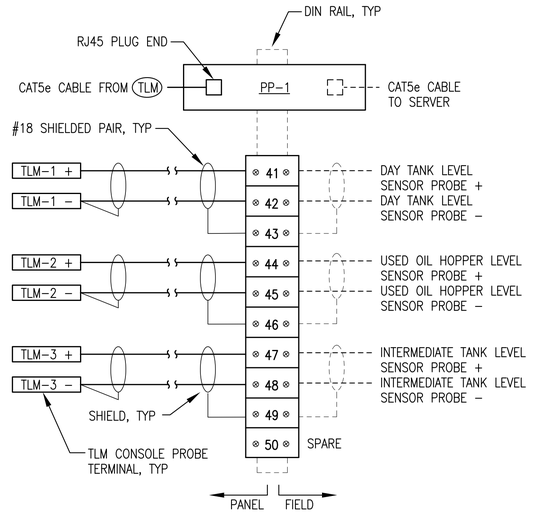
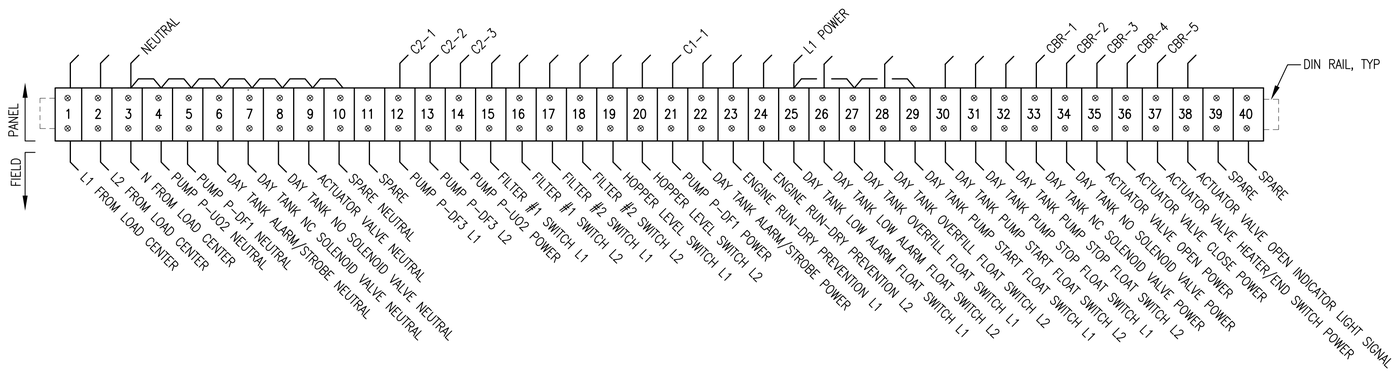


NOTES:

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.

3 E7.2 TB-2 TERM STRIP & PP-1 ENTHERNET PANEL LAYOUT
NO SCALE



NOTES:

1) INSTALL TERMINAL STRIP TB-1 ON HORIZONTAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP BELOW PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO BOTTOM OF PANEL, SEE SUB-PANEL LAYOUT.

2) IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 6 EACH 35A SCREW TERMINAL GROUNDING BUS.

4 E7.2 TB-1 TERMINAL STRIP LAYOUT
NO SCALE

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CLOIS W. VERSYP EE 7802
REGISTERED PROFESSIONAL ENGINEER

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CHECKED BY: CWV/BCG
JOB NUMBER:

DRAWING TITLE:
FUEL SYSTEM CONTROL PANEL LAYOUT & TERMINAL STRIPS

E7.2

SHEET OF 7

PANEL NOTES:

1) PROVIDE COMPLETE LISTED PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN LOGIC DIAGRAM EXCEPT FOR FIELD DEVICES. INSTALL IN A NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK. SEE SHEET E7.2 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. TAG EACH END OF ALL JUMPERS WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS).

3) LABEL ALL PANEL DEVICES 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) DEVICES AND WIRING NOTED AS "FIELD" AND SHOWN WITH DASHED LINES WILL BE FIELD INSTALLED AND ARE NOT PART OF THE PANEL SHOP FABRICATION. FOR BENCH TEST, PROVIDE TEMPORARY DEVICES AND WIRING AS REQUIRED TO SIMULATE FIELD DEVICES.

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 ENTRIES 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 STATION SERVICE PANELBOARD.

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 CAVITIES WITH LUBE OIL PRIOR TO INITIAL OPERATION. VERIFY PROPER ROTATION OF PUMPS. PRIME SYSTEM WITH HAND PRIMING PUMP PRIOR TO BEGINNING DAY TANK FILL.

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) SET TIMING RELAY TIME DELAY TO 30 MINUTES (APPROX. 55 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 4 GPM). ON THE INITIAL TANK FILL, THE PUMP TEST/RESET BUTTON MAY HAVE TO BE MANUALLY RESET IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE. SEE SEQUENCE OF OPERATIONS.

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, THE PUMP "ON" LIGHT TURNS ON, AND THE USED OIL BLENDER RUN SIGNAL DRY CONTACT CLOSES. 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, THE PUMP "ON" LIGHT TURNS OFF, AND THE USED OIL BLENDER RUN SIGNAL DRY CONTACT OPENS.

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 USED OIL BLENDER RUN SIGNAL DRY CONTACT OPENS, 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 USED OIL BLENDER RUN SIGNAL DRY CONTACT OPENS, 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, TURNS ON THE DAY TANK PUMP "RUNNING" LIGHT AND CLOSES THE USED OIL BLENDER RUN SIGNAL DRY CONTACT. 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.

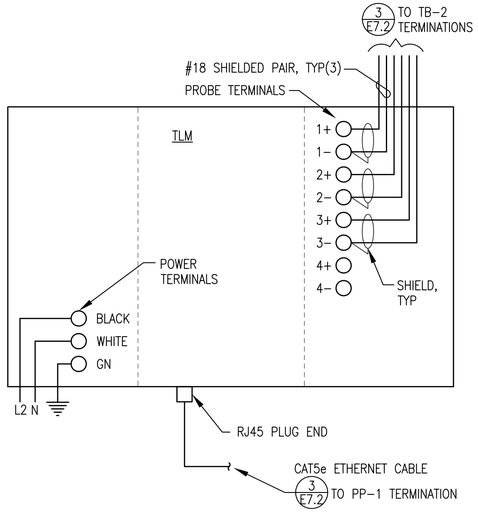
USED OIL BLENDER SYSTEM SEQUENCE OF OPERATIONS:

1) WHEN THE BLENDER CIRCUIT BREAKER AND CONTROL POWER SWITCH ARE CLOSED; THE GREEN POWER LIGHT IS ON AND POWER IS PROVIDED TO ALL CONTROL DEVICES.

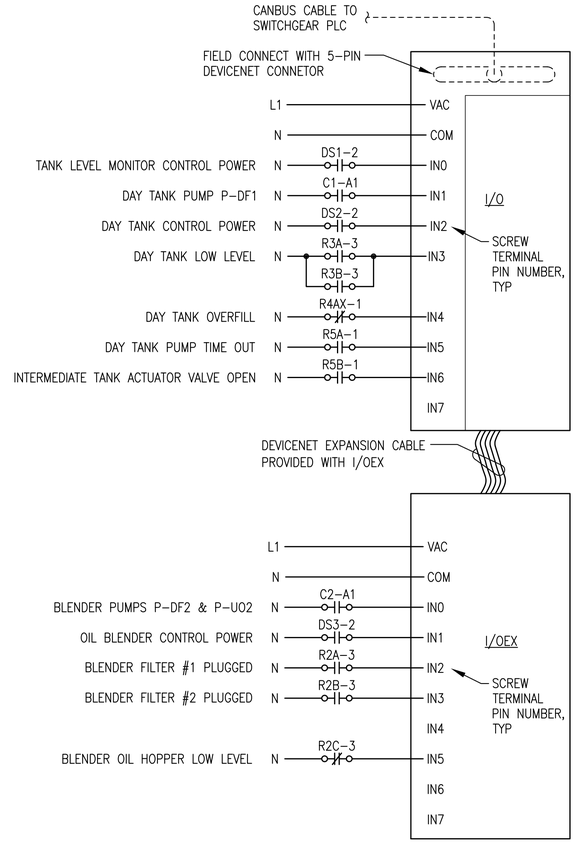
2) NORMAL OPERATION – WHENEVER THE DAY TANK FILL SEQUENCE IS INITIATED, BOTH THE DIESEL CIRCULATING PUMP P-DF2 AND THE USED OIL INJECTION PUMP P-UO2 RUN AND THE ASSOCIATED GREEN PUMP RUNNING LIGHTS ARE ON.

3) PLUGGED FILTER – IF THE DIFFERENTIAL PRESSURE ACROSS A FILTER REACHES THE ALARM SETPOINT, BOTH PUMPS STOP RUNNING AND THE RED FILTER PLUGGED LIGHT FOR THE ASSOCIATED FILTER TURNS ON. THE ALARM LATCHES AND THE SYSTEM WILL NOT OPERATE UNTIL THE PROBLEM IS CORRECTED. AFTER THE FILTER ELEMENT HAS BEEN CHANGED THE BLACK RESET BUTTON MUST BE PRESSED TO RESUME NORMAL OPERATION.

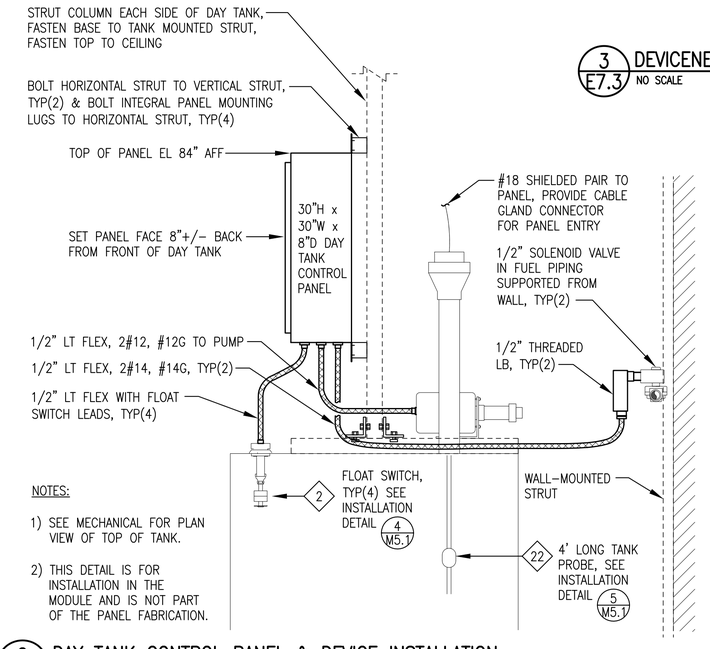
4) HOPPER LOW OIL LEVEL – WHEN THE OIL LEVEL FALLS BELOW THE LOW LEVEL FLOAT SWITCH, BOTH PUMPS STOP RUNNING AND THE AMBER HOPPER LOW OIL LEVEL LIGHT TURNS ON. THE SYSTEM WILL NOT OPERATE UNTIL THE USED OIL LEVEL IN THE HOPPER RISES ABOVE THE LOW LEVEL. RESET IS NOT REQUIRED.



1 E7.3 TANK LEVEL MONITOR (TLM) CONSOLE CONNECTIONS
NO SCALE



3 E7.3 DEVICENET TERMINAL BLOCKS (I/O & I/OEX) CONNECTIONS
NO SCALE



2 E7.3 DAY TANK CONTROL PANEL & DEVICE INSTALLATION
NO SCALE

UMIAQ
6700 Arctic Spur Road
Anchorage, AK 99518
(907) 677-8220

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

STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

CONSTRUCTION DOCUMENTS

REVISIONS REV	DATE	DESCRIPTION

VERIFY SCALES
0 ——— 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

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

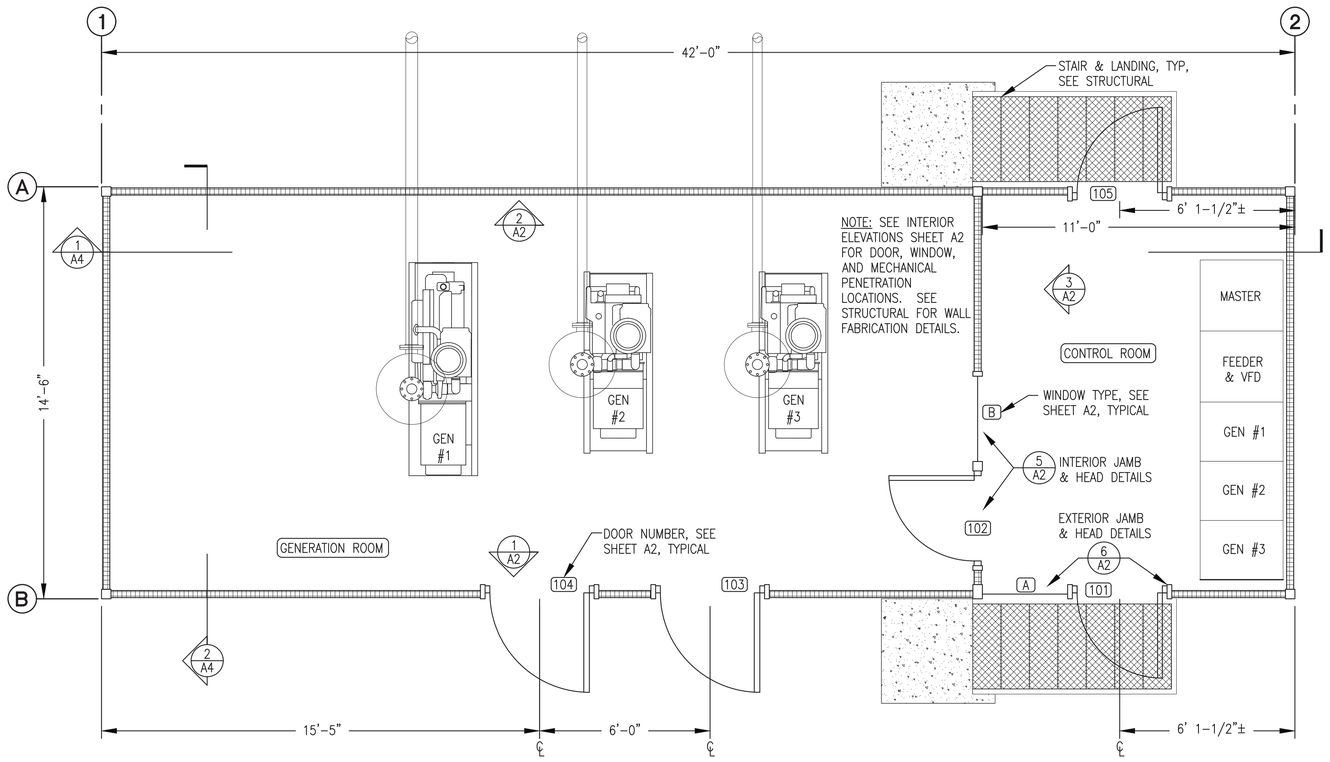
DATE:	1/14/19
DRAWN BY:	JTD
CHECKED BY:	CWV/BCG
JOB NUMBER:	

DRAWING TITLE:
FUEL SYSTEM CONTROL PANEL SEQUENCE OF OPERATION & DETAILS

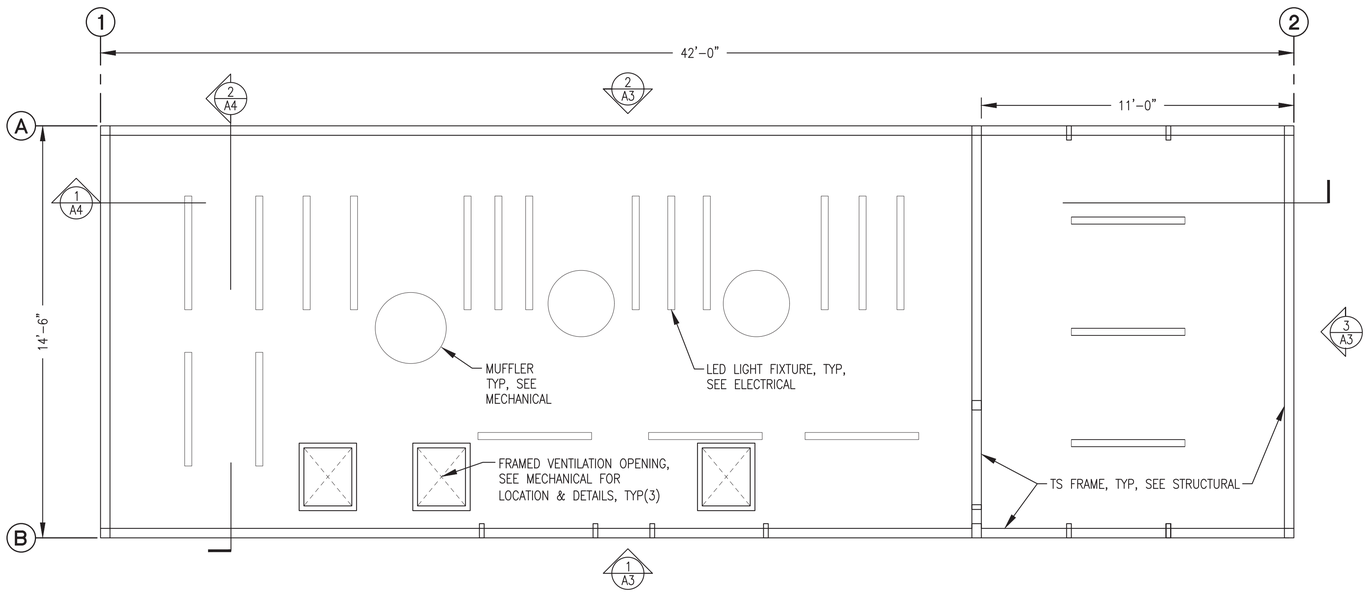
E7.3

SHEET OF 7

ISSUED FOR CONSTRUCTION JANUARY 2019



1 A1 FLOOR PLAN
3/8"=1'-0"



2 A1 REFLECTED CEILING PLAN
3/8"=1'-0"

CODE ANALYSIS – 2012 EDITION INTERNATIONAL BUILDING CODE

OCCUPANCY CLASSIFICATION
GROUP F-1: FACTORY INDUSTRIAL MODERATE HAZARD – ELECTRIC GENERATION PLANT — REF: IBC-2012, SEC. 306.2

TYPE OF CONSTRUCTION — REF: IBC-2012, TABLE 601
TYPE V-B (NON-RATED) — REF: IBC-2012, SEC. 602.5

BUILDING HEIGHTS AND AREAS — REF: IBC-2012, TABLE 503
ALLOWED 40'-0" 1 STORY 8,500 S.F. PROVIDED: 17'-0" 1 STORY 610 S.F.

FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS — REF: IBC-2012, TABLE 601
STRUCTURAL FRAME 0 HR BEARING WALLS 0 HR INTERIOR PARTITIONS 0 HR FLOOR 0 HR ROOF 0 HR

FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS — REF: IBC-2012, TABLE 602
EXTERIOR WALLS $10' \leq X \leq 30'$ 0 HR

FIRE PROTECTION SYSTEM — REF: IBC-2012, SEC. 903.2.4
FIRE PROTECTION NOT REQUIRED. WATER MIST FIRE SUPPRESSION SYSTEM PROVIDED (SEE MECHANICAL).

OCCUPANT LOAD — REF: IBC-2012, TABLE 1004.1.2
MECHANICAL/STORAGE = 300 S.F./PERSON 610 S.F./300 S.F. PER OCCUPANT = 2 OCCUPANTS

MEANS OF EGRESS – TRAVEL DISTANCE — REF: IBC-2012, TABLE 1016.2
REQUIRED 200' PROVIDED 20'

ARCHITECTURAL GENERAL NOTES:

1) SEE CIVIL SITE PLAN FOR LOCATION AND LAYOUT. PROVIDE SEPARATION TO PROPERTY BOUNDARIES IN ACCORDANCE WITH CODE ANALYSIS.
2) DO NOT BLOCK OR OBSTRUCT ACCESS, REQUIRED PARKING AREAS, OR REQUIRED EGRESS FROM NEIGHBORING FACILITIES. PROVIDE TEMPORARY BARRICADES OR OTHER FORMS OF PROTECTION TO PROTECT EMPLOYEES, RESIDENTS, AND VISITORS FROM INJURIES DURING CONSTRUCTION ACTIVITIES
3) PROJECT MANAGER SHALL BE RESPONSIBLE FOR ALL BUILDING PERMITS, LETTERS OF NON-OBJECTION, UTILITY SERVICES AND APPLICATIONS AS REQUIRED. PROJECT MANAGER OR CONSTRUCTION MANAGER TO BE RESPONSIBLE FOR ALL REQUIRED SAFETY PRECAUTIONS, METHODS AND TECHNIQUES.
4) PROVIDE A COMPLETE AND OPERATIONAL FACILITY. ALL WORK TO BE IN ACCORDANCE WITH CURRENT APPROVED EDITIONS OF THE IBC, IMC, IFC, AND NEC INCLUDING STATE OF ALASKA AMENDMENTS.
5) SEE SHEETS A3 AND A4 FOR DESCRIPTION OF FIELD INSTALLED ROOF SYSTEM.
6) INSULATE ALL WALLS, FLOORS, AND CEILINGS WITH HIGH TEMPERATURE MINERAL FIBER ACOUSTICAL FIRE BATT INSULATION, MIN R VALUE 4 PER INCH, MIN 2000F MELTING TEMP. ROXUL AFB OR EQUAL. FILL ALL PANEL VOIDS OR PROVIDE THICKNESS AS INDICATED ON DRAWINGS. MECHANICALLY FASTEN FLOOR INSULATION TIGHT TO FLOOR.
7) UPON COMPLETION OF FABRICATION ROUND ALL CORNERS AND GRIND EDGES SMOOTH AND PAINT ALL INTERIOR AND EXTERIOR EXPOSED STEEL. PERFORM ALL PAINTING IN A WARM DRY ENVIRONMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INCLUDING DRYING TIME TO RE-COAT.
8) SANDBLAST EXTERIOR SURFACE TO SSPC-SP-10. PRIME WITH ONE COAT OF REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA-COAT 302, NO SUBSTITUTES, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. COVER WITH TWO COATS OF EPOXY, DEVOE BAR-RUST 236, NO SUBSTITUTES, TO 12 MILS DRY FILM THICKNESS. FIRST COAT COLOR GRAY, SECOND COAT COLOR WHITE.
9) FINISH EXTERIOR WALLS AND SKIDS (ALL EXPOSED VERTICAL EXTERIOR SURFACES) WITH ONE COAT OF ALIPHATIC URETHANE ENAMEL, DEVOE DEVTHANE 389, NO SUBSTITUTES, COLOR WHITE, TO 3 MILS DRY FILM THICKNESS.
10) SANDBLAST INTERIOR SURFACE TO SSPC-SP-6. PRIME AND FINISH WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, TO 8 MILS TOTAL DRY FILM THICKNESS. CEILING COLOR WHITE. WALL AND FLOOR COLOR STRUCTURAL GRAY 4031. NOTE THAT FIRST COAT ON WALLS AND FLOOR MAY BE WHITE.

NOTE: THIS DRAWING INCLUDES DETAILS THAT ARE NOT PART OF THE MODULE ASSEMBLY SCOPE AND IS PROVIDED STRICTLY FOR IDENTIFYING LOCATIONS, INSTALLATION DETAILS, AND SPECIFICATIONS FOR DOORS AND WINDOWS.

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ICG Lantech Inc
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STATE OF ALASKA, AIDEA/AEA
RURAL POWER SYSTEM UPGRADE
CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

100% DESIGN DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING

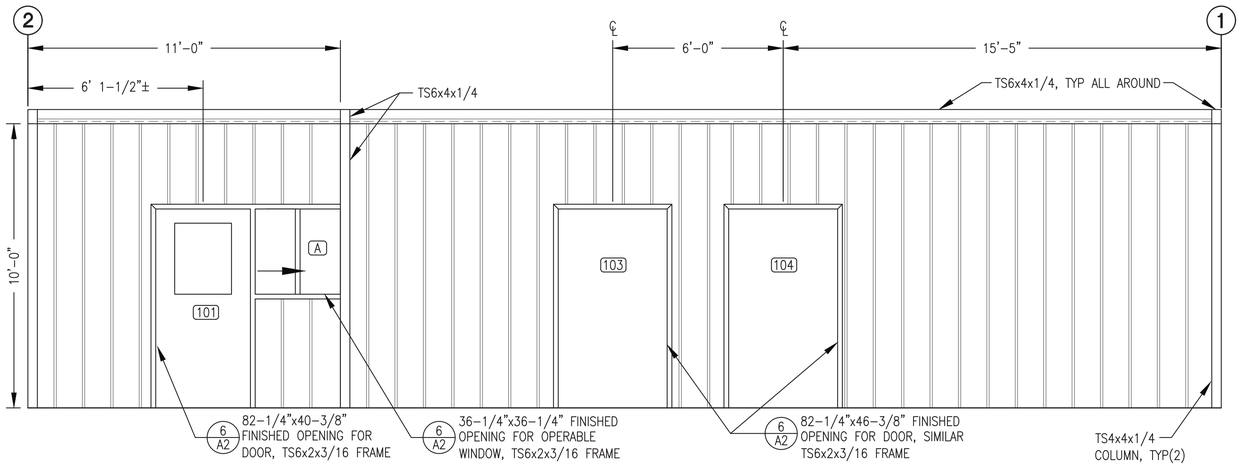
STATE OF ALASKA 49 TH
12.14.18
Ryan E. Wrocklage
No. A11803
REGISTERED PROFESSIONAL ENGINEER

DATE: 12/14/18
DRAWN BY: RW
CHECKED BY: RW
JOB NUMBER: 1026.03

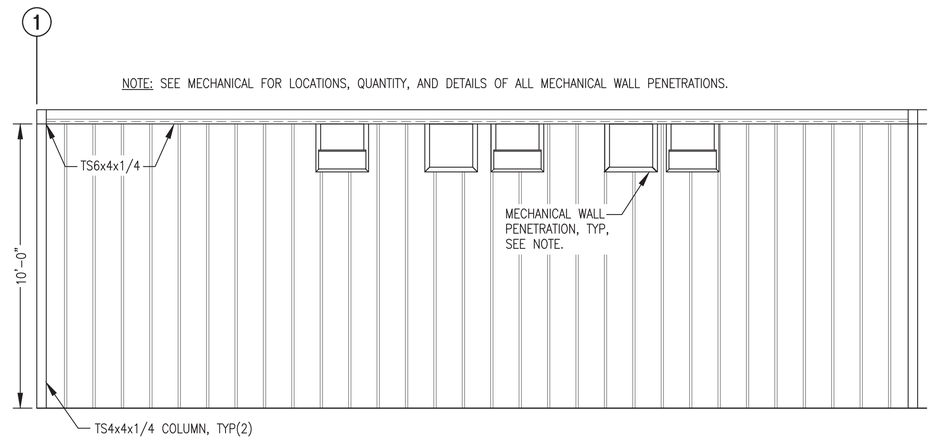
DRAWING TITLE:
FLOOR PLAN, REFLECTED CEILING PLAN, CODE ANALYSIS, & GENERAL NOTES

A1

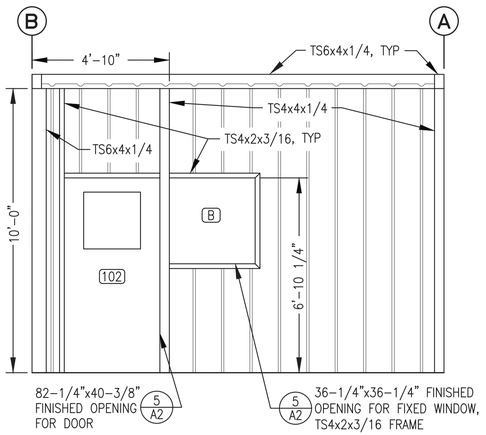
SHEET 4 OF 1



1 A2 FRONT WALL INTERIOR ELEVATION
3/8"=1'-0"



2 A2 PARTIAL GENERATOR ROOM BACK WALL INTERIOR ELEVATION
3/8"=1'-0"



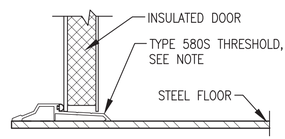
3 A2 CONTROL ROOM WALL INTERIOR ELEVATION
3/8"=1'-0"

FRAMED OPENING NOTES:

1) FABRICATE FRAMED OPENINGS FOR DOORS, WINDOWS, ETC, WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS. GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.

2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED AND LOCATE TO INSIDE EDGE OR CENTERLINE AS INDICATED.

NOTE: SET THRESHOLD IN CONTINUOUS BED OF POLYURETHANE CAULK & CAULK ENDS TO JAMB TO FORM LIQUID TIGHT CONTAINMENT.



4 A2 TYPICAL DOOR THRESHOLD
NO SCALE

DOOR CONSTRUCTION							FRAME CONSTRUCTION						
DOOR NO.	WIDTH	HEIGHT	THICK NESS	MATERIAL	CORE	REMARKS	WALL THICK.	MATERIAL	TYPE	PROFILE	PREP.	FIRE RATING	HDWR. GROUP
101	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE	24"x24" RE-LIGHT {4}	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-1
102	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE	24"x24" RE-LIGHT {4}	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-2
103	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE		N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-3
104	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE		N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-3
105	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE	24"x24" RE-LIGHT {4}	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-1

DOOR HARDWARE:

HW-1

3 EA	HINGES	HAGER	BB1191 4.5 x 4.5NRP x 630
1 EA	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1 EA	CORE	BEST	BROWN CONSTRUCTION CORE
1 EA	DOOR CLOSER	LCN	4040 x CUSH x 689
1 EA	KICK PLATE	ROCKWOOD	K1050 10 x 34 x 630
1 EA	WEATHER STRIP	PEMKO	2891AS x 36 (HEAD)
2 EA	WEATHER STRIP	PEMKO	290AS x 80 (SIDE JAMBS)
1 EA	THRESHOLD	HAGER	580S x 36

HW-2

3 EA	HINGES	HAGER	BB1191 4.5 x 4.5 x 630
1 EA	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1 EA	DOOR CLOSER	LCN	4040 x CUSH x 689
1 EA	KICK PLATE	ROCKWOOD	K1050 10 x 34 x 630
1 EA	MOP PLATE	ROCKWOOD	K1050 10 x 35 x 630
1 EA	SOUND SEAL	PEMKO	2891AS x 36 (HEAD)
2 EA	SOUND SEAL	PEMKO	290AS x 80 (SIDE JAMBS)
1 EA	THRESHOLD	HAGER	580S x 36

HW-3

3 EA	HINGES	HAGER	BB1191 4.5 x 4.5NRP x 630
1 EA	EXIT LOCK	SCHLAGE	ND25D x RHODES x 626
1 EA	OVERHEAD STOP	ROCKWOOD	OH1004M x US32D
1 EA	WEATHER STRIP	PEMKO	2891AS x 42 (HEAD)
2 EA	WEATHER STRIP	PEMKO	290AS x 80 (SIDE JAMBS)
1 EA	THRESHOLD	HAGER	580S x 42

NOTES:

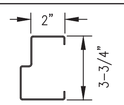
{1} DOORS AND HOLLOW METAL FRAMES GALVANIZED AND FACTORY PRIMED. ALL FRAMES WELDED CONSTRUCTION, DIMPLED AND PUNCHED.

{2} DOORS TO HAVE SOLID POLYURETHANE INSULATION CORE WITH TOPS INVERTED AND CAULKED WATER TIGHT.

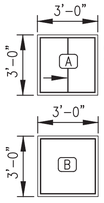
{3} FINISH ALL DOORS AND HOLLOW METAL FRAMES WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.

{4} INSTALL INSULATED RE-LIGHT WITH TWO PANES OF 1/4" LAMINATED SAFETY GLASS WITH 1/2" AIR GAP IN EACH DOOR PANEL, 24"x24" OR 24"x18" AS INDICATED.

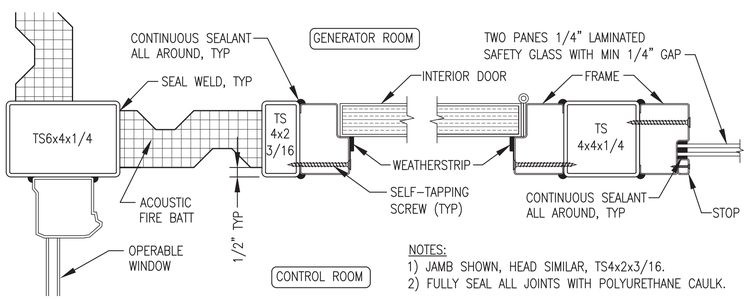
DOOR FRAME PROFILE:



WINDOW TYPES:

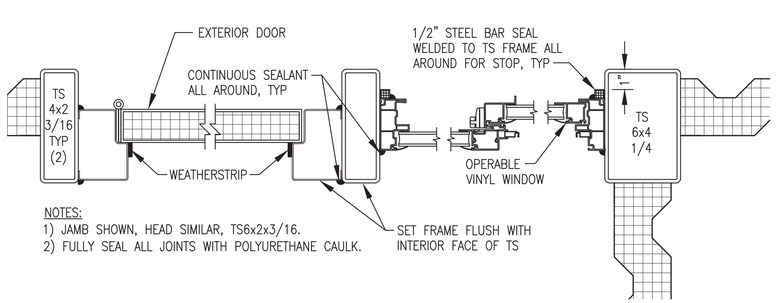


NOTE: DIMENSIONS ARE OVERALL FRAME SIZE.



NOTES:
1) JAMB SHOWN, HEAD SIMILAR, TS4x2x3/16.
2) FULLY SEAL ALL JOINTS WITH POLYURETHANE CAULK.

5 A2 INTERIOR DOOR AND WINDOW JAMB/HEAD
3"=1'-0"



NOTES:
1) JAMB SHOWN, HEAD SIMILAR, TS6x2x3/16.
2) FULLY SEAL ALL JOINTS WITH POLYURETHANE CAULK.

6 A2 TYPICAL EXTERIOR DOOR AND WINDOW JAMB/HEAD
3"=1'-0"

NOTE: THIS DRAWING INCLUDES DETAILS THAT ARE NOT PART OF THE MODULE ASSEMBLY SCOPE AND IS PROVIDED STRICTLY FOR IDENTIFYING LOCATIONS, INSTALLATION DETAILS, AND SPECIFICATIONS FOR DOORS AND WINDOWS.

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ICE Lantech Inc
architecture · engineering · surveying

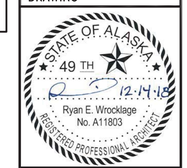
STATE OF ALASKA, AIDEA/AEA RURAL POWER SYSTEM UPGRADE

CLARKS POINT POWER PLANT
CLARKS POINT, ALASKA

100% DESIGN DOCUMENTS

REVISIONS	
REV	DATE
	DESCRIPTION

VERIFY SCALES
0 1"
THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING



DATE: 12/14/18
DRAWN BY: RW
CHECKED BY: RW
JOB NUMBER: 1026.03

DRAWING TITLE:
INTERIOR ELEVATIONS & DOOR/WINDOW DETAILS

A2

SHEET 4 OF 2

LEGEND

- DIRECTION OF FLOW
- CHANGE OF PIPE SIZE
- PIPING CONNECTION (TEE)
- ELBOW TURNED DOWN
- ELBOW TURNED UP
- FLANGED JOINT
- UNION
- FLEXIBLE CONNECTOR
- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- HOSE END DRAIN VALVE
- GAUGE COCK
- AUTOMATIC AIR VENT
- (T) THERMOMETER
- (P) PRESSURE GAUGE
- (TT) TEMPERATURE TRANSMITTER
- (PT) PRESSURE TRANSMITTER
- (FM) FLOW METER
- (FS) FLOAT SWITCH
- (LCA) LOW COOLANT ALARM
- (TLM) TANK LEVEL MONITOR
- (LSP) LEVEL SENSOR PROBE
- (GLS) GLYCOL LEVEL SENSOR

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

EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS (APPLIES TO ALL SCHEDULES):
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.

ENGINE COOLING SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
R-1 R-2	GLYCOL RADIATOR	SINGLE PASS, 4 ROW, VERTICAL CORE, 3" FLANGED CONNECTIONS, GALVANIZED COATING, EXPANDED METAL GUARD. 6,000 BTU/MIN AT 77°F AMBIENT, 50 GPM 50% ETHYLENE GLYCOL AT 192F IN, 0.22 PSI MAX GLYCOL PRESSURE DROP. 3 HP, 460 V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO.	DIESEL RADIATOR PART NO. DR3490
TV-1	COOLANT THERMOSTATIC VALVE	3" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS – 185F NOMINAL TEMPERATURE	FPE PART NO. A3010-185
TV-2	HEAT RECOV. THERMOSTATIC VALVE	2-1/2" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS, 185F NOMINAL TEMPERATURE,	FPE PART NO. A2510-185
ET-1	GEN COOLANT EXPANSION TANK	24 GALLON CAPACITY TANK, 12.75" O.D x 48" LONG FABRICATED STEEL TANK, SEE FABRICATION DETAIL	CUSTOM FABRICATION
HP-EC	ENGINE COOLANT FILL HAND PUMP	DOUBLE ACTION PISTON PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100
G-EC	ENGINE COOLANT GLYCOL TANK LEVEL GAUGE	MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL, 25 PSIG MAX OPERATING PRESSURE, 35" LIQUID COLUMN PLUS 4" RISER.	ROCHESTER MODEL 8660

HEAT RECOVERY & PLANT HEATING EQUIPMENT SCHEDULE:

HX-1	POWER PLANT HEAT EXCHANGER	316 SS PLATES, BRAZED CONST. 2.5" NPT, 600 MBH MIN CAPACITY. PRIMARY: 65 GPM 195F EWT (50% ETHYLENE) 1.2 PSI MAX WPD, SECONDARY: 60 GPM 185F LWT (50% PROPYLENE) 1.3 PSI MAX WPD	AMERIDEX SL-140-90
P-HR1	CONTROL ROOM HEAT	1 GPM AT 18' TDH, 1/25HP, 115V, 1ø. PROVIDE WITH 3/4" SOLDER COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 15-58FC, SPEED 3
P-HR2A	HEAT RECOV. PRIMARY	65 GPM AT 8' TDH, 1/3HP, 115V, 1ø. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 50-40/4, SPEED 3
P-HR2B	HEAT RECOV. SECONDARY	60 GPM AT 23' TDH, 3/4HP, 115V, 1ø. PROVIDE WITH 2" NPT COMPANION FLANGES, GASKETS, & BOLTS.	GRUNDFOS UPS 50-80/2, SPEED 3
CUH-1	CONTROL ROOM HEAT	FLOOR MOUNTED HOT WATER CABINET UNIT HEATER, 18 MBH AT 1 GPM 180F EWT & 60F EAT.	TOYOTOMI HC-20
ET-2	HEAT RECOV. EXP. TANK	BLADDER TYPE EXPANSION TANK, 106 GALLON TANK, 125 PSIG WORKING PRESSURE, 10 PSIG PRE-CHARGE.	AMTROL 400L

VENTILATION EQUIPMENT SCHEDULE:

EF-1 EF-2	GENERATION ROOM EXHAUST FANS	DIRECT DRIVE 14"ø PROPELLER SIDEWALL EXHAUST FAN, 2,100 CFM AT 0.375" SP, 1,750 RPM. FURNISH WITH SPECIAL 1/2 HP, 115 V, 1 PH VARIGREEN MOTOR WITH OPTIONAL 0-10V LEADS	GREENHECK SE1-14-436-VG (1/2 HP)
EF-1 EF-2 COMB.	FAN & INTAKE DAMPERS	OPPOSED BLADE LOW-LEAKAGE CONTROL DAMPER, GALVANIZED STEEL CONSTRUCTION, 304 STAINLESS STEEL BEARINGS AND JAMB SEALS, EPDM BLADE SEALS.	GREENHECK VCD-23
(MD)	MOTORIZED DAMPER ACTUATOR	120V SPRING RETURN ACTUATOR	BELIMO AF-BUP

FUEL SYSTEM EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
P-DF1 & P-UO1	DAY TANK FILL PUMP & USED OIL DRAIN PUMP	ROTARY GEAR PUMP, 1/2" FPT INLET AND OUTLET, DUCTILE IRON CONSTRUCTION WITH STAINLESS STEEL SHAFT, BUNA-N LIP SEAL, CARBON BEARINGS, DIRECT FLEX COUPLED TO 1725 RPM ODP THERMALLY PROTECTED, AUTO RESET MOTOR, 1/3 HP, 115 V, 1 PH, 60 HZ, 4.0 GPM @ 20 PSID.	OBERDORFER C992M3E5QF50
HP-DT	DAY TANK FILL HAND PUMP (& GLYCOL FILL)	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE.	GPI MODEL HP-100
G-DT	DAY TANK LEVEL GAUGE	MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL, 25 PSIG MAX OPERATING PRESSURE, 35" LIQUID COLUMN PLUS 4" RISER.	ROCHESTER MODEL 8660
M-DT	DAY TANK METER	STEEL BODY, 1" ANSI 300# FLANGED ENDS, 20-800 GPH FLOW RANGE, O-RINGS AND SEALS COMPATIBLE WITH #1 DIESEL, DIRECT READ 6-DIGIT REGISTER TO 0.1 GAL, DRY CONTACT PULSER.	ISTEC CONTOIL 9226-F
F-DT	DAY TANK FILTER	10 MICRON FILTER FOR DIESEL FUEL, CLEAR BOWL WITH BOTTOM DRAIN VALVE, 150 PSIG MAXIMUM OPERATING PRESSURE, 25 GPM MAXIMUM FLOW. REPLACE FPT HEAD ASSEMBLY WITH CUSTOM FABRICATED STEEL HEAD WITH ANSI 150# FLANGED ENDS. FURNISH COMPLETE WITH WRENCH AND 5 SPARE FILTER ELEMENTS.	SUPERIOR MACHINE & WELDING HEAD WITH GOLDEN ROD NO. 495-4 BOWL, 491 WRENCH, 470-5 ELEMENTS

PIPE/TUBING STRUT CLAMP SCHEDULE

PIPE/TUBE	CLAMP #	PIPE/TUBE	CLAMP #
1/2" COPPER	BVT062	1/2" STEEL	B2008
3/4" COPPER	BVT087	3/4" STEEL	B2009
1" COPPER	BVT112	1" STEEL	B2010
1-1/4" COPPER	BVT125	1-1/4" STEEL	B2011
1-1/2" COPPER	BVT162	1-1/2" STEEL	B2012
2" COPPER	BVT212	2" STEEL	B2013
2-1/2" COPPER	BVT262	2-1/2" STEEL	B2014
3" COPPER	BVT312	3" STEEL	B2015
4" COPPER	BVT412	4" STEEL	B2017

NOTES:
1) ALL CLAMP NUMBERS ARE B-LINE. EQUIVALENT EQUALS ACCEPTABLE.
2) ALL COPPER TUBE CLAMPS TO BE CUSHIONED, VIBRA-CLAMP.
3) ALL STEEL PIPE CLAMPS NOT CUSHIONED. USE FOR ALL STEEL PIPE AND RIGID CONDUIT.
4) SEE PLANS, ELEVATIONS, ISOMETRICS, AND DETAILS FOR ACTUAL PIPE SIZES.

INSTRUMENTATION: SEE ELECTRICAL INSTRUMENTATION SCHEDULE ON SHEET E1.1 FOR INSTRUMENTATION DEVICES SHOWN ON THE MECHANICAL DRAWINGS.

SEQUENCE OF OPERATIONS

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

ALL DAMPER MOTORS WILL BE NORMALLY CLOSED SPRING RETURN AND WILL CLOSE ON LOSS OF POWER (FIRE ALARM) IN LESS THAN 30 SECONDS. VENTILATION AIR INTAKE AND EXHAUST MOTORIZED DAMPERS WILL OPEN ANY TIME ASSOCIATED EXHAUST FAN OPERATES. THE COMBUSTION AIR INTAKE MOTORIZED DAMPER WILL BE OPEN ANY TIME PLANT OPERATES (STATION SERVICE POWER ON).

EXHAUST FANS EF-1 AND EF-2 WILL OPERATE ON A CALL FOR COOLING THROUGH A 24VAC DIGITAL MODULATING THERMOSTAT. THE THERMOSTAT WILL PROVIDE A 0-10V SIGNAL TO MODULATE THE FAN SPEED AS REQUIRED TO MAINTAIN GENERATING ROOM TEMPERATURE, 75F, ADJUSTABLE.

CABINET UNIT HEATER CUH-1 AND CIRCULATING PUMP P-HR1 WILL OPERATE ON A CALL FOR HEATING THROUGH THE INTERNAL CUH CONTROLS TO MAINTAIN CONTROL ROOM TEMPERATURE, 65F, ADJUSTABLE.

RADIATOR FAN MOTORS WILL OPERATE UNDER VARIABLE FREQUENCEY DRIVE (VFD) CONTROL. WHEN THE COOLANT RETURN TEMP REACHES THE WAKE UP SETPOINT THE MOTOR WILL START AT MINIMUM SPEED AND RAMP UP TO THE REQUIRED SPEED. USING PID CONTROL, THE VFD WILL MODULATE THE FAN SPEED AS REQUIRED TO MAINTAIN COOLANT RETURN TEMP AT THE PID REFERENCE SETPOINT. AS THE COOLANT RETURN TEMP RISES, THE VFD WILL INCREASE THE SPEED OF THE FAN MOTOR UP TO 100%. ONCE THE FAN REACHES THE MINIMUM SPEED, THE VFD WILL MAINTAIN THAT SPEED UNTIL THE LOW SPEED TIME OUT EXPIRES. WHEN THE LOW SPEED TIME OUT EXPIRES THE MOTOR WILL STOP. THE MOTOR WILL REMAIN OFF UNTIL THE COOLANT RETURN TEMP RISES TO THE WAKE UP SETPOINT. THE INITIAL OPERATING SETTINGS SHALL BE SET TO THE FOLLOWING VALUES AND SHALL BE ADJUSTABLE:
170F = PID REFERENCE TEMPERATURE 160F = WAKE UP TEMPERATURE
0.93 = PROPORTIONAL GAIN 0.3 = INTEGRAL GAIN 0 = DERIVATIVE
6 HZ = MINIMUM SPEED 60 SEC = LOW SPEED TIME OUT

HEAT RECOVERY PUMPS P-HR2A AND P-HR2B WILL OPERATE CONTINUOUSLY UNDER MANUAL CONTROL.

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

WHEN THE HEAT RECOVERY RETURN TEMP. IS EQUAL TO OR GREATER THAN THE HEAT RECOVERY SUPPLY TEMP. FOR 60 MINUTES, AN AMBER LAMP "NO LOAD ON HEAT RECOVERY" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE. WHEN THE HEAT RECOVERY SUPPLY TEMP. IS A MIN. OF 1°F GREATER THAN THE HEAT RECOVERY RETURN TEMP. THE LAMP WILL TURN OFF.

WHEN THE FLOW RATE IN THE HEAT RECOVERY PIPING FALLS BELOW 10 GPM FOR 15 MINUTES, A RED LAMP "HEAT RECOVERY LOSS OF FLOW" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE.

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

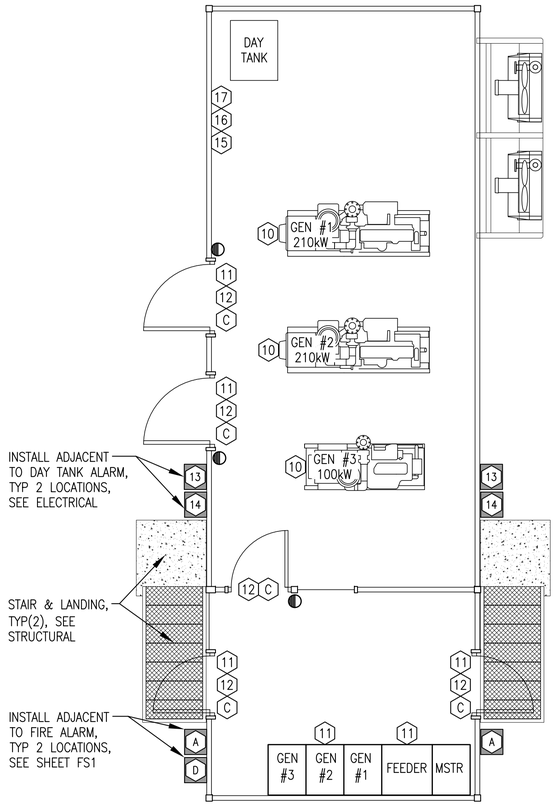
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

TITLE: MECHANICAL LEGEND, SCHEDULES, & SEQUENCE OF OPERATIONS

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M1.1 OF 7
PROJECT NUMBER:



1 / M1.2 POWER PLANT WARNING SIGN/PLACARD & FIRE EXTINGUISHER PLAN
1/4"=1'-0"

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

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

(#) DECALS — DECALS TO BE WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, ONE SIDE ONLY, SELF ADHESIVE BACK. NOMINAL 10"x14" SIZE UNLESS INDICATED OTHERWISE OR REQUIRED TO BE LARGER FOR SPECIFIED LETTER SIZE. WARNING LITES OR EQUAL. INSTALL ON FACE OF DOORS OR ELECTRICAL ENCLOSURES WHERE INDICATED. CLEAN SURFACES AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

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

WARNING SIGNS – RED LETTERING ON WHITE BACKGROUND.

- (A) "FIRE ALARM"
- (C) "CAUTION, ROOM PROTECTED BY WATER MIST FIRE PROTECTION SYSTEM, IN CASE OF FIRE KEEP DOOR CLOSED AND DO NOT ENTER"
- (D) "FLASHING LIGHT MEANS FIRE SUPPRESSION AGENT HAS DISCHARGED"
- (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 SPILL CALL DEC 1-800-478-9300"

INFORMATIONAL PLACARDS – BLACK LETTERING ON WHITE BACKGROUND.

- (15) "CHECK BULK TANK LEVEL DAILY, SWITCH TO A DIFFERENT BULK TANK WHEN LEVEL DROPS BELOW 12" "
- (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 TANK FARM USING A WRENCH
  3) OPEN NORMALLY CLOSED VALVE BY HAND PUMP
  4) OPERATE HAND PUMP WHILE MONITORING LEVEL GAUGE"
- (17) "TO CHANGE ENGINE OIL:
  1) LOCK & TAG GENERATOR OUT OF SERVICE
  2) DRAIN ENGINE OIL INTO DRUM OR BUCKET
  3) CHANGE FILTER
  4) CLOSE DRAIN VALVE & REFILL ENGINE
  5) RUN ENGINE, SHUT OFF, & CHECK DIPSTICK
  6) TOP OFF & PLACE ENGINE BACK IN SERVICE"

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 APPROVED EQUAL.
NOTE: PROVIDE TAGS NOTED AS DECALS WITHOUT ALUMINUM BACKING PLATE.

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"
- (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"
- (62) "NORMALLY OPEN, HEAT RECOVERY SUPPLY"
- (63) "NORMALLY OPEN, HEAT RECOVERY RETURN"
- (64) "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF SYSTEM"

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.

NOTES:
1) SEE DRAWINGS THAT FOLLOW FOR LOCATIONS OF ALL SPECIFIC FUNCTION TAGS.
2) 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.

MODULE SHOP/ON-SITE NOTES:

1) FURNISH AND INSTALL ALL DECALS, SIGN BOARDS. AND FIRE EXTINGUISHERS AS PART OF THE MODULE SHOP FABRICATION WORK.
2) FURNISH AND INSTALL ALL VALVE TAGS AS PART OF THE MODULE SHOP FABRICATION WORK.

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: WARNING SIGN & FIRE EXTINGUISHER PLAN, SIGN & VALVE TAG SCHEDULES

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

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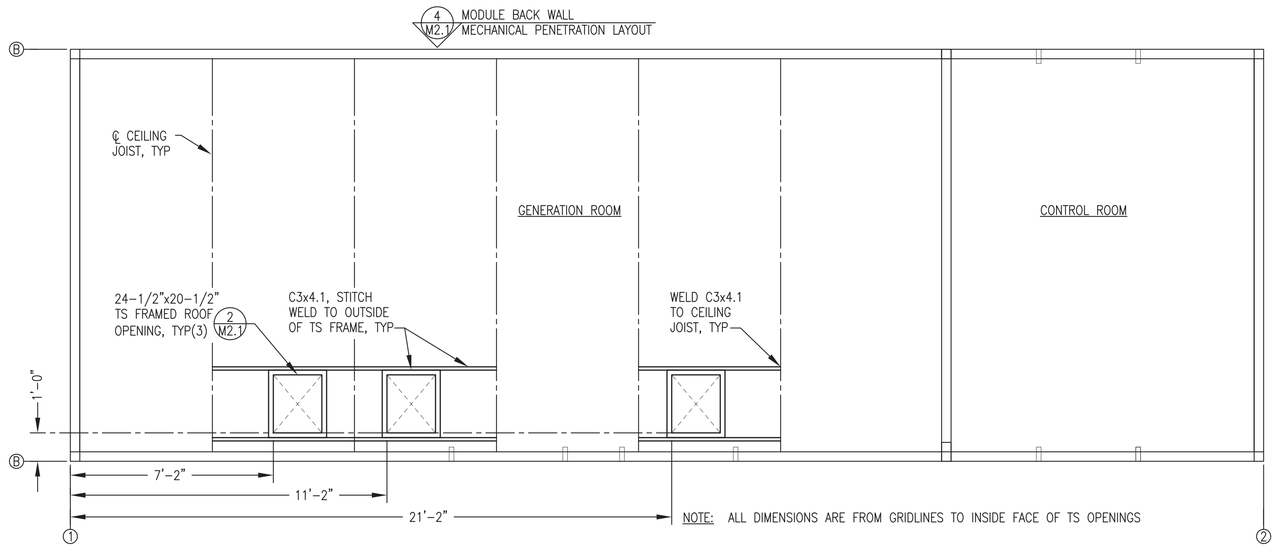
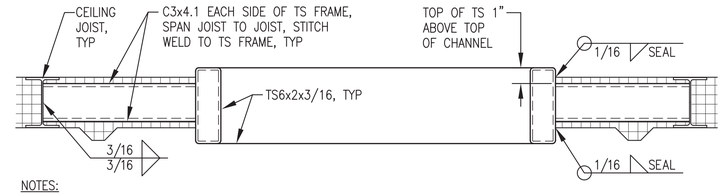
DESIGNED BY: BCG	DATE: 1-14-19
FILE NAME: PTH PPU M2-7	SHEET: M1.2 OF 7
PROJECT NUMBER:	



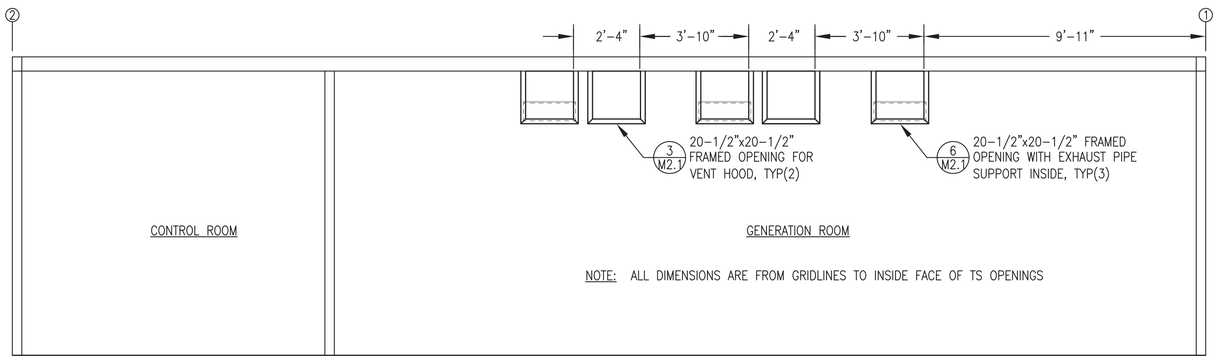
1 M2.1 MODULE MECHANICAL ROOF PENETRATION PLAN
3/8"=1'–0"



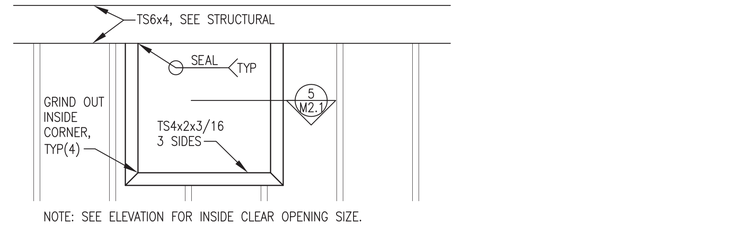
NOTES:

1) FABRICATE FRAMED OPENING WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED ON PLANS.
3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.

2 M2.1 TYPICAL ROOF OPENING DETAIL
2"=1'–0"



4 M2.1 MODULE MECHANICAL WALL PENETRATIONS AT GRID A – EXTERIOR ELEVATION
1/2"=1'–0"

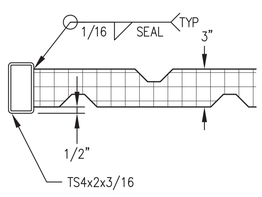


NOTE: SEE ELEVATION FOR INSIDE CLEAR OPENING SIZE.

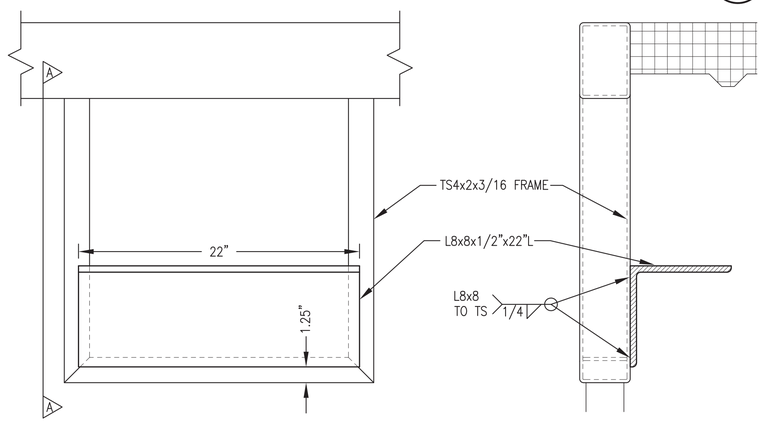
3 M2.1 TYPICAL WALL OPENING – ELEVATION
1"=1'–0"

NOTES:

1) FABRICATE FRAMED OPENING WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED ON ELEVATIONS.
3) GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.



5 M2.1 TYPICAL SECTION THROUGH WALL OPENING
2"=1'–0"



6 M2.1 EXHAUST PIPE SUPPORT AT FRAMED OPENING
2"=1'–0"

NOTE: THIS DRAWING SHOWS WORK THAT WAS PERFORMED BY OTHERS AS PART OF THE FABRICATION OF THE OWNER FURNISHED MODULE STRUCTURE AND IS PROVIDED FOR REFERENCE ONLY. SEE OWNER FURNISHED MODULE SHOP DRAWINGS FOR ADDITIONAL DETAIL.

ISSUED FOR CONSTRUCTION JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: MECHANICAL PENETRATIONS PLAN, ELEVATION, & DETAILS

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

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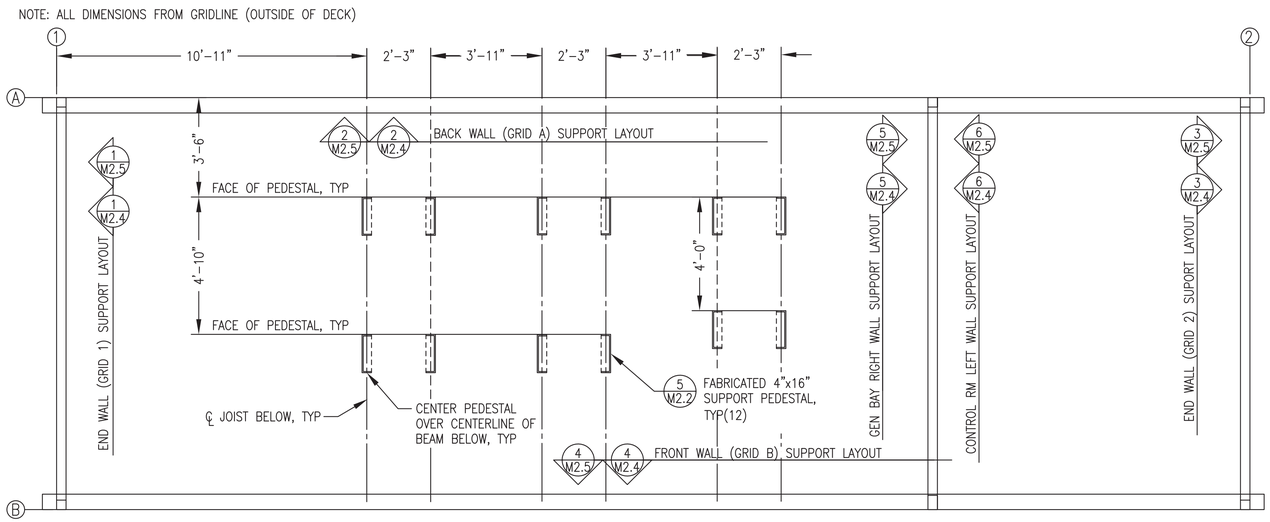
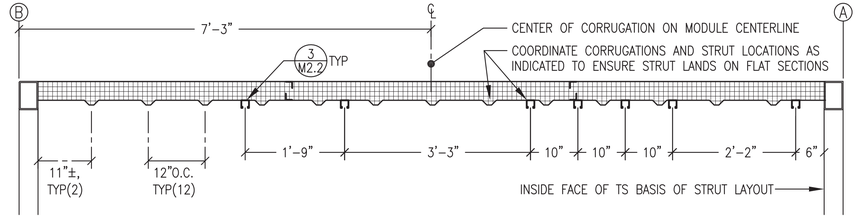
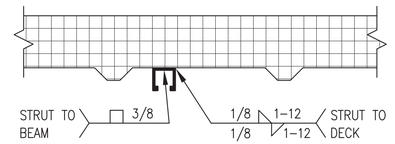


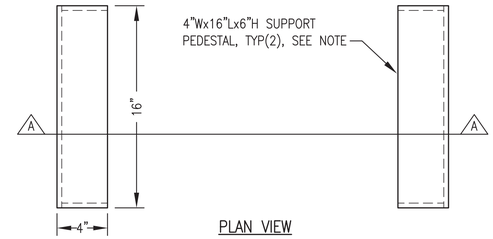
1 M2.2 MODULE MECHANICAL SUPPORT PLAN
3/8"=1'-0"



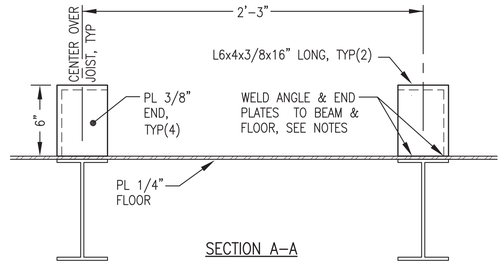
2 M2.2 SECTION THROUGH CEILING – CORRUGATION & STRUT LAYOUT
3/4"=1'-0"



3 M2.2 STRUT ATTACHMENT TO CEILING
NO SCALE



PLAN VIEW



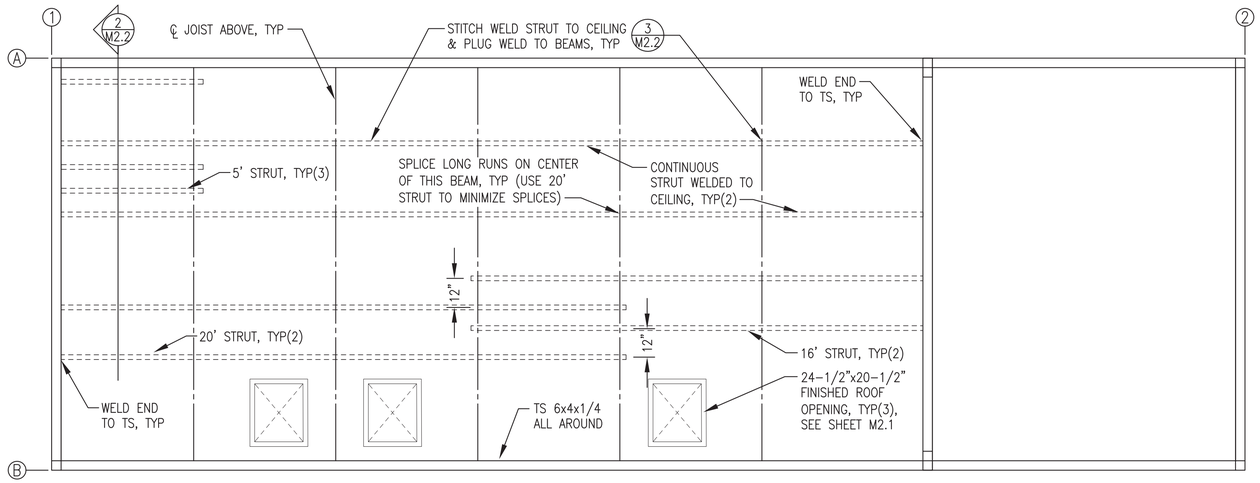
SECTION A–A

NOTES: 1) MAKE ALL JOINTS WITH CONTINUOUS GROOVE OR FILLET WELDS.
2) SLOT FLOOR PLATE 3 SIDES THEN WELD PEDESTAL TO TOP OF BEAM AND SEAL WELD TO FLOOR PLATE ALL AROUND.

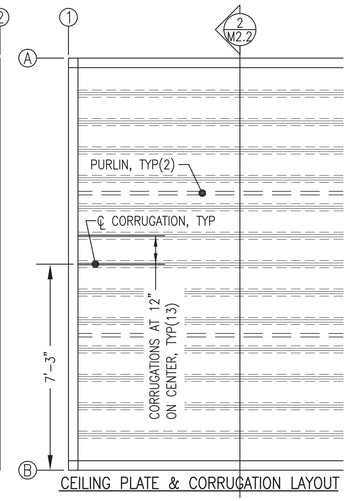
5 M2.2 SUPPORT PEDESTAL FABRICATION
2"=1'-0"

GENERAL NOTES:

1) FABRICATE PEDESTALS FROM ASTM A36 ANGLE AND PLATES AS SHOWN.
2) ALL STRUT 12 GAUGE 1-5/8"x1-5/8" SOLID BACK PLAIN (UNFINISHED). B-LINE B22-PLN OR EQUAL. PURCHASE IN 20' LENGTHS TO MINIMIZE SPLICES.
3) INSTALL ALL SUPPORTS INDICATED AND GRIND SMOOTH PRIOR TO SANDBLASTING MODULE. SANDBLAST AND PAINT ALL SUPPORTS THIS SHEET EQUIVALENT TO MODULE INTERIOR. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.



CEILING MOUNTED STRUT LAYOUT



CEILING PLATE & CORRUGATION LAYOUT

4 M2.2 CEILING STRUT SUPPORT LAYOUT PLAN
3/8"=1'-0"

NOTE: THIS DRAWING SHOWS WORK THAT WAS PERFORMED BY OTHERS AS PART OF THE FABRICATION OF THE OWNER FURNISHED MODULE STRUCTURE AND IS PROVIDED FOR REFERENCE ONLY. SEE OWNER FURNISHED MODULE SHOP DRAWINGS FOR ADDITIONAL DETAIL.

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

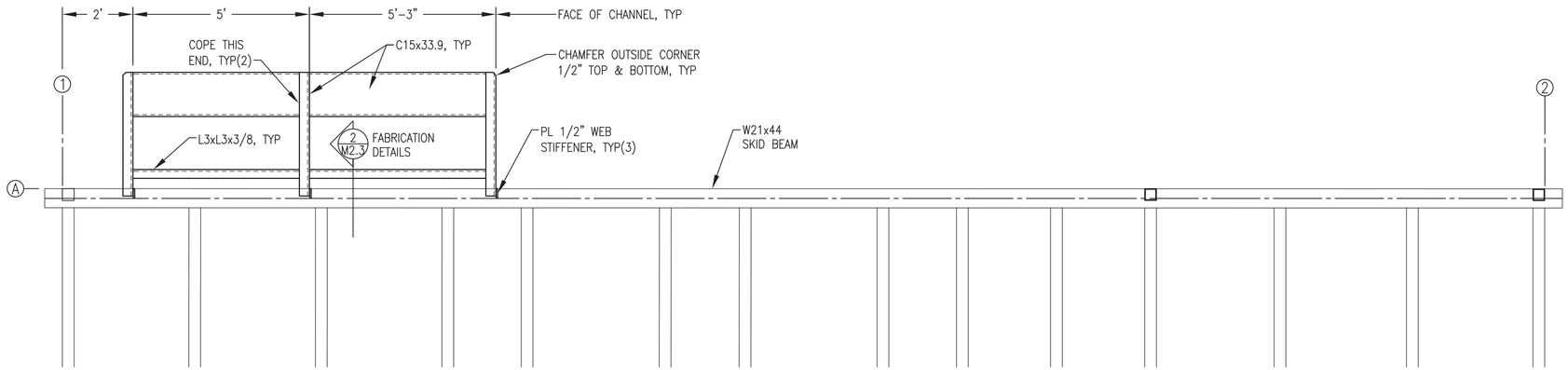
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

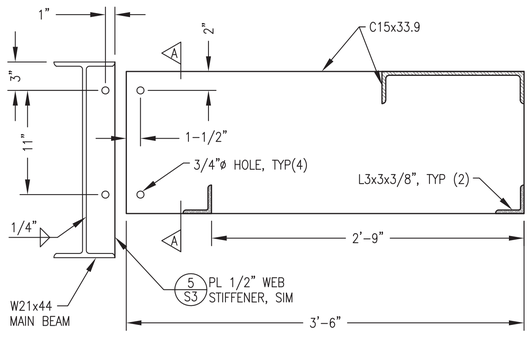
TITLE: MECHANICAL SUPPORT PLANS & DETAILS

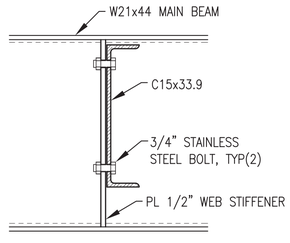
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD
DESIGNED BY: BCG
FILE NAME: PTH PPU M2-7
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 1-14-19
SHEET: M2.2 OF 7



1 M2.3 RADIATOR SUPPORT PLAN
1/2"=1'-0"





SECTION A-A

2 M2.3 RADIATOR SUPPORT FABRICATION
1-1/2"=1'-0"

SUPPORT FABRICATION NOTES:

1) FABRICATE SUPPORT FROM ASTM A36 ANGLE & CHANNEL AS SHOWN.
2) RACK ALL SUPPORT BRACKETS LEVEL & PERPENDICULAR TO SKID WITH CONNECTIONS BOLTED TIGHT PRIOR TO WELDING.
3) UPON COMPLETION OF WELDING ROUND CORNERS AND GRIND EDGES SMOOTH.
4) PRIOR TO SANDBLASTING MODULE REMOVE SUPPORTS THEN SANDBLAST AND PAINT EQUIVALENT TO MODULE EXTERIOR WALLS. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.

NOTE: THIS DRAWING SHOWS WORK THAT WAS PERFORMED BY OTHERS AS PART OF THE FABRICATION OF THE OWNER FURNISHED MODULE STRUCTURE AND IS PROVIDED FOR REFERENCE ONLY. SEE OWNER FURNISHED MODULE SHOP DRAWINGS FOR ADDITIONAL DETAIL.

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

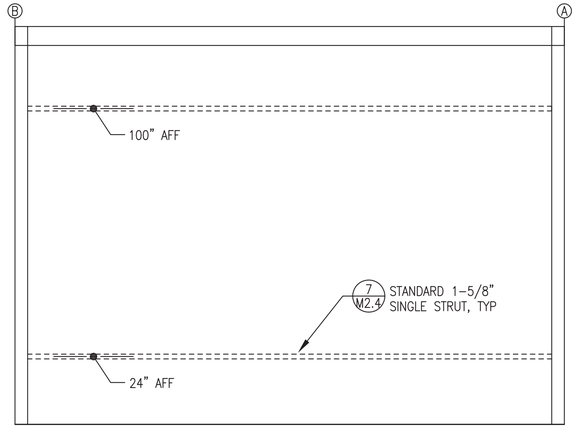
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

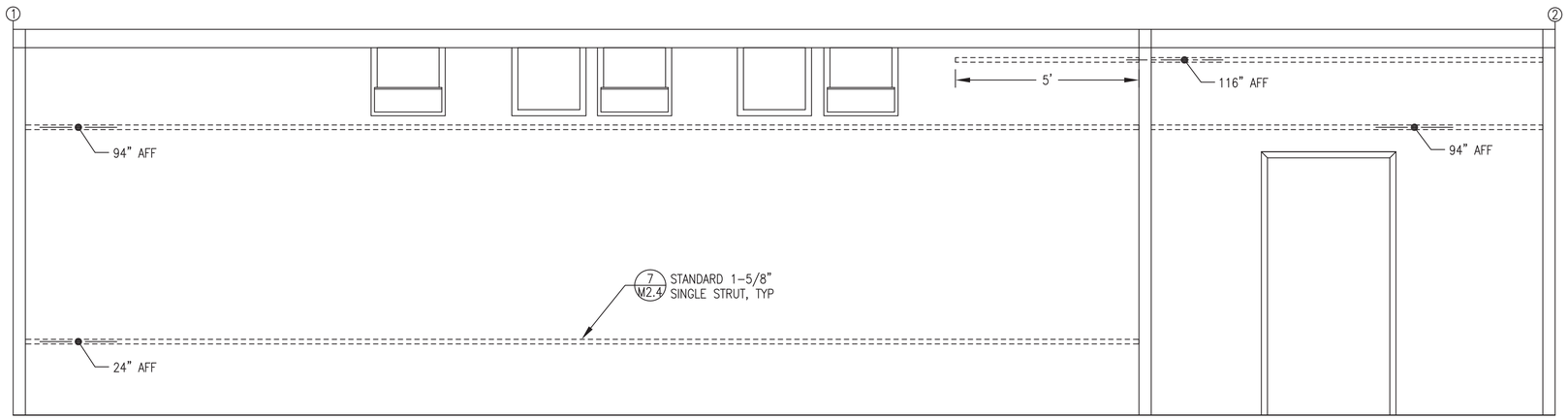
TITLE: RADIATOR SUPPORT PLAN & DETAILS

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

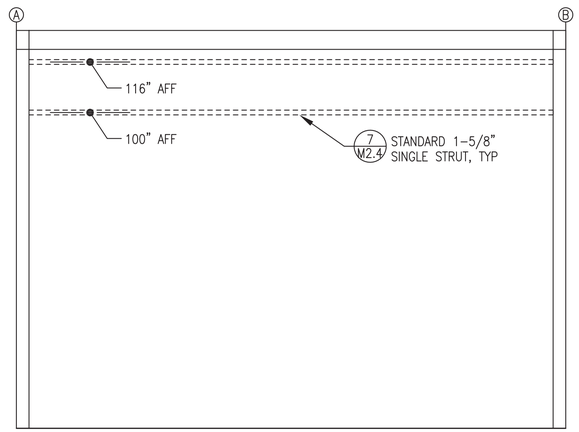
DRAWN BY: JTD
DESIGNED BY: BCG
FILE NAME: PTH PPU M2-7
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 1-14-19
SHEET: M2.3 OF 7



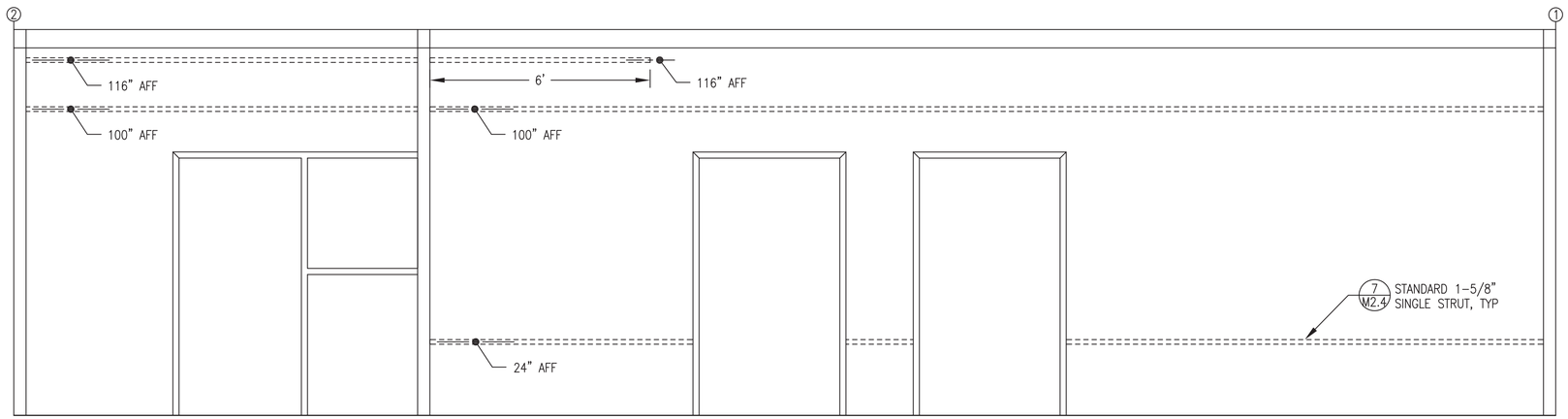
1 M2.4 END WALL (GRID 1) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



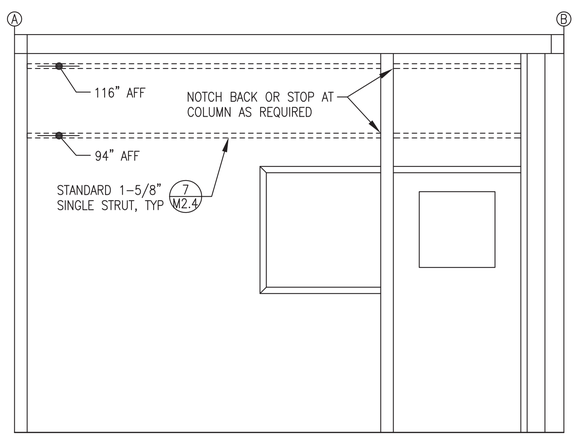
2 M2.4 BACK WALL (GRID A) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



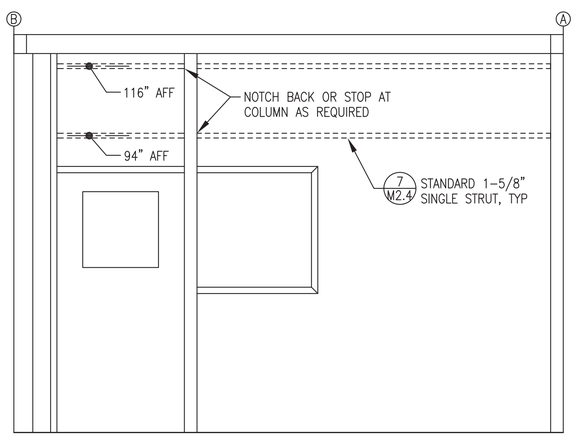
3 M2.4 END WALL (GRID 2) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



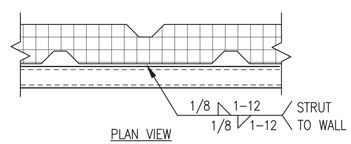
4 M2.4 FRONT WALL (GRID B) HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



5 M2.4 GEN BAY RIGHT WALL HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



6 M2.4 CONTROL ROOM LEFT WALL HORIZONTAL WALL STRUT LAYOUT
1/2"=1'-0"



7 M2.4 HORIZONTAL WALL STRUT ATTACHMENT
NO SCALE

HORIZONTAL WALL STRUT NOTES:

1) ALL LOCATIONS ARE CENTERLINE OF STRUT ABOVE FINISHED FLOOR (AFF).
2) ALL STRUT SHALL BE 12 GAUGE, 1-5/8" x 1-5/8", PLAIN (UN-FINISHED BLACK) WITH SOLID BACK, B-LINE B22-PLN OR EQUAL.
3) PRIOR TO PAINTING MODULE, WELD ALL HORIZONTAL STRUT SECTIONS TO WALLS AS SHOWN. SANDBLAST AND PAINT STRUT WITH MODULE INTERIOR WALLS. SEE SHEET A1 FOR PAINTING SPECIFICATIONS.

NOTE: THIS DRAWING SHOWS WORK THAT WAS PERFORMED BY OTHERS AS PART OF THE FABRICATION OF THE OWNER FURNISHED MODULE STRUCTURE AND IS PROVIDED FOR REFERENCE ONLY. SEE OWNER FURNISHED MODULE SHOP DRAWINGS FOR ADDITIONAL DETAIL.

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

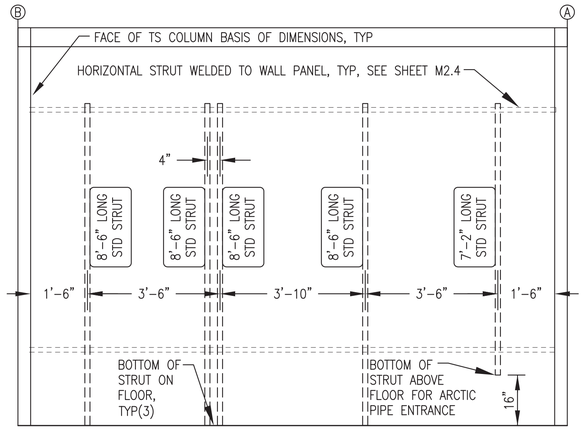
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

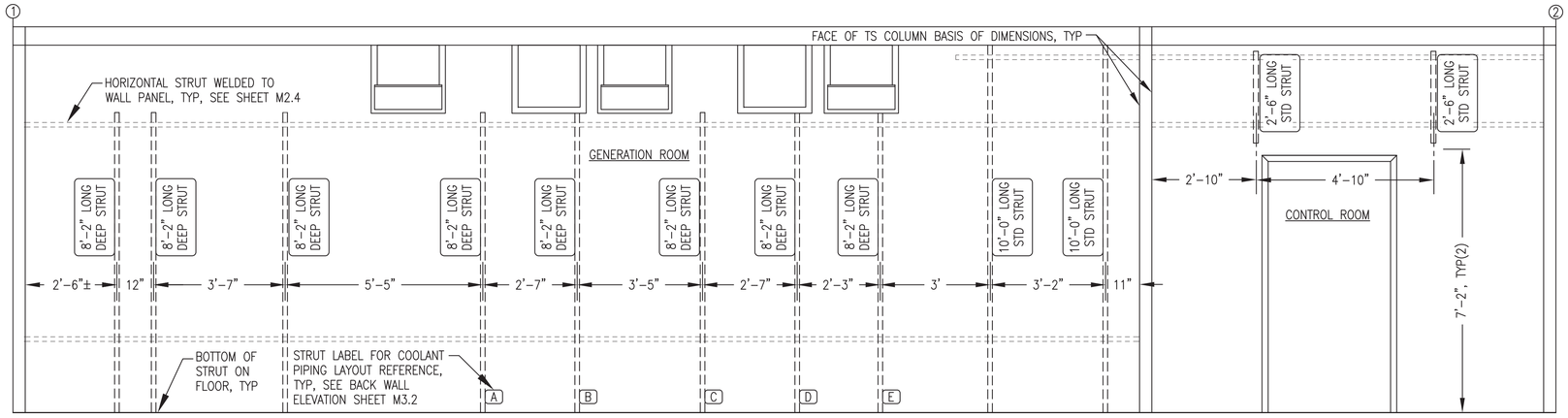
TITLE: MECHANICAL SUPPORT HORIZONTAL
WALL STRUT INSTALLATION

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

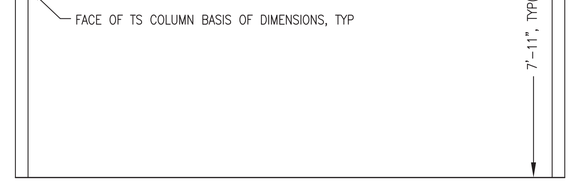
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1-14-19
FILE NAME: PTH PPU M2-7	SHEET: M2.4 OF 7
PROJECT NUMBER:	



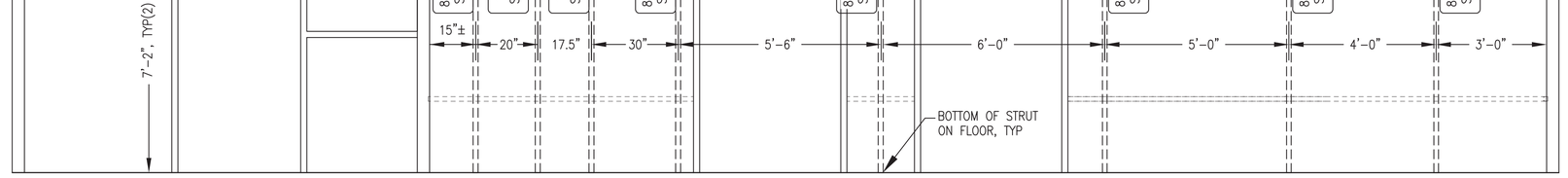
1 M2.5 END WALL (GRID 1) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



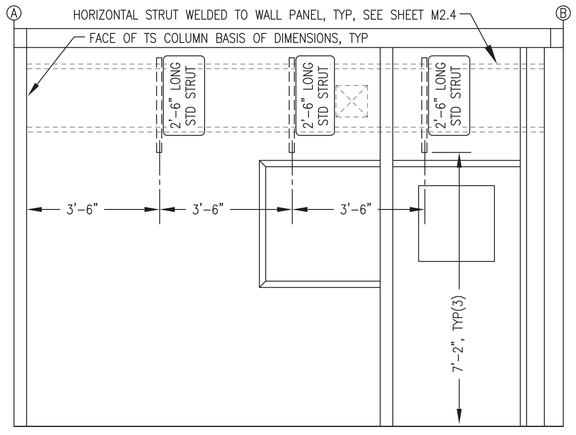
2 M2.5 BACK WALL (GRID A) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



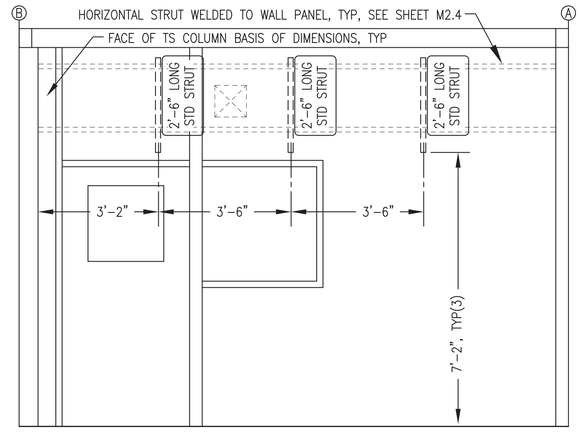
3 M2.5 END WALL (GRID 2) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



4 M2.5 FRONT WALL (GRID B) VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



5 M2.5 GEN BAY RIGHT WALL VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"



6 M2.5 CONTROL ROOM LEFT WALL VERTICAL WALL STRUT LAYOUT
1/2"=1'-0"

VERTICAL WALL STRUT INSTALLATION NOTES:

1) ALL HORIZONTAL LOCATIONS ARE CENTERLINE OF STRUT FROM FACE OF TS COLUMNS. ALL VERTICAL LOCATIONS ARE END OF STRUT ABOVE FINISHED FLOOR.

2) ALL STRUT SHALL BE 12 GAUGE, PRE-GALVANIZED FINISH WITH SLOTTED BACK.
"STD" DESIGNATES STANDARD 1-5/8" x 1-5/8" SINGLE STRUT, B-LINE B22-SH-GALV OR EQUAL.
"DEEP" DESIGNATES 3-1/4" x 1-5/8" SINGLE STRUT, B-LINE B11-SH-GALV OR EQUAL.

3) FASTEN ALL VERTICAL STRUT SECTIONS TO HORIZONTAL STRUT WITH 1/2"x1" ALLEN HEAD CAP SCREWS & STRUT NUTS.

4) ONLY MAJOR WALL MOUNTED EQUIPMENT SUPPORT STRUT SHOWN THIS SHEET. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR OTHER EQUIPMENT, PIPING, AND WIREWAY STRUT SUPPORT DETAILS.

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

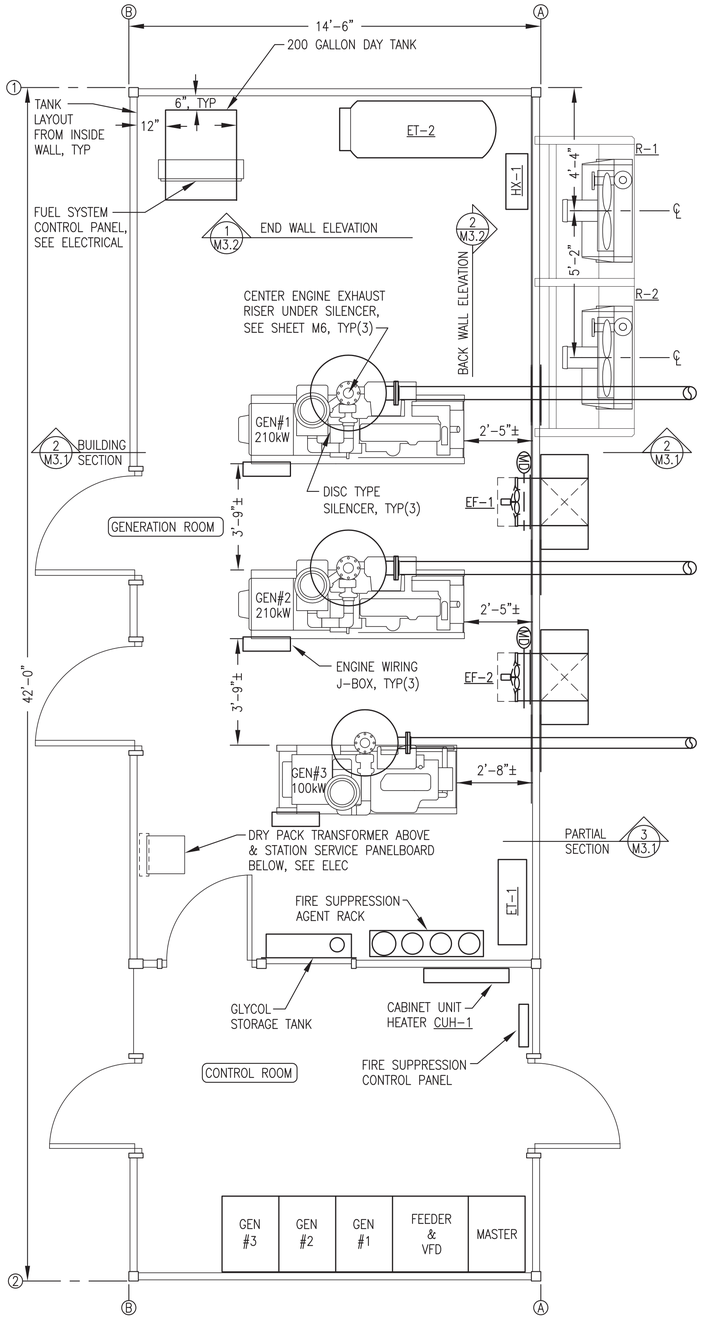
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

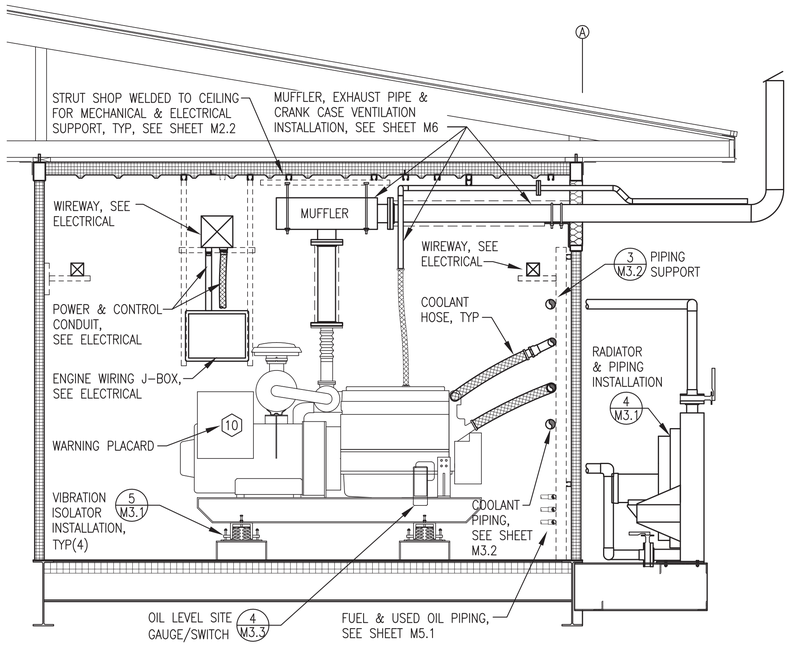
TITLE: MECHANICAL SUPPORT VERTICAL WALL STRUT INSTALLATION

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

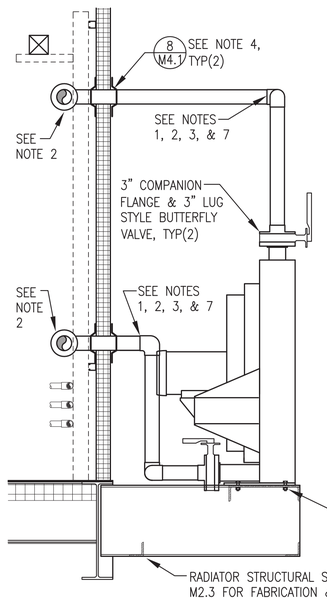
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M2.5 OF 7
PROJECT NUMBER:



1 M3.1 EQUIPMENT LAYOUT PLAN
3/8"=1'-0"



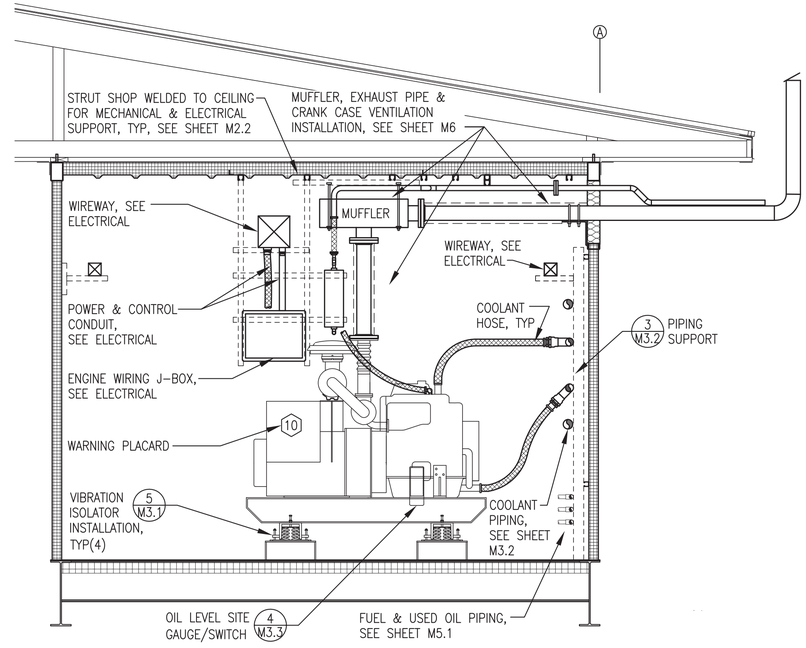
2 M3.1 BUILDING SECTION/GENERATOR #1/#2 INSTALLATION
1/2"=1'-0"



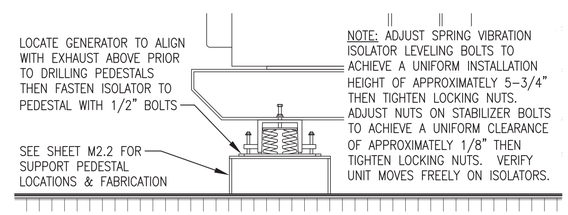
MODULE SHOP/ON-SITE NOTES:

1) DURING SHOP FABRICATION DRY FIT PIPE INTO TEE/EL & USE HOSE FOR TEMPORARY SEAL DURING TESTING.
2) AFTER TESTING REMOVE HOSE & TAKE APART FLANGE AT BUTTERFLY VALVE. REMOVE PIPE & STORE IN MODULE. SEAL WALL PENETRATION FOR SHIPPING.
3) IN FIELD REINSTALL PIPE THROUGH WALL & SOLDER TO EL.
4) IN SHOP HOLE SAW 1"ø OVERSIZE OPENING. AFTER FINAL FIELD ASSEMBLY FLASH & SEAL PENETRATION IN ACCORDANCE WITH DETAIL.
5) DURING SHOP FABRICATION BOLT RADIATOR SUPPORT TO MODULE & RADIATORS TO SUPPORTS.
6) AFTER TESTING REMOVE RADIATOR SUPPORT ASSEMBLY COMPLETE WITH RADIATORS & PIPING MANIFOLD. PACKAGE FOR SHIPPING.
7) IN FIELD BOLT RADIATOR ASSEMBLY TO MODULE, REINSTALL PIPING SECTIONS, & MAKE FINAL SOLDER CONNECTION TO ELS.

4 M3.1 RADIATOR & PIPING INSTALLATION
3/4"=1'-0"



3 M3.1 BUILDING SECTION/GENERATOR #3 INSTALLATION
1/2"=1'-0"



5 M3.1 VIBRATION ISOATOR INSTALLATION
1"=1'-0"

ISSUED FOR CONSTRUCTION JANUARY 2019

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

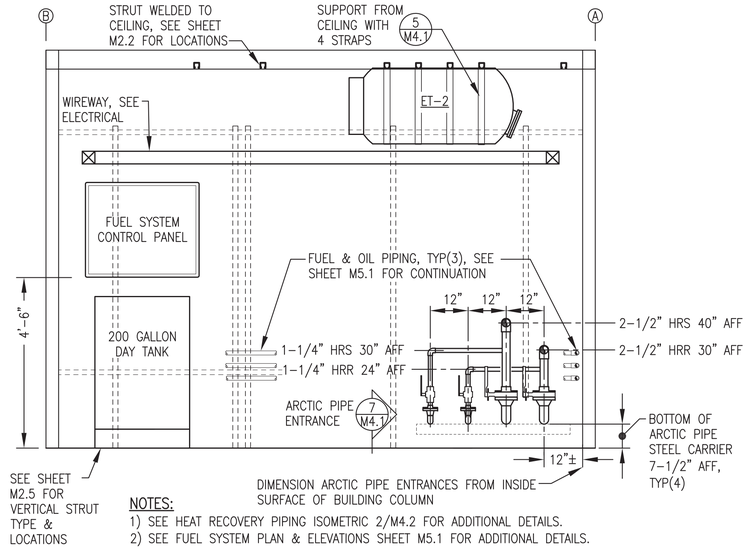
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: EQUIPMENT LAYOUT, PLAN, SECTIONS, & DETAILS

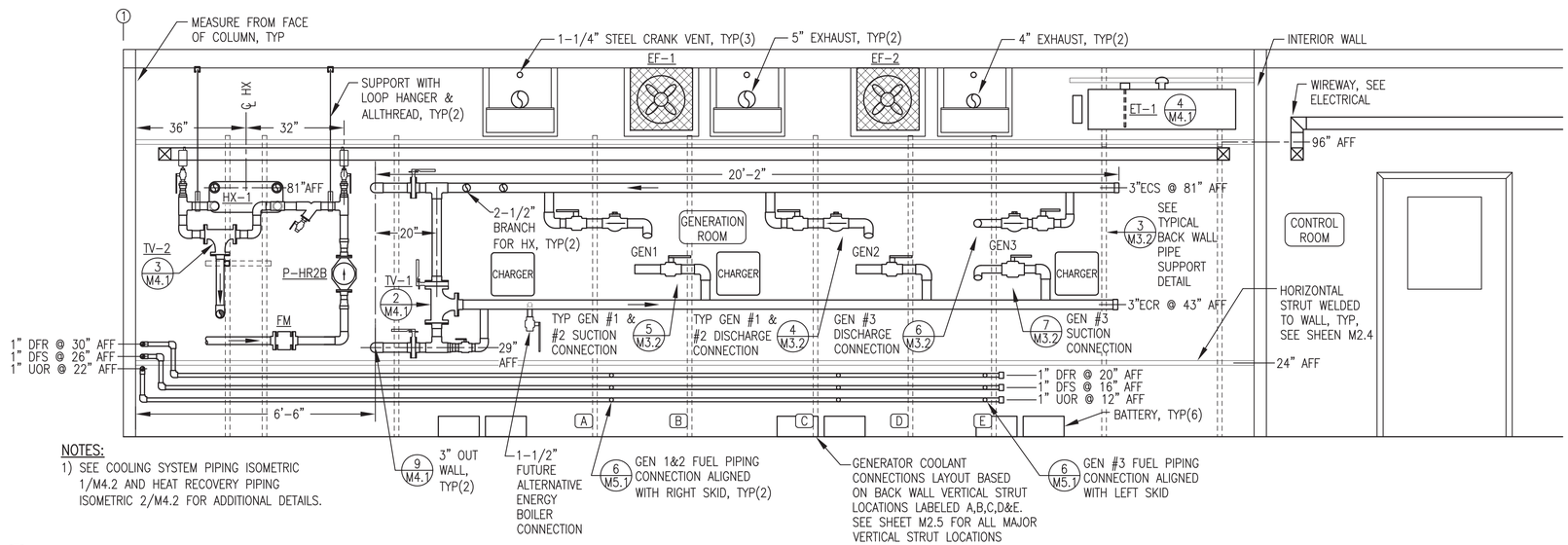
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M3.1 OF 7
PROJECT NUMBER:



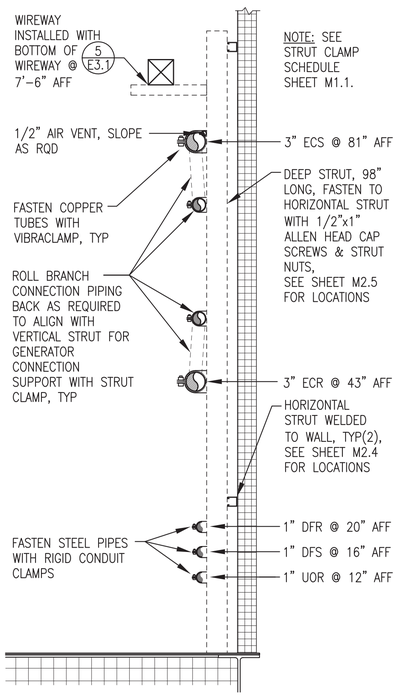
NOTES:
1) SEE HEAT RECOVERY PIPING ISOMETRIC 2/M4.2 FOR ADDITIONAL DETAILS.
2) SEE FUEL SYSTEM PLAN & ELEVATIONS SHEET M5.1 FOR ADDITIONAL DETAILS.

1 M3.2 END WALL ELEVATION
1/2"=1'-0"

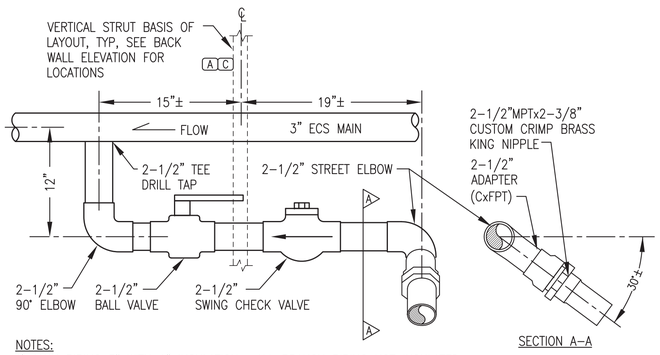


NOTES:
1) SEE COOLING SYSTEM PIPING ISOMETRIC 1/M4.2 AND HEAT RECOVERY PIPING ISOMETRIC 2/M4.2 FOR ADDITIONAL DETAILS.

2 M3.2 BACK WALL ELEVATION
1/2"=1'-0"

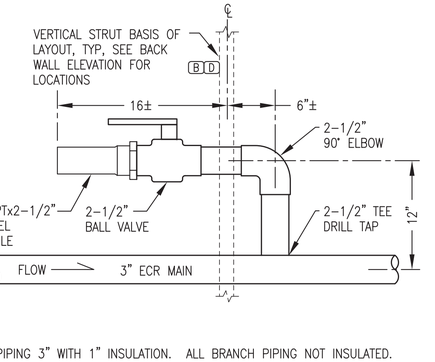


3 M3.2 TYPICAL PIPE SUPPORT AT BACK WALL
1"=1'-0"



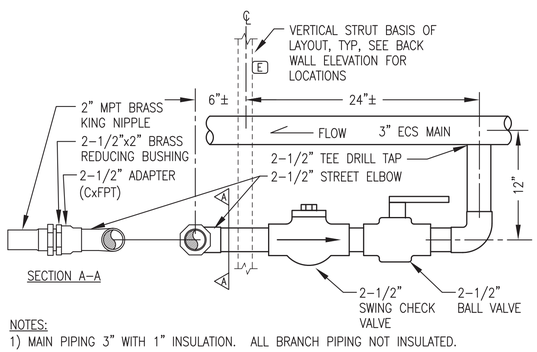
NOTES:
1) MAIN PIPING 3" WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
2) ALL PIPING TYPE L COPPER TUBE. ALL LINE SIZE VALVES SOLDER END.

4 M3.2 GENERATOR #1 & #2 DISCHARGE CONNECTION
NO SCALE



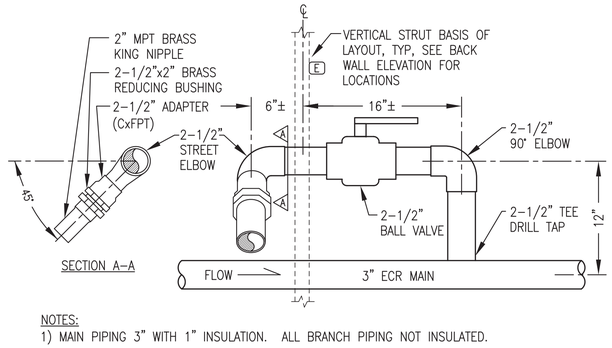
NOTES:
1) MAIN PIPING 3" WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
2) ALL PIPING TYPE L COPPER TUBE. ALL LINE SIZE VALVES SOLDER END.

5 M3.2 GENERATOR #1 & #2 SUCTION CONNECTION
NO SCALE



NOTES:
1) MAIN PIPING 3" WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
2) ALL PIPING TYPE L COPPER TUBE. ALL LINE SIZE VALVES SOLDER END.

6 M3.2 GENERATOR #3 DISCHARGE CONNECTION
NO SCALE



NOTES:
1) MAIN PIPING 3" WITH 1" INSULATION. ALL BRANCH PIPING NOT INSULATED.
2) ALL PIPING TYPE L COPPER TUBE. ALL LINE SIZE VALVES SOLDER END.

7 M3.2 GENERATOR #3 SUCTION CONNECTION
NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

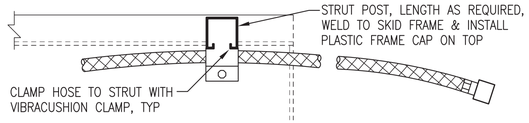
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

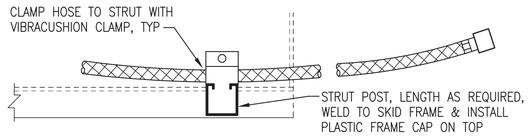
TITLE: WALL ELEVATIONS & PIPING DETAILS

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

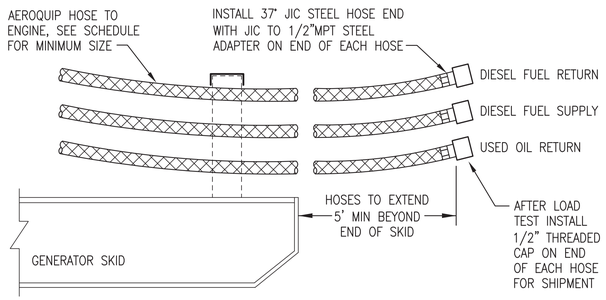
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M3.2 OF 7
PROJECT NUMBER:



GEN #3 (4045) LEFT SKID PLAN (TOP) VIEW



GEN #1 & #2 (6090) RIGHT SKID PLAN (TOP) VIEW

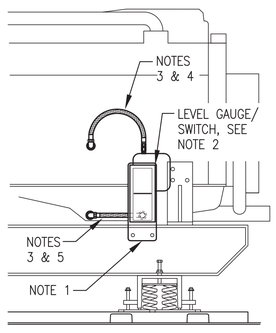


ELEVATION (SIDE) VIEW

MINIMUM HOSE SIZE SCHEDULE		
FUEL SUPPLY	FUEL RETURN	USED OIL
#8	#8	#10

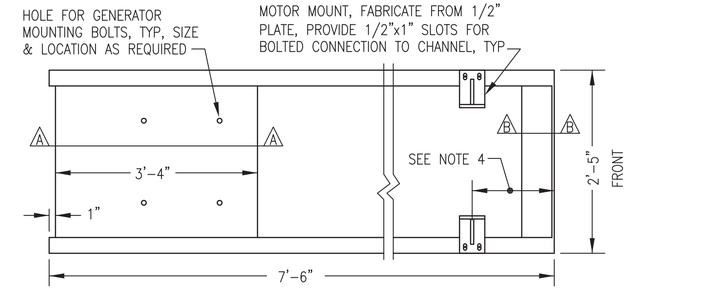
NOTE:
ON 4045 GROUP HOSES ON LEFT SKID AND ON 6090 GROUP HOSES ON RIGHT SKID AS SHOWN TO COORDINATE WITH COOLANT HOSES.

1 M3.3 FUEL & OIL HOSE TERMINATIONS
NO SCALE

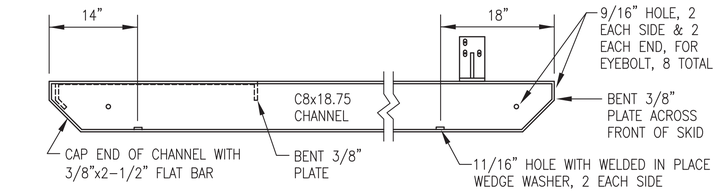


NOTES:
1) 1/4" STEEL SUPPORT PLATE PRE-DRILLED TO MATCH GAUGE/SWITCH MOUNTS, CHANNEL SKID HOLES AND BOTTOM HOSE ENTRANCE. BOLT TO INSIDE (BACK) OF CHANNEL SKID AT HEIGHT AS REQUIRED TO CENTER GAUGE AT NORMAL FULL OIL LEVEL. ADJUST SWITCH CONTACTS 1/2" ABOVE & BELOW.
2) MOUNT OIL LEVEL GAUGE/SWITCH TO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

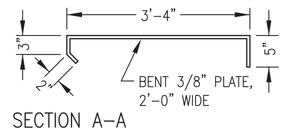
4 M3.3 TYPICAL OIL LEVEL GAUGE/SWITCH INSTALLATION
NO SCALE



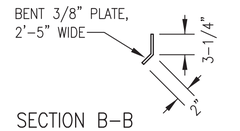
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



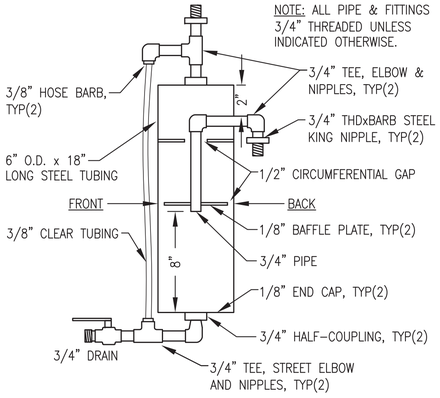
SECTION A-A



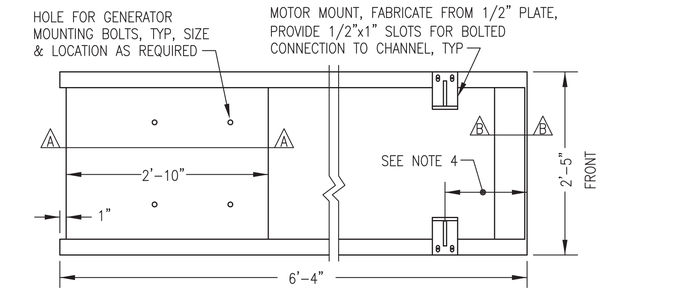
SECTION B-B

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

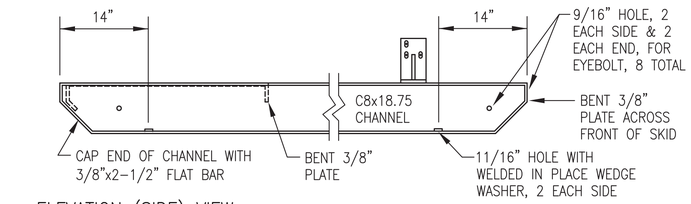
2 M3.3 GENERATOR #1 & #2 (JOHN DEERE 6090AFM75) SKID DESIGN
NO SCALE



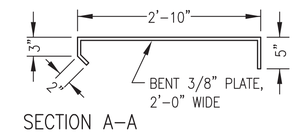
5 M3.3 CONDENSATE TRAP FABRICATION
NO SCALE



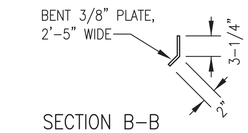
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A-A



SECTION B-B

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

3 M3.3 GENERATOR #3 (JOHN DEERE 4045AFM85) SKID DESIGN
NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: GENERATOR FABRICATION DETAILS

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M3.3 OF 7
PROJECT NUMBER:

GLYCOL TANK SPECIFIC NOTES:

1> 1–1/2" FPT – INSTALL DAY TANK GAUGE G–DT.

2> 2" FPT – INSTALL 2" SCREENED VENT CAP ON 2"x6" NIPPLE.

3> 1" SCHEDULE 80 PIPE WITH THREADED TOP CONNECTION (WITHDRAWAL)

4> 1" SOCKETWELD 90° ELBOW

5> 1" THREADED HAND PUMP ADAPTER FLANGE, TOP OF FLANGE FLUSH WITH TOP OF TANK. INSTALL DAY TANK HAND PUMP HP–DT.

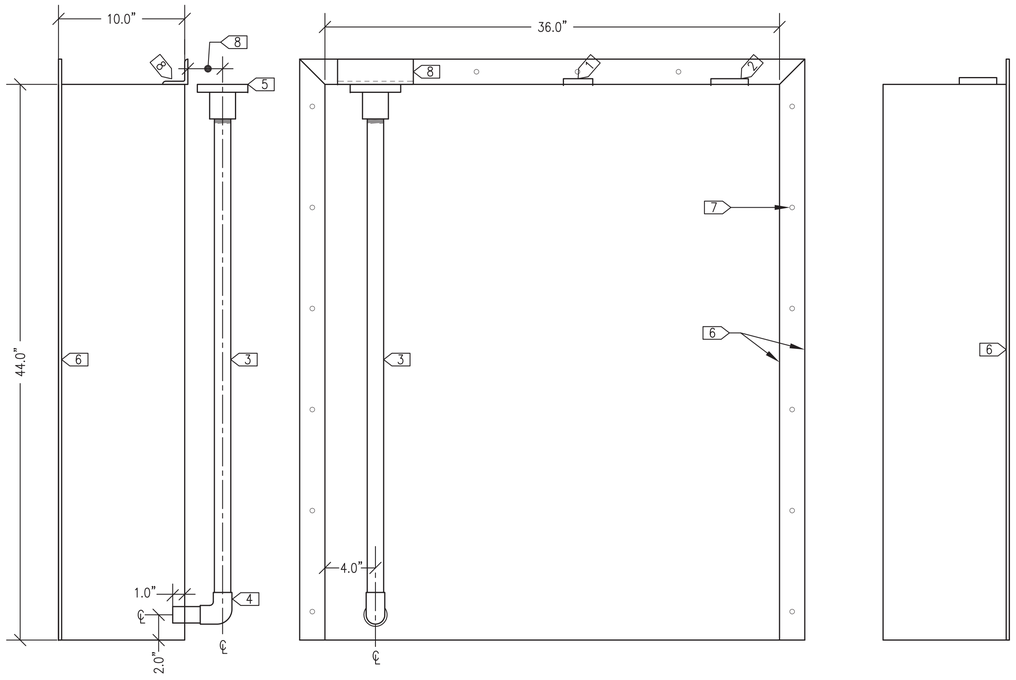
6> 2x1/4" FLAT BAR CONTINUOUS THREE SIDES

7> 3/8" HOLE AT 8" O.C. ALL AROUND

8> L2x2x1/4"x6' LONG. SET FACE TO BOLT TO HAND PUMP.

GLYCOL TANK GENERAL NOTES:

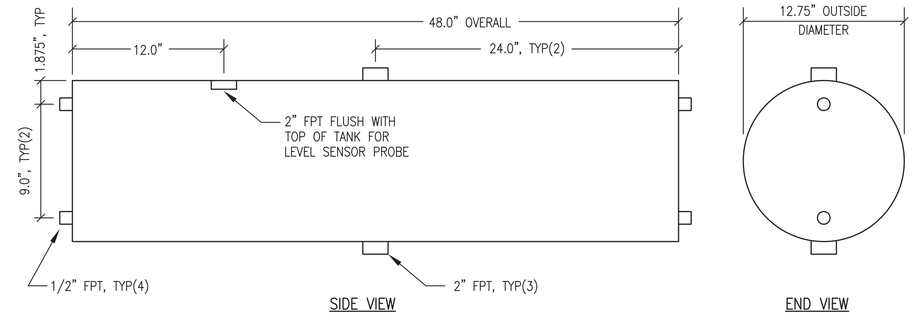
1. FABRICATE SINGLE WALL 60 GALLON NOMINAL CAPACITY GLYCOL TANK.
2. FABRICATE FROM ASTM A–36 STEEL PLATE, 10 GAUGE MINIMUM EXCEPT FOR TOP 3/16" MINIMUM. ALL TANK SEAM JOINTS TO BE FULL CONTINUOUS WELDS.
3. PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. SEAL WELD ALL TANK ATTACHMENTS.
4. ALL FPT OPENINGS TO BE FORGED STEEL HALF COUPLINGS.
5. UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC–SP–6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
6. UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS AND AIR DRY INTERIOR. INSTALL VENT CAP, GAUGE, AND HAND PUMP.



1 / M3.4 60 GALLON GLYCOL STORAGE TANK
1"=6"

EXPANSION TANK GENERAL NOTES:

1) FABRICATE SINGLE WALL 24 GALLON NOMINAL 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. PAINT WITH TWO COATS OF 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 / M3.4 24 GALLON GLYCOL EXPANSION TANK
1"=6"

ISSUED FOR CONSTRUCTION JANUARY 2019

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

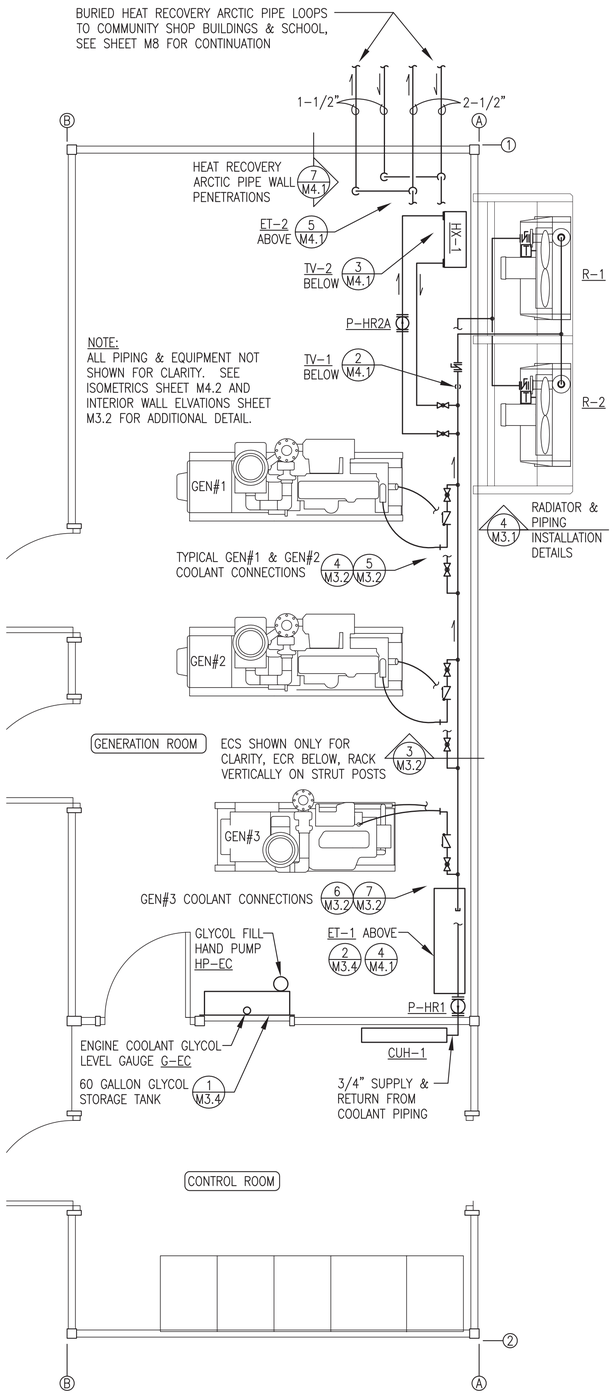
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

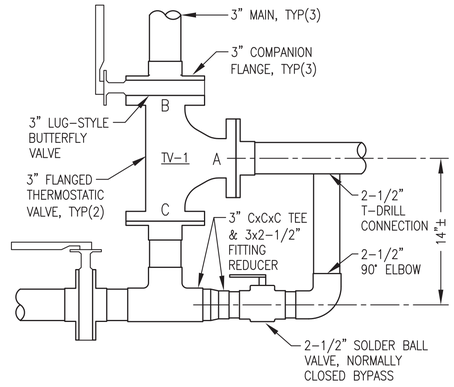
TITLE: GLYCOL STORAGE & EXPANSION TANK FABRICATION

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

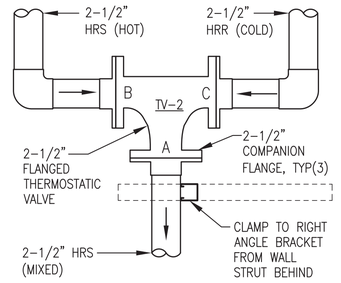
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1–14–19
FILE NAME: PTH PPU M2–7	SHEET: M3.4 OF 7
PROJECT NUMBER:	



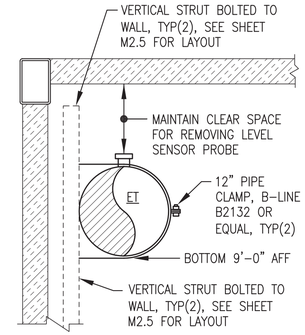
1 M4.1 COOLANT AND HEAT RECOVERY PIPING PLAN
3/8"=1'-0"



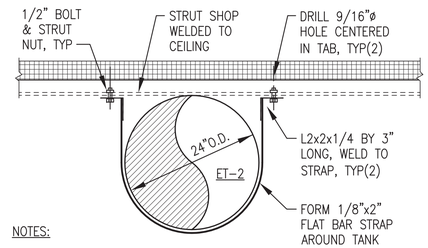
2 M4.1 TV-1 INSTALLATION
NO SCALE



3 M4.1 TV-2 INSTALLATION
NO SCALE

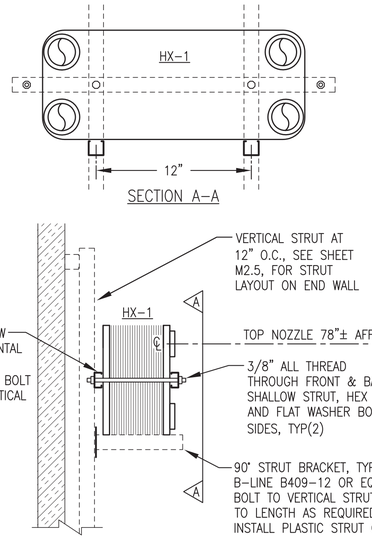


4 M4.1 EXP TANK ET-1 SUPPORT
NO SCALE



NOTES:
1) SMOOTH EDGES AFTER FABRICATION, WIRE BRUSH, SOLVENT CLEAN, AND PAINT WITH TWO COATS OF DIRECT TO METAL ALKYD ENAMEL, SHERWIN WILLIAMS DTM OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.
2) ONE STRAP SHOWN. INSTALL FOUR IDENTICAL STRAPS.

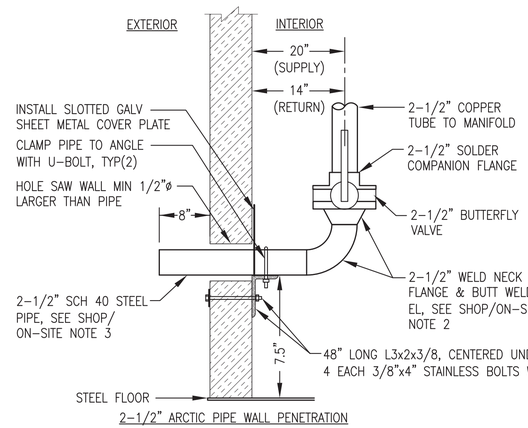
5 M4.1 HEAT RECOVERY EXP TANK ET-2 SUPPORT
NO SCALE

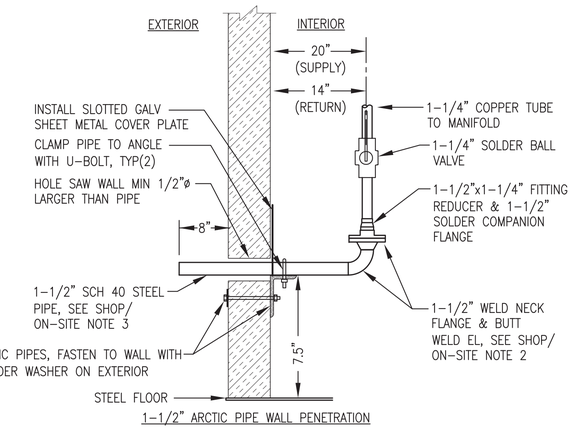


6 M4.1 HEAT EXCHANGER SUPPORT FROM WALL
NO SCALE

ARCTIC PIPE GENERAL NOTES:
1) SEE ELEVATION 3/M3.2 FOR PENETRATION LOCATIONS.
2) ONE PIPE FOR EACH SIZE SHOWN. PROVIDE TWO IDENTICAL FOR EACH SIZE.

ARCTIC PIPE SHOP/ON-SITE NOTES:
1) SHOP INSTALLATION SHOWN. STUB PIPE 8" MIN BEYOND WALL & TEMPORARILY CONNECT SUPPLY TO RETURN FOR TESTING.
2) AFTER TESTING REMOVE TEMPORARY CONNECTION, BREAK FLANGE JOINT, AND STORE PIPE IN MODULE. PLUG WALL PENETRATION FOR SHIPPING.
3) AS PART OF ON-SITE INSTALLATION REINSTALL PIPE THROUGH WALL AND CONNECT TO ARCTIC PIPE, SEE SHEET M8.

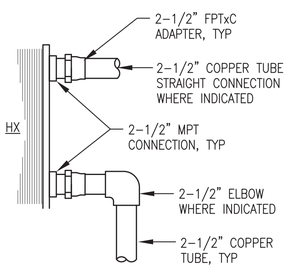




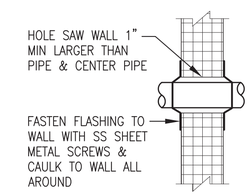
7 M4.1 HEAT RECOVERY ARCTIC PIPE WALL PENETRATIONS
NO SCALE

SHOP/ON-SITE NOTES:
1) FLASH OPENINGS AS PART OF ON-SITE WORK.

GENERAL NOTES:
1) THIS DETAIL APPLIES TO ALL PIPE & CONDUIT 2" & LARGER EXCEPT ARCTIC PIPE.
2) FLASH ALL OPENINGS TO EXTERIOR WALL. WHERE ACCESSIBLE ON INTERIOR, INSTALL FLASHING OR CAULK ALL AROUND.

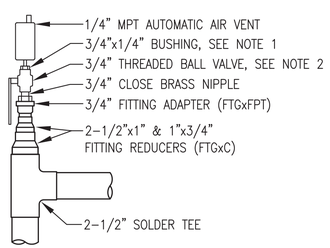


8 M4.1 HX PIPING CONNECTION
NO SCALE



9 M4.1 TYP WALL PENETRATION
NO SCALE

NOTES:
1) ON INITIAL STARTUP INSTALL HOSE ADAPTER IN PLACE OF BUSHING & USE HOSE TO FLUSH & BLEED.
2) AFTER BLEEDING SYSTEM OF AIR INSTALL BUSHING & AIR VENT & CLOSE BALL VALVE.



10 M4.1 TYPICAL AIR VENT INSTALLATION
NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

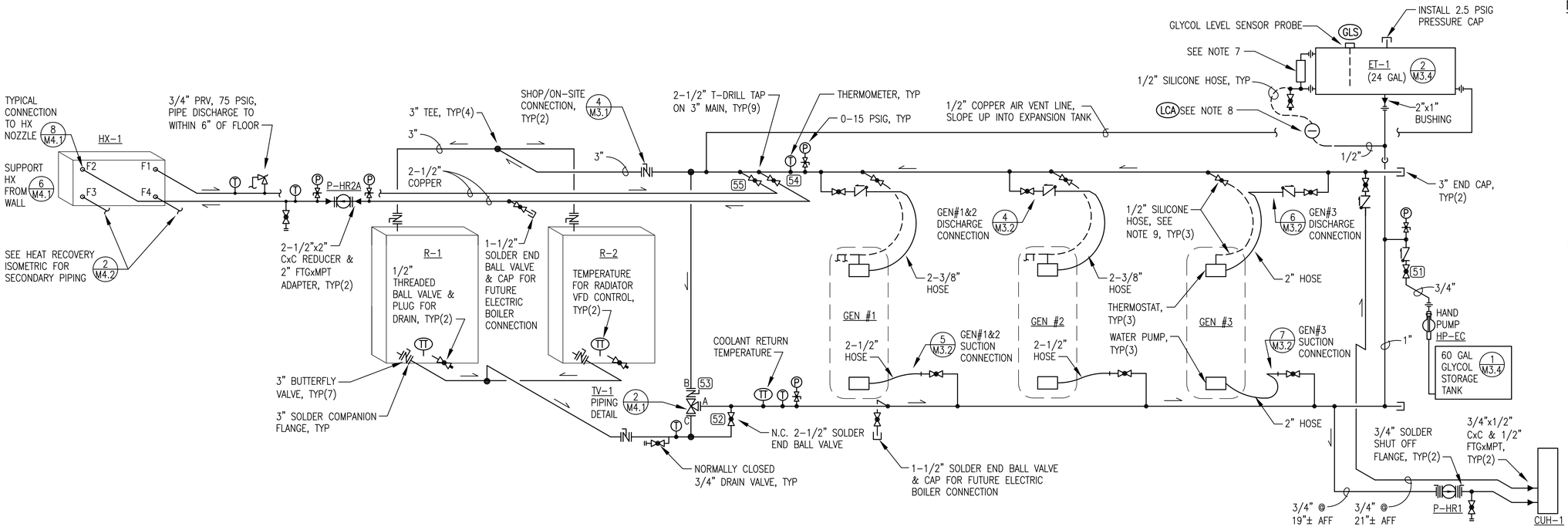
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: COOLANT & HEAT RECOVERY PIPING PLAN & DETAILS

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1-14-19
FILE NAME: PTH PPU M2-7	SHEET: M4.1 OF 7
PROJECT NUMBER:	

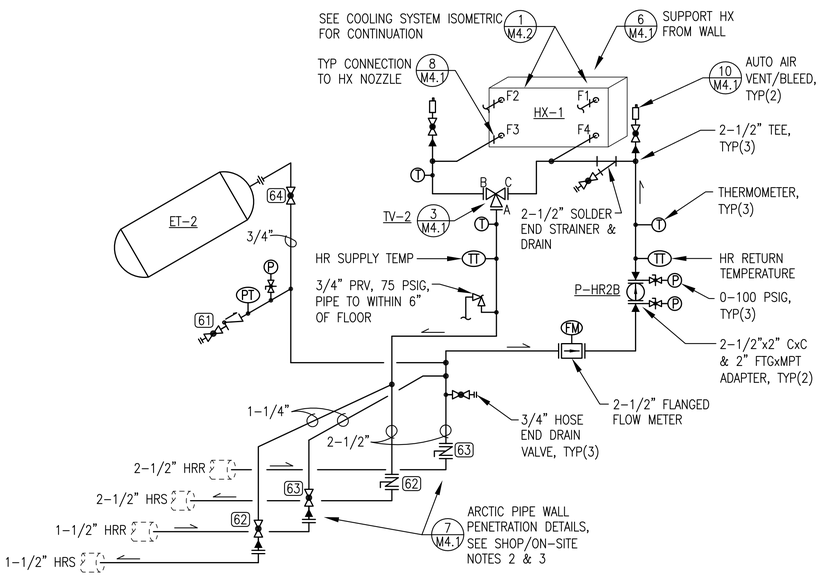


1 M4.2 COOLING SYSTEM PIPING ISOMETRIC

NO SCALE

NOTES:

1) ALL PIPING SHOWN THIS ISOMETRIC TYPE "L" COPPER WITH SOLDER JOINTS, 3"ø EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. ALL FLANGES ANSI 150# PATTERN BRONZE COMPANION WITH SOLDER ENDS.
2) MAKE ALL CONNECTIONS FOR INSTRUMENTATION WITH T-DRILL TAP, SEE DETAIL 3/M4.2. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS WITH T-DRILL TAP OR TEE AS REQUIRED.
3) ALL COOLANT PRESSURE GAUGES 0-15 PSIG. ALL THERMOMETERS FAHRENHEIT RANGE.
4) SEE ELECTRICAL INSTRUMENTATION SCHEDULE FOR TEMPERATURE TRANSMITTERS AND OTHER INSTRUMENTATION.
5) UPON COMPLETION OF FABRICATION VALVE OFF CABINET UNIT HEATER AND FLUSH PIPING TO REMOVE ALL DEBRIS, SEE SPECIFICATIONS.
6) INSULATE COOLANT PIPING MAINS FROM GENERATOR VALVES TO RADIATORS. ALL OTHER PIPING NOT INSULATED.
7) INSTALL 9" LONG COOLANT SITE GAUGE ON 1/2" TEES, INSTALL 1/2" THREADED BALL VALVE WITH PLUG FOR DRAIN.
8) LOW COOLANT ALARM SWITCH, MOUNT WITH SWITCH POINT LEVEL WITHIN 12" OF TANK BOTTOM. CONNECT TO HOSE WITH NPTx5/8" BARB, 1/2" ON BOTTOM, 1/4" ON TOP.
9) 3/4" THREADED BALL VALVE, 3/4"MPTx5/8" BARB BRASS KING NIPPLE, & 1/2" HOSE FOR ENGINE VENT & PRE-HEAT.
10) SET P-HR1 & P-HR2A TO OPERATE ON SPEED 3.

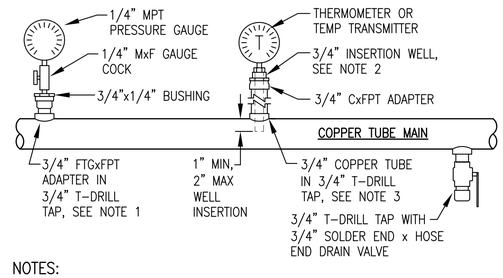


2 M4.2 HEAT RECOVERY SYSTEM PIPING ISOMETRIC

NO SCALE

NOTES:

1) ALL PIPING SHOWN THIS ISOMETRIC 2-1/2" TYPE L HARD DRAWN COPPER UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL FLANGES ANSI 150# PATTERN BRONZE COMPANION WITH SOLDER ENDS.
2) UNLESS SPECIFIED OTHERWISE MAKE ALL CONNECTIONS FOR INSTRUMENTATION WITH T-DRILL TAP, SEE DETAIL 3/M4.2. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS WITH T-DRILL TAP AS REQUIRED UNLESS INDICATED OTHERWISE.
3) ALL HEAT RECOVERY PRESSURE GAUGES 0-100 PSIG. ALL THERMOMETERS FAHRENHEIT RANGE.
4) SEE ELECTRICAL INSTRUMENTATION SCHEDULE FOR TEMPERATURE AND PRESSURE TRANSMITTERS AND FLOW METER.
5) UPON COMPLETION OF FABRICATION FLUSH PIPING TO REMOVE ALL DEBRIS, SEE SPECIFICATIONS.
6) INSULATE HEAT RECOVERY PIPING MAINS.
7) SET P-HR2B TO OPERATE ON SPEED 3.



NOTES:

1) USE T-DRILL TAPS AS SHOWN FOR 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 TRANSMITTER INSTALLATION SIMILAR TO THERMOMETER EXCEPT USE 3/4"x1/2" BUSHING.
3) FOR MAINS SMALLER THAN 2" USE COPPER TUBE RISER AS SHOWN, LENGTH AS REQUIRED FOR 1" TO 2" WELL INSERTION INTO MAIN. FOR LARGER PIPES OMIT RISER AND INSERT 3/4" FTGxFPT ADAPTER INTO T-DRILL TAP.

3 M4.2 TYPICAL INSTRUMENT INSTALLATION

NO SCALE

HYDRONIC PIPING SHOP/ON-SITE NOTES:

1) SEE SPECIFICATION 23 21 13 FOR COOLING AND HEAT RECOVERY PIPING TESTING, FLUSHING, DRAINING, AND FILLING REQUIREMENTS.
2) SEE DETAILS 4/M3.1 AND 7/M4.1 FOR SPECIFIC REQUIREMENTS FOR PIPING THROUGH THE EXTERIOR WALLS.
3) ARCTIC PIPE TO BE INSTALLED AS PART OF THE ON-SITE WORK.

ISSUED FOR CONSTRUCTION JANUARY 2019

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

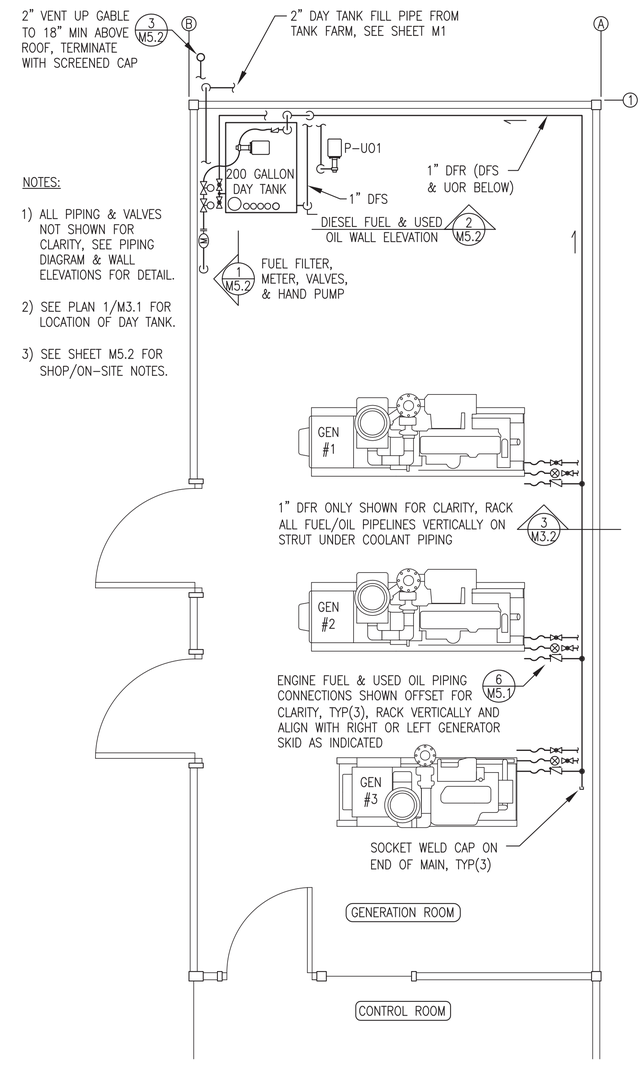
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

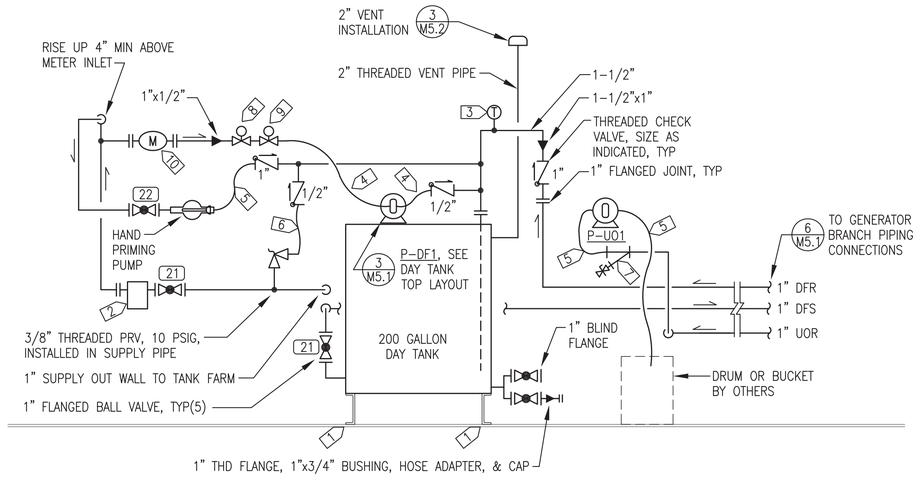
TITLE: COOLANT & HEAT RECOVERY ISOMETRICS AND DETAILS

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M4.2 OF 7
PROJECT NUMBER:



1 M5.1 DIESEL FUEL SYSTEM & USED OIL PIPING PLAN
3/8"=1'



2 M5.1 DIESEL FUEL & USED OIL PIPING DIAGRAM
NO SCALE

PIPING DIAGRAM GENERAL NOTES:

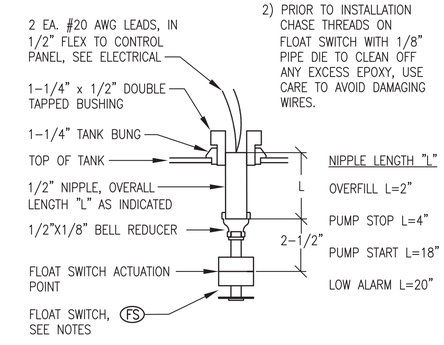
1) FABRICATE DAY TANK, FILTER BANK, & HOPPER IN ACCORDANCE WITH FABRICATION PLANS AND DETAILS.
2) ALL DAY TANK SUPPLY & RETURN PIPING 1" SCH 80 EXCEPT WHERE INDICATED AS 1-1/2". ALL VENT PIPING 2" SCH 40.
3) ALL PIPING JOINTS SOCKET OR BUTT WELD EXCEPT FOR THREADED VENT & CONNECTIONS TO EQUIPMENT & VALVES.
4) ON ALL HOSES INSTALL JICxNPT SWIVEL ENDS, SIZE REQUIRED TO MATCH PIPING OR PUMPS.

PIPING DIAGRAM SPECIFIC NOTES:

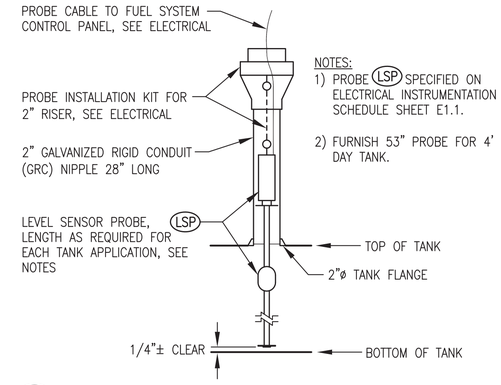
1. FASTEN DEVICE TO FLOOR WITH MIN 1"x3/16" FILLET WELD ALL 4 CORNERS, WIRE BRUSH AND RE-PAINT WELD AREA TO MATCH EXISTING.
2. 1" ANSI 150# FLANGED FILTER F-DT, REMOVE DRAIN VALVE & INSTALL 1/8"MxF DRAIN COCK.
3. THERMOMETER, INSTALL WELL IN 3/4" THREAD-O-LET.
4. #10 HOSE WITH 1/2" OR 3/4" NPT ENDS.
5. #12 HOSE WITH 1/2", 3/4", OR 1" NPT ENDS.
6. #6 HOSE WITH 1/8", 1/4", OR 3/8" NPT ENDS.
7. 1" THREADED STRAINER IN 1" UOR WITH GAUGE COCK BLOW DOWN.
8. 1/2" NO SOLENOID VALVE.
9. 1/2" NC SOLENOID VALVE.
10. METER M-DT, EQUIPPED WITH 300# FLANGED ENDS, PROVIDE 1" ANSI 300# FLANGES & GASKETS, SOCKET WELD ON INLET & THREADED ON OUTLET.

3 M5.1 TOP OF DAY TANK – PLAN VIEW
NO SCALE

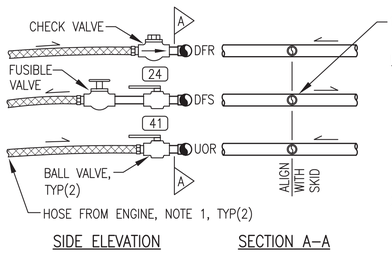
NOTES:
1) FLOAT SWITCH (FS) SPECIFIED ON ELECTRICAL INSTRUMENTATION SCHEDULE SHEET E1.1.
2) PRIOR TO INSTALLATION CHASE THREADS ON FLOAT SWITCH WITH 1/8" PIPE DIE TO CLEAN OFF ANY EXCESS EPOXY, USE CARE TO AVOID DAMAGING WIRES.



4 M5.1 DAY TANK FLOAT SWITCH INSTALLATION
NO SCALE



5 M5.1 TYPICAL LEVEL SENSOR PROBE INSTALLATION
NO SCALE



NOTES:
1) HOSES PROVIDED WITH ENGINE, SIZE VARIES PER ENGINE & PRODUCT. ALL EQUIPPED WITH JIC SWIVELS & 1/2" MPT ADAPTERS. CUT TO LENGTH & RE-INSTALL ENDS.
2) ALL PIPING & NIPPLES SCH 80. ALL VALVES 1/2" SIZE, THREADED BODY.

6 M5.1 ENGINE FUEL PIPING CONNECTION
NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

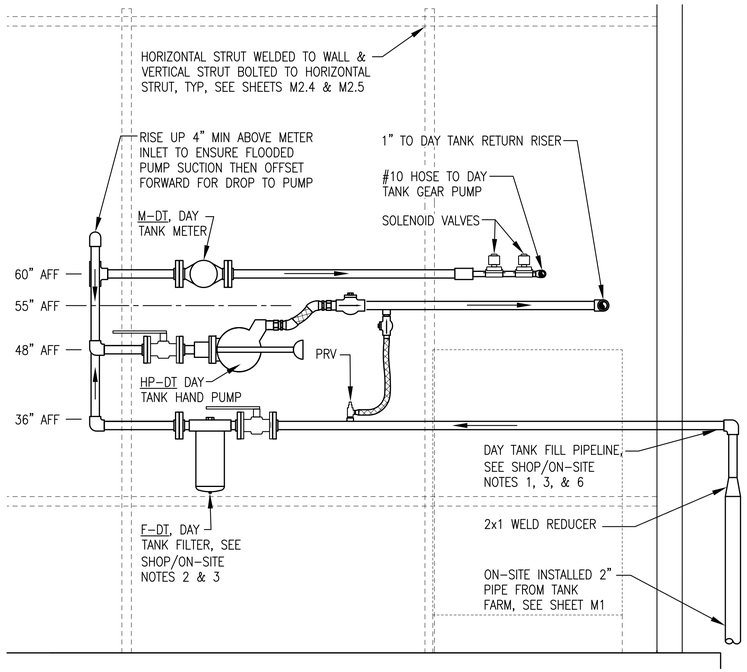
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: DIESEL FUEL & USED OIL PIPING PLAN, DIAGRAM, & DETAILS

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

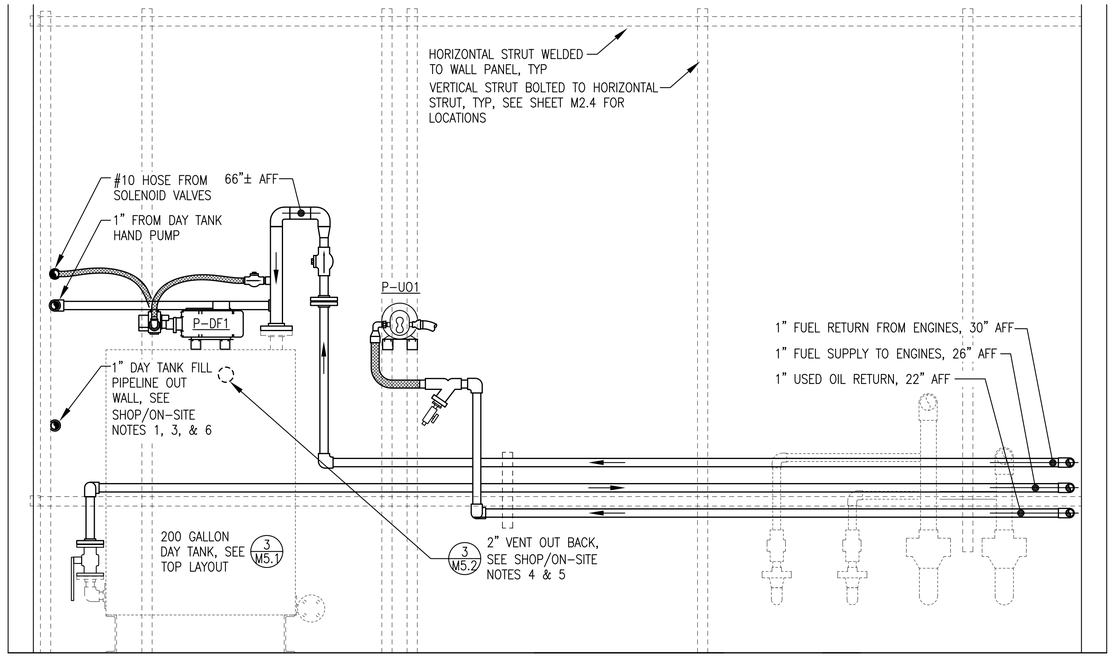
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M5.1 OF 7
PROJECT NUMBER:



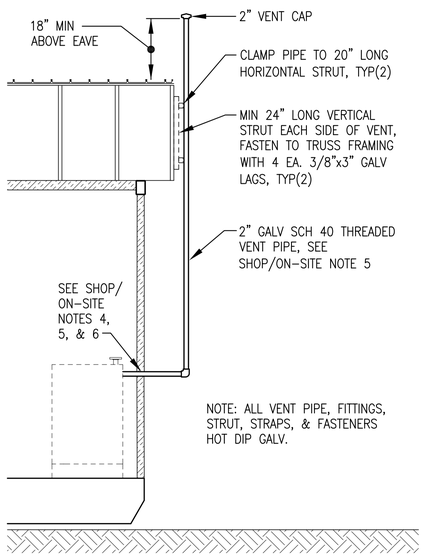
1 M5.1 DIESEL FUEL FRONT WALL ELEVATION
1"=1'

MODULE SHOP/ON-SITE NOTES:

1. DURING SHOP FABRICATION STUB DAY TANK FILL PIPE 8" MIN BEYOND WALL & TERMINATE WITH 1" MALE THREAD FOR TESTING.
2. UPON COMPLETION OF TESTING, DRAIN & REMOVE FILTER & STORE IN MODULE. SLIDE PIPE OVER & SECURE FOR SHIPPING.
3. AS PART OF ON-SITE INSTALLATION REINSTALL FILTER THEN CUT THREADS OFF END OF EXTERIOR PIPE & INSTALL SOCKET WELD ELBOW.
4. DURING SHOP FABRICATION INSTALL TEMPORARY VENT PIPE OUT WALL. REMOVE TEMP PIPE FOR SHIPPING.
5. AS PART OF ON-SITE INSTALLATION INSTALL 2" GALVANIZED THREADED VENT PIPE OUT WALL & UP TO VENT, SEE DETAIL 3/M5.2.
6. DURING SHOP FABRICATION HOLE SAW 1/2"ø OVERSIZE OPENING THEN SEAL FOR SHIPPING AFTER REMOVING PIPE. UPON FINAL ON-SITE ASSEMBLY SEAL 1" PIPE TO EXTERIOR WALL WITH POLYURETHANE CAULKING & INSTALL FLASHING ON 2" VENT, SEE DETAIL 9/M4.1.



2 M5.2 DIESEL FUEL & USED OIL END WALL ELEVATION
1"=1'



3 M5.2 DAY TANK VENT INSTALLATION
3/8"=1'-0"

ISSUED FOR CONSTRUCTION JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: DIESEL FUEL & USED OIL PIPING ELEVATIONS & DETAILS

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M5.2 OF 7
PROJECT NUMBER:

DAY TANK SPECIFICATIONS:

1) FABRICATE SINGLE WALL 200 GALLON NOMINAL CAPACITY DAY TANK. FABRICATE IN ACCORDANCE WITH UL 142.

2) FABRICATE FROM ASTM A-36 STEEL PLATE, 10 GAUGE MINIMUM EXCEPT FOR TOP 3/16" MINIMUM. ALL TANK SEAM JOINTS TO BE FULL CONTINUOUS WELDS IN ACCORDANCE WITH UL 142 FIGURE 6.5 – #1, #6, #7, OR #8.

3) PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. ALL STRUT TO BE 1-5/8"x1-5/8"x12 GA SOLID BACK PLAIN (BLACK), B-LINE B22 PLN OR EQUAL. SEAL WELD ALL TANK ATTACHMENTS.

4) INSTALL ALL FPT OPENINGS IN ACCORDANCE WITH UL 142 FIGURE 7.1 – #4 UNLESS INDICATED OTHERWISE. ALL DROP TUBES SCH 40 ASTM A53 STEEL PIPE WITH MPT OR FLANGED END AS INDICATED.

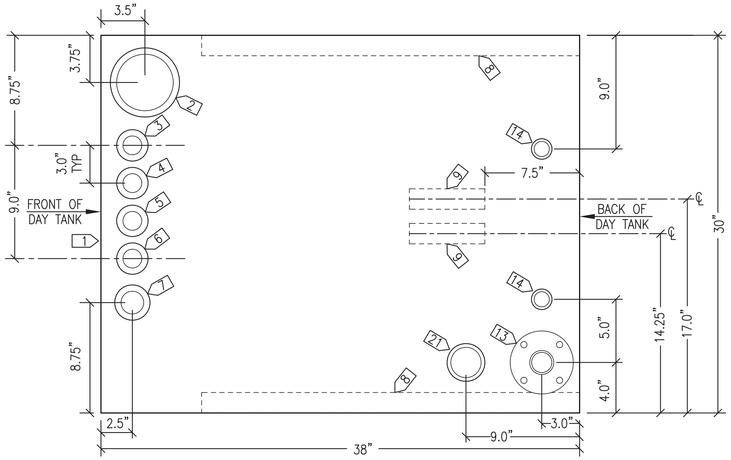
5) UPON COMPLETION OF FABRICATION, ROUND ALL CORNERS AND SHARP EDGES. SANDBLAST TANK EXTERIOR AND ALL ATTACHMENTS IN ACCORDANCE WITH SSPC-SP-6. PAINT WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646 OR APPROVED EQUAL, COLOR STRUCTURAL GRAY 4031.

6) LABEL ALL OPENINGS WITH 1/4" BLACK LETTERS INDICATING FUNCTION AS LISTED IN PARENTHESES IN SPECIFIC NOTES.

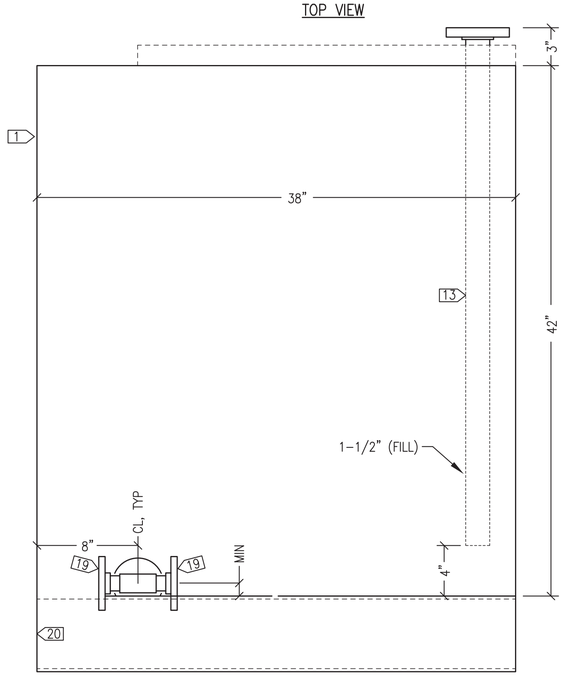
7) UPON COMPLETION FLUSH INTERIOR OF TANK TO REMOVE ALL DIRT AND DEBRIS AND AIR DRY INTERIOR. SEAL ALL MPT OPENINGS WITH THREADED STEEL CAPS. SEAL FPT TANK OPENINGS WITH THREADED STEEL PIPE PLUGS WHERE INDICATED. INSTALL 1-1/4" VENT CAP WHERE INDICATED. SEAL ALL OTHER FPT OPENINGS WITH PLASTIC OR STEEL PLUGS.

DAY TANK SPECIFIC NOTES:

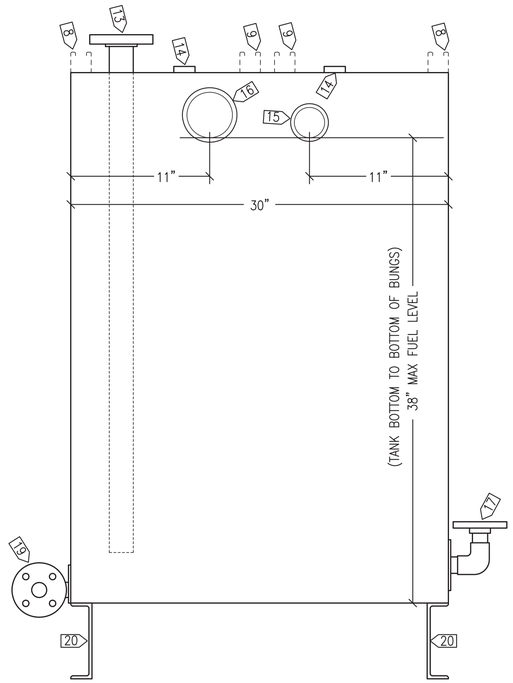
1. PROVIDE 2" HIGH LETTERING: "DIESEL FUEL 200 GALLONS"
2. 4" FPT (MANUAL FILL) – INSTALL THREADED STEEL PLUG
3. 1-1/4" FPT (OVERFILL) – INSTALL VENT CAP FOR SHIPPING
4. 1-1/4" FPT (PUMP STOP)
5. 1-1/4" FPT (PUMP START)
6. 1-1/4" FPT (LOW ALARM)
7. 1-1/2" FPT (TANK GAUGE)
8. 30"L STRUT, END FLUSH WITH BACK OF TANK
9. 6"L STRUT
10. NOT USED
11. NOT USED
12. NOT USED
13. 1-1/2" SCH 40 DROP TUBE (FILL) WITH 150# FLANGE
14. 1" FPT (SPARE) – INSTALL THREADED STEEL PLUG
15. 2" FPT (VENT)
16. 3" FPT (EMERGENCY VENT) – INSTALL THREADED STEEL PLUG
17. 1" FLANGE (SUPPLY) – SEE DETAIL 2/M5.3
18. NOT USED
19. 1" FLANGE (DRAIN) – SEE DETAIL 3/M5.3
20. C6x8.2, 38" LONG
21. 2" FPT (TANK LEVEL PROBE)



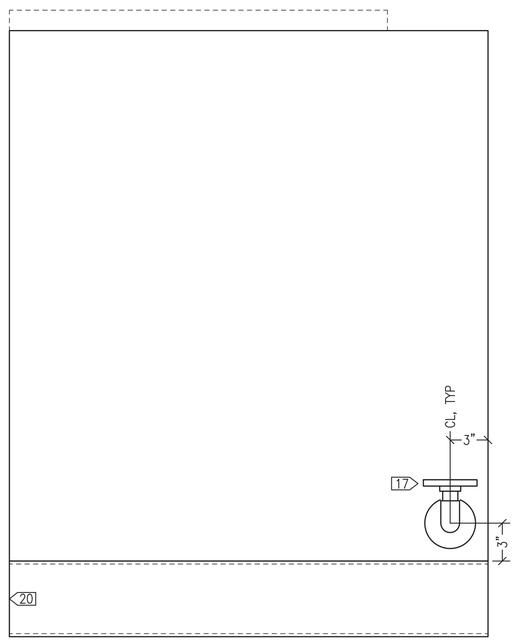
TOP VIEW



RIGHT SIDE VIEW

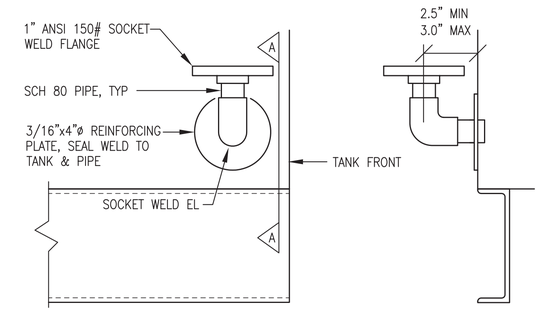


BACK VIEW



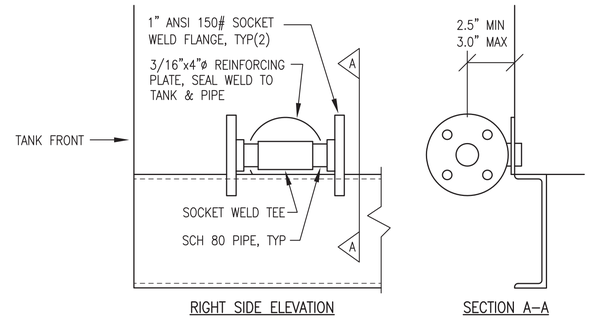
LEFT SIDE VIEW

1 M5.3 200 GALLON SINGLE WALL DAY TANK
1"=6"



LEFT SIDE ELEVATION SECTION A-A

2 M5.3 1" FLANGED SUPPLY CONNECTION
NO SCALE



RIGHT SIDE ELEVATION SECTION A-A

3 M5.3 1" FLANGED DRAIN CONNECTION
NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: 200 GALLON DAY TANK FABRICATION

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

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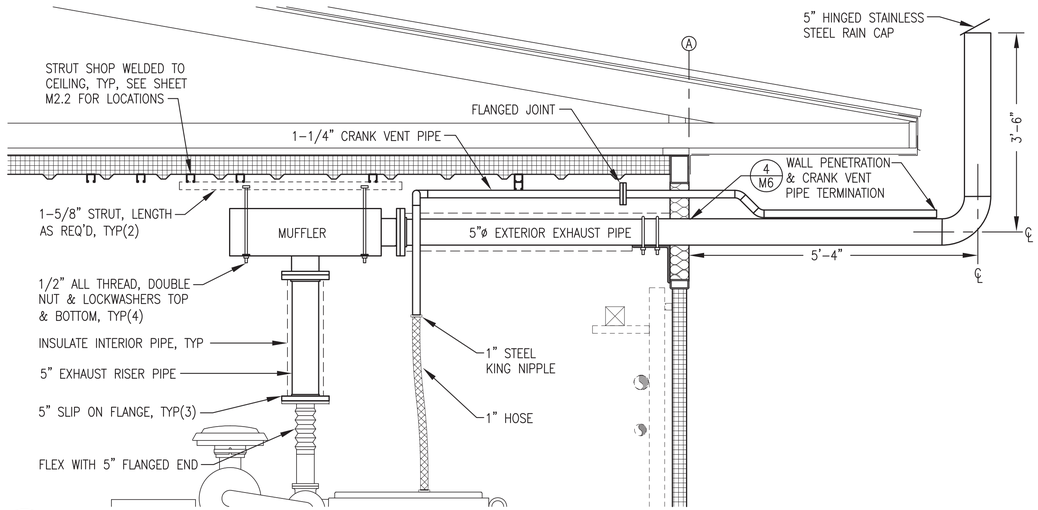
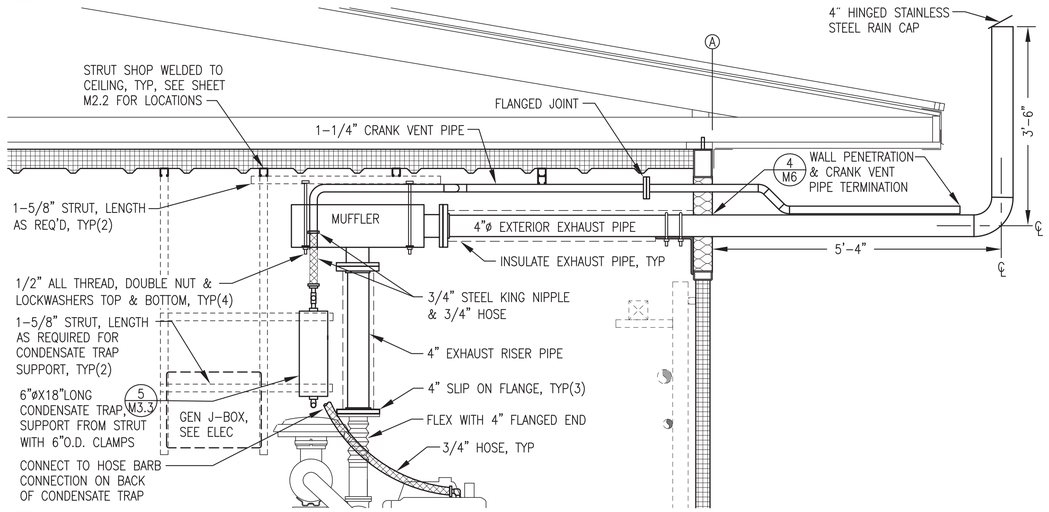
FILE NAME: PTH PPU M2-7	SHEET: M5.3 OF 7
PROJECT NUMBER:	



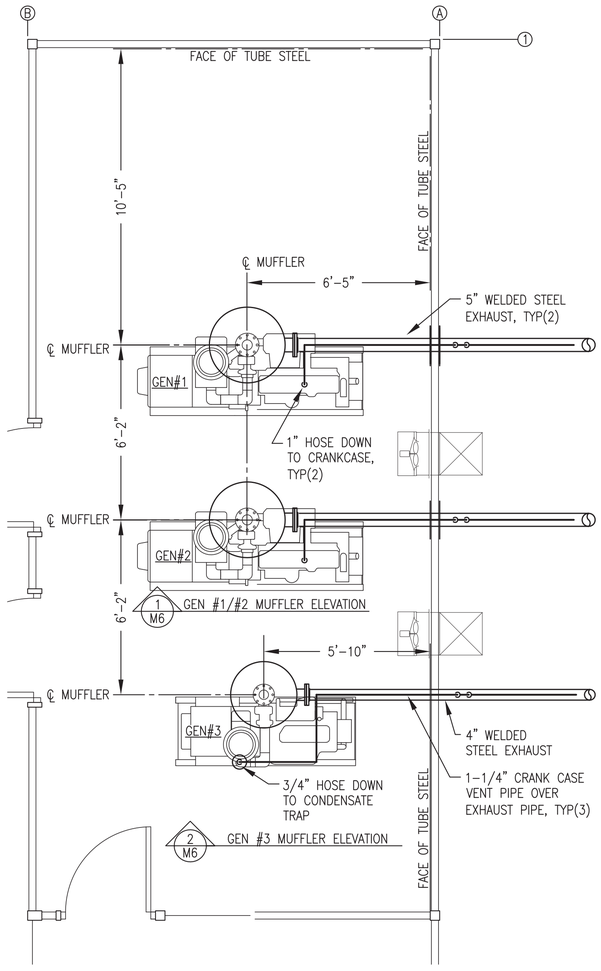
1 M6 GEN #1/#2 MUFFLER, EXHAUST & CRANK VENT PIPE INSTALLATION

3/4"=1'-0"



2 M6 GEN #3 MUFFLER, EXHAUST, CONDENSATE TRAP & CRANK VENT PIPE INSTALLATION

3/4"=1'-0"



3 M6 MUFFLER, EXHAUST & CRANK VENT PIPE PLAN

3/8"=1'-0"

EXHAUST & CRANK VENT GENERAL NOTES:

1) ALL EXTERIOR EXHAUST PIPE AND FITTINGS (FROM MUFFLER TO RAIN CAP) TYPE 304L STAINLESS STEEL WITH BUTT WELD FITTINGS. INTERIOR EXHAUST PIPE RISER (FROM FLEX TO MUFFLER) CARBON STEEL OR MAY BE STAINLESS AT CONTRACTORS OPTION. ALL FLANGES ANSI 150# FLAT FACED SLIP ON.

2) ALL EXTERIOR CRANK VENT PIPE AND FITTINGS TYPE 304L STAINLESS STEEL WITH BUTT WELD FITTINGS. ALL INTERIOR CRANK VENT PIPE AND FITTINGS CARBON STEEL WITH SOCKET WELD FITTINGS OR MAY BE STAINLESS AT CONTRACTORS OPTION. ALL FLANGES ANSI 150# FLAT FACED SOCKET WELD.

3) ALL EXHAUST FLANGE BOLTS BLACK OR STAINLESS STEEL. COAT WITH HIGH TEMPERATURE ANTI-SIEZE.

EXHAUST & CRANK VENT SHOP/ON-SITE NOTES:

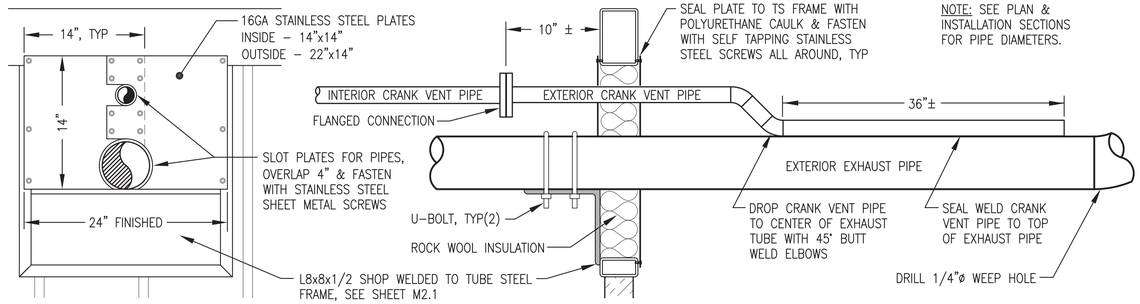
1) SHOP FABRICATE COMPLETE EXHAUST AND CRANK VENT PIPING SYSTEM AS INDICATED.

2) SHOP INSTALL INSULATION FROM FLEX TO MUFFLER. SHOP FIT INSULATION FROM MUFFLER TO WALL, LABEL FOR THE ASSOCIATED GENERATOR AND STORE INSIDE MODULE.

3) SHOP FABRICATE STAINLESS STEEL COVER PLATES BUT DO NOT INSTALL. LABEL COVER PLATES FOR THE ASSOCIATED GENERATOR AND STORE INSIDE MODULE.

4) UPON COMPLETION OF TESTING BREAK EXHAUST FLANGE JOINT ON MUFFLER OUTLET AND CRANK VENT FLANGE JOINT AND REMOVE U-BOLTS. REMOVE PIPING FOR SHIPPING AND TEMPORARILY SEAL WALL PENETRATION.

5) IN FIELD REINSTALL PIPING WITH NEW FLANGE GASKETS. RE-INSTALL PIPING INSULATION. INSULATE WALL PENETRATION, INSTALL COVER PLATES, AND SEAL TO WALL.



NOTE: SEE PLAN & INSTALLATION SECTIONS FOR PIPE DIAMETERS.

4 M6 WALL PENETRATION & CRANK VENT PIPE TERMINATION

NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

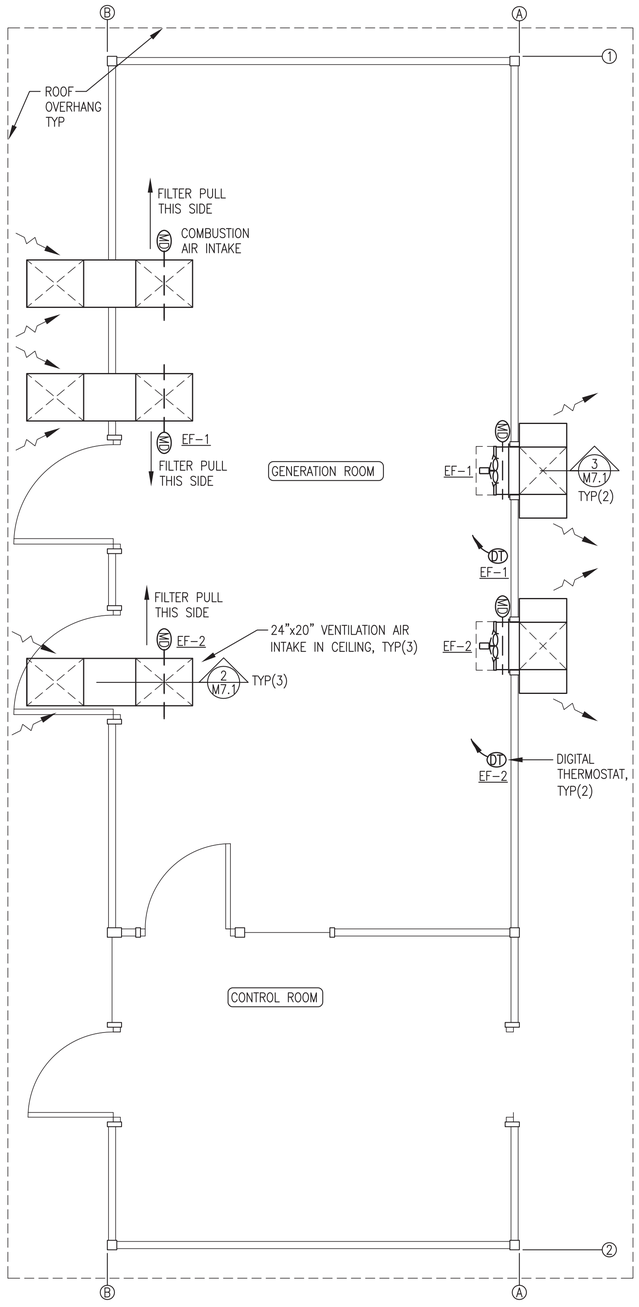
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

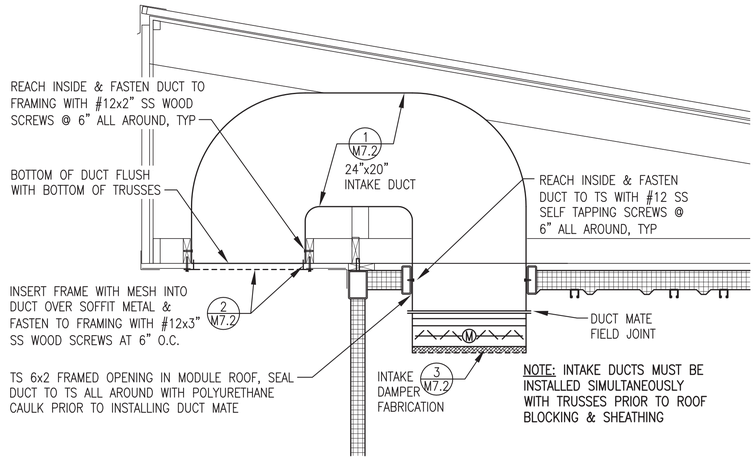
TITLE: EXHAUST & CRANK VENT PLAN & DETAILS

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

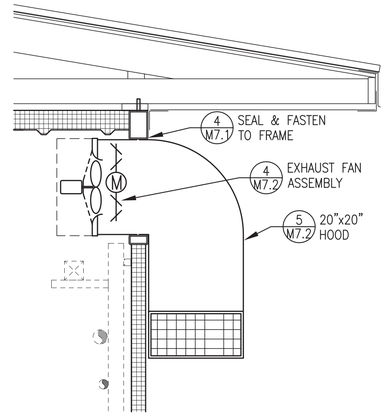
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1-14-19
FILE NAME: PTH PPU M2-7	SHEET: M6 OF 7
PROJECT NUMBER:	



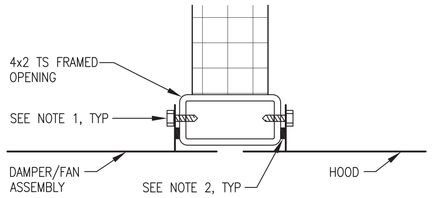
1 M7.1 VENTILATION PLAN
3/8"=1'-0"



2 M7.1 INTAKE DUCT INSTALLATION
3/4"=1'-0"



3 M7.1 EXHAUST FAN INSTALLATION
3/4"=1'-0"



NOTES:

1) FASTEN MOUNTING FLANGE TO TS WITH #12 STAINLESS STEEL SELF TAPPING SCREWS. ON HOODS FASTEN ON TOP AND SIDES ONLY. ON EXHAUST FANS FASTEN ON SIDES ONLY.
2) SEAL MOUNTING FLANGE TO TS WITH CONTINUOUS BEAD OF POLYURETHANE CAULKING ALL AROUND.

4 M7.1 TYPICAL WALL PENETRATION
4"=1'-0"

VENTILATION SYSTEM SHOP/ON-SITE NOTES:

1) FURNISH ENTIRE VENTILATION SYSTEM AS PART OF MODULE SHOP FABRICATION.
2) DURING SHOP FABRICATION INSTALL EXHAUST FAN ASSEMBLY. TEST FIT EXTERIOR HOODS AND INTAKE DUCTS BUT DO NOT INSTALL.
3) DURING SHOP FABRICATION TEMPORARILY CONNECT INTAKE DAMPERS TO ELECTRICAL ROUGH IN AND TEST TO VERIFY FUNCTION. SEE SHEET E4.2.
4) AS PART OF ON-SITE WORK INSTALL EXHAUST HOODS AND INTAKE DUCTING AS INDICATED.

ISSUED FOR CONSTRUCTION JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: VENTILATION PLAN & DETAILS

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

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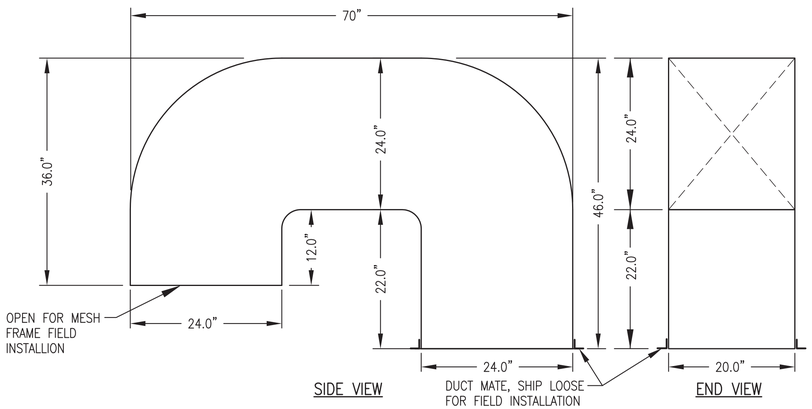
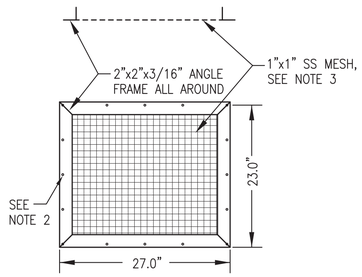
DESIGNED BY: BCG | DATE: 1-14-19
FILE NAME: PTH PPU M2-7 | SHEET: M7.1 OF 7
PROJECT NUMBER:



NOTE: FABRICATE 3 IDENTICAL DUCTS FROM MIN 18 GAUGE GALV SHEET METAL WITH SEALED MECHANICAL JOINTS OR AT CONTRACTORS OPTION 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

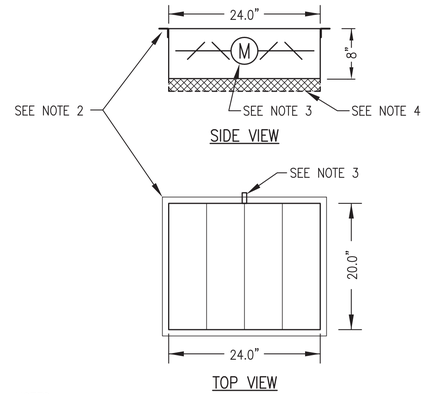
1 M7.2 INTAKE DUCT FABRICATION
1"=1'-0"



NOTES:

1. FABRICATE 3 IDENTICAL AIR INTAKE MESH FRAMES.
2. FABRICATE FRAME FROM 2"x2"x3/16" ALUMINUM ANGLE WITH MITERED AND WELDED CORNERS AND 1/4" HOLES AT 6" O.C. ALL AROUND, 1/2" FROM OUTSIDE EDGE OF FRAME.
3. INSTALL 1"x1" STAINLESS STEEL WIRE MESH IN HEMMED STAINLESS STEEL FRAME AND FASTEN TO ANGLE FRAME WITH STAINLESS STEEL SCREWS ALL AROUND.

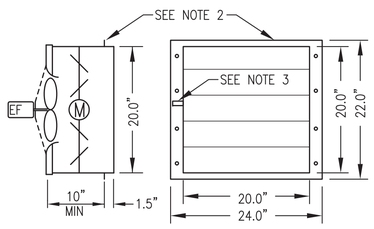
2 M7.2 INTAKE MESH FRAME
1"=1'-0"



NOTES:

1. FABRICATE 3 IDENTICAL VENTILATION INTAKE ASSEMBLIES.
2. SHOP MOUNT DUCTMATE FLANGE.
3. PROVIDE MIN 3" DAMPER ROD EXTENSION ON SIDE INDICATED AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.
4. INSTALL FRAME FOR REMOVABLE 24"x24"x2" FURNACE FILTERS. FABRICATE FROM "C" CHANNEL THREE SIDES WITH LATCHING HINGED COVER ON FOURTH SIDE TO ALLOW FILTERS TO SLIDE OUT. SEE PLAN VIEW FOR DAMPER ACTUATOR AND FILTER PULL ORIENTATION. EXTEND FILTER FRAME 2"± BEYOND DAMPER FRAME EACH WAY ON NARROW DIMENSION.

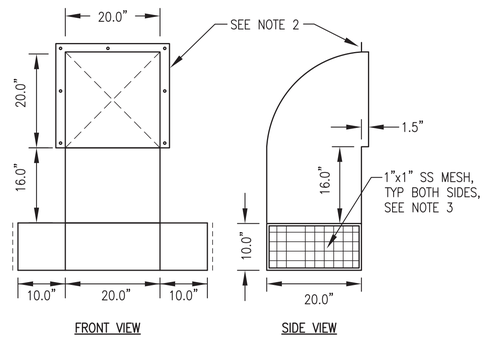
3 M7.2 INTAKE AIR DAMPER FABRICATION
1"=1'-0"



NOTES:

1) FABRICATE 2 IDENTICAL ASSEMBLIES COMPLETE WITH FAN AND DAMPER MOUNTED AND SEALED TO DUCT.
2) PROVIDE 2" WIDE MOUNTING FLANGE ON SIDES WITH 1/4" HOLES AT 5" O.C. PROVIDE 1" MOUNTING FLANGE ON TOP AND BOTTOM WITHOUT HOLES.
3) PROVIDE MIN 3" DAMPER ROD EXTENSION ON THE LEFT SIDE AND FABRICATE SHEET METAL STAND-OFF BRACKET TO FULLY SUPPORT THE ACTUATOR FROM THE DAMPER FRAME.

4 M7.2 EXHAUST FAN ASSEMBLY FABRICATION
1"=1'-0"



NOTES: 1) FABRICATE 2 IDENTICAL HOODS FROM 0.090" THICK TYPE 5052 ALUMINUM WITH ALL WELDED SEAMS.

2) PROVIDE 2" WIDE MOUNTING FLANGE ON TOP & SIDES WITH 1/4" HOLES AT 9" O.C.

3) INSTALL 1"x1" STAINLESS STEEL WIRE MESH IN HEMMED STAINLESS STEEL FRAME AND FASTEN TO ANGLE FRAME WITH STAINLESS STEEL SCREWS ALL AROUND.

5 M7.2 EXHAUST HOOD FABRICATION
3/4"=1'-0"

ISSUED FOR CONSTRUCTION JANUARY 2019

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

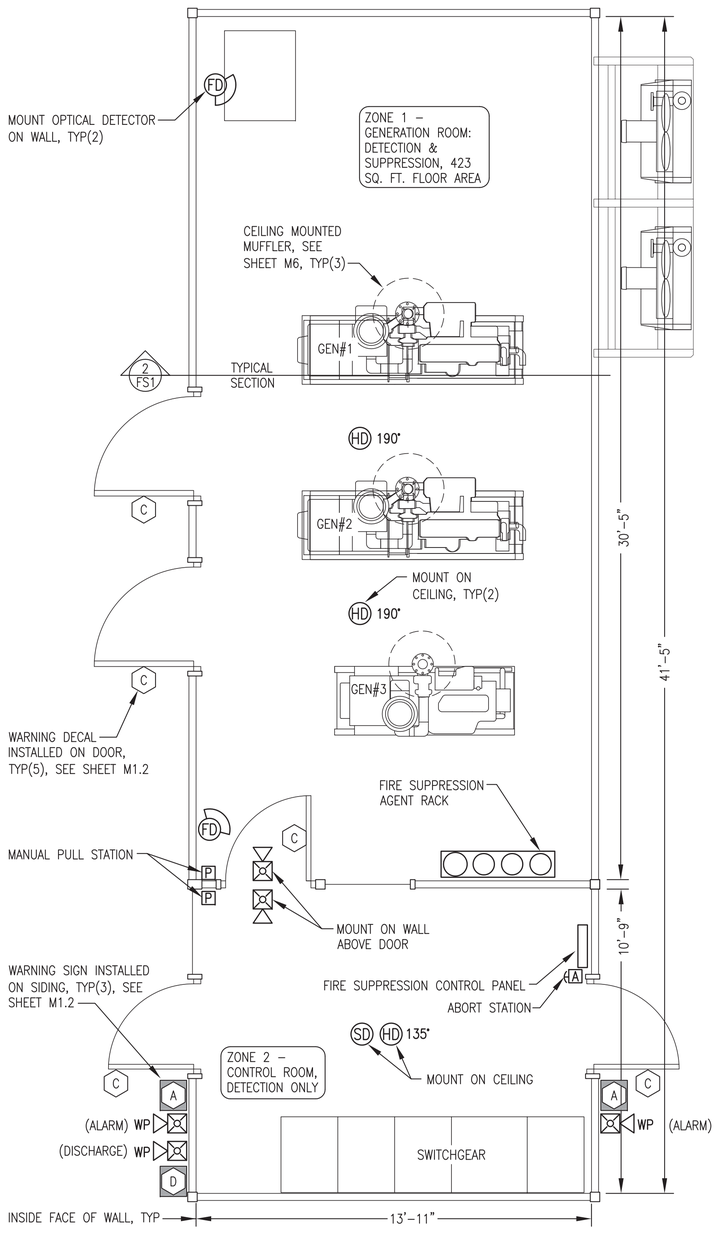
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

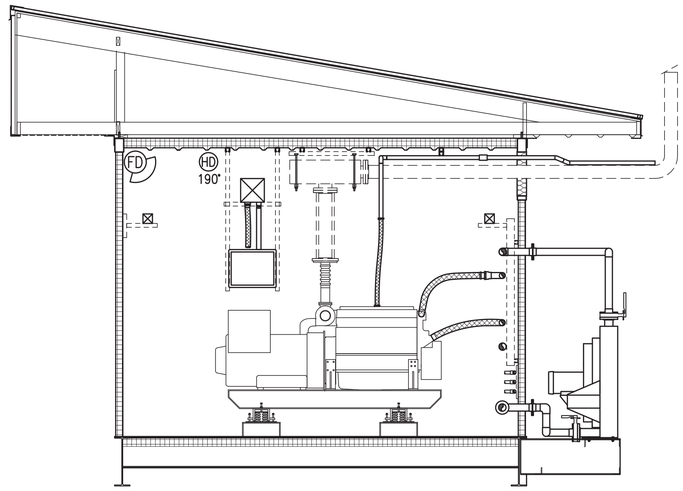
TITLE: VENTILATION FABRICATION DETAILS

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1-14-19
FILE NAME: PTH PPU M2-7	SHEET: M7.2 OF 7
PROJECT NUMBER:	



1 FS1 FIRE SUPPRESSION SYSTEM PLAN
3/8"=1'-0"



2 FS1 TYPICAL SECTION THROUGH MODULE
3/8"=1'-0"

FIRE SUPPRESSION GENERAL NOTES:

1) INTERIOR FINISH OF ALL WALLS, FLOOR, AND CEILING WELDED STEEL PLATE. CEILING HEIGHT IN ALL ROOMS 10'–2" ABOVE FINISHED FLOOR.

2) ALL DOORS SELF–CLOSING WITH GASKETS. ALL BUILDING PIPING AND CONDUIT PENETRATIONS SEALED LIQUID TIGHT. ALL BUILDING DUCT PENETRATIONS EQUIPPED WITH MOTORIZED DAMPERS THAT CLOSE ON GENERATOR SHUT DOWN.

FIRE SUPPRESSION SHOP/ON–SITE NOTES:

1) UPON COMPLETION OF MODULE SHOP TESTING: DISCONNECT BATTERIES. DRAIN ALL WATER OUT OF THE SYSTEM AND BLOW OUT WITH AIR TO PREVENT FREEZE DAMAGE. LEAVE ONE FULLY CHARGED NITROGEN CYLINDER INSTALLED IN THE RACK PLUS ONE LOOSE SHIP FULLY CHARGED SPARE NITROGEN CYLINDER.

2) DURING ON–SITE CONSTRUCTION: FILL BOTTLES WITH CLEAN POTABLE WATER IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. FULLY TEST AND CERTIFY SYSTEM. TRAIN AEA STAFF AND LOCAL OPERATORS.

FIRE SUPPRESSION SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
P	MANUAL PULL STATION	HD 135°	NORMAL TEMP. (135°F) DETECTOR
A	ABORT STATION	HD 190°	HIGH TEMP. (190°F) DETECTOR
	INTERIOR ALARM HORN/STROBE	FD	FLAME (OPTICAL) DETECTOR
WP	EXTERIOR ALARM HORN/STROBE	SD	SMOKE (IONIZATION) DETECTOR

FIRE SUPPRESSION PLACARD SCHEDULE

SYMBOL	DESCRIPTION
A	"FIRE ALARM"
C	"CAUTION, ROOM PROTECTED BY WATER MIST FIRE PROTECTION SYSTEM, IN CASE OF FIRE KEEP DOOR CLOSED AND DO NOT ENTER"
D	"FLASHING LIGHT MEANS FIRE SUPPRESSION AGENT HAS DISCHARGED"

FIRE SUPPRESSION WIRE SCHEDULE

SYMBOL	CIRCUIT DESCRIPTION	WIRE TYPE	WIRE COLOR
A	24V DC POWER	#14 AWG SOLID	RED & BLACK
B	DETECTION CIRCUITS	#14 AWG SOLID	BLUE & YELLOW
C	ANNUNCIATION ALARM	#14 AWG SOLID	BROWN & ORANGE
D	ANNUNCIATION DISCHARGE	#14 AWG SOLID	WHITE, & GRAY
E	24V DC AUX POWER	#14 AWG SOLID	RED & BLACK WITH GRAY STRIPE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

TITLE: FIRE SUPPRESSION SYSTEM PLAN, SECTION, LEGEND, & NOTES

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

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DESIGNED BY: BCG | DATE: 1–14–19
FILE NAME: PTH PPU FS1 | SHEET: FS1 OF 1
PROJECT NUMBER:

EQUIPMENT REQUIREMENTS FOR APPROVED EQUALS (APPLIES TO ALL SCHEDULES):
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.

ELECTRICAL EQUIPMENT SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
◇1	DAY TANK ALARM HORN/STROBE	MULTI-TONE ALARM WITH STROBE, 115V, NEMA 3R, WEATHER RESISTANT SURFACE MOUNT BELL BOX	WHEELOCK MT4-115-WH-VNS
◇2	DIGITAL THERMOSTAT	MULTIPLE OUTPUT MODULATING DIGITAL THERMOSTAT	HONEYWELL TB7980B
◇3	LINE VOLTAGE THERMOSTAT	HEATING/COOLING THERMOSTAT, 16 FLA @ 120V, SPDT, 50F TO 80F RANGE.	DAYTON 1UHH2
◇4	AREA LIGHT	AREA LIGHT, WIDE DISPERSION WALL PACK WITH PHOTO CONTROL. LED, 17.7W, 120-277V DRIVER	HUBBELL NRG-356L-5K-U-PC
◇5	EMERGENCY LIGHT	WALL MOUNT, WHITE 20 GA STEEL ENCLOSURE, 277/120VAC, 8.4A INPUT, SEALED LEAD-ACID BATTERY, DUAL 5.3W 6VDC LED LAMPS	HUBBEL DUAL-LITE CCU2
◇6	EMERGENCY/EXIT LIGHT COMBO	WHITE PLASTIC ENCLOSURE, RED EXIT SIGN, 277/120V INPUT, DUAL 1.5W 9.6V LED LAMPS. OPTIONAL HIGH OUTPUT NI-CAD BATTERY	LITHONIA LHQM-LED-R-HO OR EQUAL
◇7	NOT USED	NOT USED	NOT USED
◇8	MODULE INTERIOR LIGHTING	SURFACE MOUNTED LED STRIPLIGHT FIXTURE, 48" LONG, 34W, 5000'K WITH SNAP ON FROSTED DIFFUSER	LITHONIA L1N-L48-5000LM-FST
◇9	TIMER SWITCH	0-5 MINUTE , 120V, 20A, 1HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER.	INTERMATIC FF5M
◇10	LIGHT SWITCH	SINGLE POLE SNAP SWITCH, 120V, 20A, METAL, 1-1/2HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER, IVORY.	HUBBELL 1221-I
◇11	1ø SMALL MOTOR DISCONNECT	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP RATED, INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	HUBBELL 1221-PL
◇12	NOT USED	NOT USED	NOT USED
◇13	STATION SERVICE TRANSFORMER	DRY TYPE, ENERGY STAR, ENCLOSURE TYPE 3R WITH INTEGRAL WALL MOUNT BRACKETS, 9 kVA, HV 480 DELTA, LV 208Y/120	HAMMOND HPS C3F009KBS WITH NQT6 CASE
◇14	STATION SERVICE PANELBOARD	COPPER BUS, 3 PHASE, 4 WIRE, 120/208V, 100A, 30 CIRCUITS, BOLT-IN BREAKERS, SURFACE MOUNT, NEMA 1	SIEMENS OR SQUARE D
◇15	STANDARD RECEPTACLE	SURFACE MOUNT 125V NEMA 5-20R RECEPTACLE. INSTALL IN 4"x4" STEEL BOX WITH METAL COVER	PASS & SEYMOUR 5362W
◇16	EXTERIOR GFCI RECEPTACLE	125V NEMA 5-20R GFCI RECEPTACLE. MOUNT IN CAST FDA BOX WITH WEATHERPROOF COVER	PASS & SEYMOUR 2095-W
◇17	BATTERY CHARGER	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120 VAC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS	SENS NRG22-20-RCLS OR CHARLES 93-INCHGR20-A
◇18	WELDER/COMPR. RECEPTACLE	NEMA 6-30R , BLACK, 250V, 30A, 2 POLE, WITH GROUND. INSTALL IN DEEP 4"x4" STEEL BOX WITH 2.15"ø HOLE METAL COVER	PASS & SEYMOUR 3801
◇19	NOT USED	NOT USED	NOT USED
◇20	RADIATOR MOTOR DISCONNECT	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 600V, 30A, MIN 5HP RATED	SIEMENS HNF361R OR SQUARE D HU361R
◇21	24VAC CONTROL TRANSFORMER	120V PRIMARY, 24V SECONDARY, 75VA OUTPUT, PLATE MOUNT, INSTALL ON 4"x4" PRESSED STEEL BOX	HONEYWELL AT175A1008
◇22	ENCLOSED POWER RELAY	20A, 1HP RATED CONTACT, SPDT, 24VAC COIL, NEMA 1 ENCLOSURE, RED LED PILOT LIGHT	FUNCTIONAL DEVICES RIB2401B

ELECTRICAL CONDUCTOR SCHEDULE

SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL	NOTES:
GENERATOR LEADS & FEEDERS (480V) & ENGINE STARTER CABLES (24VDC)	HIGH TEMPERATURE, EXTRA FLEXIBLE CABLE, TIN COATED COPPER CONDUCTOR. THERMOSET EPDM INSULATION, UL 3340/3374, MINIMUM 600V, LISTED 150°C FOR NON-FLEXING	COBRA CABLE, BELDEN, OR OMINI	TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT 150°C.
GENERAL USE CONDUCTORS	CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.		
SHIELDED/TWISTED INSTRUMENT & CONTROL CONDUCTORS	#18 AWG STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE & PVC OUTER JACKET	BELDEN PART #'S SINGLE PAIR: #1120A FOUR PAIR: #1049A SINGLE TRIAD: #1121A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
CANBUS (DEVICENET) COMMUNICATION CONDUCTORS	STRANDED TINNED COPPER CONDUCTORS, 600V PVC/NYLON & FRPP INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH TINNED COPPER BRAID SHIELD & PVC OUTER JACKET	TWO PAIR #16 & #18 BELDEN 7896A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
EHTERNET (CAT5e) COMMUNICATION CONDUCTORS	SOLID BARE COPPER CONDUCTORS, 300V FEP INSULATION & JACKET, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE	FOUR PAIR #24 BELDEN 1585LC	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY. ROUTE ALL CAT5e CABLES IN SEPARATE DEDICATED RACEWAY.

COLOR CODING - UNLESS SPECIFICALLY INDICATED OTHERWISE CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:
- 480-VOLT POWER CONDUCTORS
  - 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
- 24 VOLT DC CONDUCTORS
  - +24VDC - RED or RED WITH GRAY STRIPE
  - -24VDC - BLACK or BLACK WITH GRAY STRIPE
- CONTROL & INSTRUMENT CONDUCTORS
  - COLOR CODED PER MANUFACTURER'S STANDARD

NOTES:
1) FOR NO. 6 AWG AND SMALLER CONDUCTORS COLOR CODING SHALL BE PROVIDED BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION. FOR ALL CONDUCTORS LARGER THAN NO. 6 SCOTCH 35 MARKING TAPE OR EQUIVALENT MAY BE USED TO COLOR CODE THE CABLE. WHERE MARKING TAPE IS USED THE CABLE SHALL BE IDENTIFIED AT EVERY ACCESSIBLE LOCATION. PROVIDE A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION.
2) GROUNDING - PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE CLASS B CONCENTRIC STRANDED, SOFT-DRAWN COPPER OF THE SIZES INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

ELECTRICAL INSTRUMENTATION SCHEDULE

SYMBOL	SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
(TT)	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
(PT)	PRESSURE TRANSMITTER	0-60 PSIG RANGE, 4-20mA OUTPUT, 1/4" NPT PIPING CONNECTION, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 100-60-1-1-2-7
(FM)	HEAT RECOVERY FLOW METER	150# ANSI FLANGED CONNECTION, SIZE AS INDICATED, PTFE LINER, HASTELLOY C ELECTRODES, RATED FOR 210F OPERATION. FURNISH WITH TRANSMITTER FOR DIRECT AND REMOTE MOUNTING, 115/230 VAC, 50/60 HZ, AND NEMA 4X BODY.	SIEMENS SITRANS METER: FM MAGFLO MAG 3100 TRANSMITTER: F M MAGFLO MAG 5000, CODE NO. FDK: 7ME6910, OPTION 1AA10-1AA0
(FS)	DAY TANK/HOPPER FLOAT SWITCH	VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VASPST NC/NO SWITCH, 1/8" NPT, 1"MAX ø BUNA-N FLOAT FOR S.G=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2
(TLM)	TANK LEVEL MONITOR PANEL	TANK LEVEL MONITOR CONSOLE FOR UP TO SIX TANKS, COLOR LCD SCREEN, ETHERNET CONNECTION WITH WEB INTERFACE, PROGRAMMABLE VOLUME CALCULATIONS WITH TEMPERATURE COMPENSATION	FRANKLIN/INCON COLIBRI CL6D
(LSP)	FUEL/OIL TANK LEVEL SENSOR PROBE	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 ON INSTALLATION DETAILS.	4' TANK PROBE: TSP-LL2-53-I FLOAT: INTSP-IDF2 2" FOR DIESEL INSTALLATION KIT: TSP-K2A
(LCA)	GLYCOL TANK LOW COOLANT ALARM	LOW COOLANT LEVEL ALARM FLOAT SWITCH, SEE MECHANICAL FOR INSTALLATION DETAILS	MURPHY EL-150-K1
(GLS)	GLYCOL TANK LEVEL SENSOR PROBE	12" PROBE, 2" NPT TANK CONNECTION, SS FLOAT, 1/4" RESOLUTION, NEMA 4 ENCLOSURE WITH SIGNAL CONDITIONER AND 1/2" NPT CONDUIT CONNECTION	INNOVATIVE COMPONENTS CLM-2012-SS

BUILDING PLANS SYMBOL LEGEND

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
(1/4)	MOTOR (HORESPOWER INDICATED)
(MD)	MOTORIZED DAMPER - SEE MECHANICAL
	125V, 20A, DUPLEX RECEPTACLE
(T)	LINE VOLTAGE THERMOSTAT
(DT)	DIGITAL THERMOSTAT, MODULATING
$	SNAP SWITCH / SMALL MOTOR DISCONNECT
T$	TIMER SWITCH
	GROUND

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

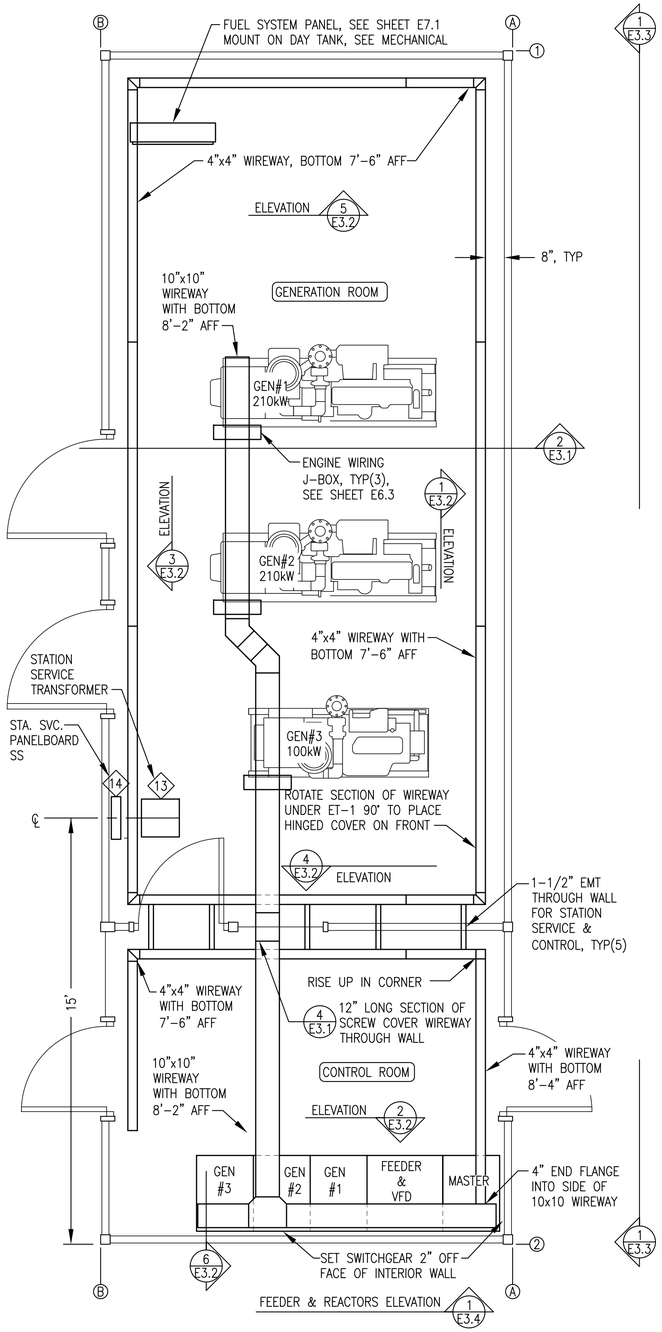
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

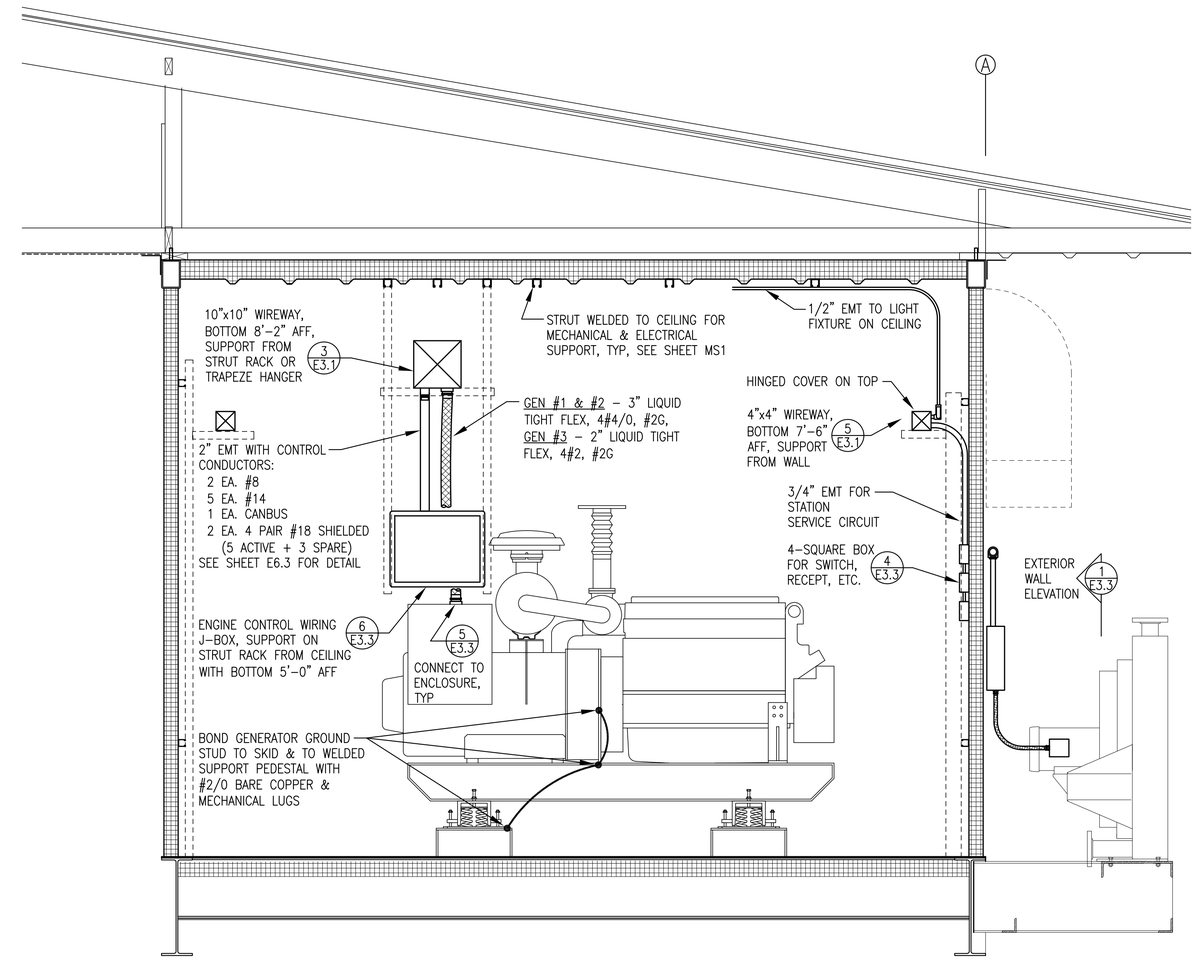
TITLE: ELECTRICAL LEGENDS & SCHEDULES

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 1/14/19
FILE NAME: PTH PPU E1-E2 | SHEET: E1.1 OF 7
PROJECT NUMBER:

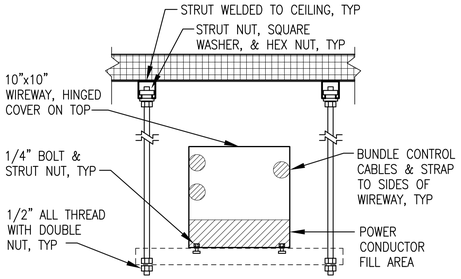


1 E3.1 EQUIPMENT LAYOUT & WIREWAY PLAN
3/8"=1'-0"

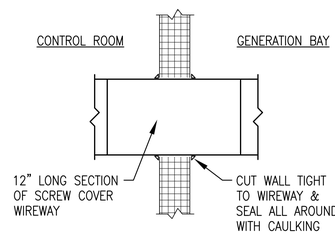


2 E3.1 TYPICAL MODULE SECTION
3/4"=1'-0"

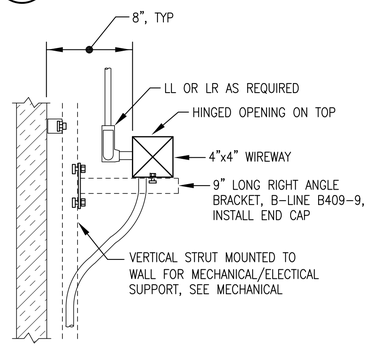
NOTES:
1) INSTALL HANGER AT EACH JOINT & AT END.
2) HANGER NOT REQUIRED AT ENGINE J-BOX SUPPORT, SEE DETAIL 4/E4.3.



3 E3.1 10" WIREWAY TRAPEZE HANGER
NO SCALE



4 E3.1 WIREWAY WALL PENETRATION
NO SCALE



5 E3.1 4" WIREWAY SUPPORT FROM WALL
NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

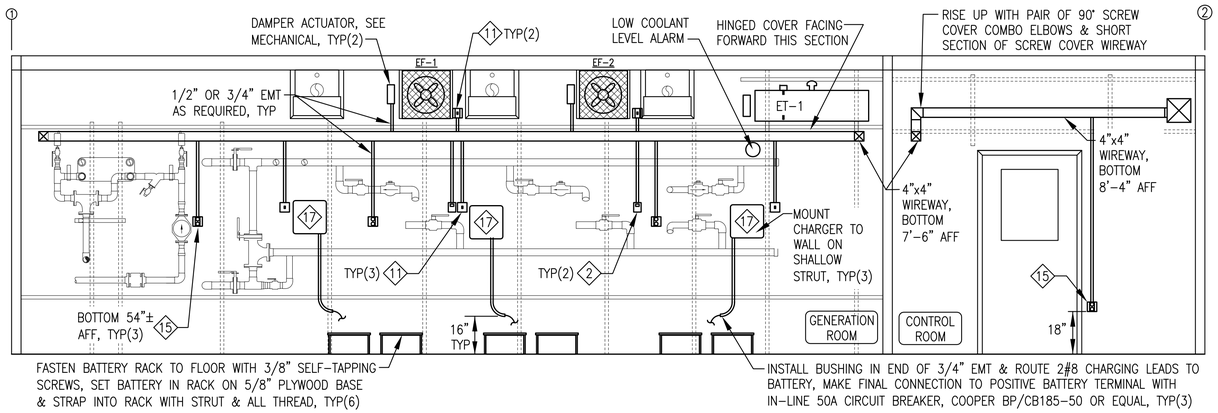
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

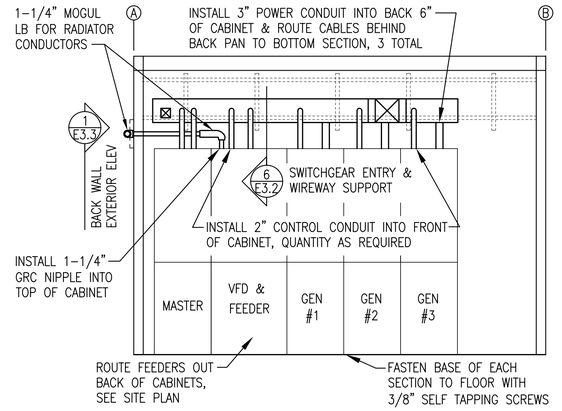
TITLE: WIREWAY PLAN, MODULE SECTION, & DETAILS

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

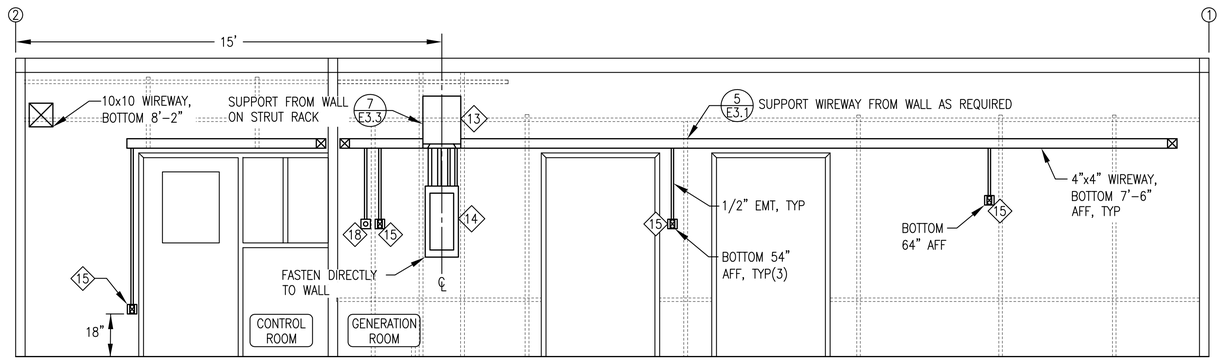
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1/14/19
FILE NAME: PTH PPU E3-E5	SHEET: E3.1 OF 7
PROJECT NUMBER:	



1 E3.2 WALL ELEVATION AT GRID A
3/8"=1'-0"

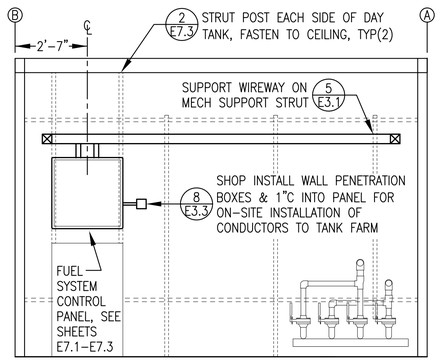


2 E3.2 WALL ELEVATION AT GRID 2
3/8"=1'-0"

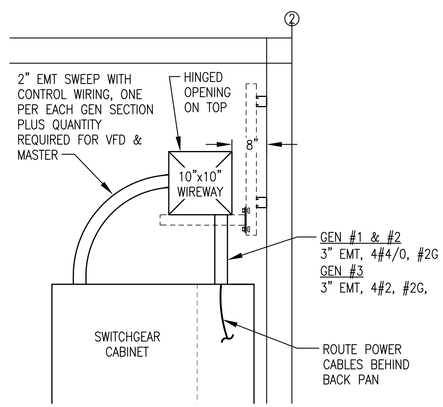


3 E3.2 WALL ELEVATION AT GRID B
3/8"=1'-0"

4 E3.2 INTERIOR WALL ELEVATION
3/8"=1'-0"



5 E3.2 WALL ELEVATION AT GRID 1
3/8"=1'-0"



6 E3.2 SWITCHGEAR ENTRY & WIREWAY SUPPORT
NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

TITLE: ELEVATIONS & DETAILS

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

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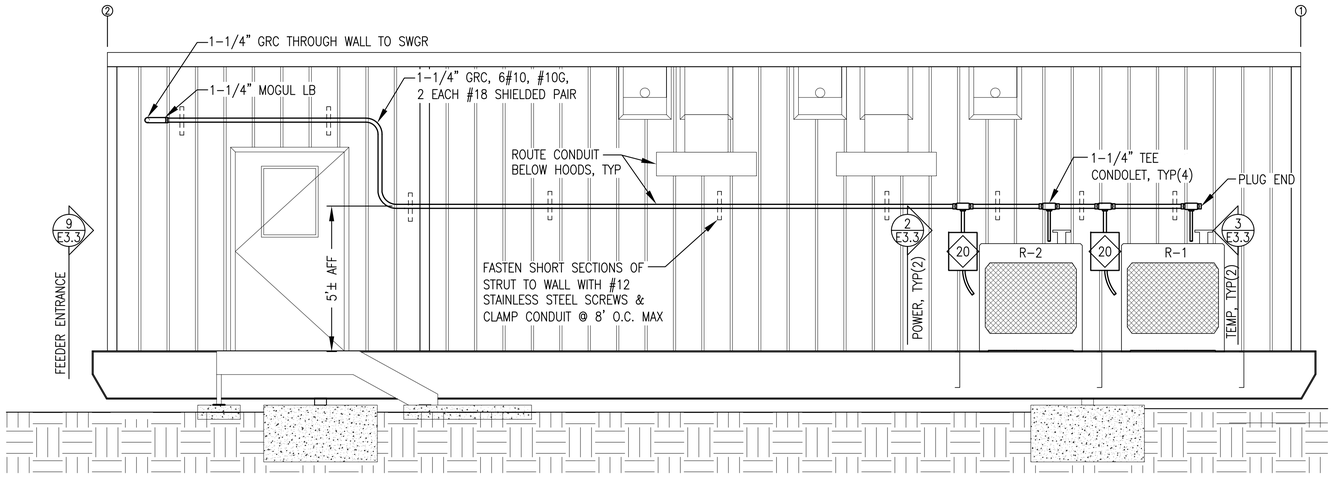
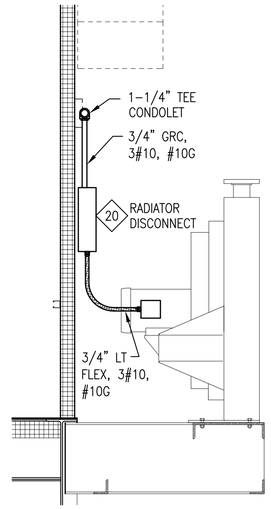
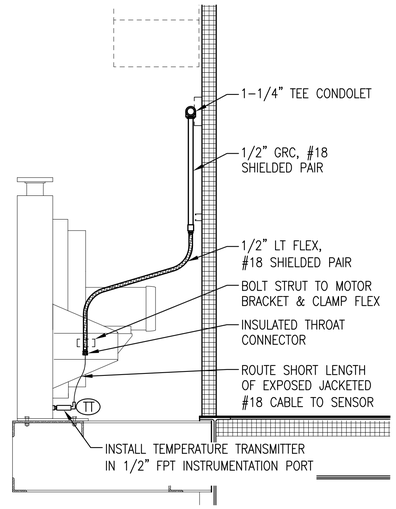
DESIGNED BY: CWV/BCG | DATE: 1/14/19
FILE NAME: PTH PPU E3-E5 | SHEET: E3.2 OF 7
PROJECT NUMBER:



1 E3.3 BACK WALL EXTERIOR ELEVATION
3/8"=1'-0"



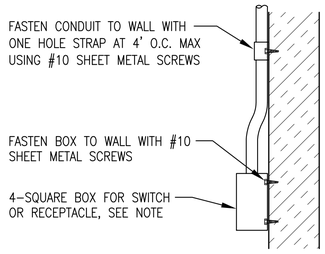
2 E3.3 RADIATOR POWER CONNECTION
3/4"=1'-0"



3 E3.3 RADIATOR TEMPERATURE TRANSMITTER
3/4"=1'-0"

RADIATOR SHOP/ON-SITE NOTES:

1) DURING SHOP FABRICATION INSTALL ALL DEVICES AND RACEWAYS AS INDICATED.
2) AS PART OF ON-SITE WORK, IF RADIATORS ARE REMOVED FOR SHIPPING DISCONNECT LIQUID TIGHT FLEXES AND SEAL ENDS. COIL AND SECURE CONDUCTORS AND FLEXES FOR SHIPPING.
3) AS PART OF ON-SITE WORK REINSTALL AS INDICATED.

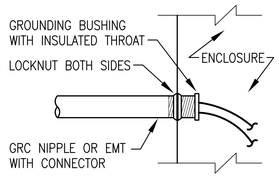


NOTE: INSTALL THERMOSTATS & TIMER SWITCHES IN DEEP SINGLE GANG BELL BOX INSTEAD OF 4-SQUARE BOX.

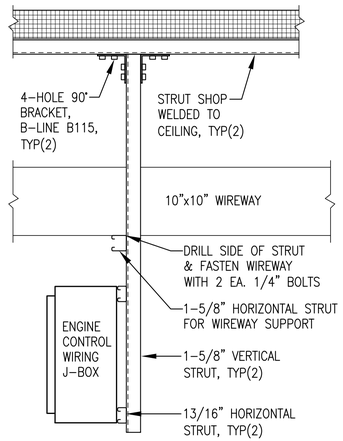
4 E3.3 TYPICAL INTERIOR DEVICE MOUNTING
NO SCALE

NOTES:

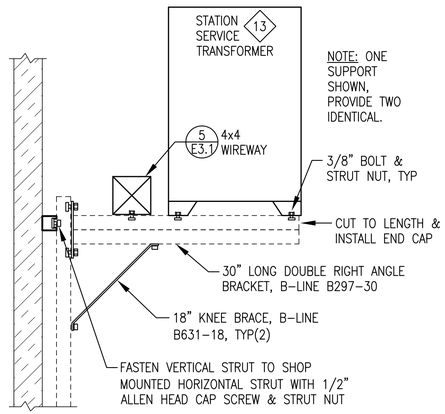
1) THIS DETAIL APPLIES TO CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS.
2) AT A MINIMUM INSTALL GROUNDING BUSHING ON ALL GENERATOR POWER CONDUIT, COMMUNITY FEEDER CONDUIT, STATION SERVICE FEEDERS, AND WHERE OTHERWISE INDICATED OR REQUIRED. BOND GROUNDING BUSHING TO EQUIPMENT GROUNDING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



5 E3.3 TYP ENCLOSURE CONNECTION
NO SCALE

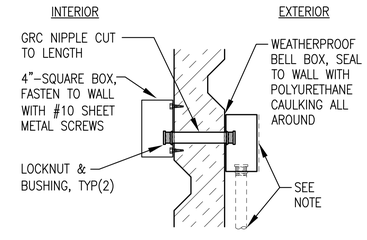


6 E3.3 ENGINE WIRING J-BOX SUPPORT
NO SCALE



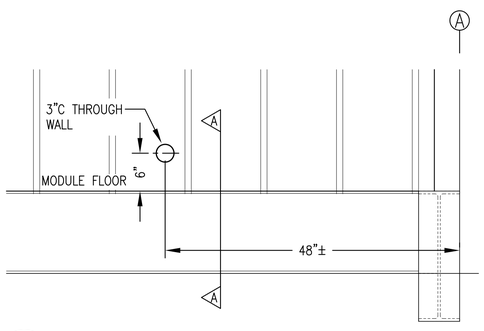
NOTE: ONE SUPPORT SHOWN, PROVIDE TWO IDENTICAL.

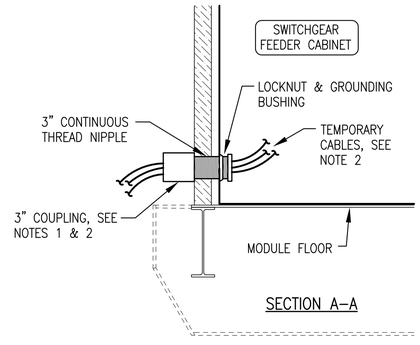
7 E3.3 STATION SERVICE TRANSFORMER SUPPORT
NO SCALE



NOTE: FOR CONDUIT PENETRATIONS WITHOUT BELL BOX SEAL ALL AROUND CONDUIT WITH POLYURETHANE CAULK.

8 E3.3 TYP EXTERIOR DEVICE INSTALLATION
NO SCALE





9 E3.3 FEEDER ENTRANCE DETAIL
1"=1'-0"

FEEDER SHOP/ON-SITE NOTES:

1) DURING SHOP FABRICATION INSTALL WALL PENETRATION AS SHOWN AND SEAL COUPLING TO EXTERIOR WALL WITH POLYURETHANE CAULK ALL AROUND.
2) USE WALL PENETRATION TO ROUTE TEMPORARY CABLES TO LOAD BANK FOR TESTING. AFTER TESTING INSTALL THREADED PLUG IN COUPLING.
3) INSTALL FEEDER TO TRANSFORMER AS PART OF ON-SITE WORK, SEE SHEET E2 FOR CONTINUATION.

ISSUED FOR CONSTRUCTION JANUARY 2019

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

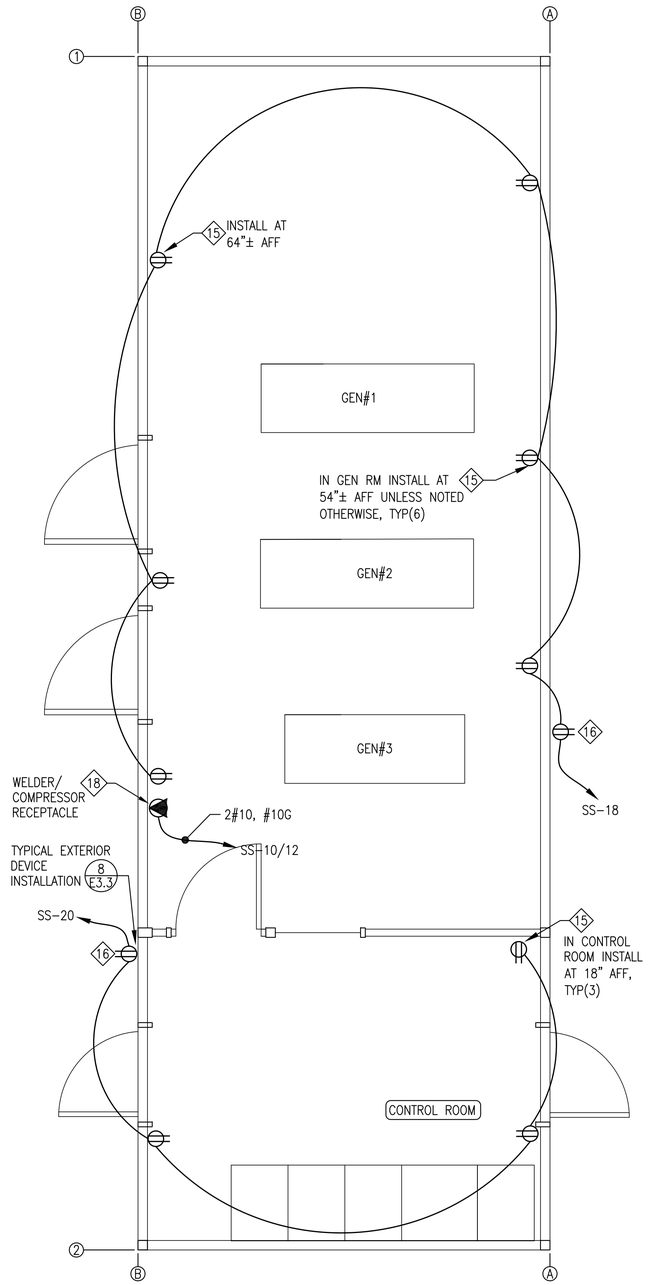
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: ELEVATIONS & DETAILS

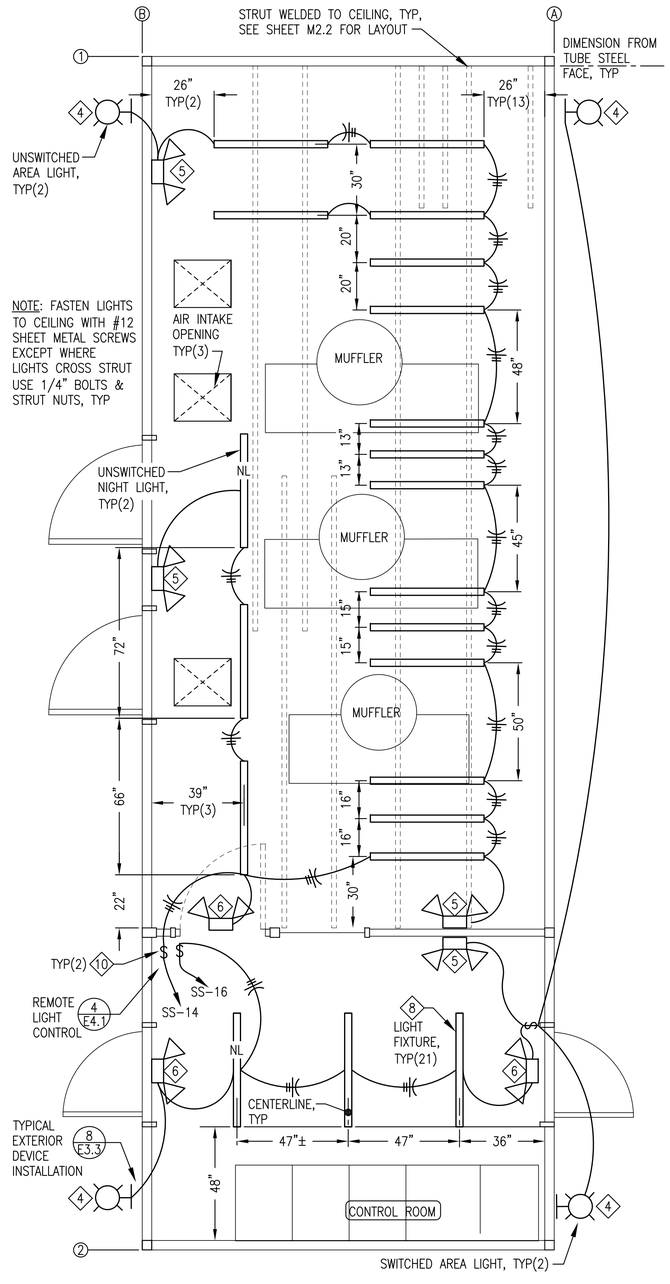
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 1/14/19
FILE NAME: PTH PPU E3-E5 | SHEET: E3.3 OF 7
PROJECT NUMBER:



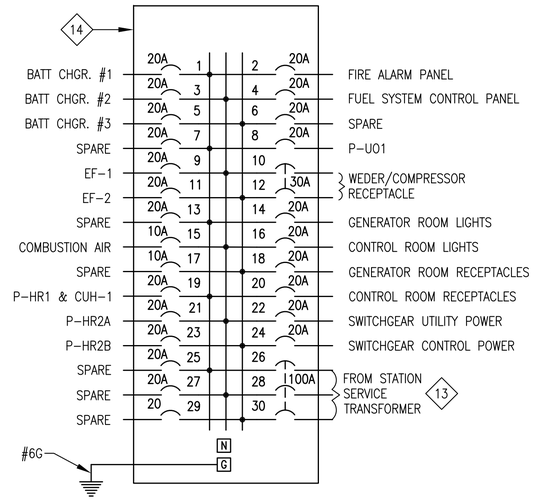
NOTE: ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

1 E4.1 RECEPTACLE PLAN
3/8"=1'-0"

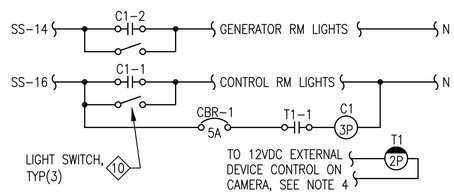


NOTE: ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

2 E4.1 LIGHTING PLAN
3/8"=1'-0"



3 E4.1 STATION SERVICE PANEL "SS"
NO SCALE



4 E4.1 LIGHTING REMOTE CONTROL SCHEMATIC
NO SCALE

NOTES:

1) INSTALL CONTACTOR, TIMER RELAY, AND CIRCUIT BREAKER IN 12"x12"x6" NEMA 1 JUNCTION BOX ON WALL ABOVE LIGHT SWITCHES.
2) ALL LIGHTING CIRCUIT WIRING MIN #12 AWG. ALL 5A CONTROL CIRCUIT WIRING MIN #16AWG.
3) SET TIMER FOR 5 MINUTES, SINGLE SHOT MODE.
4) CONNECT TO CONFIGURABLE OUTPUT PINS ON CAMERA AND PROGRAM TO POWER RELAY ON CAMERA OPERATION.

BILL OF MATERIALS:

CBR1: 5A, 1P, RAIL MOUNT CIRCUIT BREAKER. ALLEN BRADLEY 1489-A1-050.

C1: 23A, 3P CONTACTOR, 120V COIL. ALLEN BRADLEY 100-C23D10.

T1: 10A, DPDT RELAY, 12VDC COIL, WITH SOCKET BASE AND TIMING MODULE. ALLEN BRADLEY 700-HA32Z12 RELAY WITH 700HN204 BASE AND 700HT3 SERIES B TIMING MODULE.

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 CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.		125V, 20A, DUPLEX RECEPTACLE
		T	LINE VOLTAGE THERMOSTAT
		DT	DIGITAL THERMOSTAT, MODULATING
#	ELECTRICAL ITEM – SEE EQUIPMENT SCHEDULE ON SHEET E6		SNAP SWITCH / SMALL MOTOR DISCONNECT
1/4	MOTOR (HORESPOWER INDICATED)	T$	TIMER SWITCH
MD	MOTORIZED DAMPER – SEE MECHANICAL		GROUND

ISSUED FOR CONSTRUCTION JANUARY 2019

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

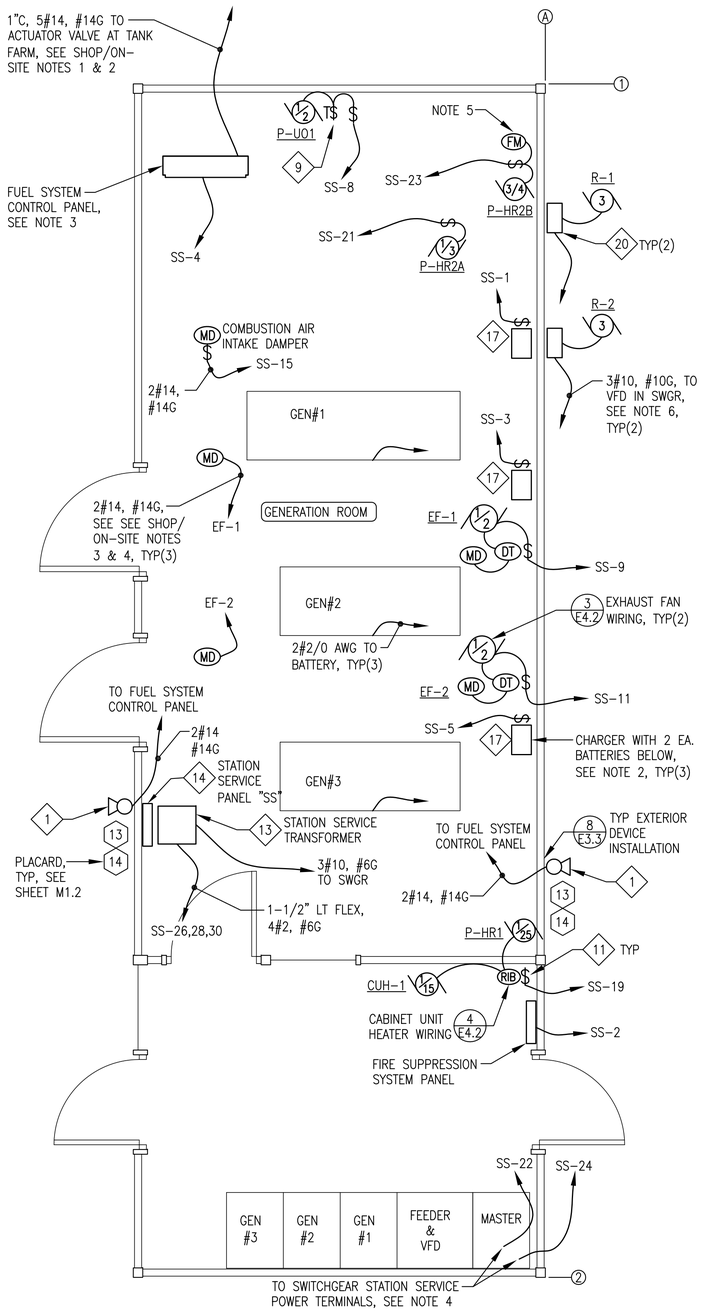
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: RECEPTACLE & LIGHTING PLANS, & STATION SERVICE PANEL

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 1/14/19
FILE NAME: PTH PPU E3-E5 | SHEET: E4.1 OF 7
PROJECT NUMBER:



1 E4.2 STATION SERVICE PLAN
3/8"=1'-0"

STATION SERVICE GENERAL NOTES:

1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

2) MOUNT BATTERY CHARGER TO WALL ON SHALLOW STRUT AND INSTALL BATTERIES ON FLOOR BELOW, SEE ELEVATION 1/E3.2.

3) SEE SHEETS E7.1-E7.3 FOR DAY TANK CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.

4) SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL POWER AND CONTROL WIRING.

5) INSTALL FLOW METER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. PROVIDE POWER FROM P-HR2B DISCONNECT.

6) RADIATOR VFD POWER CONDUCTORS OVERSIZED FOR 80% DE-RATE. DO NOT ROUTE IN WIREWAY. ROUTE IN SEPARATE EXTERIOR CONDUIT, SEE ELEVATION 1/E3.3.

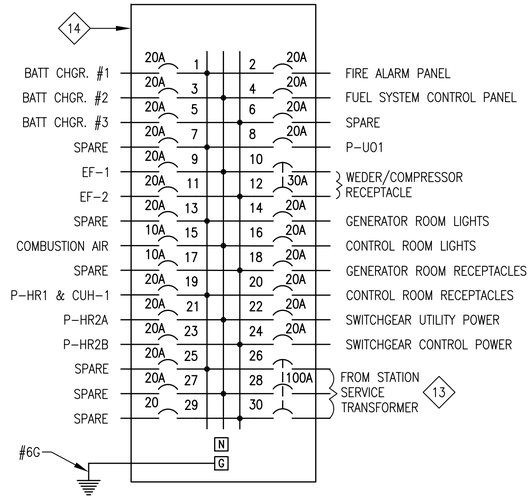
STATION SERVICE SHOP/ON-SITE NOTES:

1) DURING SHOP FABRICATION INSTALL WALL PENETRATION AND CONDUIT INTO DAY TANK PANEL. SEE ELEVATION 5/E3.2.

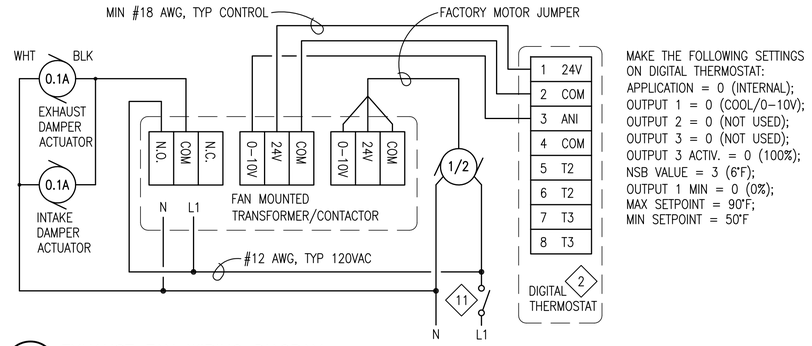
2) AS PART OF ON-SITE WORK INSTALL CONDUIT AND CONDUCTORS TO TANK FARM, SEE SHEET E2.

3) DURING SHOP FABRICATION INSTALL CEILING MOUNTED BOX ADJACENT TO DAMPER ACTUATOR AND TEMPORARILY CONNECT DAMPER TO VERIFY OPERATION.

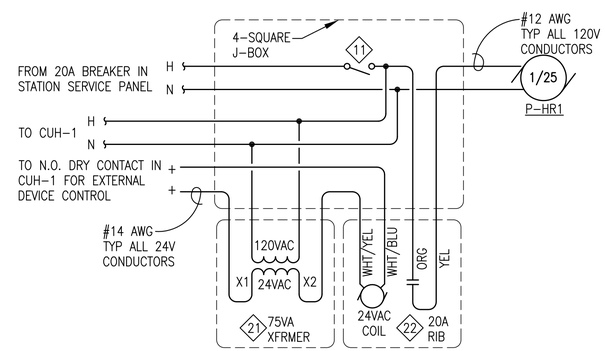
4) AS PART OF ON-SITE WORK INSTALL CONDUIT AND CONDUCTORS TO DAMPER ACTUATOR. SEE SHEET M7.



2 E4.2 STATION SERVICE PANEL "SS"
NO SCALE



3 E4.2 EXHAUST FAN WIRING DIAGRAM
NO SCALE



4 E4.2 CUH-1 WIRING DIAGRAM
NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

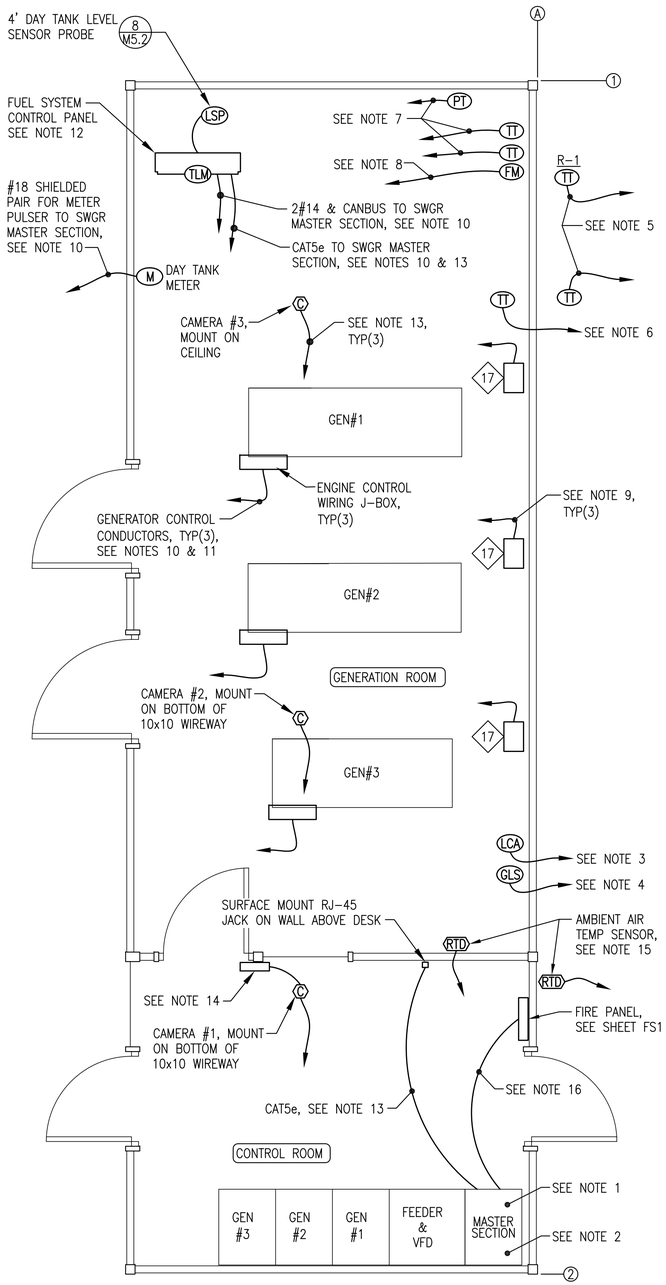
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: STATION SERVICE PLAN, DETAILS, & PANEL

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 1/14/19
FILE NAME: PTH PPU E3-35	SHEET: E4.2 OF 7
PROJECT NUMBER:	



1 E5 INSTRUMENTATION & DATA PLAN

3/8"=1'-0"

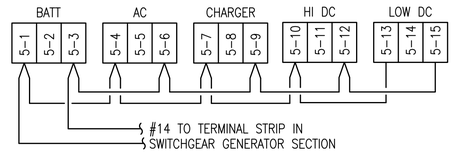
INSTRUMENTATION & DATA PLAN NOTES:

1. INSTALL CAMERA POE+ SWITCH INSIDE MASTER SECTION. CONNECT TO 120VAC CONTROL POWER AND TO ETHERNET SWITCH, SEE NOTE 10.
2. INSTALL ROUTER ON TOP OF MASTER SECTION IN RACK OR CABINET. CONNECT TO 120VAC UPS AND TO ETHERNET SWITCH, SEE NOTE 10.
3. LOW COOLANT LEVEL ALARM SWITCH INSTALLED AT EXPANSION TANK, SEE MECHANICAL. CONNECT TO N.C. SWITCH (WHITE & RED) AND ROUTE 2#14 TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
4. GLYCOL LEVEL SENSOR PROBE INSTALLED IN EXPANSION TANK, SEE MECHANICAL. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR. SEE NOTE 10.
5. INSTALL TEMP TRANSMITTER IN EACH RADIATOR, SEE DETAIL 3/E3.3. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR VFD SECTION, SEE NOTE 10.
6. INSTALL COOLANT RETURN TEMP TRANSMITTER IN PIPING MAIN WHERE SHOWN ON COOLING PIPING ISOMETRIC. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION, SEE NOTE 10.
7. INSTALL TWO TEMP TRANSMITTERS AND ONE PRESSURE TRANSMITTER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC 2/M4.2. ROUTE #18 SHIELDED PAIR FROM EACH TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
8. INSTALL FLOW METER FOR HEAT RECOVERY MONITORING WHERE SHOWN ON HEAT RECOVERY PIPING ISOMETRIC. PROVIDE POWER FROM P-HR2B DISCONNECT. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
9. ROUTE 2#14 FROM BATTERY CHARGER ALARM CONTACTS TO ASSOCIATED SWITCHGEAR GENERATOR SECTION, SEE NOTE 10 AND WIRING DIAGRAM 2/E5.
10. SEE SWITCHGEAR SHOP DRAWINGS FOR TERMINATION OF ALL INSTRUMENTATION AND DATA WIRING INCLUDING CONTROL POWER.
11. ROUTE GENERATOR CONTROL CONDUCTORS TO SWITCHGEAR IN 10x10 WIREWAY WITH POWER CONDUCTORS. SEE SHEETS E3.1, E6.3, AND NOTE 10.
12. SEE SHEETS E7.1-E7.3 FOR FUEL SYSTEM CONTROL PANEL DESIGN. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.
13. ROUTE CAT5e CONDUCTORS FROM EACH CAMERA TO POE+ SWITCH IN MASTER SECTION. ROUTE CAT5e CONDUCTORS FROM FUEL SYSTEM PANEL, FIRE SUPPRESSION PANEL, AND RJ-45 JACK TO ETHERNET SWITCH IN SWITCHGEAR MASTER SECTION. SEE NOTE 10. INSTALL ALL CAT5e CONDUCTORS IN SEPARATE DEDICATED RACEWAYS - DO NOT ROUTE WITH STATION SERVICE OR POWER CONDUCTORS.
14. INSTALL CONTACTOR WITH TIMER RELAY FOR REMOTE LIGHTING CONTROL. OPERATE FROM DRY CONTACT ON CAMERA #1. TIMER TO TURN LIGHTS ON FOR 5 MINUTES EACH TIME CAMERA IS OPERATED. SEE SCHEMATIC 4/E4.1.
15. RTD TEMPERATURE SENSOR PROVIDED WITH SWITCHGEAR. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE NOTE 10.
16. ROUTE CAT5e FOR DATA AND 2#14 FOR GENERATOR SHUT DOWN FROM FIRE PANEL TO SWITCHGEAR MASTER SECTION, SEE NOTES 10 AND 13.

DATA DEVICE SCHEDULE

DEVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL
ROUTER - HIGH SPEED INTERNET	4-PORT GIGABIT ROUTER, DUAL 2.4 AND 5 GHz WIFI WITH ADJUSTABLE ANTENNAS, 4 GIGABIT LAN, 1 GIGBIT WAN, MINIMUM 256 MB RAM	ASUS RT-N66U OR APPROVED EQUAL
POE+ - POWER OVER ETHERNET CAMERA SWITCH	MINIMUM 4 PORT MANAGED GIGABIT SWITCH, MINIMUM 14 GBPS THROUGHPUT, MINIMUM 30W POWER OVER ETHERNET PER PORT, MINIMUM 130W TOTAL, 120VAC POWER	AXIS T8508 POE+ OR APPROVED EQUAL
CAMERAS	NETWORK CAMERA, HDTV 1080P RESOLUTION, 360 DEGREE PAN, MINIMUM 90 DEGREE TILT, 10X ZOOM, AUTO FOCUS, POWER OVER ETHERNET, WITH PROGRAMMABLE OUTPUT CONNECTIONS FOR EXTERNAL CONTROL OF LIGHTING	AXIS M5525-E PTZ OR APPROVED EQUAL

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.



NOTE: PRIOR TO ENERGIZING MAKE THE FOLLOWING SETTINGS ON CHARGER:
1) AC LINE VOLTAGE SWITCH TO "115V".
2) AUTO BOOST JUMPER TO "NORM".
3) FLOAT VOLTAGE JUMPER TO "13.50/27.00" (FOR GEL CELL).
4) BATTERY RANGE JUMPER TO "24V".

2 E5 BATTERY CHARGER ALARM WIRING DIAGRAM

NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: INSTRUMENTATION & DATA PLAN & DETAILS

Gray Stassel Engineering, Inc.
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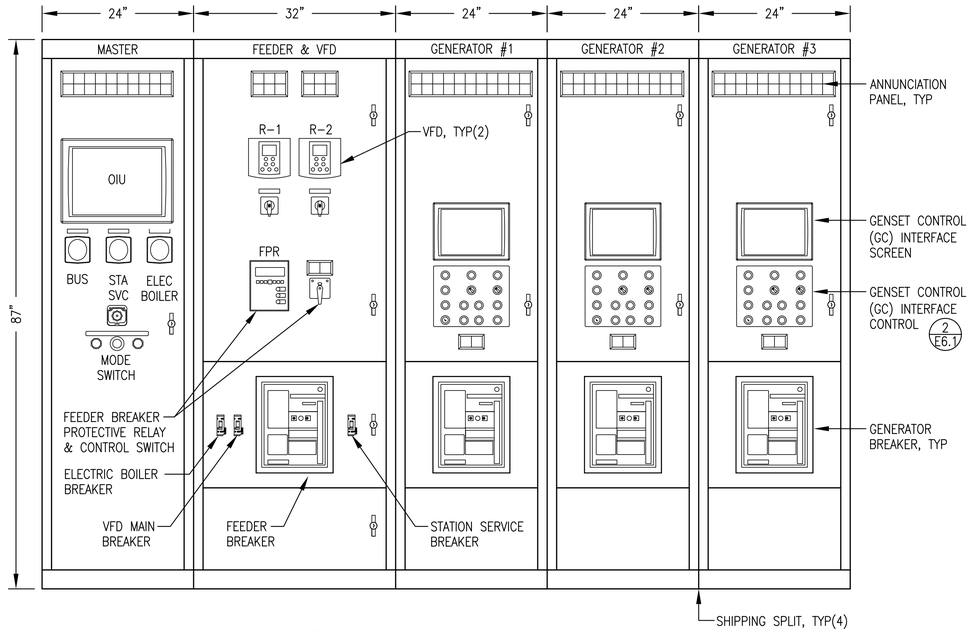
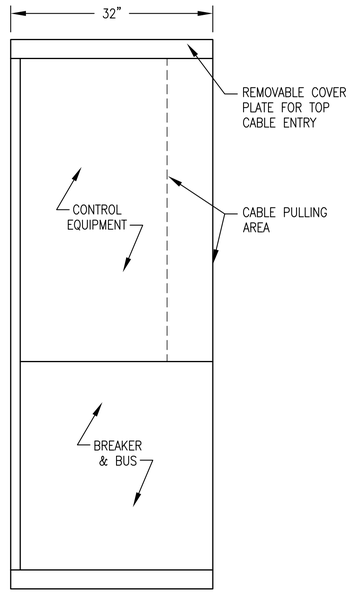
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 1/14/19
FILE NAME: PTH PPU E3-E5 | SHEET: E5 OF 7
PROJECT NUMBER:



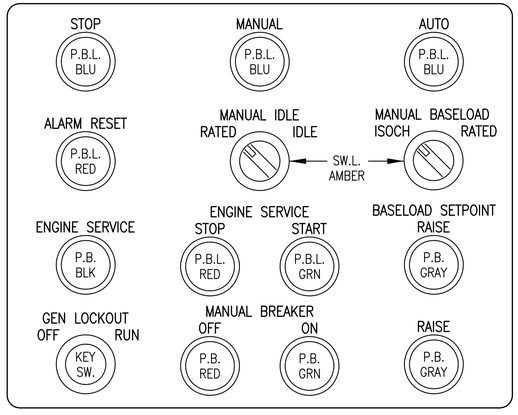
FRONT ELEVATION



TYPICAL CROSS SECTION

1 E6.1 SWITCHGEAR ENCLOSURE LAYOUT

NO SCALE



LEGEND:

P.B.	PUSH BUTTON
P.B.L.	PUSH BUTTON WITH LIGHT
SW.L.	SWITCH WITH LIGHT
KEY SW.	LOCKABLE KEY SWITCH

2 E6.1 EASYGEN INTERFACE CONTROLS

NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

TITLE: SWITCHGEAR ENCLOSURE LAYOUT

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

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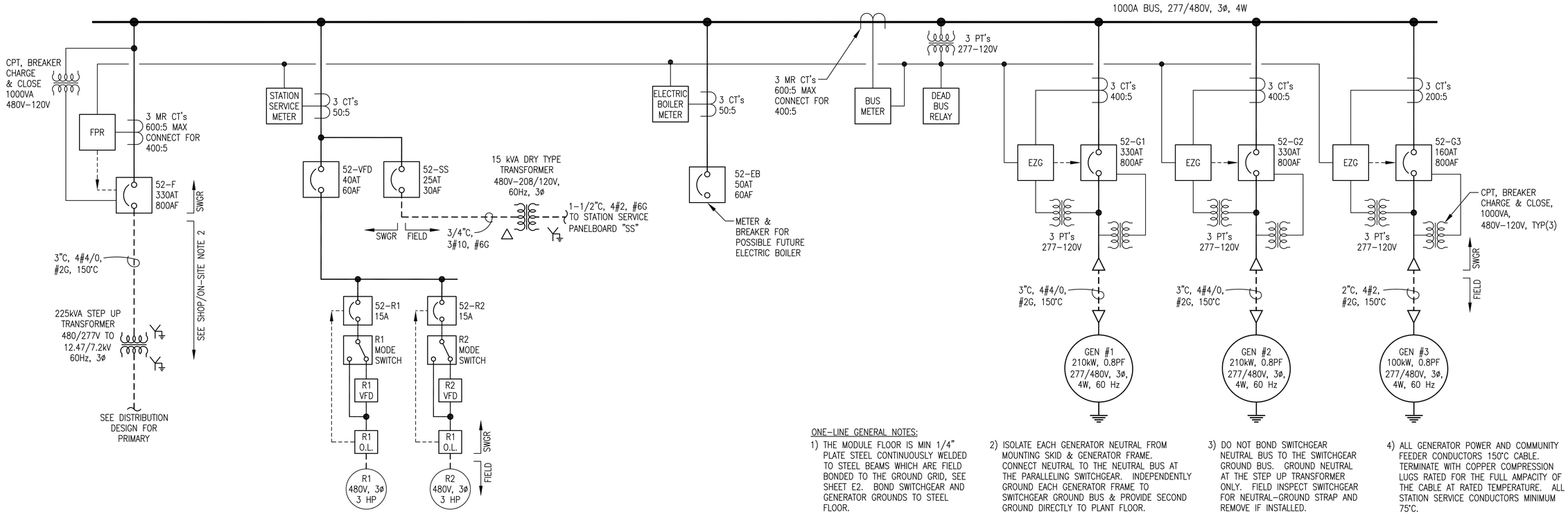
FILE NAME: PTH PPU E6	SHEET: E6.1 OF 7
PROJECT NUMBER:	

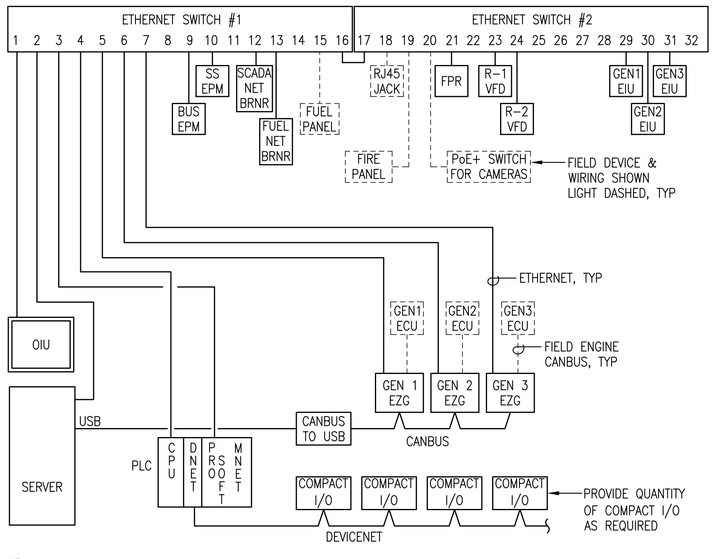


ONE–LINE GENERAL NOTES:

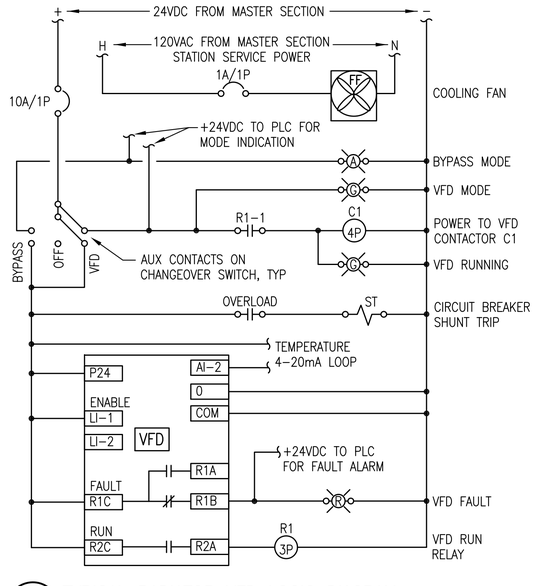
1) THE MODULE FLOOR IS MIN 1/4" PLATE STEEL CONTINUOUSLY WELDED TO STEEL BEAMS WHICH ARE FIELD BONDED TO THE GROUND GRID, SEE SHEET E2. BOND SWITCHGEAR AND GENERATOR GROUNDS TO STEEL FLOOR.
2) ISOLATE EACH GENERATOR NEUTRAL FROM MOUNTING SKID & GENERATOR FRAME. CONNECT NEUTRAL TO THE NEUTRAL BUS AT THE PARALLELING SWITCHGEAR. INDEPENDENTLY GROUND EACH GENERATOR FRAME TO SWITCHGEAR GROUND BUS & PROVIDE SECOND GROUND DIRECTLY TO PLANT FLOOR.
3) DO NOT BOND SWITCHGEAR NEUTRAL BUS TO THE SWITCHGEAR GROUND BUS. GROUND NEUTRAL AT THE STEP UP TRANSFORMER ONLY. FIELD INSPECT SWITCHGEAR FOR NEUTRAL–GROUND STRAP AND REMOVE IF INSTALLED.
4) ALL GENERATOR POWER AND COMMUNITY FEEDER CONDUCTORS 150°C CABLE. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE. ALL STATION SERVICE CONDUCTORS MINIMUM 75°C.

1 E6.2 SWITCHGEAR ONE–LINE DIAGRAM
NO SCALE

NOTE: PROVIDE 120VAC POWER FOR SERVER FROM UPS. ALL OTHER DEVICES 24VDC.



2 E6.2 COMMUNICATION SCHEMATIC
NO SCALE



3 E6.2 TYPICAL RADIATOR VFD LOGIC DIAGRAM
NO SCALE

SWITCHGEAR SYMBOL LEGEND

- TRANSFORMER PT=POTENTIAL XFRMR CPT=CONTROL POWER XFRMR
- CURRENT TRANSFORMER M.R. – INDICATES MULTIRATIO CT'S RATING FACTOR RF=2.0
- CIRCUIT BREAKER AT=AMP TRIP RATING AF=AMP FRAME RATING
- EZG — WOODWARD EASYGEN GENSET CONTROLLER
- FPR — FEEDER PROTECTION RELAY
- SHOP INSTALLED POWER WIRING/BUS
- FIELD INSTALLED POWER WIRING
- SHOP INSTALLED CONTROL WIRING

SWITCHGEAR SHOP/ON–SITE NOTES:

1) DEVICES AND WIRING NOTED AS FIELD ARE EXTERNAL TO THE SWITCHGEAR BUT ARE INCLUDED IN THE MODULE SHOP FABRICATION WORK.
2) THE FEEDER, STEP UP TRANSFORMER, AND DISTRIBUTION ARE TO BE INSTALLED AS PART OF THE ON–SITE WORK AND ARE NOT PART OF THE MODULE SHOP FABRICATION WORK.

ISSUED FOR CONSTRUCTION JANUARY 2019

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

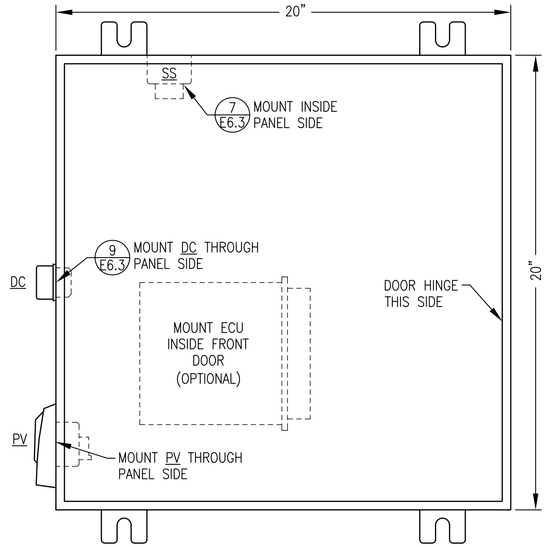
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

TITLE: SWITCHGEAR ONE–LINE & SCHEMATICS

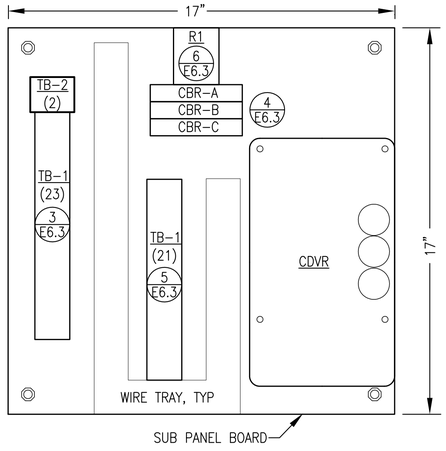
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 1/14/19
FILE NAME: PTH PPU E6 | SHEET: E6.2 OF 7
PROJECT NUMBER:



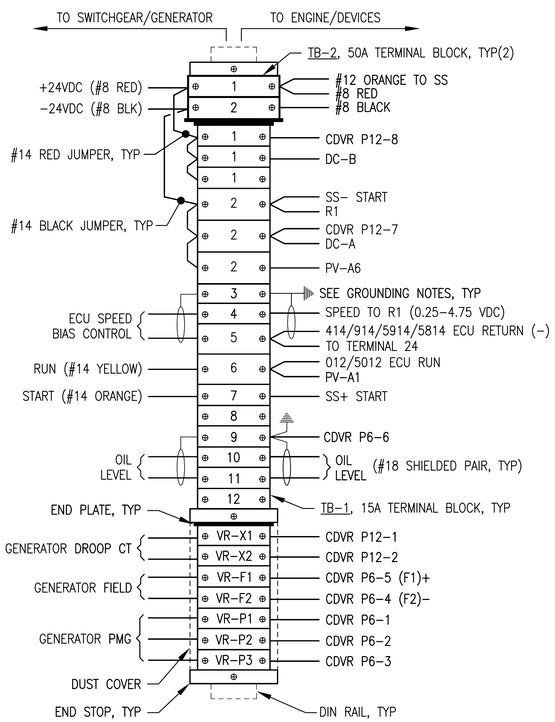
1 E6.3 JUNCTION BOX FRONT PANEL LAYOUT

NO SCALE



2 E6.3 JUNCTION BOX SUB PANEL LAYOUT

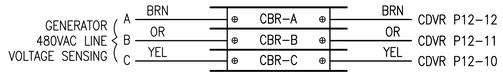
NO SCALE



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

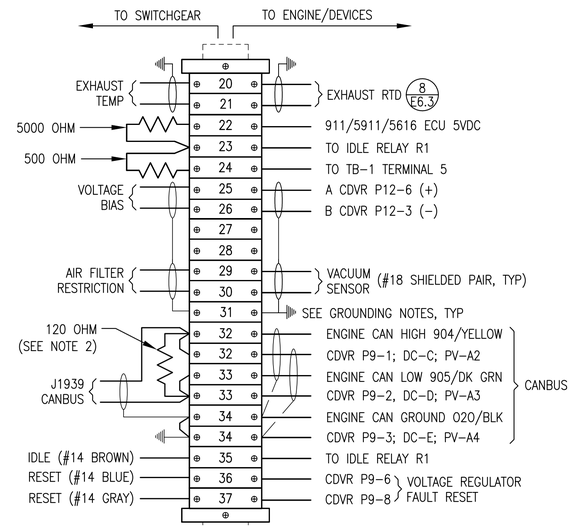
3 E6.3 TERMINAL STRIP CONNECTIONS

NO SCALE



4 E6.3 CIRCUIT BREAKER CONNECTIONS

NO SCALE



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

5 E6.3 TERMINAL STRIP CONNECTIONS

NO SCALE

BILL OF MATERIALS

TAG	MANUFACTURER	MODEL	DESCRIPTION
ENCLOSURE	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
CDVR	CATERPILLAR	314-7755	DIGITAL VOLTAGE REGULATOR
	CATERPILLAR	254-1265	HARNESS FOR VOLTAGE REGULATOR
CBR	ALLEN-BRADLEY	1489-M1-C010	RAIL MOUNT CIRCUIT BREAKER, 1-POLE, 1A
DC	JOHN DEERE	57M7919	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	JDL062397	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-8124	STARTER AUXILIARY SOLENOID, 24V
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK

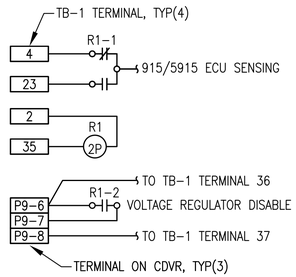
NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE 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. SIZE AS INDICATED.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE AS REQUIRED TO MATCH TERMINALS. LABEL ALL TERMINALS EXACTLY AS INDICATED ON THE DETAILS.
4) ALL WIRE #14AWG EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. LABEL BOTH ENDS OF ALL JUMPERS WITH THE ENGINE PANEL TERMINAL NUMBER.
5) PROVIDE MECHANICAL GROUND LUGS FASTENED TO BACK PANEL AND GROUNDED TO ENGINE-GENERATOR. GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.
6) PROVIDE WIRING HARNESSES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN LIQUID TIGHT FLEX OR FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
7) SHOP TEST EACH ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

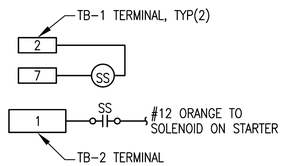
FIELD INSTALLATION NOTES:

1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE ENGINE PANEL TERMINAL NUMBER.
2) ON SHIELDED CONDUCTORS GROUND ALL SHIELD DRAIN WIRES TO LUGS AT PANEL END ONLY.



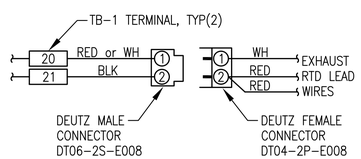
6 E6.3 IDLE RELAY R1 WIRING DIAGRAM

NO SCALE



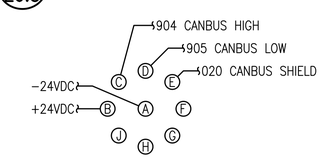
7 E6.3 STARTER AUX SOLENOID SS WIRING

NO SCALE



8 E6.3 EXHAUST RTD CONNECTOR

NO SCALE



9 E6.3 DIAGNOSTIC CONNECTOR WIRING

NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

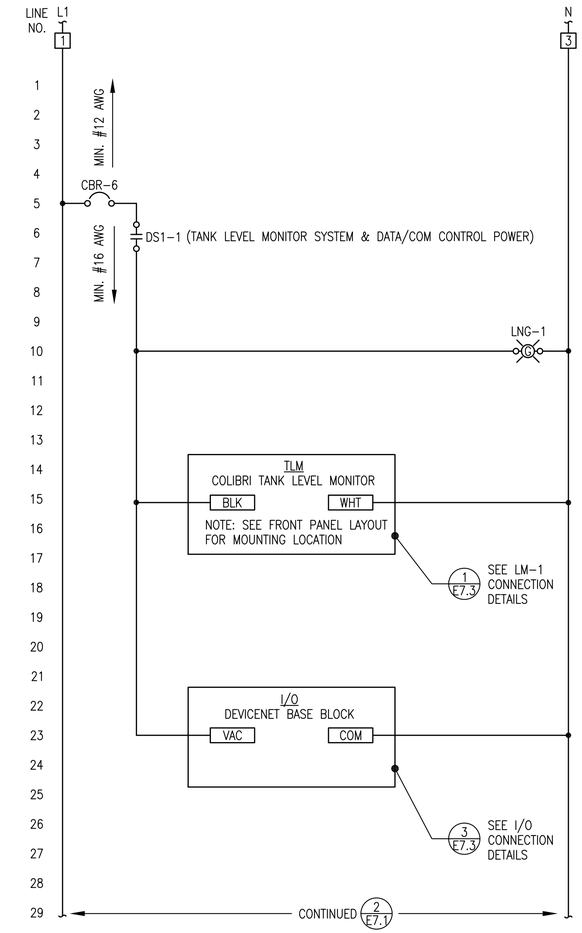
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

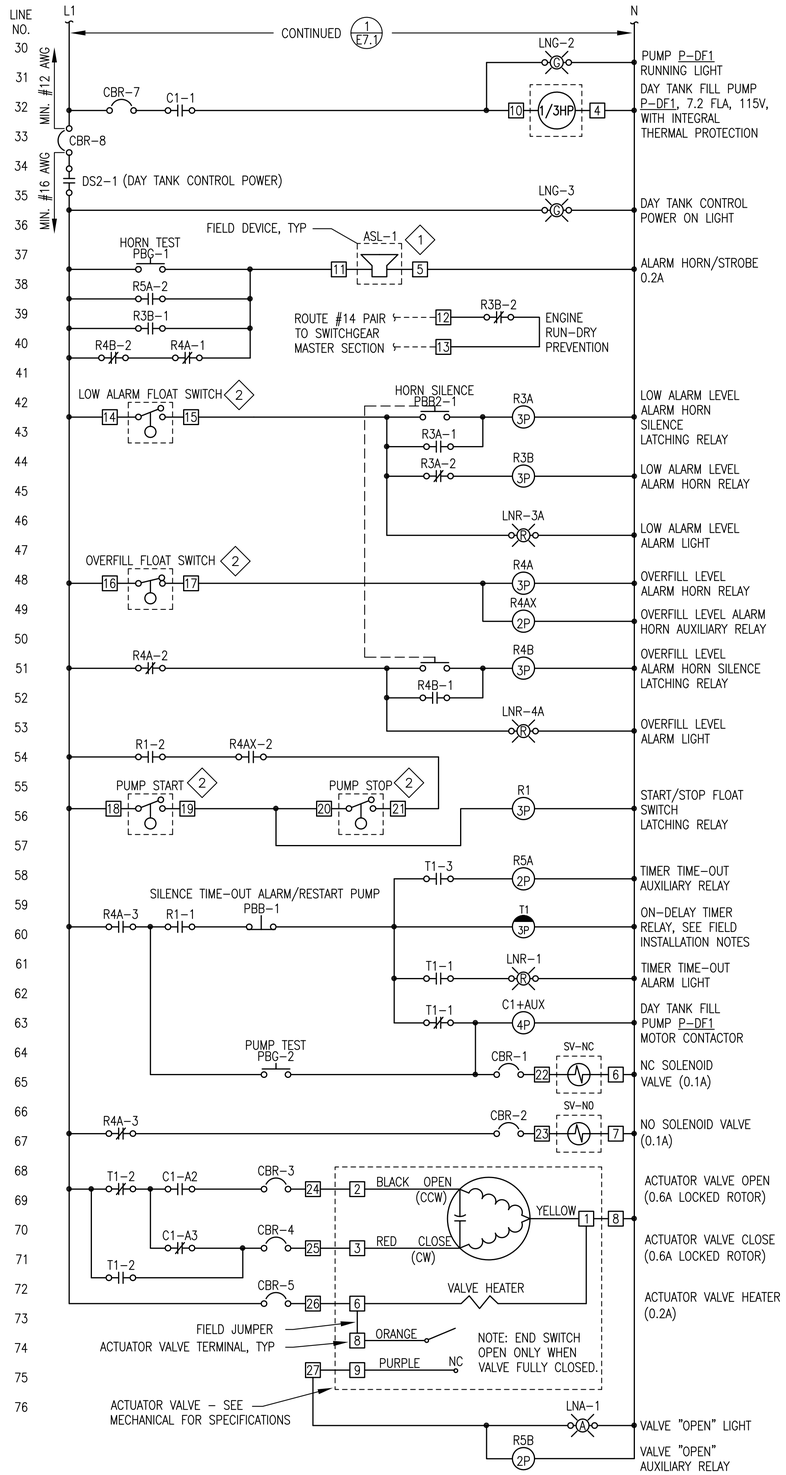
TITLE: 24VDC ENGINE WIRING JUNCTION BOX

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 1/14/19
FILE NAME: PTH PPU E6	SHEET: E6.3 OF 7
PROJECT NUMBER:	



1 E7.1 DAY TANK LOGIC LOGIC DIAGRAM
NO SCALE



2 E7.1 DAY TANK LOGIC DIAGRAM (CONTINUED)
NO SCALE

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

TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
AUX	1	ALLEN-BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
C	1	ALLEN-BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR-1,2,3,4,5	5	ALLEN-BRADLEY	1489-M1-C010	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 1A
CBR-6,8	2	ALLEN-BRADLEY	1489-M1-C050	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR-7	1	ALLEN-BRADLEY	1489-M1-C150	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 15A
DS	2	ALLEN-BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	2	ALLEN-BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNG	3	ALLEN-BRADLEY	800HQRH2G	GREEN LED PILOT LIGHT, 12-130V, NEMA 4X
LNR	3	ALLEN-BRADLEY	800HQRH2R	RED LED PILOT LIGHT, 12-130V, NEMA 4X
LNA	1	ALLEN-BRADLEY	800HQRH2A	AMBER LED PILOT LIGHT, 12-130V, NEMA 4X
I/O	1	ALLEN-BRADLEY	1790D-T8A0	120VAC DEVICENET 8 INPUT BASE TERM. BLOCK
PBB	1	ALLEN-BRADLEY	800HAR2D2	MOMENTARY PUSH BUTTON, 1 NC, NEMA 4X, BLACK
PBB2	1	ALLEN-BRADLEY	800HAR2A2	MOMENTARY PUSH BUTTON, 2 NO, NEMA 4X, BLACK
PBG	2	ALLEN-BRADLEY	800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
PP	1	PHOENIX CONTACTS	FLPPRJ45/RJ45	ETHERNET PATCH PANEL, RJ45xRJ45, DIN RAIL MOUNT
R (3P)	5	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	5	ALLEN-BRADLEY	700HN101	11 PIN SOCKET BASE
R (2P)	3	ALLEN-BRADLEY	700HA32A1	DPDT RELAY
T	3	ALLEN-BRADLEY	700HN100	8 PIN SOCKET BASE
	1	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	1	ALLEN-BRADLEY	700HN205	11 PIN RELAY SOCKET BASE FOR TIMER
	1	ALLEN-BRADLEY	700HT3	SERIES B TIMING MODULE
TB-1/2	42	ALLEN-BRADLEY	1492CAM1L	35A, 600V, LARGE-HEAD SCREW TERMINALS
*TLM	*1	* OWNER FURNISHED COMPONENT TO BE INSTALLED BY PANEL FABRICATOR IN PANEL FACE AND CONNECTED AS INDICATED		* FRANKLIN/INCON COLIBRI CL6D TANK LEVEL MONITOR CONSOLE, COLOR LCD SCREEN, ETHERNET CONNECTION WITH WEB INTERFACE, PROGRAMMABLE VOLUME CALCULATIONS FOR UP TO SIX TANKS WITH TEMPERATURE COMPENSATION

LEGEND

- R# — CONTROL RELAY
- T# — TIME DELAY RELAY
- C# — CONTACTOR
- # — TERMINAL BLOCK
- CB-# — CIRCUIT BREAKER
- PANEL WIRING
- R#-# — NORMALLY OPEN CONTACT
- SS-# — 2-POSITION SELECTOR SWITCH
- R#-# — NORMALLY CLOSED CONTACT
- O.L. — OVERLOADS
- PB-# — NORMALLY OPEN MOMENTARY PUSH BUTTON
- PB-# — NORMALLY CLOSED MOMENTARY PUSH BUTTON
- FIELD WIRING
- SW-# — NORMALLY OPEN FLOAT SWITCH
- SW-# — NORMALLY CLOSED FLOAT SWITCH
- SV# — SOLENOID VALVE
- ASL-# — ALARM & STROBE LIGHT

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

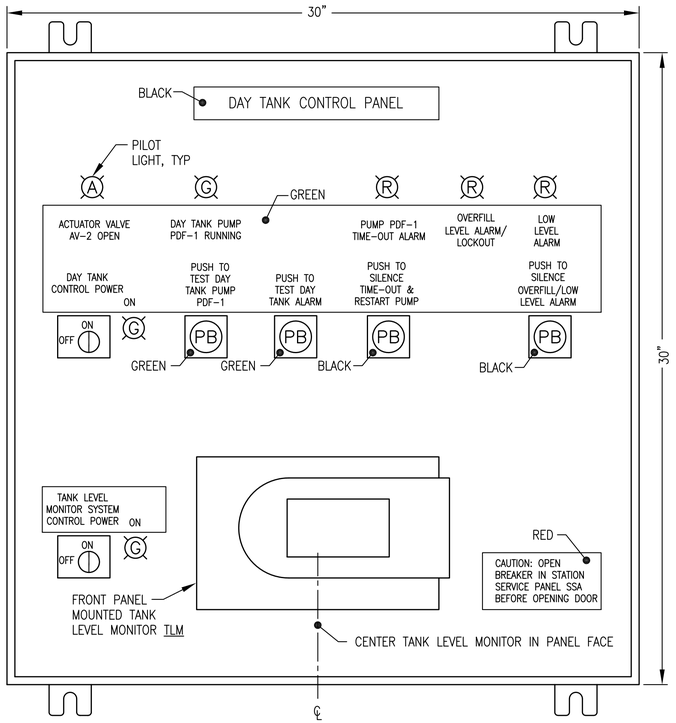
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

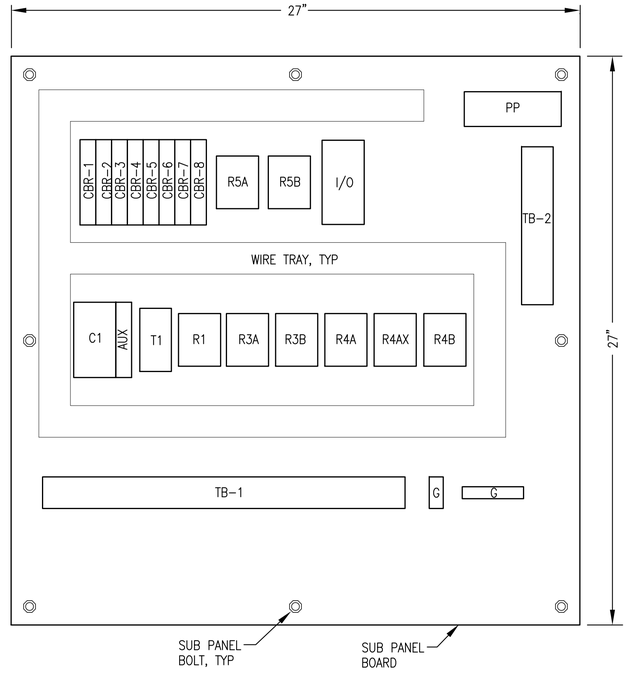
TITLE: DAY TANK CONTROL PANEL
LOGIC DIAGRAM & BILL OF MATERIALS

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

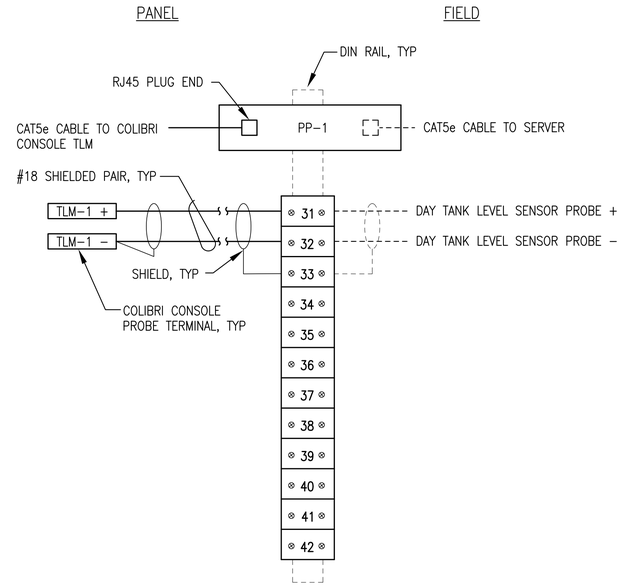
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG/CWV | DATE: 1/14/19
FILE NAME: PTH PP E7 | SHEET: E7.1 OF 7
PROJECT NUMBER:



1 E7.2 FRONT PANEL LAYOUT
NO SCALE



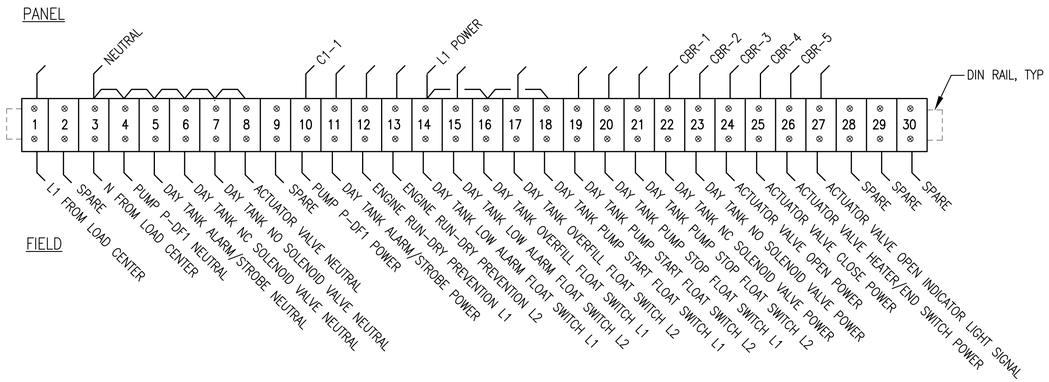
2 E7.2 SUB PANEL LAYOUT
NO SCALE



NOTES:

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.

3 E7.2 TB–2 TERMINAL STRIP AND PP–1 ETHERNET PATCH PANEL LAYOUT
NO SCALE



NOTES:

1) INSTALL TERMINAL STRIP TB–1 ON HORIZONTAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP BELOW PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO BOTTOM OF PANEL, SEE SUB–PANEL LAYOUT.

2) IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 6 EACH 35A SCREW TERMINAL GROUNDING BUS.

4 E7.2 TB–1 TERMINAL STRIP LAYOUT
NO SCALE

ISSUED FOR CONSTRUCTION
JANUARY 2019

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

ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

TITLE: DAY TANK CONTROL PANEL
LAYOUT & TERMINAL STRIPS

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

DRAWN BY: JTD
SCALE: AS NOTED
DESIGNED BY: BCG/CWV
DATE: 1/14/19
FILE NAME: PHL PP E7
SHEET: E7.2 OF 7
PROJECT NUMBER:

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"TALLx30"WIDEx8"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 ENTRIES 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) SET TIMING RELAY TIME DELAY TO 30 MINUTES (APPROX. 55 GALS. REQUIRED FROM PUMP START TO PUMP STOP LEVEL @ APPROX. 4 GPM). ON THE INITIAL TANK FILL, THE SILENCE TIME OUT/RESTART BUTTON MAY HAVE TO BE PRESSED IN ORDER TO GET THE FUEL LEVEL TO WITHIN THE NORMAL OPERATING RANGE. SEE "SEQUENCE OF OPERATIONS".

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.

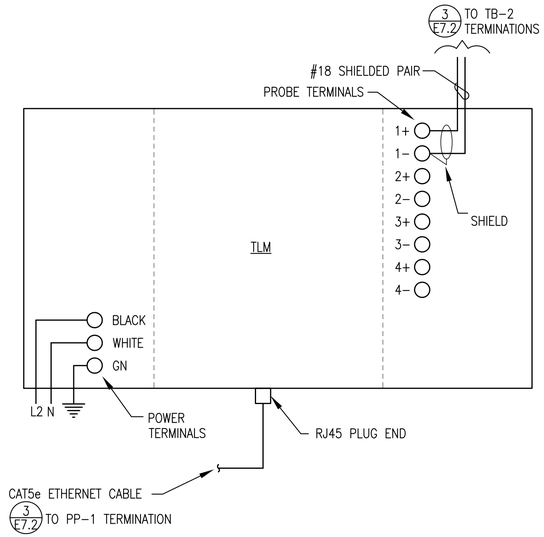
3) NORMAL FILL OPERATION – WHEN THE FUEL LEVEL DROPS TO THE "PUMP START" SWITCH, THE TIMER IS STARTED, THE N.C. DAY TANK SOLENOID VALVE OPENS, THE REMOTE ACTUATOR VALVE OPENS & THE VALVE "OPEN" LIGHT TURNS ON, THE DAY TANK PUMP IS ENERGIZED, AND THE PUMP "ON" LIGHT TURNS ON. WHEN THE ACTUATOR IS IN THE 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.

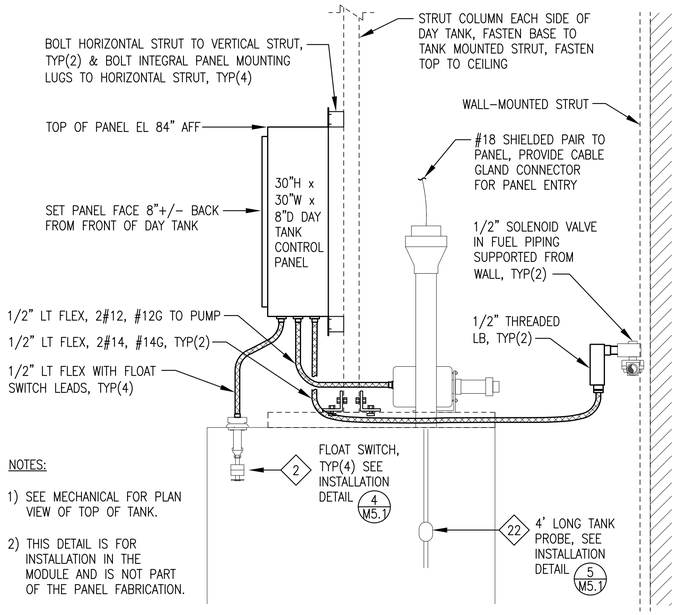
5) OVERFILL FUEL LEVEL – IF THE TANK OVERFILLS AND THE FUEL LEVEL REACHES THE "OVERFILL" FLOAT SWITCH, THE N.O. DAY TANK SOLENOID VALVE CLOSES, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, 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).

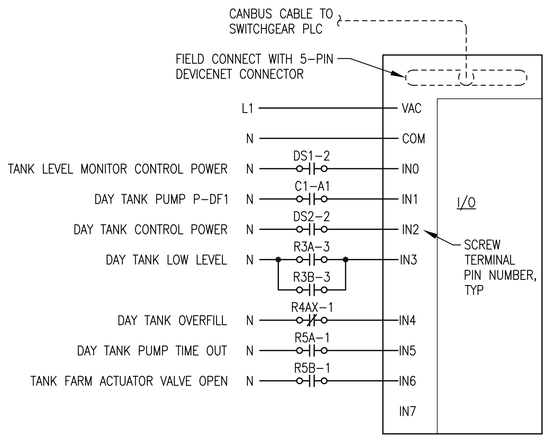
7) PUMP & HORN TEST – MOMENTARY CONTACT BUTTONS ARE PROVIDED TO TEST FUNCTION OF THE DAY TANK PUMP AND ALARM HORN. PRESSING THE "PUSH TO TEST DAY TANK PUMP" BUTTON STARTS THE TIMER, MOMENTARILY OPENS THE N.C. DAY TANK SOLENOID VALVE & ACTUATED BALL VALVE, ENERGIZES THE DAY TANK PUMP, AND TURNS ON THE 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.



1 E7.3 TANK LEVEL MONITOR (TLM) CONSOLE CONNECTION DETAILS
NO SCALE



2 E7.3 DAY TANK CONTROL PANEL & DEVICE INSTALLATION
NO SCALE



3 E7.3 DEVICENET TERMINAL BLOCKS (I/O) LOGIC & CONNECTION DETAILS
NO SCALE

ISSUED FOR CONSTRUCTION JANUARY 2019

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

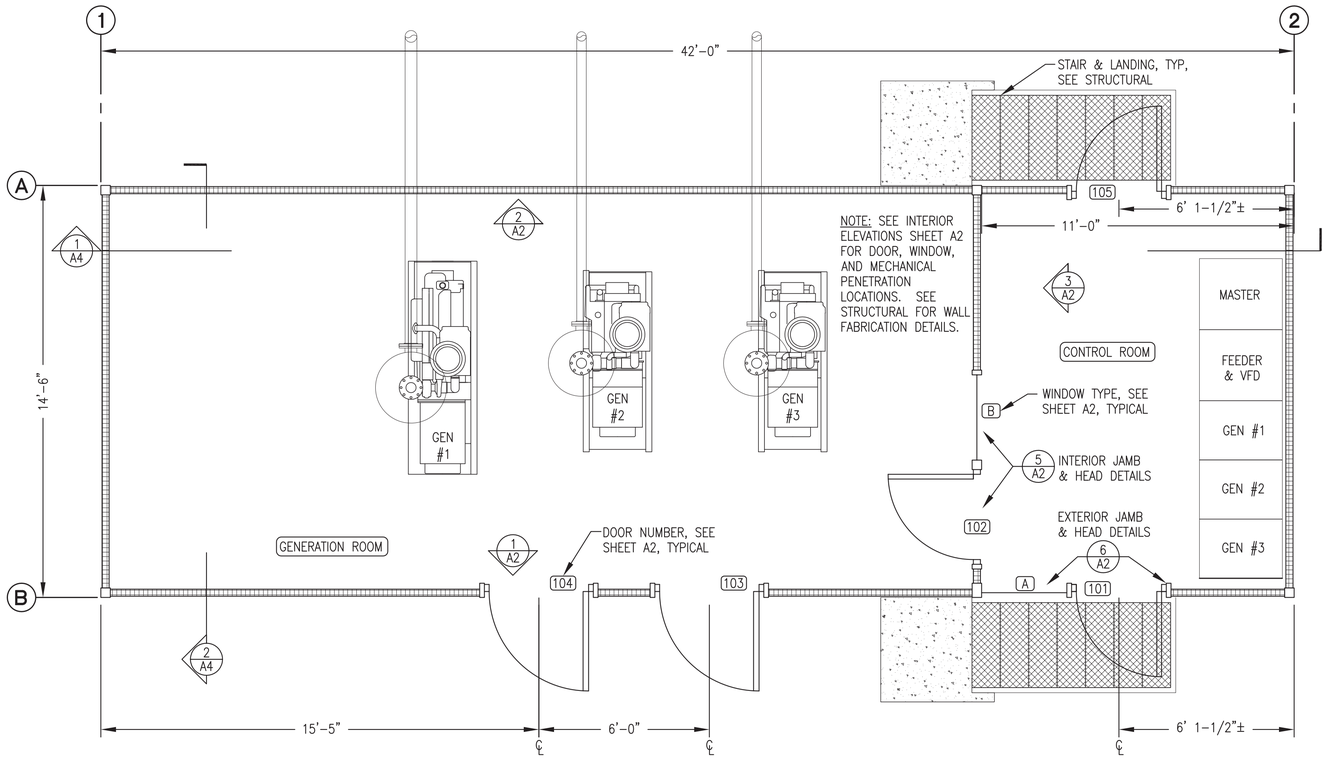
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM POWER PLANT UPGRADE

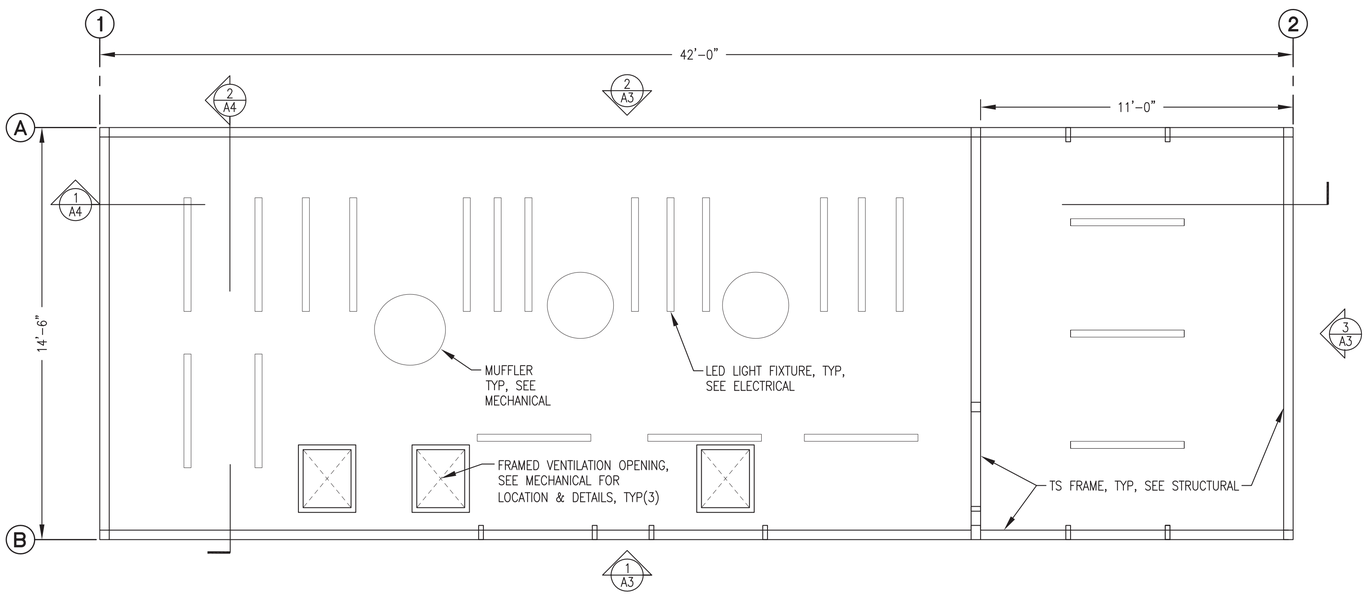
TITLE: DAY TANK CONTROL PANEL SEQUENCE OF OPERATION & DETAILS

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG/CWV	DATE: 1/14/19
FILE NAME: PTH PP E7	SHEET: E7.3 OF 7
PROJECT NUMBER:	



1 A1 FLOOR PLAN
3/8"=1'-0"



2 A1 REFLECTED CEILING PLAN
3/8"=1'-0"

CODE ANALYSIS – 2012 EDITION INTERNATIONAL BUILDING CODE

OCCUPANCY CLASSIFICATION
GROUP F-1: FACTORY INDUSTRIAL MODERATE HAZARD – ELECTRIC GENERATION PLANT — REF: IBC-2012, SEC. 306.2

TYPE OF CONSTRUCTION — REF: IBC-2012, TABLE 601
TYPE V-B (NON-RATED) — REF: IBC-2012, SEC. 602.5

BUILDING HEIGHTS AND AREAS — REF: IBC-2012, TABLE 503
ALLOWED 40'-0" 1 STORY 8,500 S.F. PROVIDED: 17'-0" 1 STORY 610 S.F.

FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS — REF: IBC-2012, TABLE 601
STRUCTURAL FRAME 0 HR BEARING WALLS 0 HR INTERIOR PARTITIONS 0 HR FLOOR 0 HR ROOF 0 HR

FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS — REF: IBC-2012, TABLE 602
EXTERIOR WALLS $10' \leq X \leq 30'$ 0 HR

FIRE PROTECTION SYSTEM — REF: IBC-2012, SEC. 903.2.4
FIRE PROTECTION NOT REQUIRED. WATER MIST FIRE SUPPRESSION SYSTEM PROVIDED (SEE MECHANICAL).

OCCUPANT LOAD — REF: IBC-2012, TABLE 1004.1.2
MECHANICAL/STORAGE = 300 S.F./PERSON 610 S.F./300 S.F. PER OCCUPANT = 2 OCCUPANTS

MEANS OF EGRESS – TRAVEL DISTANCE — REF: IBC-2012, TABLE 1016.2
REQUIRED 200' PROVIDED 20'

ARCHITECTURAL GENERAL NOTES:

1) SEE CIVIL SITE PLAN FOR LOCATION AND LAYOUT. PROVIDE SEPARATION TO PROPERTY BOUNDARIES IN ACCORDANCE WITH CODE ANALYSIS.
2) DO NOT BLOCK OR OBSTRUCT ACCESS, REQUIRED PARKING AREAS, OR REQUIRED EGRESS FROM NEIGHBORING FACILITIES. PROVIDE TEMPORARY BARRICADES OR OTHER FORMS OF PROTECTION TO PROTECT EMPLOYEES, RESIDENTS, AND VISITORS FROM INJURIES DURING CONSTRUCTION ACTIVITIES
3) PROJECT MANAGER SHALL BE RESPONSIBLE FOR ALL BUILDING PERMITS, LETTERS OF NON-OBJECTION, UTILITY SERVICES AND APPLICATIONS AS REQUIRED. PROJECT MANAGER OR CONSTRUCTION MANAGER TO BE RESPONSIBLE FOR ALL REQUIRED SAFETY PRECAUTIONS, METHODS AND TECHNIQUES.
4) PROVIDE A COMPLETE AND OPERATIONAL FACILITY. ALL WORK TO BE IN ACCORDANCE WITH CURRENT APPROVED EDITIONS OF THE IBC, IMC, IFC, AND NEC INCLUDING STATE OF ALASKA AMENDMENTS.
5) SEE SHEETS A3 AND A4 FOR DESCRIPTION OF FIELD INSTALLED ROOF SYSTEM.
6) INSULATE ALL WALLS, FLOORS, AND CEILINGS WITH HIGH TEMPERATURE MINERAL FIBER ACOUSTICAL FIRE BATT INSULATION, MIN R VALUE 4 PER INCH, MIN 2000F MELTING TEMP. ROXUL AFB OR EQUAL. FILL ALL PANEL VOIDS OR PROVIDE THICKNESS AS INDICATED ON DRAWINGS. MECHANICALLY FASTEN FLOOR INSULATION TIGHT TO FLOOR.
7) UPON COMPLETION OF FABRICATION ROUND ALL CORNERS AND GRIND EDGES SMOOTH AND PAINT ALL INTERIOR AND EXTERIOR EXPOSED STEEL. PERFORM ALL PAINTING IN A WARM DRY ENVIRONMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INCLUDING DRYING TIME TO RE-COAT.
8) SANDBLAST EXTERIOR SURFACE TO SSPC-SP-10. PRIME WITH ONE COAT OF REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA-COAT 302, NO SUBSTITUTES, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. COVER WITH TWO COATS OF EPOXY, DEVOE BAR-RUST 236, NO SUBSTITUTES, TO 12 MILS DRY FILM THICKNESS. FIRST COAT COLOR GRAY, SECOND COAT COLOR WHITE.
9) FINISH EXTERIOR WALLS AND SKIDS (ALL EXPOSED VERTICAL EXTERIOR SURFACES) WITH ONE COAT OF ALIPHATIC URETHANE ENAMEL, DEVOE DEVTHANE 389, NO SUBSTITUTES, COLOR WHITE, TO 3 MILS DRY FILM THICKNESS.
10) SANDBLAST INTERIOR SURFACE TO SSPC-SP-6. PRIME AND FINISH WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, TO 8 MILS TOTAL DRY FILM THICKNESS. CEILING COLOR WHITE. WALL AND FLOOR COLOR STRUCTURAL GRAY 4031. NOTE THAT FIRST COAT ON WALLS AND FLOOR MAY BE WHITE.

NOTE: THIS DRAWING INCLUDES DETAILS THAT ARE NOT PART OF THE MODULE ASSEMBLY SCOPE AND IS PROVIDED STRICTLY FOR IDENTIFYING LOCATIONS, INSTALLATION DETAILS, AND SPECIFICATIONS FOR DOORS AND WINDOWS.

ISSUED FOR CONSTRUCTION
OCTOBER 2018

STATE OF ALASKA 49 TH
David G. Thompson
No. 7034
10/16/18
REGISTERED PROFESSIONAL ARCHITECT

ALASKA ENERGY AUTHORITY

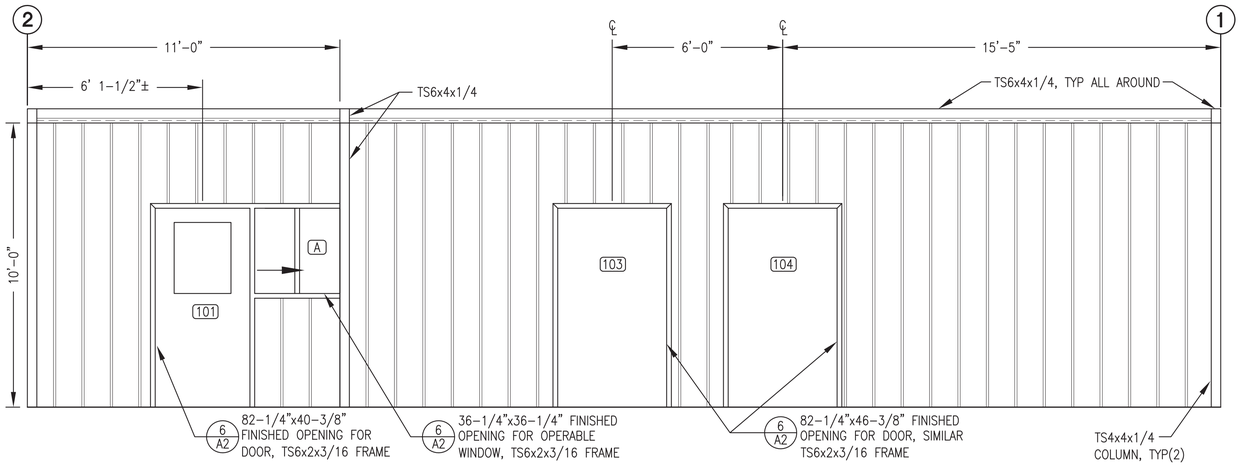
PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

TITLE: FLOOR PLAN, REFLECTED CEILING PLAN, CODE ANALYSIS, & GENERAL NOTES

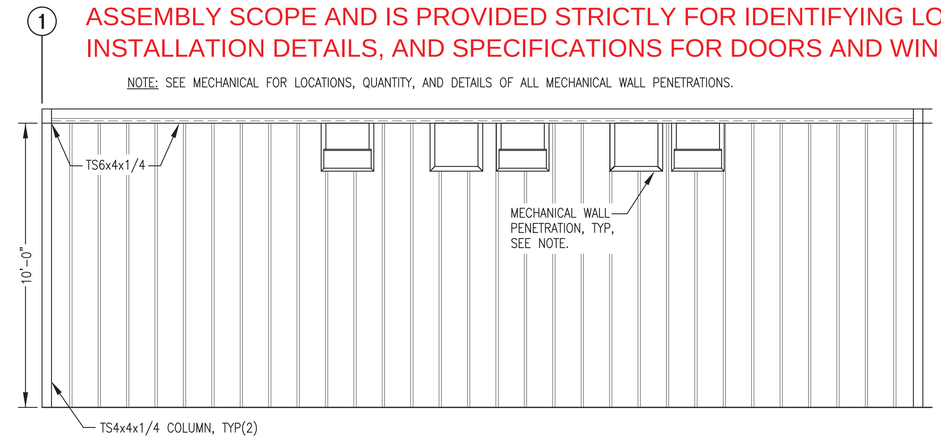
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD
DESIGNED BY: BCG/DGT
FILE NAME: PTH PPU A1-4
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 10/16/18
SHEET: A1 OF 4

NOTE: THIS DRAWING INCLUDES DETAILS THAT ARE NOT PART OF THE MODULE ASSEMBLY SCOPE AND IS PROVIDED STRICTLY FOR IDENTIFYING LOCATIONS, INSTALLATION DETAILS, AND SPECIFICATIONS FOR DOORS AND WINDOWS.



1 A2 FRONT WALL INTERIOR ELEVATION
3/8"=1'-0"



2 A2 PARTIAL GENERATOR ROOM BACK WALL INTERIOR ELEVATION
3/8"=1'-0"

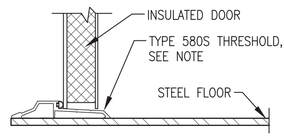
3 A2 CONTROL ROOM WALL INTERIOR ELEVATION
3/8"=1'-0"

FRAMED OPENING NOTES:

1) FABRICATE FRAMED OPENINGS FOR DOORS, WINDOWS, ETC, WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS. GRIND OUT INSIDE OF MITERED CORNERS TO PROVIDE FULL CLEAR OPENING.

2) FABRICATE TO FINISHED INSIDE (CLEAR) DIMENSIONS INDICATED AND LOCATE TO INSIDE EDGE OR CENTERLINE AS INDICATED.

NOTE: SET THRESHOLD IN CONTINUOUS BED OF POLYURETHANE CAULK & CAULK ENDS TO JAMB TO FORM LIQUID TIGHT CONTAINMENT.



4 A2 TYPICAL DOOR THRESHOLD
NO SCALE

DOOR CONSTRUCTION							FRAME CONSTRUCTION						
DOOR NO.	WIDTH	HEIGHT	THICK NESS	MATERIAL	CORE	REMARKS	WALL THICK.	MATERIAL	TYPE	PROFILE	PREP.	FIRE RATING	HDWR. GROUP
101	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE	24"x24" RE-LIGHT {4}	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-1
102	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE	24"x24" RE-LIGHT {4}	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-2
103	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE		N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-3
104	3'-6"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE		N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-3
105	3'-0"	6'-8"	1-3/4"	16 GA. H.M.	POLYURETHANE	24"x24" RE-LIGHT {4}	N/A	16 GA. H.M.	WELDED	SINGLE RABBETED	DIMPLE & PUNCH	NONE	HW-1

DOOR HARDWARE:

HW-1

3	EA	HINGES	HAGER	BB1191 4.5 x 4.5NRP x 630
1	EA	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1	EA	CORE	BEST	BROWN CONSTRUCTION CORE
1	EA	DOOR CLOSER	LCN	4040 x CUSH x 689
1	EA	KICK PLATE	ROCKWOOD	K1050 10 x 34 x 630
1	EA	WEATHER STRIP	PEMKO	2891AS x 36 (HEAD)
2	EA	WEATHER STRIP	PEMKO	290AS x 80 (SIDE JAMBS)
1	EA	THRESHOLD	HAGER	580S x 36

HW-2

3	EA	HINGES	HAGER	BB1191 4.5 x 4.5 x 630
1	EA	EXIT DEVICE	PRECISION	2108 x 4908AX3 x 630
1	EA	DOOR CLOSER	LCN	4040 x CUSH x 689
1	EA	KICK PLATE	ROCKWOOD	K1050 10 x 34 x 630
1	EA	MOP PLATE	ROCKWOOD	K1050 10 x 35 x 630
1	EA	SOUND SEAL	PEMKO	2891AS x 36 (HEAD)
2	EA	SOUND SEAL	PEMKO	290AS x 80 (SIDE JAMBS)
1	EA	THRESHOLD	HAGER	580S x 36

HW-3

3	EA	HINGES	HAGER	BB1191 4.5 x 4.5NRP x 630
1	EA	EXIT LOCK	SCHLAGE	ND25D x RHODES x 626
1	EA	OVERHEAD STOP	ROCKWOOD	OH1004M x US32D
1	EA	WEATHER STRIP	PEMKO	2891AS x 42 (HEAD)
2	EA	WEATHER STRIP	PEMKO	290AS x 80 (SIDE JAMBS)
1	EA	THRESHOLD	HAGER	580S x 42

NOTES:

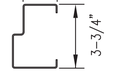
{1} DOORS AND HOLLOW METAL FRAMES GALVANIZED AND FACTORY PRIMED. ALL FRAMES WELDED CONSTRUCTION, DIMPLED AND PUNCHED.

{2} DOORS TO HAVE SOLID POLYURETHANE INSULATION CORE WITH TOPS INVERTED AND CAULKED WATER TIGHT.

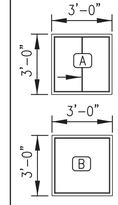
{3} FINISH ALL DOORS AND HOLLOW METAL FRAMES WITH TWO COATS OF SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.

{4} INSTALL INSULATED RE-LIGHT WITH TWO PANES OF 1/4" LAMINATED SAFETY GLASS WITH 1/2" AIR GAP IN EACH DOOR PANEL, 24"x24" OR 24"x18" AS INDICATED.

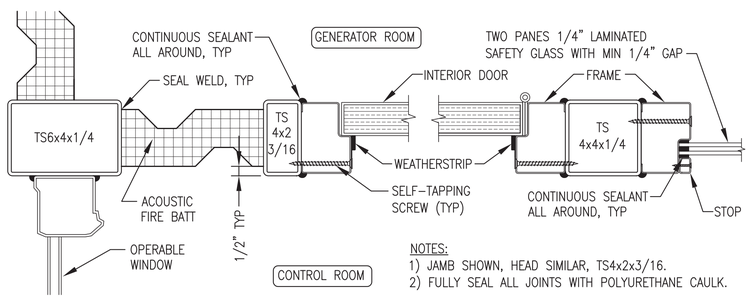
DOOR FRAME PROFILE:



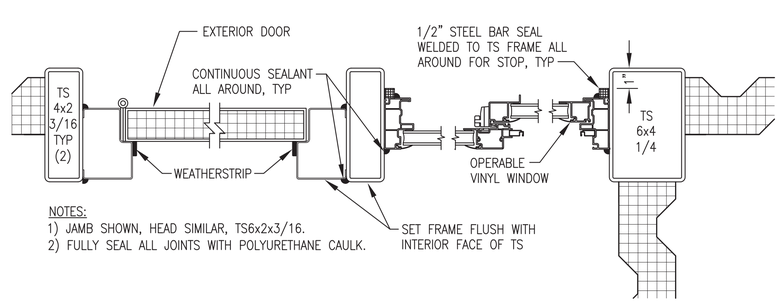
WINDOW TYPES:



NOTE: DIMENSIONS ARE OVERALL FRAME SIZE.



5 A2 INTERIOR DOOR AND WINDOW JAMB/HEAD
3"=1'-0"



6 A2 TYPICAL EXTERIOR DOOR AND WINDOW JAMB/HEAD
3"=1'-0"

ISSUED FOR CONSTRUCTION
OCTOBER 2018

STATE OF ALASKA 49 TH
David G. Thompson No. 7034 10/16/18
REGISTERED PROFESSIONAL ARCHITECT

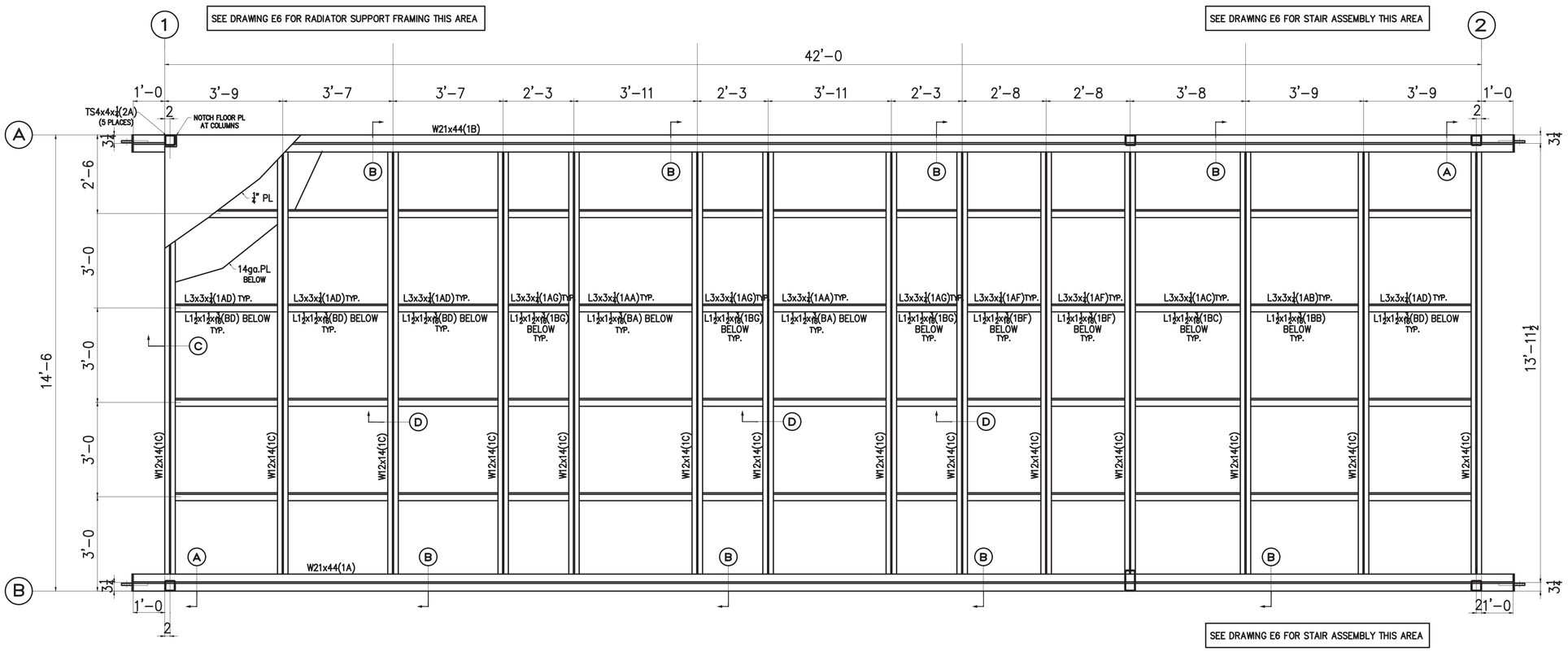
ALASKA ENERGY AUTHORITY

PROJECT: PORT HEIDEN RURAL POWER SYSTEM
POWER PLANT UPGRADE

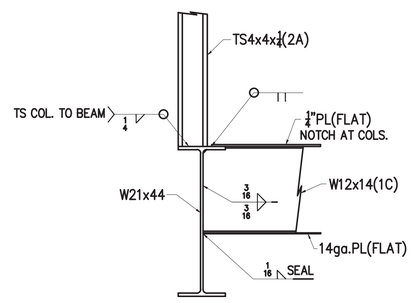
TITLE: INTERIOR ELEVATIONS & DOOR/WINDOW DETAILS

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

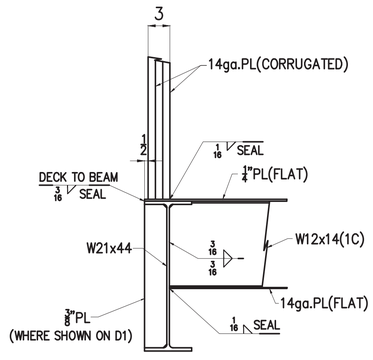
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG/DGT | DATE: 10/16/18
FILE NAME: PTH PPU A1-4 | SHEET: A2 OF 4
PROJECT NUMBER:



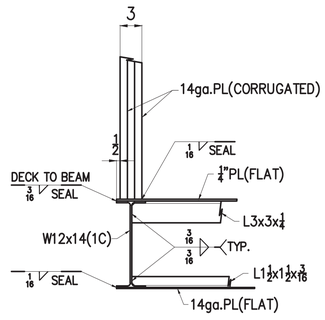
BASE FRAMING PLAN



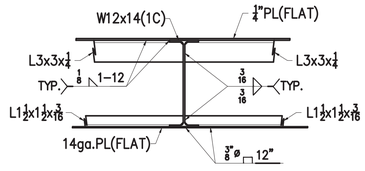
SECTION A



SECTION B



SECTION C



SECTION D

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

Submittal review is only for ascertaining general conformance with the Contract Documents. Approval does not relieve the Contractor of responsibility for full compliance with the Contract Documents.

By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
1	1/4/19	DWH	REVISED SEC. A & B
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

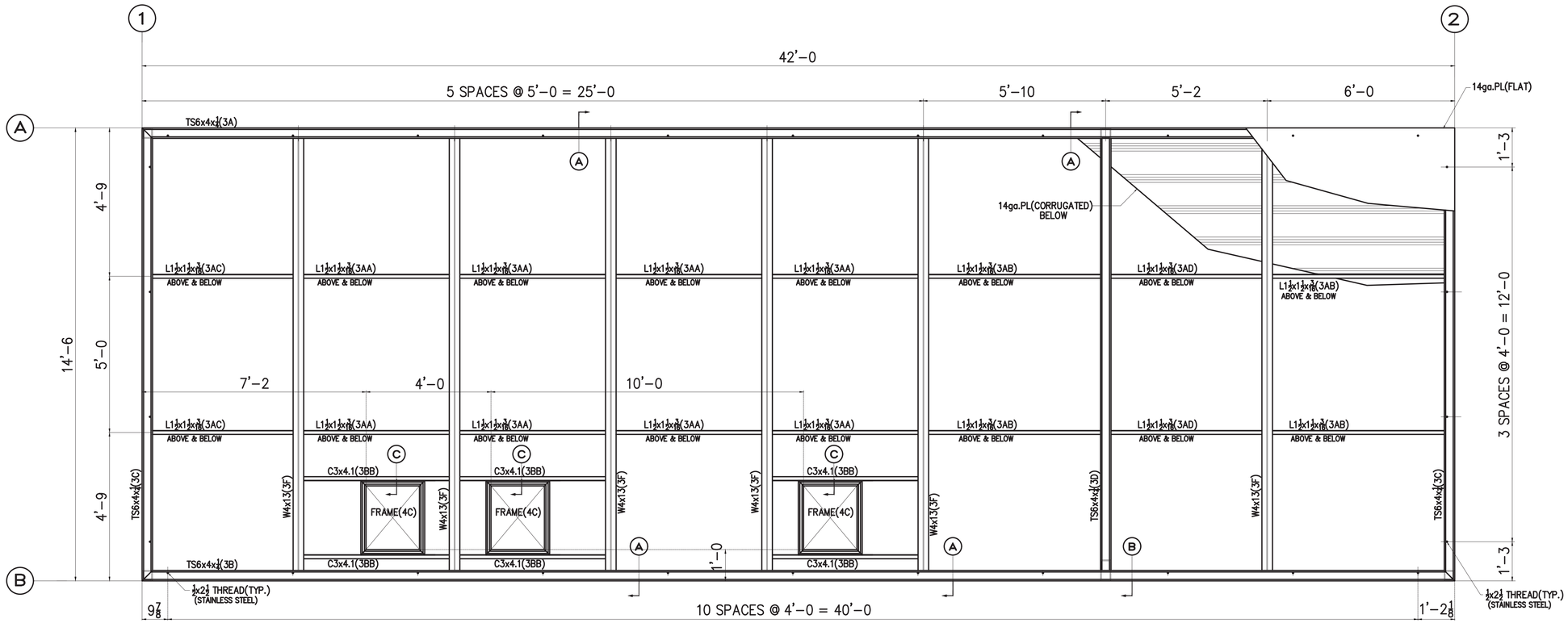
CLEANING PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

PROJECT
CLARKS POINT POWER SYSTEM UPGRADE
BASE FRAMING PLANS

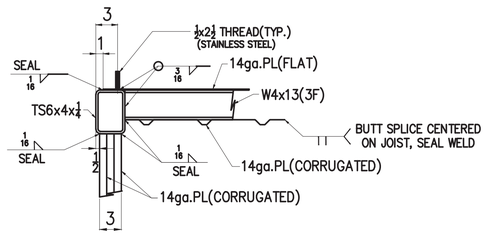
CUSTOMER
ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		E1

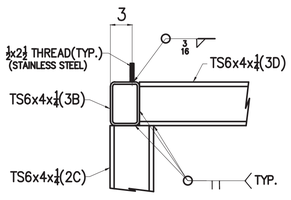
Structural Detailing Services of Alaska 907-336-2220 Fax:907-336-2231 dholland@gci.net



CEILING FRAMING PLAN



SECTION A



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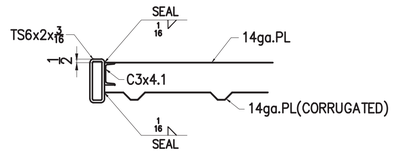


SECTION C

APPROVED
☐ APPROVED WITH CORRECTIONS NOTED
☐ REJECTED
☐ REVISE AND RESUBMIT
☐ SUBMIT SPECIFIED ITEM

Submittal review is only for ascertaining general conformance with the Contract Documents. Approval does not relieve the Contractor of responsibility for full compliance with the Contract Documents.

By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

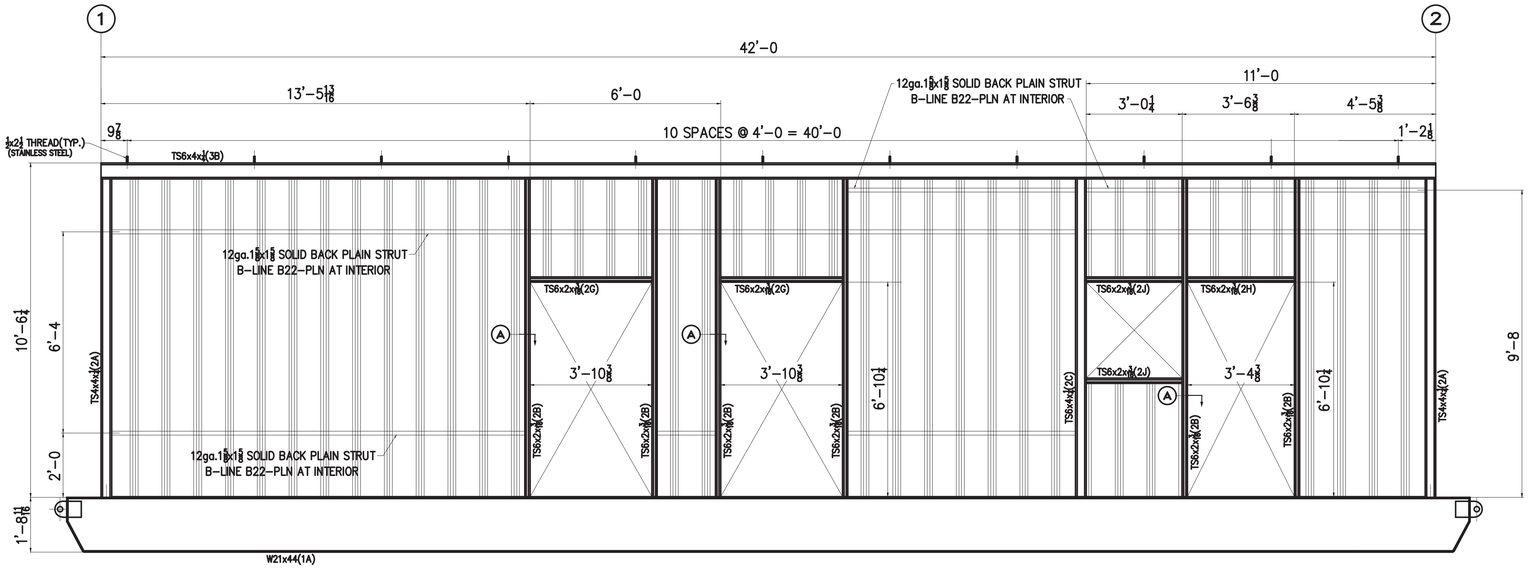
CLEANING PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

PROJECT
CLARKS POINT POWER SYSTEM UPGRADE
CEILING FRAMING PLAN

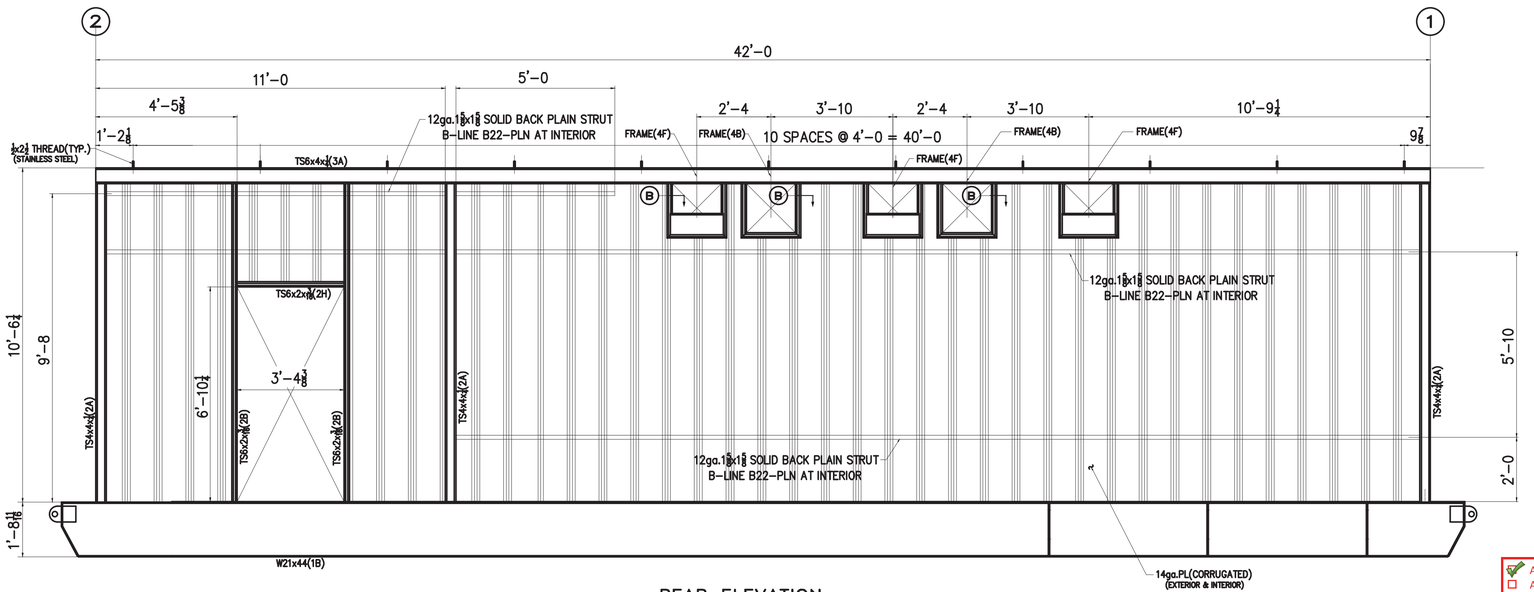
CUSTOMER
ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		E2

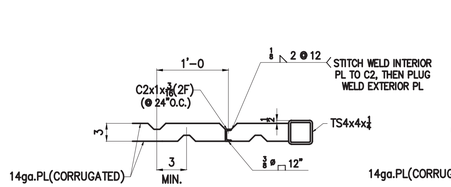
Structural Detailing Services of Alaska 907-336-2220 Fax: 907-336-2231 dholland@gci.net



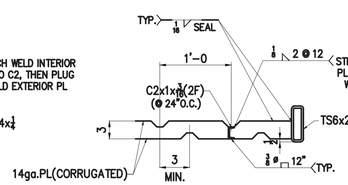
FRONT ELEVATION



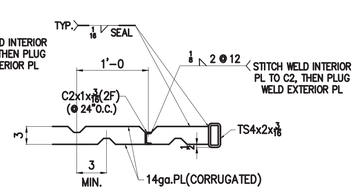
REAR ELEVATION



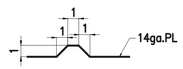
TYP. WALL SECTION



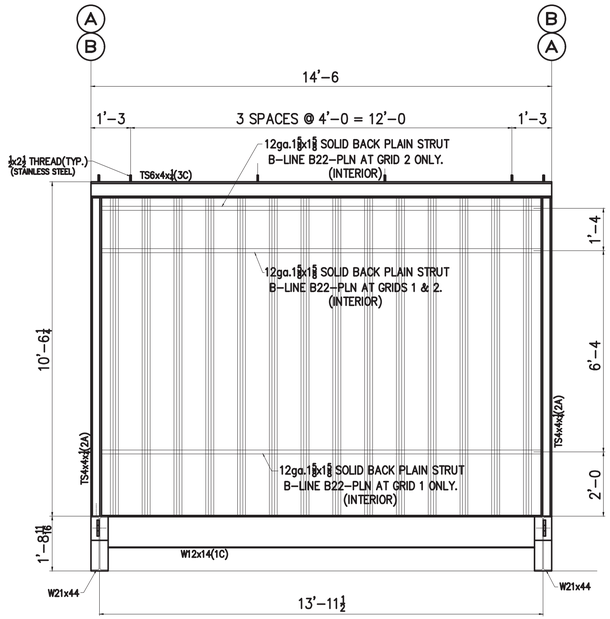
SECTION A



SECTION B



TYP. CORRUGATION



END ELEVATION

GENERAL NOTES:

STRUCTURAL STEEL

1.) THE DESIGN, FABRICATION, AND ERECTION OF ALL STRUCTURAL STEEL SHALL COMPLY WITH THE CODE OF STANDARD PRACTICE OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

2.) ALL STEEL PLATE, SHAPES AND ROLLED SECTIONS SHALL BE ASTM A36. ALL STEEL TUBING SHALL BE ASTM A500, GRADE B.

3.) ALL METAL TO METAL CONNECTIONS SHALL BE EQUAL TO STANDARD CONNECTION, OR AS DETAILED USING A325 BOLTS (BEARING TYPE CONNECTIONS). TIGHTEN HIGH STRENGTH BOLTS WITH PROPERLY CALIBRATED WRENCHES, BY TURN-OF-THE-NUT METHOD, OR BY LOAD WASHERS. ALL CONNECTIONS UNLESS OTHERWISE DETAILED, SHALL HAVE THE MAXIMUM NUMBER OF 3/4" BOLTS USING STANDARD GAUGES AND CLEARANCES.

4.) ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE CURRENT CODE OF THE AMERICAN WELDING SOCIETY. USE AWS 5.1 E70XX ELECTRODES. MINIMUM FILLET WELDS SHALL BE 3/16" EXCEPT FOR SEAL WELDS TO GAUGE METAL AS INDICATED.

FINISH

A.) INSULATE ALL WALLS, FLOORS, AND CEILINGS WITH HIGH TEMPERATURE MINERAL FIBER ACOUSTICAL FIRE BATT INSULATION, MIN. R VALUE 4 PER INCH, MIN. 2000F. MELTING TEMP, ROXUL AFB OR EQUAL. FILL ALL PANEL VOIDS OR PROVIDE THICKNESS AS INDICATED ON DRAWINGS. MECHANICALLY FASTEN FLOOR INSULATION TO TIGHT FLOOR.

B.) UPON COMPLETION OF FABRICATION ROUND ALL CORNERS AND GRIND EDGES SMOOTH AND PAINT ALL INTERIOR AND EXTERIOR EXPOSED STEEL. PERFORM ALL PAINTING IN A WARM, DRY ENVIRONMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INCLUDING DRYING TIME TO RE-COAT.

C.) SANDBLAST EXTERIOR SURFACE TO SSPC-SP-10. PRIME WITH ONE COAT OF REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA-COAT 302, NO SUBSTITUTES, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. COVER WITH TWO COATS OF EPOXY, DEVOE BAR-RUST 236, NO SUBSTITUTES, TO 12 MILS DRY FILM THICKNESS. FIRST COAT COLOR GRAY, SECOND COAT COLOR WHITE.

D.) FINISH EXTERIOR WALLS AND SKIDS (ALL EXPOSED VERTICAL EXTERIOR SURFACES) WITH ONE COAT OF ALIPHATIC URETHANE ENAMEL, DEVOE DEVTHANE 389, NO SUBSTITUTES, COLOR WHITE, TO 3 MILS DFT.

E.) SANDBLAST INTERIOR SURFACE TO SSPC-SP-6. PRIME AND FINISH WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, TO 8 MILS TOTAL DRY FILM THICKNESS. CEILING COLOR WHITE. WALL AND FLOOR COLOR STRUCTURAL GRAY 4031. NOTE THAT FIRST COAT ON WALLS AND FLOOR MAY BE WHITE.

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

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By: Date: 1-7-19

Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

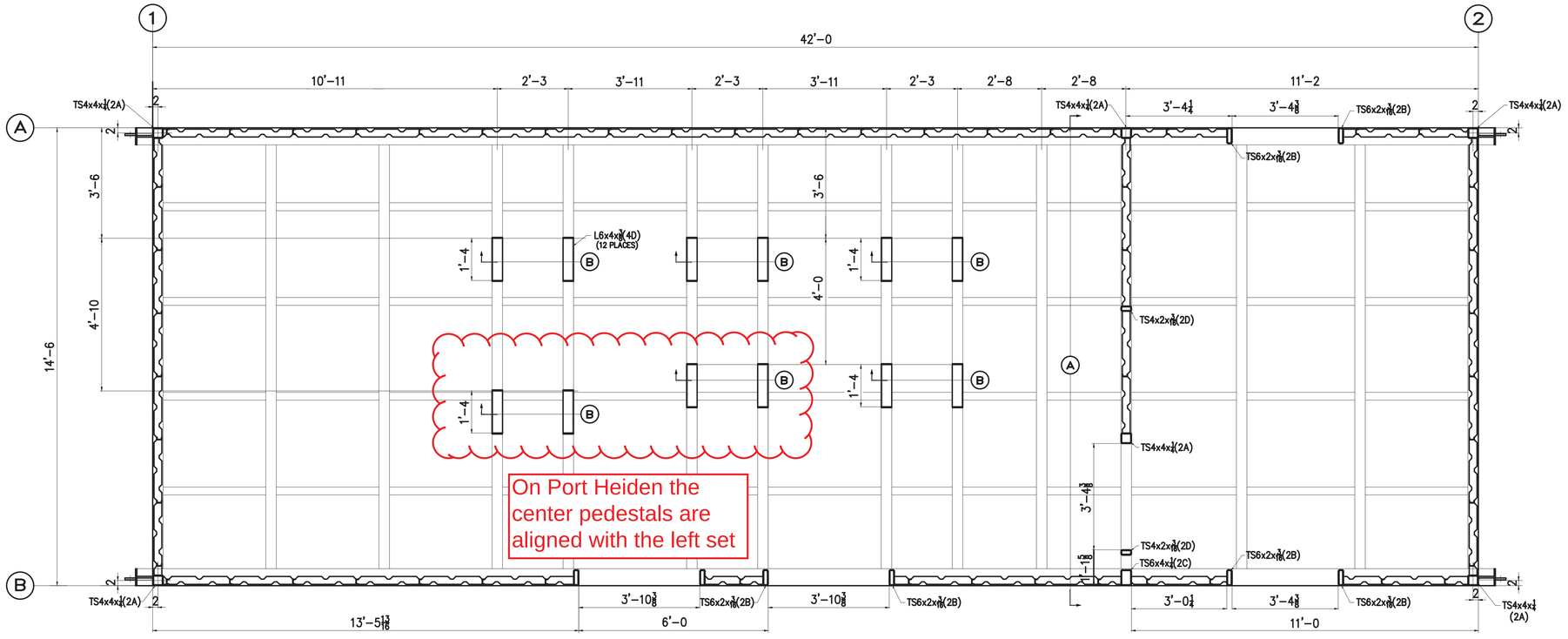
CLEANING & PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

PROJECT
CLARKS POINT POWER SYSTEM UPGRADE
EXTERIOR ELEVATIONS

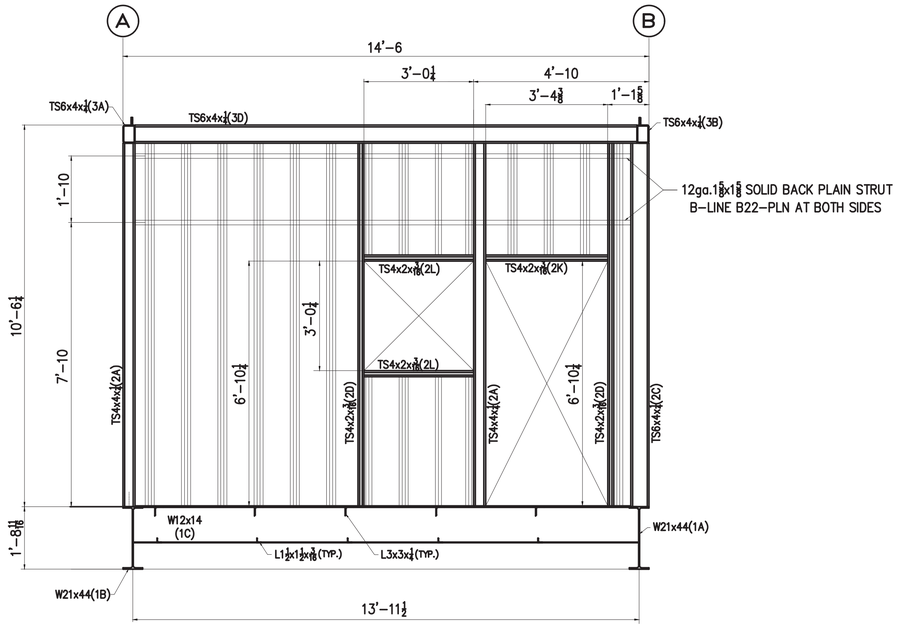
CUSTOMER
ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		E3

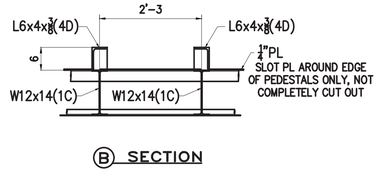
Structural Detailing Services of Alaska 907-336-2220 Fax:907-336-2231 dholland@gci.net



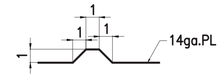
FLOOR PLAN



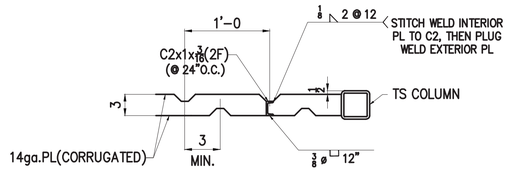
A INTERIOR WALL SECTION



B SECTION



TYP. CORRUGATION



EXTERIOR

TYP. WALL SECTION

SHOP NOTES:

1.) MAKE ALL JOINTS WITH CONTINUOUS GROOVE OR FILLET WELDS.
2.) SLOT FLOOR PLATE 3 SIDES THEN WELD PEDESTAL TO TOP OF BEAM AND SEAL WELD TO FLOOR PLATE ALL AROUND.

REV. No.	DATE	BY	DESCRIPTION
1	1/4/19	DWH	REVISED INTERIOR SECTION
0	12/28/18	DWH	ISSUED FOR APPROVAL

CLEANING	
PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

PROJECT: CLARKS POINT POWER SYSTEM UPGRADE

FLOOR PLAN

CUSTOMER: ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		E4

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

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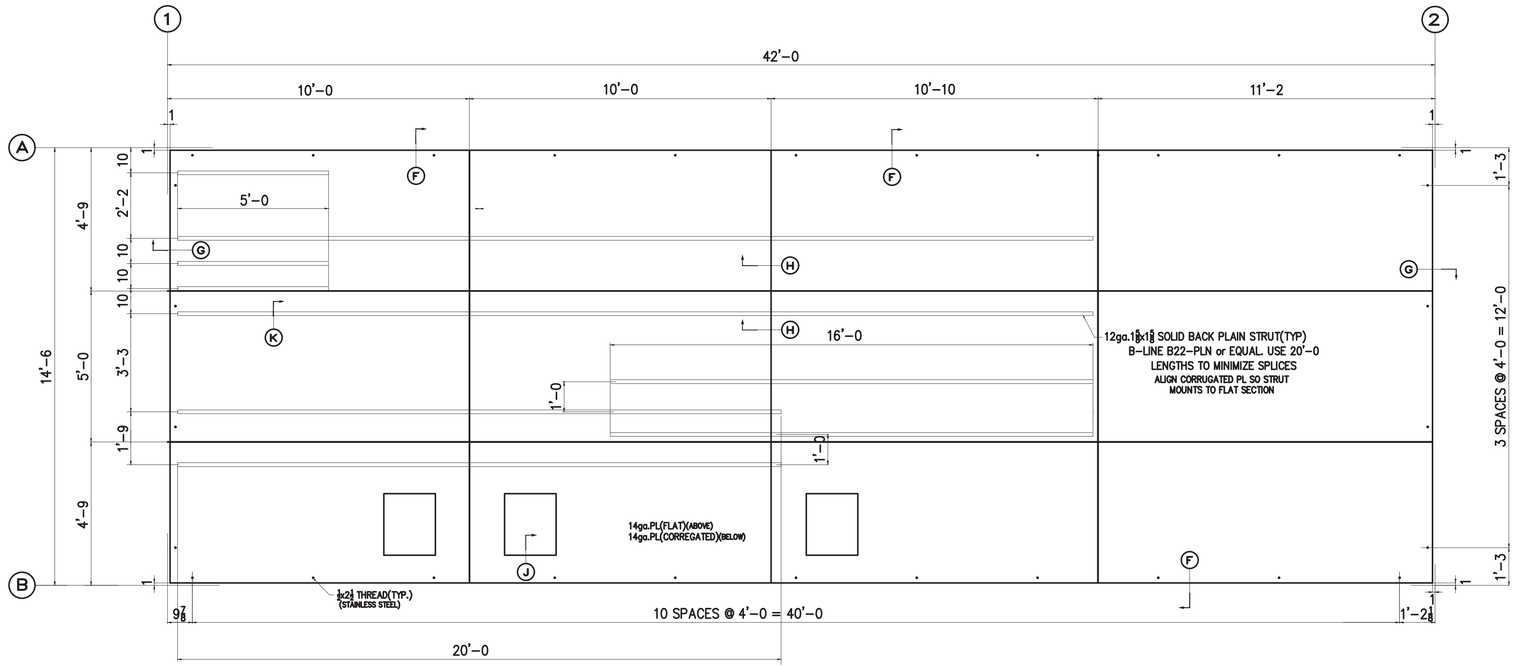
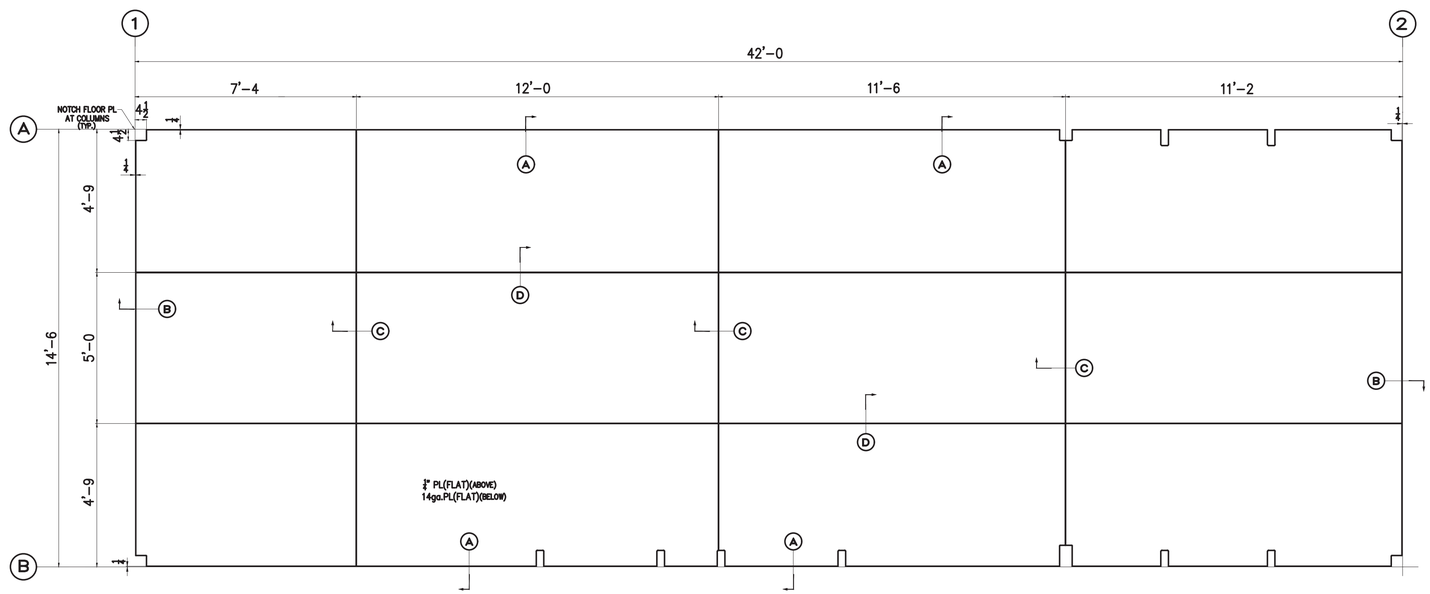
By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

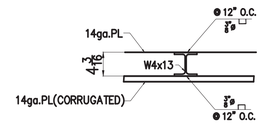
Structural Detailing Services of Alaska 907-336-2220 Fax:907-336-2231 dhalland@gci.net



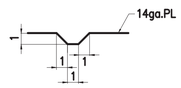
CEILING PLATE LAYOUT



FLOOR PLATE LAYOUT



TYP. CEILING SECTION



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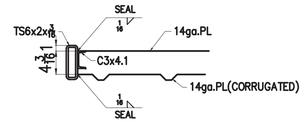
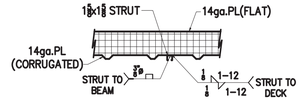
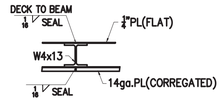


SECTION J



SECTION K

ALIGN CORRUGATED PL SO STRUT
MOUNTS TO FLAT SECTION



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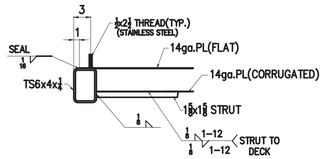

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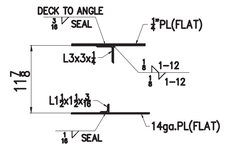
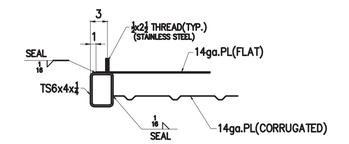


SECTION D



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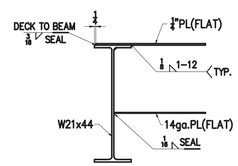
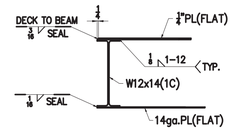
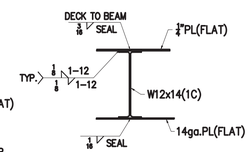


SECTION A



SECTION B



SECTION C

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

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By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
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WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

CLEANING & PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

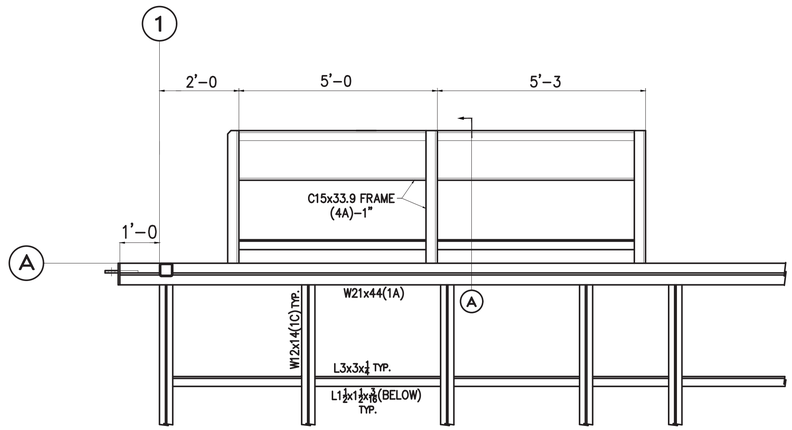
PROJECT
CLARKS POINT POWER SYSTEM UPGRADE
DECK & CEILING PLATES

CUSTOMER
ALASKA ENERGY AUTHORITY

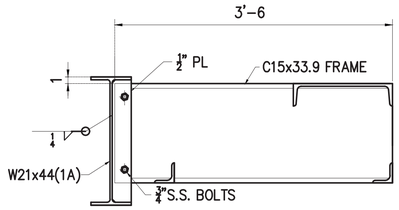
DATE	JOB No.	DWG. NO.
12/22/18		E5

SHOP NOTES:
1.) FABRICATE FLOOR AND PAN DECK DECKS USING 5' AND 6' WIDE SHEETS WITH ALL JOINTS CENTERED ON PURLINS & JOISTS.
2.) FABRICATE CEILING ASSEMBLY (FLAT & CORREGATED) USING 5' AND 6' WIDE SHEETS WITH ALL JOINTS CENTERED ON JOISTS & PURLINS.

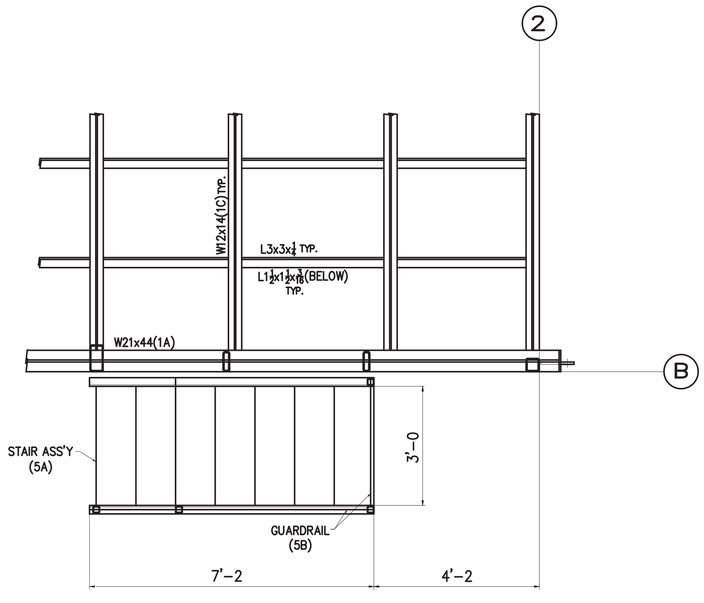
Structural Detailing Services of Alaska 907-336-2220 Fax:907-336-2231 dholland@gci.net



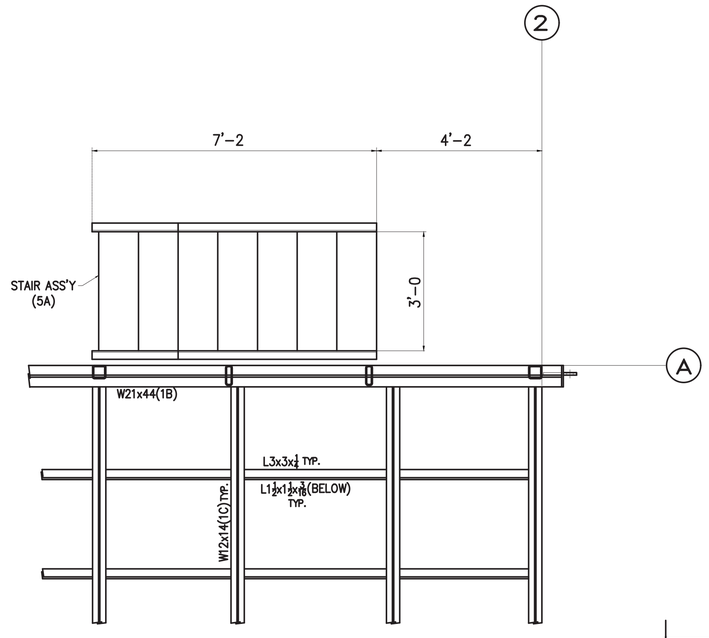
RADIATOR SUPPORTS FRAMING PLAN



SECTION A



STAIR/PLATFORM FRAMING PLAN



STAIR/PLATFORM FRAMING PLAN

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
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WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344–1921
FAX:(907)344–8244

CLEANING
PAINT
BLAST & PAINT PER SPECS.

WELDS 3/16" FILLET U.N.O.

OPEN HOLES 13/16" U.N.O.

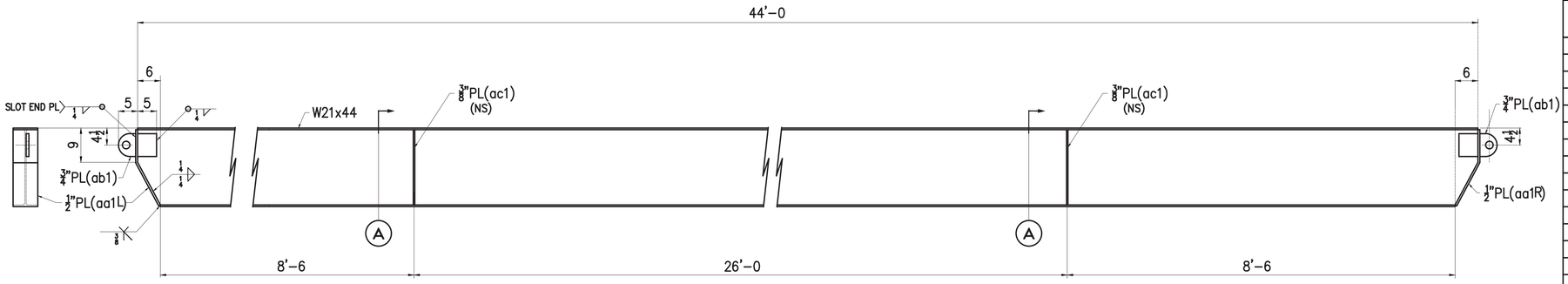
PROJECT
CLARKS POINT POWER SYSTEM UPGRADE

RADIATOR SUPPORTS & STAIR FRAMING PLANS

CUSTOMER
ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		E6

Structural Detailing Services of Alaska 907–336–2220 Fax:907–336–2231 dholland@gci.net



ONE ~ MAIN BEAM ~ 1A

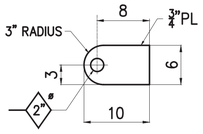
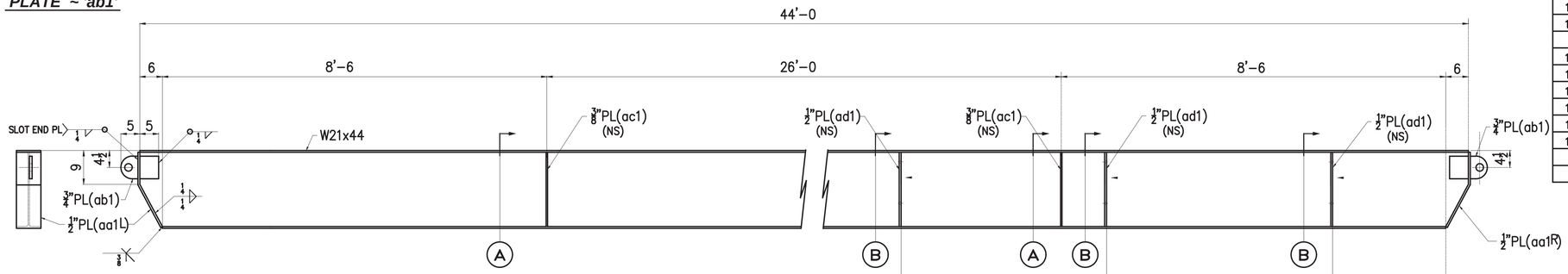
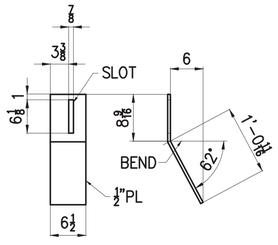


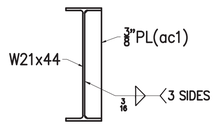
PLATE ~ 'ab1'



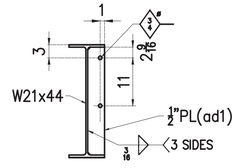
ONE ~ MAIN BEAM ~ 1B



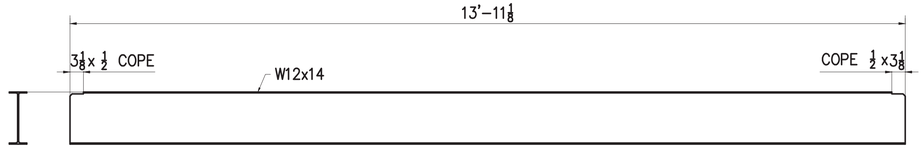
BENT PL ~ 'aa1^{L}' (AS SHOWN)
BENT PL ~ 'aa1^{R}' (OPP. HAND)



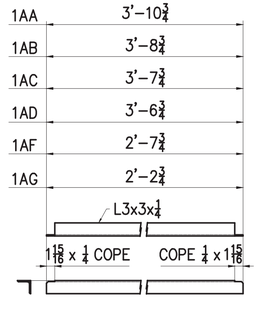
SECTION A



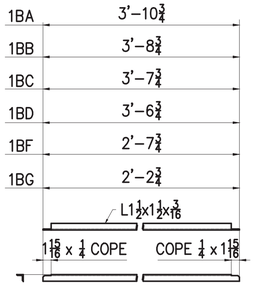
SECTION B



14 ea. ~ CROSS BEAMS ~ 1C



8 ea. ~ ANGLES ~ 1AA
4 ea. ~ ANGLES ~ 1AB
4 ea. ~ ANGLES ~ 1AC
16 ea. ~ ANGLES ~ 1AD
8 ea. ~ ANGLES ~ 1AF
12 ea. ~ ANGLES ~ 1AG



8 ea. ~ ANGLES ~ 1BA
4 ea. ~ ANGLES ~ 1BB
4 ea. ~ ANGLES ~ 1BC
16 ea. ~ ANGLES ~ 1BD
8 ea. ~ ANGLES ~ 1BF
12 ea. ~ ANGLES ~ 1BG

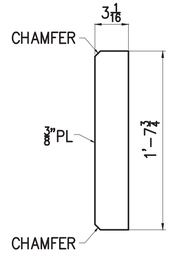


PLATE ~ 'ac1'

BILL OF MATERIAL

FIELD MARK	SHOP MARK	NO. PCS	SECTION	LENGTH	REMARKS	WT
1A		ONE	MAIN BEAM			
	1A	ONE	W21 x 44	44'–0		
	aa1⅛	2	PL ½ x 6½ BENT	1'–9½	1 LEFT/1 RIGHT	
	ab1	2	PL ¾ x 6	10	RADIUS	
	ac1	2	PL ⅜ x 3⅛	1'–7¾	STIFF. PL	
1B		ONE	MAIN BEAM			
	1B	ONE	W21 x 44	44'–0		
	aa1⅛	2	PL ½ x 6½ BENT	1'–9½	1 LEFT/1 RIGHT	
	ab1	2	PL ¾ x 6	10	RADIUS	
	ac1	2	PL ⅜ x 3⅛	1'–7¾	STIFF. PL	
	ad1	3	PL ½ x 3⅛	1'–7¾	CONN. PL	
1C		14	CROSS BEAMS			
	1C	14	W12 x 14	13'–11⅛	COPE ENDS	
			ANGLES			
1AA		8	L3 x 3 x ¼	3'–10¾	COPE ENDS	
1AB		4	L3 x 3 x ¼	3'–8¾	do	
1AC		4	L3 x 3 x ¼	3'–7¾		
1AD		16	L3 x 3 x ¼	3'–6¾		
1AF		8	L3 x 3 x ¼	2'–7¾		
1AG		12	L3 x 3 x ¼	2'–2¾		
1BA		8	L1½ x 1½ x 3⁄16	3'–10¾	COPE ENDS	
1BB		4	L1½ x 1½ x 3⁄16	3'–8¾	do	
1BC		4	L1½ x 1½ x 3⁄16	3'–7¾		
1BD		16	L1½ x 1½ x 3⁄16	3'–6¾		
1BF		8	L1½ x 1½ x 3⁄16	2'–7¾		
1BG		12	L1½ x 1½ x 3⁄16	2'–2¾		

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
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SUBMIT SPECIFIED ITEM

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Anchorage, AK
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WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344–1921
FAX:(907)344–8244

CLEANING	
PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

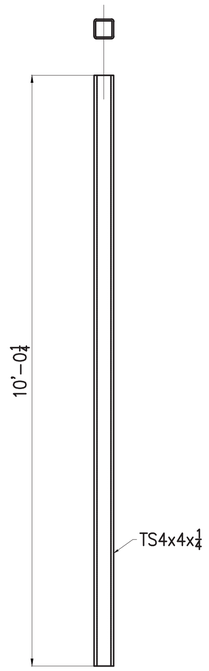
PROJECT
CLARKS POINT POWER SYSTEM UPGRADE

BASE BEAM DETAILS

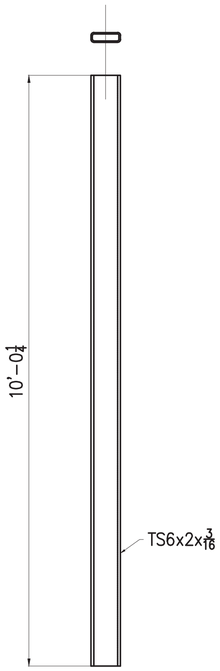
CUSTOMER
ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		D1

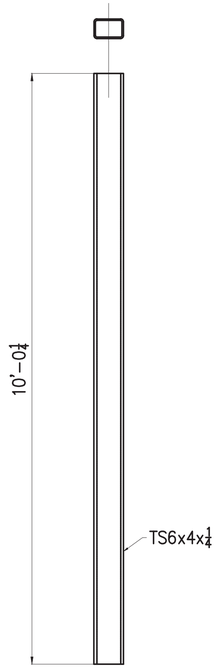
Structural Detailing Services of Alaska 907–336–2220 Fax:907–336–2231 dholland@gci.net



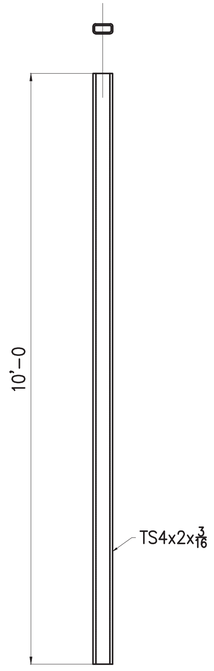
6 ea. ~ TS POSTS ~ 2A



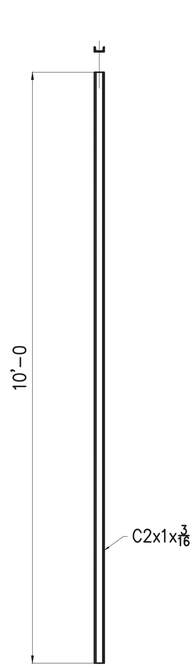
8 ea. ~ TS POSTS ~ 2B



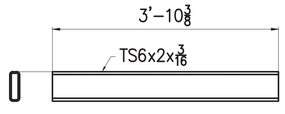
ONE ~ TS POST ~ 2C



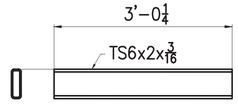
2 ea. ~ TS POSTS ~ 2D



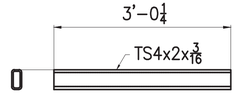
56 ea. ~ CHANNELS ~ 2F



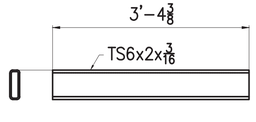
2 ea. ~ HEADER TUBE ~ 2G



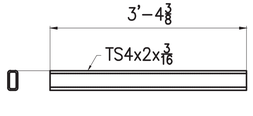
2 ea. ~ WINDOW TUBE ~ 2J



2 ea. ~ WINDOW TUBE ~ 2L



2 ea. ~ HEADER TUBE ~ 2H



ONE ~ HEADER TUBE ~ 2K

BILL OF MATERIAL

FIELD MARK	SHOP MARK	NO. PCS	SECTION	LENGTH	REMARKS	WT
2A		6	TS POSTS			
	2A	6	TS4 x 4 x 1/4	10'-0 1/4		
2B		8	TS POSTS			
	2B	8	TS6 x 2 x 3/16	10'-0 1/4		
2C		ONE	TS POST			
	2C	ONE	TS6 x 4 x 1/4	10'-0 1/4		
2D		2	TS POSTS			
	2D	2	TS4 x 2 x 3/16	10'-0		
2F		56	CHANNELS			
	2F	56	C2 x 1 x 3/16	10'-0		
2G		2	TS HEADER			
	2G	2	TS6 x 2 x 3/16	3'-10 3/8		
2H		2	TS HEADER			
	2H	2	TS6 x 2 x 3/16	3'-4 3/8		
2J		2	WINDOW TUBE			
	2J	2	TS6 x 2 x 3/16	3'-0 1/4		
2K		ONE	TS HEADER			
	2K	ONE	TS4 x 2 x 3/16	3'-4 3/8		
2L		2	WINDOW TUBE			
	2L	2	TS4 x 2 x 3/16	3'-0 1/4		

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

Submittal review is only for ascertaining general conformance with the Contract Documents. Approval does not relieve the Contractor of responsibility for full compliance with the Contract Documents.

By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
1	1/4/19	DWH	REVISED 2A, 2D, 2L
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

CLEANING
PAINT
BLAST & PAINT PER SPECS.

WELDS 3/16" FILLET U.N.O.

OPEN HOLES 13/16" U.N.O.

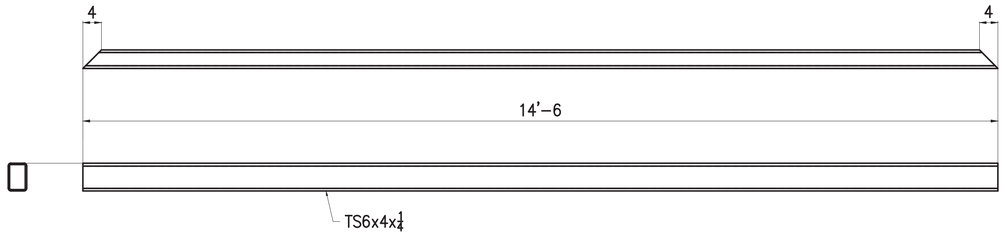
PROJECT
CLARKS POINT POWER SYSTEM UPGRADE

WALL FRAMING DETAILS

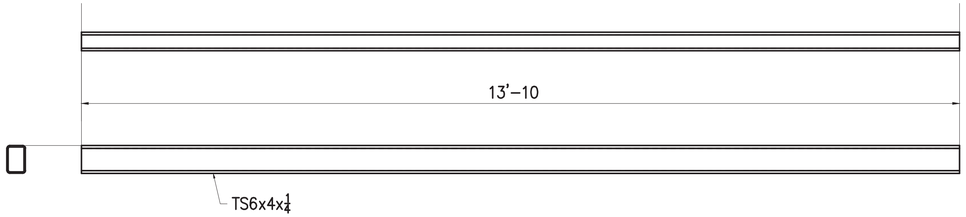
CUSTOMER
ALASKA ENERGY AUTHORITY

DATE 12/22/18 | JOB No. | DWG. NO. D2

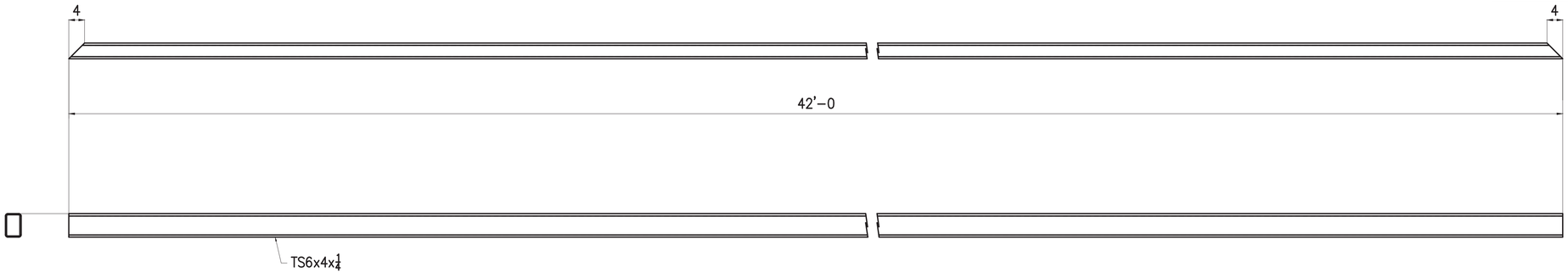
Structural Detailing Services of Alaska 907-336-2220 Fax:907-336-2231 dholland@gci.net



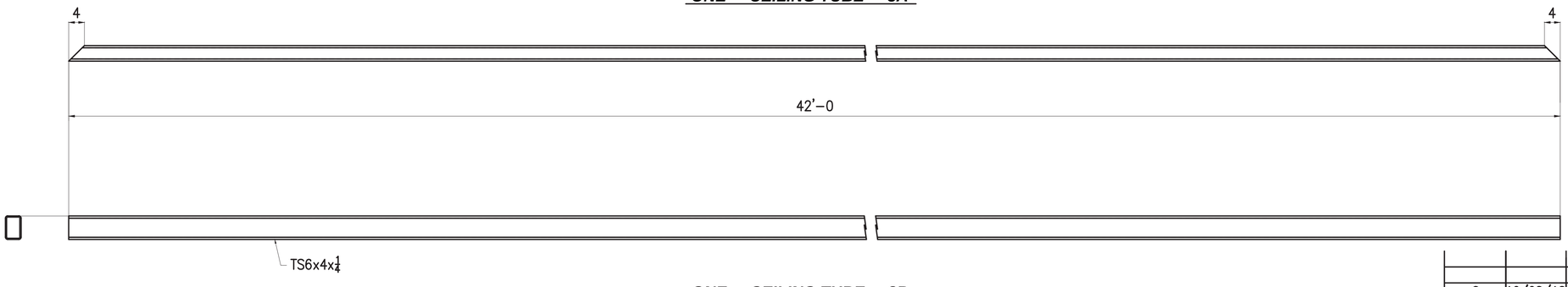
2 ea. ~ CEILING TUBE ~ 3C



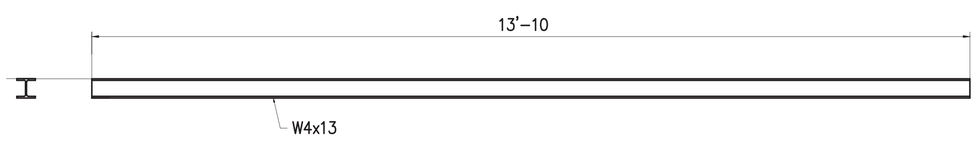
ONE ~ CEILING TUBE ~ 3D



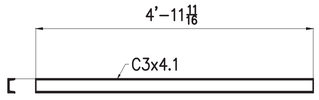
ONE ~ CEILING TUBE ~ 3A



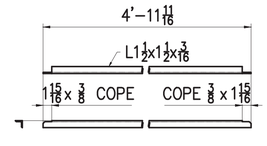
ONE ~ CEILING TUBE ~ 3B



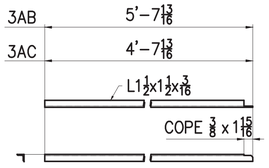
6 ea. ~ CEILING BEAM ~ 3F



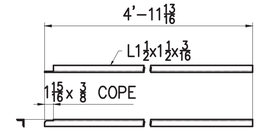
6 ea. ~ CHANNELS ~ 3BB



14 ea. ~ ANGLES ~ 3AA



8 ea. ~ ANGLES ~ 3AB
4 ea. ~ ANGLES ~ 3AC



4 ea. ~ ANGLES ~ 3AD

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

Submittal review is only for ascertaining general conformance with the Contract Documents. Approval does not relieve the Contractor of responsibility for full compliance with the Contract Documents.

By: _____ Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

BILL OF MATERIAL

FIELD MARK	SHOP MARK	NO. PCS	SECTION	LENGTH	REMARKS	WT
3A		ONE	CEILING TUBE			
	3A	ONE	TS6 x 4 x ¼	42'–0	MC2E	
3B		ONE	CEILING TUBE			
	3B	ONE	TS6 x 4 x ¼	42'–0	MC2E	
3C		2	CEILING TUBE			
	3C	2	TS6 x 4 x ¼	14'–6	MC2E	
3D		ONE	CEILING TUBE			
	3D	ONE	TS6 x 4 x ¼	13'–10		
3F		6	CEILING BEAM			
	3F	6	W4 x 13	13'–10		
			SUPPORT ANGLES			
	3AA	14	L1½ x 1½ x 3/16	4'–11 11/16	COPE 2 ENDS	
	3AB	8	L1½ x 1½ x 3/16	5'–7 13/16	COPE 1 END	
	3AC	4	L1½ x 1½ x 3/16	4'–7 13/16	COPE 1 END	
	3AD	4	L1½ x 1½ x 3/16	4'–11 13/16	COPE 1 END	
			SUPPORT CHANNEL			
	3BB	6	C3 x 4.1	4'–11 11/16		

REV. No.	DATE	BY	DESCRIPTION
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344–1921
FAX:(907)344–8244

CLEANING PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

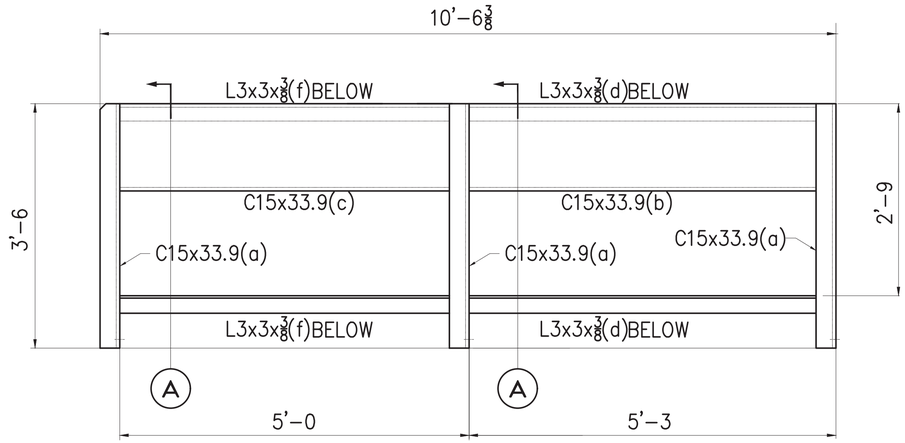
PROJECT: CLARKS POINT POWER SYSTEM UPGRADE

CEILING TUBE DETAILS

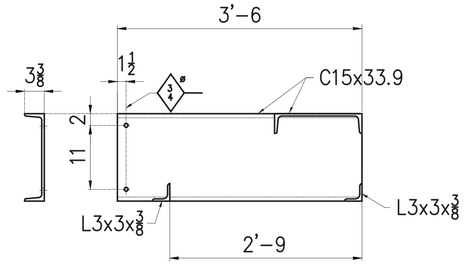
CUSTOMER: ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		D3

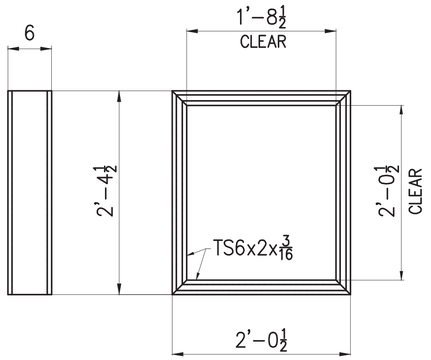
Structural Detailing Services of Alaska 907–336–2220 Fax:907–336–2231 dhalland@gci.net



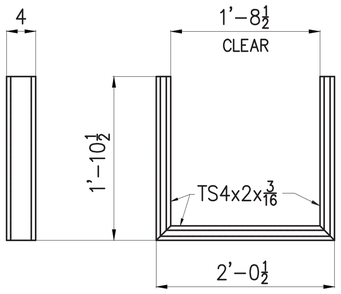
ONE ~ RADIATOR SUPPORT FRAME ~ 4A



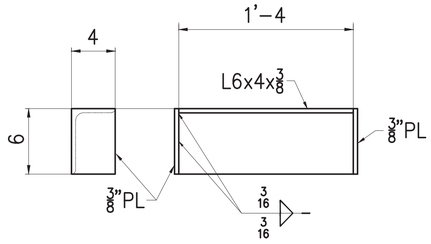
SECTION A



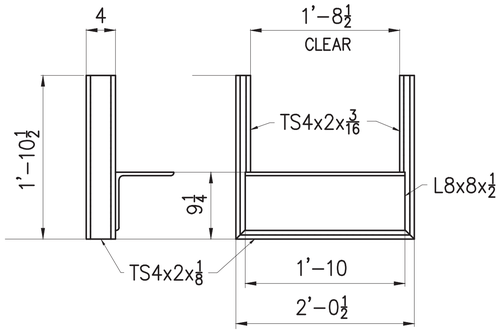
3 ea. ~ CEILING FRAMES ~ 4C



2 ea. ~ WALL FRAMES ~ 4B



12 ea. ~ ANGLE MOUNTS ~ 4D



3 ea. ~ WALL FRAMES ~ 4F

BILL OF MATERIAL

FIELD MARK	SHOP MARK	NO. PCS	SECTION	LENGTH	REMARKS	WT
4A		ONE	RADIATOR SUPPORT			
	a	3	C15 x 33.9	3'-6		
	b	ONE	C15 x 33.9	5'-2 5/8	COPE 1 END	
	c	ONE	C15 x 33.9	4'-11 5/8	COPE 1 END	
	d	2	L3 x 3 x 3/8	5'-2 5/8	COPE 1 END	
	f	2	L3 x 3 x 3/8	4'-11 5/8	COPE 1 END	
4B		2	WALL FRAMES			
		4	TS4 x 2 x 3/16	1'-10 1/2	MC1E	
		2	TS4 x 2 x 3/16	2'-0 1/2	MC2E	
4C		3	CEILING FRAMES			
		6	TS6 x 2 x 3/16	2'-0 1/2	MC2E	
		6	TS6 x 2 x 3/16	2'-4 1/2	MC2E	
4D		12	ANGLE MOUNTS			
		12	L6 x 4 x 3/8	1'-4		
		24	PL 3/8" x 4	6		
4F		3	WALL FRAMES			
		6	TS4 x 2 x 3/16	1'-10 1/2	MC1E	
		3	TS4 x 2 x 3/16	2'-0 1/2	MC2E	
		3	L8 x 8 x 1/2	1'-10		

SHOP NOTES:

1.) FABRICATE RADIATOR FRAME WITH MITERED CORNERS AND FULL PENETRATION GROOVE WELDS.
2.) GRIND OUT INSIDE OF MITERED CORNERS OF WALL & CEILING FRAMES TO PROVIDE FULL CLEAR OPENING.

CLEANING PAINT	BLAST & PAINT PER SPECS.
WELDS	3/16" FILLET U.N.O.
OPEN HOLES	13/16" U.N.O.

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM
Submittal review is only for ascertaining general conformance with the Contract Documents. Approval does not relieve the Contractor of responsibility for full compliance with the Contract Documents.
By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344-1921
FAX:(907)344-8244

PROJECT: CLARKS POINT POWER SYSTEM UPGRADE
MISCELLANEOUS DETAILS

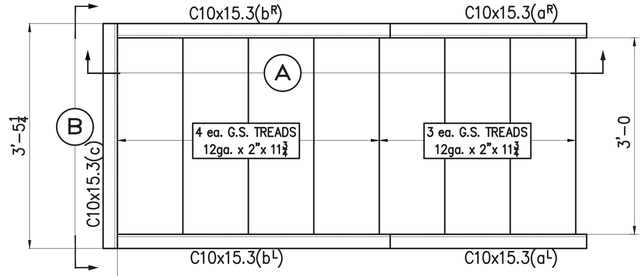
CUSTOMER: ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		D4

Structural Detailing Services of Alaska 907-336-2220 Fax:907-336-2231 dholland@gci.net

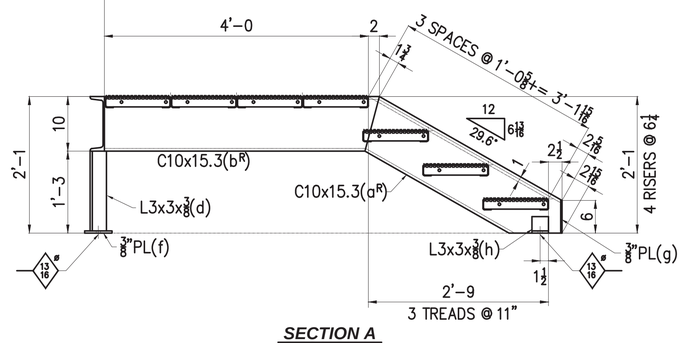
BILL OF MATERIAL

FIELD MARK	SHOP MARK	NO. PCS	SECTION	LENGTH	REMARKS	WT
5A		2	STAIR ASSEMBLY			
	a^R_L	4	C10 x 15.3	3'–5¼	2 LEFT/2 RIGHT	
	b^R_L	4	C10 x 15.3	4'–2	2 LEFT/2 RIGHT	
	c	2	C10 x 15.3	3'–5¼		
	d	4	L3 x 3 x ⅜	1'–2⅝		
	f	4	PL ⅜" x 5	5		
	g	4	PL ¼" x 2⅝	6		
	h	4	L3 x 3 x ⅜	3		
			GRIP STRUT		GALVANIZED	
		14	2"x12ga.x11¾	3'–0	TREAD	



2 ea. ~ STAIR ASSEMBLIES ~ 5A

SECTION B



SECTION A

APPROVED
APPROVED WITH CORRECTIONS NOTED
REJECTED
REVISE AND RESUBMIT
SUBMIT SPECIFIED ITEM

Submittal review is only for ascertaining general conformance with the Contract Documents. Approval does not relieve the Contractor of responsibility for full compliance with the Contract Documents.

By: Date: 1-7-19

Gray Stassel Engineering, Inc.
PO Box 111405
Anchorage, AK
P (907) 349-0100
F (907) 349-8001

REV. No.	DATE	BY	DESCRIPTION
1	1/4/19	DWH	DELETED RAILINGS
0	12/28/18	DWH	ISSUED FOR APPROVAL

WEONA CORPORATION
10501 OLIVE LANE
ANCHORAGE, AK 99515
PHONE:(907)344–1921
FAX:(907)344–8244

CLEANING
PAINT
HOT DIP GALVANIZE AFTER FAB.

WELDS 3/16" FILLET U.N.O.

OPEN HOLES 13/16" U.N.O.

PROJECT
PORT HEIDEN POWER SYSTEM UPGRADE

STAIR ASSEMBLY DETAILS

CUSTOMER
ALASKA ENERGY AUTHORITY

DATE	JOB No.	DWG. NO.
12/22/18		D5