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	EXTERIOR 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	WHITE PLASTIC ENCLOSURE, 120-347V INPUT, DUAL 5.3W LED LAMPS, LITHIUM IRON PHOSPHATE BATTERY	LITHONIA EML6L UVOLT LTP SRDT
◇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
◇7	EMERGENCY EXIT REMOTE LIGHT	REMOTE LAMP FIXTURE, DUAL HEAD, RATED FOR EXTERIOR INSTALLATION IN DAMP/WET LOCATIONS, 1.5W 9.6V LED LAMPS.	LITHONIA ELA T QWP L0309
◇8	INTERIOR LIGHT	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	$ SMALL MOTOR DISCONNECT	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1HP 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 1 WITH INTEGRAL WALL MOUNT BRACKETS, 15 kVA, HV 480 DELTA, LV 208Y/120	HAMMOND HPS SENTINEL CAT. NO. SG3A0015KB
◇14	STATION SERVICE PANELBOARD	COPPER BUS, 3 PHASE, 4 WIRE, 120/208V, 125A MAIN BREAKER, 30 CIRCUITS, BOLT-IN BREAKERS, 20" WIDE NEMA 1 ENCLOSURE, SURFACE MOUNT, NO KNOCKOUTS	SIEMENS TYPE P1 OR SQUARE D TYPE NQ
◇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 LEMARCHE ECSR-40/20-12/24V-AV1
◇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/CAC 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, 20VA OUTPUT, 1/2" THREADED HUB MOUNT	FUNCTIONAL DEVICES TR20VA001
◇22	ENCLOSED POWER RELAY (RIB)	20A, 1HP RATED CONTACT, SPDT, 24VAC COIL, NEMA 1 ENCLOSURE, RED LED PILOT LIGHT	FUNCTIONAL DEVICES RIB2401B
◇23	SNAP SWITCH WITH THERMAL UNIT	600VAC, 1HP, 16A MANUAL MOTOR STARTER WITH TYPE S, TYPE A, MELTING ALLOY, CLASS 20 THERMAL UNIT	SQUARE D 2510F01 MOTOR STARTER WITH A14.8 THERMAL UNIT
◇24	ROUTER - HIGH SPEED INTERNET	4-PORT GIGABIT ROUTER, DUAL 2.4 AND 5 GHz WIFI WITH ADJUSTABLE ANTENNAS, 4 GIGABIT LAN, 1 GIGBIT WAN, USB 2.0 AND USB 4.0, MINIMUM 256 MB RAM	ASUS RT-ACI-900P
◇25	FOC-1 ENCLOSED CONTACTOR	NEMA 1 ENCLOSURE WITH IEC STYLE CONTACTOR, 5.4-27A ADJUSTABLE RANGE SOLID STATE OVERLOAD, HAND-OFF-AUTO CONTROL, 16A, 208V 3-PHASE.	ALLEN-BRADLEY 109-C16AD-OLR ENCLOSED CONTACTOR, 193-EEEB OVERLOAD, 198-3SS HOA, & 193-ERA OVERLOAD RESET
◇26	FOC-1 TEMP CONTROLLER	NEMA 1 120/240 VAC PROGRAMMABLE TEMPERATURE CONTROLLER WITH PTC TEMPERATURE SENSOR AND 2m LONG JACKETED CABLE	PENN A421ABC-02C

ELECTRICAL CONDUCTOR SCHEDULE

SERVICE/FUNCTION	DESCRIPTION	MANUFACTURER/MODEL	NOTES:
GENERATOR LEADS (ENGINE STARTER CABLES SIMILAR)	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 XHHW2 INSULATION, 600V AND 90C RATED.		
SHIELDED/TWISTED INSTRUMENT & CONTROL & CANBUS CONDUCTORS	#18 AWG STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE & PVC OUTER JACKET	BELDEN PART #'S SINGLE PAIR: #1120A FOUR PAIR: #1049A SINGLE TRIAD: #1121A	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY.
EHTERNET (CAT5e) COMMUNICATION CONDUCTORS	SOLID BARE COPPER CONDUCTORS, 300V FEP INSULATION & JACKET, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH STRANDED TINNED COPPER DRAIN WIRE	FOUR PAIR #24 BELDEN 1585LC	GROUND SHIELD DRAIN WIRE AT PANEL END ONLY. ROUTE ALL DEVICENET & CAT5e CABLES IN SEPARATE DEDICATED RACEWAY.

UNLESS INDICATED OTHERWISE ALL CONDUCTORS SHALL USE THE FOLLOWING COLOR CODE:
- 480-VOLT POWER (PHASE) CONDUCTORS
  - PHASE A: BROWN
  - PHASE B: ORANGE
  - PHASE C: YELLOW
- 120/208-VOLT POWER (PHASE) CONDUCTORS
  - PHASE A: BLACK
  - PHASE B: RED
  - PHASE C: BLUE
- NEUTRAL: WHITE, NO EXCEPTIONS
- GROUND: GREEN OR BARE, NO EXCEPTIONS
- 24 VOLT DC CONDUCTORS
  - +24VDC: RED or RED W/GRAY STRIPE
  - -24VDC: BLACK or BLACK W/GRAY STRIPE

CONTROL AND INSTRUMENT CONDUCTORS MAY BE COLOR CODED PER MANUFACTURER'S STANDARD

NOTES:
1) COLOR CODING FOR NO. 6 AWG AND SMALLER CONDUCTORS SHALL BE BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION.
2) COLOR CODING FOR CONDUCTORS LARGER THAN NO. 6, SHALL BE BY:
   A) CONTINUOUS COLOR EMBEDDED IN THE INSULATION, OR
   B) BLACK CABLE WITH SCOTCH 35 OR APPROVED EQUAL MARKING (PHASE) TAPE. AT EVERY ACCESSIBLE LOCATION A MINIMUM 3" LONG SECTION OF CONDUCTOR SHALL BE SPIRAL WRAPPED. NOTE THAT PHASE TAPE MAY NOT BE USED ON COLORED CABLE, BLACK CABLE ONLY.
3) GROUNDING - PROVIDE A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY. DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE OF THE SAME TYPE AS THE PHASE CONDUCTORS AND SHALL BE SIZED AS INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

WIRING & DEVICE 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	$	SNAP SWITCH / SMALL MOTOR DISCONNECT
(1/4)	MOTOR (HORESPOWER INDICATED)	T$	TIMER SWITCH
(MD)	MOTORIZED DAMPER - SEE MECHANICAL	⏚	GROUND

INSTRUMENTATION & ENERGY MEASUREMENT LEGEND

NOTE: SEE SCHEDULES SHEET M1.1 FOR EQUIPMENT SPECIFICATIONS.

SYMBOL	SERVICE/FUNCTION	SYMBOL	SERVICE/FUNCTION
(TT)	TEMPERATURE TRANSMITTER	(FS)	DAY TANK/HOPPER FLOAT SWITCH
(PT)	PRESSURE TRANSMITTER	(GLS)	GLYCOL TANK LEVEL SENSOR PROBE
(FM)	HEAT RECOVERY FLOW METER	(TLM)	TANK LEVEL MONITOR PANEL
(LCA)	GLYCOL TANK LOW COOLANT ALARM	(LSP)	TANK LEVEL SENSOR PROBE

ALL MATERIALS AND EQUIPMENT ON SCHEDULES THIS SHEET WERE FURNISHED AS PART OF THE PRIOR MODULE ASSEMBLY PROJECT EXCEPT FOR THOSE ITEMS SPECIFICALLY INDICATED IN RED CLOUDS WHICH ARE TO BE FURNISHED AND INSTALLED AS PART OF THE ON SITE SCOPE.

REV #1 ISSUED FOR ON SITE CONSTRUCTION DECEMBER 2022

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

REV.	DESCRIPTION	DATE	BY
1	REVISED TO COORDINATE WITH FINAL ON-SITE DESIGN	12/15/22	BCG

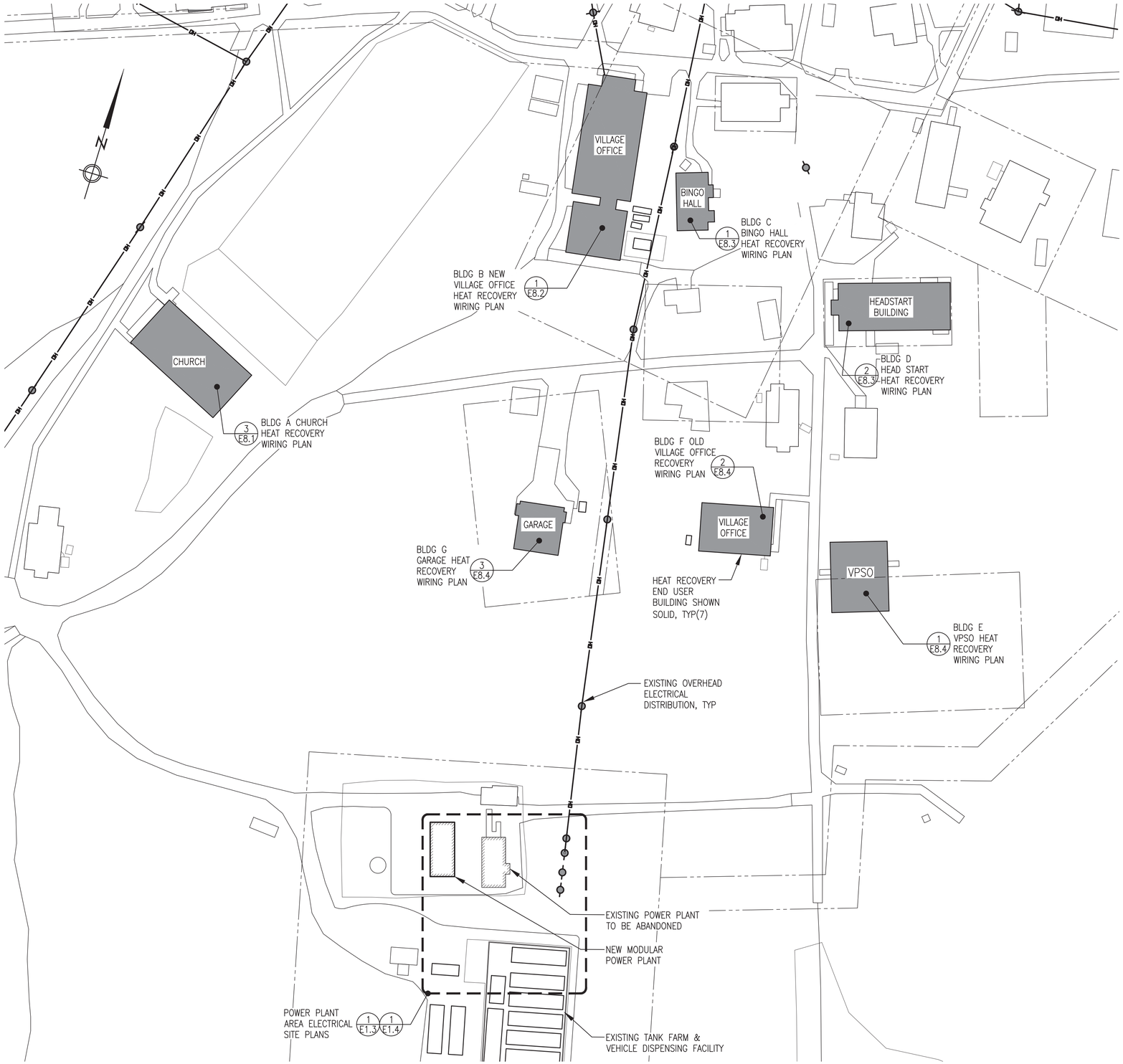
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM 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: CWV/BCG | DATE: 7/29/22
FILE NAME: NAPS E1 | SHEET: E1.1
PROJECT NUMBER:



1 E1.2 OVERALL POWER PLANT & HEAT RECOVERY VICINITY PLAN
1"=40'

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

ISSUED FOR CONSTRUCTION DECEMBER 2022

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

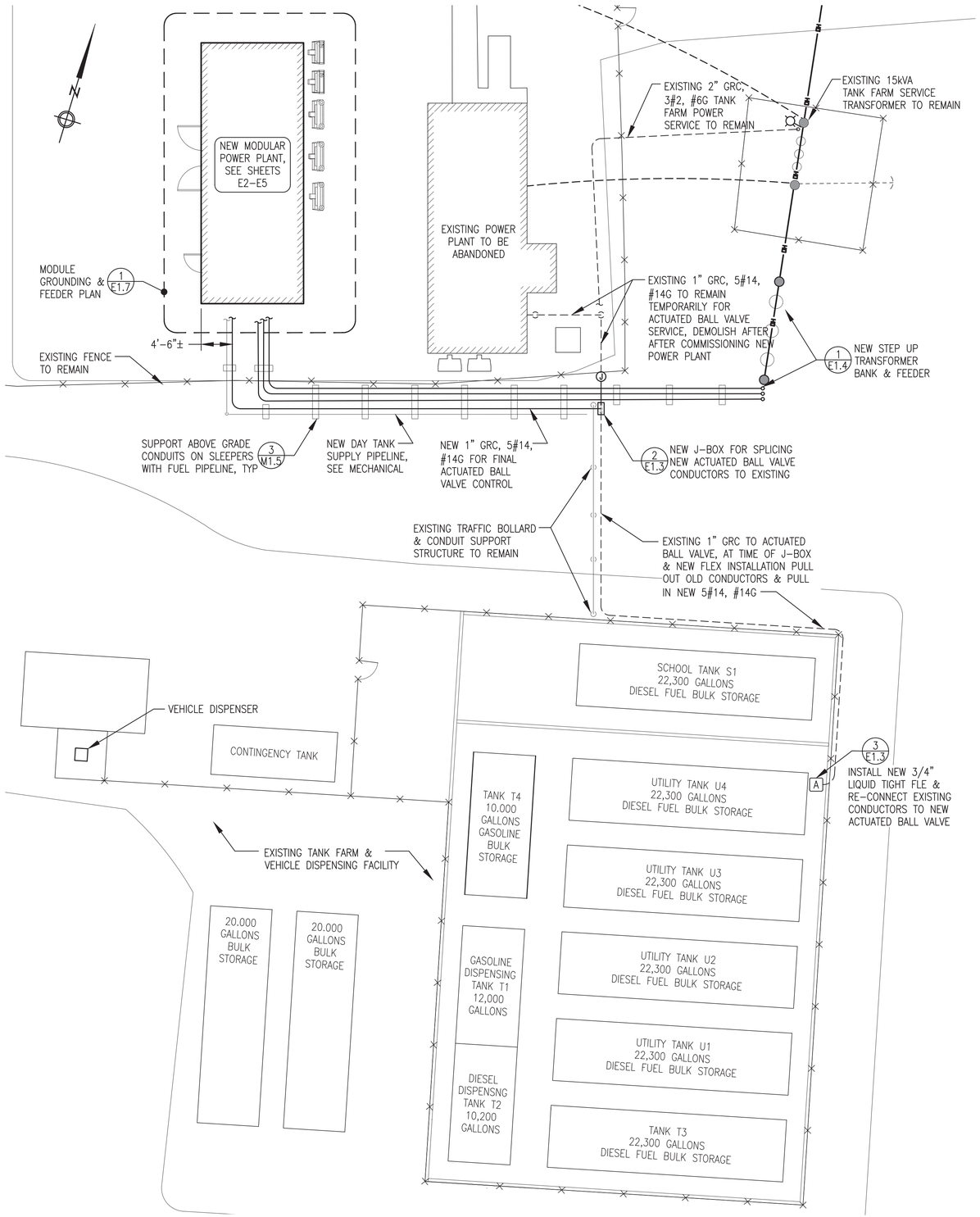
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: OVERALL POWER PLANT & HEAT RECOVERY VICINITY PLAN

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

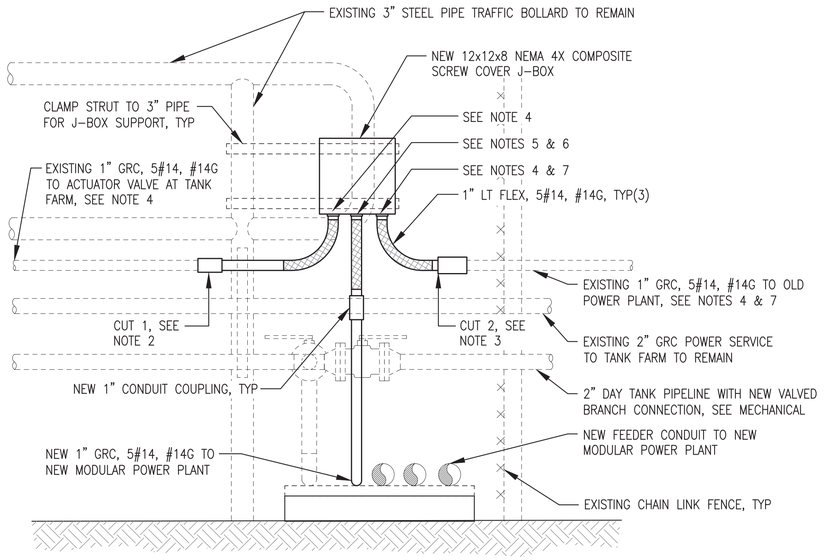
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 12/15/22
FILE NAME: NAPS PP E1	SHEET: E1.2
PROJECT NUMBER:	



1 E1.3 POWER PLANT ELECTRICAL SITE PLAN & DETAILS
1"=10'

NOTES:

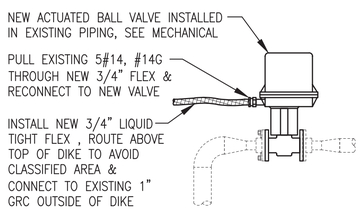
1. NEW CONDUIT & DEVICES SHOWN WITH DARK, SOLID LINES. EXISTING CONDUIT & DEVICES SHOWN WITH LIGHT, DASHED LINES.
2. CUT 1 – CUT EXISTING 1" CONDUIT & CONDUCTORS NEAR A JOINT AT A LOCATION THAT ALLOWS CONDUCTORS FROM OLD POWER PLANT TO REACH INTO J-BOX. INSTALL NEW THREADED COUPLING FOR NEW CONDUIT TO J-BOX.
3. CUT 2 – TEMPORARILY PULL CONDUCTORS BACK TOWARD OLD POWER PLANT PRIOR TO CUTTING CONDUIT. INSTALL NEW COMPRESSION COUPLING FOR NEW CONDUIT TO J-BOX. PULL EXISTING CONDUCTORS FROM OLD POWER PLANT INTO J-BOX.
4. REMOVE FLEX AT ACTUATED VALVE (SEE DETAIL 3) & PULL NEW 5/14, #14G FROM J-BOX TO ACTUATED VALVE. PERMANENTLY CONNECT TO TO ACTUATED VALVE. TEMPORARILY CONNECT NEW CONDUCTORS TO EXISTING CONDUCTORS FROM OLD POWER PLANT WITH WIRE NUTS TO ALLOW ACTUATOR VALVE OPERATION FROM OLD POWER PLANT TO CONTINUE.
5. PULL NEW 5#14, #14G FROM NEW POWER PLANT & TEMPORARILY COIL IN J-BOX FOR FUTURE PERMANENT CONNECTION.
6. WHEN NEW PLANT IS COMMISSIONED, DISCONNECT CONDUCTORS FROM OLD POWER PLANT. SOLDER SPLICE & HEAT SHRINK CONDUCTORS FROM NEW POWER PLANT TO CONDUCTORS FROM ACTUATED VALVE TO ALLOW ACTUATOR VALVE OPERATION FROM NEW POWER PLANT DAY TANK CONTROL PANEL.
7. REMOVE CONDUIT & CONDUCTORS FROM OLD POWER PLANT AND SEAL UNUSED CONDUIT ENTRANCE IN J-BOX.



2 E1.3 ACTUATED BALL VALVE CONDUCTOR SPLICE BOX INSTALLATION – ELEVATION VIEW
NO SCALE

NOTES:

1) DURING CONSTRUCTION THE EXISTING CONDUCTORS FROM THE OLD POWER PLANT IN THE SPLICE BOX WILL ALLOW THE NEW ACTUATED BALL VALVE TO BE CONTROLLED FROM THE OLD POWER PLANT DAY TANK CONTROL PANEL.
2) WHEN THE NEW MODULAR POWER PLANT IS COMMISSIONED, THE NEW CONDUCTORS FROM THE NEW POWER PLANT WILL ALLOW THE NEW ACTUATED BALL VALVE TO BE CONTROLLED FROM THE NEW POWER PLANT DAY TANK CONTROL PANEL. SEE DETAIL 2/E1.3.



3 E1.3 ACTUATOR VALVE CONNECTION
NO SCALE

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

ISSUED FOR CONSTRUCTION DECEMBER 2022

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

ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: POWER PLANT ELECTRICAL SITE PLAN & DETAILS

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

DRAWN BY: JTD	SCALE: AS NOTED
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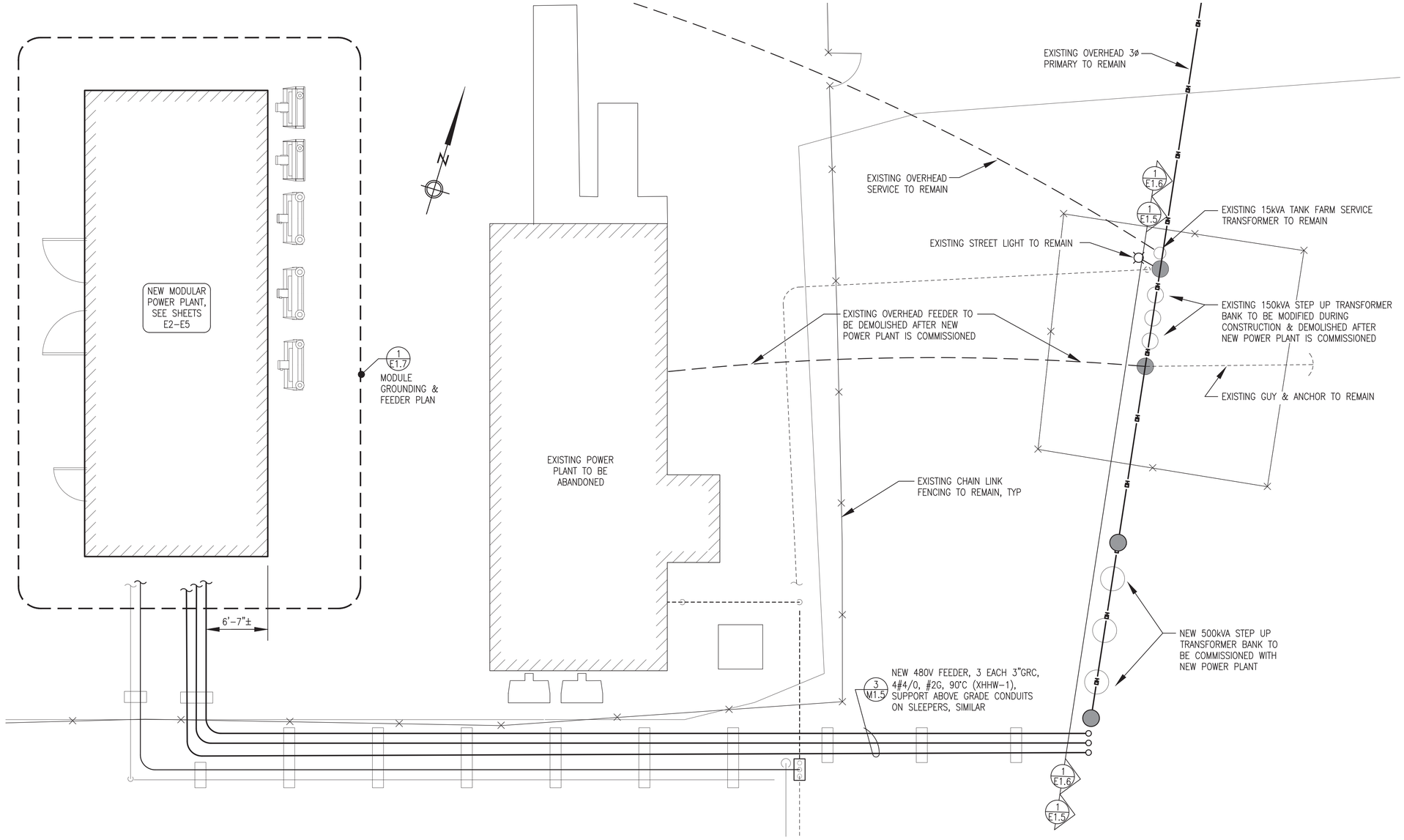
PROJECT NUMBER:	



1 E1.4 POWER PLANT FEEDER & STEP UP TRANSFORMER PLAN
1"=6'

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

ISSUED FOR CONSTRUCTION DECEMBER 2022

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

ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: POWER PLANT FEEDER & STEP UP TRANSFORMER PLAN

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 12/15/22
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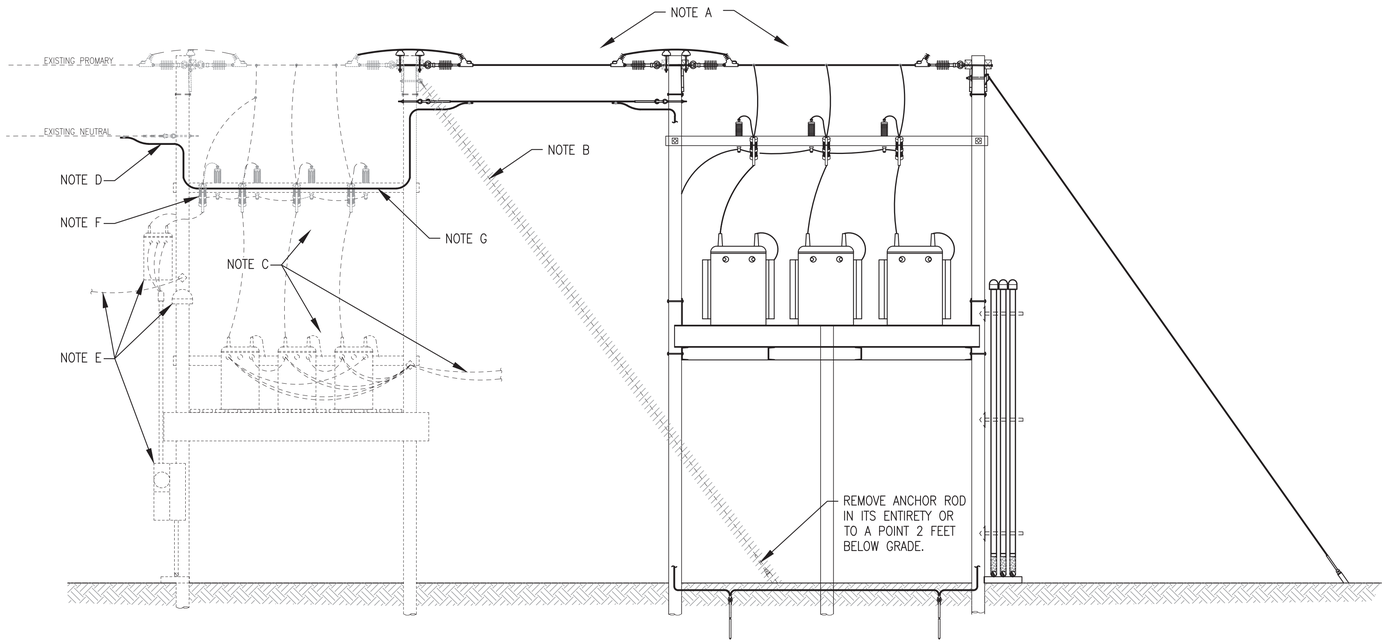
PROJECT NUMBER:	



1 / E1.5 STEP UP TRANSFORMER BANK DEMOLITION & INTERIM CONFIGURATION
1/4"=1'

WORK SEQUENCE FOR INTERIM OPERATION OF OLD AND NEW POWER PLANTS AND TRANSFORMER BANKS

A. SEE FINAL CONFIGURATION FOR SPECIFIC INSTALLATION DETAILS OF ALL NEW UNITS SHOWN WITH DARK, SOLID LINES.

B. THE EXISTING OVERHEAD ANCHOR WILL INTERFERE WITH INSTALLATION OF THE NEW 500kVA STEP UP TRANSFORMER BANK. TEMPORARILY SUPPORT OR BRACE THE EXISTING OVERHEAD DISTRIBUTION AS REQUIRED TO REMOVE THE EXISTING ANCHOR AND TO INSTALL THE TWO NEW POLES AND NEW ANCHOR.

C. THE NAPASKIAK POWER PLANT PROVIDES PRIMARY POWER TO THE ENTIRE COMMUNITY; THEREFORE, THE EXISTING 150kVA STEP UP TRANSFORMER BANK AND 480V OVERHEAD FEEDER FROM EXISTING POWER PLANT MUST REMAIN IN SERVICE UNTIL THE NEW INSTALLATION IS COMPLETE AND THE NEW POWER PLANT AND NEW STEP UP TRANSFORMER BANK HAVE BEEN COMMISSIONED. AFTER COMMISSIONING OF NEW PLANT AND TRANSFORMER BANK IS COMPLETE, DEMOLISH THE OLD TRANSFORMER BANK AND 480V FEEDER FROM OLD POWER PLANT AS SHOWN ON FINAL CONFIGURATION

D. TEMPORARILY INSTALL #1/0 BARE COPPER NEUTRAL EXTENSION TO AVOID PROXIMITY TO THE EXISTING PRIMARY TRANSFORMER JUMPERS DURING INTERIM OPERATIONS. STAPLE THE NEUTRAL CONDUCTOR TO EXISTING WOODEN POLES AND STRUCTURE AS REQUIRED TO ROUTE TO NEW OVERHEAD EXTENSION. UPON COMMISSIONING OF NEW POWER PLANT AND NEW STEP UP TRANSFORMER BANK, INSTALL NEW NEUTRAL AND DEMOLISH TEMPORARY. SEE FINAL CONFIGURATION.

E. THE EXISTING 15kVA TRANSFORMER, TANK FARM SERVICE, METER, STREET LIGHT, AND OVERHEAD SERVICE TO STORAGE BUILDING WILL REMAIN PERMANENTLY. RECONNECT PRIMARY JUMPER TO TRANSFORMER AS REQUIRED AFTER DEMOLITION OF OLD STEP UP TRANSFORMER BANK, SEE FINAL CONFIGURATION.

F. REMOVE EXISTING FUSED CUTOUT AND ARRESTER AND RELOCATE TO SIDE OF POLE WITH NEW SINGLE PHASE CUTOUT/ARRESTER EXTENSION BRACKET.

G. AFTER FINAL CONFIGURATION IS COMPLETE, REMOVE TIMBER.

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

ISSUED FOR CONSTRUCTION
DECEMBER 2022

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

ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: STEP UP TRANSFORMER BANK DEMOLITION & INTERIM CONFIGURATION

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

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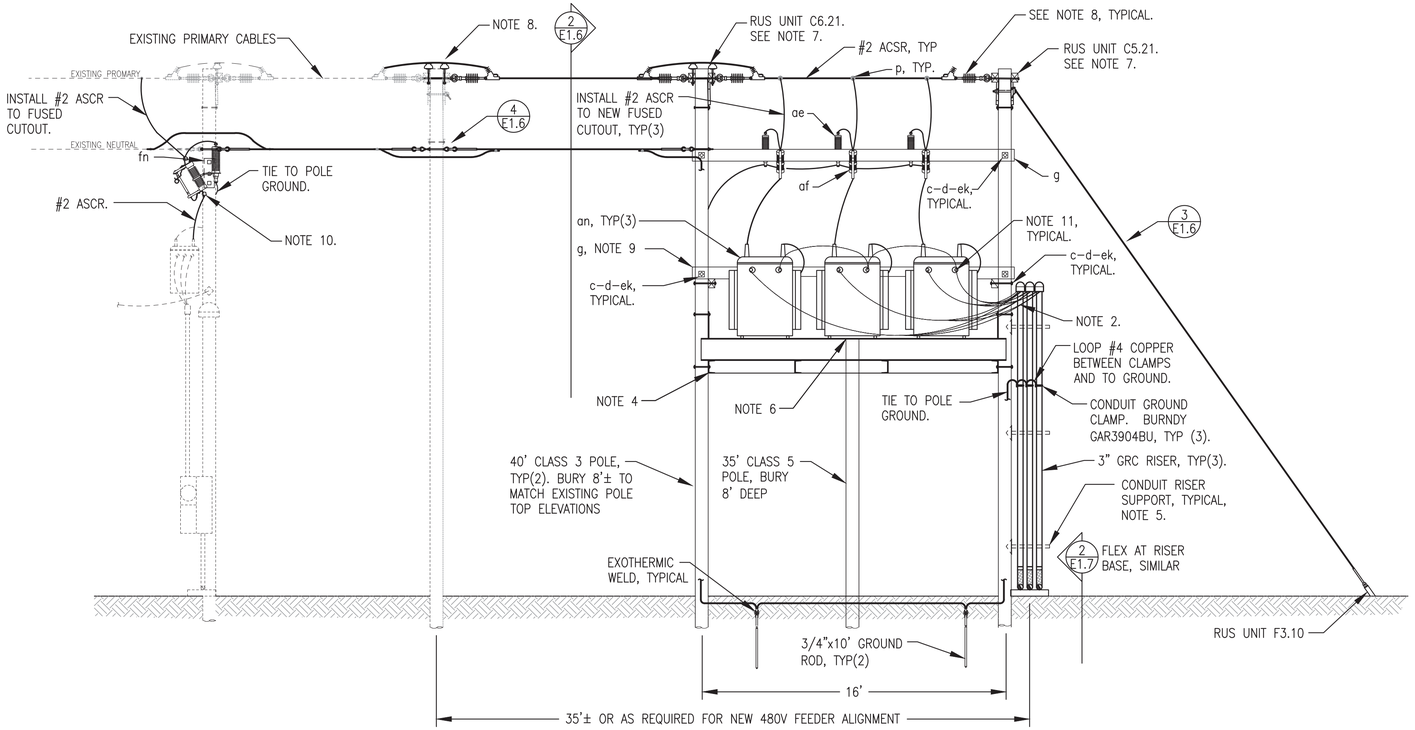
PROJECT NUMBER:	



1 E1.6 STEP UP TRANSFORMER BANK FINAL CONFIGURATION
1/4"=1'

ITEM	QTY	MATERIAL LIST
c	AS REQUIRED	BOLT, MACHINE 5/8" X REQUIRED LENGTH.
c-1	AS REQUIRED	BOLT, MACHINE 1/2" X REQUIRED LENGTH.
d	AS REQUIRED	WASHER, SQUARE 2-1/4".
d-1	AS REQUIRED	WASHER, ROUND, 1-3/8".
g	2	3-5/8"x7-1/2"x17'-0" TREATED HUGHES BROS. CROSSARM.
i	AS REQUIRED	BOLT, CARRIAGE, 3/8" X REQUIRED LENGTH.
p	AS REQUIRED	COMPRESSION CONNECTORS.
ae	3	ARRESTER, SURGE, 7.65 kV MCOV, WITH MOUNTING HARDWARE.
af	3	CUTOUT, DISTRIBUTION, OPEN (15 KV). PROVIDE 21 AMP SloFast FUSE LINKS WITH MOUNTING HARDWARE.
an	3	TRANSFORMER, 277V-7.2 kV, 167 kVA.
ek	AS REQUIRED	LOCKNUTS.
fn	1	BRACKET, EXTENSION, 18".

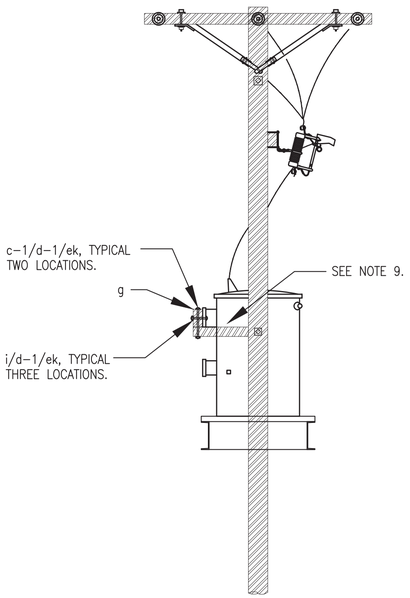
GENERAL NOTE:S

1) ADDITIONAL CONSTRUCTION UNITS AND MATERIAL REQUIRED FOR THE CONSTRUCTION OF THE PLATFORM SHALL BE PROVIDED AS REQUIRED FOR THE RUS UNITS REFERENCED.

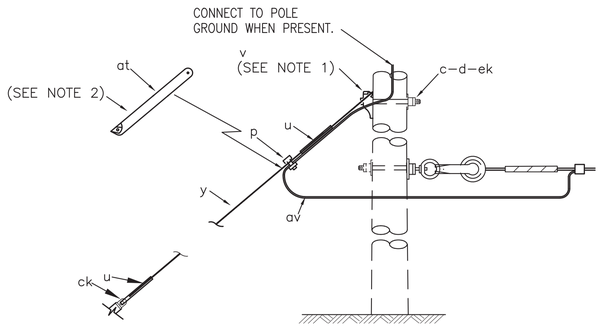
2) ALL CONSTRUCTION SHALL CONFORM TO RUS SPECIFICATIONS.

3) VERIFY EXISTING SYSTEM PHASE ROTATION AND MATCH NEW SYSTEM TO THE EXISTING.

NOTES:
1) EXISTING CONDUCTORS, POLES, AND HARDWARE TO REMAIN SHOWN WITH LIGHT, DASHED LINES. NEW CONDUCTORS, POLES AND EQUIPMENT SHOWN WITH DARK, SOLID LINES. ALL UNITS TO BE DEMOLISHED SPECIFICALLY INDICATED WITH NOTES.
2) CONDUCTORS AS INDICATED. SEE SWITCHGEAR ONE-LINE DIAGRAM. ROUTE NEW CABLE ON NEW SUPPORTS OVER TO NEW TRANSFORMERS. MAKE CONNECTIONS AT TRANSFORMERS AS REQUIRED FOR WYE CONNECTION.
3) TIE H2 BUSHING TO GROUND. GROUND TRANSFORMER TANKS, MINIMUM #4 COPPER. CONNECT ALL ARRESTERS TO GROUND AND GROUND ALL METALLIC PARTS.
4) ALUMAFORM 3PAL-16 TRANSFORMER PLATFORM, OR ENGINEER APPROVED EQUAL. INSTALL PLATFORM IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS USING MATERIAL PROVIDED OR IDENTIFIED BY THE MANUFACTURER.
5) CONDUIT SUPPORT SHALL BE B-LINE BB12-18, HOT DIP GALVANIZED. ATTACH WITH FOUR 1/4" HOT DIP GALVANIZED LAG BOLTS.
6) PROVIDE EXTRA POLE KIT. CUT POLE AS REQUIRED TO MATCH ELEVATION OF PLATFORM.
7) ADJUST DIMENSIONS AS NECESSARY TO MATCH EXISTING PLATFORM.
8) INSTALL INSULATORS IN ACCORDANCE WITH RUS UNIT A2.021, TWO EACH CROSSARM, AND A2.01 ON POLE.
9) INSTALL CROSSARM TIMBER TO PROVIDE SUPPORTS FOR TRANSFORMERS. CUT STANDARD CROSSARM AND ATTACH TO POLES FOR TIMBER SUPPORT. LOCATION OF TIMBER AND LENGTH OF CUT CROSSARMS TO BE FIELD ADJUSTED AS REQUIRED FOR TRANSFORMERS PROVIDED. ALL INSTALLATION SHALL BE LEVEL AND PLUMB. CUTS SHALL BE SQUARE.
10) REINSTALL FUSED CUTOUT AND ARRESTER ON NEW EXTENSION BRACKET. POSITION BRACKET AS REQUIRED TO COORDINATE WITH NEUTRAL.
11) PROVIDE DUAL RATED COMPRESSION LUGS ON CABLE ENDS FOR CONNECTION TO TRANSFORMER SECONDARY LOAD PADS. PROVIDE COLD SHRINK OR HEAT SHRINK MOISTURE SEAL AT END OF CABLE. MOISTURE SEAL SHALL EXTEND OVER THE INSULATION AND THE LUG TO PROVIDE A WATER TIGHT CONNECTION.



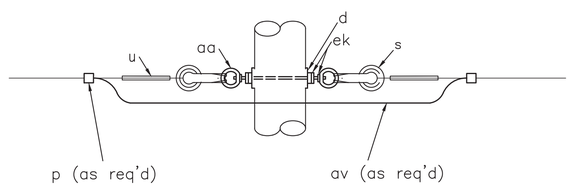
2 E1.6 TRANSFORMER BANK NEW WORK SECTION
3/8"=1'



NOTES:
1. PROVIDE PRE-FORMED GUY DEADEND (u.) OTHER DEADEND MATERIAL SHALL NOT BE SUBSTITUTED.
2. INSTALL RED STRIPED REFLECTIVE TAPE ON BOTH SIDES OF GUY GUARD. INSTALL TAPE IN WARM ENVIRONMENT, ABOVE MANUFACTURE RECOMMENDED TEMPERATURE.
3. 2-5/8" MACHINE BOLTS AND 2-3" SQUARE, CURVED WASHERS MAY BE USED TO INSTALL GUY ATTACHMENT.

ITEM	QTY	MATERIAL
c	1	Bolt, machine, 3/4 x req'd length.
ci	1	Clevis, thimble, 5/8", (20,000 lbs.).
ck	1	Clamp, anchor bonding.
d	1	Washer, square, 4", curved.
p		Connectors, guy bond and as req'd.
u	2	Deadend for guy strand, heavy duty preformed.
v	1	Guy attachment, guy hook type.
y		Guy wire, 3/8" EHS.
at	1	Guy marker, Yellow.
av		Jumpers, as required.
ek	1	Locknuts.

3 E1.6 E1.1La SINGLE DOWN GUY
NO SCALE



ITEM	QTY	MATERIAL
d	2	Washer, square 3" curve
n	1	Bolt,double arming,5/8" x req'd length
p		Connectors, as req'd
aa	2	Nut, eye, 5/8"
av		Jumpers, as req'd
ek	4	Locknuts
s	2	Clevis, secondary, swinging, insulated
u	2	Deadend for neutral, heavy duty preformed.

DESIGN PARAMETERS: PERMITTED LONGITUDINAL LOADING: 5,000 lbs.

4 E1.6 N6.1a NEUTRAL ASSEMBLY - DOUBLE DEADEND
NO SCALE

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

ISSUED FOR CONSTRUCTION DECEMBER 2022

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

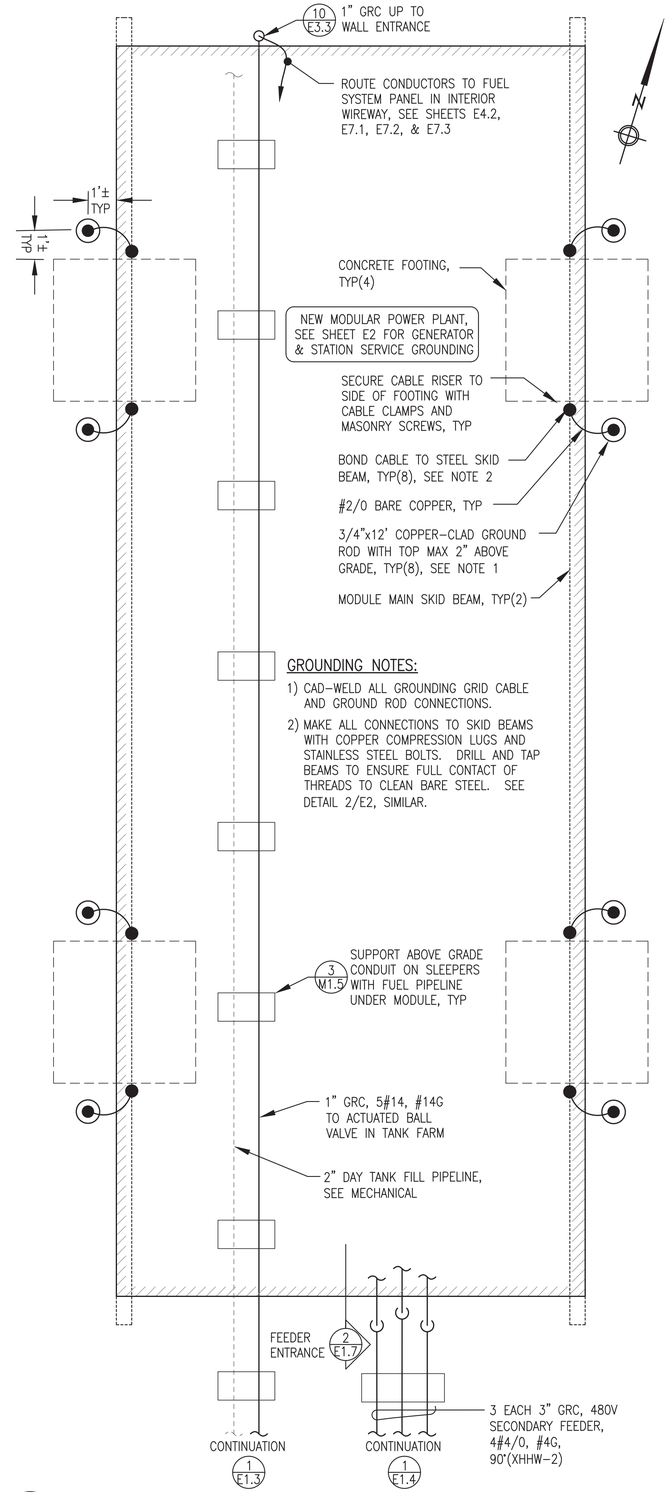
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

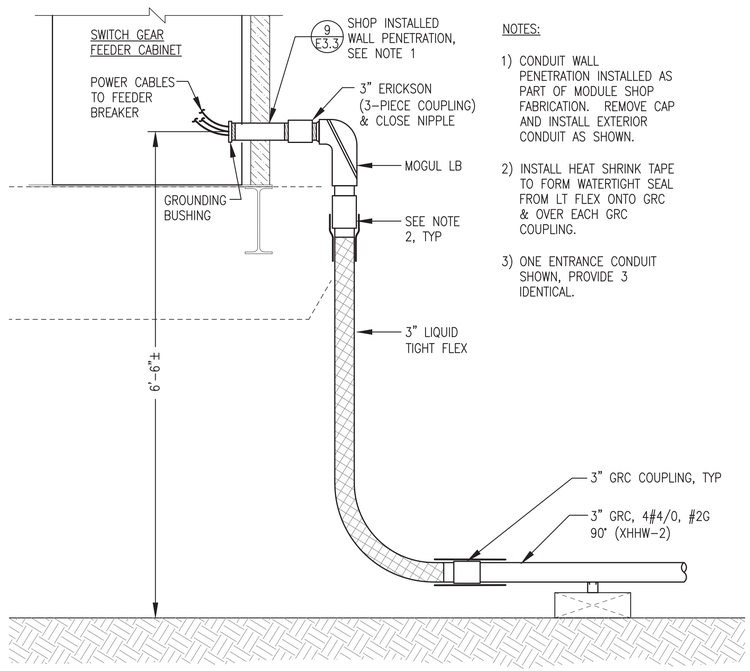
TITLE: STEP UP TRANSFORMER BANK FINAL CONFIGURATION & DETAILS

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 12/15/22
FILE NAME: NAPS PP E1 | SHEET: E1.6
PROJECT NUMBER:



1 E1.7 POWER PLANT GROUNDING & FEEDER PLAN
3/8"=1'-0"



2 E1.7 FEEDER ENTRANCE
NO SCALE

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

ISSUED FOR CONSTRUCTION
DECEMBER 2022

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

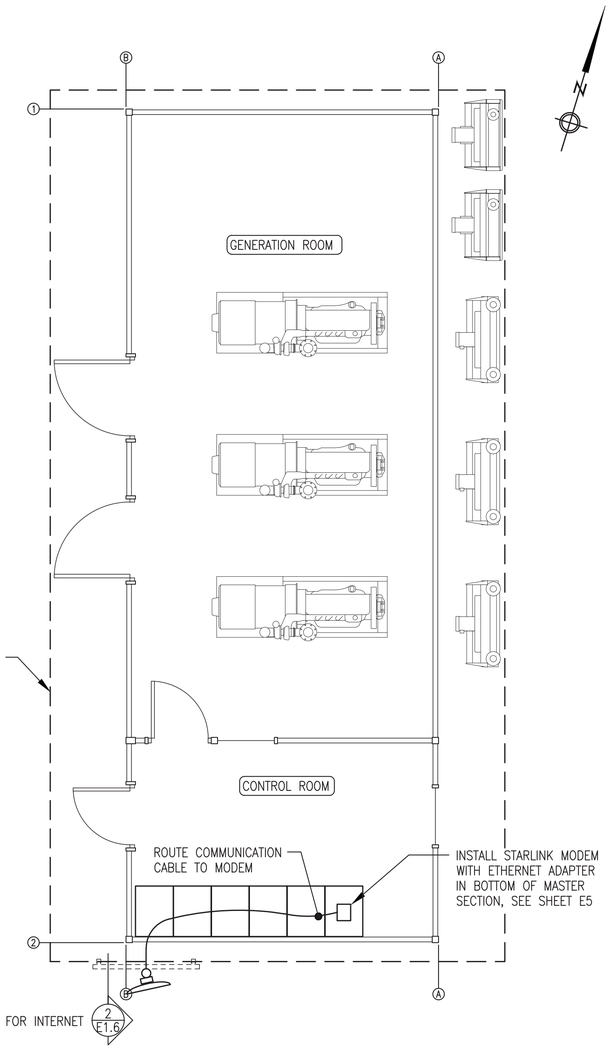
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: POWER PLANT GROUNDING PLAN & FEEDER 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: 12/15/22
FILE NAME: NAPS PP E1 | SHEET: E1.7
PROJECT NUMBER:



1 E1.8 POWER PLANT COMMUNICATION PLAN
1/4"=1'-0"

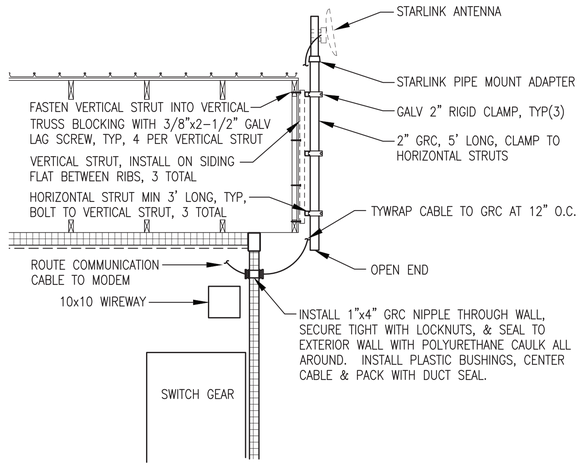
INTERNET SERVICE GENERAL NOTES:

1) THE INTERNET SERVICE SHALL HAVE THE FOLLOWING MINIMUM PERFORMANCE CHARACTERISTICS:
   20 MBPS DOWNLOAD
   5 MBPS UPLOAD
   NO MONTHLY DATA LIMIT
   STARLINK STANDARD OR APPROVED EQUAL.

2) FURNISH AND INSTALL COMPLETE SYSTEM WITH ANTENNA, PIPE MOUNT ADAPTER, MODEM, CABLE, CONNECTORS, ETHERNET ADAPTER, AND ACCESSORIES REQUIRED TO PROVIDE INTERNET SERVICE TO THE NEW POWER PLANT.

3) UPON COMPLETION OF INSTALLATION THE INTERNET SYSTEM SHALL BE COMMISSIONED IN ACCORDANCE WITH THE SERVICE PROVIDER'S REQUIREMENTS.

4) IN ADDITION TO FURNISHING AND INSTALLING SYSTEMS, THE CONTRACTOR SHALL PRE-PAY FOR A 1 YEAR INTERNET SERVICE CONTRACT.



2 E1.8 COMMUNICATIONS ANTENNA & MAST INSTALLATION DETAILS
1/2"=1'-0"

ALL WORK ON THIS SHEET IS INCLUDED IN THE ON SITE CONTRACT

REV#1
ISSUED FOR
CONSTRUCTION
NOV 2023

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

REV.	DESCRIPTION	DATE	BY
1	CHANGED INTERNET SERVICE TO STARLINK	11/10/23	BCG

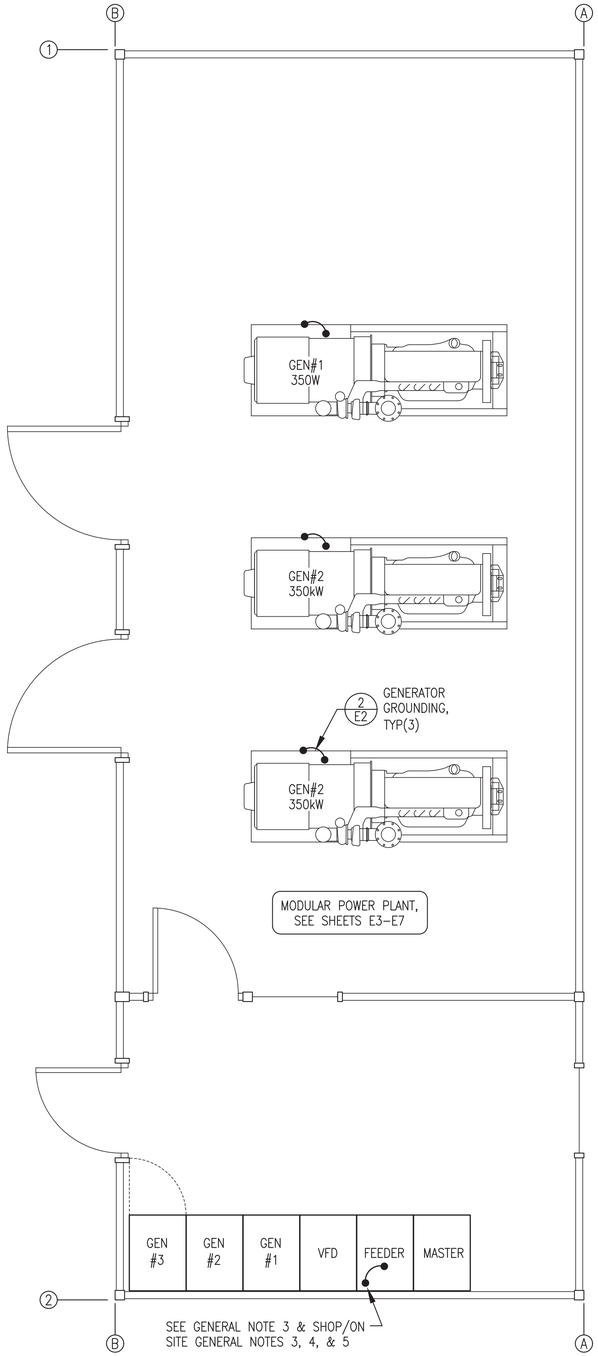
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: POWER PLANT COMMUNICATION PLAN & 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: 12/15/22
FILE NAME: NAPS PP E1	SHEET: E1.8
PROJECT NUMBER:	



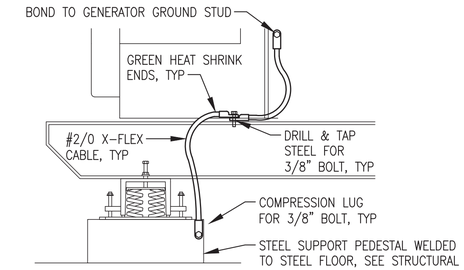
1 E2 MODULE GROUNDING PLAN
3/8"=1'-0"

GROUNDING GENERAL NOTES:

1) POWER PLANT STRUCTURE IS A CONTINUOUSLY WELDED STEEL MODULE WHICH WILL BE FIELD BONDED TO THE GROUNDING GRID.
2) MAKE ALL CABLE CONNECTIONS TO STRUCTURE, SKIDS, OR SUPPORT PEDESTALS WITH COPPER COMPRESSION LUGS AND STAINLESS STEEL BOLTS. DRILL AND TAP STRUCTURAL MEMBERS TO ENSURE FULL CONTACT OF THREADS TO CLEAN BARE STEEL. SEE DETAIL 2/E2, SIMILAR.
3) IN FEEDER SECTION PROVIDE #2/0 BARE COPPER JUMPER FROM GROUND BUS TO STEEL FLOOR. SEE DETAIL 2/E2, SIMILAR.

GROUNDING SHOP/ON–SITE NOTES:

1) ALL WORK SHOWN THIS SHEET TO BE PERFORMED AS PART OF THE SHOP FABRICATION.
2) FIELD INSTALLATION OF GROUND GRID AND BONDING TO MODULE TO BE PERFORMED AS PART OF THE ON–SITE WORK. SEE ENLARGED SITE PLAN.
3) AS PART OF SHOP FABRICATION WORK, TEMPORARILY BOND SWITCHGEAR NEUTRAL BUS TO GROUND BUS FOR LOAD BANK TESTING AND LEAVE IN PLACE.
4) AS PART OF ON–SITE WORK LEAVE NEUTRAL TO GROUND BUS BONDING JUMPER IN PLACE AS REQUIRED FOR LOAD BANK TESTING.
5) REMOVE JUMPER AFTER LOAD BANK TESTING AND PRIOR TO CONNECTING TO THE GRID FOR COMMISSIONING.



2 E2 GENERATOR GROUNDING
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE ASSEMBLY CONTRACT EXCEPT AS SPECIFICALLY INDICATED IN THE SHOP/ON SITE NOTES.

ISSUED FOR CONSTRUCTION
JULY 2022

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

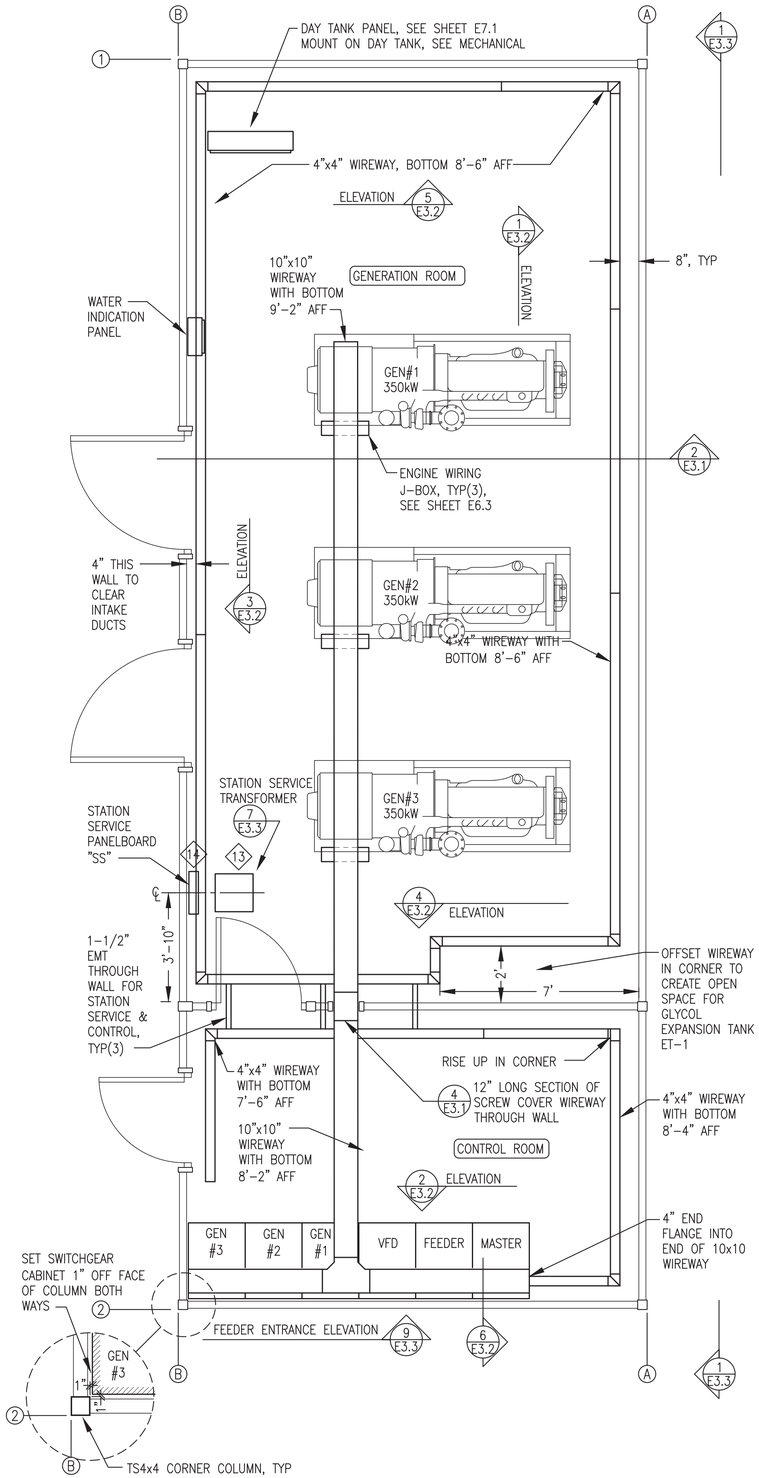
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

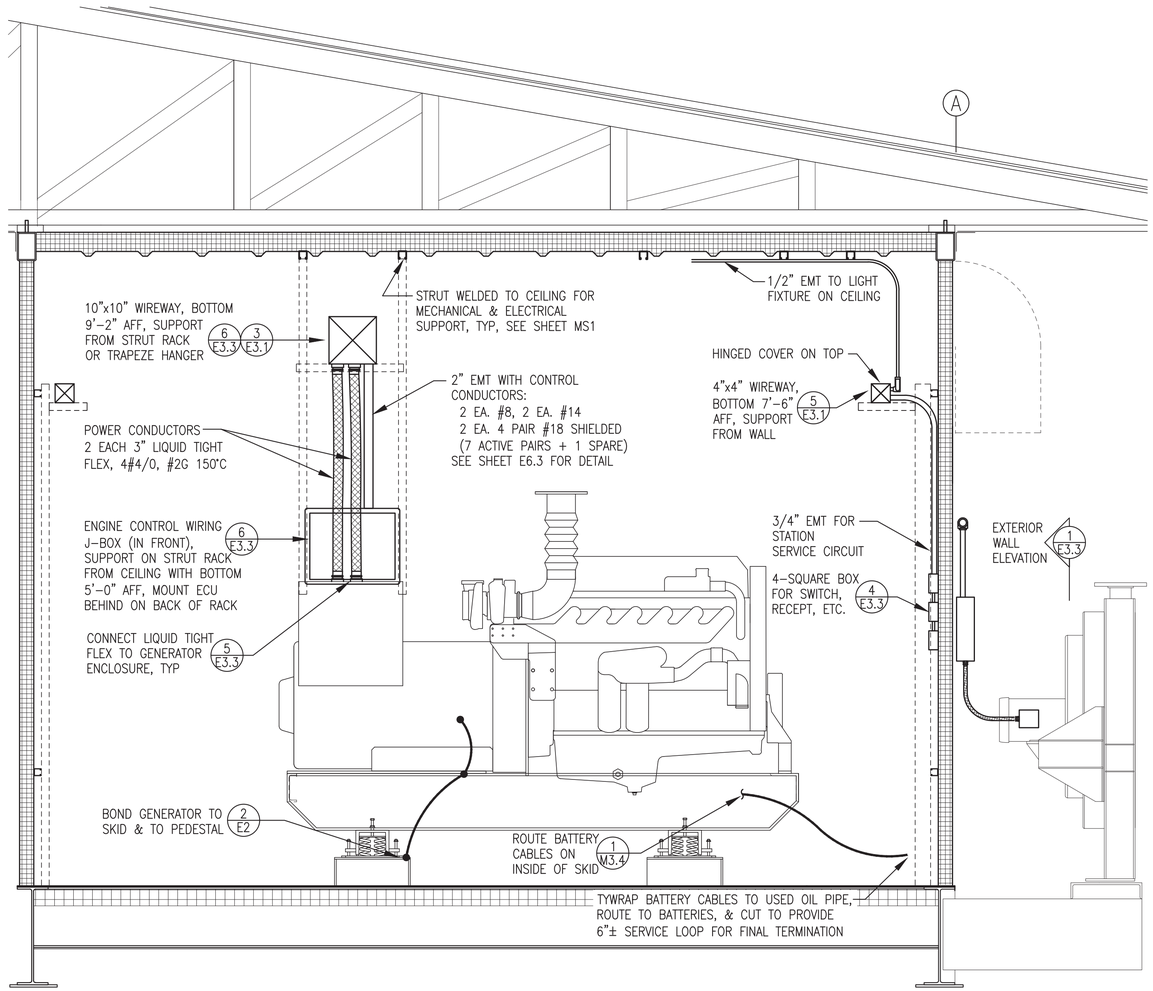
TITLE: MODULE GROUNDING PLAN & DETAILS

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

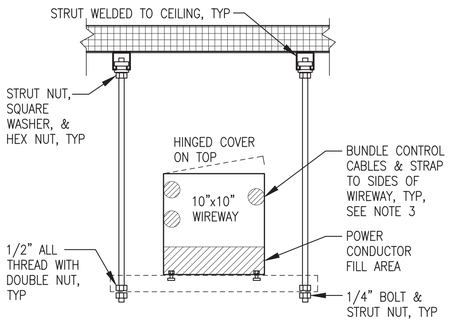
DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 7/29/22
FILE NAME: NAPS PP E2-5 | SHEET: E2
PROJECT NUMBER:



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

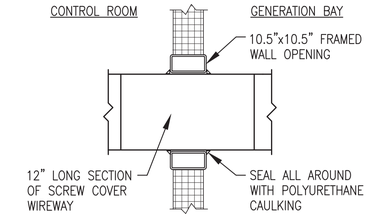


2 E3.1 TYPICAL MODULE SECTION
3/4"=1'-0"

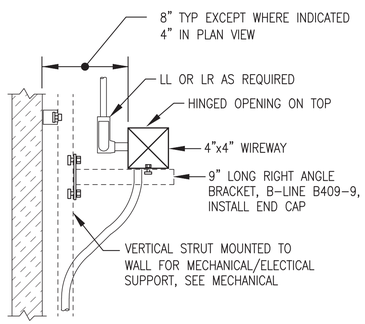


NOTES:
1) INSTALL HANGER AT EACH JOINT & AT END.
2) HANGER NOT REQUIRED AT ENGINE J-BOX SUPPORT, SEE DETAIL 4/E4.3.
3) STRAP CABLES AT 5' O.C. MIN USING 3M 06292 OR EQUAL STICKY BACK BASES. FASTEN BASES TO WIREWAY SIDE WITH MACHINE BOLTS.

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

ENGINE-GENERATOR SCHEDULE	
GENSET	DESCRIPTION
GEN #1, GEN #2, & GEN #3	ENGINE – 500 HP, 350 eKW PRIME, MTU-DETROIT 6063TK35. 24 VDC STARTING & CONTROL. GENERATOR – MINIMUM 450 KW CONTINUOUS AT 105°C RISE, NEWAGE/STAMFORD HCI534D.

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

ISSUED FOR CONSTRUCTION
JULY 2022

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

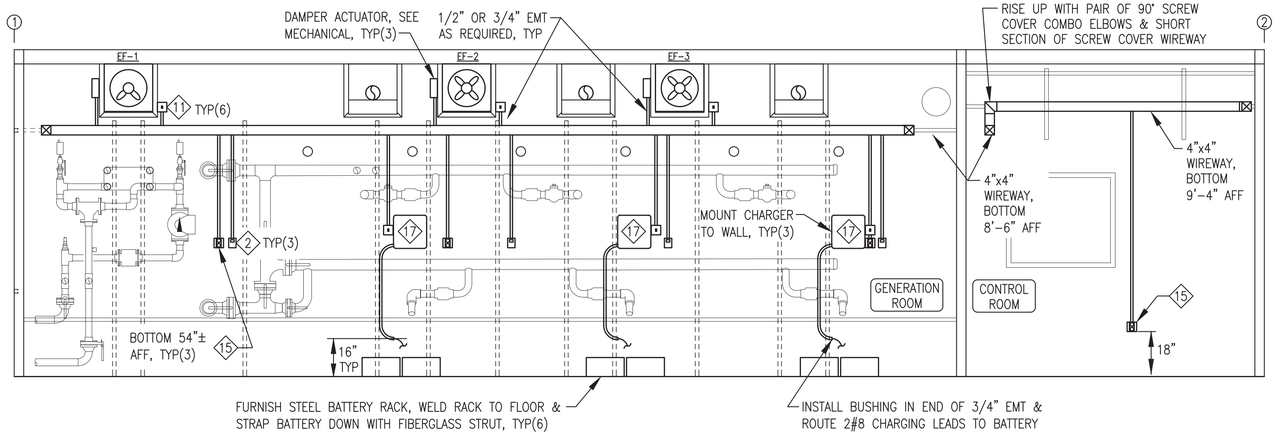
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

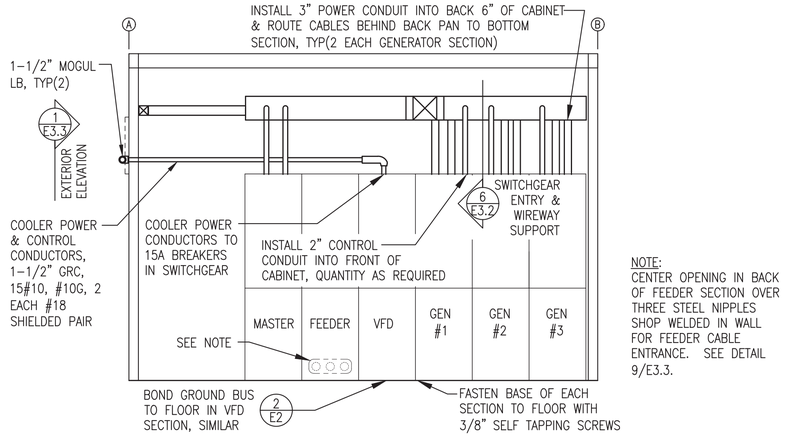
TITLE: WIREWAY PLAN, BUILDING SECTION, & DETAILS

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: CWV/BCG | DATE: 7/29/22
FILE NAME: NAPS PP E2-5 | SHEET: E3.1
PROJECT NUMBER:

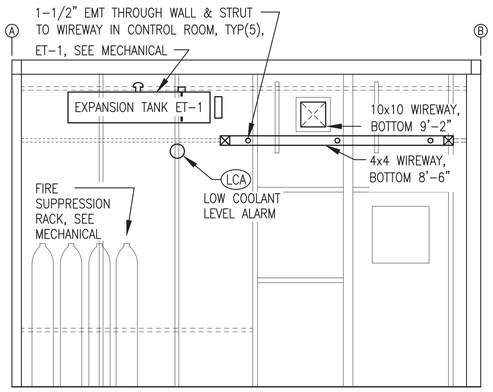


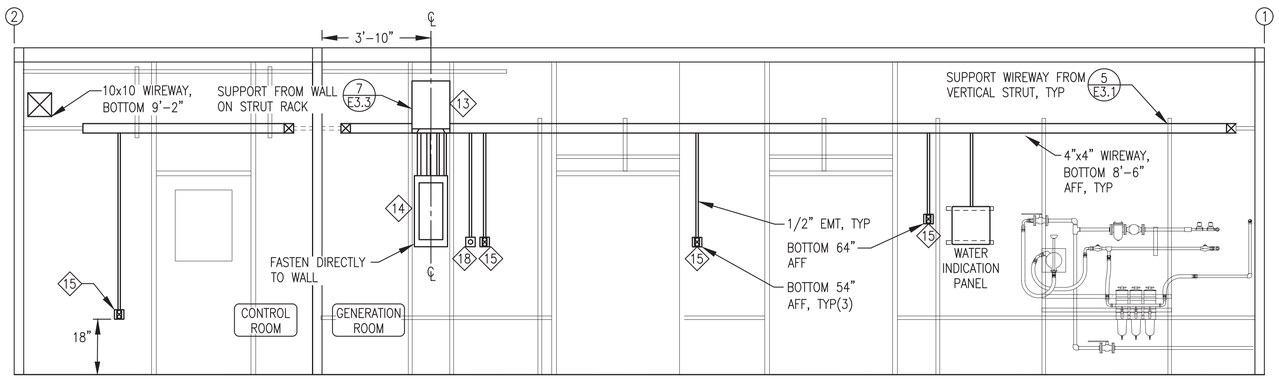
1 E3.2 WALL ELEVATION AT GRID A
3/8"=1'-0"



NOTE:
CENTER OPENING IN BACK OF FEEDER SECTION OVER THREE STEEL NIPPLES SHOP WELDED IN WALL FOR FEEDER CABLE ENTRANCE. SEE DETAIL 9/E3.3.

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

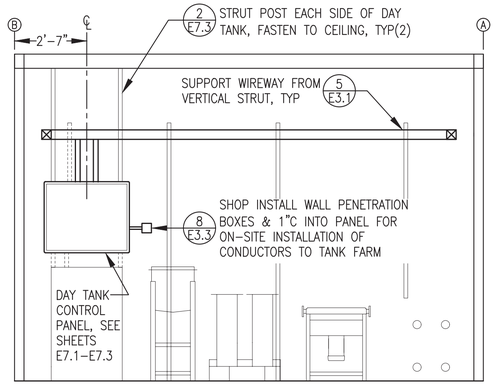




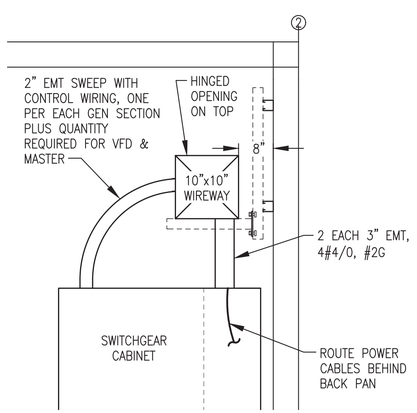
3 E3.2 WALL ELEVATION AT GRID B
3/8"=1'-0"

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

GENERAL NOTE:
WALL ELEVATIONS SHOWN PRIMARILY FOR GENERAL LAYOUT OF MAJOR RACEWAY, EQUIPMENT, AND DEVICES REQUIRING REGULAR ACCESS FOR NORMAL DAILY PLANT OPERATIONS. ALL EQUIPMENT, DEVICES & INSTRUMENTATION CIRCUITS NOT SHOWN FOR CLARITY. SEE PLANS & DETAILS FOR COMPLETE ELECTRICAL INSTALLATIONS.



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



6 E3.2 SWITCHGEAR ENTRY & WIREWAY SUPPORT
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

ISSUED FOR CONSTRUCTION
JULY 2022

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

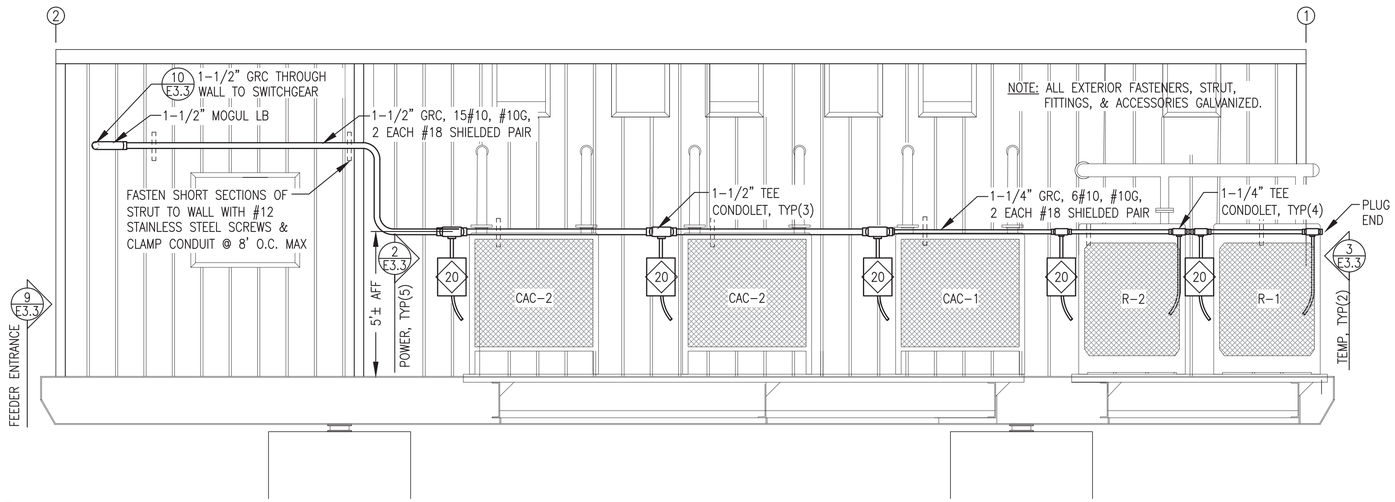
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

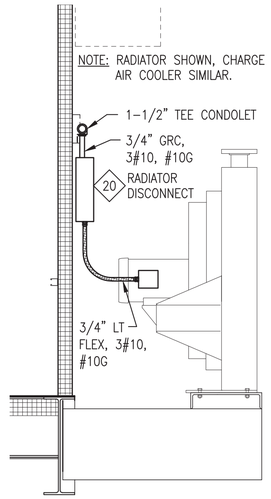
TITLE: ELEVATIONS & DETAILS

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

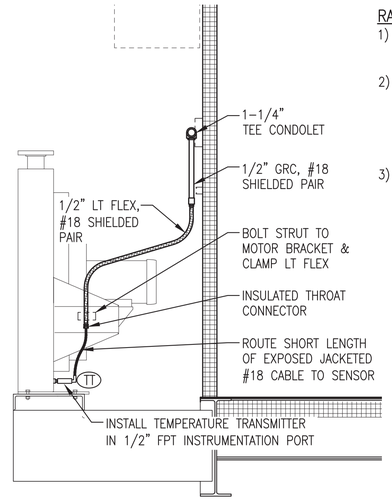
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E2-5	SHEET: E3.2
PROJECT NUMBER:	



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

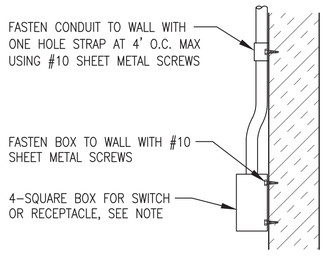


2 E3.3 RADIATOR POWER CONNECTION
3/4"=1'-0"



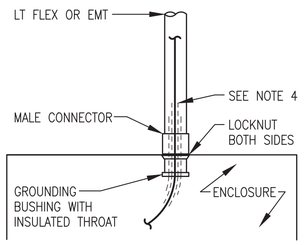
3 E3.3 RADIATOR TEMPERATURE TRANSMITTER
3/4"=1'-0"

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.



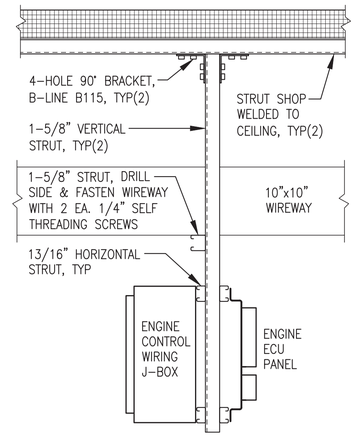
NOTE: INSTALL THERMOSTATS & TIMER SWITCHES IN DEEP SINGLE GANG BELL BOX INSTEAD OF 4-SQUARE BOX.

4 E3.3 TYPICAL INTERIOR DEVICE MOUNTING
NO SCALE

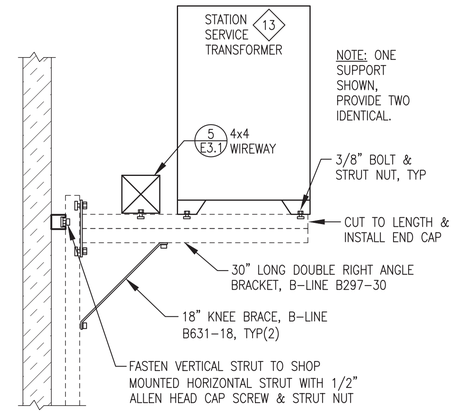


NOTES:
1) THIS DETAIL APPLIES TO CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS.
2) AT A MINIMUM INSTALL GROUNDING BUSHING ON ALL GENERATOR POWER CONDUIT, COMMUNITY FEEDER CONDUIT, STATION SERVICE FEEDERS, AND WHERE OTHERWISE INDICATED OR REQUIRED. BOND GROUNDING BUSHING TO EQUIPMENT GROUNDING CONDUCTOR.
3) INSTALL PLASTIC BUSHING WHERE GROUNDING BUSHING IS NOT REQUIRED.
4) ON GENERATOR ENCLOSURES PROTECT CABLES FROM WEAR BY INSTALLING 2 LAYERS OF HEAVY WALL HEAT SHRINK. BASE LAYER 12" LONG & SECOND LAYER 8" LONG, CENTERED IN CONNECTOR.

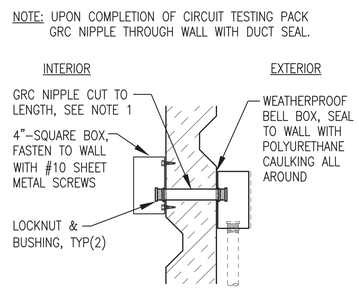
5 E3.3 TYP ENCLOSURE CONNECTION
NO SCALE



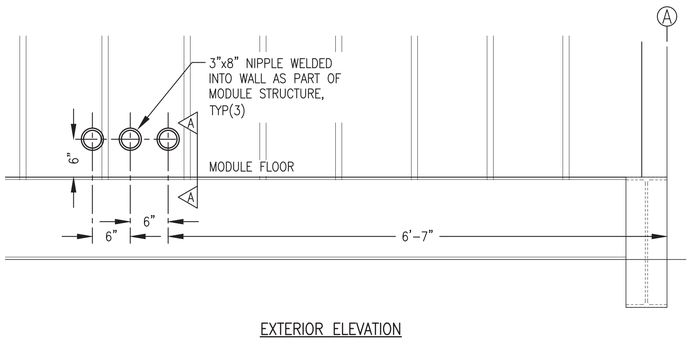
6 E3.3 ENGINE WIRING J-BOX SUPPORT
NO SCALE



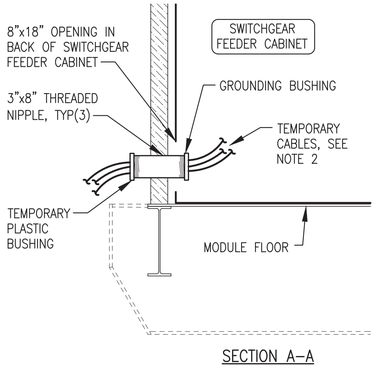
7 E3.3 STATION SERVICE TRANSFORMER SUPPORT
NO SCALE



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



EXTERIOR ELEVATION

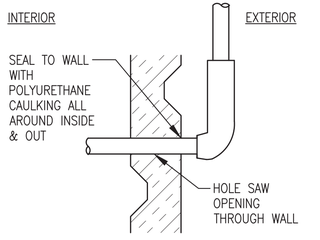


SECTION A-A

FEEDER SHOP/ON-SITE NOTES:
1) DURING SHOP FABRICATION INSTALL TEMPORARY FEEDER CABLES THROUGH ONE NIPPLE AS SHOWN. SPARE NIPPLE TO REMAIN CAPPED.
2) ROUTE TEMPORARY CABLES TO LOAD BANK FOR TESTING. AFTER TESTING INSTALL THREADED CAP ON EXTERIOR END OF NIPPLE.
3) INSTALL FEEDER TO TRANSFORMER AS PART OF ON-SITE WORK, SEE SHEET E1.2. FOR CONTINUATION.
4) UPON COMPLETION OF TESTING PACK GRC NIPPLES THROUGH WALL WITH DUCT SEAL.

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

NOTE: UPON COMPLETION OF CIRCUIT TESTING PACK GRC NIPPLE THROUGH WALL WITH DUCT SEAL.



10 E3.3 TYP CONDUIT WALL PENETRATION
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE ASSEMBLY CONTRACT EXCEPT AS SPECIFICALLY INDICATED IN THE SHOP/ON SITE NOTES.

ISSUED FOR CONSTRUCTION
JULY 2022

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

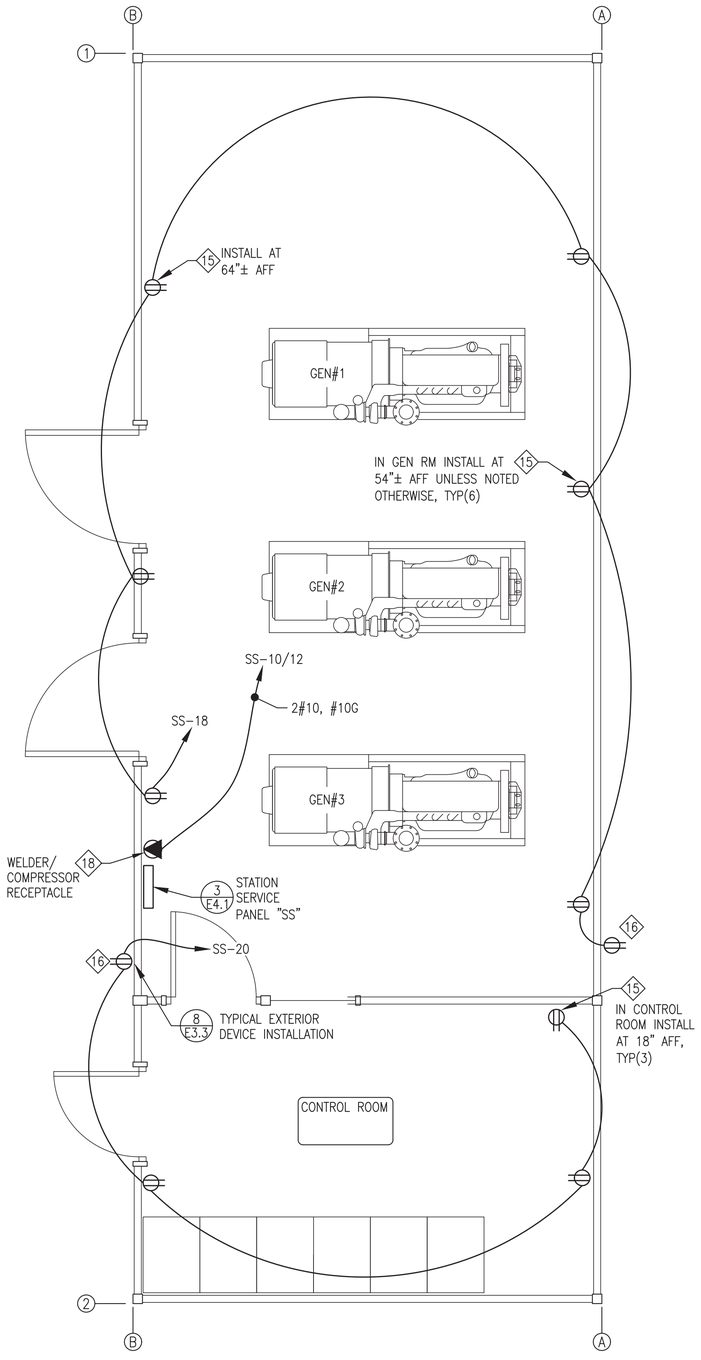
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: ELEVATIONS & DETAILS

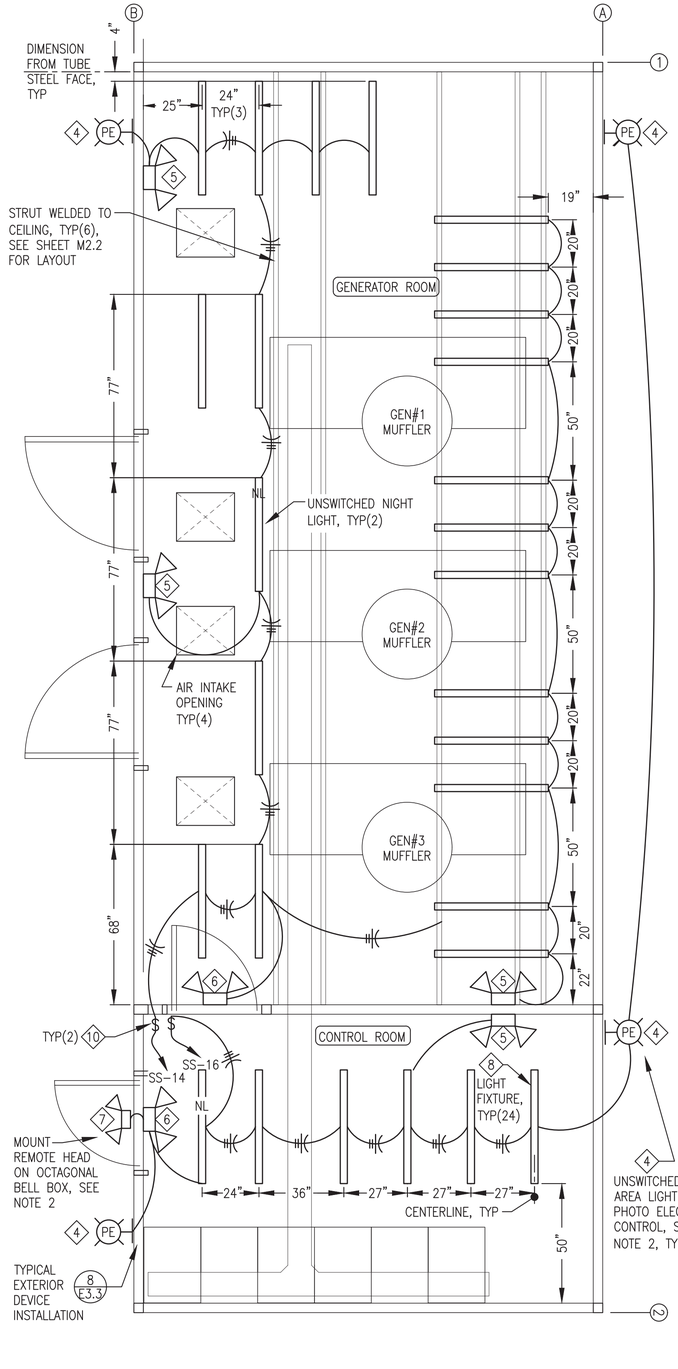
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E2-5	SHEET: E3.3
PROJECT NUMBER:	



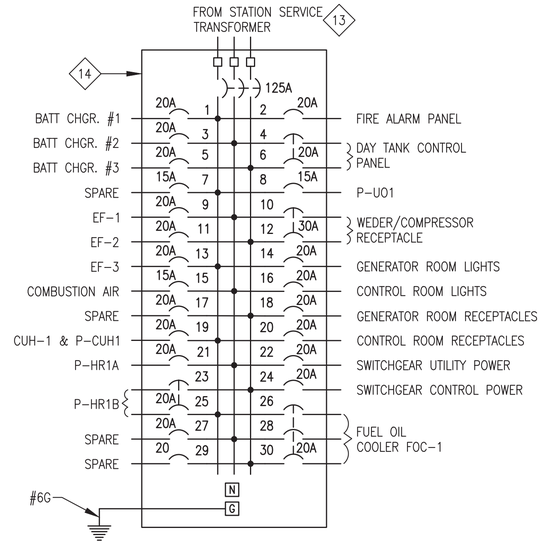
NOTES:
1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.

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



NOTES:
1) ALL WIRING RUNS 2#12, #12G UNLESS SPECIFICALLY NOTED OTHERWISE.
2) MOUNT EXTERIOR AREA AND EMERGENCY LIGHTS WITH TOP 10'-0" AFF.
3) FASTEN INTERIOR LIGHTS TO CEILING WITH #12 SHEET METAL SCREWS EXCEPT WHERE LIGHTS CROSS STRUT USE 1/4" BOLTS & STRUT NUTS, TYP

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



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

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

ISSUED FOR CONSTRUCTION JULY 2022

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

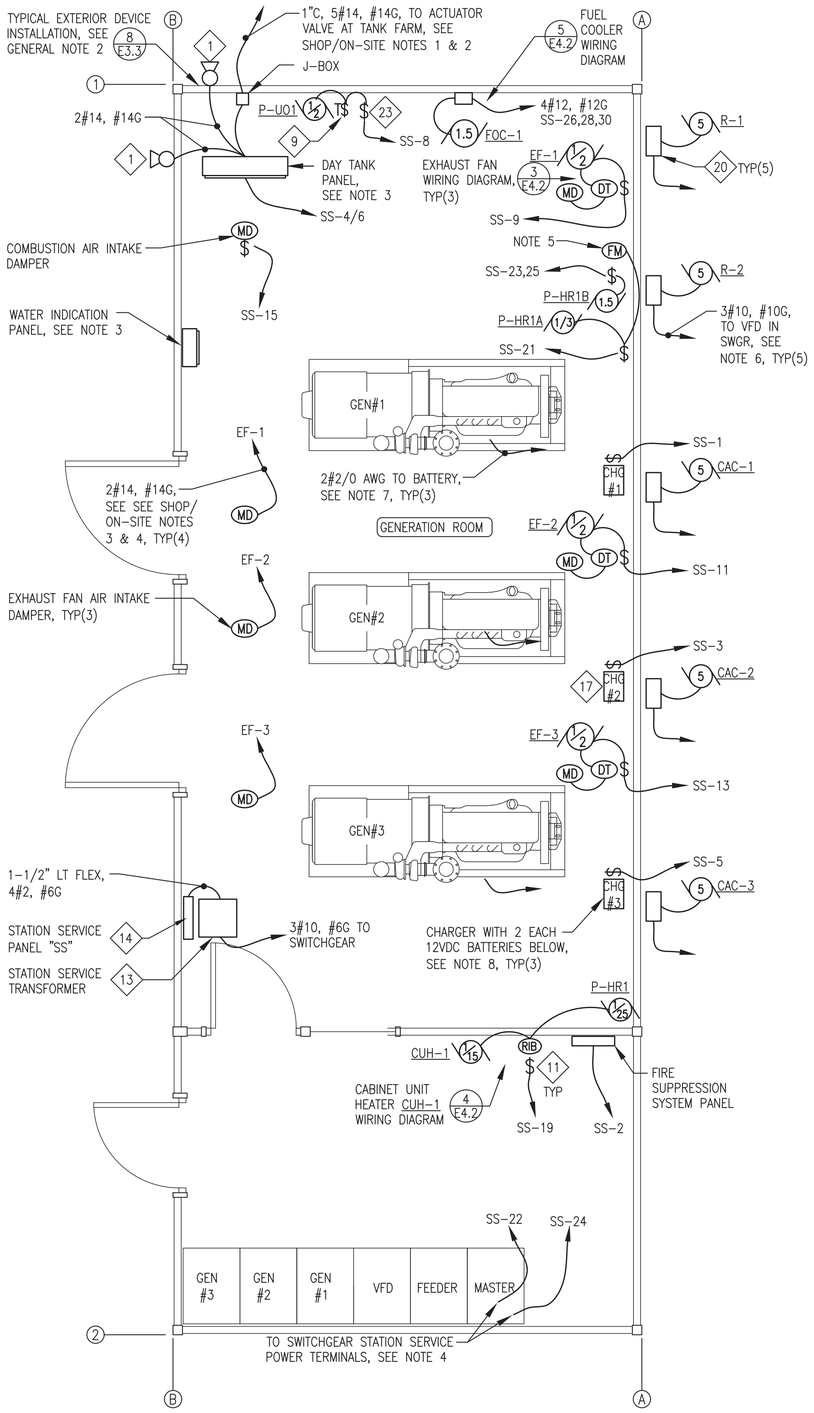
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: RECEPTACLE & LIGHTING PLANS & PANELBOARD

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E2-5	SHEET: E4.1
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 ALARMS HORNS WITH TOP AT 10'-0" AFF TO MATCH EXTERIOR LIGHTS, SEE SHEET E4.1

3) SEE SHEETS E7.1-E7.4 FOR DAY TANK AND WATER INDICATION PANEL DESIGN AND WIRING TERMINATIONS. 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 2/M4.2. PROVIDE CONTROL POWER FROM P-HR1A DISCONNECT.

6) ROUTE RADIATOR VFD POWER CONDUCTORS IN SEPARATE EXTERIOR CONDUIT, SEE ELEVATION 1/E3.3. DO NOT ROUTE IN WIREWAY. NOTE THAT CONDUCTORS ARE OVERSIZED FOR 50% DE-RATE AND PROVIDED WITH 15A BREAKER IN SWITCHGEAR.

7) ROUTE BATTERY CABLES TO FRONT OF SKID SUPPORTED WITH CUSHIONED CLAMPS, SEE SHEET M3.4. ROUTE FROM SKID DIRECTLY UNDER FUEL HOSES TO WALL AND TYWRAP CABLES TO USED OIL PIPE ALONG WALL, SEE DETAIL 2/E3.1. CUT TO PROVIDE 6"± SERVICE LOOP FOR FINAL TERMINATION ON BATTERIES.

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

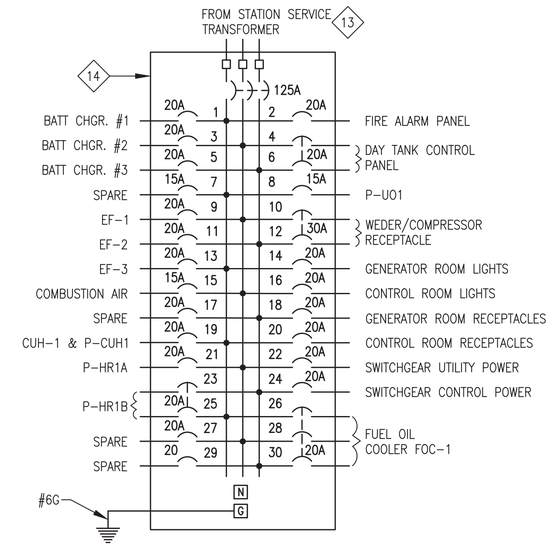
STATION SERVICE SHOP/ON-SITE NOTES:

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 ACTUATOR VALVE AT TANK FARM, SEE ENLARGED SITE PLAN.

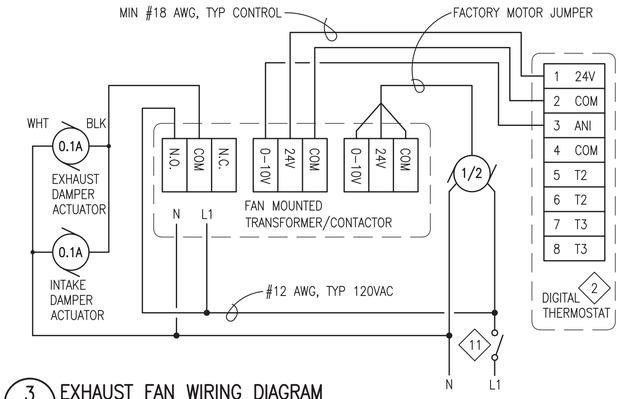
3) DURING SHOP FABRICATION INSTALL CEILING MOUNTED BOX ADJACENT TO DAMPER ACTUATOR AND TEMPORARILY CONNECT DAMPER TO VERIFY OPERATION.

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



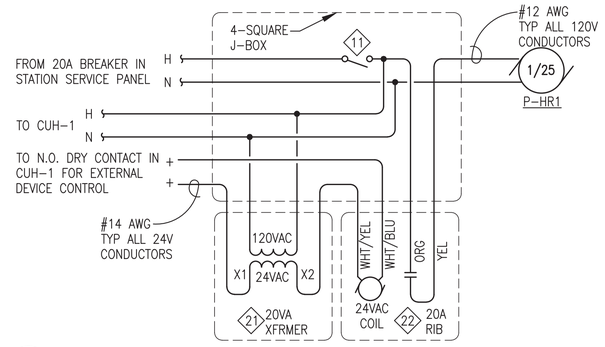
2 E4.2 STATION SERVICE PANEL "SS"

NO SCALE



3 E4.2 EXHAUST FAN WIRING DIAGRAM

NO SCALE



4 E4.2 CUH-1 WIRING DIAGRAM

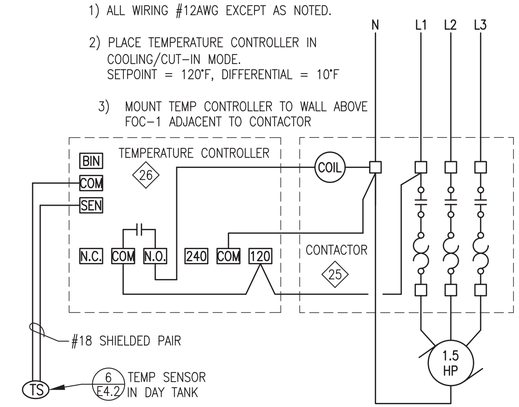
NO SCALE

NOTES:

1) ALL WIRING #12AWG EXCEPT AS NOTED.

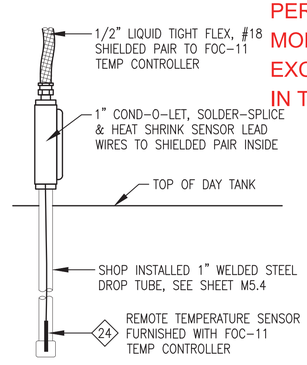
2) PLACE TEMPERATURE CONTROLLER IN COOLING/CUT-IN MODE. SETPOINT = 120°F, DIFFERENTIAL = 10°F

3) MOUNT TEMP CONTROLLER TO WALL ABOVE FOC-1 ADJACENT TO CONTACTOR



5 E4.2 FOC-1 WIRING DIAGRAM

NO SCALE



6 E4.2 TANK TEMP SENSOR INSTALLATION

NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE ASSEMBLY CONTRACT EXCEPT AS SPECIFICALLY INDICATED IN THE SHOP/ON SITE NOTES.

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

REVISION #1 ISSUED AUGUST 2022

REV.	DESCRIPTION	DATE	BY
1	REVISED TO COORDINATE WITH FINAL ON-SITE DESIGN	8/26/22	BCG

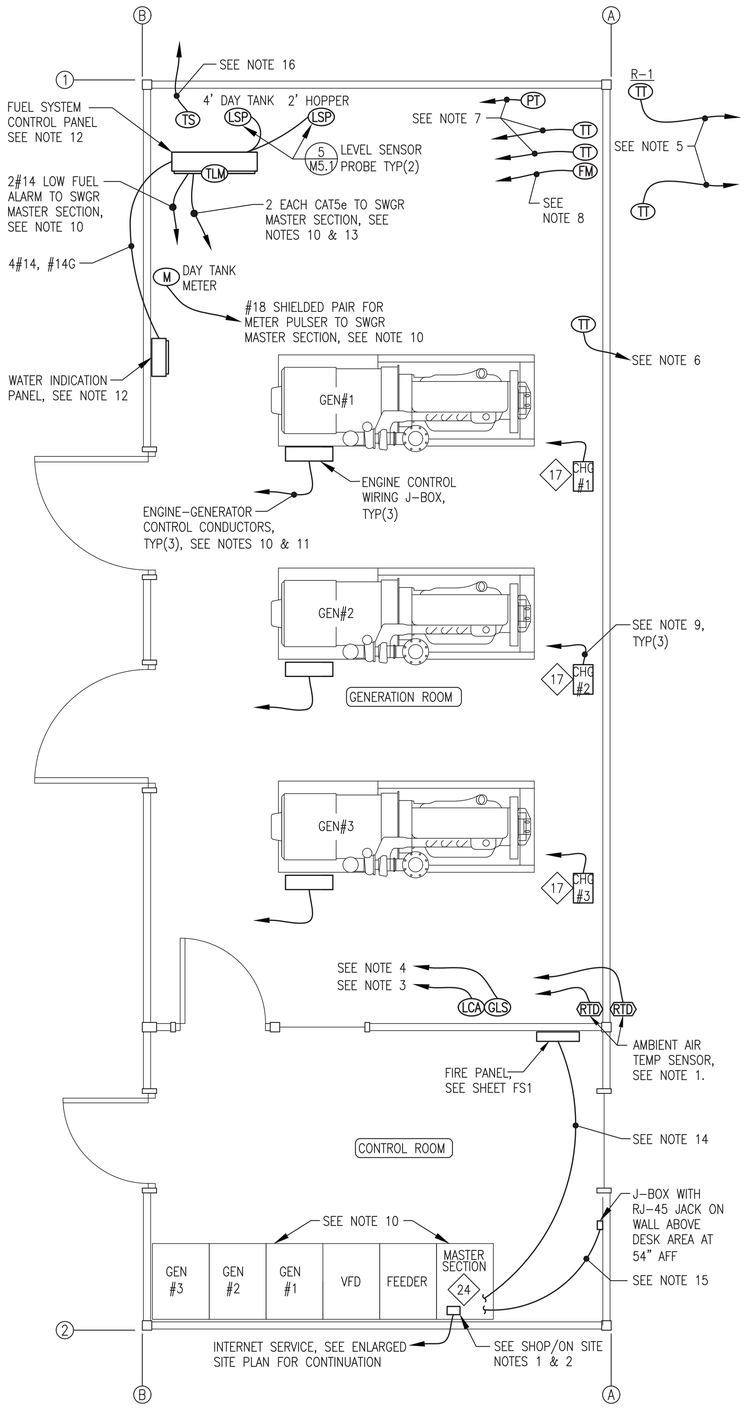
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: STATION SERVICE PLAN, DETAILS, & PANELBOARD

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E2-5	SHEET: E4.2
PROJECT NUMBER:	



1 E5 INSTRUMENTATION & DATA PLAN

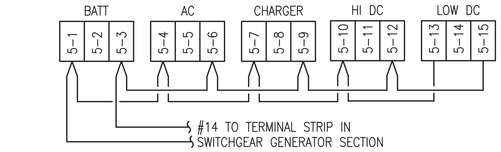
3/8"=1'-0"

INSTRUMENTATION & DATA PLAN NOTES:

1. RTD TEMPERATURE SENSOR PROVIDED WITH SWITCHGEAR. ROUTE #18 SHIELDED PAIR TO SWITCHGEAR MASTER SECTION. SEE DETAIL 3/E5 AND NOTE 10.
2. INSTALL RBB WIFI ROUTER MODEM AND INTERNET ROUTER ON TOP OF MASTER SECTION IN RACK OR CABINET. CONNECT MODEM TO ROUTER. CONNECT ROUTER TO ETHERNET SWITCH INSIDE MASTER SECTION. CONNECT BOTH TO 120VAC UPS. SEE NOTE 10 AND SHOP/ON SITE NOTES 1 AND 2.
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 1/M4.2. 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 2/M4.2. 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 ENGINE-GENERATOR CONTROL CONDUCTORS TO SWITCHGEAR IN 10x10 WIREWAY WITH POWER CONDUCTORS. SEE DETAIL 2/E3.1, SHEET E6.3, AND NOTE 10.
12. SEE SHEETS E7.1-E7.4 FOR DAY TANK AND WATER INDICATION CONTROL PANEL DESIGN AND WIRING TERMINATIONS. ALL ACCESSORIES NOT SHOWN ON PLANS. SEE LOGIC DIAGRAMS FOR ADDITIONAL DETAIL.
13. ROUTE CAT5e CONDUCTORS FROM DAY TANK PANEL REMOTE I/O AND TANK LEVEL MONITOR TO ETHERNET SWITCH IN SWITCHGEAR MASTER SECTION. INSTALL IN SEPARATE DEDICATED RACEWAY. DO NOT ROUTE WITH STATION SERVICE OR POWER CONDUCTORS.
14. ROUTE CAT5e FOR DATA AND 2#14 FOR GENERATOR SHUT DOWN FROM FIRE PANEL TO SWITCHGEAR MASTER SECTION, SEE SHEET FS1 AND NOTE 10. INSTALL IN SEPARATE DEDICATED RACEWAY, COLOR RED. DO NOT ROUTE WITH STATION SERVICE OR POWER CONDUCTORS.
15. ROUTE CAT5e FROM RJ-45 JACK IN DESK AREA TO ETHERNET SWITCH IN MASTER SECTION. INSTALL IN SEPARATE DEDICATED RACEWAY. DO NOT ROUTE WITH STATION SERVICE OR POWER CONDUCTORS.
16. INSTALL FUEL COOLER TEMP SENSOR IN DAY TANK AND ROUTE #18 SHIELDED PAIR TO FUEL COOLER CONTROLLER, SEE DETAILS 5/E4.2 AND 6/E4.2.

INSTRUMENTATION SHOP/ON-SITE NOTES:

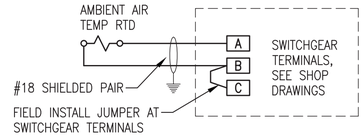
1. AS PART OF SHOP FABRICATION INSTALL ETHERNET SWITCH IN MASTER SECTION.
2. AS PART OF ON-SITE WORK INSTALL STARLINK MODEM WITH ETHERNET ADAPTER IN BOTTOM OF MASTER SECTION. CONNECT MODEM TO ETHERNET SWITCH AND TO 120VAC UPS INSIDE MASTER SECTION. SEE NOTE 10.



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



3 E5 AMBIENT AIR TEMP RTD TERMINATION

NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE ASSEMBLY CONTRACT EXCEPT AS SPECIFICALLY INDICATED IN THE SHOP/ON SITE NOTES.

REV#1
ISSUED FOR CONSTRUCTION
NOV 2023

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

REV.	DESCRIPTION	DATE	BY
1	CHANGED INTERNET SERVICE TO STARLINK	11/10/23	BCG

ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: INSTRUMENTATION & DATA PLAN & 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: 7/29/22
FILE NAME: NAPS PP E2-5 | SHEET: E5
PROJECT NUMBER:

Final (Permanent) Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	One Gen	350	310	---
Level 2	Two Gens	700	620	280
Level 3	All	1050	---	560
Note: All generators are equal capacity. Manually select lead unit.				
Temporary Demand Control for Shop Load Test with 300kW Load Bank				
Level 1	One Gen	150	135	---
Level 2	Two Gens	300	270	120
Level 3	All	450	---	240
Note: Temporarily set to reduced values in order to test all demand levels.				

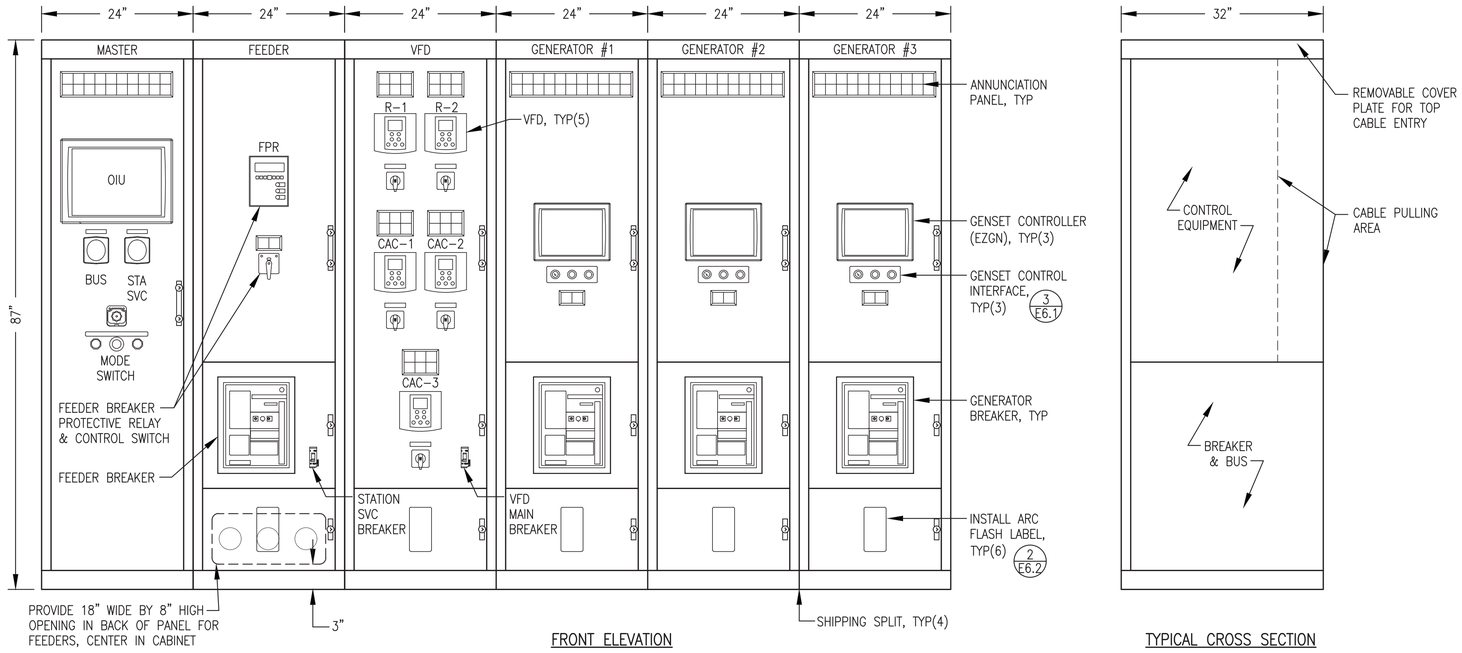
Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Air Filter Vacuum	1-10" H2O	15" H2O	20" H2O
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Charge Air Temp.	100-120°F	140°F	150°F
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Gen Breaker Trip Setpoint (EZGN Rated Current)	600 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

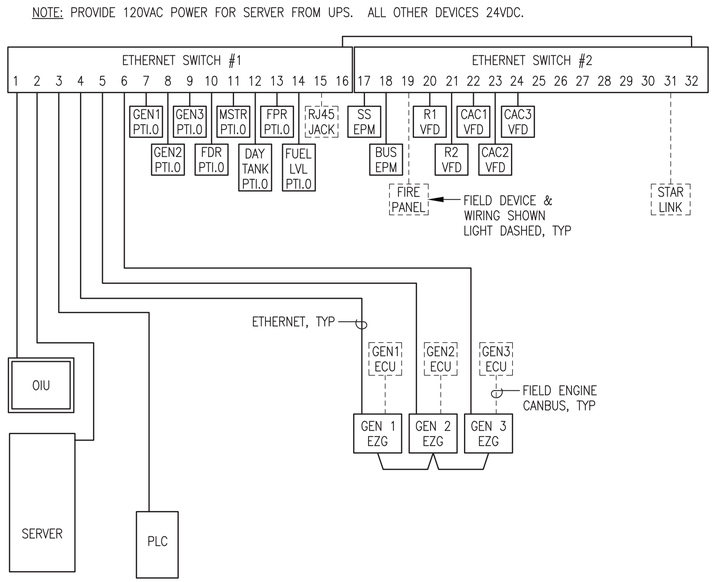
Feeder Breaker Settings (Feeder Protection Relay - FPR)	
Function (Note: Element 1 is the only active element)	Setting
T.O.C. Trip Pickup (amps) Note: 5A = 100% of CT rating	4.7
T.O.C. Curve Selection	U4
T.O.C. Time Dial	5.00
E.M Reset delay (Y/N)	N
Constant Time Adder (seconds)	0.00
Minimum Response Time (seconds)	0.00
Maximum Phase T.O.C. Torque Control	1

Radiator VFD Settings	
Function	Setting
Min PID Feedback	20
Max PID Feedback	240
rSL (Wake UP Threshold)	1
PID Reference Temperature	175°F
Proportional Gain	0.93
Integral Gain	0.3
Derivative	0
Minimum Speed	10 Hz.
Low Speed Timeout	10 sec.
Loss of Phase	Ignore

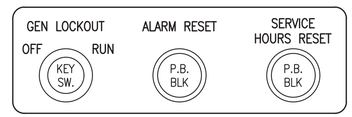
Charge Air Cooler VFD Settings	
Function	Setting
Min PID Feedback	20
Max PID Feedback	240
rSL (Wake UP Threshold)	Not Used
PID Reference Temperature	100°F
Proportional Gain	0.2
Integral Gain	0.1
Derivative	0



1 E6.1 SWITCHGEAR ENCLOSURE LAYOUT
NO SCALE



2 E6.1 COMMUNICATION SCHEMATIC
NO SCALE



EASYGEN INTERFACE CONTROLS

INTERFACE CONTROLS LEGEND:
P.B. PUSH BUTTON
KEY SW. KEY OPERATED LOCKABLE SWITCH

3 E6.1 GENSET CONTROL (EZGN) INTERFACE CONTROLS
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

REV#1
ISSUED FOR CONSTRUCTION
NOV 2023

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

REV.	DESCRIPTION	DATE	BY
1	REVISE PANEL TO MATCH SHOP AS BUILT	11/13/23	BCG

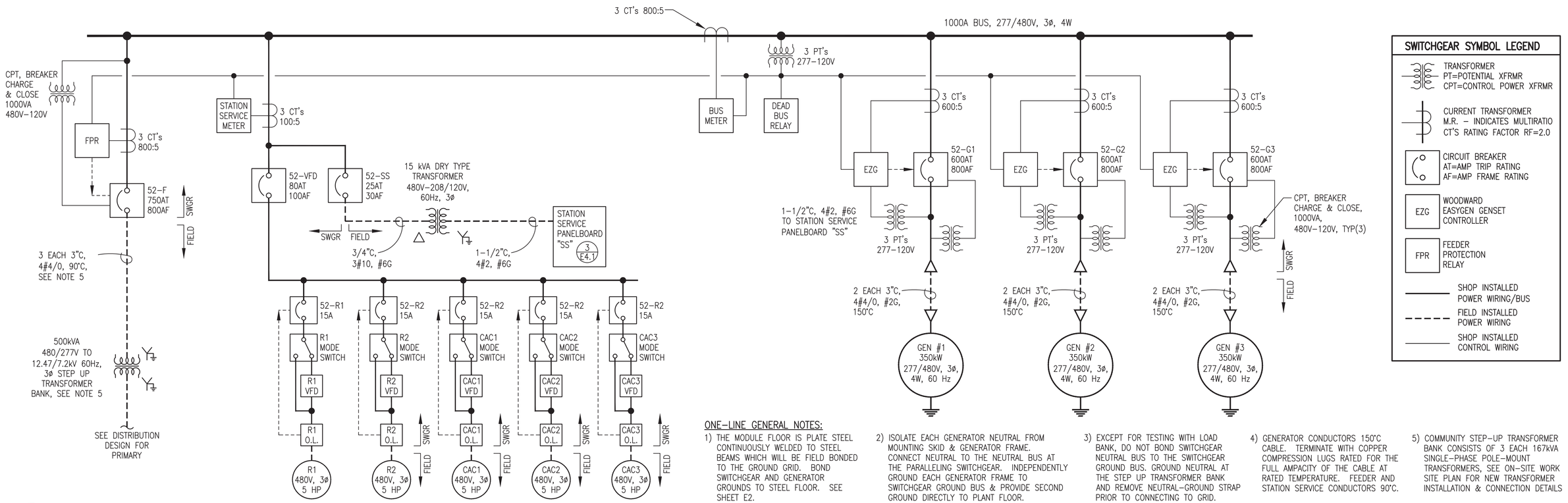
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: SWITCHGEAR ENCLOSURE LAYOUT, SETTING TABLE, & DETAILS

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

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E6	SHEET: E6.1
PROJECT NUMBER:	



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

ONE–LINE GENERAL NOTES:

1) THE MODULE FLOOR IS PLATE STEEL CONTINUOUSLY WELDED TO STEEL BEAMS WHICH WILL BE FIELD BONDED TO THE GROUND GRID. BOND SWITCHGEAR AND GENERATOR GROUNDS TO STEEL FLOOR. SEE SHEET E2.
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) EXCEPT FOR TESTING WITH LOAD BANK, DO NOT BOND SWITCHGEAR NEUTRAL BUS TO THE SWITCHGEAR GROUND BUS. GROUND NEUTRAL AT THE STEP UP TRANSFORMER BANK AND REMOVE NEUTRAL–GROUND STRAP PRIOR TO CONNECTING TO GRID.
4) GENERATOR CONDUCTORS 150°C CABLE. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE. FEEDER AND STATION SERVICE CONDUCTORS 90°C.
5) COMMUNITY STEP–UP TRANSFORMER BANK CONSISTS OF 3 EACH 167kVA SINGLE–PHASE POLE–MOUNT TRANSFORMERS, SEE ON–SITE WORK SITE PLAN FOR NEW TRANSFORMER INSTALLATION & CONNECTION DETAILS

1 E6.2 SWITCHGEAR ONE–LINE DIAGRAM
NO SCALE

ARC FLASH NOTES:

1) PERMANENTLY AFFIX ARC FLASH LABELS TO EACH SECTION WITH 480V POWER AS INDICATED.
2) SCALED PDF IMAGES OF THESE LABELS WILL BE FURNISHED TO THE FABRICATOR UPON REQUEST.

WARNING

07-13-2022

Arc Flash and Shock Hazard Appropriate PPE Required

Arc Flash Boundary	1.6 ft
Incident Energy (cal/cm²)	1.3
Working Distance	18.0 in

Arc-rated long-sleeve shirt and arc-rated pants or arc-rated coverall and/or arc flash suit, Arc-rated face shield, Arc-rated jacket, Hard hat, Arc-rated hard hat liner, Safety glasses, Hearing protection, Leather gloves and Leather work shoes.

Shock Hazard Exposure: **480 V**
Shock Hazard **when covers removed**

Limited Approach	3.5 ft	Class 00
Restricted Approach	1.0 ft	Insulating Gloves
		V-rating 500 VAC

GENERATOR

WARNING

07-13-2022

Arc Flash and Shock Hazard Appropriate PPE Required

Arc Flash Boundary	1.6 ft
Incident Energy (cal/cm²)	1.3
Working Distance	18.0 in

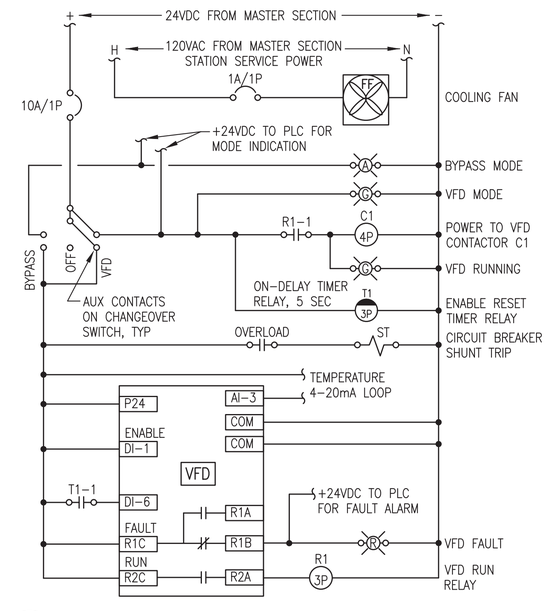
Arc-rated long-sleeve shirt and arc-rated pants or arc-rated coverall and/or arc flash suit, Arc-rated face shield, Arc-rated jacket, Hard hat, Arc-rated hard hat liner, Safety glasses, Hearing protection, Leather gloves and Leather work shoes.

Shock Hazard Exposure: **480 V**
Shock Hazard **when covers removed**

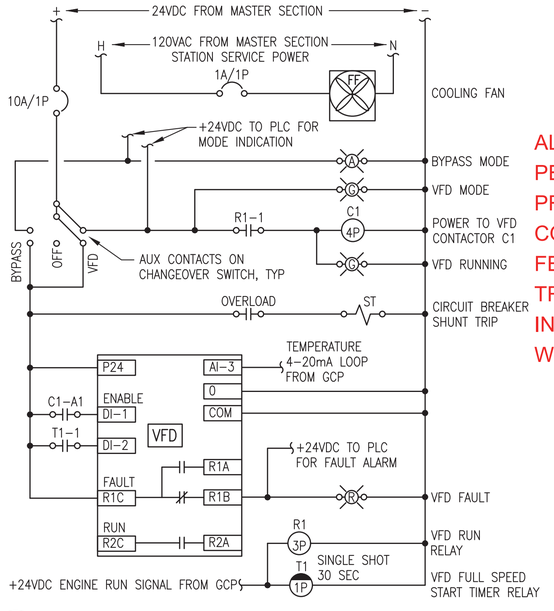
Limited Approach	3.5 ft	Class 00
Restricted Approach	1.0 ft	Insulating Gloves
		V-rating 500 VAC

FEEDER

2 E6.2 ARC FLASH LABELS
NO SCALE



3 E6.2 TYPICAL RADIATOR VFD LOGIC DIAGRAM
NO SCALE



4 E6.2 TYPICAL CHARGE AIR COOLER VFD LOGIC DIAGRAM
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE ASSEMBLY CONTRACT EXCEPT FOR THE FEEDER AND STEP UP TRANSFORMER WHICH ARE INCLUDED IN THE ON SITE WORK.

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

ISSUED FOR CONSTRUCTION JULY 2022

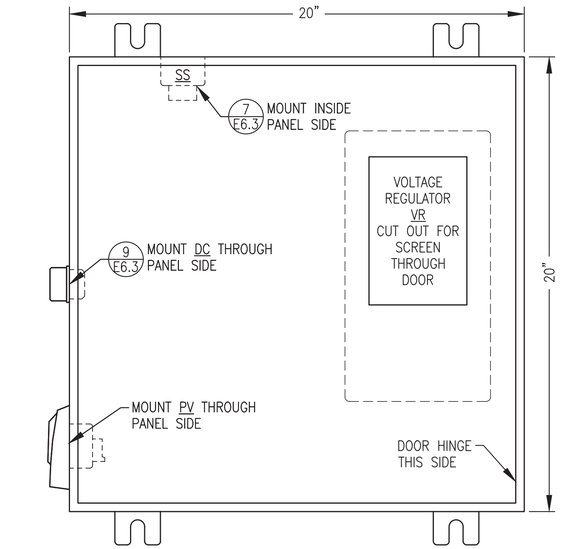
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

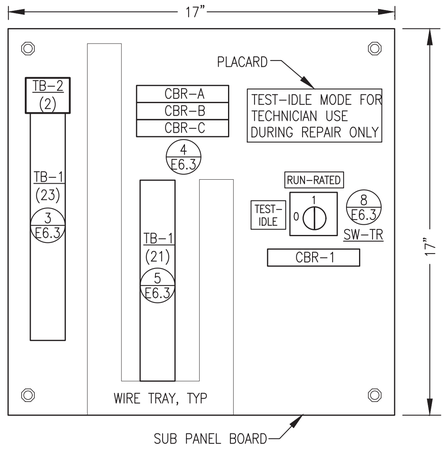
TITLE: SWITCHGEAR ONE–LINE & DETAILS

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

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E6	SHEET: E6.2
PROJECT NUMBER:	



1 E6.3 JUNCTION BOX FRONT PANEL LAYOUT
NO SCALE



2 E6.3 JUNCTION BOX SUB PANEL LAYOUT
NO SCALE

BILL OF MATERIALS

TAG	MANUFACTURER	MODEL	DESCRIPTION
CBR-A/B/C	ALLEN-BRADLEY	1489-M1-C010	RAIL MOUNT CIRCUIT BREAKER, 1P, 1A
CBR-1	ALLEN-BRADLEY	1489-M1-C050	RAIL MOUNT CIRCUIT BREAKER, 1P, 5A
DC	DEUTSCH	HD10-9-1939P	DIAGNOSTIC CONNECTOR, 9-PIN, CAN-BUS
	DEUTSCH	HD18-009	CONNECTOR STRAIN RELIEF
	DEUTSCH	HDC16-9	CONNECTOR PROTECTIVE DUST CAP
	DEUTSCH	HD10-9-GKT	CONNECTOR GASKET
	DEUTSCH	JDL062397	CONNECTOR LANYARD
ENCL.	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
PV	MURPHY	PV101-C	POWER VIEW (NON-TIER 4) WITH HARNESS
SS	JOHN DEERE	AT145341	STARTER AUXILIARY SOLENOID, 24V
SW-TR	ALLEN-BRADLEY	194L-A12-225-2	CHANGEOVER SWITCH, 12A, 2P
	ALLEN-BRADLEY	194L-HE-4A-175	90 DEGREE I-O HANDLE
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK
VR	BASLER	DECS-150 5NS1V1N1S	DIGITAL VOLTAGE REGULATOR

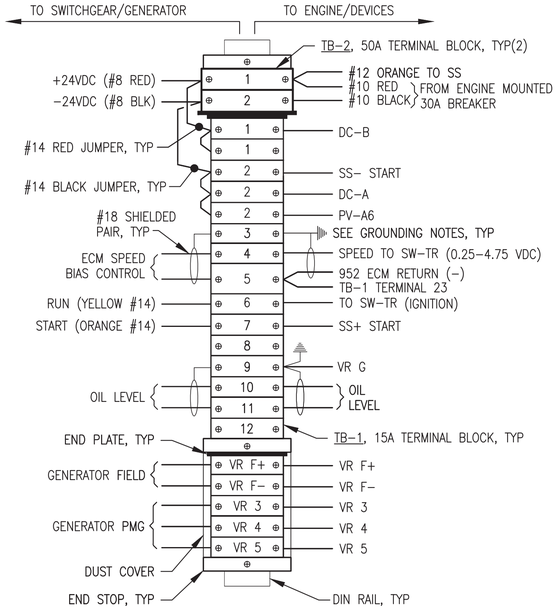
BRAND SPECIFIC NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE 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:

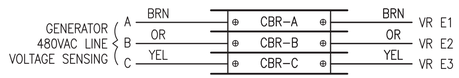
1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
2) INSTALL IN A NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL AND HINGED LOCKABLE DOOR. SIZE AS INDICATED.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS 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 BACK PANEL ONLY.
6) PROVIDE WIRING HARNESSES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN LIQUID TIGHT FLEX OR FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
7) SHOP TEST EACH NEW ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

FIELD INSTALLATION NOTES:

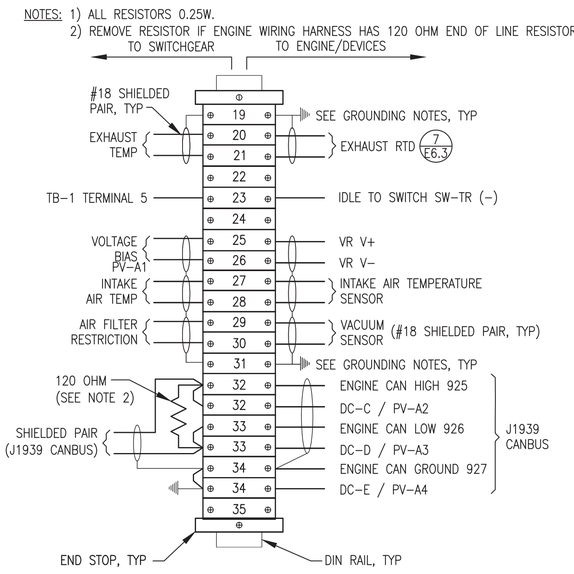
1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE ENGINE PANEL TERMINAL NUMBER.
2) ON SHIELDED CONDUCTORS GROUND ALL SHIELD DRAIN WIRES AT ENGINE J-BOX ONLY. CLIP DRAIN WIRES AT OPPOSITE ENDS.



3 E6.3 TERMINAL STRIP CONNECTIONS
NO SCALE



4 E6.3 CIRCUIT BREAKER CONNECTIONS
NO SCALE



5 E6.3 TERMINAL STRIP CONNECTIONS
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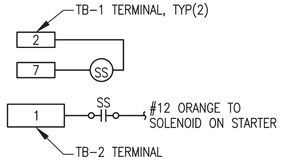
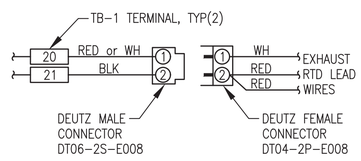
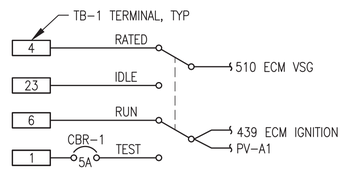


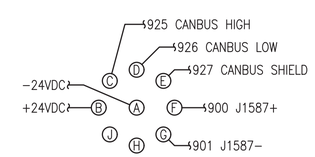
6 E6.3 STARTER AUX SOLENOID SS WIRING
NO SCALE



7 E6.3 EXHAUST RTD CONNECTOR
NO SCALE



8 E6.3 TEST-IDLE/RUN-RATED SWITCH SW-TR WIRING
NO SCALE



9 E6.3 DIAGNOSTIC CONNECTOR WIRING
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

ISSUED FOR CONSTRUCTION JULY 2022

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

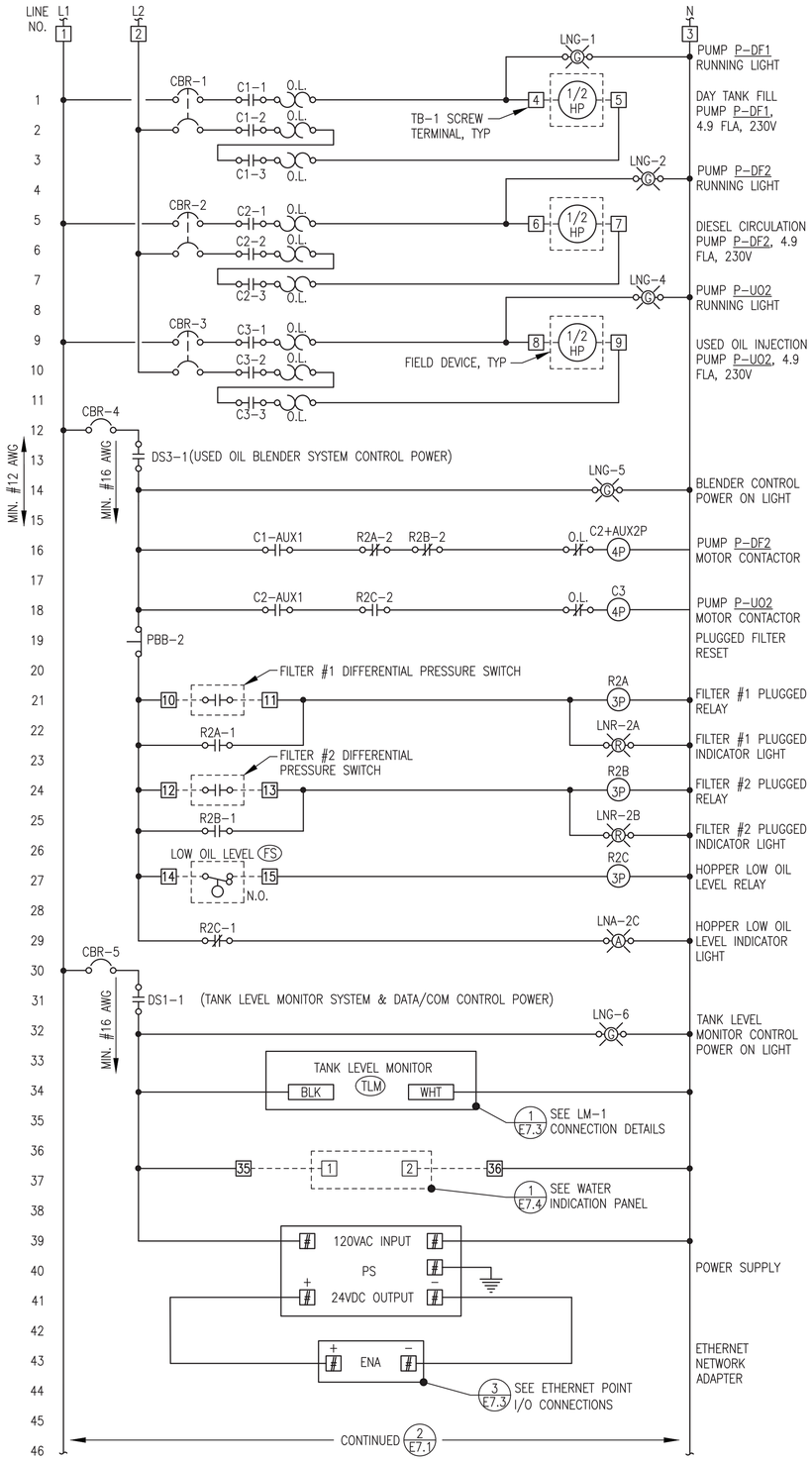
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

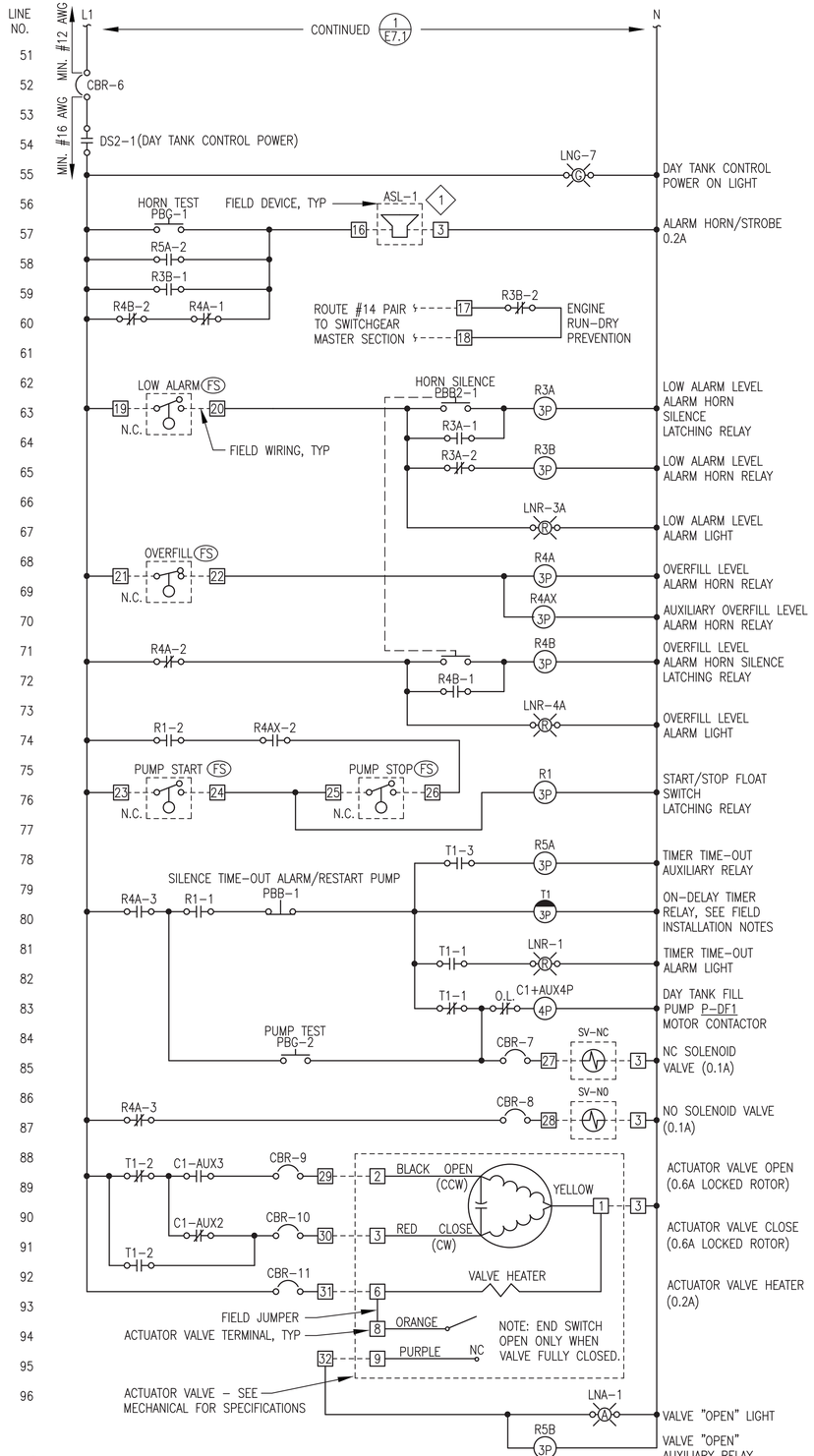
TITLE: 24VDC ENGINE WIRING JUNCTION BOX

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

DRAWN BY: JTD | SCALE: NO SCALE
DESIGNED BY: CWV/BCG | DATE: 7/29/22
FILE NAME: NAPS PP E6 | SHEET: E6.3
PROJECT NUMBER:



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



2 E7.1 DAY TANK LOGIC DIAGRAM
NO SCALE

BILL OF MATERIALS

NOTE: ON THIS SHEET AND THE PANEL DRAWINGS THAT FOLLOW SPECIFIC PARTS MANUFACTURER AND MODEL ARE 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
AUX2P	ALLEN-BRADLEY	100FA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
AUX4P	ALLEN-BRADLEY	100FA31	AUXILIARY CONTACT FOR CONTACTOR, 4 POLE, 3NO, 1NC
C	ALLEN-BRADLEY	100C09D10	CONTACTOR, 120V COIL, 9A, 4 POLE
CBR-1,2,3	ALLEN-BRADLEY	1489-M2-C150	RAIL-MOUNT CIRCUIT BREAKER, 2 POLE, 15A
CBR-4,5,6	ALLEN-BRADLEY	1489-M1-C050	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR-7,8,9,10,11	ALLEN-BRADLEY	1489-M1-C010	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 1A
DS	ALLEN-BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	ALLEN-BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
ENA	ALLAN-BRADLEY	1734-AENTR	I/O DUAL PORT ETHERNET NETWORK ADAPTER
DI8	ALLAN-BRADLEY	1734-IB8	DIGITAL INPUT MODULE, 24VDC, 8 POINT, SINKING
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
OL	ALLEN-BRADLEY	193-1EEDB	OVERLOAD, 230V, 1ø, ADJUSTABLE 3.2A-16.0A RANGE
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
PS	PULS	CP5.241-S1	5A, 120VAC/24VDC POWER SUPPLY
R	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	ALLEN-BRADLEY	700HN101	11 PIN SOCKET BASE
T	ALLEN-BRADLEY	700HT3	SERIES B TIMING MODULE
	ALLEN-BRADLEY	700HA33A1	3PDT RELAY
	ALLEN-BRADLEY	700HN205	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 SHEET M1.1		

LEGEND

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

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE ASSEMBLY CONTRACT EXCEPT FOR TERMINATION AT THE PANEL OF EXTERIOR FIELD CONDUCTORS SHOWN ON SHEET E1.7 IS INCLUDED IN THE ON SITE WORK.

REV#1
ISSUED FOR CONSTRUCTION
NOV 2023

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

REV.	DESCRIPTION	DATE	BY
1	REVISE PANEL TO MATCH SHOP AS BUILT	11/13/23	BCG

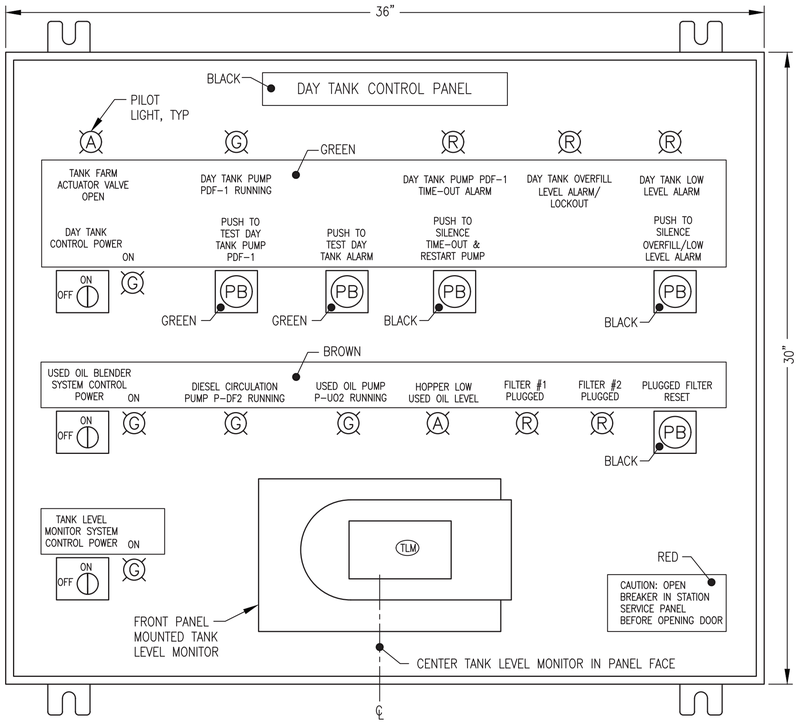
ALASKA ENERGY AUTHORITY

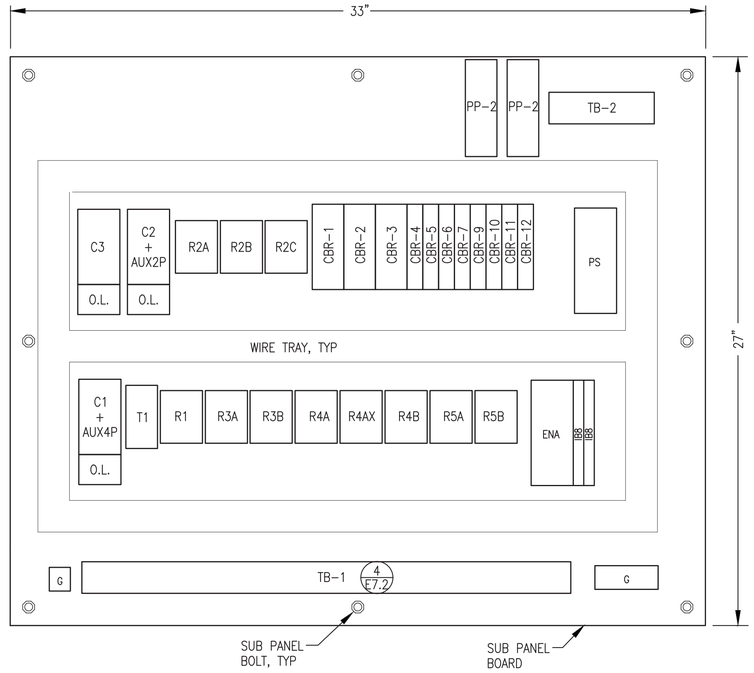
PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

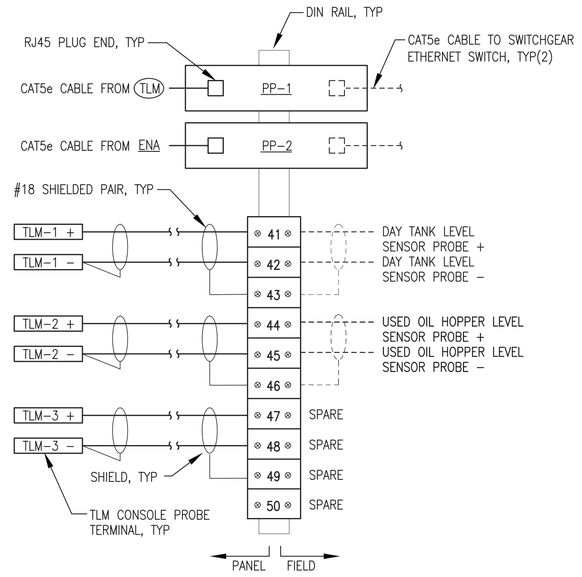
TITLE: DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

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

DRAWN BY: BCG/JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E7	SHEET: E7.1
PROJECT NUMBER:	







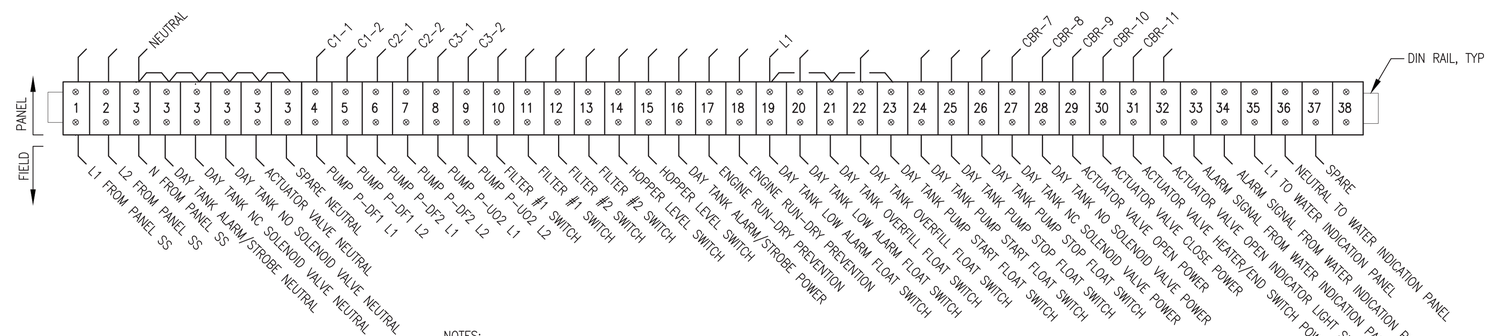
NOTES:

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.

1 E7.2 FRONT PANEL LAYOUT
NO SCALE

2 E7.2 SUB PANEL LAYOUT
NO SCALE

3 E7.2 TB-2 TERM STRIP 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

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

REV#1
ISSUED FOR CONSTRUCTION
NOV 2023

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

REV.	DESCRIPTION	DATE	BY
1	REVISE PANEL TO MATCH SHOP AS BUILT	11/13/23	BCG

ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: DAY TANK CONTROL PANEL LAYOUT & TERMINAL STRIPS

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

DRAWN BY: BCG/JTD
DESIGNED BY: CWV/BCG
FILE NAME: NAPS PP E7
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 7/29/22
SHEET: E7.2

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 DAY TANK 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. VERIFY THAT THE HOPPER FLOAT SWITCH IS ORIENTED FOR N.O. (CLOSE ON RISE) OPERATION.

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.

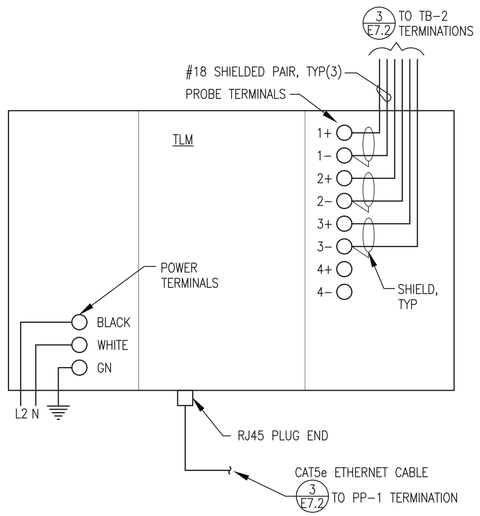
USED OIL BLENDER SYSTEM SEQUENCE OF OPERATIONS:

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.

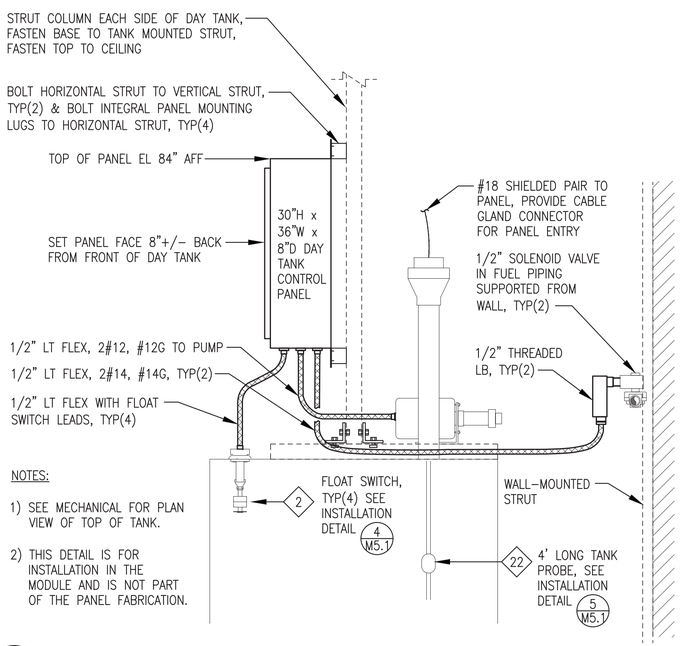
2) NORMAL OPERATION – WHENEVER THE DAY TANK FILL SEQUENCE IS INITIATED, BOTH THE DIESEL CIRCULATING PUMP P-DF2 AND THE USED OIL INJECTION PUMP P-UO2 RUN AND THE ASSOCIATED GREEN PUMP RUNNING LIGHTS ARE ON.

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.

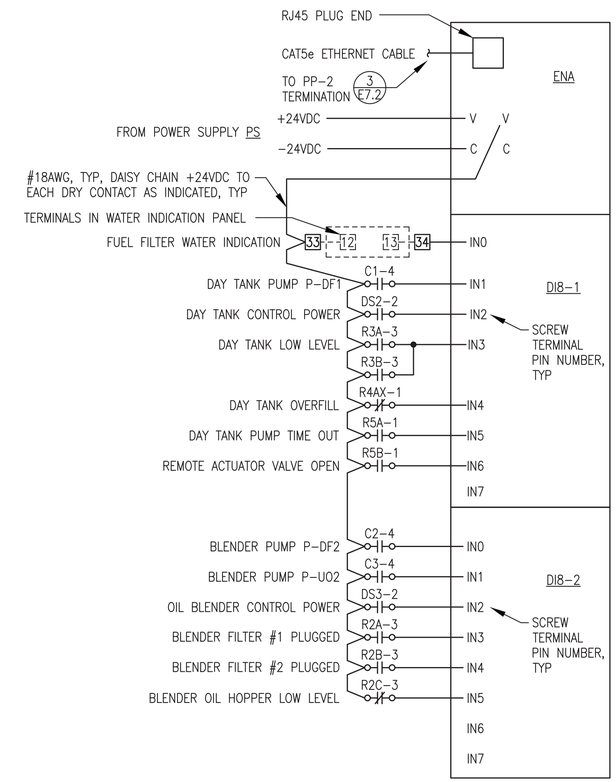
4) HOPPER LOW OIL LEVEL – WHEN THE OIL LEVEL FALLS BELOW THE LOW LEVEL FLOAT SWITCH, USED OIL INJECTION PUMP P-UO2 STOPS RUNNING AND THE AMBER HOPPER LOW OIL LEVEL LIGHT TURNS ON. PUMP P-UO2 WILL NOT OPERATE UNTIL THE USED OIL LEVEL IN THE HOPPER RISES ABOVE THE LOW LEVEL. RESET IS NOT REQUIRED.



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



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



3 E7.3 ETHERNET POINT I/O CONNECTIONS
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

REV#1
ISSUED FOR CONSTRUCTION
NOV 2023

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

REV.	DESCRIPTION	DATE	BY
1	REVISE PANEL TO MATCH SHOP AS BUILT	11/13/23	BCG

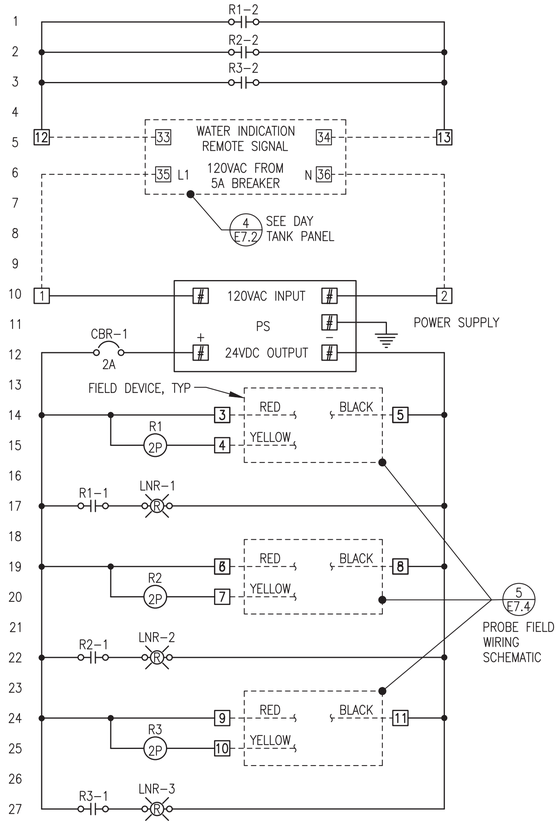
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

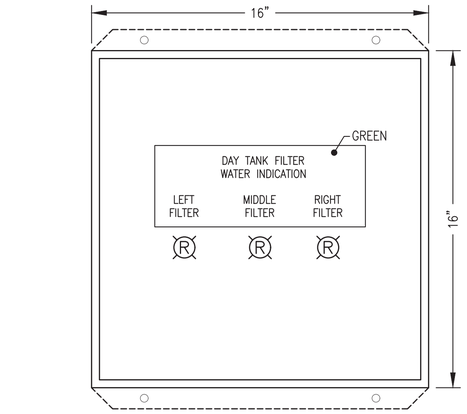
TITLE: DAY TANK CONTROL PANEL NOTES, SEQUENCE OF OPERATIONS & INTERCONNECT DETAILS

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

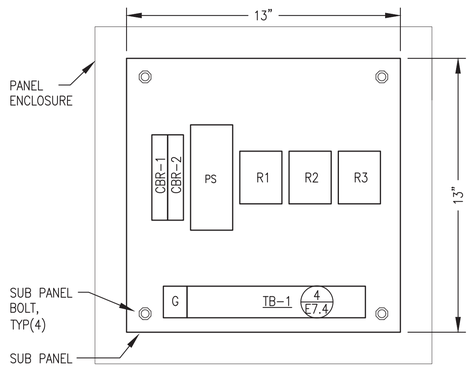
DRAWN BY: BCG/JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 7/29/22
FILE NAME: NAPS PP E7	SHEET: E7.3
PROJECT NUMBER:	



1 E7.4 PANEL WIRING DIAGRAM
NO SCALE



2 E7.4 FRONT PANEL LAYOUT
NO SCALE



3 E7.4 SUB PANEL LAYOUT
NO SCALE

PANEL BILL OF MATERIALS

TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
CBR-1	1	ALLEN-BRADLEY	1489-M1-C020	RAIL-MOUNT CIRCUIT BREAKER, 1 POLE, 2A
LNR	3	ALLEN-BRADLEY	800HQRH2R	RED LED PILOT LIGHT, 12-130V, NEMA 4X
PS	1	PULS	CP.241-S1	5A, 120VAC/24VDC POWER SUPPLY
R	3	ALLEN-BRADLEY	700HA32A1	2PDT RELAY
	3	ALLEN-BRADLEY	700HN100	8 PIN SOCKET BASE
TB	15	ALLEN-BRADLEY	1492CAM1L	35A, 600V, LARGE-HEAD SCREW TERMINALS

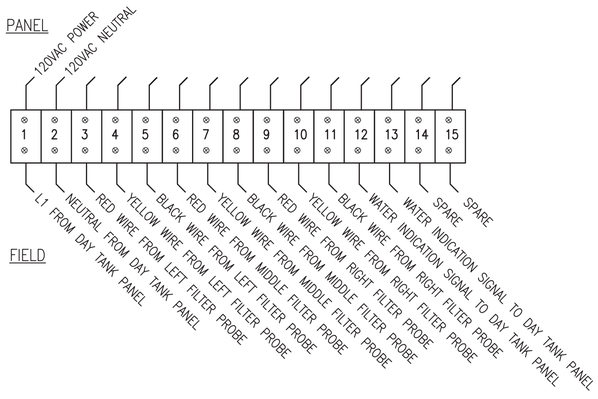
PANEL SHOP FABRICATION NOTES:

1) FURNISH COMPLETE PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN WIRING DIAGRAM AND BILL OF MATERIALS ALONG WITH ALL PANEL DEVICE ACCESSORIES, DIN RAIL, & HARDWARE REQUIRED FOR COMPLETE INSTALLATION.

2) INSTALL IN A 16"x16"x8" NEMA 12 STEEL ENCLOSURE WITH INTEGRAL MOUNTING FLANGES AT BACK, A MIN 16 GAUGE INTERIOR BACK PANEL, AND HINGED DOOR. ENCLOSURE COLOR ANSI 61 GRAY AND BACK PANEL COLOR WHITE.

3) PROVIDE BEVELED EDGE WHITE CORE NAMEPLATES, FACE COLOR AS INDICATED. SECURE TO PANEL FACE WITH A MINIMUM OF TWO MOUNTING SCREWS.

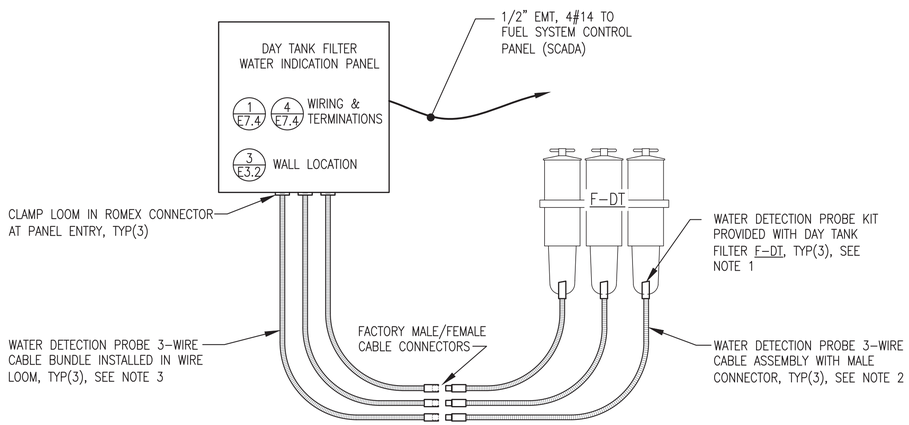
4) CONNECT DEVICES WITH MANUFACTURER PROVIDED CABLES IN ACCORDANCE WITH INSTALLATION INSTRUCTIONS.



NOTES:

1. INSTALL TERMINAL STRIP TB-1 HORIZONTALLY AS SHOWN. LOCATE TERMINAL STRIP BELOW WIRE TRAY TO ACCOMMODATE FIELD CONDUCTORS ENTERING BOTTOM OF PANEL, SEE SUB-PANEL LAYOUT.
2. IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 2 EACH 60A SCREW TERMINAL GROUNDING BUS.

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



NOTES:

1. THREE EACH RACOR WATER DETECTION PROBE KITS, MODEL RK30880E, SHIPPED LOOSE WITH 3-FILTER BANK. NOT ALL KIT COMPONENTS USED THIS INSTALLATION. KEEP THREE EACH WATER DETECTION PROBE CABLES WITH MOLDED MALE CONNECTORS AND KEEP THREE EACH 3-WIRE CABLE BUNDLES WITH MOLDED FEMALE CONNECTORS. DISCARD THREE EACH PILOT LIGHTS AND DISCARD THREE EACH MOUNTING PANELS.
2. PRIOR TO FLOODING SYSTEM WITH FUEL INSTALL WATER DETECTION PROBES IN EACH FILTER ACCORDING TO MANUFACTURER'S INSTRUCTIONS. ROUTE FACTORY LOOMED CABLES WITH MOLDED FEMALE CONNECTORS BACK TO WALL IN NEAT AND ORGANIZED FASHION FOR CONNECTION TO WIRE EXTENSION CONNECTORS. TYWRAP LOOM TO CONDUIT OR PIPING.
3. FACTORY 3-WIRE CABLE BUNDLES FURNISHED WITH MOLDED MALE CONNECTORS. FIELD INSTALL IN 3/8" PLASTIC WIRE LOOM FROM CONNECTOR TO PANEL ENTRY AND ROUTE TO PANEL IN NEAT AND ORGANIZED FASHION. TYWRAP LOOM TO ADJACENT CONDUIT, PIPING, OR STRUT.

5 E7.4 FIELD WIRING SCHEMATIC
NO SCALE

ALL WORK ON THIS SHEET WAS PERFORMED AS PART OF THE PRIOR MODULE FABRICATION CONTRACT AND IS SHOWN HERE FOR REFERENCE ONLY.

ISSUED FOR CONSTRUCTION
JULY 2022

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

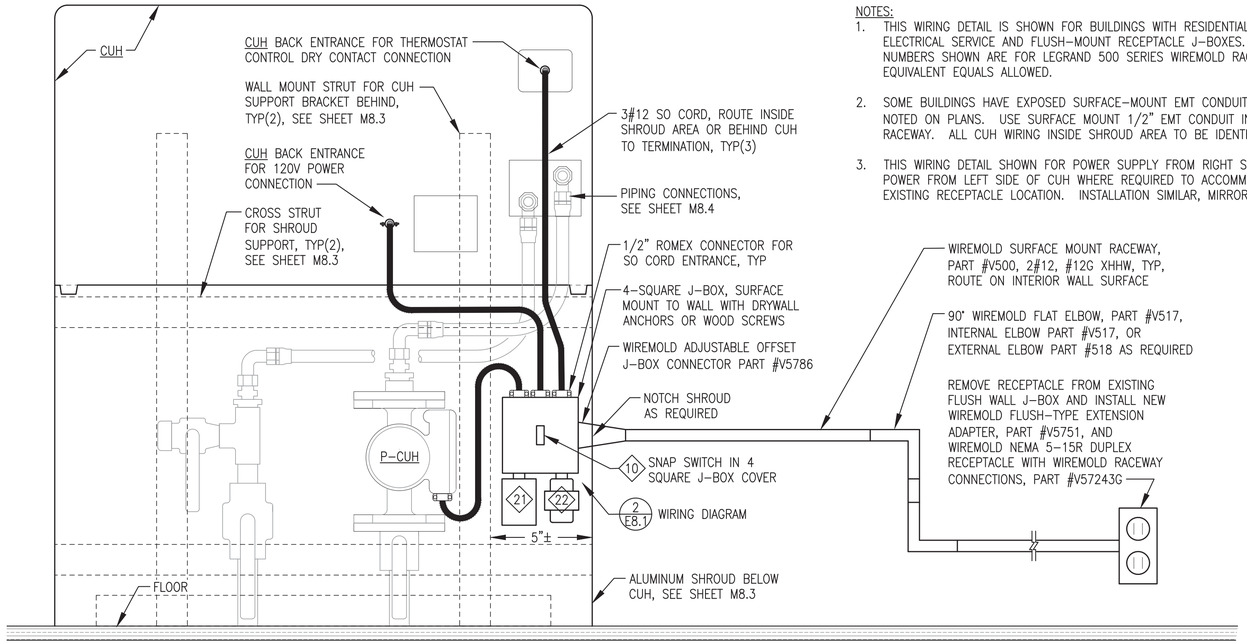
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: DAY TANK FILTER WATER INDICATION PANEL

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

DRAWN BY: BCG/JTD
DESIGNED BY: CWV/BCG
FILE NAME: NAPS PP E7
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 7/29/22
SHEET: E7.4

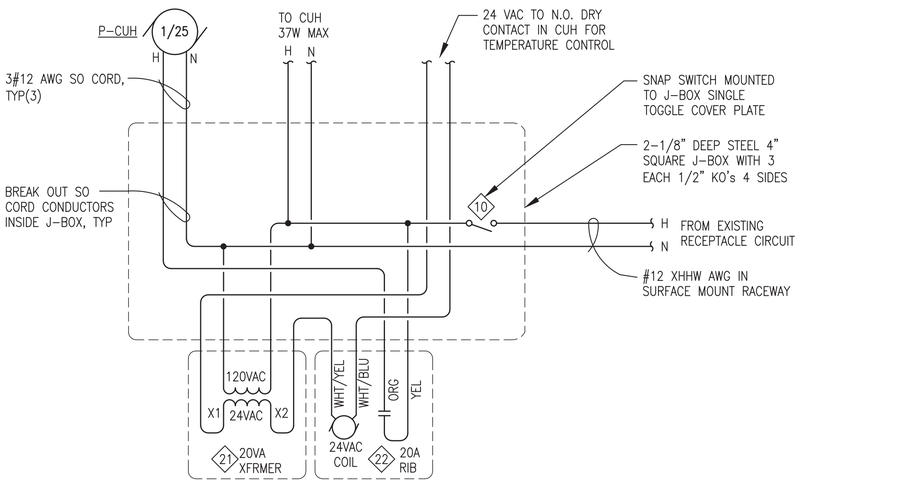


NOTES:

1. THIS WIRING DETAIL IS SHOWN FOR BUILDINGS WITH RESIDENTIAL STYLE IN-WALL ELECTRICAL SERVICE AND FLUSH-MOUNT RECEPTACLE J-BOXES. WIREMOLD PART NUMBERS SHOWN ARE FOR LEGRAND 500 SERIES WIREMOLD RACEWAY & FITTINGS. EQUIVALENT EQUALS ALLOWED.
2. SOME BUILDINGS HAVE EXPOSED SURFACE-MOUNT EMT CONDUIT AND J-BOXES AS NOTED ON PLANS. USE SURFACE MOUNT 1/2" EMT CONDUIT IN PLACE OF WIREMOLD RACEWAY. ALL CUH WIRING INSIDE SHROUD AREA TO BE IDENTICAL TO THIS DETAIL.
3. THIS WIRING DETAIL SHOWN FOR POWER SUPPLY FROM RIGHT SIDE OF CUH. PROVIDE POWER FROM LEFT SIDE OF CUH WHERE REQUIRED TO ACCOMMODATE NEAREST EXISTING RECEPTACLE LOCATION. INSTALLATION SIMILAR, MIRROR IMAGE.

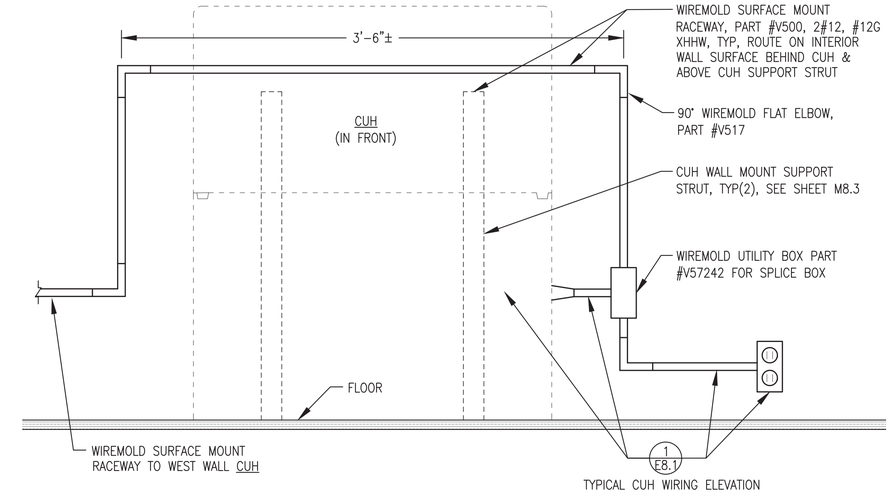
1 E8.1 TYPICAL CUH WIRING ELEVATION

NO SCALE



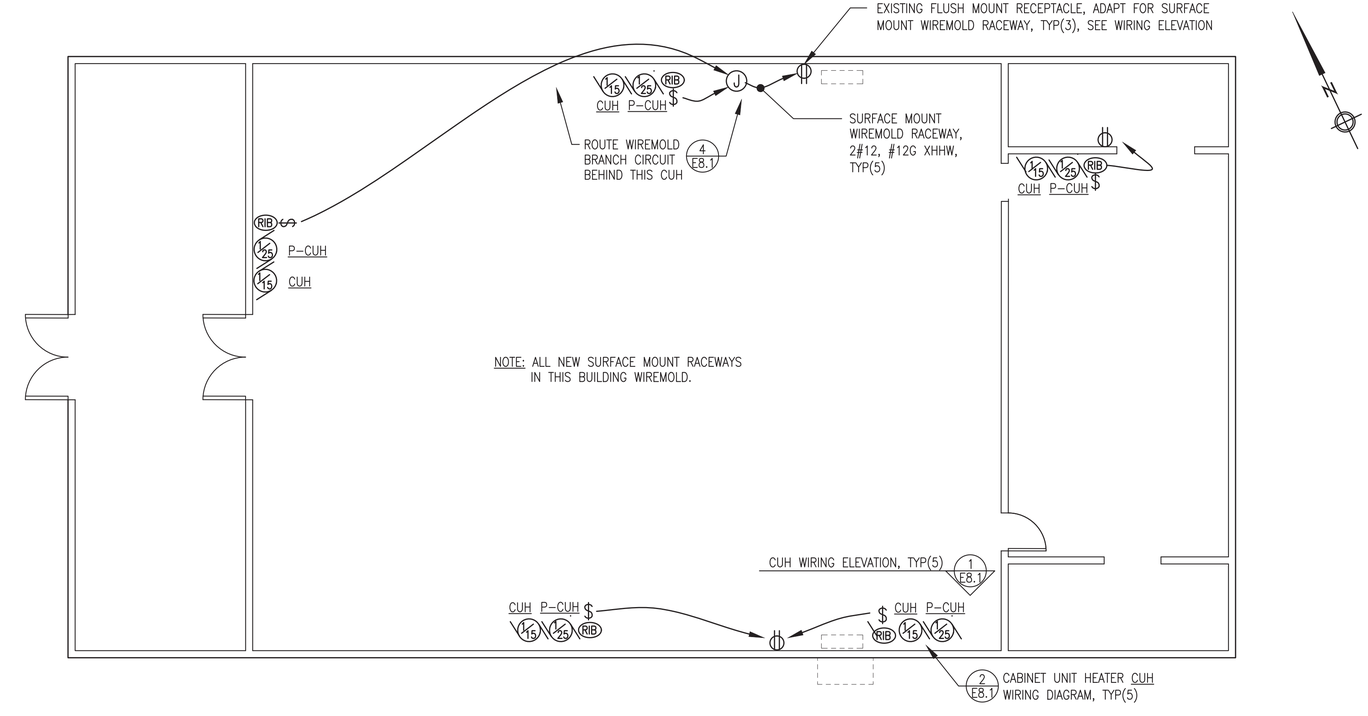
2 E8.1 TYPICAL CUH WIRING DIAGRAM

NO SCALE



4 E8.1 WIREMOLD RACEWAY BRANCH CIRCUIT BEHIND CUH ON CHURCH NORTH WALL

NO SCALE



3 E8.1 BUILDING A RUSSIAN OTHODOX CHURCH ELECTRICAL PLAN

3/16"=1'-0"

ALL WORK ON SHEETS E8.1 THROUGH E8.4 IS INCLUDED IN THE ON SITE CONTRACT.
PROVIDE ENTIRE HEAT RECOVERY SYSTEM AS SHOWN ON SHEETS E8.1 THROUGH E8.4 UNDER ADDITIVE ALTERNATE #1.

ISSUED FOR CONSTRUCTION DECEMBER 2022

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

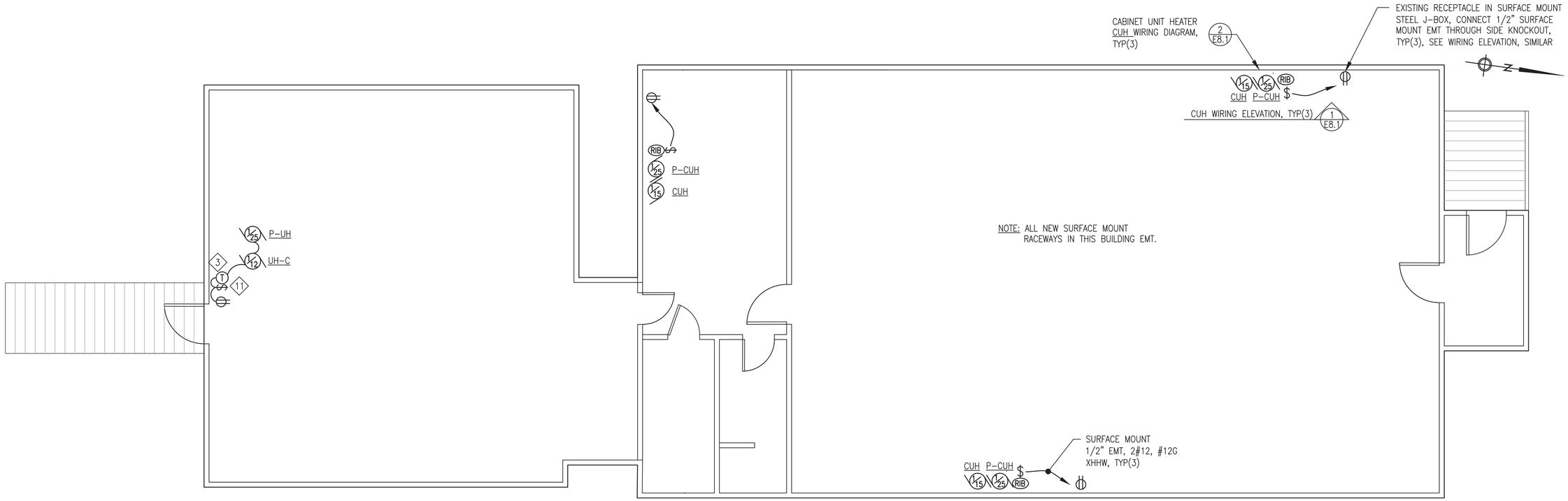
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: HEAT RECOVERY SYSTEM
BUILDING A ELECTRICAL PLAN & DETAILS

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

DRAWN BY: JTD
DESIGNED BY: CWV/BCG
FILE NAME: NAPS PP E8
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 12/15/22
SHEET: E8.1



1 E8.2 BUILDING B NEW OFFICE BUILDING ELECTRICAL PLAN
3/16"=1'-0"

ISSUED FOR
CONSTRUCTION
DECEMBER 2022

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

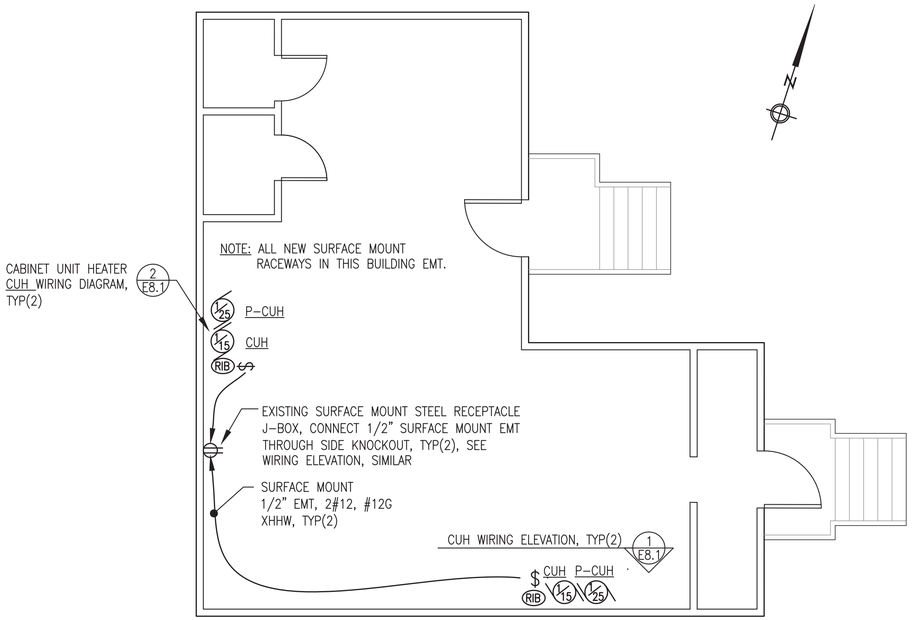
ALASKA ENERGY AUTHORITY

PROJECT:
NAPASKIAK POWER SYSTEM UPGRADE

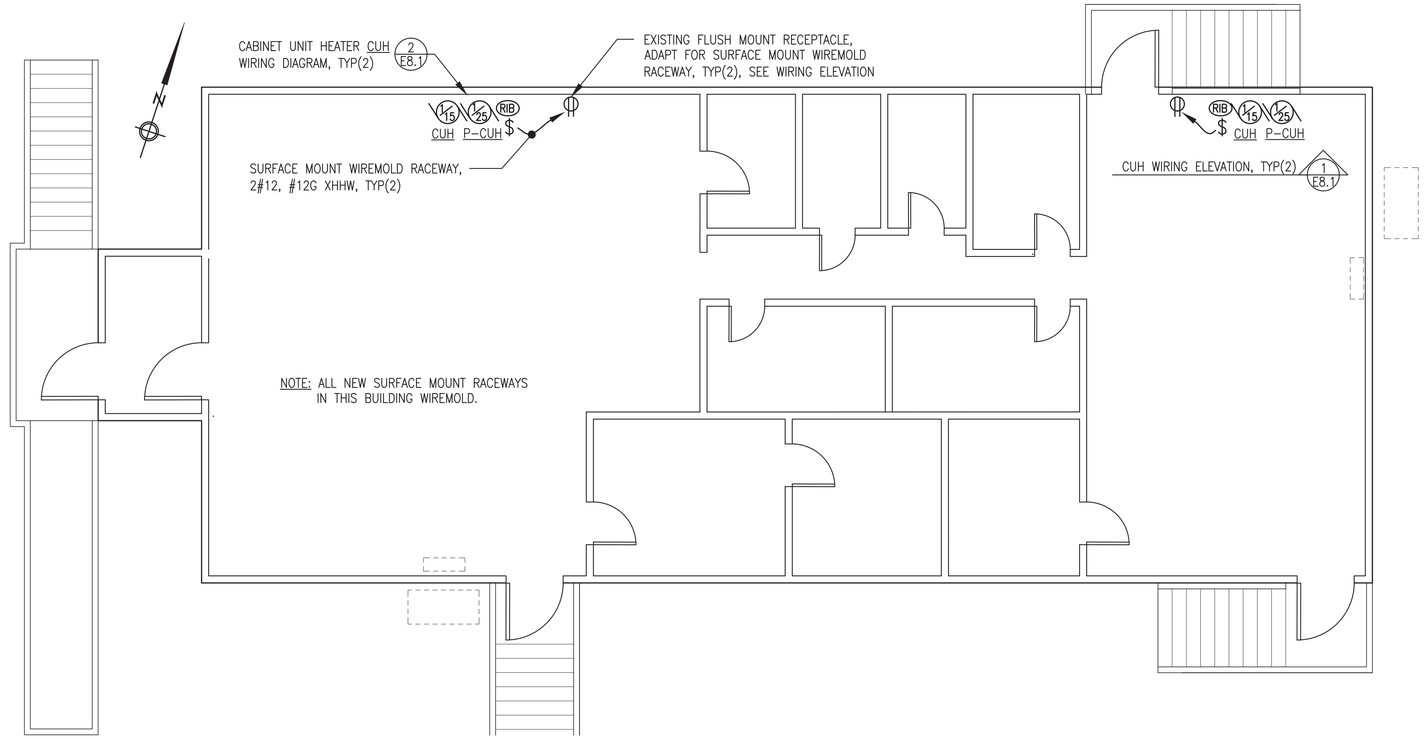
TITLE:
HEAT RECOVERY SYSTEM
BUILDING B ELECTRICAL PLAN

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 12/15/22
FILE NAME: NAPS PP E8	SHEET: E8.2
PROJECT NUMBER:	



1 E8.3 BUILDING C BINGO HALL ELECTRICAL PLAN
3/16"=1'-0"



2 E8.3 BUILDING D HEADSTART ELECTRICAL PLAN
3/16"=1'-0"

ISSUED FOR CONSTRUCTION
DECEMBER 2022

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

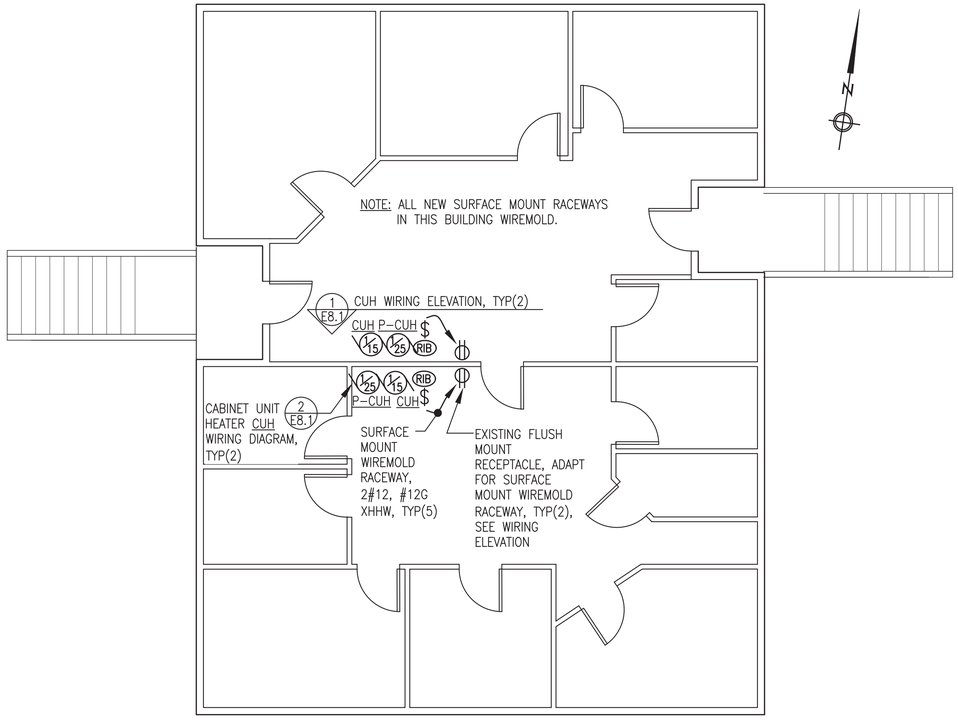
ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: HEAT RECOVERY SYSTEM
BUILDINGS C & D ELECTRICAL PLANS

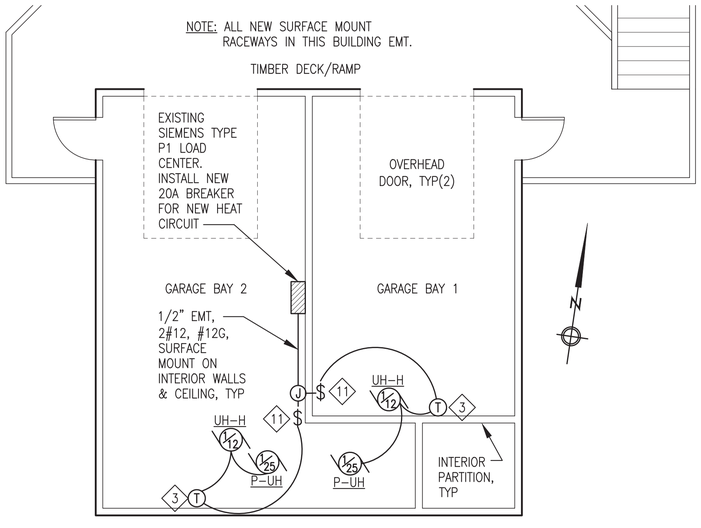
Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 12/15/22
FILE NAME: NAPS PP E8	SHEET: E8.3
PROJECT NUMBER:	



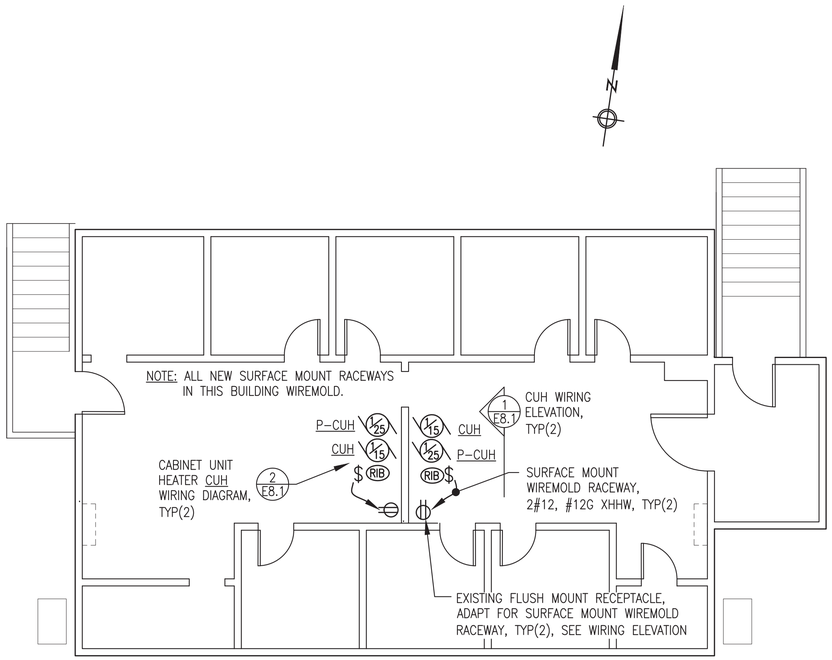
1 E8.4 BUILDING E VPSO ELECTRICAL PLAN

3/16"=1'-0"



3 E8.4 BUILDING G GARAGE ELECTRICAL PLAN

3/16"=1'-0"



2 E8.4 BUILDING F OLD OFFICE BUILDING ELECTRICAL PLAN

3/16"=1'-0"

ISSUED FOR CONSTRUCTION
DECEMBER 2022

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

ALASKA ENERGY AUTHORITY

PROJECT: NAPASKIAK POWER SYSTEM UPGRADE

TITLE: HEAT RECOVERY SYSTEM
BUILDINGS E, F, & G ELECTRICAL PLANS

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

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 12/15/22
FILE NAME: NAPS PP E8	SHEET: E8.4
PROJECT NUMBER:	

DISTRIBUTION SYSTEM GENERAL NOTES

1. ALL CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STAKING SHEETS, NOTES TO STAKING SHEETS, SPECIFICATIONS, AND THE DRAWINGS.

2. ALL INSTALLATION SHALL MEET THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL SAFETY CODE (NESC), ANSI C2, AND THE NATIONAL ELECTRICAL CODE, NFPA 70, INCLUDING ANY STATE OF ALASKA AMENDMENTS. RUS BULLETIN 1728F–804, SPECIFICATIONS AND DRAWINGS FOR 12.47/7.2 kV LINE CONSTRUCTION SHALL BE FOLLOWED UNLESS SPECIFICALLY MODIFIED BY THESE DRAWINGS OR SPECIFICATIONS. ALL MATERIALS SHALL BE RUS APPROVED. OBTAIN COPIES OF THE RUS BULLETINS AND MAINTAIN COPIES ON THE JOB SITE. ADDITIONALLY, CONSTRUCTION SPECIFICATIONS ARE INCLUDED IN DIVISIONS 26 AND 33 OF THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH THE CONTRACT DOCUMENTS, RUS CONSTRUCTION UNITS, AND ANSI C2.

3. THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM CURRENTLY SERVES CUSTOMERS. SERVICE SHALL BE MAINTAINED AT ALL TIMES TO THE CUSTOMERS EXCEPT WHEN OUTAGES ARE REQUIRED FOR SERVICE CONVERSION OR OTHER CONSTRUCTION RELATED ACTIVITIES. ALL OUTAGES SHALL BE COORDINATED IN ADVANCE WITH NAPASKIAK ELECTRIC UTILITY (OWNER). PRIOR TO COMMENCING WORK ON THE UPGRADE, MEET WITH NAPASKIAK ELECTRIC UTILITY TO DEVELOP AN OUTAGE SCHEDULE THAT WILL KEEP DISRUPTIONS OF POWER TO THE CUSTOMERS TO A MINIMUM. NAPASKIAK ELECTRIC UTILITY SHALL HAVE FINAL AUTHORITY ON WHEN OUTAGES CAN OCCUR.

4. UNLESS OTHERWISE INDICATED, THE EXISTING PRIMARY AND SECONDARY DISTRIBUTION SYSTEM, INCLUDING HARDWARE, CONDUCTORS (BOTH PRIMARY AND SECONDARY), TRANSFORMERS, CROSSARMS, INSULATORS, LIGHTS, ANCHOR RODS, GUYS, AND ALL OTHER MATERIAL DIRECTLY RELATED TO THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM BEING TAKEN OUT OF SERVICE SHALL BE REMOVED AFTER COMPLETION OF THE INSTALLATION, ENERGIZATION, AND SERVICE CONVERSIONS TO THE NEW ELECTRICAL DISTRIBUTION SYSTEM. POLES THAT HAVE TELECOM SYSTEM CONDUCTORS OR EQUIPMENT ATTACHED SHALL NOT BE REMOVED.

5. ALL EXISTING UTILITIES MAY NOT BE SHOWN. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO DIGGING HOLES FOR POLES AND ANCHORS. COORDINATE WITH THE NAPASKIAK ELECTRIC UTILITY AND THE CITY OF NAPASKIAK TO LOCATE UNDERGROUND UTILITIES.

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

7. ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK ASSOCIATED WITH WORKING ON OR NEAR AN ENERGIZED MEDIUM VOLTAGE DISTRIBUTION SYSTEM.

8. THE SITE PLANS USED WERE DEVELOPED USING A COMBINATION OF AERIAL PHOTOGRAPHY AND SURVEY DATA PROVIDED BY OTHERS. ANY VARIATIONS BETWEEN WHAT IS SHOWN AND THE ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

9. SEE CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL INFORMATION.

10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COORDINATING HIS WORK WITH EXISTING FACILITY OPERATORS, OTHER CONTRACTORS AND/OR SUBCONTRACTORS WORKING IN THE COMMUNITY, LOCAL UTILITY AND GOVERNMENT ORGANIZATIONS, AND STATE AND FEDERAL AUTHORITIES.

11. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING CONSTRUCTION ACCESS FOR EQUIPMENT AND PERSONNEL AS REQUIRED TO COMPLETE POLE INSTALLATION, POLE HARDWARE AND CONDUCTOR INSTALLATION, AND ALL OTHER PROJECT TASKS. CONTRACTOR SHALL COORDINATION WITH LOCAL ENTITIES AND RESIDENTS, ERECT TEMPORARY STRUCTURES, AND PERFORM TEMPORARY REMOVAL/RELOCATION AND REPLACEMENT OF ALL STRUCTURES, STEAM HOUSES, ETC. AS NECESSARY TO COMPLETE THE WORK. ALL EXISTING STRUCTURES AFFECTED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL OR BETTER CONDITION BY THE CONTRACTOR IMMEDIATELY AFTER THE CONTRACTOR'S WORK IN THAT AREA IS COMPLETED. CONTRACTOR SHALL COORDINATE ALL NECESSARY PUBLIC SAFETY ACTIVITIES INCLUDING SIGNAGE, BARRIERS, TRAFFIC CONTROL PLANS, LIGHTING, PUBLIC NOTIFICATIONS, AND OTHER ITEMS DEEMED NECESSARY TO PROTECT THE PUBLIC DURING CONSTRUCTION ACTIVITIES.

12. NEW TRANSFORMERS ADD TO THE DISTRIBUTION SYSTEM OR REPLACING EXISTING TRANSFORMERS SHALL BE CONNECTED TO PHASES IN A WAY THAT BALANCES THE DISTRIBUTION SYSTEM. DURING CONSTRUCTION LOAD IMBALANCE SHOULD BE KEPT TO A MINIMUM AND SHALL NOT EXCEED 10%.

TELECOM SYSTEM GENERAL NOTES

1. THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM POLES ARE SHARED WITH THE TELECOM SYSTEM, UNITED UTILITY, INC. CONTRACTOR SHALL NOT DISRUPT THE EXISTING TELECOM SYSTEM WITHOUT THE CONSENT OF THE TELECOM COMPANY. ANY PART OF THE EXISTING TELECOM SYSTEM DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE TELCOM COMPANY.

2. UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE EXISTING TELECOM SYSTEM SHALL REMAIN AS IS. WHERE POLES WITH TELECOM CONDUCTORS OR EQUIPMENT ARE REPLACED, TELECOM CONDUCTORS OR EQUIPMENT SHALL BE REATTACHED TO THE NEW POLE.

3. POLES TAKEN OUT OF SERVICE THAT HAVE TELECOM CONDUCTORS OR EQUIPMENT ATTACHED SHALL NOT BE REMOVED.

DISTRIBUTION UPGRADE SCOPE OF WORK

1. THE SCOPE OF WORK FOR UPGRADING THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM IN NAPASKIAK, ALASKA, IS AS FOLLOWS:
   - REPLACE EXISTING TRANSFORMERS NOTED. UPSIZE TRANSFORMERS WHERE REQUIRED TO ACCOMMODATE THE NUMBER OF SERVICES BEING SERVED.
   - INSTALL NEW TRANSFORMERS TO REDUCE EXCESSIVELY LONG SECONDARY RUNS.
   - RESET LEANING POLES, RE–TENSION GUYS, INSTALL NEW GUYS AND ANCHORS WHERE NEEDED AND REPLACE POLES TO RAISE LOW SECONDARY CONDUCTORS OR WHERE POLE CONDITION REQUIRE REPLACEMENT.
   - EXTEND PRIMARY DISTRIBUTION WHERE REQUIRED.

2. THE LIMIT OF CONSTRUCTION FOR NEW SERVICE DROPS IS THE CONNECTION TO THE EXISTING SERVICE MAST OF THE HOUSE BEING SERVED. THE CONTRACTOR SHALL REMOVE THE EXISTING SECONDARY SERVICE DROP CONDUCTORS AS INDICATED ON THE DRAWINGS AND INSTALL NEW SERVICE CONDUCTORS AS INDICATED ON THE DRAWINGS. THE EXISTING METER BASE OR SERVICE MAST WILL NOT BE THE RESPONSIBILITY OF THE CONTRACTOR EXCEPT FOR PROVIDING DEADEND ASSEMBLIES AND MAKING THE CONNECTION TO THE EXISTING SERVICE ENTRANCE CONDUCTORS AT THE SERVICE MAST. IF THE EXISTING SERVICE MAST IS NOT IN SATISFACTORY CONDITION TO SUPPORT THE NEW SERVICE, THE CONTRACTOR SHALL NOTIFY NAPASKIAK ELECTRIC UTILITY FOR RESOLUTION. THE CONTRACTOR SHALL PROVIDED NOTIFICATION FAR ENOUGH IN ADVANCE TO ALLOW NAPASKIAK ELECTRIC UTILITY TIME TO REPAIR OR REPLACE THE SERVICE MAST.

DISTRIBUTION SYSTEM INSTALLATION NOTES

1. SEE SPECIFICATIONS FOR EQUIPMENT REQUIREMENTS AND COMPLETE REQUIREMENTS FOR ELECTRICAL DISTRIBUTION INSTALLATION.

2. WHERE RUS UNITS ARE REFERENCED, MATERIAL ITEMS MAY NOT BE LISTED IN THE MATERIAL LIST. CONTRACTOR SHALL REFER TO RUS UNIT REFERENCED TO DETERMINE WHAT MATERIAL MUST BE PROVIDED.

3. ANY MODIFIED RUS CONSTRUCTION UNIT OR ANY NEW CONSTRUCTION UNITS ARE INCLUDED IN THE DETAIL SHEETS OF THE DRAWINGS. ANY STANDARD RUS CONSTRUCTION UNITS REFERENCED ON THE DRAWINGS OR STAKING SHEETS SHALL BE OBTAINED BY THE CONTRACTOR. FAILURE TO HAVE THE CORRECT RUS CONSTRUCTION UNIT WILL NOT BE ACCEPTABLE AS AN EXCUSE FOR AN INCORRECT INSTALLATION.

4. ALL HARDWARE SHALL BE ALUMINUM, HOT DIP GALVANIZED, OR STAINLESS STEEL. ALL SMALL FASTENERS SHALL BE STAINLESS STEEL.

5. PRIMARY OVERHEAD CONDUCTOR SHALL #2 ACSR.

6. ALL INSULATOR TIES SHALL BE PREFORMED TYPE. ALL NEUTRAL AND PHASE CONDUCTOR DEADENDS SHALL BE PREFORMED TYPE.

7. ALL PHASE CONDUCTOR DEADENDS SHALL BE MADE USING A SHOE TYPE CLAMP.

8. NOT ALL GROUNDS ARE SHOWN. GROUND NEUTRAL WIRE AND TRANSFORMER GROUNDED BUSHING ALONG WITH TRANSFORMER CASE. ROUTE #4 AWG SOLID COPPER GROUND CONDUCTOR DOWN POLE GROUND. ATTACH COPPER GROUND CONDUCTOR TO POLE WITH COPPER PLATED STAPLES. ALL CONNECTIONS TO CABLE SHALL BE MADE WITH COPPER COMPRESSION LUGS. NO ALUMINUM CONNECTORS OR CABLES SHALL BE USED, EXCEPT AT CONNECTIONS TO ACSR. AT ACSR CONNECTIONS, USE CONNECTORS RATED FOR COPPER/ALUMINUM.

9. ALL QUANTITIES MAY NOT BE SHOWN. DETERMINE QUANTITIES OF ALL NECESSARY MATERIAL AND EQUIPMENT.

10. ARMOR RODS SHALL BE PROVIDED FOR ALL NEW ACSR CONDUCTORS. ARMOR RODS SHALL BE INSTALLED AT EACH INSULATOR BUT WILL NOT BE REQUIRED AT PRIMARY DEAD–END ASSEMBLIES.

11. INSULATORS SHALL BE SELECTED TO PROPERLY ACCOMMODATE THE ARMOR ROD INSTALLED ON THE CONDUCTOR.

DISTRIBUTION SYSTEM TEMPORARY INSTALLATION NOTES

1. THE UPGRADES TO THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM WILL REQUIRE TEMPORARY INSTALLATIONS TO MINIMIZE OUTAGES AND MAINTAIN POWER TO THE CUSTOMERS DURING THE CONSTRUCTION OF THE UPGRADES. AS INDICATED, ALL OUTAGES SHALL BE COORDINATED WITH AND APPROVED BY THE NAPASKIAK ELECTRIC UTILITY. ACCEPTABLE METHODS WILL BE AS FOLLOWS:

   a) CONTRACTOR MAY INSTALL TEMPORARY INSULATED MEDIUM VOLTAGE CONDUCTORS AND ROUTE THE CONDUCTORS ON THE GROUND. IF THIS METHOD IS CHOSEN, THE AT–GRADE CONDUCTORS SHALL BE PROTECTED FROM VANDALISM AND DAMAGE AND PROVISIONS SHALL BE MADE FOR THE SUPPORT OF THE EXISTING POLES DURING THE INSTALLATION OF THE UPGRADES.

   b) OTHER METHODS MAY BE PROPOSED BY THE CONTRACTOR AS APPLICABLE TO ALLOW INSTALLATION OF THE UPGRADES WHILE THE EXISTING SYSTEM REMAINS IN SERVICE.

2. IN ALL CASES, THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE BEST METHOD OF MAINTAINING POWER TO CUSTOMERS WHILE THE UPGRADES ARE BEING INSTALLED. THE CONTRACTOR SHALL PROVIDE ALL MATERIAL REQUIRED FOR TEMPORARY INSTALLATIONS.

3. AT ALL TIMES AND IN ALL LOCATIONS, TEMPORARY INSTALLATIONS SHALL MEET THE NESC SAFETY REQUIREMENTS. ANY TEMPORARY INSTALLATION THAT IS ROUTED ON THE GROUND SHALL BE CLEARLY IDENTIFIED AND, IF REQUIRED, PROVISIONS SHALL BE INSTALLED FOR PERSONNEL AND VEHICLE CROSSING.

ALL WORK ON SHEETS E10.0 THROUGH E12.4 IS INCLUDED IN THE ON SITE CONTRACT.

PROVIDE DISTRIBUTION UPGRADES UNDER ADDITIVE ALTERNATE #3 AND #4 AS SHOWN ON THE FOLLOWING SHEETS.

ABBREVIATIONS

(E)	EXISTING
A	AMPERE
AC	ALTERNATING CURRENT
AIC	AMPERES INTERRUPTING CAPACITY
AWG	AMERICA WIRE GAGE
BCu	BARE COPPER
C	CONDUCTOR
C	CONDUIT
CB	CIRCUIT BREAKER
CIC	CABLE IN CONDUIT
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
DWG	DRAWING
EA	EACH
EL	ELEVATION
F	FAHRENHEIT
FT	FEET
FU	FUSE
G,GND	GROUND
H	HOT CONDUCTOR
HDPE	HIGH DENSITY POLYETHYLENE
HPS	HIGH PRESSURE SODIUM
HZ	HERTZ
JCN	JACKETED CONCENTRIC NEUTRAL
KVA	KILOVOLT–AMPERES
KW	KILOWATT
LFMC	LIQUID–TIGHT FLEXIBLE METAL CONDUIT
LFNC	LIQUID–TIGHT FLEXIBLE NON–METALLIC CONDUIT
LTG	LIGHTING
M	METER
MAX	MAXIMUM
MCM	THOUSAND CIRCULAR MILLS
MFR	MANUFACTURER
MIN	MINIMUM
N	NEUTRAL CONDUCTOR
NTS	NOT TO SCALE
P	POLE
PED	SECONDARY SERVICE PEDESTAL
PDS	PRIMARY DISTRIBUTION SWITCHGEAR
PH	PHASE
PVC	POLYVINYL CHLORIDE
R	SHUNT REACTOR
RMC	RIGID METAL CONDUIT, GALVANIZED
TR	TRANSFORMER
TYP	TYPICAL
UD	UNDERGROUND DISTRIBUTION
U/G	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
USGS	UNITED STATES GEOLOGICAL SURVEY
V	VOLTS
VA	VOLT–AMPERES
VAC	VOLTS–ALTERNATING CURRENT
W	WATTS
WP	WEATHERPROOF
XFMR	TRANSFORMER
XLP	CROSS LINKED POLYETHYLENE

LEGEND

EXISTING SINGLE PHASE OVERHEAD PRIMARY	NEW SINGLE PHASE OVERHEAD PRIMARY
EXISTING 2–PHASE OVERHEAD PRIMARY	NEW 2–PHASE OVERHEAD PRIMARY
EXISTING 3–PHASE OVERHEAD PRIMARY	NEW 3–PHASE OVERHEAD PRIMARY
EXISTING UNDERGROUND	NEW UNDERGROUND
EXISTING SECONDARY*	NEW SECONDARY*
EXISTING ELECTRICAL POLE	NEW ELECTRICAL POLE
EXISTING STUB POLE	NEW STUB POLE
EXISTING TRANSFORMER XX=SIZE	NEW TRANSFORMER XX=SIZE
EXISTING GUY	NEW GUY
EXISTING LIGHT	NEW LIGHT

(NOTE: STANDARD LEGEND NOT ALL SYMBOLS MAY BE USED.)
*SINGLE PHASE UNLESS OTHERWISE NOTED

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER EE-11401 12/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION LEGEND, ABBREVATIONS, SPECIFICATIONS & NOTES

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22 | Designed TRK | Drawn TRK | Approved KH

Sheet No. E10.0

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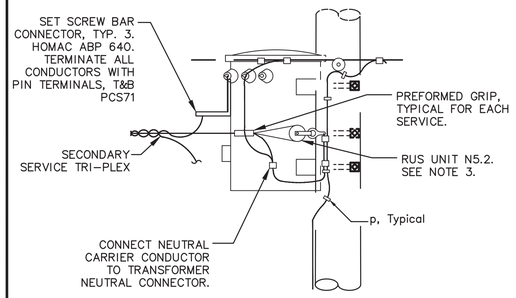
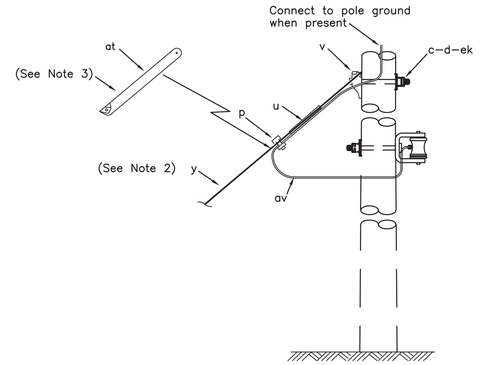


NOTES:
1) THIS CONSTRUCTION UNIT APPLIES ONLY TO SINGLE-PHASE SECONDARY CONNECTIONS AT SINGLE-PHASE TRANSFORMERS. FOR CONNECTIONS THREE-PHASE TRANSFORMERS SEE APPROPRIATE RUS CONSTRUCTION UNIT.
2) FOR POLE GROUNDING, TRANSFORMER GROUNDING, NEUTRAL CONNECTIONS, ETC. SEE THE APPROPRIATE RUS CONSTRUCTION UNIT.
3) FOR SERVICES ON OPPOSITE SIDES OF POLE PROVIDE TWO UNITS. AN EYE NUT MAY BE USED FOR THE SECOND UNIT IF DESIRED BY THE CONTRACTOR.

ITEM	QTY	MATERIAL
p		Connectors, as req'd
–	–	–
av		Jumpers, as req'd

SINGLE-PHASE SECONDARY SERVICE ASSEMBLY

DEC 2017 | N7.6



NOTES:
1. PROVIDE PRE-FORMED GUY DEADEND (u.) OTHER DEADEND MATERIAL SHALL NOT BE SUBSTITUTED.
2. GUY WIRE SHALL BE 3/8" EHS UNLESS OTHERWISE NOTED. SEE SPECIFICATION.
3. INSTALL RED STRIPED REFLECTIVE TAPE ON BOTH SIDES OF GUY GUARD. INSTALL TAPE IN WARM ENVIRONMENT, ABOVE MANUFACTURE RECOMMENDED TEMPERATURE.

ITEM	QTY	MATERIAL
c	1	Bolt, machine, 3/4" x req'd length
d	1	Washer, square, 4", curved
P		Connectors, guy bond and as req'd
j	1	Screw, lag, 1/2" x 4"
u	2	Deadend for guy strand, heavy duty
v	1	Guy attachment, guy hook type
y		Guy wire, as req'd
at	1	Guy marker, Yellow
av		Jumpers, as req'd
ck	1	Clamp, anchor bonding
ek	1	Locknuts

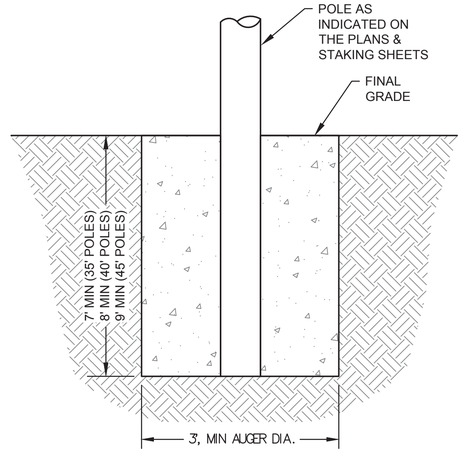
DESIGN PARAMETERS:

PERMITTED LOAD IS LEAST OF: 8,500 LBS (IN ANY DIRECTION) or 90% of RATED BREAKING STRENGTH OF GUY WIRE

SINGLE DOWN GUY (THROUGH BOLT TYPE)

DEC 2017 | E1.1La

TRANSFORMER FUSE LINK SCHEDULE	
TRANSFORMER SIZE	FUSE LINK SIZE AND TYPE
10KVA	1.4 Amp, SloFast
15KVA	2.1 Amp, SloFast
25 KVA	3.5 Amp, SloFast
37.5 KVA	5.2 Amp, SloFast
75 KVA	10.4 Amp, SloFast
100 KVA	14 Amp, SloFast



NOTES:
1. AUGER MINIMUM 3' DIAMETER HOLE, DEPTH AS INDICATED.
2. BACKFILL WITH GRAVEL AND COMPACT IN MAXIMUM 8" LIFTS.

1 / E10.1 **TYPICAL POLE INSTALLATION**
Scale: NTS

ALASKA ENERGY AUTHORITY

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — K. KAMM — EE-11401 — 12/15/22 — PROFESSIONAL ENGINEER

CRW ENGINEERING GROUP LLC — PHONE: (907) 562-3252
Gray Stassel Engineering, Inc. — PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE
DISTRIBUTION DETAILS
NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22 | Designed TRK | Drawn TRK | Approved KH

Sheet No. E10.1

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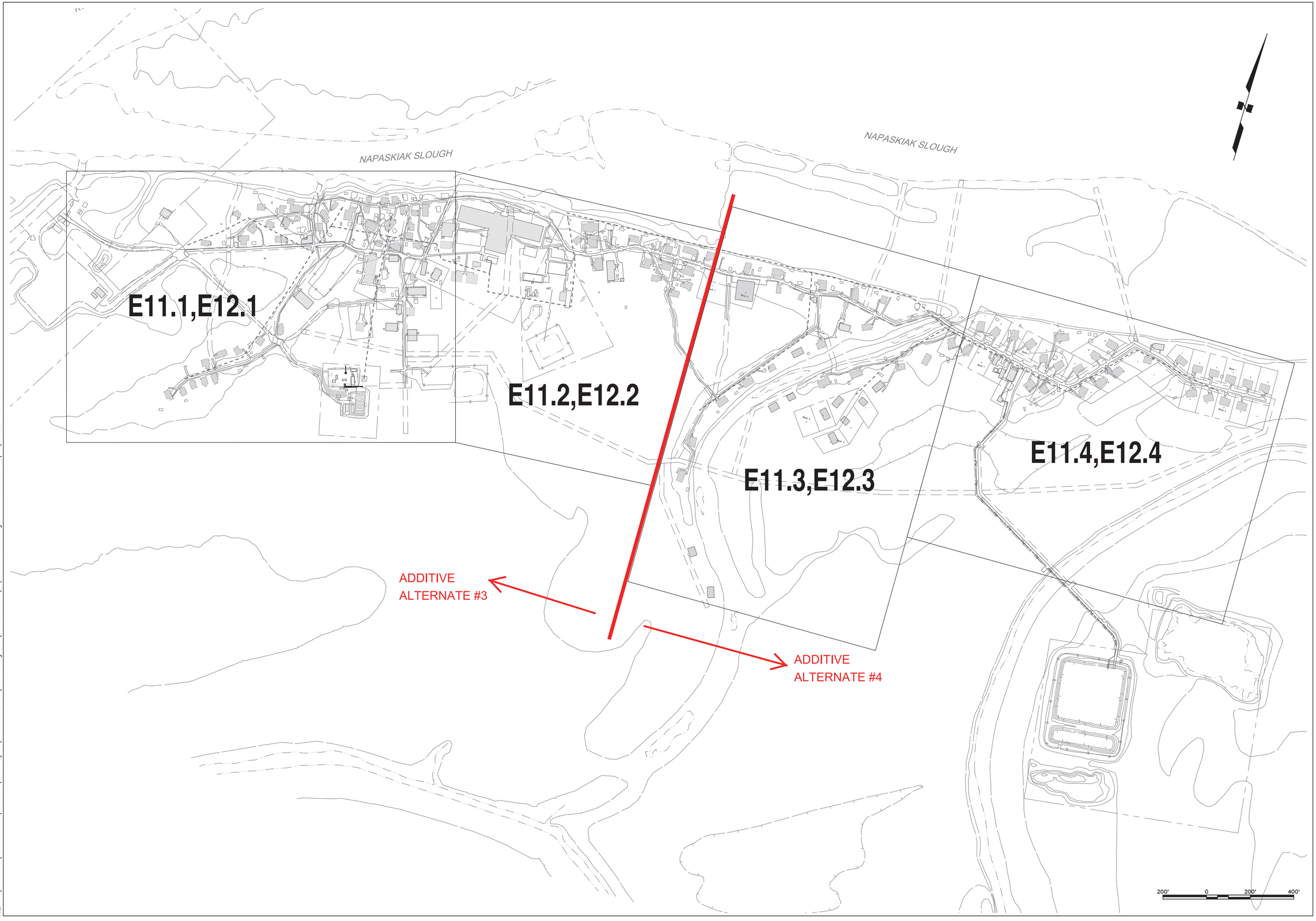

ALASKA ENERGY AUTHORITY

STATE OF ALASKA
49TH
REGISTERED PROFESSIONAL ENGINEER
EE-11401
12/15/22

CRW ENGINEERING GROUP LLC
PHONE: (907) 562-3252

Gray Stassel Engineering, Inc.
PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

OVERALL DISTRIBUTION SITE PLAN

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22
Designed TRK
Drawn TRK
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Sheet No.
E11.0

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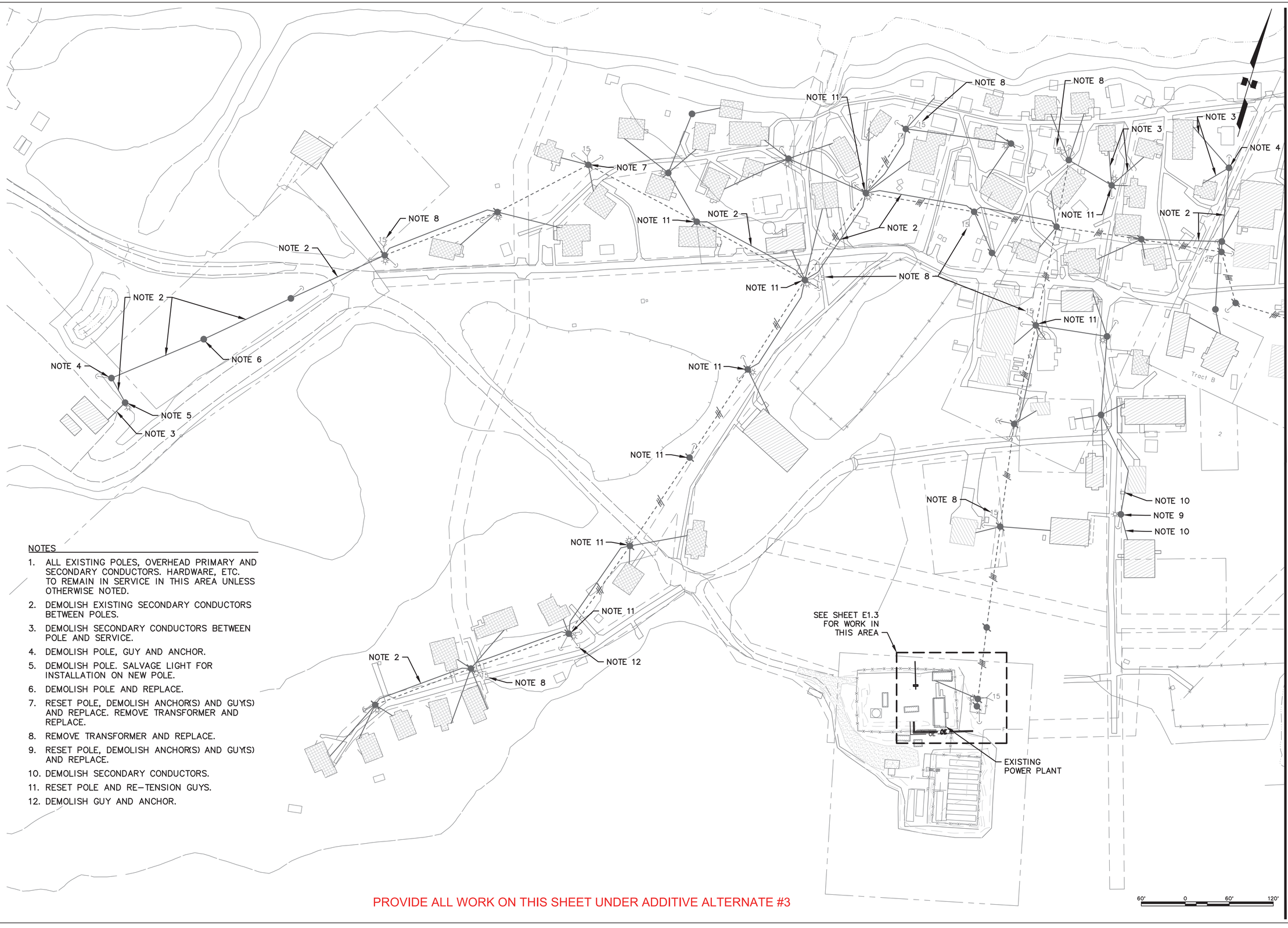

NOTES

1. ALL EXISTING POLES, OVERHEAD PRIMARY AND SECONDARY CONDUCTORS. HARDWARE, ETC. TO REMAIN IN SERVICE IN THIS AREA UNLESS OTHERWISE NOTED.
2. DEMOLISH EXISTING SECONDARY CONDUCTORS BETWEEN POLES.
3. DEMOLISH SECONDARY CONDUCTORS BETWEEN POLE AND SERVICE.
4. DEMOLISH POLE, GUY AND ANCHOR.
5. DEMOLISH POLE. SALVAGE LIGHT FOR INSTALLATION ON NEW POLE.
6. DEMOLISH POLE AND REPLACE.
7. RESET POLE, DEMOLISH ANCHOR(S) AND GUY(S) AND REPLACE. REMOVE TRANSFORMER AND REPLACE.
8. REMOVE TRANSFORMER AND REPLACE.
9. RESET POLE, DEMOLISH ANCHOR(S) AND GUY(S) AND REPLACE.
10. DEMOLISH SECONDARY CONDUCTORS.
11. RESET POLE AND RE-TENSION GUYS.
12. DEMOLISH GUY AND ANCHOR.

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #3

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER T. KARNS EE-11401 12/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION DEMOLITION PLAN (1 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
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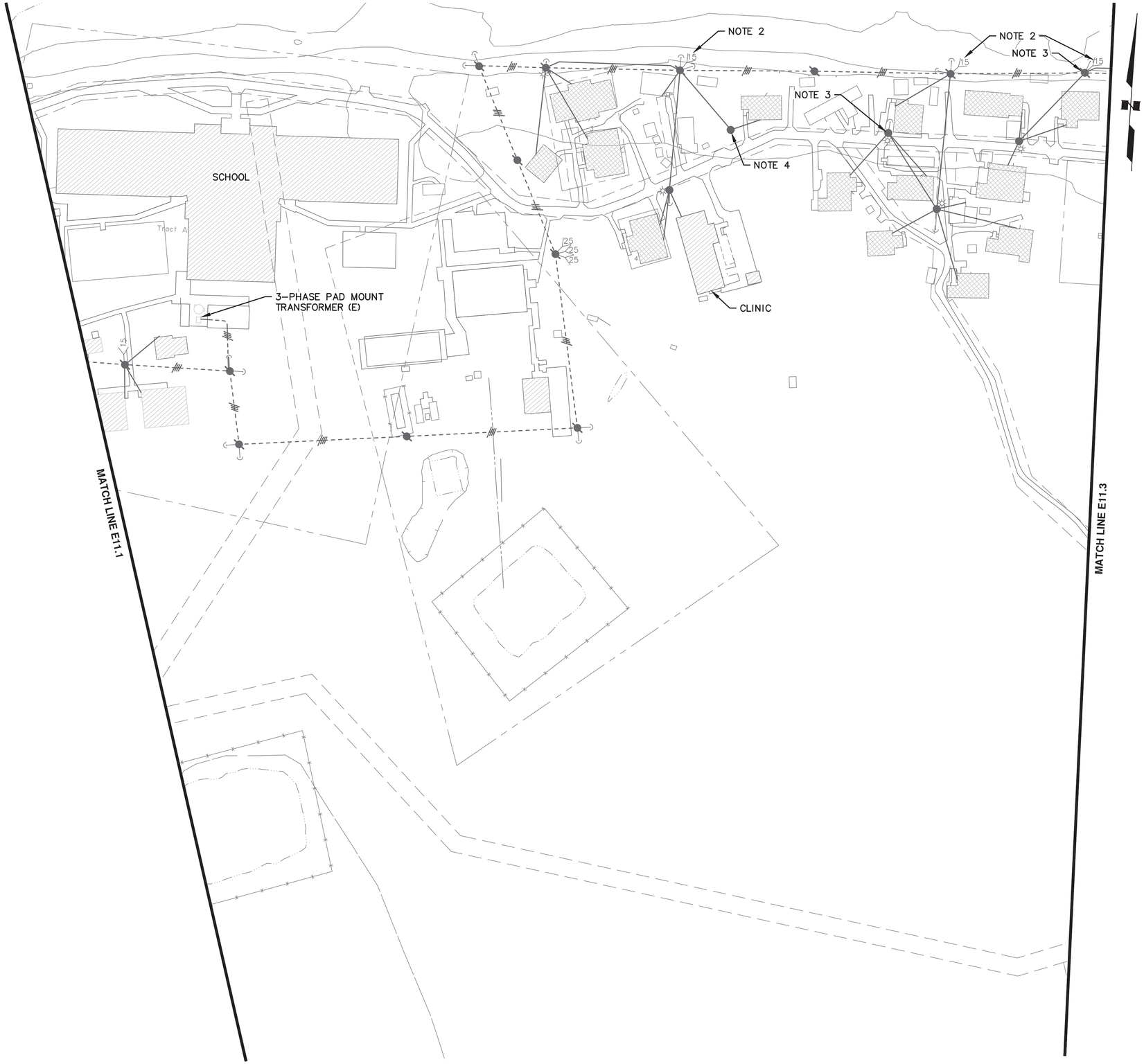

NOTES

1. ALL EXISTING POLES, OVERHEAD PRIMARY AND SECONDARY CONDUCTORS. HARDWARE, ETC. TO REMAIN IN SERVICE IN THIS AREA UNLESS OTHERWISE NOTED.
2. REMOVE TRANSFORMER AND REPLACE.
3. RESET POLE, DEMOLISH ANCHOR(S) AND GUY(S) AND REPLACE.
4. RESET POLE AND ADD GUY AND ANCHOR.

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #3

60' 0 60' 120'

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER T. K. KEMPF EE-11401 12/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION DEMOLITION PLAN (2 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
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Sheet No. E11.2

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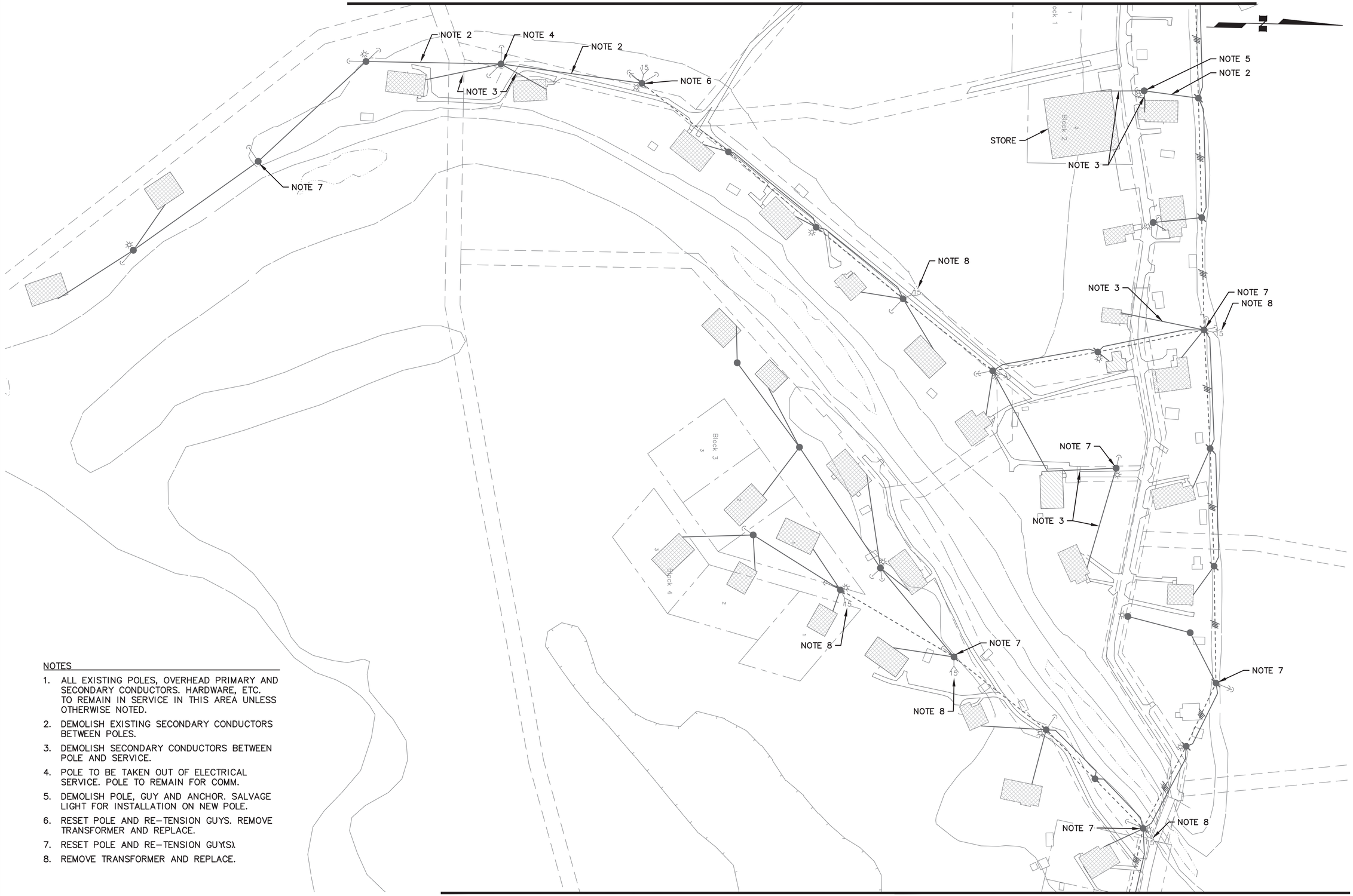
MATCH LINE E11.2



NOTES

1. ALL EXISTING POLES, OVERHEAD PRIMARY AND SECONDARY CONDUCTORS. HARDWARE, ETC. TO REMAIN IN SERVICE IN THIS AREA UNLESS OTHERWISE NOTED.
2. DEMOLISH EXISTING SECONDARY CONDUCTORS BETWEEN POLES.
3. DEMOLISH SECONDARY CONDUCTORS BETWEEN POLE AND SERVICE.
4. POLE TO BE TAKEN OUT OF ELECTRICAL SERVICE. POLE TO REMAIN FOR COMM.
5. DEMOLISH POLE, GUY AND ANCHOR. SALVAGE LIGHT FOR INSTALLATION ON NEW POLE.
6. RESET POLE AND RE-TENSION GUYS. REMOVE TRANSFORMER AND REPLACE.
7. RESET POLE AND RE-TENSION GUY(S).
8. REMOVE TRANSFORMER AND REPLACE.

MATCH LINE E11.4

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #4

60' 0 60' 120'

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER T. KARNS EE-11401 12/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE
DISTRIBUTION DEMOLITION PLAN
(3 of 4)
NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22
Designed TRK
Drawn TRK
Approved KH

Sheet No. E11.3

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NOTES

1. ALL EXISTING POLES, OVERHEAD PRIMARY AND SECONDARY CONDUCTORS. HARDWARE, ETC. TO REMAIN IN SERVICE IN THIS AREA UNLESS OTHERWISE NOTED.
2. DEMOLISH SECONDARY CONDUCTORS BETWEEN POLES.
3. RESET POLE AND ADD GUY AND ANCHOR.
4. REMOVE TRANSFORMER AND REPLACE.

NOTE 4

NOTE 2

NOTE 4

NOTE 3

NOTE 4

NOTE 4

3–PHASE SERVICE

3–PHASE SECONDARY

Block 1

Block 2

MATCH LINE E11.3

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #4

60' 0 60' 120'

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER K. KAMM EE-11401 12/15/22

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Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION DEMOLITION PLAN (4 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

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Sheet No. E11.4

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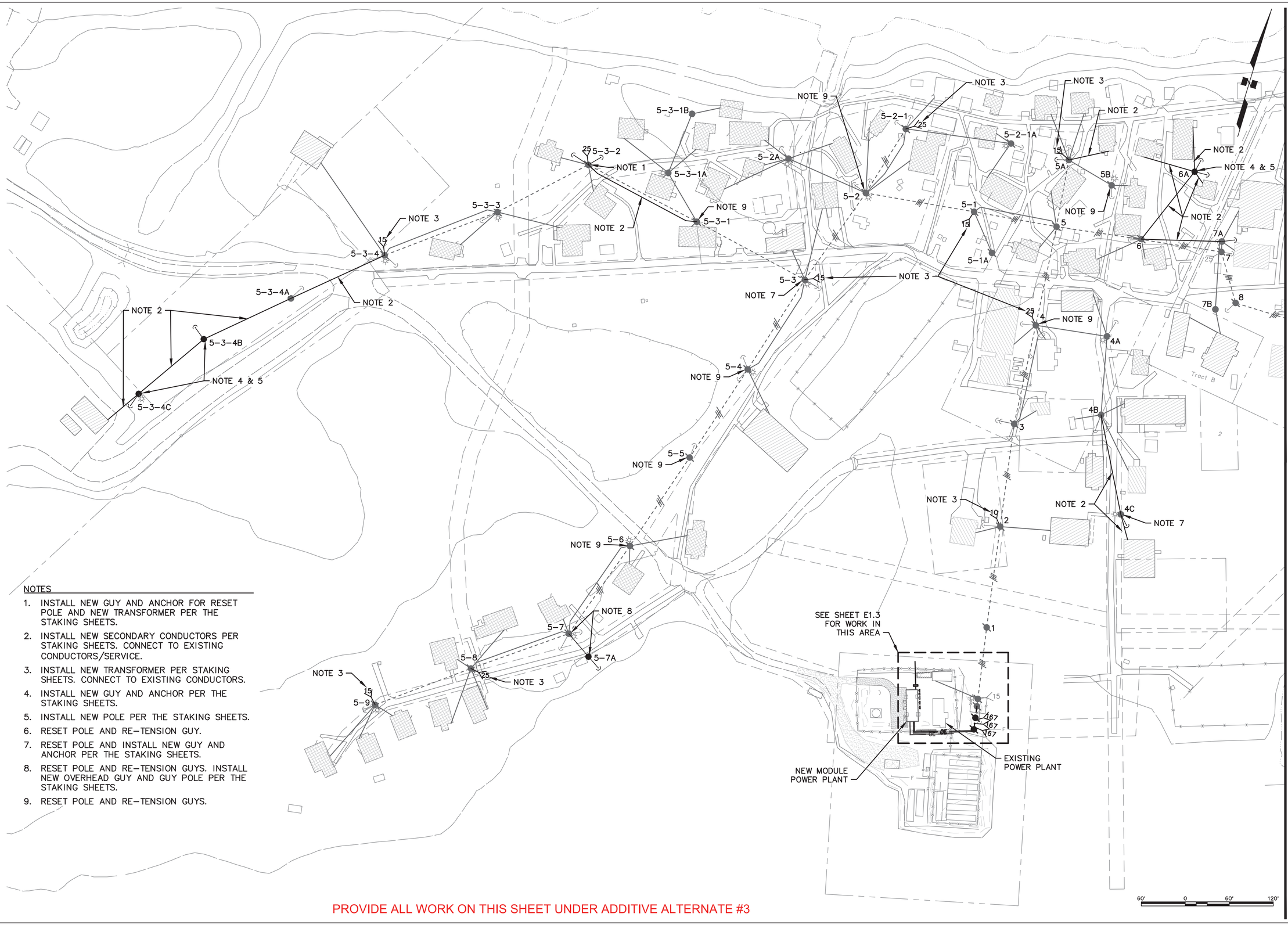

NOTES

1. INSTALL NEW GUY AND ANCHOR FOR RESET POLE AND NEW TRANSFORMER PER THE STAKING SHEETS.
2. INSTALL NEW SECONDARY CONDUCTORS PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS/SERVICE.
3. INSTALL NEW TRANSFORMER PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS.
4. INSTALL NEW GUY AND ANCHOR PER THE STAKING SHEETS.
5. INSTALL NEW POLE PER THE STAKING SHEETS.
6. RESET POLE AND RE-TENSION GUY.
7. RESET POLE AND INSTALL NEW GUY AND ANCHOR PER THE STAKING SHEETS.
8. RESET POLE AND RE-TENSION GUYS. INSTALL NEW OVERHEAD GUY AND GUY POLE PER THE STAKING SHEETS.
9. RESET POLE AND RE-TENSION GUYS.

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #3

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER T. KEMPF EE-11401 12/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION PLAN (1 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

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Sheet No. E12.1

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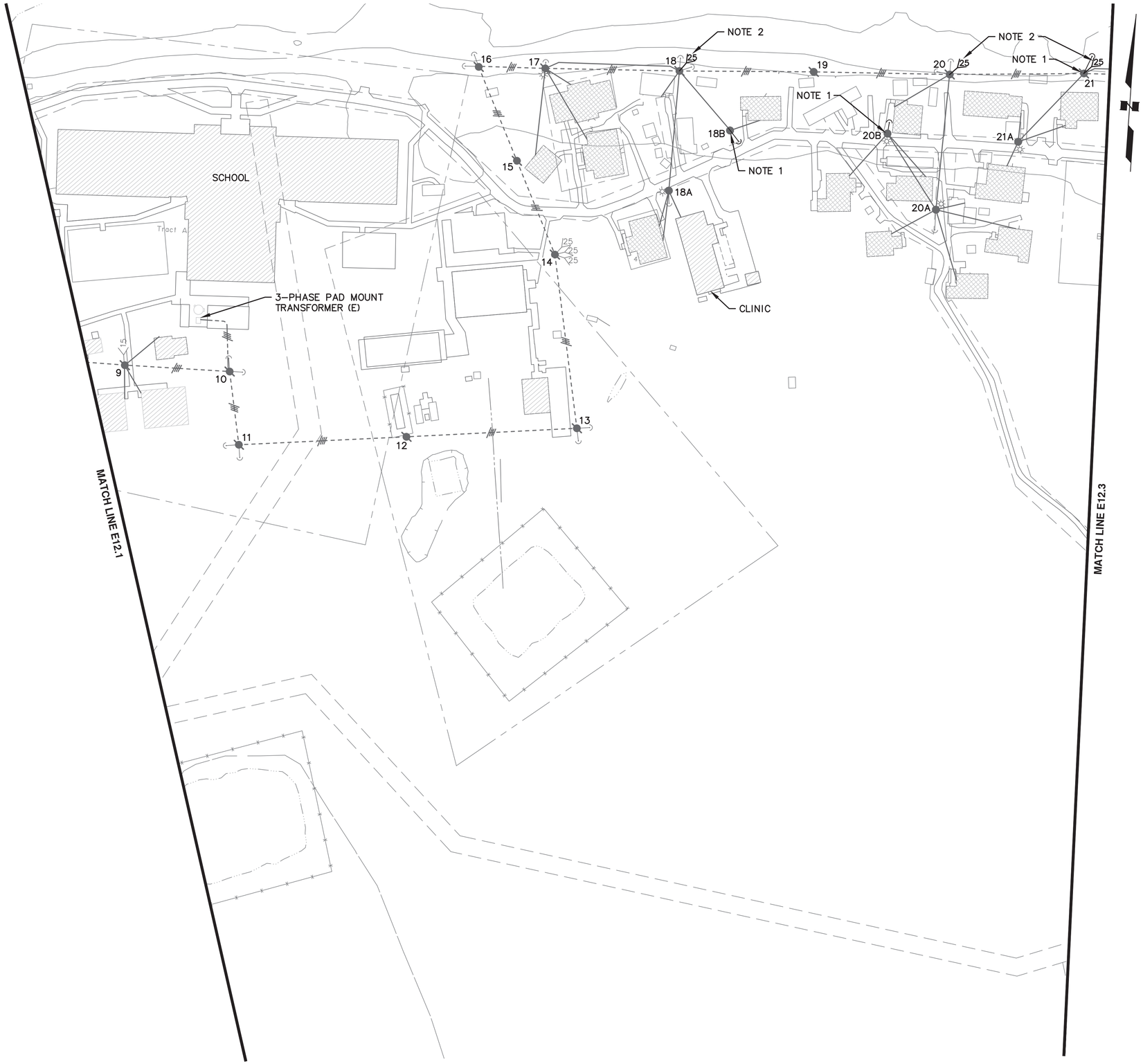

NOTES

1. INSTALL NEW GUY AND ANCHOR PER THE STAKING SHEETS FOR RESET POLE.
2. INSTALL NEW TRANSFORMER PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS.

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #3

60' 0 60' 120'

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER T. K. KEMPF EE-11401 2/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION PLAN (2 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22 | Designed TRK | Drawn TRK | Approved KH

Sheet No. E12.2

File: J:\JobsData\72309.00 Napaskiak Rpsu Project\00 Cadd 2019\01 Working Set\03 Electrical\Napaskiak RPSU.dwg Plot Date: 12/13/2022 1:53 PM

MATCH LINE E12.2

NOTE 3
15
NOTE 1 & 4
24–9
NOTE 2
24–9A
NOTE 6
NOTE 1 & 4
NOTE 2
24–8
NOTE 1
24–7
NOTE 2
NOTE 3
10
24–6
NOTE 4 & 5
NOTE 2
NOTE 6
NOTE 2
NOTE 7
24–9B
24–9C
24–5
24–4
NOTE 3
15
24–3
29–3C
24–2
24–1
NOTE 1 & 4
22A
NOTE 2
NOTE 4
22
STORE
Block 2
23A
23
NOTE 1
24A
NOTE 2
NOTE 7
NOTE 3
24
25
NOTE 7
NOTE 8
NOTE 2
NOTE 4
25
25A
25B
NOTE 1
NOTE 2
26
29–3B
29–4A
29–3A
29–4
15
NOTE 3
27B
27A
NOTE 9
27
NOTE 9
29–3
29
NOTE 3
29–2
28
29–1
NOTE 7
29
25
29A
NOTE 10
NOTE 4
NOTE 3
Block 3
Block 4

NOTES

1. INSTALL NEW POLE PER THE STAKING SHEETS.
2. INSTALL NEW SECONDARY CONDUCTORS PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS/SERVICE.
3. INSTALL NEW TRANSFORMER PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS.
4. INSTALL NEW GUY AND ANCHOR PER THE STAKING SHEETS.
5. RESET POLE AND RE–TENSION GUY. INSTALL NEW HARDWARE PER THE STAKING SHEETS. CONNECT TO NEW TO EXISTING PRIMARY.
6. INSTALL NEW PRIMARY PER THE STAKING SHEETS.
7. RESET POLE AND RE–TENSION GUY(S).
8. INSTALL NEW GUY AND ANCHOR FOR EXISTING POLE.
9. RESET POLE AND RE–TENSION GUY. INSTALL NEW GUY(S) AND ANCHOR(S) PER THE STAKING SHEETS.
10. INSTALL NEW OVERHEAD GUY AND GUY POLE PER THE STAKING SHEETS.

MATCH LINE E12.4

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #4

60' 0 60' 120'

ALASKA ENERGY AUTHORITY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER K. KAMM EE-11401 12/15/22

CRW ENGINEERING GROUP LLC PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION PLAN (3 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22
Designed TRK
Drawn TRK
Approved KH

Sheet No. E12.3

File: J:\JobsData\72309.00 Napaskiak Rpsu Project\00 Cadd 2019\01 Working Set\03 Electrical\Napaskiak RPSU.dwg Plot Date: 12/13/2022 1:53 PM

MATCH LINE E12.3

NOTES

1. INSTALL NEW GUY AND ANCHOR FOR RESET POLE. SEE STAKING SHEETS.
2. INSTALL NEW SECONDARY CONDUCTORS PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS.
3. INSTALL NEW TRANSFORMER PER STAKING SHEETS. CONNECT TO EXISTING CONDUCTORS.
4. INSTALL NEW GUY AND ANCHOR PER THE STAKING SHEETS.

PROVIDE ALL WORK ON THIS SHEET UNDER ADDITIVE ALTERNATE #4

60' 0 60' 120'

ALASKA ENERGY AUTHORITY

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — T. KARNS — EE-11401 — 12/15/22

CRW ENGINEERING GROUP LLC — PHONE: (907) 562-3252

Gray Stassel Engineering, Inc. — PHONE: (907) 349-0100

NAPASKIAK POWER SYSTEM UPGRADE

DISTRIBUTION PLAN (4 of 4)

NAPASKIAK, ALASKA

NO.	REVISION	BY	DATE
0	ISSUED FOR CONSTRUCTION	TRK	12/15/22

Plot Date 12/9/22 | Designed TRK | Drawn TRK | Approved KH

Sheet No. E12.4

File: J:\JobsData\72309.00 Napaskiak Rpsu Project\00 Cadd 2019\01 Working Set\03 Electrical\Napaskiak RPSU.dwg Plot Date: 12/13/2022 1:53 PM

NAPASKIAK RPSU
DISTRIBUTION UPGRADES

STAKING SHEETS

ISSUED FOR CONSTRUCTION
DECEMBER 2022

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503

ALL WORK ON THE STAKING SHEETS IS INCLUDED IN THE ON SITE CONTRACT.

PROVIDE DISTRIBUTION UPGRADES FROM LOCATION 2 THROUGH LOCATION 21 UNDER ADDITIVE ALTERNATE #3 AND FROM LOCATION 22 THROUGH 38 UNDER ADDITIVE ALTERNATE #4 AS SHOWN ON THE DRAWINGS.

REV. NO.	DATE	DESCRIPTION	BY
0	12/2/22	ISSUED FOR CONSTRUCTION	TRK

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
(907) 562-3252

DESIGNER	DATE
TRK	December 2, 2022
CHECKER	**DATE**
TRK	December 2, 2022
DIST. ENG.	**DATE**
TRK	December 2, 2022

NAPASKIAK RPSU DISTRIBUTION UPGRADES

STAKING SHEETS SHOW ONLY LOCATION WHERE NEW WORK IS REQUIRED.

LOCATION NUMBER	STATION	LINE ANGLE (DEG)	CONDUCTOR No.	CONDUCTOR SIZE/TYPE	CONDUCTOR Back Span	POLE HEIGHT	POLE CLASS	PRIMARY ASSEMBLY No.	PRIMARY ASSEMBLY Units	GUYS No.	GUYS Units	ANCHORS No.	ANCHORS Units	XFMRS No.	XFMRS Units	SECONDARY CONDUCTOR SERVICE No.	SECONDARY CONDUCTOR SERVICE SIZE/TYPE	SECONDARY CONDUCTOR BACKFEED Back Span	SECONDARY CONDUCTOR BACKFEED No.	SECONDARY CONDUCTOR BACKFEED SIZE/TYPE	SECONDARY SERVICE No.	SECONDARY SERVICE Units	MISCELLANEOUS CONSTRUCTION UNITS No.	MISCELLANEOUS CONSTRUCTION UNITS Units	RIGHT OF WAY	REMARKS/COMMENTS/NOTES
2														1	G1.4-10	2	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE NEW #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
4														1	G1.4-25	2	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											RESET POLE AND RE-TENSION GUY.
															1-PHASE											REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
4B																2	EXISTING				1	J3.1				EXISTING POLE.
																										CONNECT NEW TO EXISTING SECONDARY
																										CONNECT NEW TO EXISTING SECONDARY
4C										1	E1.1La	1	F3.10			1	#4 TRIPLEX	140	1	#4 TRIPLEX	2	J3.1				EXISTING POLE.
																										RESET POLE.
																										INSTALL NEW GUY AND ANCHOR.
5A										1	E1.1La	1	F3.10	1	G1.4-15	2	EXISTING						1	H1.1		EXISTING POLE.
															120/240V	1	#4 TRIPLEX									REPLACE XFMR.
															1-PHASE											PROVIDE NEW #2 ACSR JUMPERS.
																										INSTALL NEW GUY AND ANCHOR.
																										CONNECT CONDUCTORS TO NEW XFMR.
5B																1	EXISTING									EXISTING POLE.
																										RESET POLE AND RE-TENSION GUY.
5-1														1	G1.4-15								1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE NEW #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
5-2																										EXISTING POLE.
																										RESET POLE AND RE-TENSION GUY.
5-2-1														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE NEW #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
5-3														1	G1.4-15	2	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											RESET POLE AND RE-TENSION GUYS.
															1-PHASE											REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.

LOCATION NUMBER	STATION	LINE ANGLE (DEG)	CONDUCTOR			POLE		PRIMARY ASSEMBLY		GUYS		ANCHORS		XFMRS		SECONDARY CONDUCTOR					SECONDARY SERVICE		MISCELLANEOUS CONSTRUCTION UNITS		RIGHT OF WAY	REMARKS/COMMENTS/NOTES
																SERVICE		BACKFEED								
			No.	SIZE/TYPE	Back Span	HEIGHT	CLASS	No.	Units	No.	Units	No.	Units	No.	Units	No.	SIZE/TYPE	Back Span	No.	SIZE/TYPE	No.	Units	No.	Units		
5-3-1																1	EXISTING						1	H1.1		EXISTING POLE. RESET POLE. CONNECT NEW TO EXISTING SECONDARY
5-3-2										2	E1.1La	2	F3.10	1	G1.4-25 120/240V 1-PHASE	2	EXISTING	175	1	#1/0 TRIPLEX	3	J3.1	1	H1.1		EXISTING POLE. RESET POLE, REMOVE GUYS/ANCHORS. INSTALL NEW GUYS AND ANCHORS. REPLACE XFMR. PROVIDE #2 ACSR JUMPERS. CONNECT CONDUCTORS TO NEW XFMR.
5-3-4														1	G1.4-15 120/240V 1-PHASE	1	EXISTING				1	J3.1	1	H1.1		EXISTING POLE. REPLACE XFMR. PROVIDE NEW #2 ACSR JUMPERS. CONNECT CONDUCTORS TO NEW XFMR.
5-3-4A																		141	1	#1/0 TRIPLEX	2	J3.1				EXISTING POLE.
5-3-4B						35	4			1	E1.1La	1	F3.10					132	1	#1/0 TRIPLEX	2	J3.1				NEW POLE
5-3-4C						35	4			1	E1.1La	1	F3.10			1	#4 TRIPLEX	116	1	#1/0 TRIPLEX	2	J3.1				NEW POLE INSTALL SALVAGED LIGHT ON NEW POLE
5-4																1	EXISTING									EXISTING POLE. RESET POLE AND RE-TENSION GUYS.
5-5																										EXISTING POLE. RESET POLE AND RE-TENSION GUY.
5-6																2	EXISTING									EXISTING POLE. RESET POLE AND RE-TENSION GUY.
5-7																1	EXISTING									EXISTING POLE. RESET POLE AND RE-TENSION GUYS. REMOVE (1) GUY/ANCHOR PER PLANS. CONNECT NEW OVERHEAD GUY.
5-7A						40	4			1	E1.1La	1	F3.10										1	E1.4L		NEW POLE INSTALL OVERHEAD GUY
5-8														1	G1.4-25 120/240V 1-PHASE	4	EXISTING						1	H1.1		EXISTING POLE. REPLACE XFMR. PROVIDE NEW #2 ACSR JUMPERS. CONNECT CONDUCTORS TO NEW XFMR.

LOCATION NUMBER	STATION	LINE ANGLE (DEG)	CONDUCTOR			POLE		PRIMARY ASSEMBLY		GUYS		ANCHORS		XFMRS		SECONDARY CONDUCTOR					SECONDARY SERVICE		MISCELLANEOUS CONSTRUCTION UNITS		RIGHT OF WAY	REMARKS/COMMENTS/NOTES
																SERVICE			BACKFEED							
			No.	SIZE/TYPE	Back Span	HEIGHT	CLASS	No.	Units	No.	Units	No.	Units	No.	Units	No.	SIZE/TYPE	Back Span	No.	SIZE/TYPE	No.	Units	No.	Units		
5-9														1	G1.4-15	3	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE NEW #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
6										2	E1.1La	2	F3.10			3	#4 TRIPLEX	120	1	#1/0 TRIPLEX	3	J3.1				EXISITING POLE
																										CONNECT NEW TO EXISTING SECONDARY
6A						35	4			2	E1.1La	2	F3.10			3	#4 TRIPLEX	120	1	#1/0 TRIPLEX	3	J3.1				NEW POLE
7A										1	E1.1La	1	F3.10			2	EXISTING	115	1	#1/0 TRIPLEX	1	J3.1				EXISITING POLE
																										CONNECT NEW TO EXISTING SECONDARY
18														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
18B										1	E1.1La	1	F3.10			1	EXISTING									EXISTING POLE.
																										RESET POLE.
																										INSTALL NEW GUYS AND ANCHORS.
20														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
20B										1	E1.1La	1	F3.10			2	EXISTING									EXISTING POLE.
																										RESET POLE, REMOVE GUY/ANCHOR.
																										INSTALL NEW GUY AND ANCHOR.
21										1	E1.1La	1	F3.10	1	G1.4-25								1	H1.1		EXISTING POLE.
															120/240V											RESET POLE.
															1-PHASE											INSTALL NEW GUY AND ANCHOR.
																										REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
22										1	E1.1La	1	F3.10								1	J3.1				EXISTING POLE.
																										INSTALL NEW GUY AND ANCHOR.
																										CONNECT NEW TO EXISTING SECONDARY
22A						35	4			2	E1.1La	2	F3.10			1	#4 TRIPLEX	120	1	#1/0 TRIPLEX	3	J3.1				NEW POLE
																1	#1/0 TRIPLEX									INSTALL SALVAGED LIGHT ON NEW POLE
24														1	G1.4-25	1	EXISTING				1	J3.1	1	H1.1		EXISTING POLE.
															120/240V											RESET POLE AND RE-TENSION GUY.
															1-PHASE											REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
24A						35	4									1	#4 TRIPLEX	75	1	#2 TRIPLEX	2	J3.1				NEW POLE

LOCATION NUMBER	STATION	LINE ANGLE (DEG)	CONDUCTOR			POLE		PRIMARY ASSEMBLY		GUYS		ANCHORS		XFMRS		SECONDARY CONDUCTOR					SECONDARY SERVICE		MISCELLANEOUS CONSTRUCTION UNITS		RIGHT OF WAY	REMARKS/COMMENTS/NOTES
																SERVICE		BACKFEED								
			No.	SIZE/TYPE	Back Span	HEIGHT	CLASS	No.	Units	No.	Units	No.	Units	No.	Units	No.	SIZE/TYPE	Back Span	No.	SIZE/TYPE	No.	Units	No.	Units		
24-3														1	G1.4-15	2	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
24-6								1	A5.1	1	E1.1La	1	F3.10	1	G1.4-10						1	J3.1	1	H1.1		EXISTING POLE.
															120/240V								1	N7.6		RESET POLE AND RE-TENSION GUYS.
															1-PHASE											INSTALL NEW GUY AND ANCHOR.
																										REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT NEW TO EXISTING PRIMARY.
24-7		110	2	#2 ACSR	175	45	4	1	A1.1							1	#4 TRIPLEX	110	1	#1/0 TRIPLEX	3	J3.1				NEW POLE.
24-8		115	2	#2 ACSR	110	45	4	1	A2.1	1	E1.1La	1	F3.10			1	#4 TRIPLEX	115	1	#1/0 TRIPLEX	2	J3.1				NEW POLE.
24-9			2	#2 ACSR	115	45	4	1	A5.1	2	E1.1La	2	F3.10	1	G1.4-15			115	1	#1/0 TRIPLEX	1	J3.1	1	H1.1		NEW POLE.
															120/240V								1	N7.6		
															1-PHASE											
24-9A																		55	1	#1/0 TRIPLEX	1	J3.1				EXISTING POLE.
																										CONNECT NEW TO EXISTING SECONDARY
24-9B																										EXISTING POLE.
																										RESET POLE AND RE-TENSION GUY.
25										1	E1.1La	1	F3.10			1	EXISTING									EXISTING POLE.
																										INSTALL NEW GUY AND ANCHOR.
																										CONNECT NEW TO EXISTING SECONDARY
25A										1	E1.1La	1	F3.10					130	1	#2 TRIPLEX	2	J3.1				EXISTING POLE.
																										RESET POLE AND RE-TENSION GUY.
																										INSTALL NEW GUY AND ANCHOR.
25B						35	4									1	#4 TRIPLEX	70	1	#2 TRIPLEX	2	J3.1				NEW POLE
																										ATTACH TELECOM TO NEW POLE.
27										2	E1.1La	2	F3.10													EXISTING POLE.
																										RESET POLE AND RE-TENSION GUYS.
																										INSTALL NEW GUYS AND ANCHORS.
29														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											RESET POLE AND RE-TENSION GUY.
															1-PHASE											REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
																										CONNECT TO OVERHEAD GUY.
29A						45	4			1	E1.1La	1	F3.10										1	E1.4L		NEW POLE.
																										INSTALL OVERHEAD GUY

LOCATION NUMBER	STATION	LINE ANGLE (DEG)	CONDUCTOR			POLE		PRIMARY ASSEMBLY		GUYS		ANCHORS		XFMRS		SECONDARY CONDUCTOR					SECONDARY SERVICE		MISCELLANEOUS CONSTRUCTION UNITS		RIGHT OF WAY	REMARKS/COMMENTS/NOTES
																SERVICE		BACKFEED								
			No.	SIZE/TYPE	Back Span	HEIGHT	CLASS	No.	Units	No.	Units	No.	Units	No.	Units	No.	SIZE/TYPE	Back Span	No.	SIZE/TYPE	No.	Units	No.	Units		
29-3										1	E1.1La	1	F3.10	1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											RESET POLE AND RE-TENSION GUY.
															1-PHASE											INSTALL NEW GUY AND ANCHOR.
																										REPLACE XFMR.
																										PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
29-4														1	G1.4-15	2	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
30A										1	E1.1La	1	F3.10			2	EXISTING									EXISTING POLE.
																										INSTALL NEW GUY AND ANCHOR.
31														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
31B										2	E1.1La	2	F3.10			2	EXISTING									EXISTING POLE.
																										RESET POLE.
																										INSTALL NEW GUYS AND ANCHORS.
32														1	G3.3-15								1	H1.1		EXISTING POLE.
															208Y120V											REPLACE XFMRS.
															3-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
34														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
35														1	G1.4-25								1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.
36																3	EXISTING				1	J3.1				EXISTING POLE.
																										CONNECT NEW TO EXISTING SECONDARY
37																2	EXISTING	140	1	#1/0 TRIPLEX	1	J3.1				EXISTING POLE.
																										CONNECT NEW TO EXISTING SECONDARY
38														1	G1.4-25	1	EXISTING						1	H1.1		EXISTING POLE.
															120/240V											REPLACE XFMR.
															1-PHASE											PROVIDE #2 ACSR JUMPERS.
																										CONNECT CONDUCTORS TO NEW XFMR.

LOCATION NUMBER	STATION	LINE ANGLE (DEG)	CONDUCTOR			POLE		PRIMARY ASSEMBLY		GUYS		ANCHORS		XFMRS		SECONDARY CONDUCTOR					SECONDARY SERVICE		MISCELLANEOUS CONSTRUCTION UNITS		RIGHT OF WAY	REMARKS/COMMENTS/NOTES
																SERVICE		BACKFEED								
			No.	SIZE/TYPE	Back Span	HEIGHT	CLASS	No.	Units	No.	Units	No.	Units	No.	Units	No.	SIZE/TYPE	Back Span	No.	SIZE/TYPE	No.	Units	No.	Units		

STAKING SHEET NOTES:

1. SEE PROJECT DETAIL DRAWINGS FOR MODIFIED RUS CONSTRUCTION UNITS. UNLESS OTHERWISE INDICATED, GUY LEADS SHALL BE 30 FEET.
2. ON THE RUS CONSTRUCTION UNIT G1.4 AND G1.5 AN ARMOR ROD IS INDICATED AT THE CONNECTION TO THE LINE WITH A HOT LINE CLAMP. DO NOT INSTALL SURGE ARRESTERS ON TRANSFORMERS.