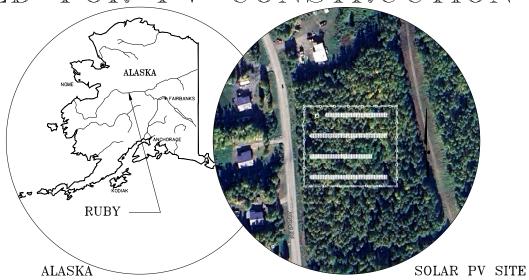
TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY DESIGN ISSUED FOR PV CONSTRUCTION BID





DRAWING II	SCOPE OF WORK			
TITLE	DRAWING NUMBER	SHEET	REVISION	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM-IN RUBY, AK.
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	RYRE-EL-0000	1	В	THE SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	RYRE-EL-0000	2	В	2 STRING INVERTERS MOUNTED INSIDE A CONTAINER. THE BATTERY
				MODULES AND INVERTER WILL BE HOUSED INSIDE A CONTAINER AND HAVE SELF—SERVING AUXILIARY LOADS. BOTH SYSTEMS WILL
SITE LAYOUT DIAGRAM	RYRE-EL-2500	1	В	OPERATE IN PARALLEL WITH THE LOCAL UTILITY AND HAVE RELATED
SITE LAYOUT - PV ARRAY	RYRE-EL-2500	2	В	ELECTRICAL SAFETY AND METERING SYSTEMS.
-SITE LAYOUT - BESS	RYRE-EL-2500	3	A—	
SITE LAYOUT - INTERCONNECTION	RYRE-EL-2500	4	A	SYSTEM SUMMARY
SITE LAYOUT - POWER CONVERSION HUT LAYOUT	RYRE-EL-2500	5	В	PV SYSTEM SIZE: 257.046kWDC/250KWAC
SITE LAYOUT - COMMUNICATIONS PANEL DETAILS	RYRE-EL-2500	6	А	BESS SYSTEM SIZE: 450KW INTERCONNECTION VOLTAGE: 12.47kV, 3 PHASE, 4 WRE
				INTERCONNECTION VOLTAGE. 12.47KV, 3 FITASE, 4 WIRE
ONE LINE DIAGRAM	RYRE-EL-0010	1	В	
				GENERAL NORTH
THREE LINE DIAGRAM	RYRE-EL-0100	1	А	GENERAL NOTES
				ALL ELECTRICAL WORK TO BE INSTALLED BY A CHALLED AND
PV ARRAY DC WIRING DIAGRAM	RYRE-EL-0011	1	A	ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND LICENSED ELECTRICAL CONTRACTOR.
PV ELECTRICAL SITE PLAN	RYRE-EL-0020	1	A	00NTD40T0D WWW FOULOW IDO 0004 AND NEDA TO NEO 0007 AC
				CONTRACTOR WILL FOLLOW IBC 2021 AND NFPA 70 NEC 2023 AS WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY
GROUNDING PLAN	RYRE-SS-2000	1	A	CODES, ORDINANCES AND REGULATIONS.
WIREWAY DETAILS	RYRE-SS-2000	1	A	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC
GROUNDING AND WIREWAY DETAILS	RYRE-SS-2000	1	A	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL
SITE FENCING DETAILS	RYRE-SS-2000	1	A	BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE MANNER.
EQUIPMENT SAFETY LABEL SCHEUDLE	RYRE-SS-2000	1	A	DOIGN TO INCTALLATION. THE CONTRACTOR CHAIL INDEPOTANCE AND
TRANSFORMER DETAILS	RYRE-SS-2000	1	A	PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL DRAWINGS AND PRODUCT MANUALS.
EQUIPMENT NAMEPLATE DETAILS	RYRE-SS-2000	1	A	ALL DECICE AND ODEOISION TIONS OF OTDUCTURAL COMPONENTS ARE
				ALL DESIGN AND SPECIFICATIONS OF STRUCTURAL COMPONENTS ARE OUTSIDE THE SCOPE OF THESE PLANS.
PV STRING CALCULATIONS	RYRE-EL-0700	1	А	
				PROJECT ENTITIES
				OWNER: TANANA CHIEFS CONFERENCE
				ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.
				ELECTRIC SERVICE PROVIDER: CITY OF RUBY ELECTRIC UTILITY

NOT FOR CONSTRUCTION

PROJ DESIG	ect: Ruby Renewable energy design Sner/project engineer: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0227
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
Α	ISSUED FOR 35% REVIEW	TJT/05-05-2025	JRV/05-05-2025
В	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025

BESS DRAWINGS NOT INCLUDED IN THIS DRAWING SET

	Ŀ
Clectric Power System	
Consulting Engineers	Inc.
TEL: (907) 522–195. FAX: (907) 522–118 WEB: WWW.EPSINC.CO	2 L

ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DIVAMING NAME.
tems				
뻍				1
,				1
953 182				
сом				REF DWG(S):

TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY COVER SHEET AND INDEX

RYRE-PR-0001

SHEET 1 OF 1

ELECTRICAL SPECIFICATIONS

GENERAL

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR DRAWINGS THE MISSING THEM SO ALLOW THE SYSTEM TO ELINCATION. PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION
- ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT, CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS.
- ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- ALL THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS (360 DEGREES) BETWEEN PULL POINTS.
- 12. METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE ECC SYSTEM. GROUNDS SHALL BE SIZED ACCORDING TO THE NEC.
- 13. CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE NEUTRAL

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNTIL THESE DRAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET RATED AND UV RESISTANT.
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE.
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWINGS. FOR OUTDOOR INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR

PROJECT: RUBY RENEWABLE ENERGY DESIGN

- 20. AC WIRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS.
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION INTEGRITY.

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED

GROUNDING

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS
- 27. NON—CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT
- 28. MODULES SHALL BE BONDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS: 30.1. SOLID CONDUCTORS: ASTM B 3. 30.2. STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED: WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE.
- 33 INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS FLECTRICALLY CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS SHOWN ON DRAWINGS.

RACEWAYS

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS: 34.1. RIGID STEEL CONDUIT: ANSI C80.1.
- 34.2. FMT: ANSI C80.3. (FOR INDOOR USE ONLY)
- 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 36. COATED FITTINGS FOR PVC—COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER. EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS. COVER IS CASKETED WITH OIL—RESISTANT CASKET MATERIAL AND FASTENED WITH CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE. CONNECTIONS ARE FLANGED, WITH STAINLESS—STEEL SCREWS AND OIL—RESISTANT GASKETS.
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED
- 38.1. 3/4—INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 50 FEET.
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF
- 38.3. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS.
 SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT
 DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH THESE

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS INCLUDING POWER SYSTEMS AND ENERGY STORAGE SYSTEMS.
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING MEANS.

PANEL BOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1. EACH TYPE OF PANELBOARD, OVERCURRENT PROTECTIVE DEVICE, TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED.
 INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES,
 PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF GRAVITY AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.

ENG. STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING:
 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
 41.3.3. RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS. SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5. OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION O1 SECTION "OPERATION AND MAINTENANCE DATA." INCLUDE THE FOLLOWING:
 - MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING OVERCURRENT PROTECTIVE DEVICES.
- 41.5.2. TIME—CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:

- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES. COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.

 42.2. PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEM INDICATED. REFER TO DIVISION 01 SECTION "PROPUCT REQUIREMENTS."

 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- COMPLY WITH NEMA PR 1
- 43. CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCOMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING CRITERIA

- CRITERIA
 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."
 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.
 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.
 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.
 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.
 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH—MOUNTED FRONTS, WERLAP BOX. FRONTS, OVERLAP BOX. 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT.
 DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN
- METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES:
 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1. LUGS: MECHANICAL TYPE.
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURRENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES-CONNECTED SHORT-CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES—CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAI MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT FLEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP—UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING; FIELD—REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD—ADJUSTABLE
- 45.4.1. INSTANTANEOUS TRIP. 45.4.2. LONG- AND SHORT-TIME PICKUP LEVELS. 45.4.3. LONG- AND SHORT-TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30-MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC FOLIPMENT

REQUIRED SAFETY SIGNS AND LABELS

- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21
- 2. THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT INSTALLED IN PER NEC 110.21.
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1).
- UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535 RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:
 ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.
 SISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.
 DANGER" HEADER; RED BACKGROUND WITH WHITE LETTERING.

- "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING. "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
- "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING. OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND.
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690.

NOT FOR CONSTRUCTION

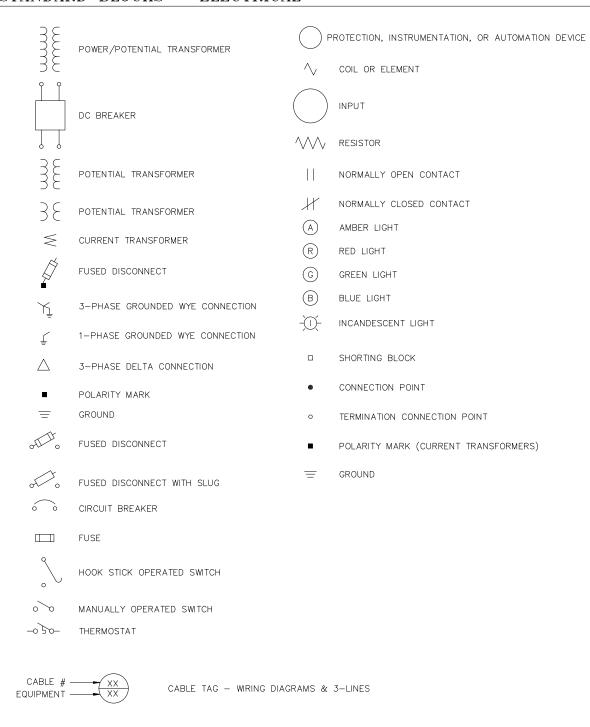
JOB #: 25-0227 DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON DESIGN / CONSTRUCTION / ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED /10-11-2025



TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY GENERAL INFORMATION AND SPECIFICATIONS

REF DWG(S) RYRE-EL-0000 HEET 1 OF 2

STANDARD BLOCKS - ELECTRICAL



STANDARD ABBREVIATIONS - ELECTRICAL

В	AMPERE AIR CIRCUIT BREAKER	EIA EJ	ELECTRONICS INDUSTRY ASSOCIATION EXPANSION JOINT	N N	NEWTON NORTH	TIA	TELECOMMUNICATIONS INDUSTRY ASSOCIATION
3	AIR BREAK	EL	ELECTRICAL	NC	NORMALLY CLOSED	TRP	TRIP
V	ABOVE	ELEV	ELEVATION	NCC	NORMALLY CLOSED CONTACT	TURB	TURBINE
v						TX	TRANSMIT
	ALTERNATING CURRENT	ENCL	ENCLOSURE	N/C	NO CONNECTION		
	ADJUSTABLE	EQ	EQUAL	NIC	NOT IN CONTRACT	TYP	TYPICAL
Т	ADJACENT	EQUIP	EQUIPMENT	NO	NORMALLY OPEN	UG	UNDERGROUND
	ALTERNATE	EST	ESTIMATE	NOC	NORMALLY OPEN CONTACT	UNO	UNLESS NOTED OTHERWISE
	ALUMINUM	EXIST	EXISTING	NS	SYNCHRONIZING NEUTRAL	٧	VOLT
RX	APPROXIMATE	F	FARAD	NTS	NOT TO SCALE	VA	VOLTAMPERE
	BUS	F	FUSE	OD	OUTSIDE DIAMETER	VA	PHASE A VOLTAGE
	BREAKER FAIL	FREQ	FREQUENCY	OUT	OUTPUT	VAR	REACTIVE POWER
	BREAKER FAIL INITIATE	FT	FEET	P	REAL POWER OR PRIMARY	VB	PHASE B VOLTAGE
						VAC	ALTERNATING CURRENT VOLTAGE
	BREAKER	FT	FEED THROUGH	PB	PUSH BUTTON		
;	BUILDING	FUT	FUTURE	PF	POWER FACTOR	VC	PHASE C VOLTAGE
	BLOCK	G	CONDUCTANCE OR GROUND	PLC	PROGRAMMABLE LOGIC CONTROLLER	VCB	VACUUM CIRCUIT BREAKER
	BOTTOM	GA	GAUGE	PM	PAD-MOUNT TRANSFORMER	VDC	DIRECT CURRENT VOLTAGE
	BRITISH THERMAL UNIT	GALV	GALVANIZED	PSSS	PROVIDER SWITCHYARD	VERT	VERTICAL
١	BETWEEN	GB	GROUND BUS	PT	POINT	VIF	VERIFY IN FIELD
•	BACKUP	GCB	GAS CIRCUIT BREAKER	PT	POTENTIAL TRANSFORMER	VN	NEUTRAL VOLTAGE
				PVC		VR	VOLTAGE REGULATOR
	COLOUMB	GEN	GENERATOR		POLYVINYL CHLORIDE	VREG	VOLTAGE REGULATOR
	CAPACITOR OR CAPACITANCE	GI	GALVANIZED IRON	PVMT	PAVEMENT	VREG	
	CORRUGATED ALUMINUM PIPE	GND	GROUND	PWR	POWER		SYNCHRONIZING VOLTAGE
	CENTER BREAK	GOAB	GANG OPERATED AIR-BREAK SWITCH	Q	REACTIVE POWER	VT	VOLTAGE TRANSFORMER
	CABLE	GRC	GALVANIZED RIGID CONDUIT	R	RESISTANCE OR RESISTOR	W	WEST
	CEMENT	GRD	GRADE, GRADING	RCLS	RECLOSE	W	WATT
	CUBIC FOOT	GRSC	GALVANIZED RIGID STEEL CONDUIT	RAD	RADIUS	W/	WITH
	CHECK	H	HENERY	RAD	RADIAN	w/o	WITHOUT
						X	REACTANCE
	CAST IRON	HDPE	HIGH-DENSITY POLYETHYLENE	RD	ROAD		
	CAST IRON PIPE	HLO	HOT LINE ORDER	RE	REMOTE END	XFMR	TRANSFORMER
	CAST-IN-PLACE CONCRETE	HORIZ	HORIZONTAL	REF	REFERENCE	XMSSN	TRANSMISSION
	CIRCLE	HP	HORSEPOWER	REQD	REQUIRED	Υ	ADMITTANCE
	CIRCUIT	HZ	HERTZ	RET	REMOTE END TRIP	YL	YELLOW
	CLOCK	IA	PHASE A CURRENT	RET	RETURN	Z	IMPEDANCE
	CLOSE	IB	PHASE B CURRENT	REV	REVISION	2	TIME-DELAY
						21	DISTANCE
	CIRCULAR MIL	IC	PHASE C CURRENT	RLY	RELAY		
	CORRUGATED METAL PIPE	ID	INSIDE DIAMETER	RR	RAILROAD	25	SYNCHRONISM CHECK
	COSINE	IN	INPUT	ROW	RIGHT OF WAY	27	UNDERVOLTAGE
С	CONCRETE	IN	INCH	RTS	READY TO SEND	30	ANNUNCIATOR
ST	CONSTRUCTION	IN	NEUTRAL CURRENT	RTU	REMOTE TERMINAL UNIT	32	DIRECTIONAL POWER
Т	CONTINUOUS	INCL	INCLUDE(D), INCLUDING	RX	RECEIVE	37	UNDERCURRENT OR UNDERPOWER
	CONTRACTOR	IND	INDUSTRY	S	APPARENT POWER	38	BEARING
111	CONTINACTOR				SOUTH	40	FIFI D
		INT	INTERSECTION	S		43	===
	CORRUGATED STEEL PIPE	INV	INVERT	S	SOURCE		MANUAL TRANSFER OR SELECTOR D
	CURRENT TRANSFORMER	IP	POLARIZING CURRENT	S-L	SOURCE-LOAD	46	REVERSE-PHASE
	CURRULANITCHER OR CONTROL SWITCH	i	COMPLEX NUMBER	SA	SURGE ARRESTOR	47	PHASE-SEQUENCE VOLTAGE
	CLEAR TO SEND	j	JOULE	SC	SWITCH CABINET	49	MACHINE OR TRANSFORMER THERMAL RELAY
	COPPER	JВ	JUNCTION BOX	SEC	SECTION	50	INSTANTANEOUS OVERCURRENT
	DIRECT CURRENT	KA	KILOAMPRERE	SEC	SECONDARY	51	AC TIME OVERCURRENT
						52	AC CIRCUIT BREAKER
	DATA CARRIER DETECT	KV	KILOVOLT	SVC	SERVICE		
	DATA COMMUNICATIONS EQUIPMENT	KW	KILOWATT	SVC	STATIC VAR COMPENSATOR	52a	NORMALLY OPEN BREAKER CONTACT
	DOUBLE DEAD END	L	INDUCTANCE	SHT	SHEET	52b	NORMALLY CLOSED BREAKER CONTA
	DEAD END	L	LINE	SIM	SIMILAR	59	OVERVOLTAGE
	DEMOLISH, DEMOLITION	L	LOAD	SIN	SINE	60	VOLTAGE BALANCE
ЭВ	DEMOBILIZE	LB	LOAD BREAK	SPEC	SPECIFICATION	63	PRESSURE SWITCH
-	DETAIL	LGPP	LANDFILL GAS POWER PLANT	SPECS	SPECIFICATIONS	64	APPARATUS GROUND
		LT	LIGHT	SPSS		67	AC DIRECTIONAL OVERCURRENT
	DISTURBANCE FAULT RECORDER				SPARTAN SUBSTATION	68	BLOCKING
	DIGITAL INPUT	M	METER(S)	SS	SYNCHRONIZING SWITCH		
	DIAMETER	MAT	MATERIAL	STA	STATION	69	PERMISSIVE
	DIAGONAL	MAX	MAXIMUM	STD	STANDARD	71	LEVEL SWITCH
	DIMENSION	MFG	MANUFACTURER	SW	SWITCH	74	ALARM
	DISTRIBUTION	MI	MILE	SWGR	SWITCHGEAR	76	DC OVERCURRENT
	DISTRIBUTED NETWORK PROTOCOL	MIN	MINIMUM	SYM	SYMMETRICAL	78	OUT-OF-STEP
						79	RECLOSING RELAY
	DIGITAL OUTPUT	MISC	MISCELLANEOUS	SYNCH	SYNCHRONIZE		FREQUENCY
5	D STREET SUBSTATION	MM	MILLIMETER(S)	Т	TIME OR TRANSFORMER	81	
	DATA TERMINAL EQUIPMENT	MO	MOTOR OPERATED (OR)	TAN	TANGENT	85	CARRIER OR PILOT WIRE
	DRAWING	MOB	MOBILIZE	TCM	TRIP COIL MONITOR	86	LOCK OUT
	EACH	MTR	METER	TEL	TELEPHONE	87	DIFFERENTIAL
					TERMINAL	94	TRIPPING
		MW	MEGAWATT	TERM			IRIFFING

NOT FOR CONSTRUCTION

PROU DESIG	BECT: RUBY RENEWABLE ENERGY DESIGN GNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0227
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
Α	ISSUED FOR 35% REVIEW	TJT/05-05-2025	JRV/05-05-2025
В	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025



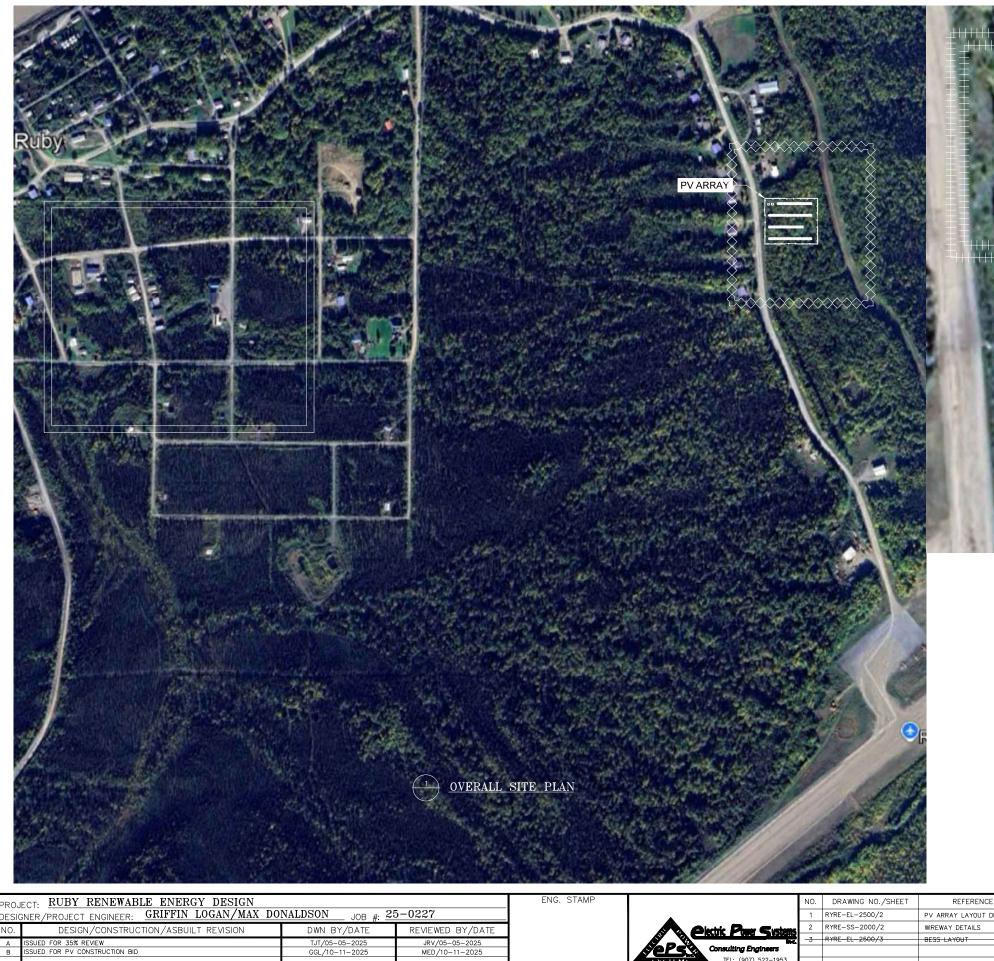
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAV
ems				
inc.				
3				
2 M				REF
·M				,
	I			DRAV

TANANA CHIEFS CONFERENCE
RUBY RENEWABLE ENERGY
GENERAL INFORMATION AND SPECIFICATIONS

GENERAL INFORMATION AND SPECIFICATIONS

ryre-el-0000

RYRE-EL-0000 SHEET 2 OF 2





NOT FOR CONSTRUCTION

SEE REFERENCE 1

- SHEET NOTES

 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE LOCATIONS OF EXISTING PROPERTY LINES AND CORNERS PRIOR TO CONSTRUCTION.

 2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND UTILITIES MARKED PRIOR TO CONSTRUCTION.

 3. ALL DIMENSIONS ARE FOR REFERENCE ONLY. PLEASE REFER TO MANUFACTURERS DRAWINGS TO CONFIRM ALL DIMENSIONS.

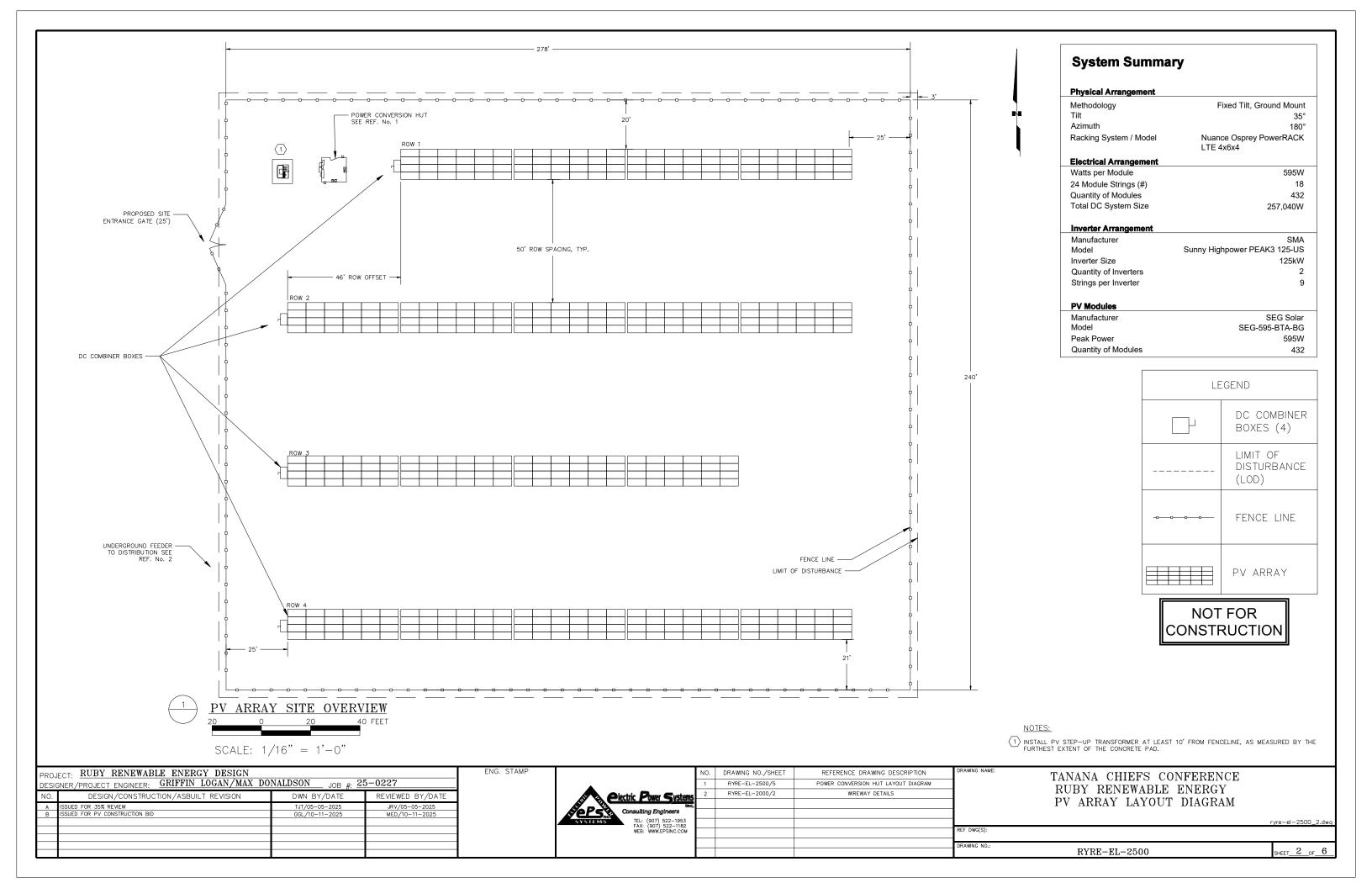
- BESS DRAWINGS NOT INLCUDED IN THIS DRAWING SET

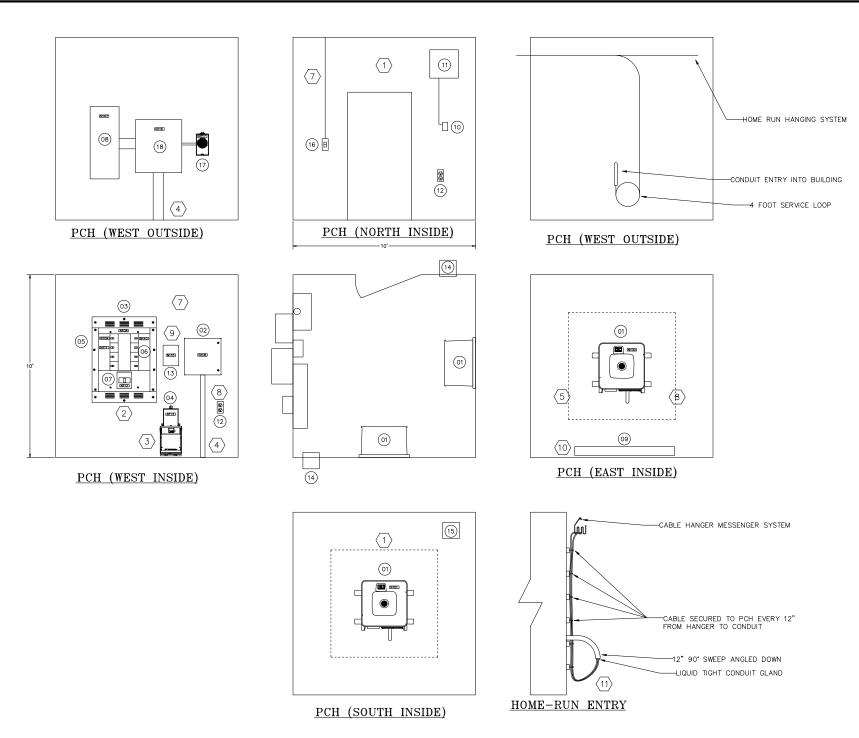
ECT: RUBY RENEWABLE ENERGY DESIGN		
NER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0227
DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
ISSUED FOR 35% REVIEW ISSUED FOR PV CONSTRUCTION BID	TJT/05-05-2025 GGL/10-11-2025	JRV/05-05-2025 MED/10-11-2025
	,	,
	NER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO DESIGN/CONSTRUCTION/ASBUILT REVISION ISSUED FOR 35% REVIEW	NER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE ISSUED FOR 35% REVIEW TJT/05-05-2025

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING N
	1	RYRE-EL-2500/2	PV ARRAY LAYOUT DIAGRAM	
ens	2	RYRE-SS-2000/2	WIREWAY DETAILS	
#	-3-	RYRE-EL-2500/3	BESS LAYOUT	
53 32				
ОМ				REF DWG(S

TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY SITE LAYOUT DIAGRAM

SHEET 1 OF 6 RYRE-EL-2500





ENG. STAM

BUILDING MANUFACTURER TO PROVIDE PRE-FABRICATED METAL BUILDING PER FOLLOWING SPECIFICATIONS: STRUCTURAL:

- -ROOF DEAD LOAD 30PSF MINIMUM
- -MAX WALL LOAD: 220LBS (INVERTER)
 -MAX FLOOR LOAD: 210LBS (STATION SERVICE SUBSTATION)
- INSULATION:
- -WALL INSULATION: R22 MINIMUM
- -CEILING INSULATION: R30 MINIMUM

ALL INTERIOR CONDUITS SHALL BE GALVANIZED RIGID CONDUIT (GRC) OR ELECTRICAL METALLIC TUBING (EMT). EXTERIOR CONDUIT SHALL BE RIGID GALVANIZED CONDUIT ONLY. EMT TYPE COUPLERS AND FITTINGS SHALL BE RAIN-TIGHT COMPRESSION TYPE. GROUNDING BUSHINGS SHALL BE INSTALLED AT THE SOURCE END OF THE EMT CONDUIT RUNS FROM THE AC PANEL.

PROJ DESIG	ECT: RUBY RENEWABLE ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0227
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
Α	ISSUED FOR 35% REVIEW	TJT/05-05-2025	JRV/05-05-2025
В	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025
_			



TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM

02)	EA	1	COMMUNICATION PANEL	SEE REF. 1
03	EA	1	POWER DISTRIBUTION PANELBOARD	SQUARED/HCJ23734M
04)	EA	1	STATION SERVICE SUBSTATION, 10kVA	HAMMOND/M1PC010LESF
05)	EA	2	200A CIRCUIT BREAKER	
06	EA	1	30A/2P CIRCUIT BREAKER	
07	EA	1	400A MAIN CIRCUIT BREAKER	
08	EA	1	400A LOAD BREAK DISCONNECT W/PROVISIONS FOR PADLOCK	
09	EA	1	ELECTRIC BASEBOARD HEATER, 1000W, 120VAC W/ BUILD-IN THERMOSTAT	
10	EA	1	ADJUSTABLE THERMOSTAT	
11)	EA	1	WALL MOUNT SHUTTER FAN, >2500CFM, 120VAC W/ DAMPER MOTOR CONTROLLED BY THERMOSTAT	
12	EA	2	GFCI RECEPTACLE	
13)	EA	1	SHARK 250 SELF-ENCLOSED METER ASSEMBLY	ELECTRO INDUSTRIES /ENCSHK250-277-60-10-V3-D2-INP100S-X
14)	EA	2	90' VENTILATION HOOD WITH INSECT SCREEN	
15)	EA	1	10" MOTORIZED INTAKE DAMPER	
16)	EA	1	LIGHT SWTICH	
17)	EA	1	600V 20A METER SOCKET W/SELF -SHUNTING BYPASS	MILBANK/UC7237-XL
18	EA	1	400A CT ENCLOSURE	
<u></u>	NOTES:	_	-125-US INVERTERS SUCH THAT THEY ARE 4".	AWAY FROM THE WALL.

BILL OF MATERIAL

MFGR./CATALOG NO.

SMA/SHP 125-US-21

DESCRIPTION

SUNNY HIGHPOWER PEAK3-125KW

REF. NO.

(01)

UNIT

EΑ

QTY.

2

- AND 20" ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES. MAINTAIN 4' WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. PROVIDE A 4" X 4" WIREWAY (MINIMUM) BETWEEN INVERTERS AND PANELBOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARD SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARD AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- (3) MOUNT STATION SERVICE SUBSTATION SUCH THAT ALL MANUFACTURER RECOMMENDED CLEARANCE ZONES AWAY FROM EQUIPMENT IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE ZONE IN FRONT OF THE DEVICE, PER NEC
- $\stackrel{\textstyle \leftarrow}{4}$ route conduits such that the stub-up area is directly under all destination devices in the power conversion hut
- (5) PROVIDE CEILING MOUNTED LIGHTING SUCH THAT 30 FOOTCANDLES IS MAINTAINED. MOUNT LIGHT SWITCH NEXT TO DOOR AT LEAST 40" FROM FLOOR.
- 6 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT-HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- (7) VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY A WEATHERPROOF 120VAC EXHAUST FAN WITH A MINIMUM FLOW RATE OF 2500CRFM, CONTROLLED BY AN ADJUSTABLE THERMOSTAT FOR FAN OPERATION OF INTERIOR AIR TEMPERATURES OF 35°C AND ABOVE, AND BY A 10" MOTORIZED INTAKE DAMPER. EXHAUST SHALL BE PROVIDED WITH A 90° EXTERIOR HOOD WITH A 900° EXTERIOR HOOD WITH INSECT SCREENS TO PREVENT INTRUSIONS OF WIND DRIVEN RAIN/SNOW.
- $\langle 8
 angle$ mount receptacles on inside walls of pch at least 18" from floor. Mount one RECEPTACLE ON SOUTH SIDE OF DOOR (EAST WALL), AND ONE RECEPTACLE NEXT TO POWER DISTRIBUTION PANELBOARD (WEST WALL)
- 9 CONNECT SHARK 250 CURRENT TRANSFORMERS AND POTENTIAL TRANSFORMERS TO THE 400A OUTPUT BREAKER AT POWER DISTRIBUTION PANELBOARD THROUGH A 1" CONDUIT.
- $\stackrel{\text{$(1)$}}{\text{$(1)$}}$ Heating to be provided by electric baseboard heater with built—in thermostat. Heater to turn on below 10°F.
- HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES. ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON-SITE

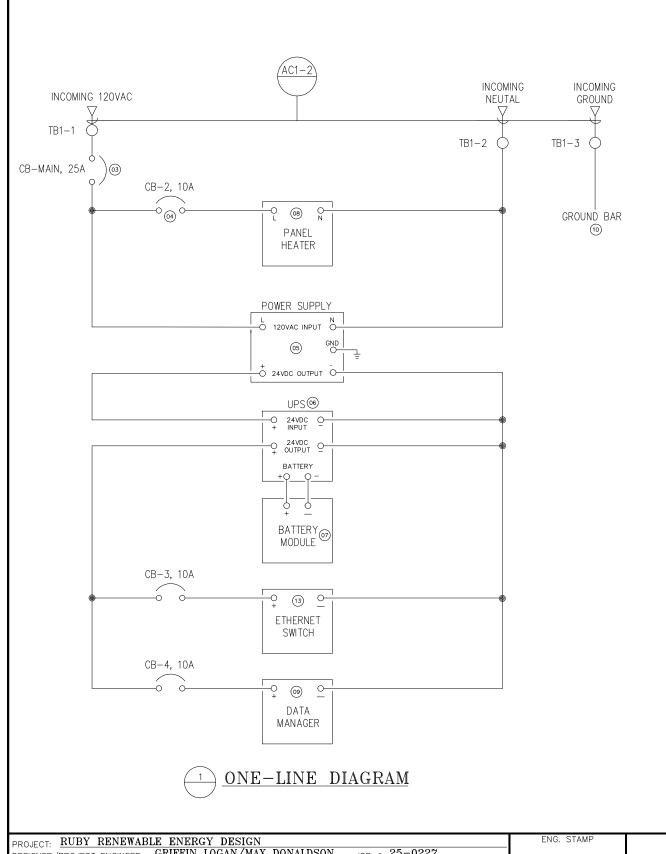
REFERENCE DRAWING DESCRIPTION TANANA CHIEFS CONFERENCE RYRE-EL-2500/6 COMMUNICATIONS PANEL DETAILS RUBY RENEWABLE ENERGY RYRE-SS-2000/7 EQUIPMENT NAMEPLATE SCHEDULE

REF DWG(S)

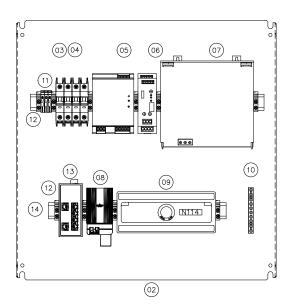
POWER CONVERSION HUT LAYOUT

HEET 5 OF 6

DRAWING NO. RYRE-EL-2500







			BILL OF MATERIAL	
REF. NO.	UNIT	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.
(01)	EA	2	24" X 24" X 10" NEMA 1 MILD STEEL WALL MOUNTED ENCLOSURE	
02	EA	1	INNER PANEL FOR 24X24X10 ENCLOSURE	
03	EA	1	25A, 600V UL489 1-POLE BREAKER	
04)	EA	3	10A, 600V UL489 1-POLE BREAKER	
05)	EA	1	PHOENIX CONTACT 120VAC/24VDC PS, 20 AMP	PHOENIX CONTACT/ 2866776
06	EA	1	PHOENIX CONTACT 20 AMP UPS	PHOENIX CONTACT/ 2320238
07	EA	1	PHOENIX CONTACT 12 Ah BATTERY	PHOENIX CONTACT/ 1274119
08	EA	1	150W PANEL HEATER W/BUILT IN REGULATION ON: 41°F - OFF: 59	STEGO/06021.0-00
09	EA	1	DATA MANAGER	SMA/EDMM-20
10	EA	1	UL467 GROUND BAR, 6 POLE MINIMUM	
11)	EA	3	6MM DINRAIL MOUNTED TERMINAL BLOCK	
(12)	EA	10	6MM DINRAIL MOUNTED TERMINAL BLOCK END STOP	
13	EA	1	UNMANAGED ETHERNET SWITCH, 2 FIBER PORTS	MOXA/EDS-G308-2SPF
14)	EA	1	35MM DIN MOUNTING RAIL	

- NOTES:

 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT-HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IT HE CENTER COLUMN, AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- $\fbox{2}$ PROVIDE 1 SPARE CIRCUIT BREAKER FOR EACH SIZE (REF. NO. 3, AND RE. NO. 4) AND STORE IN BOTTOM OF ENCLOSURE

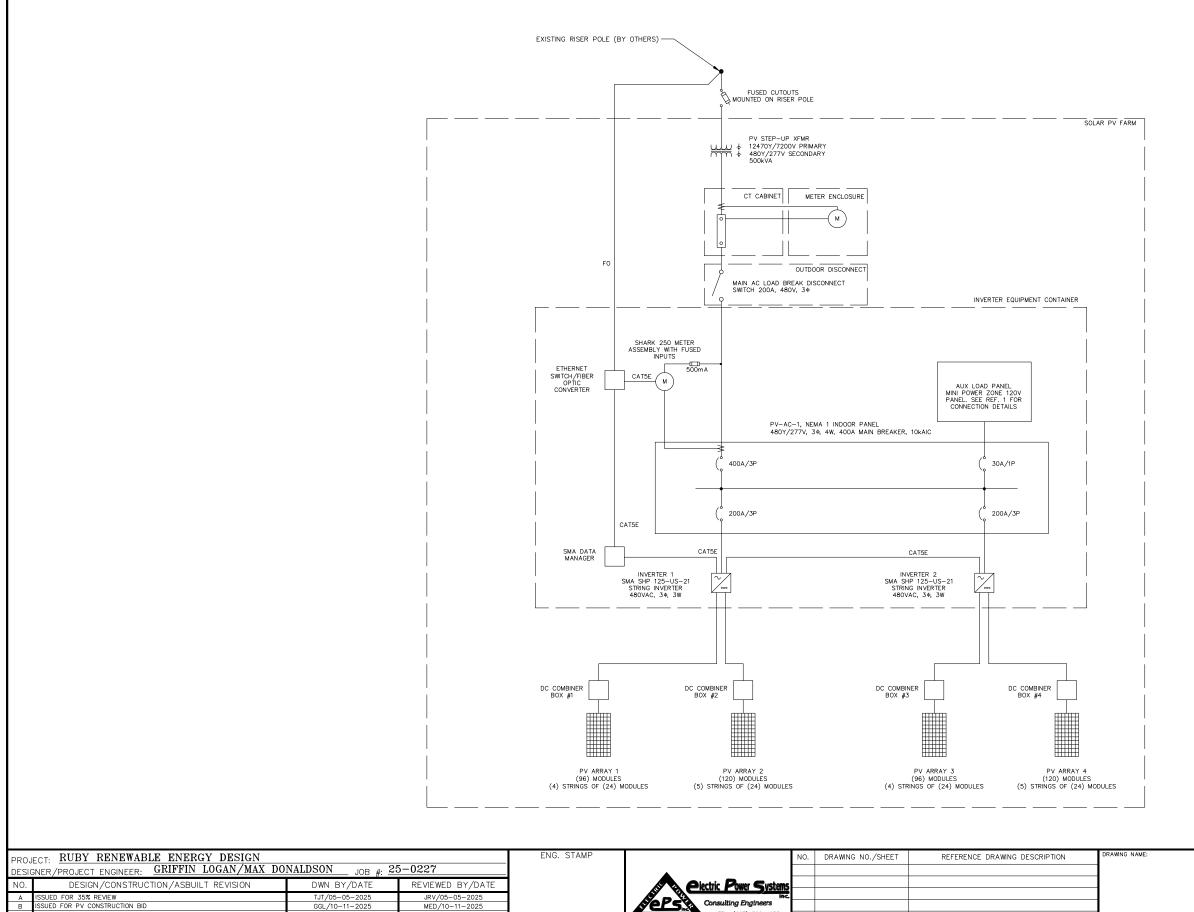




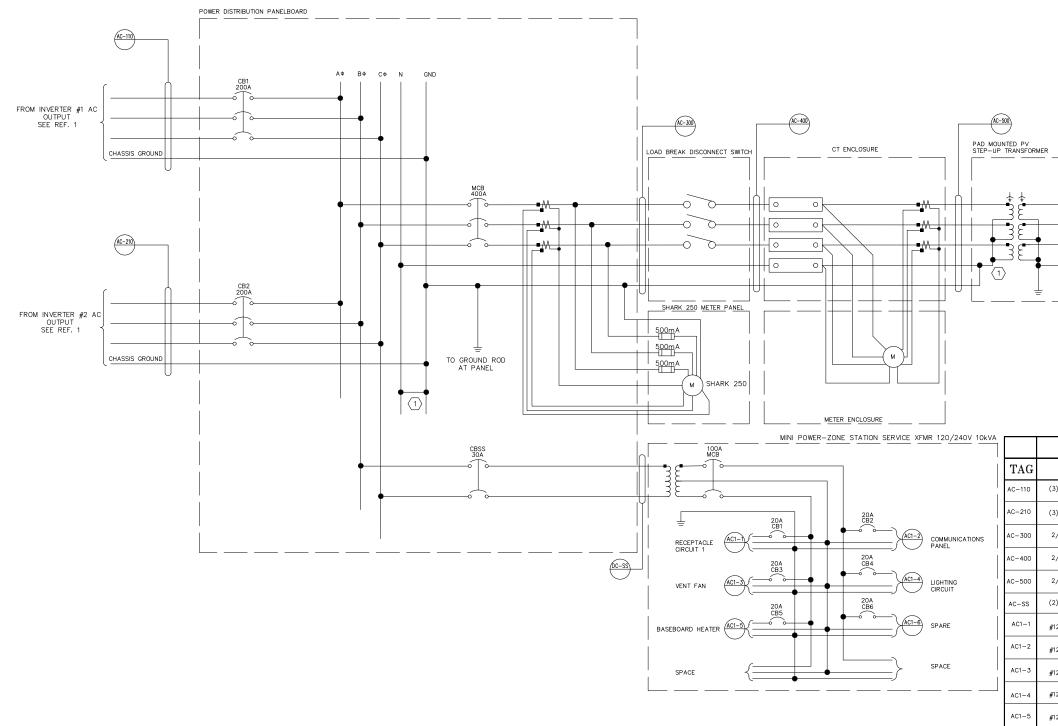
NOT FOR CONSTRUCTION

1

P	ROJECT: RUBY RENEWABLE ENERGY DESIGN			ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE	
	esigner/project engineer: GRIFFIN LOGAN/MAX DOI	NALDSON JOB #: 2	5-0227			1	RYRE-SS-2000/7	EQUIPMENT NAMEPLATE SCHEDULE		RUBY RENEWABLE ENERGY	
1	O. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems					COMMUNICATIONS PANEL	
F	A ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers				_		
⊢									_	DETAILS	ryre-el-2500_6.dwg
					TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		.,
\vdash									DRAWING NO.:		
									DIVAMINO NO.:	RYRE-EL-2500	SHEET6_OF6_



PROJECT: RUBY RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0227	ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY	
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE		Plectric Power Systems					SITE ONELINE DIAGRAM	
A ISSUED FOR 35% REVIEW TJT/05-05-2025 JRV/05-05-2025 B ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025		Consulting Engineers	-			-	SILE ONELINE DIAGNAM	
B ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025			-			-	г	ryre-el-0010_1.dwg
		TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		
	-					DRAWING NO.:		
							RYRE-EL-0010	SHEET 1 OF 1



	CABLE SCHEDULE	
TAG	NO. CONDUCTOR	RACEWAY
AC-110	(3) 2/0 CU XHHW, (1) #6 CU GEC	C-0111
AC-210	(3) 2/0 CU XHHW, (1) #6 CU GEC	C-0112
AC-300	2/PHASE 2/0 CU XHHW, (1) #6 CU XHHW NEUTRAL, (1) #6 CU GEC	C-11 C-12 C-13
AC-400	2/PHASE 2/0 CU XHHW, (1) #6 CU XHHW NEUTRAL, (1) #6 CU GEC	C-21 C-22 C-23
AC-500	2/PHASE 2/0 CU XHHW, (1) #6 CU XHHW NEUTRAL, (1) #6 CU GEC	C-31 C-32 C-33
AC-SS	(2) #10 CU XHHW	1/2" EMT
AC1-1	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT
AC1-2	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT
AC1-3	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT
AC1-4	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT
AC1-5	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT

NOTES:

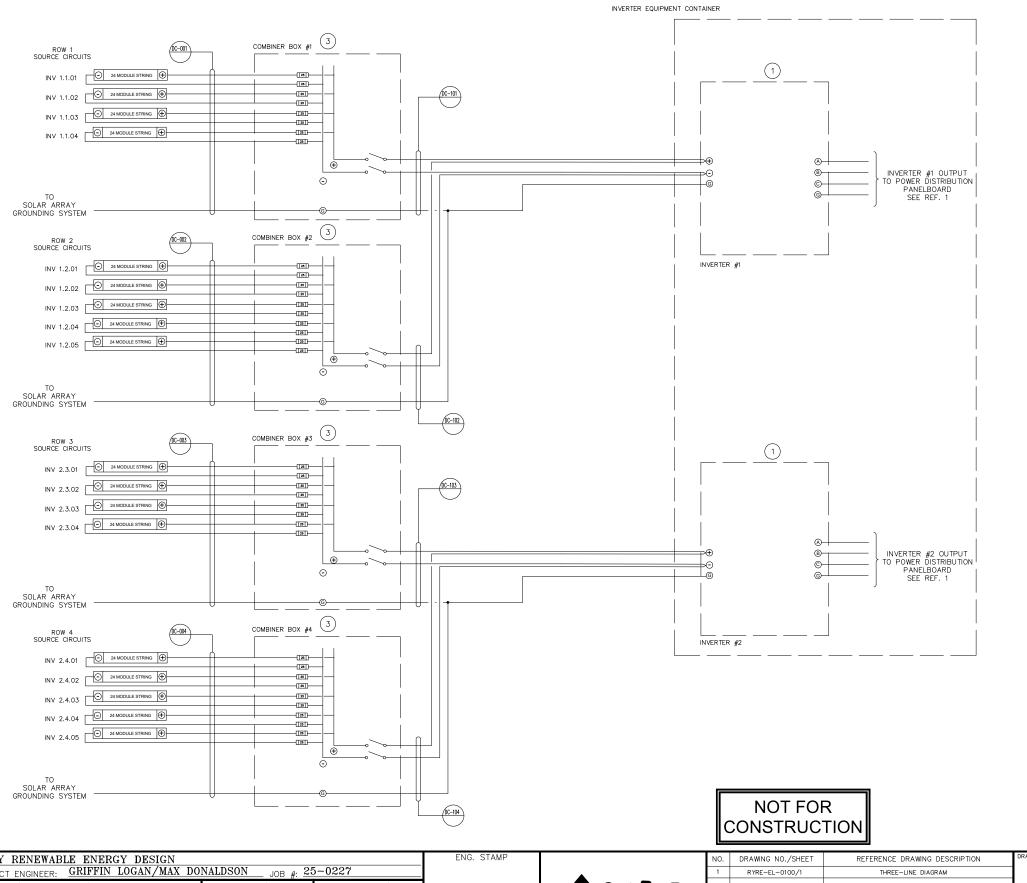
(1) LIFT XO BUSHING BOND JUMPER AND ISOLATE ALL XO CONNECTIONS FROM ANY GROUNDING AT THE UTILITY SERVICE POLE. INSTALL N-G BOND JUMPER ONLY IN THE POWER DISTRIBUTION PANELBOARD TO GROUND SECONDARY OF TRANSFORMER AT PCH.

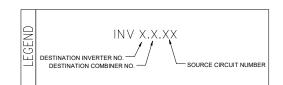
NOT FOR CONSTRUCTION

NOTE:
-LOW VOLTAGE AC CONDUCTOR SIZING BASED ON A TEMPERATURE RATING OF 75°C.
-MEDIUM VOLTAGE AC CABLES BASED ON A TEMPERATURE RATING OF 105°C.
-USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE TEMPERATURE RATING OF THE CONDUCTOR IS MAINTAINED.
-IF LARGER-THAN-SPECIFIED CABLE IS USED, CONFIRM THAT THE CONDUIT SIZE IN THE ASSOCIATED RACEWAY MAINTAINS A MAXIMUM 40% FILL RATIO
-SEE REF. 2 FOR CONDUIT SCHEDULE

TO DISTRIBUTION (BY OTHERS)

PRO	DUECT: RUBY RENEWABLE ENERGY DESIGN			ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE	
DES	GIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0227		A	1	RYRE-EL-0011/1	PV ARAY DC WIRING DIAGRAM		RUBY RENEWABLE ENERGY	
NO	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power System	2	RYRE-SS-2000/2	WIREWAY DETAILS			
А	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		100	-				SITE THREELINE DIAGRAM	
					Consulting Engineers				_		
					TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		ryre-el-0100_1.dwq
					WEB: WWW.EPSINC.COM				- KEI DWG(3).		
									DRAWING NO.:	DVDE EL 0100	1 1
<u> </u>										RYRE-EL-0100	SHEET1_OF1_





	EQUIPMENT SCHEDULE						
	TAG QUANTITY DESCRIPTION						
Ī	(1)	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US					
	2	4	10 INPUT DC COMBINER; TERRASMART FSFT275-10-N4-CD OR EQUIVALENT				

	CABLE SCHE	DULE
TAG	NO. CONDUCTOR	RACEWAY
DC-001	(8) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-002	(10) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-003	(8) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-004	(10) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-101	(2) #4 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-102	(2) #2 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-103	(2) #4 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-104	(2) #2 AL PV WIRE, (1) #6 CU EGC	FREE AIR

- NOTE: 1) DC STRING CONDUCTOR SIZING BASED ON COPPER UL 4703 PV WIRE WITH A TEMPERATURE RATING OF 90°C

 2) DC CABLE SIZING FOR HOME-RUNS BASED ON AL 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C IN FREE AIR (TABLE 310.15(B)(17)) AND A VOLTAGE DROP OF LESS THAN 2% USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE CONDUCTOR DESCRIPTION IS MAINTAINED.

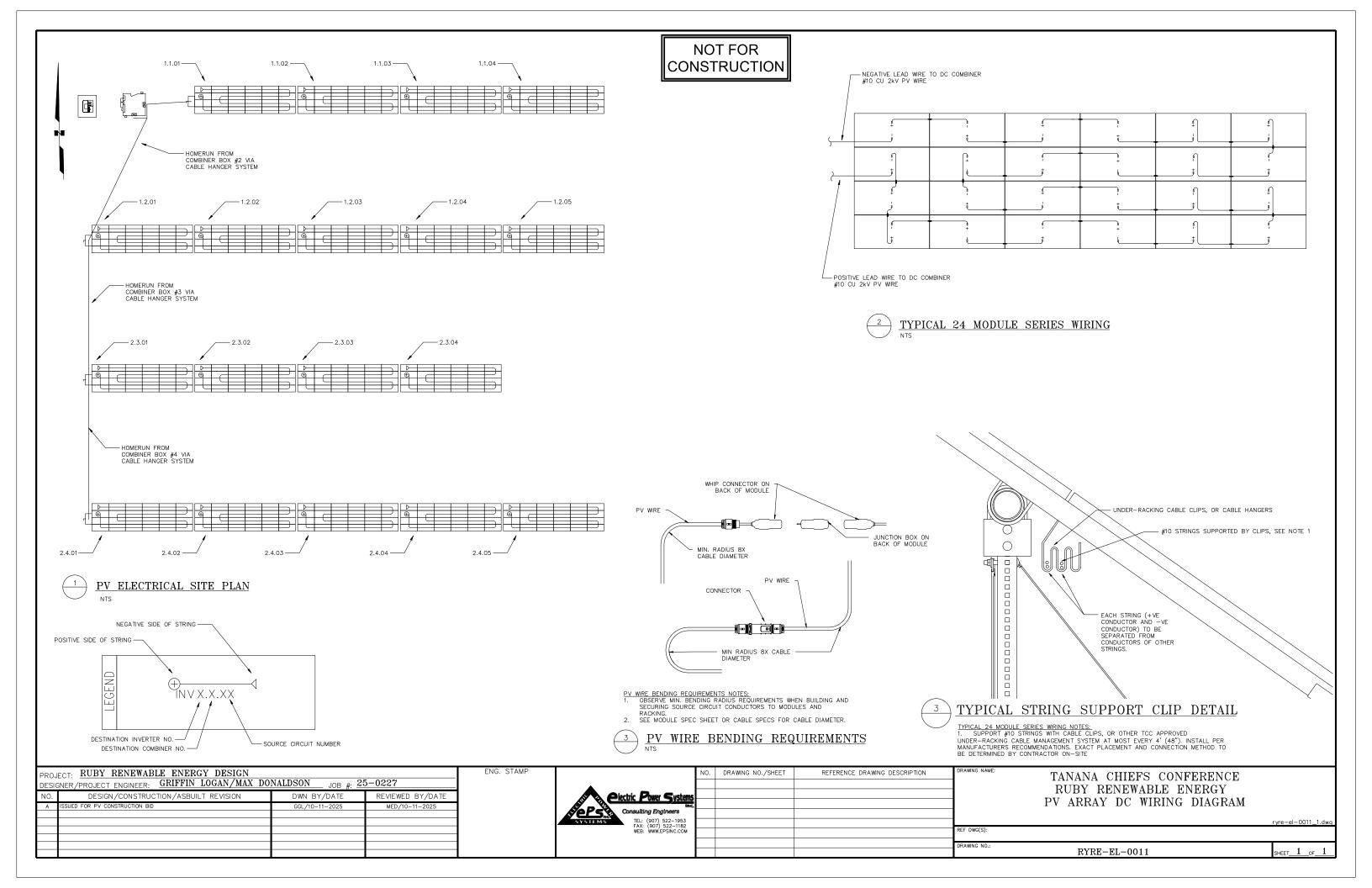
 3) USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE TEMPERATURE RATING OF THE CONDUCTOR IS MAINTAINED.

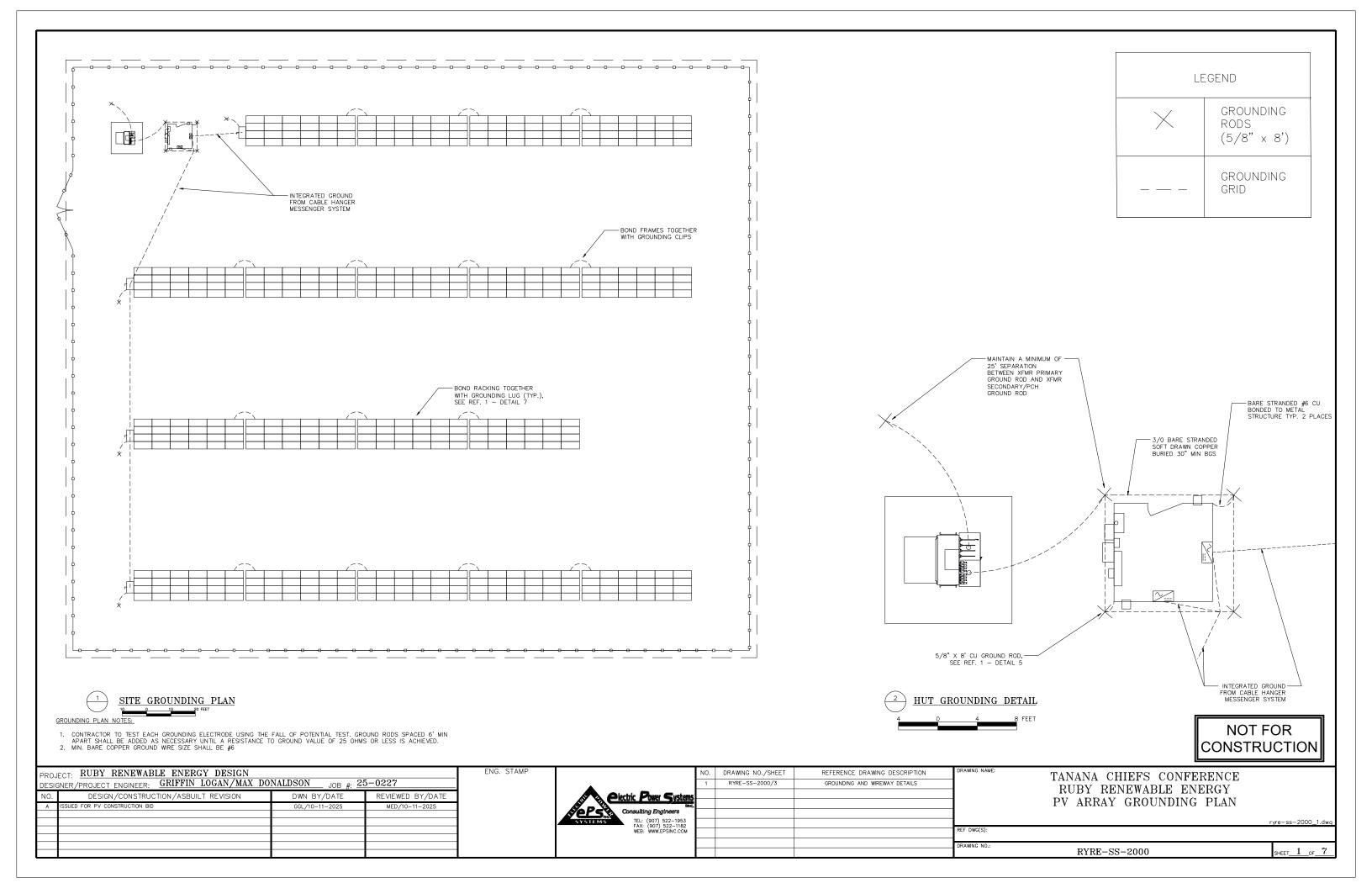
TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY PV ARRAY DC WIRING DIAGRAM

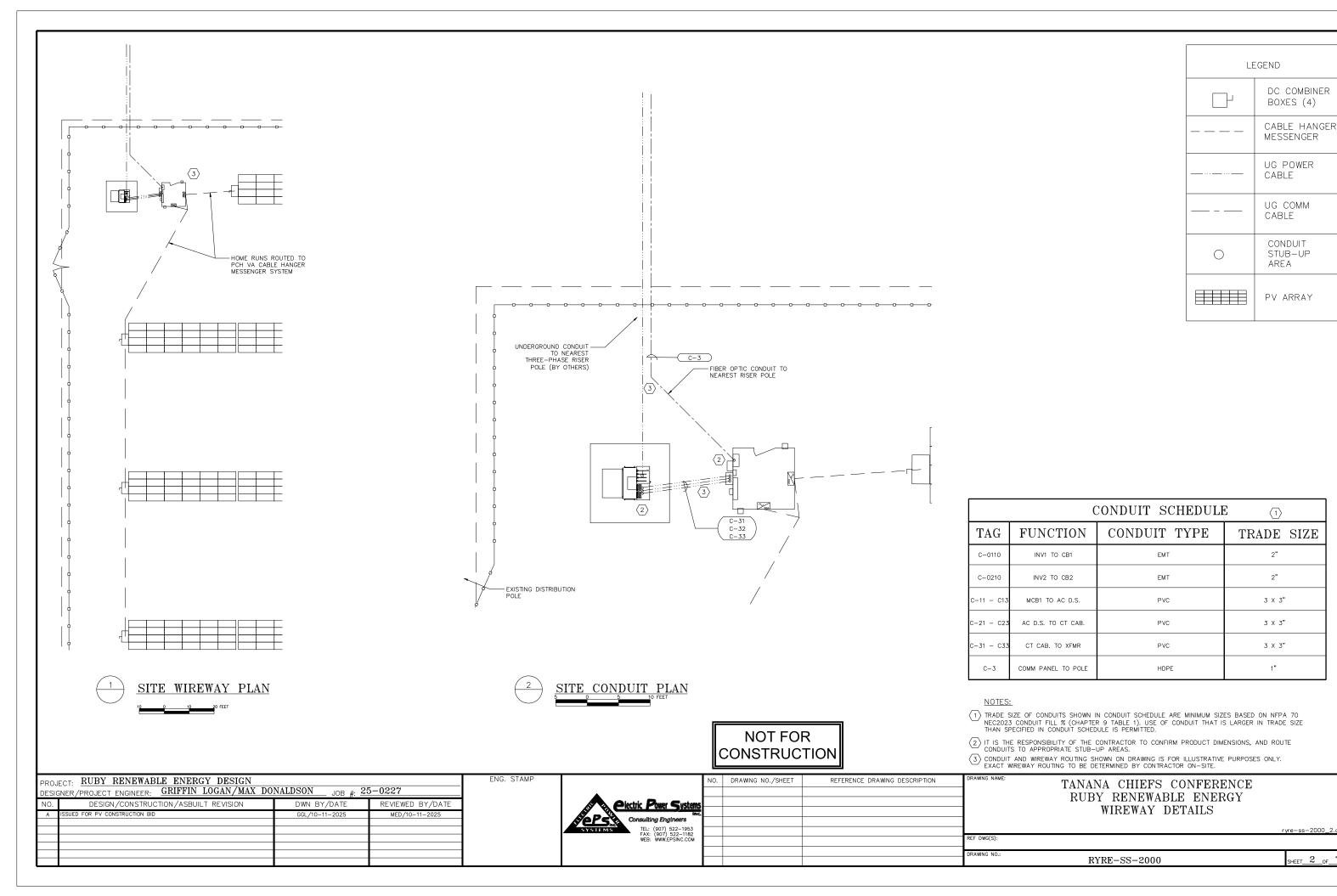
ryre-el-0011_1.dw REF DWG(S): DRAWING NO.: RYRE-EL-0011 SHEET 1 OF 1

PROJ DESIG	PROJECT: RUBY RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0227								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE						
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025						

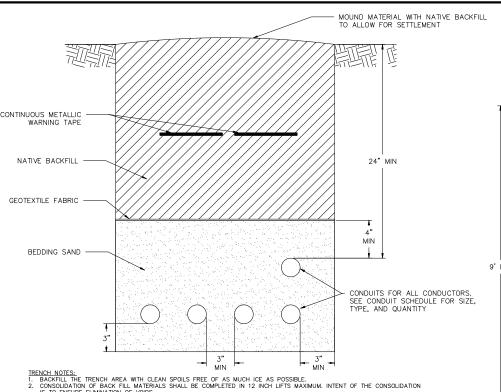
TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM







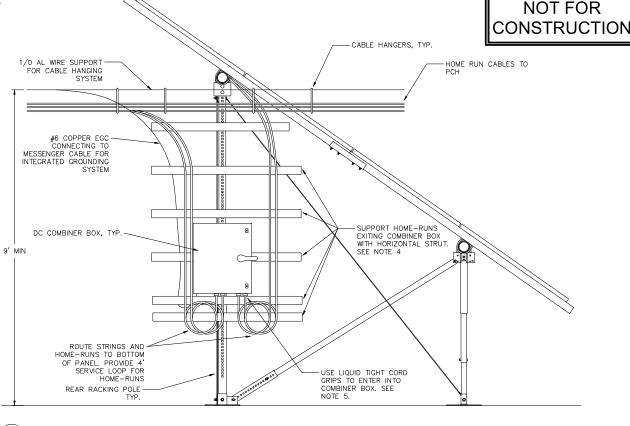
SHEET 2 OF 7



- CABLE AND BACKFILING OF TRENCH (24—HOUR NOTICE REQUIRED). AGENCY REPRESENTATIVE SHALL ALSO PROVIDE
 6. BEDDING SHALL BE 3/8" MINUS MATERIAL, NO CRUSHED OR SHARP ROCK. BEDDING MATERIAL SHALL NOT BE MACHINE
 COMPACTED WITHIN 6" OF CABLES. SLURRY OF A COMPOSITION THAT WILL NOT DAMAGE THE CABLE IS AN ACCEPTABLE
 BEDDING MATERIAL.
- BEDDING MATERIAL.

 7. MAINTAIN 1' MIN. SEPARATION BETWEEN POWER CONDUCTORS AND COMMUNICATION CABLES





WHIP CONNECTOR ON BACK OF MODULE PV WIRE JUNCTION BOX ON MIN. RADIUS 8X CABLE DIAMETER BACK OF MODULE PV WIRE CONNECTOR MIN RADIUS 8X CABLE DIAMETER

PV WIRE BENDING REQUIREMENTS NOTES:

1. OBSERVE MIN. BENDING RADIUS REQUIREMENTS WHEN BUILDING AND SECURING SOURCE CIRCUIT CONDUCTORS TO MODULES AND

SEE MODULE SPEC SHEET OR CABLE SPECS FOR CABLE DIAMETER.

COPPER EQUIPMENT

GROUNDING CONDUCTOR

PV WIRE BENDING REQUIREMENTS

2 TYPICAL HOME RUN CABLE RUNWAY DETAIL

- TYPICAL COMBINER BOX DETAIL NOTES:

 1. ENSURE THAT CABLES ROUTED FROM HANGING SYSTEM TO COMBINER BOXES DO NOT EXCEED CONDUCTOR BENDING RADIUS

 2. INSTALL CABLE HANGING SYSTEM ACCORDING TO MANUFACTURERS INSTALLATION INSTRUCTIONS

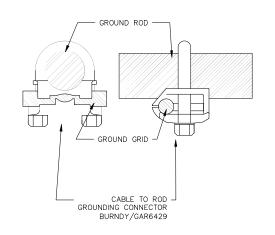
 3. CONTRACTOR TO DETERMINE MOST SUITABLE MOUNTING SOLUTION FOR OVERHEAD CABLE MANAGEMENT SYSTEM

 4. SUPPORT DC CABLES EXTING THE DC COMBINER BOX WITH A UV RESISTANT, OUTDOOR AFAID CABLE ITE CONNECTED TO A

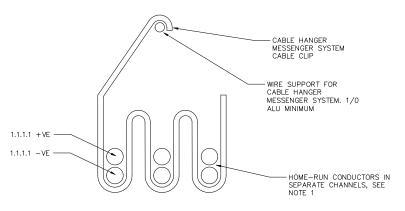
 HORIZONTAL STRUT. INSTALL CLOSEST CABLE SUPPORT A DISTANCE OF NO MORE THAN 12" AWAY FROM THE COMBINER BOX,

 AS MEASURED BY THE CABLE PATH, SUPPORT HOME—RUNS EVERY 12" UNTIL SUPPORTED BY CABLE MANAGEMENT SYSTEM.

 5. USE A LIQUID TIGHT CORD GRIP OR CABLE GLAND FOR HOME—RUNS SWHEN ENTERING COMBINER BOX.







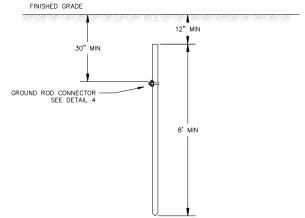
5 TYPICAL HOME-RUN CABLE HANGER DETAIL

- TYPICAL HOME—RUN CABLE HANGER DETAIL NOTES:

 1. HOME—RUN CONDUCTORS OF DIFFERENT CIRCUITS TO BE ROUTED IN SEPARATE CHANNELS IN CABLE HANGER MESSENGER SYSTEM. THE +WE AND VE CONDUCTORS OF A SINGLE HOME—RUN CIRCUIT MAY BE ROUTED IN THE SAME CHANNEL.

 2. INSTALL CABLE HANGERS IN REQUIAR INTERVALS AS DIRECTED BY MANUFACTURERS INSTALTION INSTRUCTIONS, OR, A DISTANCE OF NO MORE THAN 5' APART FROM EACH OTHER.

 3. IF HOME—RUNS AND STRINGS ARE ROUTED IN THE SAME CABLE HANGER MESSENGER SYSTEM, SEPARATE HOME—RUNS AND STRINGS IN SEPARATE CHANNELS.



TYPICAL GROUND ROD NOTES:

1. CONTRACTOR TO PERFORM SOIL RESISTIVITY TESTING TO DETERMINE AMOUNT OF GROUND RODS NEEDED TO KEEP RESISTANCE BELOW 5 OHMS

TYPICAL GROUND ROD



SS NUT WITH INTEGRATED STAR WASHER

METAL SURFACE - BOX OR RACKING

TIN PLATED COPPER GROUND

rvre-ss-2000 3 d

HEET 3 OF 7

SEE NOTE 1

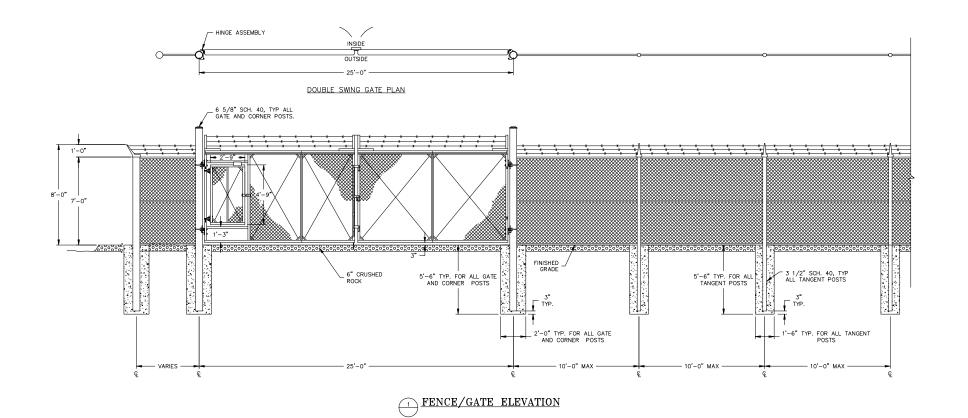
TYPICAL METAL RACKING GROUNDING NOTES:

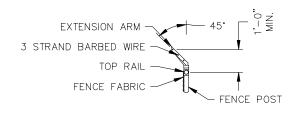
1. PRIOR TO MOUNTING LUGS ON ANDDIZED ALUMINUM OR PAINTED METAL SURFACES, THE SURFACE MUST BE STRIPPED AND THEN COVERED WITH BURDNY PENETROX A-13 ANTI-OXIDANT COMPOUND BELOW THE LUG TO ENSURE CONDUCTIVITY

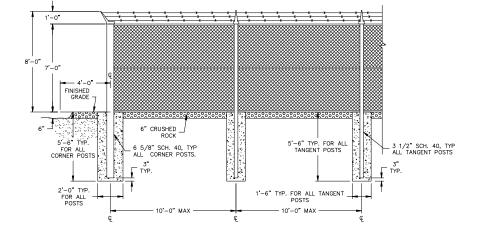
ON ANODIZED AL SURFACES, THE ANODIZATION SHALL BE GROUND OFF. ON PAINTED SURFACES, THE PAINT LAYER SHALL BE GROUND OR SCRATCHED OFF.

7 TYPICAL METAL RACKING BONDING

RUBY RENEWABLE ENERGY DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0227 RUBY RENEWABLE ENERGY GROUNDING AND WIREWAY DETAILS Consulting Engineers TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.FPSINC.COM REF DWG(S) DRAWING NO. RYRE-SS-2000







BARBED WIRE

EXTENSION ARM SET

@ A 45' ANGLE

LOCK WIRE FOR BARBED
WIRE PLACED INSIDE ARM

TOP RAIL
CONTINUOUS

FENCE FABRIC

4 POST EXTENSION WITH BARBED WIRE N.T.S.

2 CORNER/TERMINAL FENCE POST ELEVATION

PROJECT: RUBY RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	25-0227	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY	
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems				FENCE DETAILS	
A ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers					
				TEL: (907) 522-1953 FAX: (907) 522-1182			DEE DWG(S).		ryre-ss-2000_4.dwg
				WEB: WWW.EPSINC.COM			REF DWG(S):		
							DRAWING NO.:	RYRE-SS-2000	SHEET 4 OF 7

MANUAL DISCONNECT FOR PARALLEL **GENERATION**

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. LABEL TO BE ENGRAVED PLASTIC.

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM GENERATION METER. (1) TOTAL

NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC DISCONNECT AND POWER SOURCE RATED OUTPUT CURRENT: 351A NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. (1) TOTAL

NEC 2023 705.12(B)(3)(3)



THIS EQUIPMENT FED BY MULTIPLE SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (1) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 1069VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (4) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

> NOT FOR CONSTRUCTION

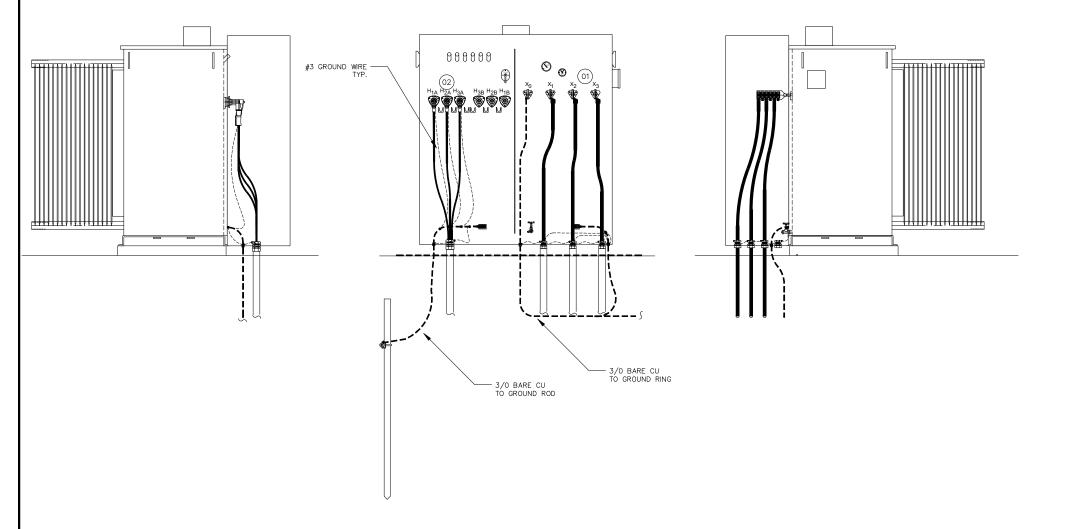
PROJ	ECT: RUBY RENEWABLE ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5_0227
DESIC	SNER/PROJECT ENGINEER: GIVITTIV BOGATY MAX DO	108 #: 20	0 0551
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025

	REF DW
	L KEP DY
	O./SHEET REFERENCE DRAWING DESCRIPTION

TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY EQUIPMENT SAFETY LABEL SCHEDULE

DRAWING NO.: RYRE-SS-2000

SHEET 5 OF 7



ENG. STAMP

BILL OF MATERIAL								
REF. NO.	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.					
01	-	CABLE LUG, NEMA 2-HOLE, 4/0 AWG CU	BURNDY/YA282N					
02	-	CONNECTOR, COMPRESSION, 4/0 CU TO #6-#2 CU	BURNDY/YGHC29C26					
03)								
04)								
05)								
06)								
07								
08)								
09								
10								
11)								
12								
(13)								
14)								
(15)								
<u>(16)</u>								
17)								
18								
19								
20								
21)								
(22)								
23)								
24)								
25)								
26)								
27)								
28)								
29								
(30)								

NOT FOR CONSTRUCTION

PROJ DESIG	PROJECT: RUBY RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0227								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE						
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025						



	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWIN
<u>ms</u>				
nc.				
1				REF DW
				DRAWIN

TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY TRANSFORMER DETAILS

DWG(S):

RYRE-SS-2000 SHEET 6 OF 7

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1			2 x 4	3/8
N101	1	INVERTER 2			2 x 4	3/8
N102	1	DC COMBINER	BOX 1		2 × 4	3/8
N103	1	DC COMBINER	BOX 2		2 x 4	3/8
N104	1	DC COMBINER	BOX 3		2 x 4	3/8
N105	1	DC COMBINER	BOX 4		2 x 4	3/8
N106	1	COMMUNICATIONS	PANEL		2 x 4	3/8
N107	1	400A	MAIN AC PANEL		2 x 4	3/8
N108	1	POWER DISTRIBUTION	PANELBOARD		2 x 4	3/8
N109	1	CB 1			1 x 3	1/8
N1010	1	CB 2			1 x 3	1/8
N111	1	CB SS			1 x 3	1/8
N112	1	мсв			2 x 4	3/8
N113	1	120V STATION SERVICE PANEL			2 x 4	3/8
N114		DATA MANAGER			1 x 3	1/8
N115		METER PANEL			2 x 4	3/8
N116		CT ENCLOSURE			2 x 4	3/8
N117		METER ENCLOSURE			2 x 4	3/8

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT. 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
 7) ALL DIMENSIONS SHOWN IN INCHES.

PRO DES	JECT: RUBY RENEWABLE ENERGY DESIGN IGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 23	5-0227	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE RUBY RENEWABLE ENERGY	
NO	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			4		
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers			4	EQUIPMENT NAMEPLATE SCHEDULE	
					TFI: (907) 522-1953			4		rvre-ss-2000 7.dwa
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		1 yrc 33 2000_7.4 mg
										•
		 						_ DRAWING NO.:	RYRE-SS-2000	SHEET 7 OF 7

Circuit Information				Electrical calculations												System Information				
Destination Inverter No.	Destination Combiner No.	Source Circuit No.	Modules (#)	Open Circu Voltage (VOC)	it Maximum Power Voltage (Vmp)	Short Circuit Current (Isc)	Continuous Current (1.25*Isc)	Irradiance Current (1.25*CC)	Mininum Fuse Size (A)	Selected Fuse Size (A)	Minimum Wire Ampacity (A)	Selected String Wire Size (CU 2KV PV Wire, 90°C, <2% Voltage Drop) (AWG)	Wire Distance	Voltage Drop (V)	Voltage Drop (%)	Circuit In from to	nformation	Continuous Current (A)	Minimum Wire Ampacity From Selected Device (A)	Selected Wire Size (AL 2KV PV Wire, 75°C, <2% Voltage Drop)(AWG)
1	1	1	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	25	1.41	0.13	DS1	INV1	87.44	88	4
1	1	2	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	75	4.23	0.40	DS2	INV1	109.30	110	2
1	1	3	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	120	6.77	0.63	DS3	INV2	87.44	88	4
1	1	4	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	165	9.31	0.87	DS4	INV2	109.30	110	2
1	1	1	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	25	1.41	0.13					
1	2	2	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	75	4.23	0.40					
1	2	3	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	120	6.77	0.63					
1	2	4	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	165	9.31	0.87			PANEL CHARA	CTERISTICS	
1	2	5	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	210	11.84	1.11			Voc (V)	52.58	
2	3	1	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	25	1.41	0.13			Voc Coef. (%/℃)	-0.25	
2	3	2	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	75	4.23	0.40			Vmp (V)	44.64	
2	3	3	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	120	6.77	0.63			Pmax Coef. (%/℃)	-0.3	
2	3	4	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	165	9.31	0.87					
2	4	1	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	25	1.41	0.13			SITE CHARAC	TERISTICS	
2	4	2	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	75	4.23	0.40			T_Amb Min (°C)	-45	
2	4	3	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	120	6.77	0.63			T_Amb Max (℃)	26	
2	4	4	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	165	9.31	0.87					
2	4	5	24	1483	1068.1	13.99	17.49	21.86	21.86	25	25	10	210	11.84	1.11					

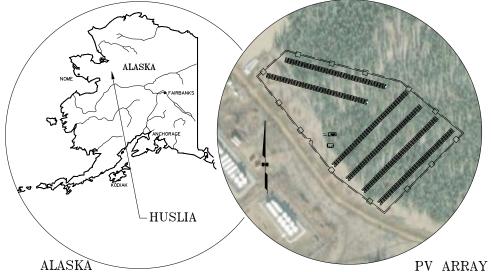
NOTES:

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

Y
S
ט
ryre-el-0700_1.dwg
SHEET 1 OF 1

TANANA CHIEFS CONFERENCE HUSLIA PV/BESS DESIGN

EPS JOB NO. 25-0360 - ISSUED FOR PV CONSTRUCTION BID





	ALASKA				PV ARRAY
	DRAWIN	G INDEX			SCOPE OF WORK
	TITLE	DRAWING NUMBER	SHEET	REVISION	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR PHOTOVOLTAIC SYSTEM AND A DESS SYSTEM IN HUSLIA, AK
	GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	HPVD-EL-0001	1	В	THE PV SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND 3 STRING INVERTERS. THE BESS SYSTEM CONSISTS OF A
	GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	HPVD-EL-0001	2	В	BATTERY CONTAINER NEAR THE SOLAR ARRAY. THE PV SYSTEM
					WILL OPERATE IN PARALLEL WITH THE LOCAL UTILITY, WHILE THE BESS WILL HAVE GRID FORMING CAPABILITIES. EACH SYSTEM WILL
BESS DRAWINGS NOT -	-SITE LAYOUT DIAGRAM	HPVD-EL-2500	1	D	HAVE RELATED ELECTRICAL SAFETY AND METERING SYSTEMS.
INCLUDED IN THIS DRAWING SET	SITE LAYOUT - PV	HPVD-EL-2500	2	В	
DRAWING SET	SITE LAYOUT - INTERCONNECTION	HPVD-EL-2500	3	В	
	SITE LAYOUT - POWER CONVERSION HUT	HPVD-EL-2500	4	Α	SYSTEM SUMMARY
	SITE LAYOUT - COMMUNICATIONS PANEL	HPVD-EL-2500	5	A	PV SYSTEM SIZE: 518kWdc / 375kWac
					BESS SYSTEM SIZE: 500kVA / 750kWh INTERCONNECTION VOLTAGE: 480V. 3 PHASE, 4 WIRE
	ONE LINE DIAGRAM	HPVD-EL-0010	1	В	INTERCONNECTION VOLTAGE. 400V, 3 THASE, 4 WIRE
	THREE LINE DIAGRAM	HPVD-EL-0100	1	A	GENERAL NOTES
					GENERAL NUIES
	PV ARRAY DC WIRING DIAGRAM	HPVD-EL-0011	1	A	ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND
	PV ELECTRICAL SITE PLAN	HPVD-EL-0020	1	A	LICENSED ELECTRICAL CONTRACTOR.
					CONTRACTOR WILL FOLLOW IBC 2021, NFPA 70, AND NEC 2023 AS
	GROUNDING PLAN	HPVD-SS-2000	1	A	WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY
	WIREWAY DETAILS	HPVD-SS-2000	2	A	CODES, ORDINANCES AND REGULATIONS.
	EQUIPMENT SAFETY LABEL SCHEDULE	HPVD-SS-2000	3	A	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC
	SITE FENCING DETAILS	HPVD-SS-2000	4	A	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE
	EQUIPMENT NAMEPLATE SCHEDULE	HPVD-SS-2000	5	A	MANNER.
					PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL
					DRAWINGS AND PRODUCT MANUALS.
	PV STRING CALCULATIONS	HPVD-EL-0700	1	A	
					PROJECT ENTITIES
					PROJECT DEVELOPER: TANANA CHIEFS CONFERENCE
					ELECTRICAL ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.
					·
					ELECTRIC SERVICE PROVIDER: AVEC
	i e		1	1	

PROJECT: HUSLIA PV/BESS DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOC	GAN/MAX DONALDSON JOB #: 2	25-0360	ENG. STAMP	_	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE HUSLIA PV/BESS DESIGN	
NO. DESIGN/CONSTRUCTION/ASBUILT R	,	REVIEWED BY/DATE		Plectric Power Systems	<u> </u>			-	COVER SHEET/INDEX	
A ISSUED FOR 35% REVIEW B ISSUED FOR PV CONSTRUCTION BID	GGL/08-22-2025 GGL/10-08-2025	MED/08-22-2025 MED/10-08-2025		Consulting Engineers TEL: (907) 522–1953						hpvd-pr-0000_1.
			1	TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM				REF DWG(S):		пруа-рг-оооо_г.
					\vdash			DRAWING NO.:	HPVD-PR-0000	SHEET 1 OF

ELECTRICAL SPECIFICATIONS

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL IT IS THE RESPONSIBILITY OF THE CONTRACTION TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION
- ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT. CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS
- ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- ALL THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- 11. CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS (360 DEGREES) BETWEEN PULL POINTS.
- METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE EGC SYSTEM. GROUNDS SHALL BE SIZED ACCORDING TO THE NEC.
- CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE

RECORD DOCUMENTS

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNITL THESE DRAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE.

WIRING METHODS

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET RATED AND UV RESISTANT.
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE.
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90
 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWNGS. FOR OUTDOOR
 INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATION.
- 20. AC WRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS.
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION INTEGRITY

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED CRIMPING TOOL.

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS SHALL BE MADE FOR SYSTEM GROUNDING.
- 27. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT IS TO BE REMOVED.
- 28. MODULES SHALL BE BONDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS:
- SOLID CONDUCTORS: ASTM B 3.
 STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED; WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE
- 33 INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS ELECTRICALLY CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS

RACEWAYS

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS:
- RIGID STEEL CONDUIT: ANSI C80.1. EMT: ANSI C80.3.
- 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 36. COATED FITTINGS FOR PVC-COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER, EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS. COVER IS GASKETED WITH OIL-RESISTANT GASKET MATERIAL AND FASTENED WITH CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE FLANGED, WITH STAINLESS-STEEL SCREWS AND OIL-RESISTANT GASKETS.
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED.
- 38.1. 3/4-INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF
- 1-INCH IMADE SIZE AND LONGEST WITTENSTREET.

 5. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH THESE

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS INCLUDING POWER SYSTEMS AND ENERGY STORAGE SYSTEMS.
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING MEANS.

PANEL BOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1. EACH TYPE OF PANELBOARD, OVERCURRENT PROTECTIVE DEVICE, TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED.
 INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES,
 PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- WINDAMING:

 1. BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS
 BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION.

 2. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF GRAVITY AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- PROVISIONS.

 41.2.3. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.

FNG STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING: 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS, SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5. OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION 01 SECTION "OPERATION AND MAINTENANCE INCLUDE THE FOLLOWING:
- 41.5.1. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING
- OVERCURRENT PROTECTIVE DEVICES.

 41.5.2. TIME-CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:
- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
- PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEI INDICATED. REFER TO DIVISION 01 SECTION "PRODUCT REQUIREMENTS."
- 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- COMPLY WITH NEMA PB 1.
- 42.5. COMPLY WITH NFPA 70.
- 43. CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING
- 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC

- SEISME PORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISME CONTROLS FOR ELECTRICAL SYSTEMS.

 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.

 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.

 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.

 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH—MOUNTED FRONTS OVERLAP BOX FRONTS, OVERLAP BOX.
- 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT.
 DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES:
 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1. LUGS: MECHANICAL TYPE.
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES—CONNECTED SHORT—CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES-CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAL—MAGNETIC CIRCUIT BREAKERS: INVERSE TIME—CURRENT ELEMENT FOR LOW—LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT—BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS—TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT—MOUNTED, FIELD—ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP-UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING; FIELD-REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD-ADJUSTABLE SETTINGS:
 45.4.1. INSTANTANEOUS TRIP.
- 45.4.2. LONG— AND SHORT—TIME PICKUP LEVELS. 45.4.3. LONG— AND SHORT—TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30—MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC EQUIPMENT.

REQUIRED SAFETY SIGNS AND LABELS

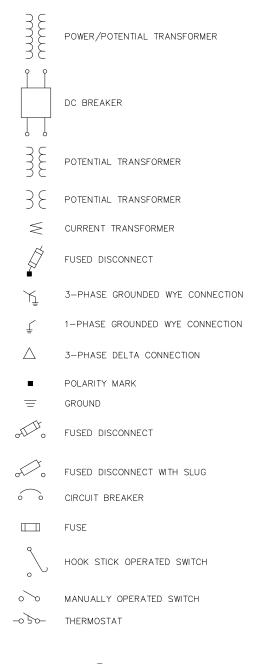
- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21.
- THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- 3. THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH THE NEC.
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1)
- UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535 RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:
 6.1. ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.
 6.2. VISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.

- "DANGER" HEADER; RED BACKGROUND WITH WHITE LETTERING.
 "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING. 6.4.
- "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
 "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING.
 OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND.
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690.

NOT FOR CONSTRUCTION

HUSLIA PV/BESS DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION PROJECT: TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 HUSLIA PV/BESS DESIGN DWN BY/DATE REVIEWED BY/DATE GENERAL INFORMATION AND SPECIFICATIONS SSUED FOR 35% REVIEW GGL /08-22-2025 MED /08-25-202 В SSUED FOR PV CONSTRUCTION BID GGL/10-08-2025 TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM nvd-el-0000 1 d REF DWG(S) DRAWING NO HEET_1 OF 2 HPVD-EL-0000

STANDARD BLOCKS - ELECTRICAL



CABLE #

EQUIPMENT

PROTECTION, INSTRUMENTATION, OR AUTOMATION DEVICE COIL OR ELEMENT RESISTOR NORMALLY OPEN CONTACT NORMALLY CLOSED CONTACT AMBER LIGHT (R)RED LIGHT GREEN LIGHT (B) BLUE LIGHT INCANDESCENT LIGHT SHORTING BLOCK CONNECTION POINT

TERMINATION CONNECTION POINT

 \equiv

CABLE TAG - WIRING DIAGRAMS & 3-LINES

GROUND

POLARITY MARK (CURRENT TRANSFORMERS)

CAST-IN-PLACE CONCRETE CIRCLE CIRCUIT CLOCK CLOSE CIRCULAR MIL CORRUGATED METAL PIPE COSINE CONCRETE CONST CONSTRUCTION CONT CONTR CONTINUOUS CONTRACTOR CSP CT CORRUGATED STEEL PIPE CURRENT TRANSFORMER CTRL CTS CU DC DCD DCD CURROLSWITCHER OR CONTROL SWITCH CLEAR TO SEND COPPER DIRECT CURRENT DATA CARRIER DETECT

ACB AB ABV AC ADJ ADJT

ALT

BFI BKR BLDG

BLK BOT BTU

BTWN

BU

DDE DE DEM

DEMOB

DET DFR

DI DIA

DIAG

DIM DIST DNP

DO DSSS

DTE DWG

EΑ

AIR CIRCUIT BREAKER

ALTERNATING CURRENT

BREAKER FAIL INITIATE

BRITISH THERMAL UNIT

CAPACITOR OR CAPACITANCE

CORRUGATED ALUMINUM PIPE

DATA COMMUNICATIONS EQUIPMENT

DISTURBANCE FAULT RECORDER

DISTRIBUTED NETWORK PROTOCOL

DOUBLE DEAD END

DEMOLISH, DEMOLITION

DEAD END

DEMOBILIZE

DIGITAL INPUT

DIAMETER

DIAGONAL

DRAWING

EACH

DIMENSION

DISTRIBUTION

DIGITAL OUTPUT

D STREET SUBSTATION

DATA TERMINAL EQUIPMENT

DETAIL

AIR BREAK

ADJUSTABLE

ADJACENT

ALTERNATE

ALUMINUM

BREAKER

BUILDING

BLOCK

воттом

BETWEEN

BACKUP

COLOUMB

CEMENT

CHECK

CUBIC FOOT

CAST IRON

CAST IRON PIPE

CENTER BREAK

APPROXIMATE

BREAKER FAIL

ABOVE

STANDARD ABBREVIATIONS - ELECTRICAL

EXPANSION JOIN ELECTRICAL ELEVATION ELEV ENCLOSURE EQ EQUIP EQUAL EQUIPMENT ESTIMATE FXIST FXISTING FARAD FRFQ FREQUENCY FEED THROUGH FUT FUTURE CONDUCTANCE OR GROUND GAUGE GAL VANIZED GAL V GROUND BUS GCB GAS CIRCUIT BREAKER GEN GENERATOR GALVANIZED IRON GND GROUND GANG OPERATED AIR-BREAK SWITCH GOAB GALVANIZED RIGID CONDUIT GRD GRADE, GRADING GALVANIZED RIGID STEEL CONDUIT GRSC

HIGH-DENSITY POLYETHYLENE HOT LINE ORDER

HORIZONTAL

HERTZ

INPLIT

INDUSTRY

INVERT

JOULE

KII OVOLT

KILOWATT

LINE

LOAD

LIGHT

MILE

METER(S)

MATERIAL

MAXIMUM

MINIMUM

MOBILIZE

MEGAWATT

NEUTRAL

METER

MANUFACTURER

MISCELLANEOUS

MOTOR OPERATED (OR)

MILLIMETER(S)

INDUCTANCE

LOAD BREAK

LANDFILL GAS POWER PLANT

INTERSECTION

JUNCTION BOX

KILOAMPRERE

HORSEPOWER

PHASE A CURRENT

PHASE B CURRENT

PHASE C CURRENT

NEUTRAL CURRENT

INCLUDE(D), INCLUDING

POLARIZING CURRENT

COMPLEX NUMBER

INSIDE DIAMETER

HDPF

HLO

ΗZ

KW

LGPP

MAT

MAX

MIN

MM

мов

MTR

NS NTS SYNCHRONIZING NEUTRAL NOT TO SCALE OD OUT P OUTSIDE DIAMETER OUTPUT REAL POWER OR PRIMARY PUSH BUTTON POWER FACTOR PROGRAMMABLE LOGIC CONTROLLER PLC РМ PAD-MOUNT TRANSFORMER PROVIDER SWITCHYARD PSSS PT PT PVC POTENTIAL TRANSFORMER POLYVINYL CHLORIDE PVMT PAVEMENT PWR POWER REACTIVE POWER Q RESISTANCE OR RESISTOR RCLS RECLOSE RAD RADIUS RAD RADIAN RD RE REF ROAD REMOTE END REFERENCE REQD REQUIRED REMOTE END TRIP RET RET RETURN REV RLY REVISION RELAY RAILROAD ROW RTS RIGHT OF WAY

RTU

RX

S-L

SEC

SEC

SVC SVC SHT SIM SIN SPEC

SPECS

SPSS SS STA STD SW

SWGR

SYM

TAN

TCM

NEWTON

NCC

N/C NIC NO

NOC

NORMALLY CLOSED

NO CONNECTION

NOT IN CONTRACT

NORMALLY OPEN

READY TO SEND

APPARENT POWER

RECEIVE

SOURCE

SECTION

SERVICE

SIMILAR

STATION

STANDARD

SWITCHGEAR

SYMMETRICAL

TANGENT

TELEPHONE

TERMINAL

SYNCHRONIZE

SECONDARY

SPECIFICATION

SPECIFICATIONS SPARTAN SUBSTATION

SYNCHRONIZING SWITCH

TIME OR TRANSFORMER

TRIP COIL MONITOR

SOURCE-LOAD

SURGE ARRESTOR

SWITCH CARINET

REMOTE TERMINAL UNIT

NORMALLY CLOSED CONTACT

NORMALLY OPEN CONTACT

VS W/0 XMSSN 47 STATIC VAR COMPENSATOR 52b

ΠA

TURB

TX

TYP

UG

VA

VAC

VCB VDC

VERT

VREG

UNO

TELECOMMUNICATIONS INDUSTRY

ASSOCIATION

UNDERGROUND

VOLTAMPERE

VERTICAL

WEST WATT

WITHOUT

REACTANCE

TRANSFORMER

TRANSMISSION ADMITTANCE

PHASE A VOLTAGE

PHASE C VOLTAGE

VERIFY IN FIELD NEUTRAL VOLTAGE

VOLTAGE REGULATOR

VOLTAGE REGULATOR SYNCHRONIZING VOLTAGE

VOLTAGE TRANSFORMER

VACUUM CIRCUIT BREAKER DIRECT CURRENT VOLTAGE

REACTIVE POWER

UNLESS NOTED OTHERWISE

PHASE B VOLTAGE ALTERNATING CURRENT VOLTAGE

TURBINE

TRANSMIT

TYPICAL

YELLOW IMPEDANCE TIME-DELAY SYNCHRONISM CHECK UNDERVOLTAGE ANNUNCIATOR DIRECTIONAL POWER
UNDERCURRENT OR UNDERPOWER BEARING FIFI D MANUAL TRANSFER OR SELECTOR DEVICE REVERSE-PHASE PHASE-SEQUENCE VOLTAGE MACHINE OR TRANSFORMER THERMAL RELAY INSTANTANEOUS OVERCURRENT AC TIME OVERCURRENT AC CIRCUIT BREAKER NORMALLY OPEN BREAKER CONTACT NORMALLY CLOSED BREAKER CONTACT OVERVOLTAGE VOLTAGE BALANCE 63 PRESSURE SWITCH APPARATUS GROUND AC DIRECTIONAL OVERCURRENT 68 BLOCKING PERMISSIVE

LEVEL SWITCH

OUT-OF-STEP

FREQUENCY

LOCK OUT DIFFERENTIAL

RECLOSING RELAY

CARRIER OR PILOT WIRE

ALARM DC OVERCURRENT

74

NOT FOR CONSTRUCTION

PROJECT: HUSLIA PV/BESS DESIGN ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DWN BY/DATE SSUED FOR 35% REVIEW GGL/08-22-2025 MED /08-25-2025 SSUED FOR PV CONSTRUCTION BI В

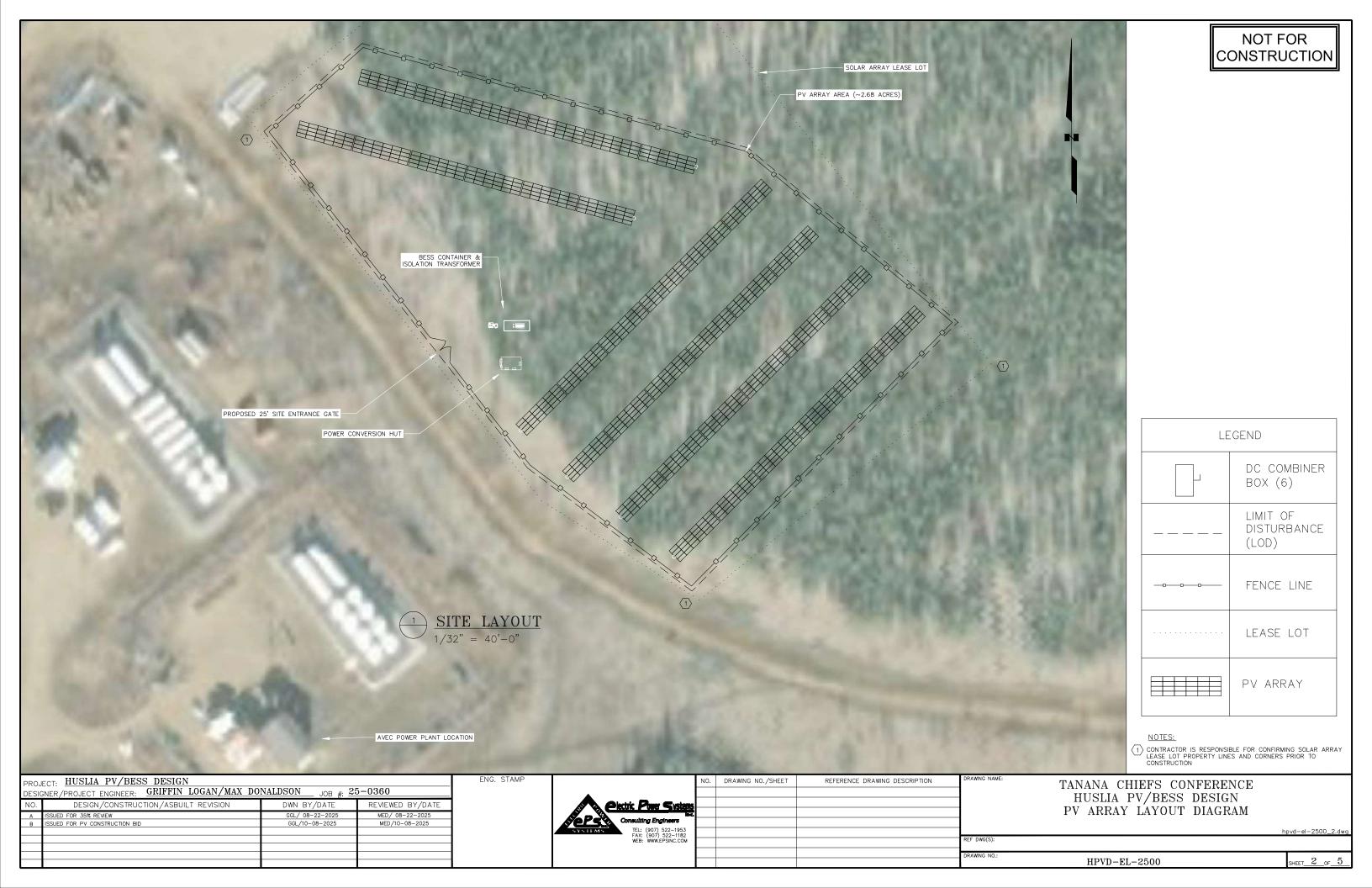
ENG. STAM

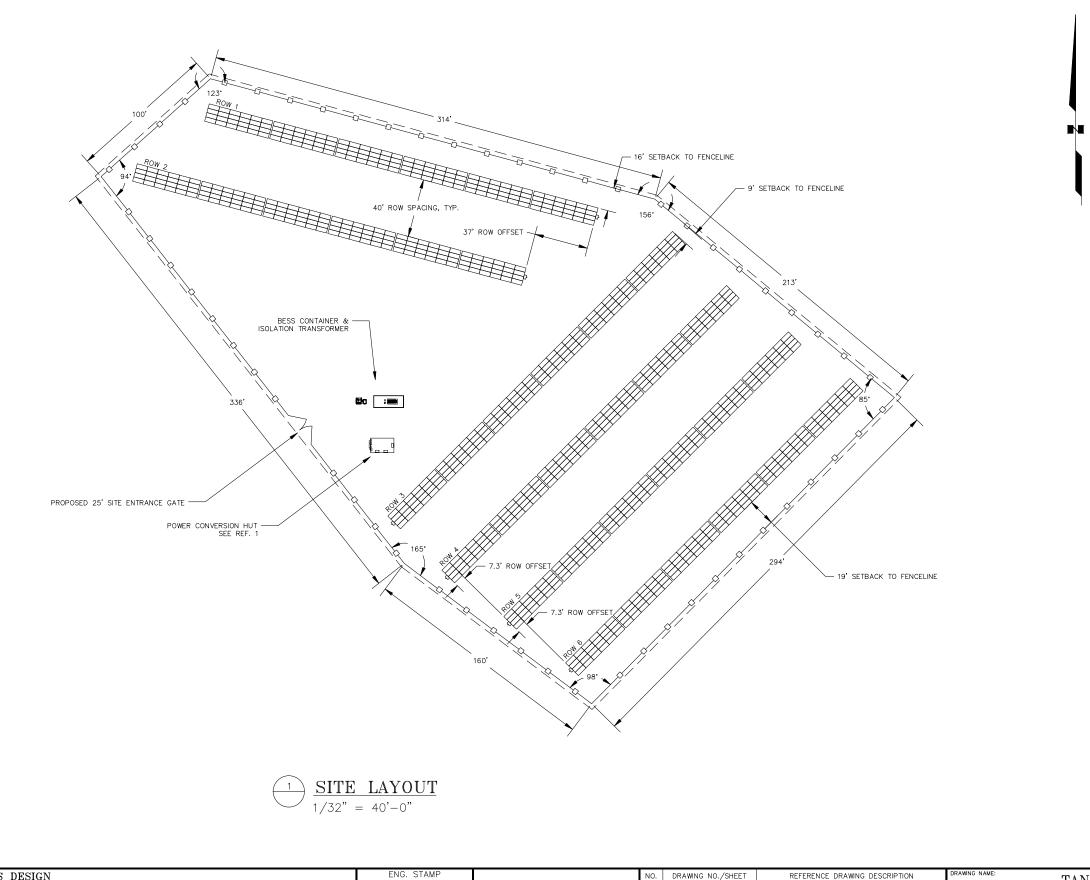
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAM
s				
				REF DWG(S):
				DRAWING NO.

TANANA CHIEFS CONFERENCE HUSLIA PV/BESS DESIGN GENERAL INFORMATION AND SPECIFICATIONS

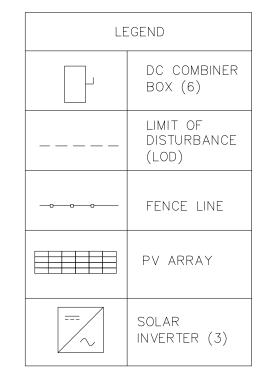
hpvd-el-0000_1.dwg

AWING NO.: HPVD-EL-0000 SHEET_2 OF 2





System Summa	гу
Physical Arrangement	
Methodology Tilt	Fixed Tilt, Ground Mount 35°
Racking System / Model	Nuance PowerRACK 4X6
Electrical Arrangement	
Watts per Module	595W
24 Module Strings (#)	36
Quantity of Modules	864
Total DC System Size	514,080W 1.37
Inverter Arrangement	
Manufacturer	SMA
Model	Sunny Highpower PEAK3 125-US
Inverter Size	125kW
Quantity of Inverters	3
Strings per Inverter	12
PV Modules	
Manufacturer	SEG SOLAF
Model	SEG-595-BTA-BG
Model	
Peak Power	595W



NOT FOR CONSTRUCTION

PROJECT: HUSLIA PV/BESS DESIGN

DESIGN/PROJECT ENGINEER: MAX DONALDSON/JOHN VENABLES JOB #: 25-0360

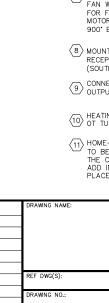
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE ALISSUED FOR 35% REVIEW GGL/10-08-2025 JRV/10-08-2025 JRV/10

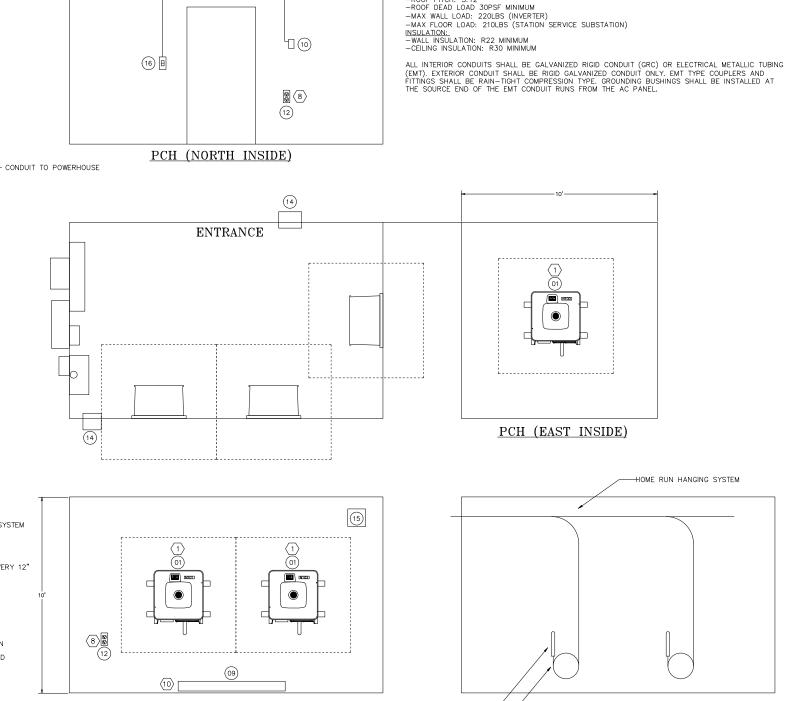






- MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4" AWAY FROM THE WALL, AND 20" ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES. MAINTAIN 4' WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. PROVIDE A 4" X 4" WIREWAY (MINIMUM) BETWEEN INVERTERS AND PANELBOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARD SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARD AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- (3) MOUNT STATION SERVICE SUBSTATION SUCH THAT ALL MANUFACTURER RECOMMENDED CLEARANCE ZONES AWAY FROM EQUIPMENT IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE ZONE IN FRONT OF THE DEVICE, PER NEC
- 4 ROUTE CONDUITS SUCH THAT THE STUB-UP AREA IS DIRECTLY UNDER ALL DESTINATION DEVICES IN THE POWER CONVERSION HUT
- (5) PROVIDE CEILING MOUNTED LIGHTING SUCH THAT 30 FOOTCANDLES IS MAINTAINED. MOUNT LIGHT SWITCH NEXT TO DOOR AT LEAST 40" FROM FLOOR.
- 6 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT-HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- (7) VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY A WEATHERPROOF 120VAC EXHAUST FAN WITH A MINIMUM FLOW RATE OF 2500CFM, CONTROLLED BY AN ADJUSTABLE THERMOSTAT FOR FAN OPERATION OF INTERIOR AIR TEMPERATURES OF 35°C AND ABOVE, AND BY A 10° MOTORIZED INTAKE DAMPER. EXHAUST SHALL BE PROVIDED WITH A 90° EXTERIOR HOOD WITH A 900' EXTERIOR HOOD WITH INSECT SCREENS TO PREVENT INTRUSIONS OF WIND DRIVEN RAIN/SNOW.
- (8) MOUNT RECEPTACLES ON INSIDE WALLS OF PCH AT LEAST 18" FROM FLOOR. MOUNT ONE RECEPTACLE ON EAST SIDE OF DOOR (NORTH WALL), AND ONE RECEPTACLE NEXT TO INVERTER 2
- ONNECT SHARK 250 CURRENT TRANSFORMERS AND POTENTIAL TRANSFORMERS TO THE 400A OUTPUT BREAKER AT POWER DISTRIBUTION PANELBOARD THROUGH A 1" CONDUIT.
- $\stackrel{\text{$\langle 1 \rangle}}{\text{$| 0$}}$ HEATING TO BE PROVIDED BY ELECTRIC BASEBOARD HEATER WITH BUILT-IN THERMOSTAT. HEATER OT TURN ON BELOW 10 F.
- (11) HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES. ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON—SITE.





(11)

BUILDING MANUFACTURER TO PROVIDE PRE-FABRICATED METAL BUILDING PER FOLLOWING SPECIFICATIONS:

HUSLIA PV/BESS ENERGY DESIGN ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 JED FOR PV CONSTRUCTION BID

-CABLE HANGER MESSENGER SYSTEM

-CABLE SECURED TO PCH EVERY 12" FROM HANGER TO CONDUIT

12" 90' SWEEP ANGLED DOWN

HIQUID TIGHT CONDUIT GLAND

08)

02

HOME-RUN ENTRY

 $\langle 4 \rangle$

CONDUIT FROM BESS -

(18)

PCH (WEST OUTSIDE)

(04)

PCH (WEST INSIDE)

CONDUIT ENTRY INTO BUILDING-

4 FOOT SERVICE LOOP-

PCH (SOUTH INSIDE)

ENG. STAM

DRA	REFERENCE DRAWING DESCRIPTION	DRAWING NO./SHEET	NO.
	COMMUNICATIONS PANEL DETAILS	HPVD-EL-2500/4	1
	EQUIPMENT NAMEPLATE SCHEDULE	HPVD-EL-2000/5	2
REF			

NOT FOR CONSTRUCTION

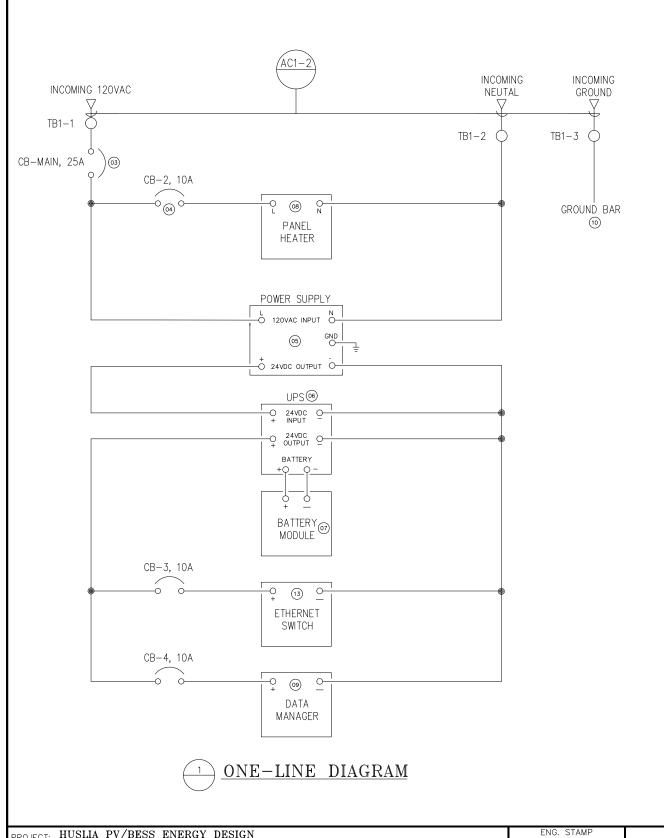
PCH (SOUTH OUTSIDE)

TANANA CHIEFS CONFERENCE HUSLIA PV/BESS ENERGY POWER CONVERSION HUT LAYOUT DIAGRAM

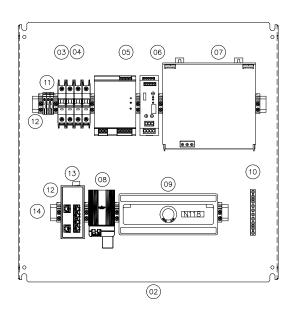
hnvd-el-2500 4 de

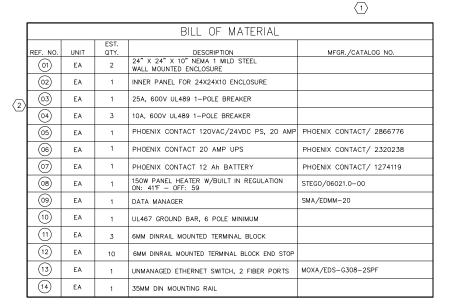
HPVD-EL-2500

HEET 4 OF 5









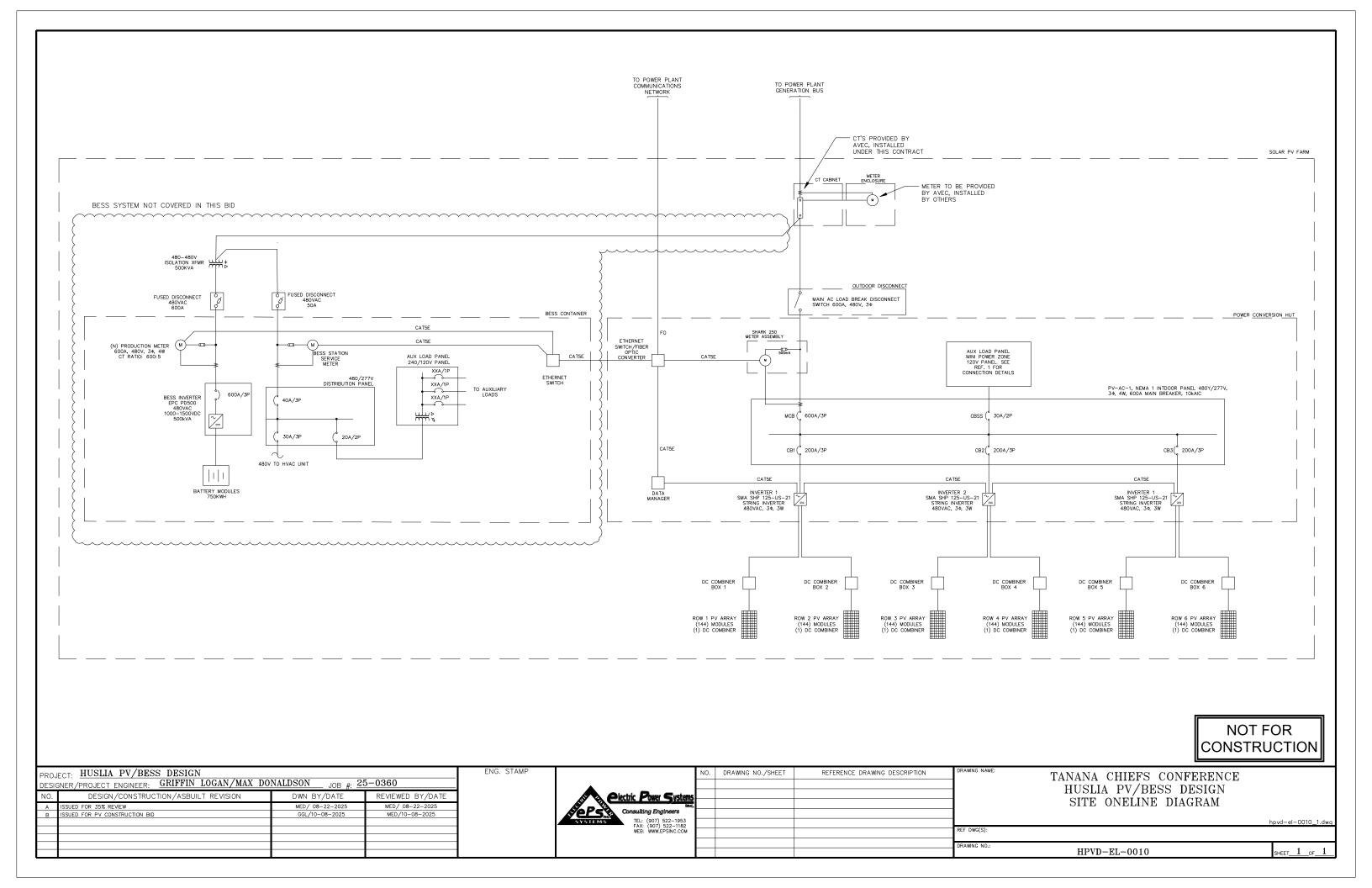


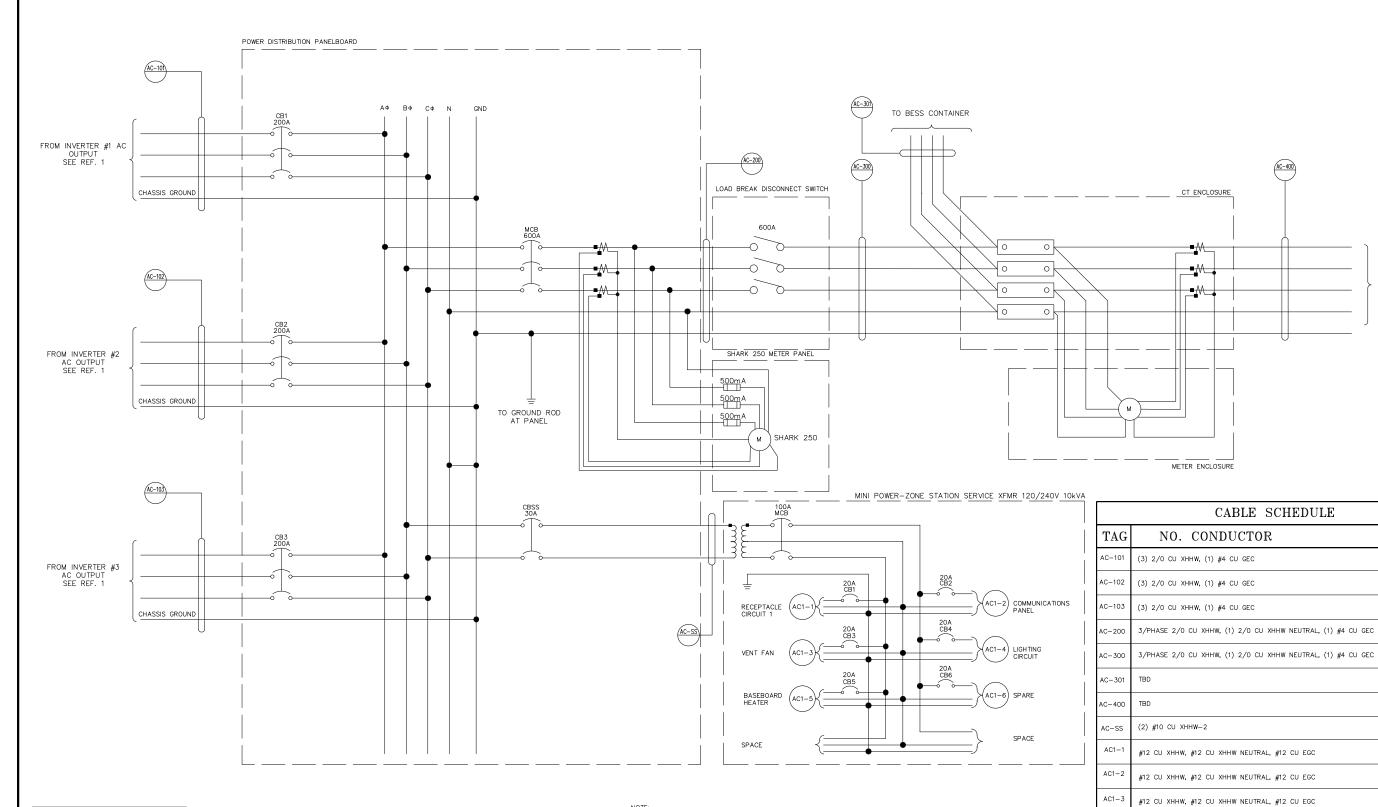
PANEL BOM

- NOTES:

 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IN THE CENTER COLUMN, AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- $\fbox{2}$ PROVIDE 1 SPARE CIRCUIT BREAKER FOR EACH SIZE (REF. NO. 3, AND RE. NO. 4) AND STORE IN BOTTOM OF ENCLOSURE

	BECT: HUSLIA PV/BESS ENERGY DESIGN GNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	25-0360	ENG. STAMP		NO. DRAWING NO./SHEET 1	REFERENCE DRAWING DESCRIPTION EQUIPMENT NAMEPLATE SCHEDULE	DRAWING NAME:	TANANA CHIEFS CONFERENCE HUSLIA PV/BESS ENERGY	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems				COMMUNICATIONS PANEL	
_ A	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		Consulting Engineers				DETAILS	
					TEL: (907) 522-1953 FAX: (907) 522-1182			DEE DWC(E).	DETMIES	hpvd-el-2500_5.dwg
					WEB: WWW.EPSINC.COM			REF DWG(S):		
								DRAWING NO.:	HPVD-EL-2500	SHEET 5 OF 5





NOT FOR CONSTRUCTION E:
-LOW VOLTAGE AC CONDUCTOR SIZING BASED ON A COPPER CONDUCTOR WITH A TEMPERATURE RATING OF 75°C.
-USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE TEMPERATURE RATING
OF THE CONDUCTOR IS MAINTAINED.
-IF LARGER-THAN-SPECIFIED CABLE IS USED, CONFIRM THAT THE CONDUIT SIZE IN THE ASSOCIATED RACEWAY MAINTAINS A
MAXIMUM 40% FILL RATIO
-SEE REF. 2 FOR CONDUIT SCHEDULE

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DR.
	1	HPVD-EL-0011/1	PV ARRAY DC WIRING DIAGRAM	
ms	2	HPVD-EL-2000/2	WIREWAY DETAILS	
Ž				
				L
1				REI
				DR.

TANANA CHIEFS CONFERENCE HUSLIA PV/BESS DESIGN ŚITE

TO POWERPLANT

RACEWAY AC-0101

AC-0102

AC-0103

AC-0300

TBD

TBD

1/2" EMT

1/2" EMT

1/2" EMT

1/2" EMT

1/2" EMT

1/2" EMT

hpvd-el-0100 1 dv

THREE-LINE DIAGRAM

#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC

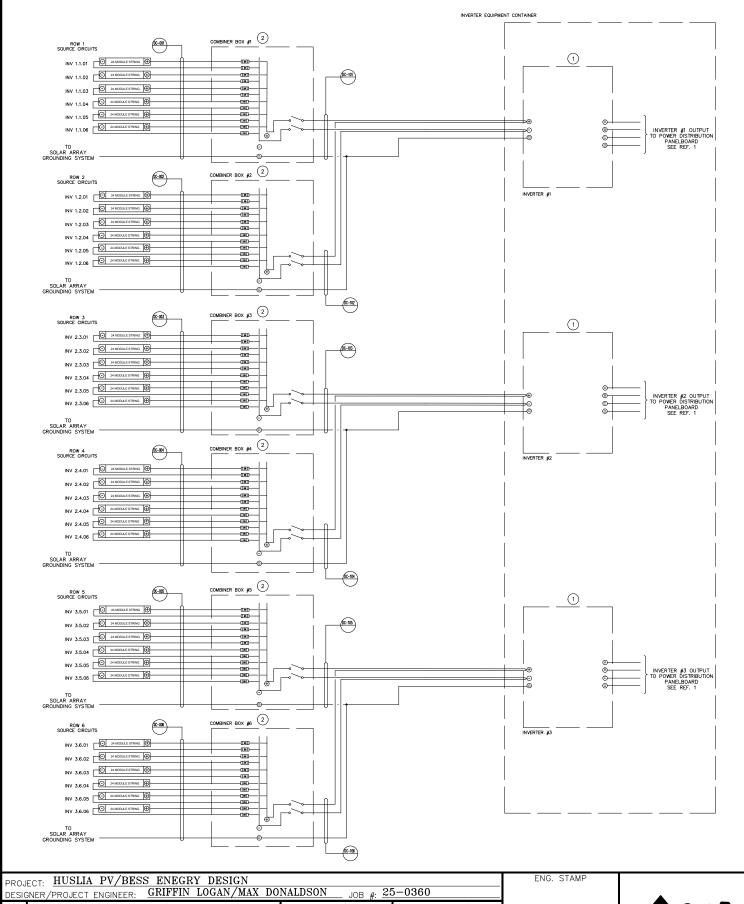
#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC

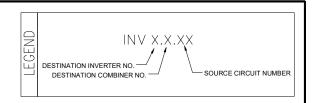
AC1-4

AC1-5

HPVD-EL-0100 SHEET 1 OF 1

PRO	JECT: HUSLIA PV/BESS ENEGRY DESIGN			ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TA
DES	IGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	ONALDSON JOB #: 2	25-0360		A	1	HPVD-EL-0011/1	PV ARRAY DC WRING DIAGRAM		* 4
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		electric Power Systems	2	HPVD-EL-2000/2	WIREWAY DETAILS		
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		inc.				_	
					Consulting Engineers				_	
					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM				REF DWG(S):	
					WEB. WWW.EFSINC.COM				—	
									DRAWING NO.:	





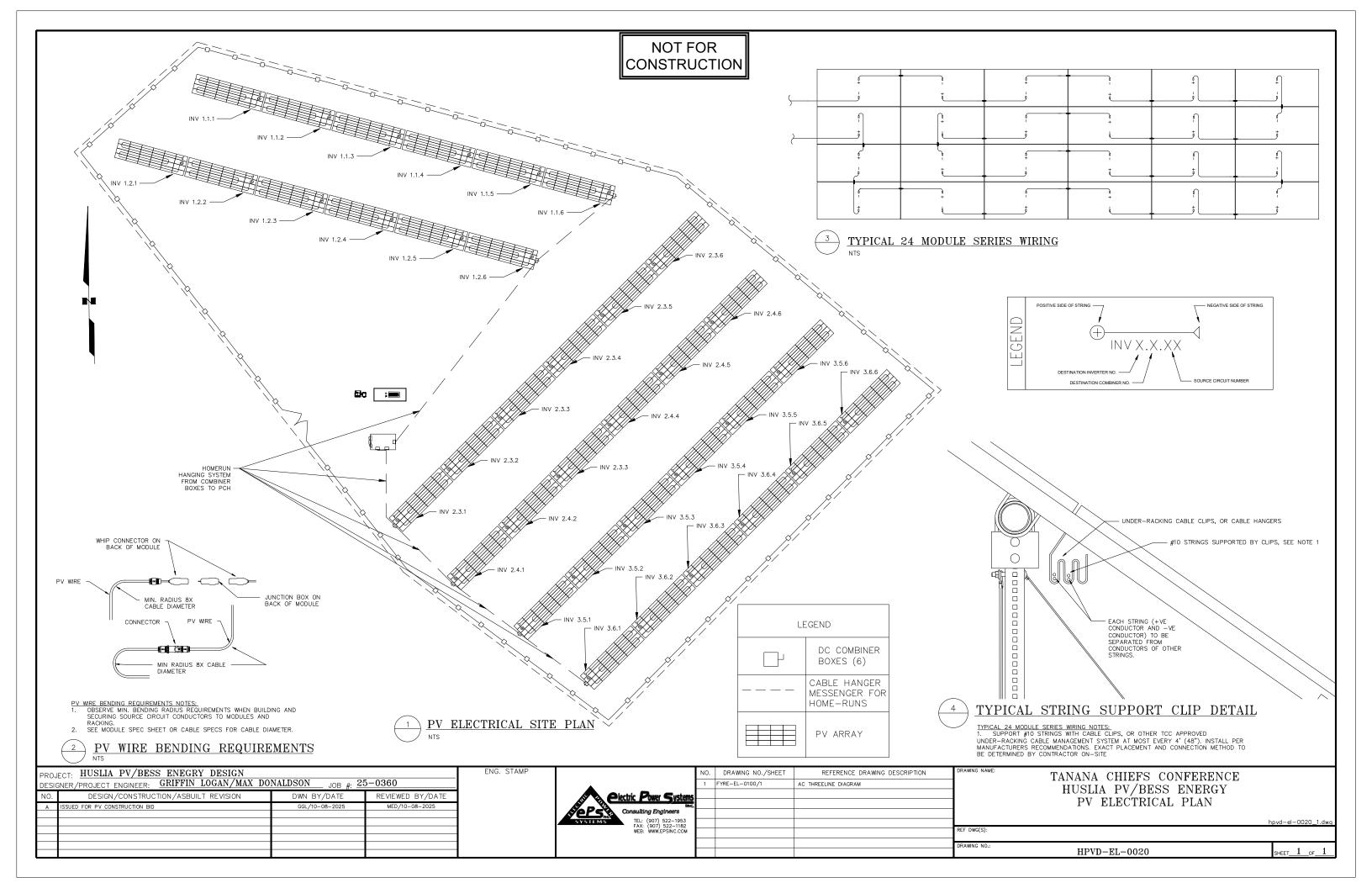
	CABLE SCHE	DULE
TAG	NO. CONDUCTOR	RACEWAY
C-001	(12) #10 CU PV WIRE, (1) #8 CU EGC	FREE AIR
C-002	(12) #10 CU PV WIRE, (1) #8 CU EGC	FREE AIR
C-003	(12) #10 CU PV WIRE, (1) #8 CU EGC	FREE AIR
C-004	(12) #10 CU PV WIRE, (1) #8 CU EGC	FREE AIR
C-005	(12) #10 CU PV WIRE, (1) #8 CU EGC	FREE AIR
C-006	(12) #10 CU PV WIRE, (1) #8 CU EGC	FREE AIR
OC-101	(2) 1/0 AL PV WRE, (1) #8 CU EGC	FREE AIR
C-102	(2) 1/0 AL PV WIRE, (1) #8 CU EGC	FREE AIR
C-103	(2) 1/0 AL PV WIRE, (1) #8 CU EGC	FREE AIR
C-104	(2) 1/0 AL PV WIRE, (1) #8 CU EGC	FREE AIR
C-105	(2) 1/0 AL PV WIRE, (1) #8 CU EGC	FREE AIR
C-106	(2) 1/0 AL PV WIRE, (1) #8 CU EGC	FREE AIR
D ON I	II 4703 PV WIRE WITH A TEMPERATURE RATING	OF GOT SEE CABLE SCHEDULE FOR

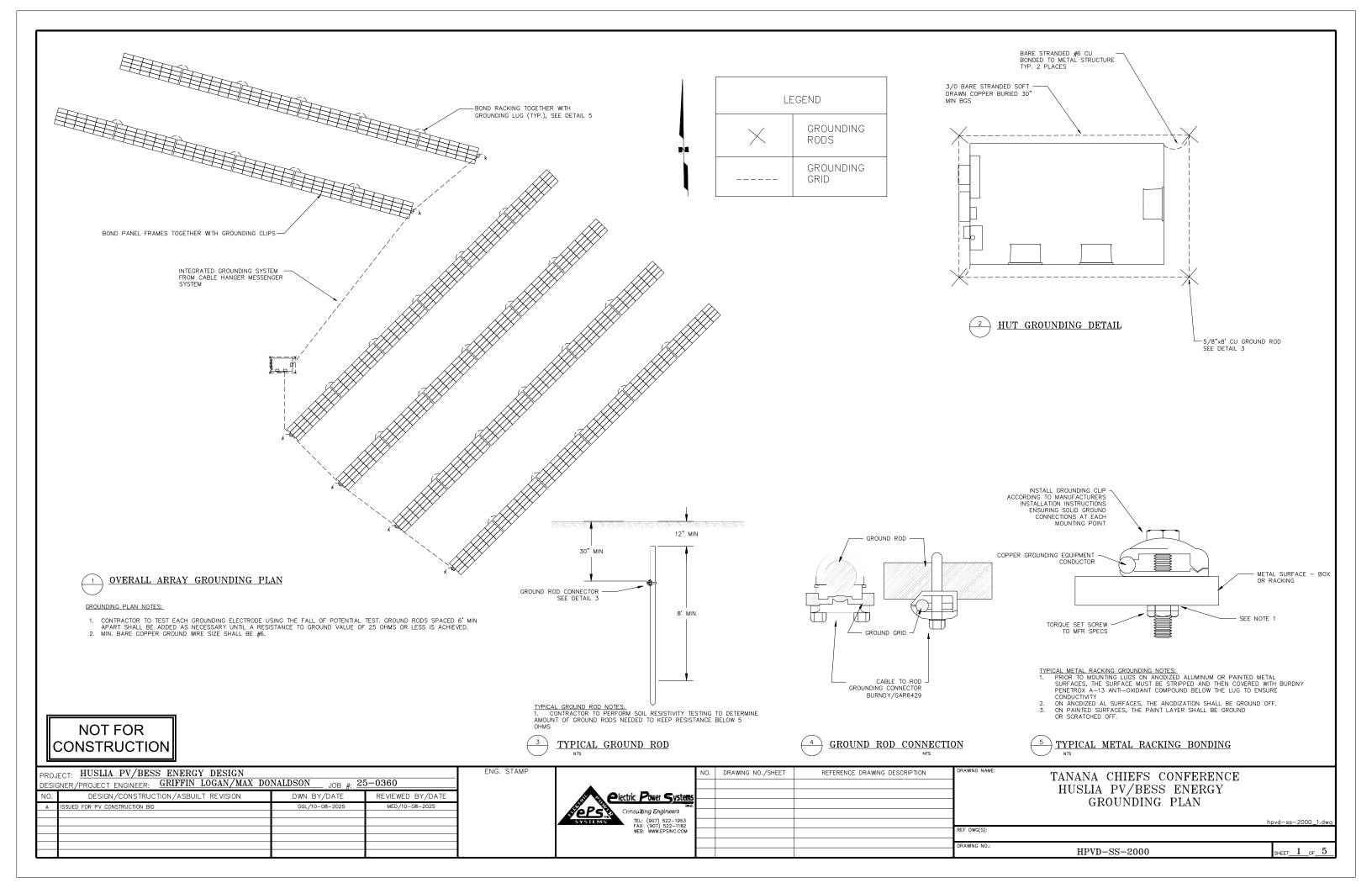
NOTE: DC CONDUCTOR SIZING BASED ON UL 4703 PV WIRE WITH A TEMPERATURE RATING OF 90°C, SEE CABLE SCHEDULE FOR

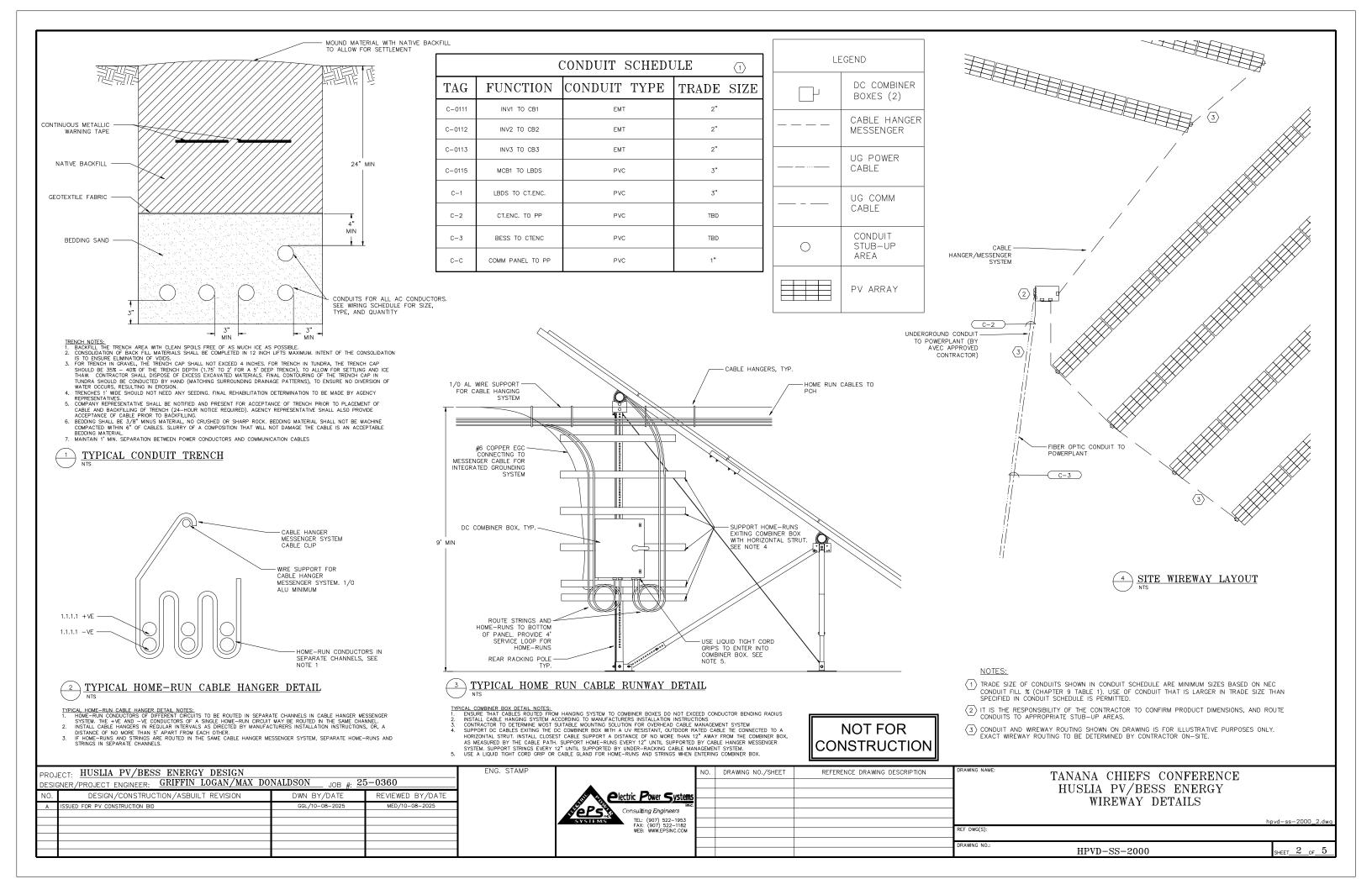
NOT FOR CONSTRUCTION

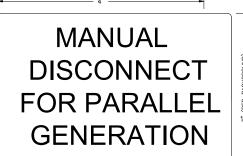
	EQUIPMENT SCHEDULE												
TAG	QUANTITY	DESCRIPTION											
(1)	3	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US											
2	6	12 INPUT DC COMBINER; TERRASMART FSFT275-12-N4-CD OR EQUIVALENT											

OJECT: HUSLIA PV/BESS ENEGRY DESIGN			ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE	
	NALDSON JOB #: 2	5-0360			1	HPVD-EL-0100/1	AC THREE LINE DIAGRAM			
D. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems						
ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		VA los					PV ARRAY DC WIRING DIAGRAM	
								_		hpvd-el-0011_1.dwg
				FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		iipva-ei-0011_i.awq
								_		
								DRAWING NO.:	HPVD-EL-0011	SHEET 1 OF 1
	signer/project engineer: <u>GRIFFIN LOGAN/MAX DO</u> D. <u>DESIGN/CONSTRUCTION/ASBUILT REVISION</u>	signer/project engineer: <u>GRIFFIN LOGAN/MAX DONALDSON</u> job #: <u>2</u> d. <u>Design/construction/asbuilt revision</u> dwn by/date	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE	CSIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 COLUMN TV/ BLISS BANGAY DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 COLUMN TV/ BLISS BANGAY DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 COLUMN TV/ BLISS BANGAY DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 COLUMN TV/ BLISS BANGAY DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 COLUMN TV/ BLISS BANGAY DESIGN COL	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 D. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE A ISSUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025 Consulting Engineers Consulting Engineers	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE SISSUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025 MED/10-08-2025	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE SISUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025 The property of the consulting Engineers of the consulti	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE SISUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025 MED/10-08-2025	SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE A ISSUED FOR PV CONSTRUCTION BID CONSUMING PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360 HUSLIA PV/BESS ENERGY PV ARRAY DC WIRING DIAGRAM TEL: (907) 522-1953 FAX: (907) 522-









LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. LABEL TO BE ENGRAVED PLASTIC. (1) TOTAL

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM GENERATION METER.

(1) TOTAL

NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC
DISCONNECT AND POWER SOURCE
RATED OUTPUT CURRENT: 453A
NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. (1) TOTAL

NEC 2023 705.12(B)(3)(3)

▲ WARNING

HIS EQUIPMENT FED BY MULTIPLE SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (1) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 1072VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (6) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

NOT FOR CONSTRUCTION

PROJECT: HUSLIA PV/BESS ENERGY DESIGN

DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0360

NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE

A ISSUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025

Consulting Engineers

TEL: (907) 522-1953
FAX: (907) 522-1952
WE: WWX.EFSIN.C.COM

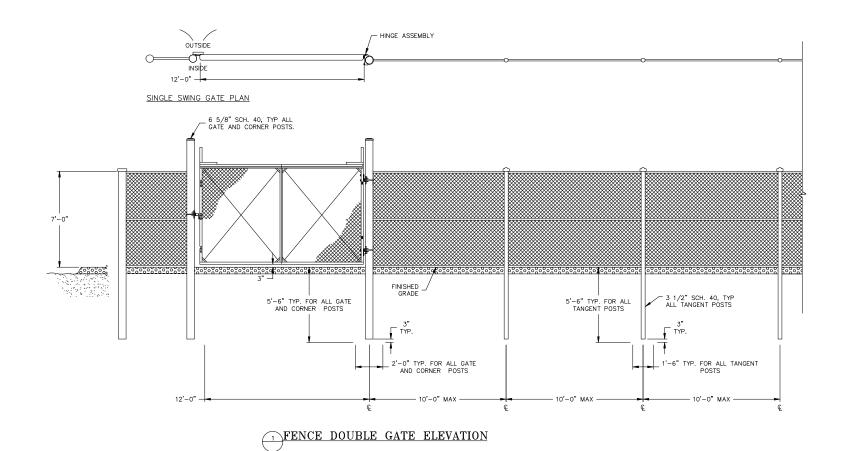
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING
ems				
inc.				
3				
3 32 DM				REF DWG

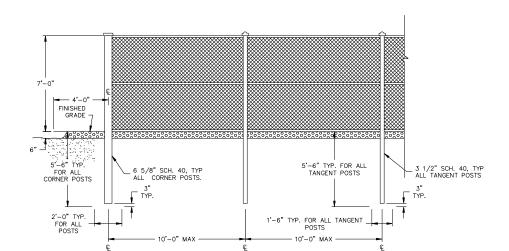
TANANA CHIEFS CONFERENCE HUSLIA PV/BESS ENERGY EQUIPMENT SAFETY LABEL SCHEDULE

hpvd-ss-2000_3.dwg

NO.: HPVD-SS-2000

SHEET 3 OF 5





2 CORNER/TERMINAL FENCE POST ELEVATION

PROJECT: HUSLIA PV/BESS ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0360	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE HUSLIA PV/BESS ENERGY	
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			4	SITE FENCING	
A ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		Consulting Engineers			-	DETAILS	
				TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			055 000(0)	DETAILS	hpvd-ss-2000_4.dwg
				WEB: WWW.EPSINC.COM			REF DWG(S):		
							DRAWING NO.:	HPVD-SS-2000	SHEET 4 OF 5

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1			2 x 4	3/8
N101	1	INVERTER 2			2 x 4	3/8
N102	1	INVERTER 3			2 x 4	3/8
N103	1	DC COMBINER	BOX 1		2 x 4	3/8
N104	1	DC COMBINER	BOX 2		2 x 4	3/8
N105	1	DC COMBINER	BOX 3		2 x 4	3/8
N106	1	DC COMBINER	BOX 4		2 x 4	3/8
N107	1	DC COMBINER	BOX 5		2 x 4	3/8
N108	1	DC COMBINER	BOX 6		2 x 4	3/8
N109	1	COMMUNICATIONS	PANEL		2 x 4	3/8
N110	1	600A	MAIN AC PANEL		2 x 4	3/8
N111	1	POWER DISTRIBUTION	PANELBOARD		2 x 4	3/8
N112	1	CB 1			1 x 3	1/8
N113	1	CB 2			1 x 3	1/8
N114	1	CB 3			1 x 3	1/8
N115	1	CB SS			1 x 3	1/8
N116	1	MCB			1 x 3	1/8
N117	1	120V STATION SERVICE PANEL			2 x 4	3/8
N118	1	DATA MANAGER			1 × 3	1/8
N119	1	METER PANEL			2 x 4	3/8
N120	1	CT ENCLOSURE			2 x 4	3/8
N121	1	METER ENCLOSURE			2 x 4	3/8

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WTH WHITE TEXT.
 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
 7) ALL DIMENSIONS SHOWN IN INCHES.

PRO- DESI	ECT: HUSLIA PV/BESS ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0360	ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE HUSLIA PV/BESS ENERGY	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems					EQUIPMENT NAMEPLATE SCHEDULE	
A	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		Consulting Engineers				4	EQUIPMENT NAMEPLATE SCHEDULE	
-					TEL: (907) 522–1953 FAX: (907) 522–1182				-		hpvd-ss-2000 5.dwa
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		.,,
									DRAWING NO.:		
									DIVAMING NO.:	HPVD-SS-2000	SHEET5_OF5_

	Circuit Informo	ation						Elec	trical calculat	ions								System Infor	mation				
Destination Inverter No.	Destination Combiner No.	Source Circuit No.	Modules (#)	Open Circu Voltage (VOC)	Maximum Power Voltage (Vmp)	Short Circuit Current (Isc)	Continuous Current (1.25*Isc)	Irradiance Current (1.25*CC)	Mininum Fuse Size (A)	Selected Fuse Size (A)	Minimum Wire Ampacity (A)	Selected String Wire Size (UL4703, CU, AWG)	Maximum Wire Distance (FT)	Voltage Drop (V)	Voltage Drop (%)	Circuit Ir from to	nformation	Continuous Current (A)				Voltage Drop (V)	Voltage) Drop (%)
1	1	1	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05	DS1	INV1	131.16	132	1/0	405	0.20	2.01
1	1	2	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29	DS2	INV1	131.16	132	1/0	340	0.93	1.68
1	1	3	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55	DS3	INV2	131.16	132	1/0	280	1.46	1.39
1	1	4	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82	DS4	INV2	131.16	132	1/0	215	1.65	1.06
1	1	5	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	195	11.00	1.03	DS5	INV3	131.16	132	1/0	145	1.40	0.72
1	1	6	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	250	14.10	1.32	DS6	INV3	131.16	132	1/0	80	0.99	0.40
1	2	1	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05								+
1	2	2	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29			PANEL CHARA	CTERISTICS				
1	2	3	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55			Voc (V)	52.58				
1	2	4	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82			Voc Coef. (%/°C)	-0.25				
1	2	5	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	195	11.00	1.03			Vmp (V)	44.64				+
1	2	6	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	250	14.10	1.32			Pmax Coef. (%/°C)	-0.3				
2	3	1	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05								+
2	3	2	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29			SITE CHARAC	CTERISTICS				
2	3	3	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55			T_Amb Min (°C)	-30				
2	3	4	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82			T_Amb Max (°C)	25				
2	3	5	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	195	11.00	1.03								+
2	3	6	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	250	14.10	1.32								+
2	4	1	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05								
2	4	2	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29								
2	4	3	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55								
2	4	4	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82								
2	4	5	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	195	11.00	1.03								
2	4	6	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	250	14.10	1.32								
3	5	1	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05								
3	5	2	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29								
3	5	3	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55								
3	5	4	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82								
3	5	5	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	195	11.00	1.03								
3	5	6	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	250	14.10	1.32								
3	6	1	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05					1			
3	6	2	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29								
3	6	3	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55								
3	6	4	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82								
3	6	5	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	195	11.00	1.03								
3	6	6	24	1435	1071.4	13.99	17.49	21.86	21.86	25	25	10	250	14.10	1.32								

NOTES:

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

PRO DESI	JECT: HUSLIA PV/BESS ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0360	ENG. STAMP	_	NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE HUSLIA PV/BESS ENERGY	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION ISSUED FOR PV CONSTRUCTION BID	DWN BY/DATE GGL/10-08-2025	REVIEWED BY/DATE MED/10-08-2025		Consulting Engineers			-	PV STRING CALCULATIONS	
					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM			REF DWG(S):		hpvd-ss-07
								DRAWING NO.:	HPVD-SS-0700	SHEET 1

TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY DESIGN ISSUED FOR PV CONSTRUCTION BID





		VEN	ETIE	
DRAWING	INDEX			SCOPE OF WORK
TITLE	DRAWING NUMBER	SHEET	REVISION	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM IN VENETIE, AK.
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	VPBD-EL-0000	1	A	THE SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	VPBD-EL-0000	2	A	1 STRING INVERTERS MOUNTED INSIDE A CONTAINER. THE BATTERY
				MODULES AND INVERTER WILL BE HOUSED INSIDE A CONTAINER AND HAVE SELF—SERVING AUXILIARY LOADS. BOTH SYSTEMS WILL
SITE LAYOUT DIAGRAM	VPBD-EL-2500	1		OPERATE IN PARALLEL WITH THE LOCAL UTILITY AND HAVE
SITE LAYOUT - PV	VPBD-EL-2500	2	В	RELATED ELECTRICAL SAFETY AND METERING SYSTEMS.
SITE LAYOUT - INTERCONNECTION	VPBD-EL-2500	3	D	
SITE LAYOUT - POWER CONVERSION HUT	VPBD-EL-2500	4	С	SYSTEM SUMMARY
SITE LAYOUT - COMMUNICATIONS PANEL	VPBD-EL-2500	5	A	PV SYSTEM SIZE: 209.44kWdc / 125kWac INTERCONNECTION VOLTAGE: 12.47kV, 3 PHASE, 4 WIRE
ONE LINE DIAGRAM	VPBD-EL-0010	1	В	
THREE LINE DIAGRAM	VPBD-EL-0100	1	В	GENERAL NOTES
PV ARRAY DC WIRING DIAGRAM	VPBD-EL-0011	1	D	NA STREET, WORK TO BE WORK TO BE WATER BY A STREET, WE
PV ELECTRICAL SITE PLAN	VPBD-EL-0020	1	С	ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND LICENSED ELECTRICAL CONTRACTOR.
GROUNDING PLAN	VPBD-SS-2000	1	A	CONTRACTOR WILL FOLLOW IBC 2021 AND NFPA 70 NEC 2023 AS WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY
WIREWAY DETAILS	VPBD-SS-2000	2	A	CODES, ORDINANCES AND REGULATIONS.
EQUIPMENT SAFETY LABEL SCHEDULE	VPBD-SS-2000	3	A	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC
SITE FENCING DETAILS	VPBD-SS-2000	4	A	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL
EQUIPMENT NAMEPLATE SCHEDULE	VPBD-SS-2000	5	A	BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE MANNER.
TRANSFORMER DETAILS	VPBD-SS-2000	6	A	PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL DRAWINGS AND PRODUCT MANUALS.
PV STRING CALCULATIONS	VPBD-EL-0700	1	С	ALL DESIGN AND SPECIFICATIONS OF STRUCTURAL COMPONENTS ARE
				OUTSIDE THE SCOPE OF THESE PLANS.
				PROJECT ENTITIES
				OWNER: TANANA CHIEFS CONFERENCE
				ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.
				ELECTRIC SERVICE PROVIDER: VILLAGE OF VENETIE ELECTRIC UTILITY

NOT FOR CONSTRUCTION

PROJ DESIG	BOT: VENETIE RENEWABLE ENERGY DESIGN GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0173
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025

BESS DRAWINGS NOT INCLUDED IN THIS DRAWING SET

١	•	L
1	Clectric Power Systems	L
- 1	Consulting Engineers	Γ
ŀ	TEL: (907) 522–1953 FAX: (907) 522–1182	ſ
- 1	WEB: WWW.EPSINC.COM	L

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DIAMING NAME.
tens				1
:				
53 182				
COM				REF DWG(S):

TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY COVER SHEET AND INDEX

vpbd-el-0001_1.dwg

VPBD-EL-0001

SHEET 1 OF 1

ELECTRICAL SPECIFICATIONS

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION
- 2. ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE VERIFIED IN THE FIELD.
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT. CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS.
- 6. ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED ALL THE EQUIPMENT SHOULD BE FREE FROM COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- 11. CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF
- 12. METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE EGC SYSTEM. GROUNDS SHALL BE SIZED
- 13. CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE

RECORD DOCUMENTS

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNTIL THESE DEAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE.

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET RATED AND UV RESISTANT.
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE.
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWNGS. FOR OUTDOOR INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR
- 20. AC WIRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED CRIMPING TOOL.

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS
- 27. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT IS TO BE REMOVED.
- 28 MODULES SHALL BE BONDED WITH FOUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS:
- 30.1. SOLID CONDUCTORS: ASTM B 3.
 30.2. STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED; WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE.
- 33. INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS, ELECTRICALLY CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS SHOWN ON DRAWINGS.

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS:
- 34.1. RIGID STEEL CONDUIT: ANSI C80.1.
- 34.2. EMT: ANSI C80.3. (FOR INDOOR USE ONLY).
 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH
- 36. COATED FITTINGS FOR PVC-COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER, EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS. COVER IS GASKETED WITH OIL—RESISTANT GASKET MATERIAL AND FASTENED WITH CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE. CONNECTIONS ARE FLANGED, WITH STAINLESS-STEEL SCREWS AND OIL-RESISTANT GASKETS
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED AS FOLLOWS:
- 38.1. 3/4-INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF
- 38.3. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINET'S WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS.

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING

PANELBOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1. EACH TYPE OF PANELBOARD, OVERCURRENT PROTECTIVE DEVICE, TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES, PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION WAND ACTIVITY SEISMIC VERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF
- GRAVITY AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.

FNG STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING:
- 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST PROCEDURES USED.
 41.3.3. RESULTS THAT COMPLY WITH REQUIREMENTS.
 RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS. SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5 OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION 01 SECTION "OPERATION AND MAINTENANCE DATA " INCLUDE THE FOLLOWING:
- MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING
- OVERCURRENT PROTECTIVE DEVICES.
 41.5.2. TIME-CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:
- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
- PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL 42.2. PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEM INDICATED. REFER TO DIVISION 01 SECTION "PRODUCT REQUIREMENTS."

 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

- 43 CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING
- 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND

- 44.2. FABRICALE AND TEST PANCLEDARUS ACCORDING TO TELE 344 TO WITHSTANC SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."

 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.

 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.

 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.

 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS METOH BOY DIMPNISIONS: FOR ELISH—MOUNTED FRONTS METOH BOY DIMPNISIONS FOR ELISH—MOUNTED FRONTS METOH B
- SURFACE-MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH-MOUNTED FRONTS, OVERLAP BOX.

 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT. 44.3.6. DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES
- 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1 LUGS: MECHANICAL TYPE
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURRENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES—CONNECTED SHORT—CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES-CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAL—MAGNETIC CIRCUIT BREAKERS: INVERSE TIME—CURRENT ELEMENT FOR LOW—LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT—BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP-UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING; FIELD-REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD-ADJUSTABLE SETTINGS:
- SETTINGS: 45.4.1. INSTANTANEOUS TRIP. 45.4.2. LONG- AND SHORT-TIME PICKUP LEVELS. 45.4.3. LONG- AND SHORT-TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30-MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC FOLIPMENT

REQUIRED SAFETY SIGNS AND LABELS

- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21
- 2. THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- 3. THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT INSTALLED IN PER NEC 110.21.
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1).
- 6. UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535
- RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:

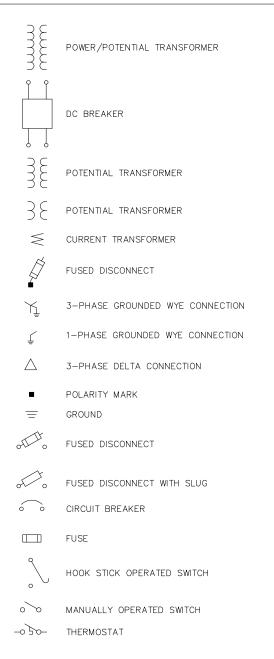
 1. ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.

 2. VISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.
- "DANGER" HEADER: RED BACKGROUND WITH WHITE LETTERING.
- "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING.
 "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
- "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING.
- OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND.
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690

NOT FOR CONSTRUCTION

VENETIE RENEWABLE ENERGY DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION PROJECT: TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173 VENETIE RENEWABLE ENERGY DWN BY/DATE DESIGN/CONSTRUCTION/ASBUILT REVISION REVIEWED BY/DATE GENERAL INFORMATION AND SPECIFICATIONS Consulting Engineers TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM nhd-el-0000 2 de REF DWG(S) DRAWING NO HEET 2 OF 2 VPBD-EL-0000

STANDARD BLOCKS - ELECTRICAL



STANDARD ABBREVIATIONS - ELECTRICAL

	AMPERE	EIA	ELECTRONICS INDUSTRY ASSOCIATION	N	NEWTON	TIA	TELECOMMUNICATIONS INDUSTRY
CB	AIR CIRCUIT BREAKER	EJ	EXPANSION JOINT	N	NORTH	TRP	ASSOCIATION TRIP
3	AIR BREAK	EL	ELECTRICAL	NC	NORMALLY CLOSED	TURB	
3V	ABOVE	ELEV	ELEVATION	NCC	NORMALLY CLOSED CONTACT		TURBINE
2 .	ALTERNATING CURRENT	ENCL	ENCLOSURE	N/C	NO CONNECTION	TX	TRANSMIT
IJ	ADJUSTABLE	EQ	EQUAL	NIC	NOT IN CONTRACT	TYP	TYPICAL
JT	ADJACENT	EQUIP	EQUIPMENT	NO	NORMALLY OPEN	UG	UNDERGROUND
.T	ALTERNATE	EST	ESTIMATE	NOC	NORMALLY OPEN CONTACT	UNO	UNLESS NOTED OTHERWISE
	ALUMINUM	EXIST	EXISTING	NS	SYNCHRONIZING NEUTRAL	٧	VOLT
PRX	APPROXIMATE	F	FARAD	NTS	NOT TO SCALE	VA	VOLTAMPERE
	BUS	F	FUSE	OD	OUTSIDE DIAMETER	VA	PHASE A VOLTAGE
	BREAKER FAIL	FREQ	FREQUENCY	OUT	OUTPUT	VAR	REACTIVE POWER
	BREAKER FAIL INITIATE	FT	FEET	Р	REAL POWER OR PRIMARY	VB	PHASE B VOLTAGE
₹	BREAKER	FT	FEED THROUGH	PB	PUSH BUTTON	VAC	ALTERNATING CURRENT VOLTAGE
)G	BUILDING	FUT	FUTURE	PF	POWER FACTOR	VC	PHASE C VOLTAGE
	BLOCK	G	CONDUCTANCE OR GROUND	PLC	PROGRAMMABLE LOGIC CONTROLLER	VCB	VACUUM CIRCUIT BREAKER
	BOTTOM	GA	GAUGE	PM	PAD-MOUNT TRANSFORMER	VDC	DIRECT CURRENT VOLTAGE
Γ						VERT	VERTICAL
J	BRITISH THERMAL UNIT	GALV	GALVANIZED	PSSS	PROVIDER SWITCHYARD	VERT	
٧N	BETWEEN	GB	GROUND BUS	PT	POINT		VERIFY IN FIELD
	BACKUP	GCB	GAS CIRCUIT BREAKER	PT	POTENTIAL TRANSFORMER	VN	NEUTRAL VOLTAGE
	COLOUMB	GEN	GENERATOR	PVC	POLYVINYL CHLORIDE	VR	VOLTAGE REGULATOR
	CAPACITOR OR CAPACITANCE	GI	GALVANIZED IRON	PVMT	PAVEMENT	VREG	VOLTAGE REGULATOR
	CORRUGATED ALUMINUM PIPE	GND	GROUND	PWR	POWER	VS	SYNCHRONIZING VOLTAGE
	CENTER BREAK	GOAB	GANG OPERATED AIR-BREAK SWITCH	Q	REACTIVE POWER	VT	VOLTAGE TRANSFORMER
	CABLE	GRC	GALVANIZED RIGID CONDUIT	R	RESISTANCE OR RESISTOR	W	WEST
	CEMENT	GRD	GRADE. GRADING	RCLS	RECLOSE	W	WATT
	CUBIC FOOT	GRSC	GALVANIZED RIGID STEEL CONDUIT	RAD	RADIUS	W/	WITH
	CHECK	H	HENERY	RAD	RADIAN	w/o	WITHOUT
		HDPE		RD		x ×	REACTANCE
	CAST IRON		HIGH-DENSITY POLYETHYLENE		ROAD	XFMR	TRANSFORMER
	CAST IRON PIPE	HLO	HOT LINE ORDER	RE	REMOTE END	XMSSN	TRANSMISSION
)	CAST-IN-PLACE CONCRETE	HORIZ	HORIZONTAL	REF	REFERENCE		
	CIRCLE	HP	HORSEPOWER	REQD	REQUIRED	Υ	ADMITTANCE
	CIRCUIT	HZ	HERTZ	RET	REMOTE END TRIP	YL	YELLOW
	CLOCK	IA	PHASE A CURRENT	RET	RETURN	Z	IMPEDANCE
	CLOSE	IB	PHASE B CURRENT	REV	REVISION	2	TIME-DELAY
_	CIRCULAR MIL	IC	PHASE C CURRENT	RLY	RELAY	21	DISTANCE
5	CORRUGATED METAL PIPE	ID	INSIDE DIAMETER	RR	RAILROAD	25	SYNCHRONISM CHECK
3	COSINE	IN	INPUT	ROW	RIGHT OF WAY	27	UNDERVOLTAGE
1C ,	CONCRETE	IN	INCH	RTS	READY TO SEND	30	ANNUNCIATOR
				RTU	REMOTE TERMINAL UNIT	32	DIRECTIONAL POWER
IST	CONSTRUCTION	IN	NEUTRAL CURRENT			37	UNDERCURRENT OR UNDERPOWER
1T	CONTINUOUS	INCL	INCLUDE(D), INCLUDING	RX	RECEIVE		
ITR	CONTRACTOR	IND	INDUSTRY	S	APPARENT POWER	38	BEARING
		INT	INTERSECTION	S	SOUTH	40	FIELD
	CORRUGATED STEEL PIPE	INV	INVERT	S	SOURCE	43	MANUAL TRANSFER OR SELECTOR DE
	CURRENT TRANSFORMER	IP	POLARIZING CURRENT	S-L	SOURCE-LOAD	46	REVERSE-PHASE
L	CURROLSWITCHER OR CONTROL SWITCH	i	COMPLEX NUMBER	SA	SURGE ARRESTOR	47	PHASE-SEQUENCE VOLTAGE
	CLEAR TO SEND	, J	JOULE	SC	SWITCH CABINET	49	MACHINE OR TRANSFORMER THERMAL RELAY
	COPPER	JB	JUNCTION BOX	SEC	SECTION	50	INSTANTANEOUS OVERCURRENT
	DIRECT CURRENT	KA	KILOAMPRERE	SEC		51	AC TIME OVERCURRENT
	DATA CARRIER DETECT	KV KV	KILOVOLT	SEC	SECONDARY SERVICE	52	AC CIRCUIT BREAKER
						52a	NORMALLY OPEN BREAKER CONTACT
	DATA COMMUNICATIONS EQUIPMENT	KW	KILOWATT	SVC	STATIC VAR COMPENSATOR	52a 52b	NORMALLY CLOSED BREAKER CONTACT
	DOUBLE DEAD END	L	INDUCTANCE	SHT	SHEET		
	DEAD END	L	LINE	SIM	SIMILAR	59	OVERVOLTAGE
	DEMOLISH, DEMOLITION	L	LOAD	SIN	SINE	60	VOLTAGE BALANCE
IOB	DEMOBILIZE	LB	LOAD BREAK	SPEC	SPECIFICATION	63	PRESSURE SWITCH
	DETAIL	LGPP	LANDFILL GAS POWER PLANT	SPECS	SPECIFICATIONS	64	APPARATUS GROUND
	DISTURBANCE FAULT RECORDER	LT	LIGHT	SPSS	SPARTAN SUBSTATION	67	AC DIRECTIONAL OVERCURRENT
	DIGITAL INPUT	M	METER(S)	SS	SYNCHRONIZING SWITCH	68	BLOCKING
	DIAMETER	MAT	MATERIAL	STA	STATION	69	PERMISSIVE
:	DIAGONAL	MAX	MAXIMUM	STD	STANDARD	71	LEVEL SWITCH
		MFG	MANUFACTURER			74	ALARM
	DIMENSION			SW	SWITCH	7 4 76	DC OVERCURRENT
	DISTRIBUTION	MI	MILE	SWGR	SWITCHGEAR		
	DISTRIBUTED NETWORK PROTOCOL	MIN	MINIMUM	SYM	SYMMETRICAL	78	OUT-OF-STEP
	DIGITAL OUTPUT	MISC	MISCELLANEOUS	SYNCH	SYNCHRONIZE	79	RECLOSING RELAY
S	D STREET SUBSTATION	MM	MILLIMETER(S)	T	TIME OR TRANSFORMER	81	FREQUENCY
	DATA TERMINAL EQUIPMENT	MO	MOTOR OPERATED (OR)	TAN	TANGENT	85	CARRIER OR PILOT WIRE
	DRAWING	MOB	MOBILIZE	TCM	TRIP COIL MONITOR	86	LOCK OUT
					TELEPHONE	87	DIFFERENTIAL
	EACH	MTR MW	METER MEGAWATT	TEL TERM	TERMINAL	94	TRIPPING

CABLE # XX CABLE TAG - WIRING DIAGRAMS & 3-LINES

PROJECT: VENETIE RENEWABLE ENERGY DESIGN
DESIGNER/PROJECT ENGINEER: MAX DONALDSON/JOHN VENABLES

NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE

REVIEWED BY/DATE

PROTECTION, INSTRUMENTATION, OR AUTOMATION DEVICE

COIL OR ELEMENT

AMBER LIGHT

RED LIGHT

GREEN LIGHT
BLUE LIGHT

INCANDESCENT LIGHT

SHORTING BLOCK

CONNECTION POINT

TERMINATION CONNECTION POINT

POLARITY MARK (CURRENT TRANSFORMERS)

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

INPUT

 $\bigvee\bigvee$ RESISTOR



	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAMI
tems				
inc.				
53 82				
OM				REF DWG(S):

TANANA CHIEFS CONFERENCE
VENETIE RENEWABLE ENERGY
GENERAL INFORMATION AND SPECIFICATIONS

vpbd-el-0000_2.dwg

NOT FOR CONSTRUCTION

DRAWING NO.: VPBD-EL-0000

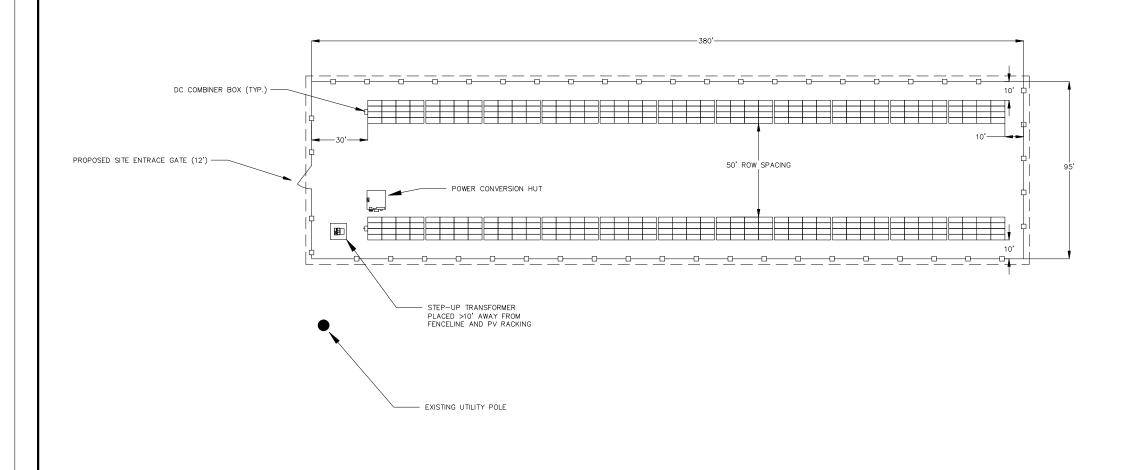
SHEET 2 OF 2

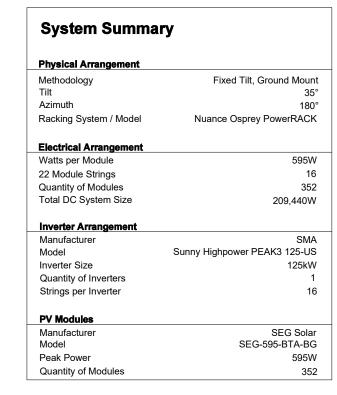


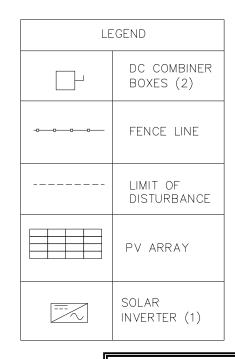
	LE	GEND
		DC COMBINER BOXES (2)
-0	0-0-0-	FENCE LINE
		LIMIT OF DISTURBANCE
		PV ARRAY
		SOLAR INVERTER (1)

NOT FOR CONSTRUCTION

PR DE:	OJECT: VENETIE RENEWABLE ENEGRY DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0173	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY	
NC	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			4	PV ARRAY LAYOUT DIAGRAM	
А	ISSUED FOR 35% REVIEW	MED/05-01-2025	JRV/05-01-2025		line.			_	FV ARRAI LAIOUI DIAGRAM	
В	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		Consulting Engineers					
					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM					vpbd-el-2500_2.dwg
					WEB: WWW.EPSINC.COM			REF DWG(S):		
								DRAWING NO.:	VDDD DI 0500	2 5
									VPBD-EL-2500	SHEET & OF 3

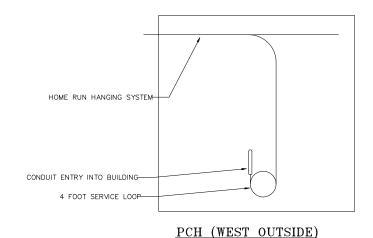


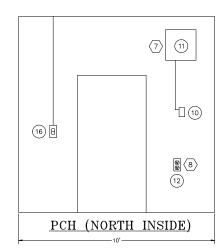


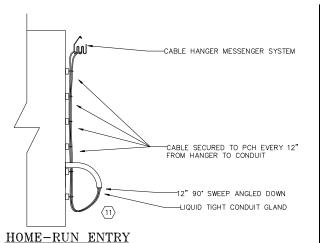


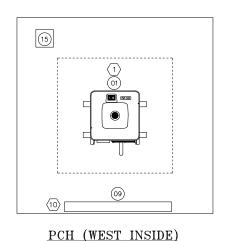
NOT FOR CONSTRUCTION

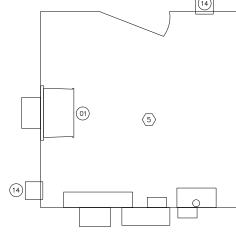
	OJECT: VENETIE RENEWABLE ENEGRY DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	25-0173	ENG. STAMP		NO. DRAWING I	NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY	
N	D. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems						
	A ISSUED FOR 65% REVIEW	MED/03-07-2025	JRV/03-07-2025		A VA					PV ARRAY LAYOUT DIAGRAM	
	ISSUED FOR 95% REVIEW	MED/04-29-2025	JRV/04-29-2025		Consulting Engineers						
	ISSUED FOR DISTRIBUTION DESIGN	MED/09-04-2025	JRV/09-04-2025		TEL: (907) 522-1953 FAX: (907) 522-1182						vpbd-el-2500_3.dwq
	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		WEB: WWW.EPSINC.COM				REF DWG(S):		
\vdash									DRAWING NO.:	VPBD-EL-2500	SHEET 3 OF 5
										TIDD EL SOUU	SHEET 3 OF 8

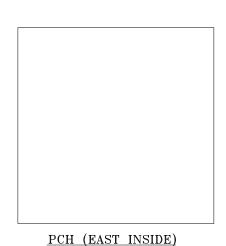


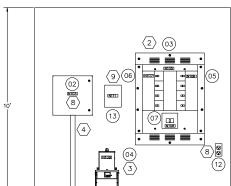




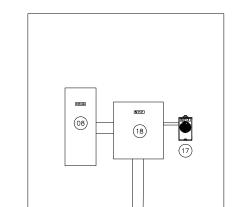








PCH (SOUTH INSIDE)



BUILDING MANUFACTURER TO PROVIDE PRE-FABRICATED METAL BUILDING PER FOLLOWING SPECIFICATIONS:

- STRUCTURAL:

 -ROOF PITCH: 3:12

 -ROOF DEAD LOAD 30PSF MINIMUM
- -MAX WALL LOAD: 220LBS (INVERTER)
 -MAX FLOOR LOAD: 210LBS (STATION SERVICE SUBSTATION)
- INSULATION:

 -WALL INSULATION: R22 MINIMUM

 -CEILING INSULATION: R30 MINIMUM

ALL INTERIOR CONDUITS SHALL BE GALVANIZED RIGID CONDUIT (GRC) OR ELECTRICAL METALLIC TUBING (EMT). EXTERIOR CONDUIT SHALL BE RIGID GALVANIZED CONDUIT ONLY. EMT TYPE COUPLERS AND FITTINGS SHALL BE RAIN—TIGHT COMPRESSION TYPE. GROUNDING BUSHINGS SHALL BE INSTALLED AT THE SOURCE END OF THE EMT CONDUIT RUNS FROM THE AC PANEL.

PCH (SOUTH OUTSIDE)

			BILL OF MATERIAL	
REF. NO.	UNIT	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.
01)	EA	1	SUNNY HIGHPOWER PEAK3-125KW	SMA/SHP 125-US-21
02	EA	1	COMMUNICATION PANEL	SEE REF. 1
03	EA	1	POWER DISTRIBUTION PANELBOARD	SQUARED/HCJ23734M
04)	EA	1	STATION SERVICE SUBSTATION, 10kVA	HAMMOND/M1PC010LESF
05)	EA	1	200A CIRCUIT BREAKER	
06	EA	1	30A/2P CIRCUIT BREAKER	
07	EA	1	200A MAIN CIRCUIT BREAKER	
08)	EA	1	200A LOAD BREAK DISCONNECT	
09	EA	1	ELECTRIC BASEBOARD HEATER, 1000W, 120VAC W/ BUILD-IN THERMOSTAT	
10	EA	1	ADJUSTABLE THERMOSTAT	
(11)	EA	1	WALL MOUNT SHUTTER FAN, >2500CFM, 120VAC W/ DAMPER MOTOR CONTROLLED BY THERMOSTAT	
(12)	EA	2	GFCI RECEPTACLE	
13	EA	1	SHARK 250 SELF-ENCLOSED METER ASSEMBLY	ELECTRO INDUSTRIES /ENCSHK250-277-60-10-V3-D2-INP100S-X
14)	EA	2	90° VENTILATION HOOD WITH INSECT SCREEN	
15)	EA	1	10" MOTORIZED INTAKE DAMPER	
16	EA	1	LIGHT SWTICH	
17	EA	1	600V 20A METER SOCKET W/SELF-SHUNTING BYPASS	MILBANK/UC7237-XL
18	EA	1	400A CT ENCLOSURE	

- 1 MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4" AWAY FROM THE WALL, AND 20" ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES.
 MAINTAIN 4' WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. PROVIDE A 4" X 4" WIREWAY (MINIMUM) BETWEEN INVERTERS AND PANELBOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARD SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARD AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- 3 MOUNT STATION SERVICE SUBSTATION SUCH THAT ALL MANUFACTURER RECOMMENDED CLEARANCE ZONES AWAY FROM EQUIPMENT IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE ZONE IN FRONT OF THE DEVICE, PER NEC
- $\stackrel{\textstyle \longleftarrow}{4}$ route conduits such that the stub-up area is directly under all destination devices in the power conversion hut
- $\stackrel{\textstyle <}{\footnotesize \sim}$ provide ceiling mounted lighting such that 30 footcandles is maintained. Mount light switch next to door at least 40" from floor.
- (6) ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- (7) VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY A WEATHERPROOF 120VAC EXHAUST FAN WITH A MINIMUM FLOW RATE OF 2500CRFM, CONTROLLED BY AN ADJUSTABLE THERMOSTAT FOR FAN OPERATION OF INTERIOR AIR TEMPERATURES OF 35°C AND ABOVE, AND BY A 10° MOTORIZED INTAKE DAMPER. EXHAUST SHALL BE PROVIDED WITH A 90° EXTERIOR HOOD WITH A
- (8) MOUNT RECEPTACLES ON INSIDE WALLS OF PCH AT LEAST 18" FROM FLOOR. MOUNT ONE RECEPTACLE ON EAST SIDE OF DOOR (NORTH WALL), AND ONE RECEPTACLE NEXT TO POWER DISTRIBUTION PANELBOARD (SOUTH WALL).
- \bigcirc Connect shark 250 current transformers and potential transformers to the 400a output breaker at power distribution panelboard through a 1" conduit.
- \bigcirc HEATING TO BE PROVIDED BY ELECTRIC BASEBOARD HEATER WITH BUILT-IN THERMOSTAT. HEATER OT TURN ON BELOW 10 F.
- (11) HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES. ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON—SITE.

NOT FOR CONSTRUCTION

PROJECT: VENETIE RENEWABLE ENERGY DESIGN ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173 JRV/04-29-2025 SUED FOR 95% REVIEW MED/04-29-2025 SSUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025

TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM

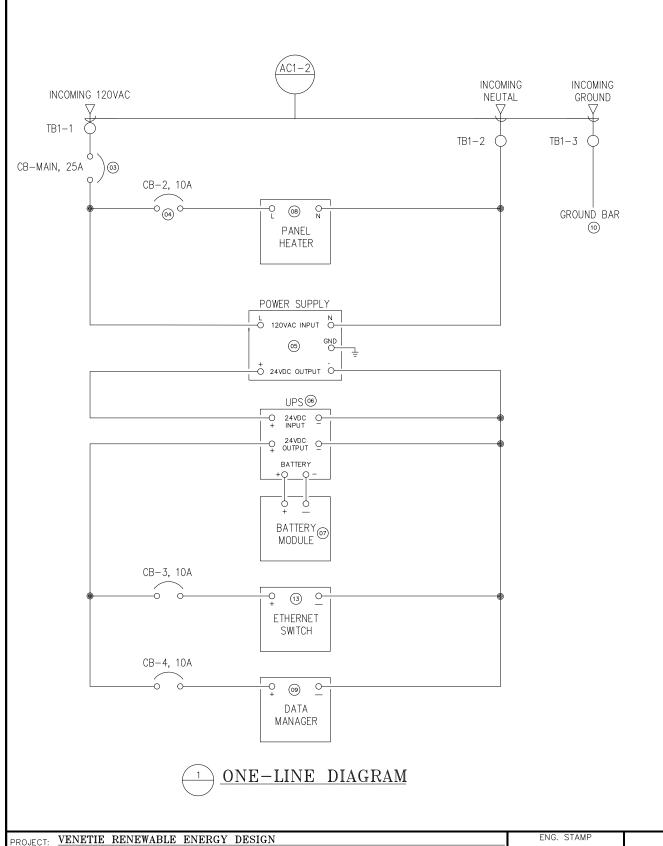
DRAWI	REFERENCE DRAWING DESCRIPTION	DRAWING NO./SHEET	NO.
	COMMUNICATIONS PANEL DETAILS	VPBD-EL-2500/4	1
	EQUIPMENT NAMEPLATE SCHEDULE	VPBD-EL-2000/5	2
REF D			

TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY POWER CONVERSION HUT LAYOUT DIAGRAM

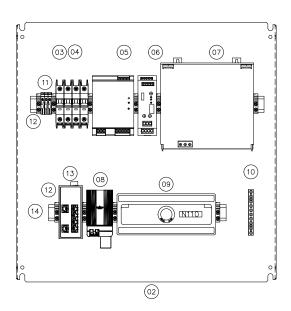
VPBD-EL-2500

vnhd-el-2500 4 de

SHEET 4 OF 5







BILL OF MATERIAL EST. QTY. DESCRIPTION

24" X 24" X 10" NEMA 1 MILD STEEL
WALL MOUNTED ENCLOSURE MFGR./CATALOG NO. EF. NO. UNIT 01) EA 2 02 INNER PANEL FOR 24X24X10 ENCLOSURE EΑ 03) 25A, 600V UL489 1-POLE BREAKER 04) 10A, 600V UL489 1-POLE BREAKER 05) PHOENIX CONTACT 120VAC/24VDC PS, 20 AMP PHOENIX CONTACT/ 2866776 06) PHOENIX CONTACT 20 AMP UPS EΑ PHOENIX CONTACT/ 2320238 07 EΑ PHOENIX CONTACT 12 Ah BATTERY PHOENIX CONTACT/ 1274119 08 150W PANEL HEATER W/BUILT IN REGULATION ON: 41°F - OFF: 59 STEGO/06021.0-00 EΑ EΑ SMA/EDMM-20 DATA MANAGER (10) UL467 GROUND BAR, 6 POLE MINIMUM 11) EA 6MM DINRAIL MOUNTED TERMINAL BLOCK (12) EA 6MM DINRAIL MOUNTED TERMINAL BLOCK END STOP 13 EA UNMANAGED ETHERNET SWITCH, 2 FIBER PORTS | MOXA/EDS-G308-2SPF 14)



PANEL BOM

1 35MM DIN MOUNTING RAIL

EΑ

- NOTES:

 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IN THE CENTER COLUMN, AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- $\fbox{2}$ PROVIDE 1 SPARE CIRCUIT BREAKER FOR EACH SIZE (REF. NO. 3, AND RE. NO. 4) AND STORE IN BOTTOM OF ENCLOSURE

PANEL ELEVATION - INSIDE

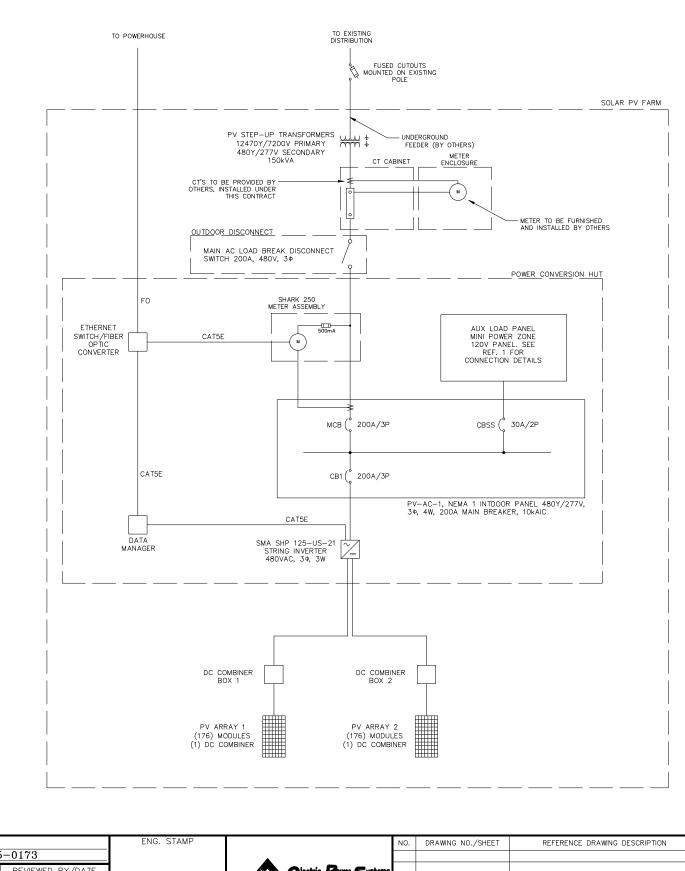
1: 4 - 1" = 4"

8

NOT FOR CONSTRUCTION

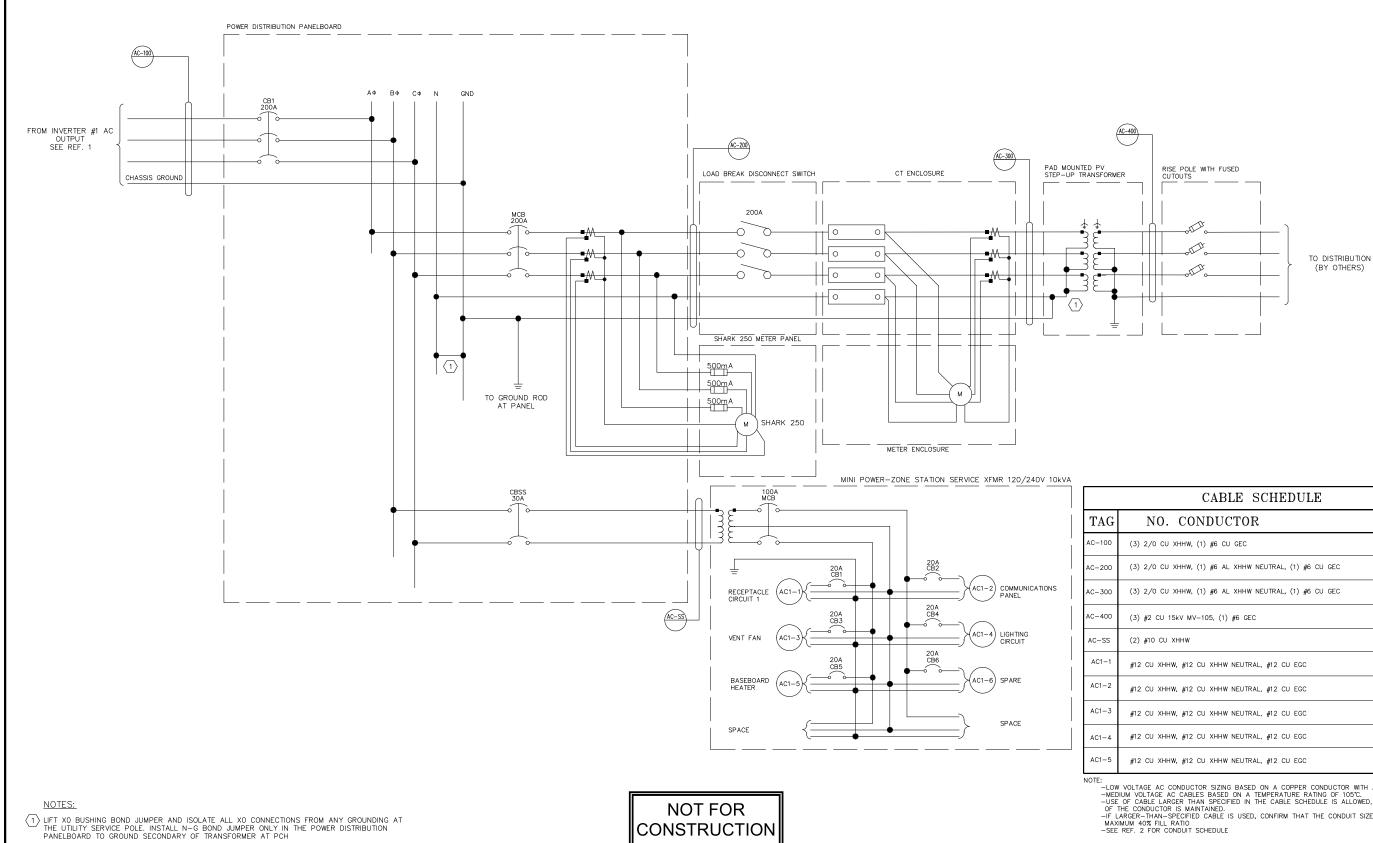
 $\langle 1 \rangle$

PR DE	PROJECT: VENETIE RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173				_	NO.	DRAWING NO./SHEET VPBD-SS-2000/5	REFERENCE DRAWING DESCRIPTION EQUIPMENT NAMEPLATE SCHEDULE	DRAWING NAME:	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY	
NO	. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems					COMMUNICATIONS PANEL	
_ /	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		Consulting Engineers				-		
					TEL: (907) 522-1953				-	DETAILS	vpbd-el-2500_5.dwg
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		vpbd-ei-2500_5.dwq
									_		
									DRAWING NO.:	VPBD-EL-2500	SHEET 5 OF 5



NOT FOR CONSTRUCTION

PRO DES	JECT: VENETIE RENEWABLE ENEGRY DESIGN IGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO DESIGN/CONSTRUCTION/ASBUILT REVISION	ENG. STAMP	Plectric Power Systems	NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY SITE			
A B	ISSUED FOR 35% REVIEW ISSUED FOR PV CONSTRUCTION BID	MED/ 05-01-2025 GGL/10-08-2025	JRV/ 05-01-2025 MED/10-08-2025		Consulting Engineers TEL: (907) 522–1953 FAX: (907) 522–1182 WE: WWKEPSINC.COM			_	ONELINE DIAGRAM	vpbd-el-0010_1.dwq
					FAX: (907) 522-1162 WEB: WWW.EPSINC.COM			REF DWG(S): DRAWING NO.:	VPBD-EL-0010	SHEET 1 OF 1



E:

-LOW VOLTAGE AC CONDUCTOR SIZING BASED ON A COPPER CONDUCTOR WITH A TEMPERATURE RATING OF 75°C.

-MEDIUM VOLTAGE AC CABLES BASED ON A TEMPERATURE RATING OF 105°C.

-USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE TEMPERATURE RATING OF THE CONDUCTOR IS MAINTAINED.

-IF LARGER-THAN-SPECIFIED CABLE IS USED, CONFIRM THAT THE CONDUIT SIZE IN THE ASSOCIATED RACEWAY MAINTAINS A MAXIMUM 40% FILL RATIO

-SEE REF. 2 FOR CONDUIT SCHEDULE

ENG. STAMP

DRAWING NAM	REFERENCE DRAWING DESCRIPTION	DRAWING NO./SHEET	NO.
	PV ARRAY DC WRING DIAGRAM	VPBD-EL-0011/1	1
	WIREWAY DETAILS	VPBD-EL-2000/2	2
REF DWG(S):			

TANANA CHIEFS CONFERENCE VENETIE RENEABLE ENERGY SITE

THREE-LINE DIAGRAM

RAWING NO.: VPBD-EL-0100 SHEET 1 OF 1

RACEWAY C-0111

C-0112

C-1

C-2

1/2" EMT

1/2" EMT

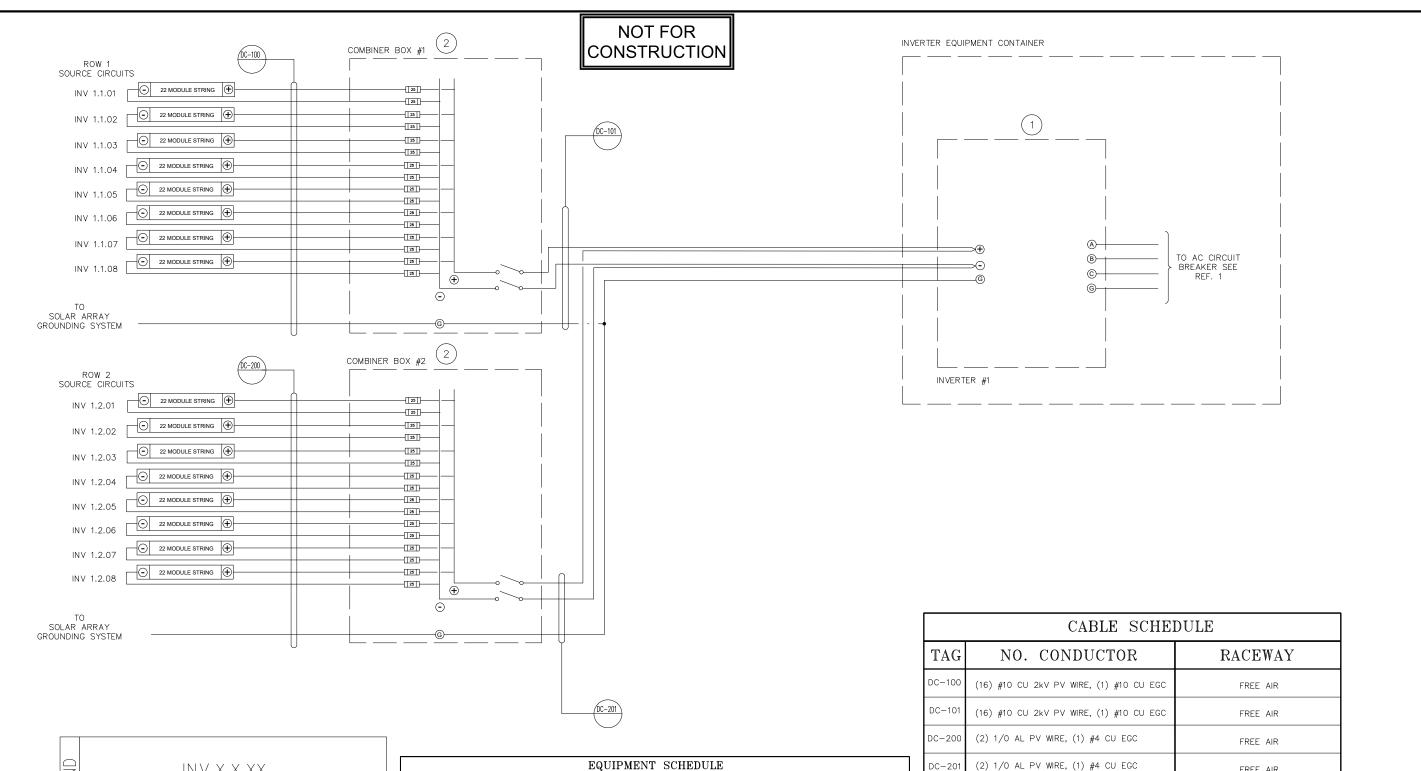
1/2" EMT

1/2" EMT

1/2" EMT

vnbd-el-0100 1 d

PROJECT: VENETIE RENEWABLE ENEGRY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173							
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE				
Α	ISSUED FOR 35% REVIEW	MED/ 05-01-2025	JRV/ 05-01-2025				
В	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025				

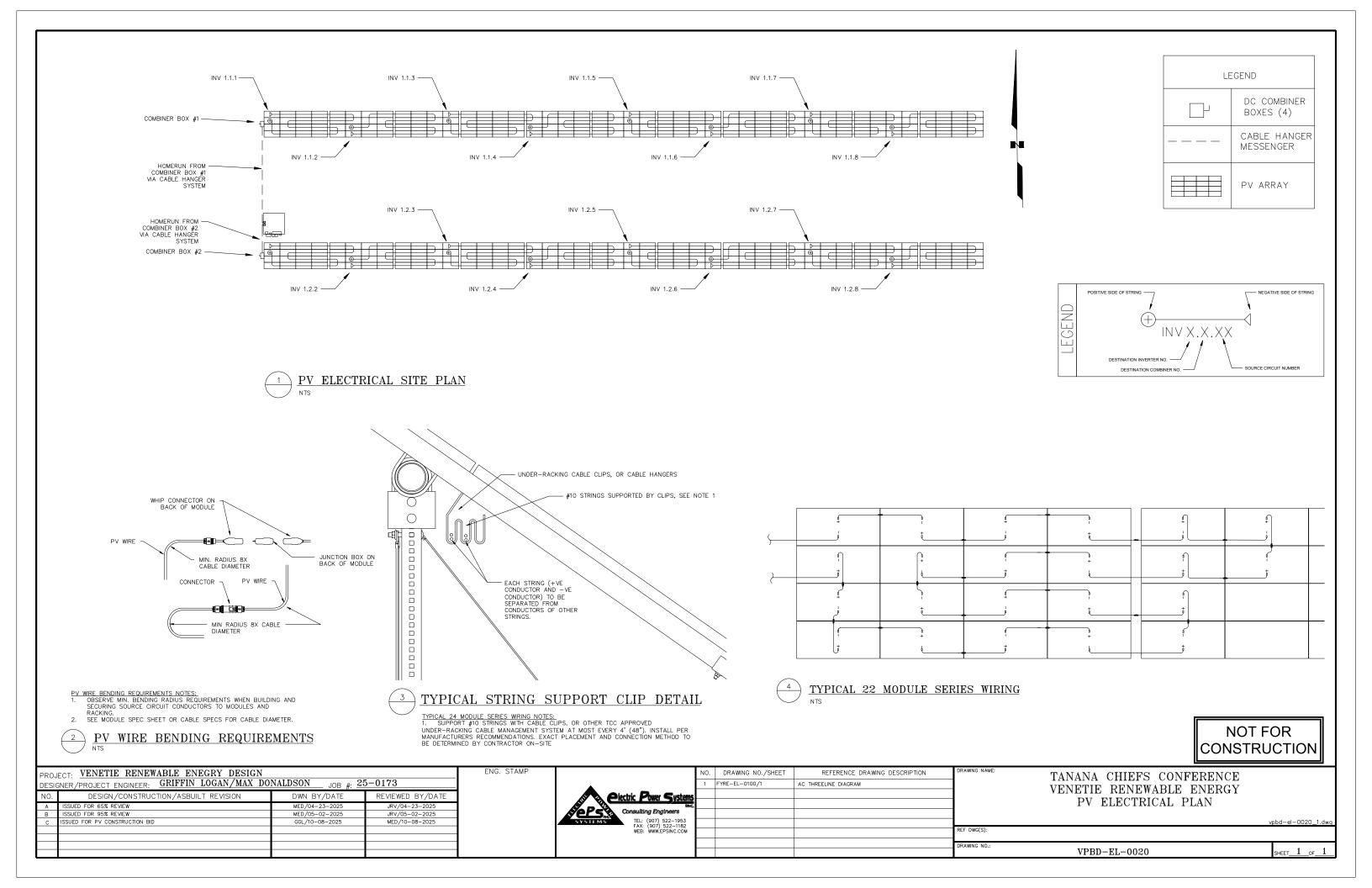


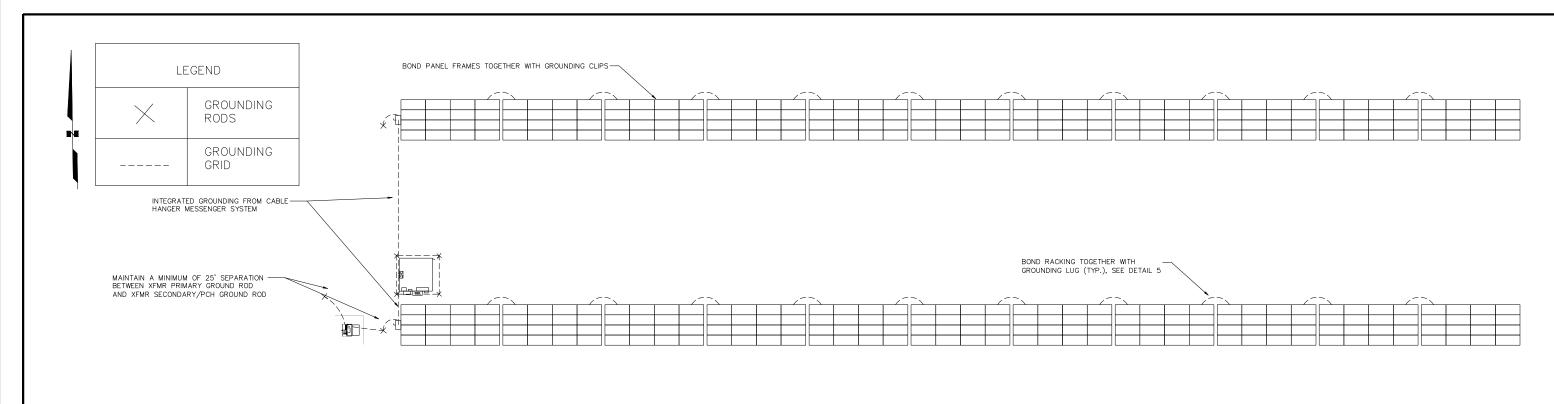
		EQUIPMENT SCHEDULE
TAG	QUANTITY	DESCRIPTION
1	1	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US
2	2	16 INPUT DC COMBINER; TERRASMART FSFT275-16-25-N4-CD OR EQUIVALENT

	CABLE SCHEDULE							
TAG	NO. CONDUCTOR	RACEWAY						
DC-100	(16) #10 CU 2kV PV WIRE, (1) #10 CU EGC	FREE AIR						
DC-101	(16) #10 CU 2kV PV WIRE, (1) #10 CU EGC	FREE AIR						
DC-200	(2) 1/0 AL PV WIRE, (1) #4 CU EGC	FREE AIR						
DC-201	(2) 1/0 AL PV WIRE, (1) #4 CU EGC	FREE AIR						

- 1) DC STRING CONDUCTOR SIZING BASED ON CU UL4703 2KV PV WIRE WITH A TEMPERATURE RATING OF 90°C
- 2) DC CABLE SIZING FOR HOME-RUNS BASED ON AL 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C IN FREE AIR (TABLE 310.15(B)(17)) AND A VOLTAGE DROP OF LESS THAN 2%. USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE CONDUCTOR DESCRIPTION IS MAINTAINED.

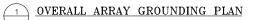
PRC DES	JECT: VENETIE RENEWABLE ENEGRY DESIGN IGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	25-0173	ENG. STAMP		NO. DRAWING NO./SHEET 1 VPBD-EL-0100/1	REFERENCE DRAWING DESCRIPTION AC THREE LINE DIAGRAM	DRAWING NAME:	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			_	PV ARRAY DC WIRING DIAGRAM	
A	ISSUED FOR 65% REVIEW	MED/03-07-2025	JRV/03-07-2025		Consulting Engineers			_	FV AIMAI DO WIMING DIAGNAM	
В	ISSUED FOR 95% REVIEW	MED/04-29-2025	JRV/04-29-2025							
С	RE-ISSUED FOR 95% REVIEW	MED/04-30-2025	JRV/04-30-2025		TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM					vpbd-el-0011_1.dwg
D	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		WEB: WWW.EPSINC.COM			REF DWG(S):		
								_		
								DRAWING NO.:		4 4
									VPBD-EL-0011	SHEET 1 OF 1

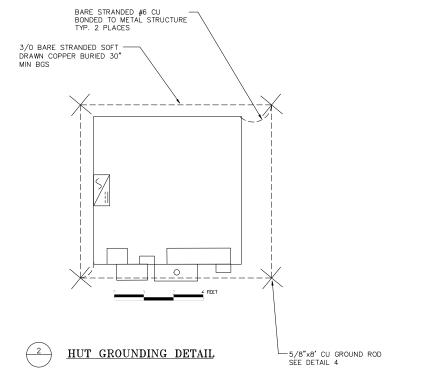


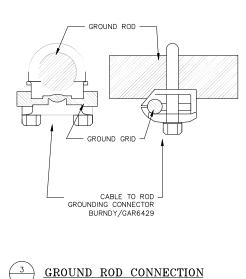


GROUNDING PLAN NOTES:

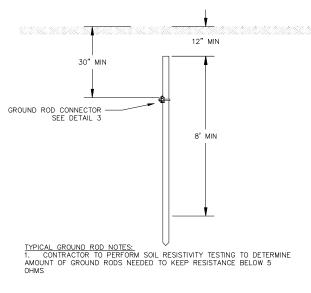
- CONTRACTOR TO TEST EACH GROUNDING ELECTRODE USING THE FALL OF POTENTIAL TEST. GROUND RODS SPACED 6' MIN APART SHALL BE ADDED AS NECESSARY UNTIL A RESISTANCE TO GROUND VALUE OF 25 OHMS OR LESS IS ACHIEVED.
 MIN. BARE COPPER GROUND WIRE SIZE SHALL BE #6.



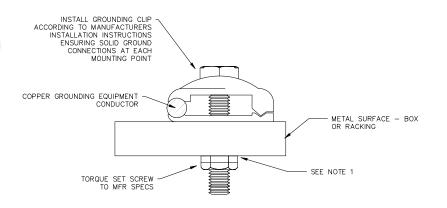




ENG. STAME







TYPICAL METAL RACKING GROUNDING NOTES:

1. PRIOR TO MOUNTING LUGS ON ANODIZED ALUMINUM OR PAINTED METAL SURFACES, THE SURFACE MUST BE STRIPPED AND THEN COVERED WITH BURDNY PENETROX A-13 ANTI-OXIDANT COMPOUND BELOW THE LUG TO ENSURE CONDUCTIVITY

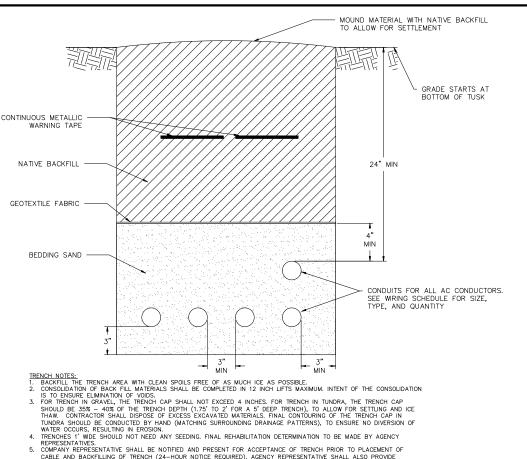
2. ON ANODIZED AL SURFACES, THE ANODIZATION SHALL BE GROUND OFF.

3. ON PAINTED SURFACES, THE PAINT LAYER SHALL BE GROUND OR SCRATCHED OFF.

- (5) TYPICAL METAL RACKING BONDING

NOT FOR CONSTRUCTION

VENETIE RENEWABLE ENERGY DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION PROJECT: TANANA CHIEFS CONFERENCE DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173 VENETIE RENEWABLE ENERGY DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE GROUNDING PLAN Consulting Engineers TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM vnhd-ss-2000 1 dv REF DWG(S): DRAWING NO.: SHEET 1 OF 6 VPBD-SS-2000

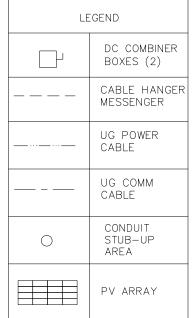


- CABLE AND BACKFILLING OF TRENCH (24—HOUR NOTICE REQUIRED). AGENCY REPRESENTATIVE SHALL ALSO PROVIDE ACCEPTANCE OF CABLE PRIOR TO BACKFILLING.

 6. BEDDING SHALL BE 3/8" MINUS MATERIAL, NO CRUSHED OR SHARP ROCK. BEDDING MATERIAL SHALL NOT BE MACHINE COMPACTED WITHIN 6" OF CABLES. SLURRY OF A COMPOSITION THAT WILL NOT DAMAGE THE CABLE IS AN ACCEPTABLE DECORDS. UNITRIM.
- BEDDING MATERIAL.

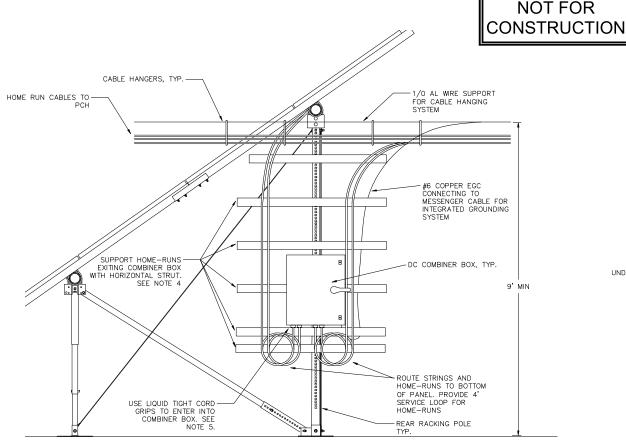
 7. MAINTAIN 1' MIN. SEPARATION BETWEEN POWER CONDUCTORS AND COMMUNICATION CABLES

1 TYPICAL CONDUIT TRENCH



- $\langle 1 \rangle$ Trade Size of conduits shown in conduit schedule are minimum sizes based on Nec CONDUIT FILL % (CHAPTER 9 TABLE 1). USE OF CONDUIT THAT IS LARGER IN TRADE SIZE THAN SPECIFIED IN CONDUIT SCHEDULE IS PERMITTED.
- $\fbox{2}$ IT is the responsibility of the contractor to confirm product dimensions, and route conduits to appropriate stub-up areas.
- $\begin{tabular}{lllll} \hline $\langle 3 \rangle$ conduit and wireway routing shown on drawing is for illustrative purposes only. \\ \hline $\rm EXACT WIREWAY ROUTING TO BE DETERMINED BY CONTRACTOR ON-SITE. \\ \hline \end{tabular}$

ENG. STAME



TYPICAL COMBINER BOX DETAIL

NIS

TYPICAL COMBINER BOX DETAIL NOTES:

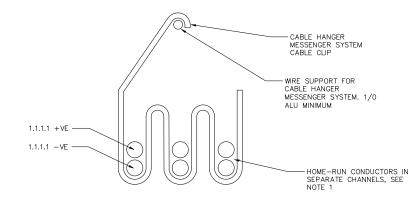
1. ENSURE THAT CABLES ROUTED FROM HANGING SYSTEM TO COMBINER BOXES DO NOT EXCEED CONDUCTOR BENDING RADIUS

2. INSTALL CABLE HANGING SYSTEM ACCORDING TO MANUFACTURERS INSTALLATION INSTRUCTIONS

3. CONTRACATOR TO DETERMINE MOST SUITABLE MOUNTING SOLUTION FOR OVERHEAD CABLE MANAGEMENT SYSTEM

4. SUPPORT DC CABLES EXTINGS THE DC COMBINER BOX WITH A UV RESISTANT, OUTDOOR RATED CABLE TIE CONNECTED TO A HORIZONTAL STRUCT. INSTALL CLOSEST CABLE SUPPORT A DISTANCE OF NO MORE THAN "2" AWAY FROM THE COMBINER BOX, AS MEASURED BY THE CABLE PATH. SUPPORT BUSPORTS DETAIL SUPPORTED BY CABLE HANGER MESSENGER SYSTEM. SUPPORT STRINGS EVERY 12" UNIT SUPPORTED BY CABLE HANGER MESSENGER

5. USE A LIQUID TIGHT CORD GRIP OR CABLE GLAND FOR HOME—RUNS AND STRINGS WHEN ENTERING COMBINER BOX.



4 TYPICAL HOME-RUN CABLE HANGER DETAIL

- TYPICAL HOME—RUN CABLE HANGER DETAIL NOTES:

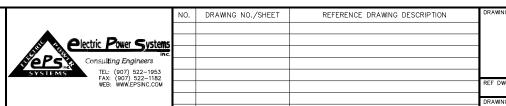
 1. HOME—RUN CONDUCTORS oF DIFFERENT CIRCUITS TO BE ROUTED IN SEPARATE CHANNELS IN CABLE HANGER MESSENGER SYSTEM. THE +VE AND -VE CONDUCTORS OF A SINGLE HOME—RUN CIRCUIT MAY BE ROUTED IN THE SAME CHANNEL.

 2. INSTALL CABLE HANGERS IN REGULAR INTERVALS AS DIRECTED BY MANUFACTURERS INSTALLATION INSTRUCTIONS, OR, A
- DISTANCE OF NO MORE THAN 5' APART FROM EACH OTHER. IF HOME-RUNS AND STRINGS ARE ROUTED IN THE SAME CABLE HANGER MESSENGER SYSTEM, SEPARATE HOME—RUNS AND STRINGS IN SEPARATE CHANNELS.

ф	
CABLE————————————————————————————————————	
UNDERGROUND CONDUIT TO PAD MOUNT TRANSFORMER 2 C-1	
FIBER OPTIC CONDUIT TO RISER POLE UNDERGROUND CONDUIT TO RISER POLE	
SITE WIREWAY LAYOUT	

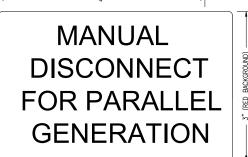
	CONDUIT SCHEDULE 1							
TAG	FUNCTION	CONDUIT TYPE	TRADE SIZE					
C-0111	INV1 TO CB1	EMT	2"					
C-0112	MCB1 TO LBDS	PVC	2"					
C-1	LBDS TO XFMR1	PVC	2"					
C-2	XFMR1 TO POLE	PVC	3"					
C-3	COMM PANEL TO POLE	HDPE	1"					

PROU DESIG	PROJECT: VENETIE RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173							
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE					
В	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025					



TANANA	CHIEFS	CON	FERENCE
VENETIE	RENEWA	BLE	ENERGY
W	REWAY 1	DETA	ILS

WINDWA	1 DETAILS	
	vpbd-ss-2000_2.dwg	q
DWG(S):		7
ING NO.:		-
VPBD-SS-20	$_{SHEET}$ $_{OF}$ $_{OF}$ $_{OF}$	_



LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. LABEL TO BE ENGRAVED PLASTIC. (1) TOTAL

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM GENERATION METER. (1) TOTAL

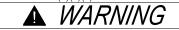
NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC DISCONNECT AND POWER SOURCE RATED OUTPUT CURRENT: 151A NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. (1) TOTAL

NEC 2023 705.12(B)(3)(3)



TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE. SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (1) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 985VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (2) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

> **NOT FOR** CONSTRUCTION

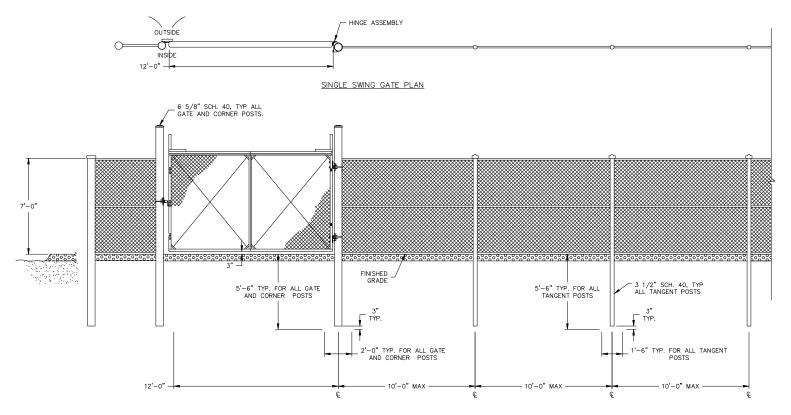
PROJECT: VENETIE RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING
ems				
inc.				
7				
32				REF DWG
MC				KEL DWG

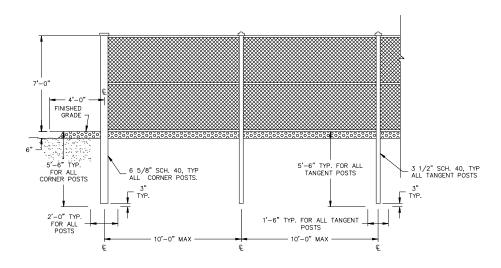
TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY EQUIPMENT SAFETY LABEL SCHEDULE

VPBD-SS-2000

SHEET 3 OF 6







2 CORNER/TERMINAL FENCE POST ELEVATION

NOT FOR CONSTRUCTION

PROJECT: VENETIE RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173	ENG. STAMP	NO. DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE	electric Power Systems	<u> </u>	SITE FENCING
A ISSUED FOR PV CONSTRUCTION BID GGL/10-08-2025 MED/10-08-2025	Consulting Engineers		DETAILS
	SYSTEMS TEL: (907) 522-1953 FAY: (907) 522-1182		DETAILS vpbd-ss-2000_4.dwq
	FAX: (907) 522-1182 WEB: WWW.EPSINC.COM	R	EF DWG(S):
		DF	PRAWING NO.:
			VPBD-SS-2000 SHEET 4 OF 6

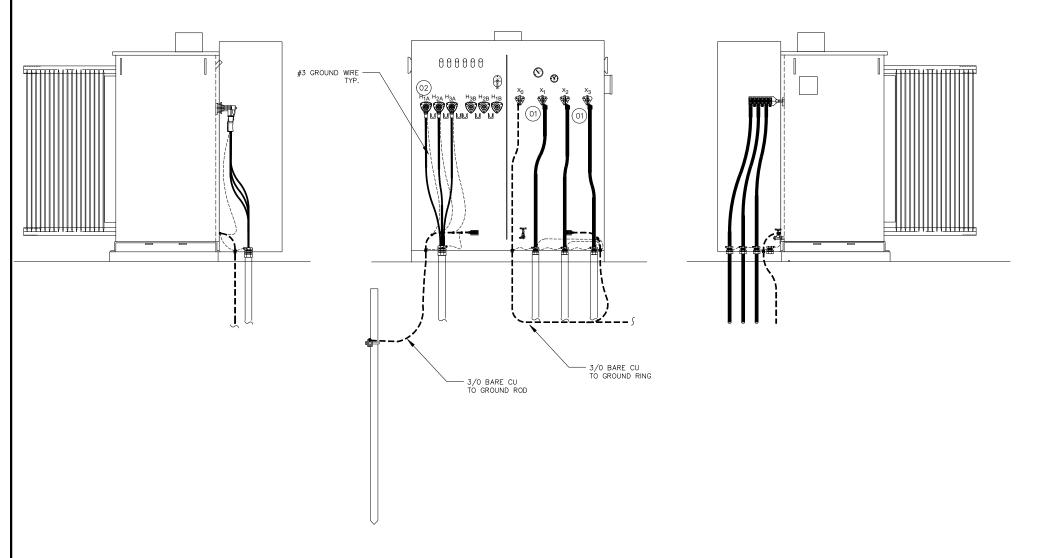
NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1			2 x 4	3/8
N101	1	DC COMBINER	BOX 1		2 x 4	3/8
N102	1	DC COMBINER	BOX 2		2 x 4	3/8
N103	1	COMMUNICATIONS	PANEL		2 x 4	3/8
N104	1	200A	MAIN AC PANEL		2 x 4	3/8
N105	1	POWER DISTRIBUTION	PANELBOARD		2 x 4	3/8
N106	1	CB 1			1 x 3	1/8
N107	1	CB SS			1 x 3	1/8
N108	1	MCB			1 x 3	1/8
N109	1	120V STATION SERVICE PANEL			2 x 4	3/8
N110	1	DATA MANAGER			1 x 3	1/8
N111	1	METER PANEL			2 x 4	3/8
N112	1	CT ENCLOSURE			2 x 4	3/8
N113	1	METER ENCLOSURE			2 x 4	3/8

NOTES

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WTH WHITE TEXT.
- 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
- 7) ALL DIMENSIONS SHOWN IN INCHES.

NOT FOR CONSTRUCTION

PRC DES	JECT: VENETIE RENEWABLE ENERGY DESIGN GNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0173	ENG. STAMP		NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems					EQUIPMENT NAMEPLATE SCHEDULE	
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025		Consulting Engineers				-	EQUIPMENT NAMEPLATE SCREDULE	
									1		vobd-ss-2000 5.dwa
					TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM				REF DWG(S):		
									DRAWING NO.:		
									DIVAMINO NO.	VPBD-SS-2000	SHEET 5 OF 6



ENG. STAMP

		BILL OF MATERIA	L
REF. NO.	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.
01)	-	CABLE LUG, NEMA 2-HOLE, 4/0 AWG CU	BURNDY/YA282N
02	-	CONNECTOR, COMPRESSION, 4/0 CU TO #6-#2 CU	BURNDY/YGHC29C26
03)			
04)			
05)			
06)			
07			
08			
09			
10			
(11)			
(12)			
13)			
14)			
(15)			
16)			
17)			
(18)			
19			
20			
21)			
22)			
23)			
24)			
25)			
26)			
27)			
28)			
29			
(30)			

NOT FOR CONSTRUCTION

PROJECT: VENETIE RENEWABLE ENERGY DESIGN
DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE
A ISSUED FOR PV CONSTRUCTION BID

GGL/10-08-2025

MED/10-08-2025

Consulting Engineers
FAX: (907) 522-1953
FAX: (907) 522-1182
WEB: WWW.EPSINC.COM

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME
<u> 115</u>				
Ž.				
				REF DWG(S):
				DRAWING NO.:

TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY TRANSFORMER DETAILS

vpbd-ss-2000_6

VPBD-SS-2000 SHEET__6_OF__6

С	ircuit Informa	ıtion						El	ectrical calcu	lations								System In	formation	
Destination Inverter No.	Destination Combiner No.	Source Circuit No.	Modules (#)	Open Circuit Voltage (VOC)	Maximum Power Voltage (Vmp)	Short Circuit Current (Isc)	Continuous Current (1.25*Isc)	Irradiance Current (1.25*CC)	Mininum Fuse Size (A)	Selected Fuse Size (A)	Minimum Wire Ampacity (A)	Selected String Wire Size (cu 2kV PV Wire, 90°C, <2% Voltage Drop, AWG)	Distance	Voltage Drop (V)	Voltage Drop (%)	Circuit In from to	formation	Continuous Current (A)	Minimum Wire Ampacity From Selected Device (A)	Selected Wire Size (AL 2KV PV Wire, 75°CM <2% Voltage Drop, AWG)
1	1	1	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	310	17.48	1.77	DS1	INV1	174.88	175	1/0
1	1	2	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	270	15.23	1.55	DS2	INV1	174.88	175	1/0
1	1	3	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	225	12.69	1.29					
1	1	4	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	185	10.43	1.06					
1	1	5	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	140	7.90	0.80					
1	1	6	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	100	5.64	0.57					
1	1	7	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	50	2.82	0.29					
1	1	8	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	5	0.28	0.03			PANEL CHARA	CTERISTICS	
1	2	1	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	310	17.48	1.77			Voc (V)	52.58	
1	2	2	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	270	15.23	1.55			Voc Coef. (%/°C)	-0.25	
1	2	3	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	225	12.69	1.29			Vmp (V)	44.64	
1	2	4	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	185	10.43	1.06			Pmax Coef. (%/°C)	-0.3	
1	2	5	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	140	7.90	0.80					
1	2	6	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	100	5.64	0.57			SITE CHARAC	TERISTICS	
1	2	7	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	50	2.82	0.29			T_Amb Min (°C)	-45	
1	2	8	22	1359	985.0	13.99	17.49	21.86	21.86	25	25	10	5	0.28	0.03			T_Amb Max (°C)	24	

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

NOT FOR CONSTRUCTION

PROJ DESIG	PROJECT: VENETIE RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0173								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE						
	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025						
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-08-2025	MED/10-08-2025						

ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DIVINITO HAME.
ems				
inc.				
3 32 DM				
Й				REF DWG(S):
				25.1111.0
				DRAWING NO.:

TANANA CHIEFS CONFERENCE VENETIE RENEWABLE ENERGY PV STRING CALCULATIONS

VPBD-SS-0700 SHEET 1 OF 1

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY DESIGN ISSUED FOR PV CONSTRUCTION BID





BESS DRAWINGS NOT — INCLUDED IN THIS

		GRAY	LING	
DRAW	ING INDEX			SCOPE OF WORK
TITLE	DRAWING NUMBER	SHEET	REVISION	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM IN GRAYLING, AK.
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	GRRE-EL-0000	1	С	THE SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	GRRE-EL-0000	2	С	2 STRING INVERTERS MOUNTED INSIDE A CONTAINER. THE BATTERY
				MODULES AND INVERTER WILL BE HOUSED INSIDE A CONTAINER AND HAVE SELF—SERVING AUXILIARY LOADS: BOTH SYSTEMS WILL
-SITE LAYOUT DIAGRAM	GRRE-EL-2500	1	D-	OPERATE IN PARALLEL WITH THE LOCAL UTILITY AND HAVE RELATED
SITE LAYOUT - PV	GRRE-EL-2500	2	D	ELECTRICAL SAFETY AND METERING SYSTEMS.
-SITE LAYOUT - BESS LAYOUT DIAGRAM	GRRE-EL-2500	3	С—	
SITE LAYOUT - INTERCONNECTION	GRRE-EL-2500	4	С	SYSTEM SUMMARY
SITE LAYOUT - POWER CONVERSION HUT	GRRE-EL-2500	5	С	PV SYSTEM SIZE: 285.60kWdc / 250kWac
SITE LAYOUT - COMMUNICATIONS PANEL	GRRE-EL-2500	6	A	INTERCONNECTION VOLTAGE: 12.47kV, 3 PHASE, 4 WIRE
ONE LINE DIAGRAM	GRRE-EL-0010	1	D	
ONE ENTE BINORYMI	SINIE EE SSIS	,		
THREE LINE DIAGRAM	GRRE-EL-0100	1	С	GENERAL NOTES
PV ARRAY DC WRING DIAGRAM	GRRE-EL-0011	1	D	ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND LICENSED ELECTRICAL CONTRACTOR.
PV ELECTRICAL SITE PLAN	GRRE-EL-0020	1	С	LICENSED ELECTRICAL CONTRACTOR.
				CONTRACTOR WILL FOLLOW IBC 2021 AND NFPA 70 NEC 2023 AS WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY
GROUNDING PLAN	GRRE-SS-2000	1	С	CODES, ORDINANCES AND REGULATIONS.
CONDUIT DETAILS	GRRE-SS-2000	2	В	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC
EQUIPMENT SAFETY LABEL SCHEDULE	GRRE-SS-2000	3	В	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL
SITE FENCING DETAILS	GRRE-SS-2000	4	A	BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE MANNFR.
EQUIPMENT NAMEPLATE SCHEDULE	GRRE-SS-2000	5	A	DDIOD TO INICTALLATION THE CONTRACTOR CHAIL HINDERCTAND ALL
				PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL DRAWINGS AND PRODUCT MANUALS.
PV STRING CALCULATIONS	GRRE-EL-0700	1	С	ALL DESIGN AND SPECIFICATIONS OF STRUCTURAL COMPONENTS ARE OUTSIDE THE SCOPE OF THESE PLANS.
				PROJECT ENTITIES
				OWNER: TANANA CHIEFS CONFERENCE
				ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.
				ELECTRIC SERVICE PROVIDER: ALASKA VILLAGE ELECTRIC COOPERATIVE
ENG. STAI	MP		NO. DRAWING NO.	/SHEET REFERENCE DRAWING DESCRIPTION DRAWING NAM

NOT FOR CONSTRUCTION

PROJ DESIG	PROJECT: GRAYLING RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560							
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE					
Α	ISSUED FOR 65% REVIEW	MED/03-07-2025	JRV/03-07-2025					
В	ISSUED FOR 95% REVIEW	MED/04-29-2025	JRV/04-29-2025					
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025					

	IN
A	
Plectric Power Systems	
Estate Lang 2131919	
Consulting Engineers	
TEL: (907) 522-1953 FAX: (907) 522-1182	
WEB: WWW.EPSINC.COM	
	_

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME
vstens				
les.				l
ers -1953				
:-1182 NC.COM				REF DWG(S):
10.0011				` '

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY COVER SHEET AND INDEX

grre-pr-0001_1.dwg

GRRE-PR-0001

SHEET 1 OF 2

ELECTRICAL SPECIFICATIONS

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION PROPOREDLY.
- ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT. CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS
- ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- ALL THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- 11. CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS (360 DEGREES) BETWEEN PULL POINTS.
- METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE EGC SYSTEM. GROUNDS SHALL BE SIZED ACCORDING TO THE NEC.
- CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE

RECORD DOCUMENTS

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNTIL THESE DRAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE

WIRING METHODS

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWINGS. FOR OUTDOOR INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATION.
- 20. AC WRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS.
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED CRIMPING TOOL.

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS SHALL BE MADE FOR SYSTEM GROUNDING.
- 27. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT IS TO BE REMOVED.
- 28. MODULES SHALL BE BONDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS:
- SOLID CONDUCTORS: ASTM B 3.
 STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED; WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE
- .33 INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS ELECTRICALL' CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS

RACEWAYS

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS: 34.1. RIGID STEEL CONDUIT: ANSI C80.1. 34.2. EMT: ANSI C80.3. (FOR INDOOR USE ONLY).

- 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 36. COATED FITTINGS FOR PVC—COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER, EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS. COVER IS CASKETED WITH OIL—RESISTANT GASKET MATERIAL AND FASTENED WITH CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE. CONNECTIONS ARE FLANGED, WITH STAINLESS—STEEL SCREWS AND OIL—RESISTANT GASKETS.
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED
- 38.1. 3/4-INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF
- 38.3. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS.
 SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH T

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS INCLUDING POWER SYSTEMS AND ENERGY STORAGE SYSTEMS.
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING MEANS.

PANELBOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1 FACH TYPE OF PANELBOARD OVERCURRENT PROTECTIVE DEVICE TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED.
 INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES,
 PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- OLLOWING:

 BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS

 BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION.

 DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- 41.2.3. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS

FNG STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING: 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS, SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5. OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION 01 SECTION "OPERATION AND MAINTENANCE INCLUDE THE FOLLOWING:
- 41.5.1. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING
- OVERCURRENT PROTECTIVE DEVICES.

 41.5.2. TIME-CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:
- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
- PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEI INDICATED. REFER TO DIVISION 01 SECTION "PRODUCT REQUIREMENTS."
- 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- COMPLY WITH NEMA PB 1.
- 42.5. COMPLY WITH NFPA 70.
- 43. CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING
- 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC

- SEISME PORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISME CONTROLS FOR ELECTRICAL SYSTEMS.

 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.

 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.

 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.

 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH—MOUNTED FRONTS OVERLAP BOX FRONTS, OVERLAP BOX. 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT.
 DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES:
 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1. LUGS: MECHANICAL TYPE.
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES—CONNECTED SHORT—CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES-CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAL—MAGNETIC CIRCUIT BREAKERS: INVERSE TIME—CURRENT ELEMENT FOR LOW—LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT—BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS—TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT—MOUNTED, FIELD—ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP—UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING;
 FIELD—REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD—ADJUSTABLE
 SETTINGS:
 45.4.1. INSTANTANEOUS TRIP.
- 45.4.2. LONG— AND SHORT—TIME PICKUP LEVELS. 45.4.3. LONG— AND SHORT—TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30—MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC EQUIPMENT.

REQUIRED SAFETY SIGNS AND LABELS

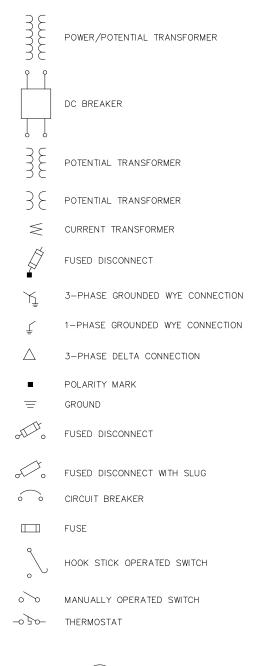
- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21.
- THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- 3. THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH THE NEC.
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1)
- UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535 RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:
 6.1. ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.
 6.2. VISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.

- "DANGER" HEADER; RED BACKGROUND WITH WHITE LETTERING.
 "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING.
- 6.4.
- "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
 "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING.
- OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690.

NOT FOR CONSTRUCTION

GRAYLING RENEWABLE ENERGY DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION PROJECT: TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560 GRAYLING RENEWABLE ENERGY DWN BY/DATE REVIEWED BY/DATE GENERAL INFORMATION AND SPECIFICATIONS Consulting Engineers SUFD FOR 95% REVIEW MED /04-29-2025 JRV/04-29-202 TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM SSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025 arre-el-0000 1 d REF DWG(S) DRAWING NO HEET__1 OF 1 GRRE-EL-0000

STANDARD BLOCKS - ELECTRICAL



PROTECTION, INSTRUMENTATION, OR AUTOMATION DEVICE COIL OR ELEMENT √√√ RESISTOR NORMALLY OPEN CONTACT NORMALLY CLOSED CONTACT AMBER LIGHT RED LIGHT GREEN LIGHT BLUE LIGHT INCANDESCENT LIGHT SHORTING BLOCK CONNECTION POINT TERMINATION CONNECTION POINT POLARITY MARK (CURRENT TRANSFORMERS) GROUND

CABLE # XX
EQUIPMENT XX

CABLE TAG - WIRING DIAGRAMS & 3-LINES

STANDARD ABBREVIATIONS - ELECTRICAL

	INDAIND ADDINEVIAL	10110	ELECTIVICAL				
Α	AMPERE	EIA	ELECTRONICS INDUSTRY ASSOCIATION	N	NEWTON	TIA	TELECOMMUNICATIONS INDUSTRY
ACB	AIR CIRCUIT BREAKER	EJ	EXPANSION JOINT	N	NORTH		ASSOCIATION
AB	AIR BREAK	EL	ELECTRICAL	NC	NORMALLY CLOSED	TRP	TRIP
ABV	ABOVE	ELEV	ELEVATION	NCC	NORMALLY CLOSED CONTACT	TURB	TURBINE
AC	ALTERNATING CURRENT	ENCL	ENCLOSURE	N/C	NO CONNECTION	TX	TRANSMIT
ADJ	ADJUSTABLE	EQ	EQUAL	NIC	NOT IN CONTRACT	TYP	TYPICAL
ADJT	ADJACENT	EQUIP	EQUIPMENT	NO	NORMALLY OPEN	UG	UNDERGROUND
ALT	ALTERNATE	EST	ESTIMATE	NOC	NORMALLY OPEN CONTACT	UNO	UNLESS NOTED OTHERWISE
AL	ALUMINUM	EXIST	EXISTING	NS	SYNCHRONIZING NEUTRAL	V	VOLT
APPRX	APPROXIMATE	F	FARAD	NTS	NOT TO SCALE	VA VA	VOLTAMPERE PHASE A VOLTAGE
В	BUS	F	FUSE	OD	OUTSIDE DIAMETER	VA VAR	REACTIVE POWER
BF	BREAKER FAIL	FREQ	FREQUENCY	OUT	OUTPUT	VAR VB	PHASE B VOLTAGE
BFI	BREAKER FAIL INITIATE	FT	FEET TURQUOU	P	REAL POWER OR PRIMARY	VAC	ALTERNATING CURRENT VOLTAGE
BKR BLDG	BREAKER BUILDING	FT FUT	FEED THROUGH FUTURE	PB PF	PUSH BUTTON POWER FACTOR	VAC	PHASE C VOLTAGE
BLDG	BLOCK	G	CONDUCTANCE OR GROUND	PLC	PROGRAMMABLE LOGIC CONTROLLER	VCB	VACUUM CIRCUIT BREAKER
BOT	BOTTOM	GA	GAUGE	PM	PAD-MOUNT TRANSFORMER	VDC	DIRECT CURRENT VOLTAGE
BTU	BRITISH THERMAL UNIT	GALV	GALVANIZED	PSSS	PROVIDER SWITCHYARD	VERT	VERTICAL
BTWN	BETWEEN	GB	GROUND BUS	PT	POINT	VIF	VERIFY IN FIELD
BU	BACKUP	GCB	GAS CIRCUIT BREAKER	PT	POTENTIAL TRANSFORMER	VN	NEUTRAL VOLTAGE
C	COLOUMB	GEN	GENERATOR	PVC	POLYVINYL CHLORIDE	VR	VOLTAGE REGULATOR
CAP	CAPACITOR OR CAPACITANCE	GI	GALVANIZED IRON	PVMT	PAVEMENT	VREG	VOLTAGE REGULATOR
CAP	CORRUGATED ALUMINUM PIPE	GND	GROUND	PWR	POWER	VS	SYNCHRONIZING VOLTAGE
CB	CENTER BREAK	GOAR	GANG OPERATED AIR-BREAK SWITCH	0	REACTIVE POWER	VT	VOLTAGE TRANSFORMER
CBL	CABLE	GRC	GALVANIZED RIGID CONDUIT	R	RESISTANCE OR RESISTOR	w	WEST
CEM	CEMENT	GRD	GRADE. GRADING	RCLS	RECLOSE	W	WATT
CF	CUBIC FOOT	GRSC	GALVANIZED RIGID STEEL CONDUIT	RAD	RADIUS	W/	WITH
CHK	CHECK	Н	HENERY	RAD	RADIAN	W/0	WITHOUT
CI	CAST IRON	HDPE	HIGH-DENSITY POLYETHYLENE	RD	ROAD	X	REACTANCE
CIP	CAST IRON PIPE	HLO	HOT LINE ORDER	RE	REMOTE END	XFMR	TRANSFORMER
CIPC	CAST-IN-PLACE CONCRETE	HORIZ	HORIZONTAL	REF	REFERENCE	XMSSN	TRANSMISSION
CIR	CIRCLE	HP	HORSEPOWER	REQD	REQUIRED	Υ	ADMITTANCE
CKT	CIRCUIT	HZ	HERTZ	RET	REMOTE END TRIP	YL	YELLOW
CLK	CLOCK	IA	PHASE A CURRENT	RET	RETURN	Z	IMPEDANCE
CLS	CLOSE	IB	PHASE B CURRENT	REV	REVISION	2	TIME-DELAY
CMIL	CIRCULAR MIL	IC	PHASE C CURRENT	RLY	RELAY	21	DISTANCE
CMP	CORRUGATED METAL PIPE	ID	INSIDE DIAMETER	RR	RAILROAD	25	SYNCHRONISM CHECK
COS	COSINE	IN	INPUT	ROW	RIGHT OF WAY	27	UNDERVOLTAGE
CONC	CONCRETE	IN	INCH	RTS	READY TO SEND	30	ANNUNCIATOR
CONST	CONSTRUCTION	IN	NEUTRAL CURRENT	RTU	REMOTE TERMINAL UNIT	32	DIRECTIONAL POWER
CONT	CONTINUOUS	INCL	INCLUDE(D), INCLUDING	RX	RECEIVE	37	UNDERCURRENT OR UNDERPOWER
CONTR	CONTRACTOR	IND	INDUSTRY	S	APPARENT POWER	38 40	BEARING FIELD
CS	000000000000000000000000000000000000000	INT	INTERSECTION	S	SOUTH	43	MANUAL TRANSFER OR SELECTOR DEVICE
CSP	CORRUGATED STEEL PIPE	INV IP	INVERT	S	SOURCE	43 46	REVERSE-PHASE
CT CTRL	CURRENT TRANSFORMER		POLARIZING CURRENT COMPLEX NUMBER	S-L	SOURCE-LOAD	47	PHASE-SEQUENCE VOLTAGE
CTS	CUNCTUROLSWITCHER OR CONTROL SWITCH CLEAR TO SEND	j	JOULE	SA SC	SURGE ARRESTOR SWITCH CABINET	49	MACHINE OR TRANSFORMER THERMAL RELAY
CU	COPPER	J JB	JUNCTION BOX	SEC		50	INSTANTANEOUS OVERCURRENT
DC	DIRECT CURRENT	KA	KILOAMPRERE		SECTION	51	AC TIME OVERCURRENT
DCD	DATA CARRIER DETECT	KV	KILOVOLT	SEC SVC	SECONDARY SERVICE	52	AC CIRCUIT BREAKER
DCE	DATA COMMUNICATIONS EQUIPMENT	KW	KILOWATT	SVC	STATIC VAR COMPENSATOR	52a	NORMALLY OPEN BREAKER CONTACT
DDE	DOUBLE DEAD END	L	INDUCTANCE	SHT	SHEET	52b	NORMALLY CLOSED BREAKER CONTACT
DE	DEAD END	Ĺ	LINE	SIM	SIMILAR	59	OVERVOLTAGE
DEM	DEMOLISH, DEMOLITION	Ĺ	LOAD	SIN	SINE	60	VOLTAGE BALANCE
DEMOB	DEMOBILIZE	LB	LOAD BREAK	SPEC	SPECIFICATION	63	PRESSURE SWITCH
DET	DETAIL	LGPP	LANDFILL GAS POWER PLANT	SPECS	SPECIFICATIONS	64	APPARATUS GROUND
DFR	DISTURBANCE FAULT RECORDER	LT	LIGHT	SPSS	SPARTAN SUBSTATION	67	AC DIRECTIONAL OVERCURRENT
DI	DIGITAL INPUT	M	METER(S)	SS	SYNCHRONIZING SWITCH	68	BLOCKING
DIA	DIAMETER	MAT	MATERIAL	STA	STATION	69	PERMISSIVE
DIAG	DIAGONAL	MAX	MAXIMUM	STD	STANDARD	71	LEVEL SWITCH
DIM	DIMENSION	MFG	MANUFACTURER	SW	SWITCH	74	ALARM
DIST	DISTRIBUTION	MI	MILE	SWGR	SWITCHGEAR	76	DC OVERCURRENT
DNP	DISTRIBUTED NETWORK PROTOCOL	MIN	MINIMUM	SYM	SYMMETRICAL	78	OUT-OF-STEP
DO	DIGITAL OUTPUT	MISC	MISCELLANEOUS	SYNCH	SYNCHRONIZE	79	RECLOSING RELAY
DSSS	D STREET SUBSTATION	MM	MILLIMETER(S)	Т	TIME OR TRANSFORMER	81	FREQUENCY
DTE	DATA TERMINAL EQUIPMENT	MO	MOTOR OPERATED (OR)	TAN	TANGENT	85	CARRIER OR PILOT WIRE
DWG	DRAWING	MOB	MOBILIZE	TCM	TRIP COIL MONITOR	86	LOCK OUT
	EACH	MTR	METER	TEL	TELEPHONE	87	DIFFERENTIAL
EA							
ŁA		MW N	MEGAWATT NEUTRAL	TERM	TERMINAL	94	TRIPPING

NOT FOR CONSTRUCTION

PROJ DESIG	ECT: GRAYLING RENEWABLE ENERGY DESIGN GNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 24	1-0560
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025



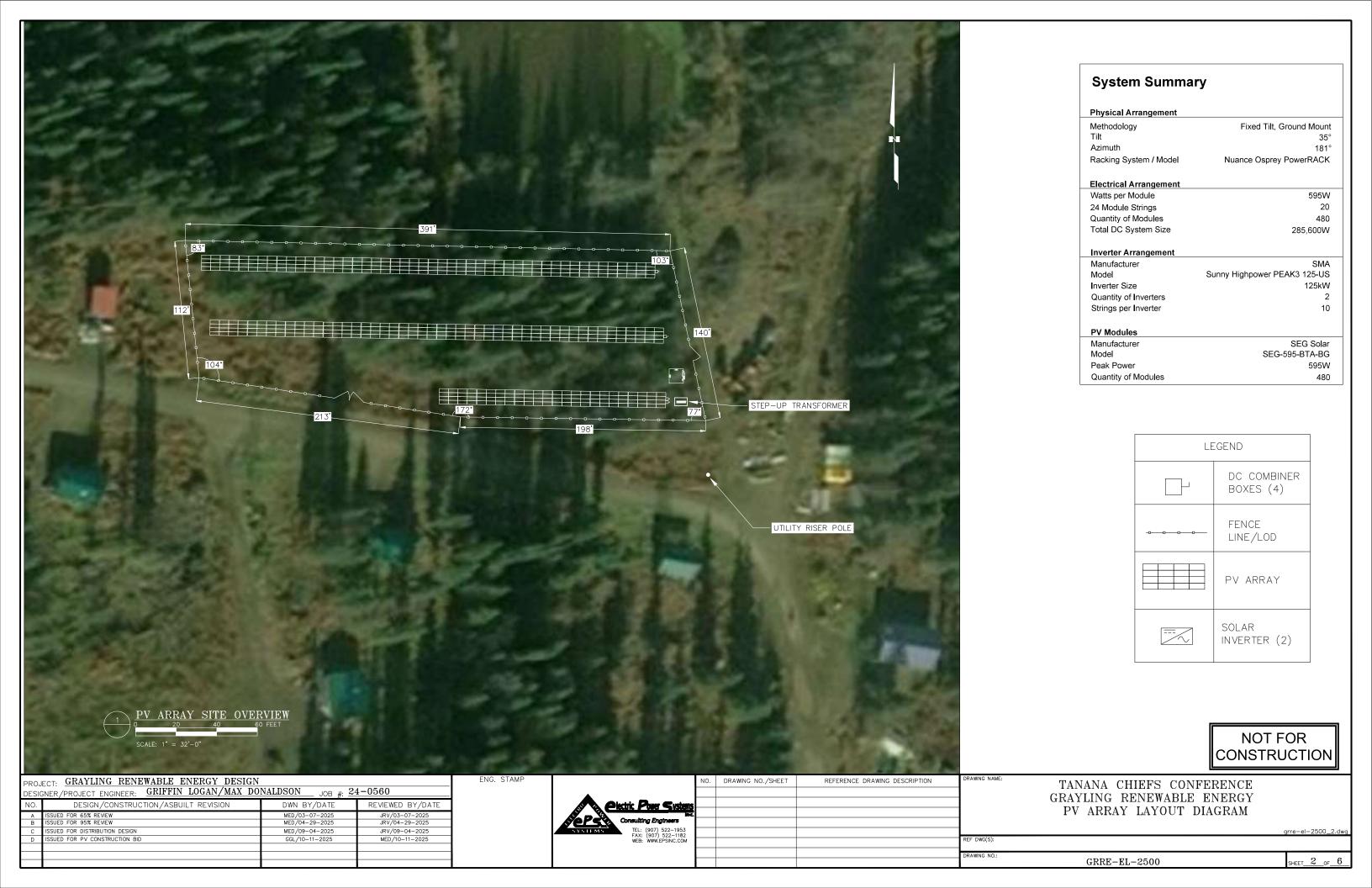
NO. DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION	DRAWING NAM
ens — — — — — — — — — — — — — — — — — — —	
inc.	
3	
M	REF DWG(S):
	22.000

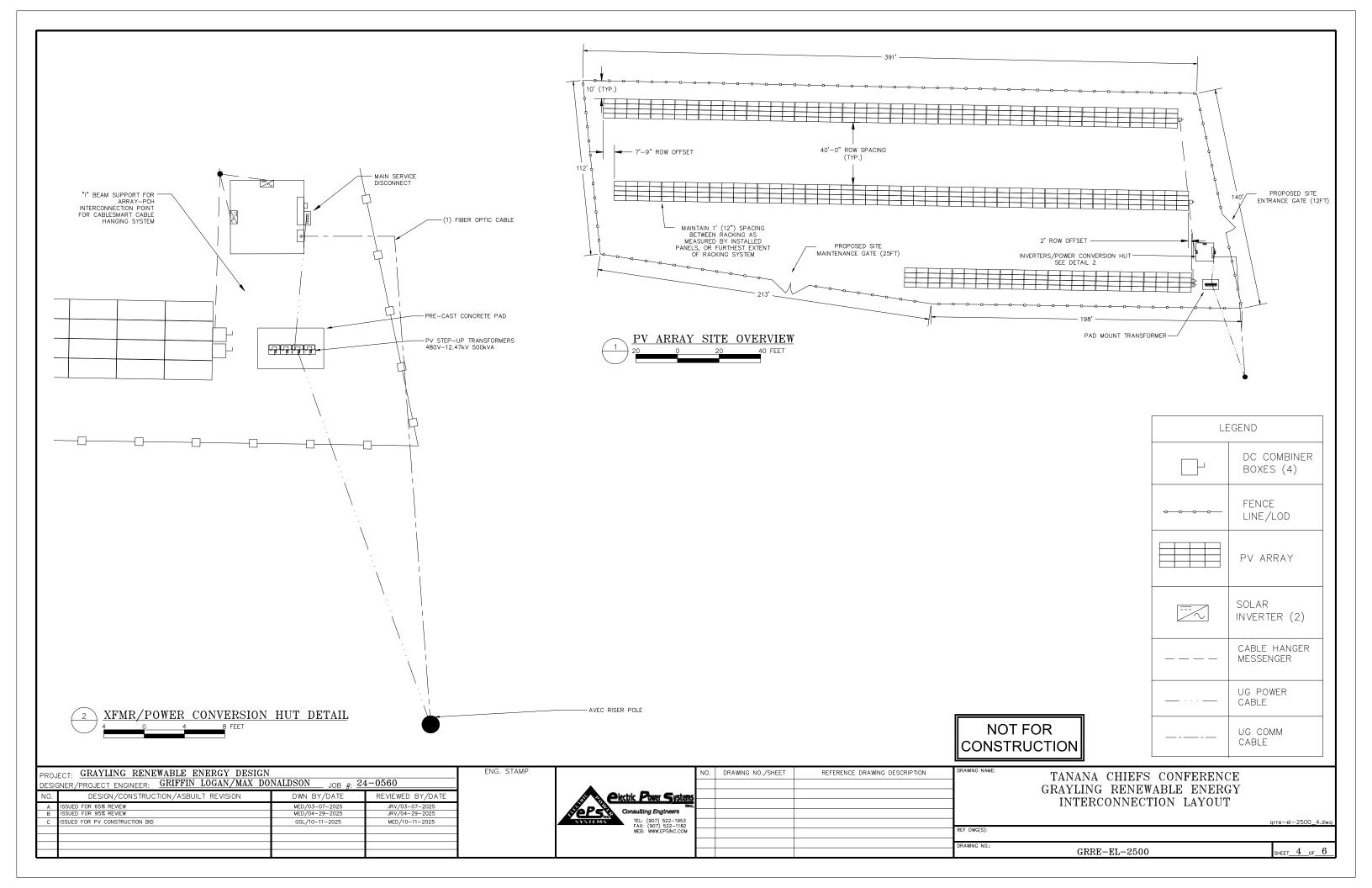
TANANA CHIEFS CONFERENCE
GRAYLING RENEWABLE ENERGY
GENERAL INFORMATION AND SPECIFICATIONS

grre-el-0000_2.dwg

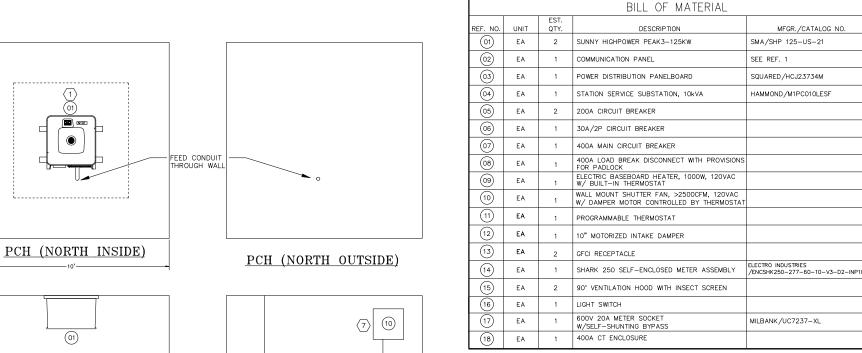
RAWING NO.: GRRE-EL-0000

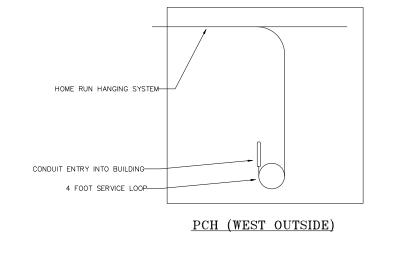
SHEET 2 OF 2

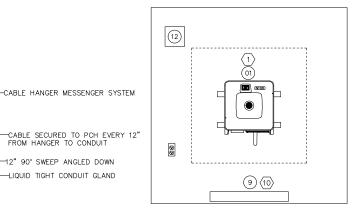




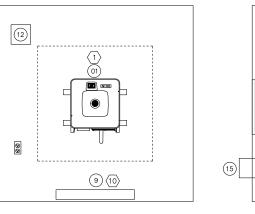


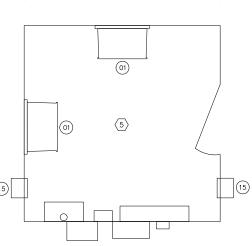


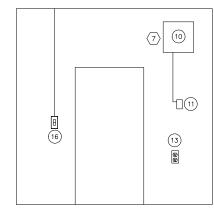




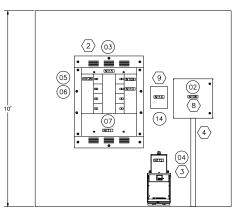
PCH (WEST INSIDE)

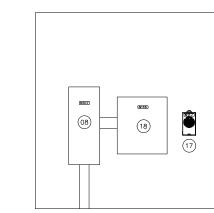






PCH (EAST INSIDE)





PCH (SOUTH INSIDE)

PCH (SOUTH OUTSIDE)

NOT FOR ONSTRUCTION

- (1) MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4" AWAY FROM THE WALL, AND 20" ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES. MAINTAIN 4' WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. PROVIDE A 4" X 4" WIREWAY (MINIMUM) BETWEEN INVERTERS AND PANELBOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARD SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARD AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- (3) MOUNT STATION SERVICE SUBSTATION SUCH THAT ALL MANUFACTURER RECOMMENDED CLEARANCE ZONES AWAY FROM EQUIPMENT IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE ZONE IN FRONT OF THE DEVICE, PER NEC
- 4 ROUTE CONDUITS SUCH THAT THE STUB-UP AREA IS DIRECTLY UNDER ALL DESTINATION DEVICES IN THE POWER CONVERSION HUT
- $\stackrel{\textstyle <}{\footnotesize \sim}$ Provide ceiling mounted lighting such that 30 footcandles is maintained. Mount light switch next to door at least 40" from floor.
- (6) ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT-HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- (7) VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY A WEATHERPROOF 120VAC EXHAUST FAN WITH A MINIMUM FLOW RATE OF 2500CFM, CONTROLLED BY AN ADJUSTABLE THERMOSTAT FOR FAN OPERATION OF INTERIOR AIR TEMPERATURES OF 35°C AND ABOVE, AND BY A 10° MOTORIZED INTAKE DAMPER SHALL BE PROVIDED WITH A 90° EXTERIOR HOOD WITH INSECT SCREENS TO PREVENT INTRUSIONS OF WIND DRIVEN RAIN/SNOW.
- (8) MOUNT RECEPTACLES ON INSIDE WALLS OF PCH AT LEAST 18" FROM FLOOR. MOUNT ONE RECEPTACLE ON SOUTH SIDE OF DOOR (EAST WALL) AND ONE RECEPTACLE NEXT TO POWER BASEBOARD HEATER (WEST WALL).
- CONNECT SHARK 250 CURRENT TRANSFORMERS AND POTENTIAL TRANSFORMERS TO THE 400A OUTPUT BREAKER AT POWER DISTRIBUTION PANELBOARD THROUGH A 1" CONDUIT.
- $\stackrel{\text{$(1)$}}{\text{$(1)$}}$ HEATING TO BE PROVIDED BY ELECTRIC BASEBOARD HEATER WITH BUILT-IN THERMOSTAT. HEATER TO TURN ON BELOW 10°F.
- HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS
 TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY
 THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES.
 ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND
 PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON—SITE.

INSULATION: -WALL INSULATION: R22 MINIMUM -CEILING INSULATION: R30 MINIMUM	1011 (500111	<u>iivoidi</u>	
ALL INTERIOR CONDUITS SHALL BE GALVANIZED RIGID CONDUIT (GRC) OR ELECTRICAL METALLIC TUBING (EMT). EXTERIOR CONDUIT SHALL BE RIGID GALVANIZED CONDUIT ONLY. EMT TYPE COUPLERS AND FITTINGS SHALL BE RAIN—TIGHT COMPRESSION TYPE. GROUNDING BUSHINGS SHALL BE INSTALLED AT THE SOURCE END OF THE EMT CONDUIT RUNS FROM THE AC PANEL.				cc

ENG. STAMP

PROJ DESIG	ECT: GRAYLING RENEWABLE ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0560
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025

BUILDING MANUFACTURER TO PROVIDE PRE-FABRICATED METAL BUILDING PER FOLLOWING SPECIFICATIONS:

FROM HANGER TO CONDUIT

12" 90' SWEEP ANGLED DOWN

-LIQUID TIGHT CONDUIT GLAND

HOME-RUN ENTRY

STRUCTURAL:

-ROOF PITCH: 3:12

-ROOF DEAD LOAD 30PSF MINIMUM

-MAX WALL LOAD: 220LBS (INVERTER)
-MAX FLOOR LOAD: 210LBS (STATION SERVICE SUBSTATION)

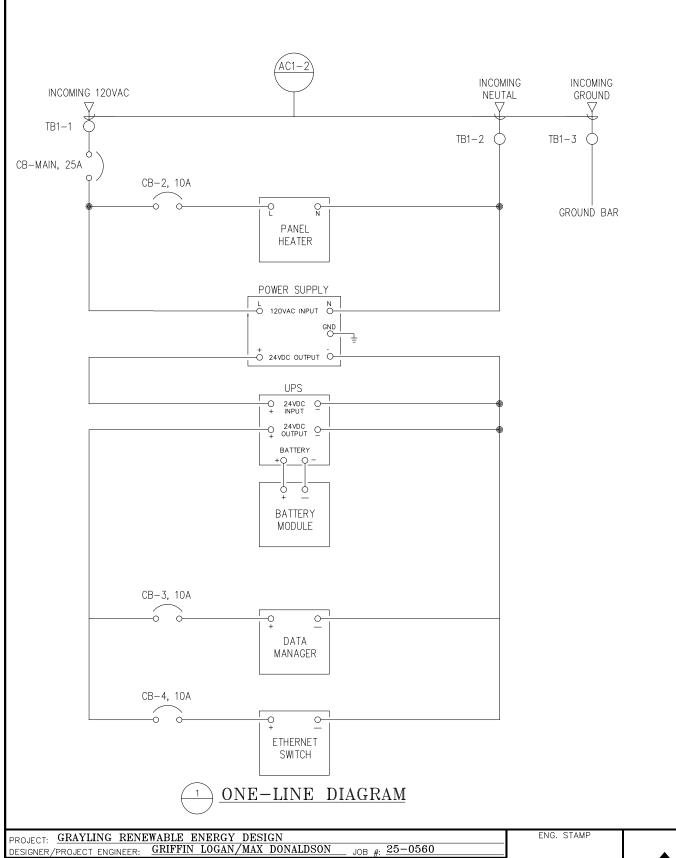
Olectric Proper Systems
Consulting Engineers TEL: (907) 522–1953
FAX: (907) 522-1182 WEB: WWW.EPSINC.COM

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DR
	1	GRRE-EL-2500/6	COMMUNICATIONS PANEL	
MS	1	GRRE-SS-2000/5	EQUIPMENT NAMEPLATE SCHEDULE	
7 6				
1				REI
				DR

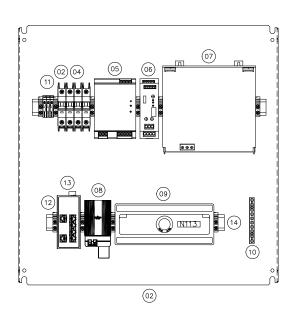
TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY POWER CONVERSION HUT

GRRE-EL-2500

	LAYOUT	DIAGRAM	(grre-el-2500_5.dw
F DWG(S):				
AMINO NO				1







BILL OF MATERIAL EST. QTY. EF. NO. UNIT DESCRIPTION

24" X 24" X 10" NEMA 1 MILD STEEL
WALL MOUNTED ENCLOSURE MFGR./CATALOG NO. 01) EA 02 EΑ INNER PANEL FOR 24X24X10 ENCLOSURE 03 04 25A, 600V UL489 1-POLE BREAKER 05) PHOENIX CONTACT 120VAC/24VDC PS, 20 AMP PHOENIX CONTACT/ 2866776 06) EA PHOENIX CONTACT 20 AMP UPS PHOENIX CONTACT/ 2320238 07 08 09 EΑ PHOENIX CONTACT 12 Ah BATTERY PHOENIX CONTACT/ 1274119 150W PANEL HEATER W/BUILT IN REGULATION ON: 41°F - OFF: 59° EA STEGO/06021.0-00 EΑ SMA/EDMM-20 DATA MANAGER (10) UL 467 GROUND BAR, 6 POLE MINIMUM 11) EA 6MM DINRAIL MOUNTED TERMINAL BLOCK (12) EA 6MM DINRAIL MOUNTED TERMINAL BLOCK END STOP 13) EΑ UNMANAGED ETHERNET SWITCH, 2 FIBER PORTS MOXA/EDS-G308-2SPF 14) EΑ

- NOTES:

 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IN THE CENTER COLUMN, AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- $\fbox{2}$ PROVIDE 1 SPARE CIRCUIT BREAKER FOR EACH SIZE (REF. NO. 3, AND REF. NO. 4) AND STORE IN BOTTOM OF ENCLOSURE

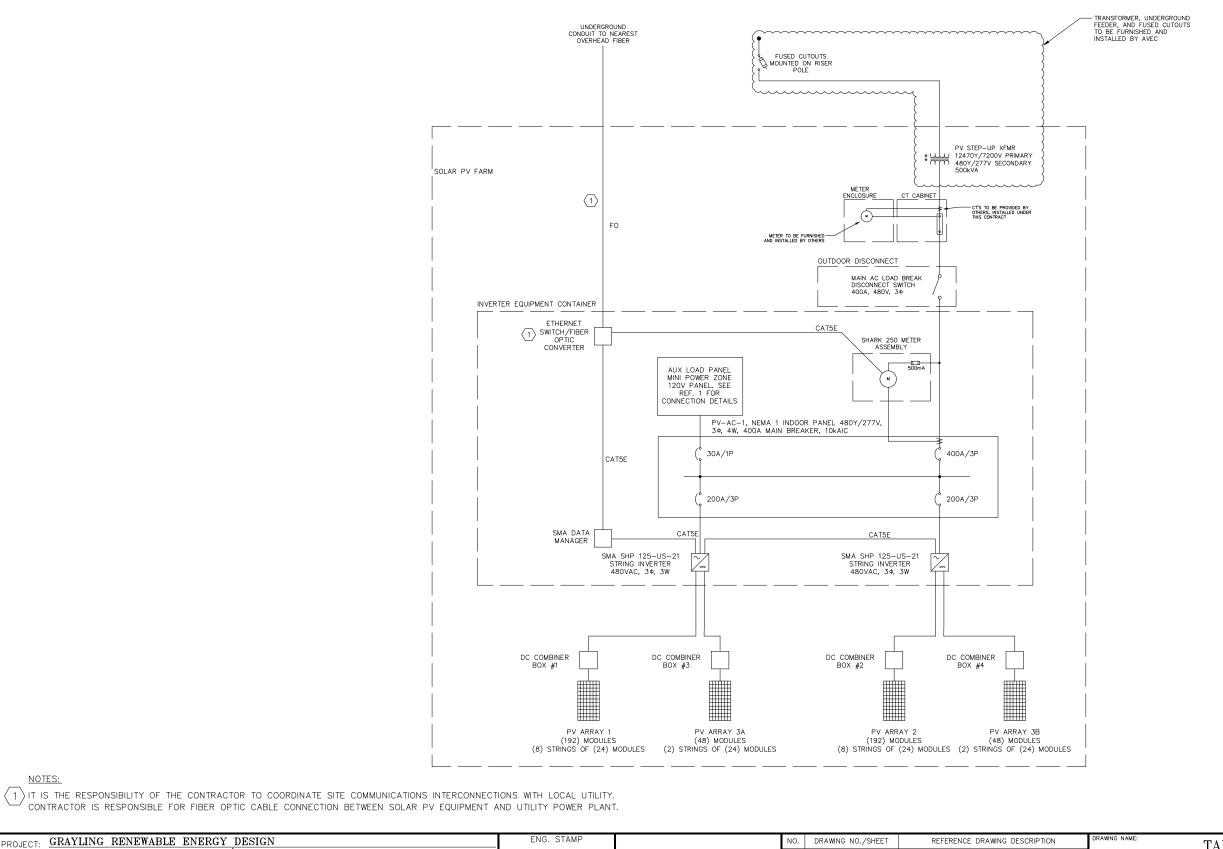




NOT FOR CONSTRUCTION

 $\langle 1 \rangle$

PRO DES	JECT: GRAYLING RENEWABLE ENERGY DESIGN GNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	25-0560	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY	
NO	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			4	COMMUNICATIONS PANEL	
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers inc.			-		
					TEL: (907) 522-1953			4	PANEL ELEVATION DRAWING	grre-el-2500_6.dwg
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		qire-ei-2500_0.dwq
								_ DRAWING NO.:	GRRE-EL-2500	SHEET 6 OF 6



NOT FOR CONSTRUCTION

DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560 SSUED FOR 65% REVIEW
SSUED FOR 95% REVIEW GGL/03-07-2025 GGL/04-29-2025 JRV/03-07-2025 JRV/04-29-2025 SSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025

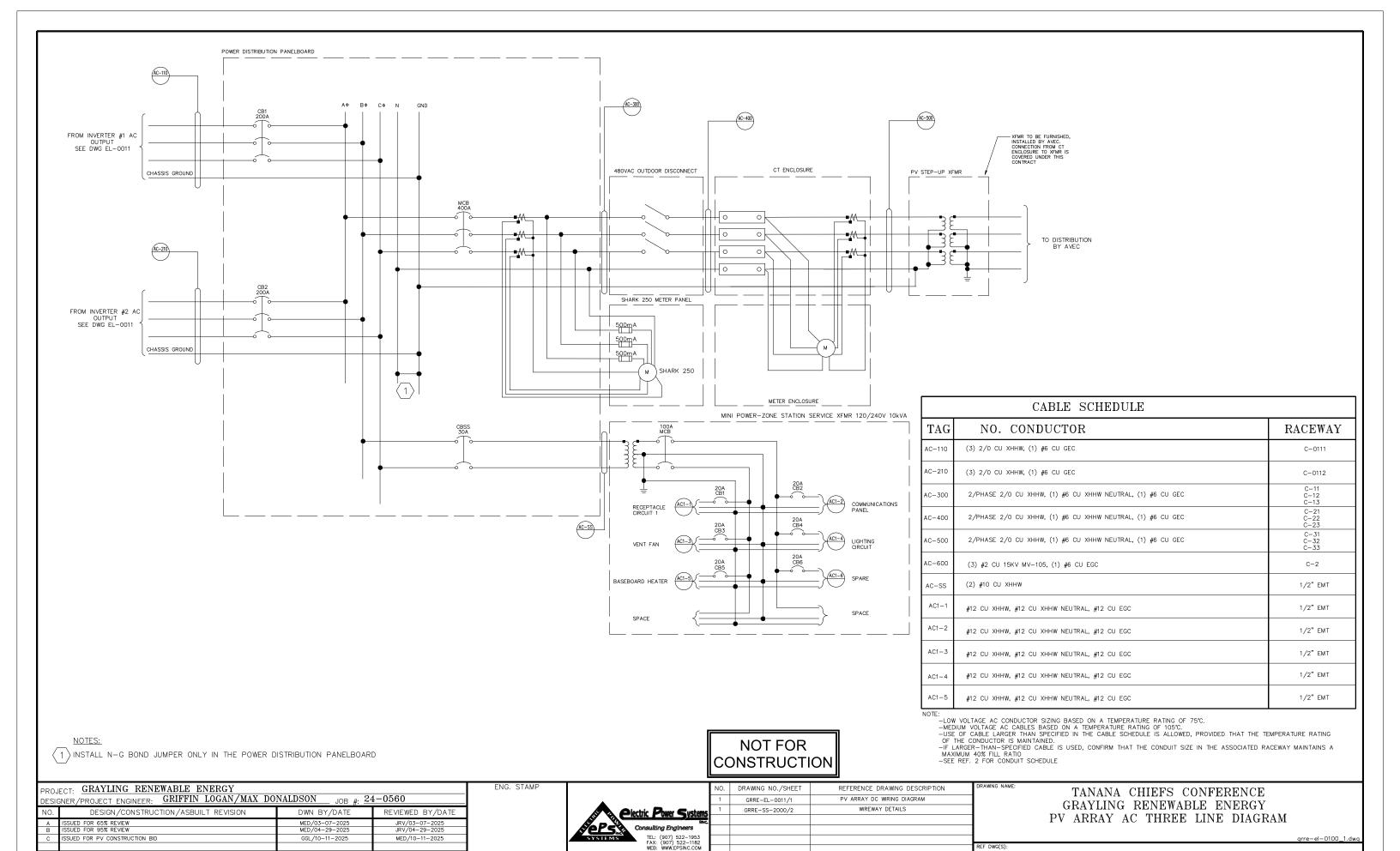
INC	DRAWING NO./ SHEET	REFERENCE DRAWING DESCRIPTION	
•			
			REF DWG(S):
			DRAWING NO.:
			DIVAMINO NO.

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY SYSTEM ONE-LINE DIAGRAM

arre-el-0010 1.d

AWING NO.: GRRE-EL-0010

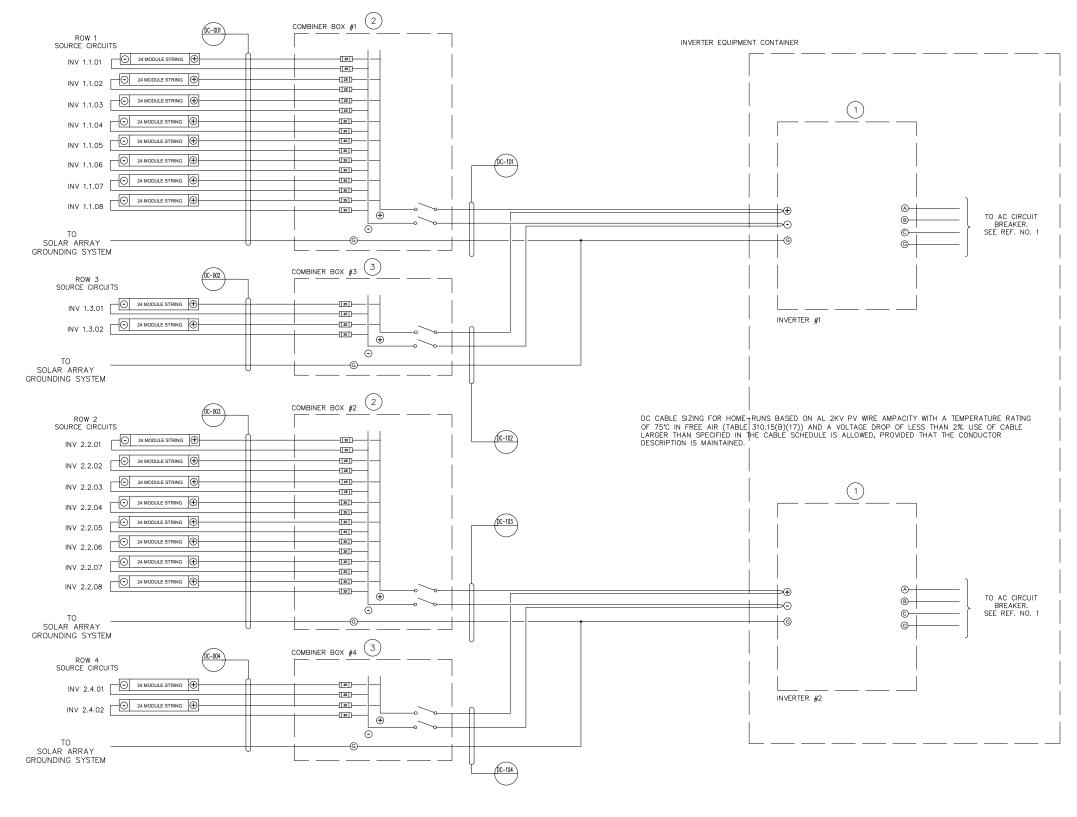
SHEET 1 OF 1

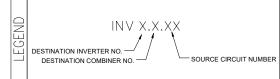


DRAWING NO.:

GRRE-EL-0100

SHEET 1 OF 1





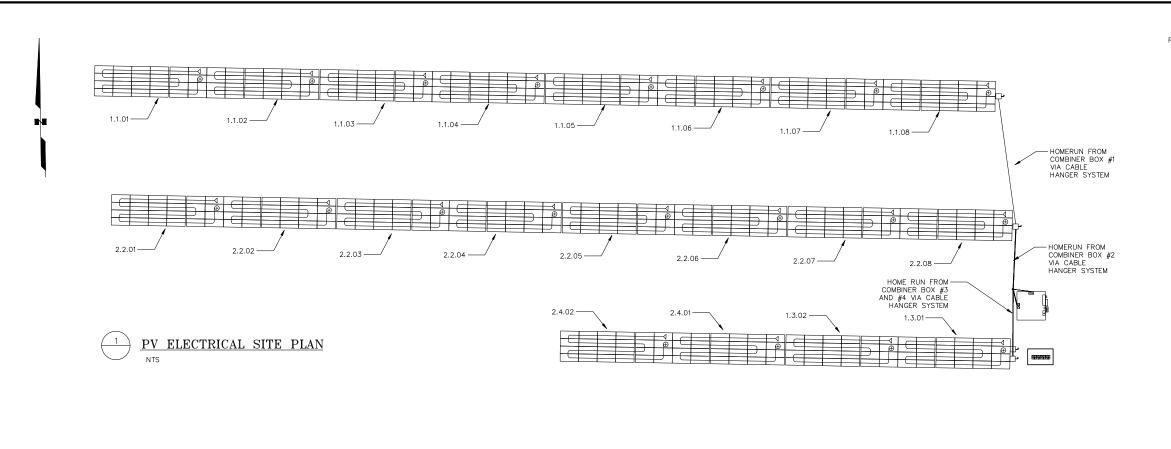
	EQUIPMENT SCHEDULE					
TAG	QUANTITY	DESCRIPTION				
1	2	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US				
2	2	16 INPUT DC COMBINER; TERRASMART FSFT275-16-25-N4-CD OR EQUIVALENT				
3	2	4 INPUT DC COMBINER; TERRASMART FSFT275-4-25-N4-CD OR EQUIVALENT				

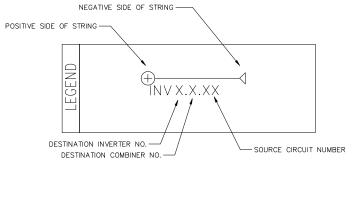
	CABLE SCHE	DULE
TAG	NO. CONDUCTOR	RACEWAY
DC-001	(16) #10 CU 2kV PV WIRE, (1) #10 CU EGC	FREE AIR
DC-002	(4) #10 CU 2kV PV WIRE, (1) #10 CU EGC	FREE AIR
DC-003	(16) #10 CU 2kV PV WIRE, (1) #10 CU EGC	FREE AIR
DC-004	(4) #10 CU 2kV PV WIRE, (1) #10 CU EGC	FREE AIR
DC-101	(2) 1/0 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-102	(2) #8 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-201	(2) 1/0 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-202	(2) #8 AL PV WIRE, (1) #6 CU EGC	FREE AIR

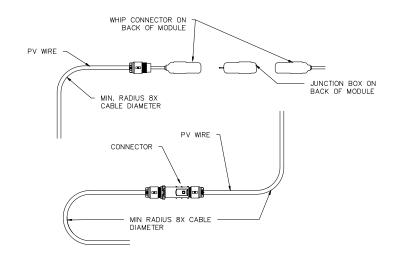
:1) DC STRING CONDUCTOR SIZING BASED ON CU UL4703 2KV PV WIRE WITH A TEMPERATURE RATING OF 90°C
2) DC CABLE SIZING FOR HOME—RUNS BASED ON AL 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C IN FREE AIR (TABLE 310.15(B)(17)) AND A VOLTAGE DROP OF LESS THAN 2% USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE CONDUCTOR DESCRIPTION IS MAINTAINED.

NOT FOR CONSTRUCTION

PROJECT: GRAYLING RENEWABLE ENERGY DESIGN ENG. STAMP DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION TANANA CHIEFS CONFERENCE DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: <u>24-</u>0560 AC THREE-LINE DIAGRAM GRRE-EL-0100/1 GRAYLING RENEWABLE ENERGY PV ARRAY DC WIRING DIAGRAM SSUED FOR 65% REVIEW
SSUED FOR 95% REVIEW MED/03-07-2025 MED/04-29-2025 JRV/03-07-2025 JRV/04-29-2025 grre-el-0011_1.dw TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.FPSINC.COM MED/04-30-2025 GGL/10-11-2025 JRV/04-30-2025 MED/10-11-2025 RE-ISSUED FOR 95% REVIEW ISSUED FOR PV CONSTRUCTION BID REF DWG(S): DRAWING NO.: SHEET 1 OF 1 GRRE-EL-0011





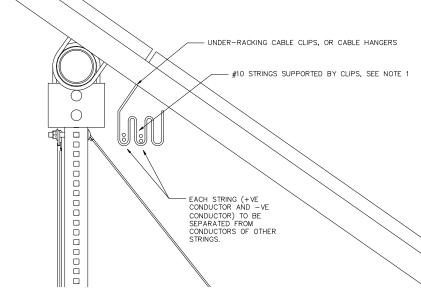


PV WIRE BENDING REQUIREMENTS NOTES:

1. OBSERVE MIN. BENDING RADIUS REQUIREMENTS WHEN BUILDING AND SECURING SOURCE CIRCUIT CONDUCTORS TO MODULES AND RACKING.

2. SEE MODULE SPEC SHEET OR CABLE SPECS FOR CABLE DIAMETER.

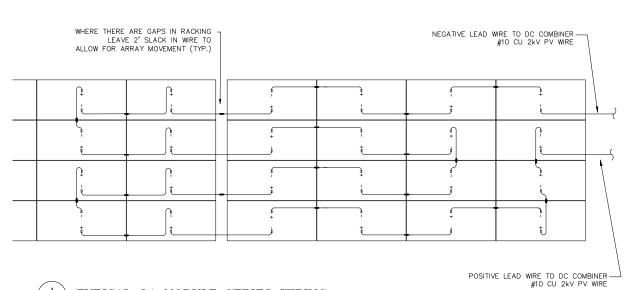
PV WIRE BENDING REQUIREMENTS





TYPICAL 24 MODULE SERIES WIRING NOTES:

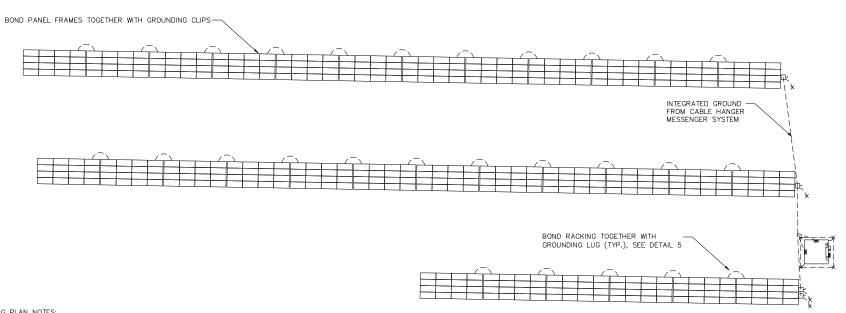
1. SUPPORT #10 STRINGS WITH CABLE CLIPS, OR OTHER TCC APPROVED UNDER-RACKING CABLE MANAGEMENT SYSTEM AT MOST EVERY 4' (48"). INSTALL PER MANUFACTURERS RECOMMENDATIONS. EXACT PLACEMENT AND CONNECTION METHOD TO BE DETERMINED BY CONTRACTOR ON—SITE

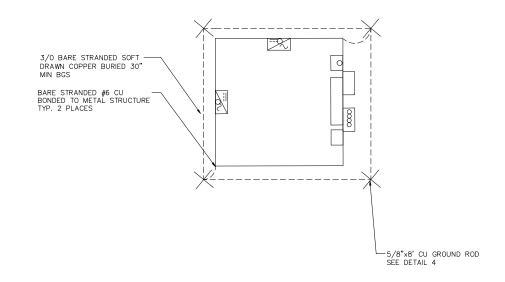


TYPICAL 24 MODULE SERIES WIRING

NOT FOR CONSTRUCTION

PR DE	PROJECT: GRAYLING RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560			ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY	
NO	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			4		
А	ISSUED FOR 65% REVIEW	MED/03-07-2025	JRV/03-07-2025 JRV/04-29-2025		Consulting Engineers			4	PV ELECTRICAL SITE PLAN	
В	ISSUED FOR 95% REVIEW ISSUED FOR PV CONSTRUCTION BID	MED/04-29-2025 GGL/10-11-2025	JRV/04-29-2025 MED/10-11-2025							1 0000 1 1
	ISSUED FOR PY CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		grre-el-0020_1.dwg
					WEB. WWW.EFSING.COM			-		
								DRAWING NO.:	GRRE-EL-0020	1 1
		l							GRRE-EL-0020	SHEET 1 OF 1



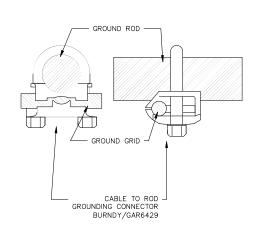


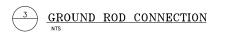
PCH GROUNDING DETAIL

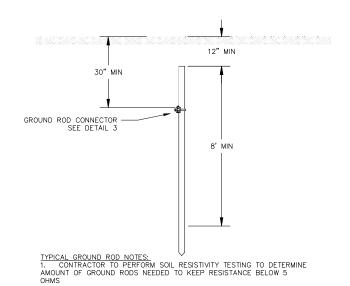
GROUNDING PLAN NOTES:

- CONTRACTOR TO TEST EACH GROUNDING ELECTRODE USING THE FALL OF POTENTIAL TEST. GROUND RODS SPACED 6' MIN APART SHALL BE ADDED AS NECESSARY UNTIL A RESISTANCE TO GROUND VALUE OF 25 OHMS OR LESS IS ACHIEVED.
 MIN. BARE COPPER GROUND WIRE SIZE SHALL BE #6.



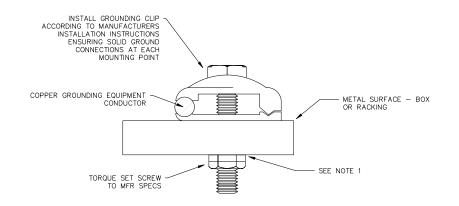






TYPICAL GROUND ROD

NOT FOR CONSTRUCTION



TYPICAL METAL RACKING GROUNDING NOTES:

1. PRIOR TO MOUNTING LUGS ON ANODIZED ALUMINUM OR PAINTED METAL SURFACES, THE SURFACE MUST BE STRIPPED AND THEN COVERED WITH BURDNY PENETROX A -13 ANTI-OXIDANT COMPOUND BELOW THE LUG TO ENSURE CONDUCTIVITY

2. ON ANODIZED AL SURFACES, THE ANODIZATION SHALL BE GROUND OFF.

3. ON PAINTED SURFACES, THE PAINT LAYER SHALL BE GROUND OR SCRATCHED OFF.

(5) TYPICAL METAL RACKING BONDING

LEGEND				
X	GROUNDING RODS			
	GROUNDING GRID			

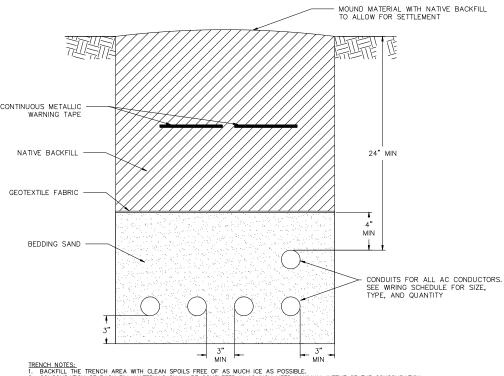
arre-ss-2000 1 dv

SHEET 1 OF 5

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY GROUNDING PLAN

GRRE-SS-2000

PROJE DESIG	ECT: GRAYLING RENEWABLE ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	N DNALDSON JOB #: 2	24-0560	ENG. STAMP	<u> </u>	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE	1	Plectric Power Systems				
	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025		Consulting Engineers	-			-
	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		SYSTEMS TEL: (907) 522-1953 FAX: (907) 522-1182				
				-	WEB: WWW.EPSINC.COM				REF DWG(S):
				1					DRAWING NO.:



- IRENCH NOTES:

 1. BACKFILL THE TRENCH AREA WITH CLEAN SPOILS FREE OF AS MUCH ICE AS POSSIBLE.

 2. CONSOLIDATION OF BACK FILL MATERIALS SHALL BE COMPLETED IN 12 INCH LIFTS MAXIMUM. INTENT OF THE CONSOLIDATION IS TO ENSURE ELIMINATION OF VOIDS.

 3. FOR TRENCH IN GRAVEL, THE TRENCH CAP SHALL NOT EXCEED 4 INCHES. FOR TRENCH IN TUNDRA, THE TRENCH CAP SHOULD BE 35% 40% OF THE TRENCH DEPTH (1.75' TO 2' FOR A 5' DEEP TRENCH), TO ALLOW FOR SETTLING AND ICE THAW. CONTRACTOR SHALL DISPOSE OF EXCESS EXCAVATED MATERIALS, FINAL CONTOURS OF THE TRENCH CAP IN TUNDRA SHOULD BE CONDUCTED BY HAND (MATCHING SURROUNDING DRAINAGE PATTERNS), TO ENSURE NO DIVERSION OF WATER OCCURS, RESULTING IN REPOSION.

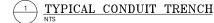
 4. TRENCHES 1' WIDE SHOULD NOT NEED ANY SEEDING. FINAL REHABILITATION DETERMINATION TO BE MADE BY AGENCY REPRESENTATIVE.

 5. COMPANY REPRESENTATIVE SHALL BE NOTIFIED AND PRESENT FOR ACCEPTANCE OF TRENCH PORT TO PLACEMENT OF CABLE AND BACKFILLING OF TIRENCH (24-HOUR NOTICE REQUIRED). AGROTY SEPARATIVE SHALL ALSO PROVIDE

- 5. COMPANY REPRESENTATIVE SHALL BE NOTHED AND PRESENT FOR ACCEPTANCE OF IRENCH PRIOR TO PLACEMENT OF CABLE AND BACKFILLING OF TRENCH (24—HOUR NOTICE REQUIRED). AGENCY REPRESENTATIVE SHALL ALSO PROVIDE ACCEPTANCE OF CABLE PRIOR TO BACKFILLING.

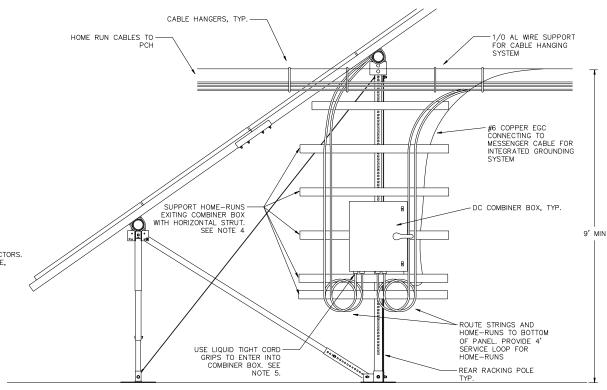
 6. BEDDING SHALL BE 3/8" MINUS MATERIAL, NO CRUSHED OR SHARP ROCK. BEDDING MATERIAL SHALL NOT BE MACHINE COMPACTED WITHIN 6" OF CABLES. SLURRY OF A COMPOSITION THAT WILL NOT DAMAGE THE CABLE IS AN ACCEPTABLE BEDDING MATERIAL.

 7. MAINTAIN 1" MIN. SEPARATION BETWEEN POWER CONDUCTORS AND COMMUNICATION CABLES



NOT FOR CONSTRUCTION

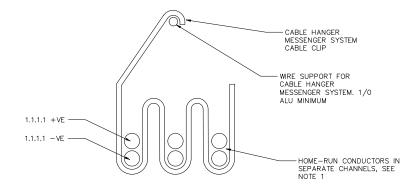
	CONDUIT SCHEDULE (1)							
TAG	FUNCTION	CONDUIT TYPE	TRADE SIZE					
C-0111	INV1 TO CB1	ЕМТ	2"					
C-0112	INV2 TO CB2	ЕМТ	2"					
C-11 - C13	MCB1 TO AC D.S.	PVC	3 × 3"					
C-21 - C23	AC D.S. TO CT CAB.	PVC	3 × 3"					
C-31 - C33	CT CAB. TO XFMR	PVC	3 X 3"					
C-3	COMM PANEL TO POLE	HDPE	1"					



TYPICAL COMBINER BOX DETAIL

TYPICAL COMBINER BOX DETAIL NOTES:

1. ENSURE THAT CABLES ROUTED FROM HANGING SYSTEM TO COMBINER BOXES DO NOT EXCEED CONDUCTOR BENDING RADIUS
2. INSTALLATION INSTRUCTIONS
3. CONTRACTOR TO DETERMINE MOST SUITABLE MOUNTING SOLUTION FOR OVERHEAD CABLE MANAGEMENT SYSTEM.
4. SUPPORT TO CABLES EXITING THE DC COMBINER BOX WITH A UV RESISTANT, OUTDOOR RATED CABLE THE CONNECTED TO A HORIZONTAL STRUT. INSTALL CLOSEST CABLE SUPPORT A DISTANCE OF NO MORE THAN 12" AWAY FROM THE COMBINER BOX, AS MEASURED BY THE CABLE PATH. SUPPORT HOME—RUNS EVERY 12" UNTIL SUPPORTED BY CABLE HANGER MESSENGER SYSTEM.
5. USE A LIQUID TIGHT CORD GRIP OR CABLE GLAND FOR HOME—RUNS AND STRINGS WHEN ENTERING COMBINER BOX.



2 TYPICAL HOME-RUN CABLE HANGER DETAIL

ENG. STAMP

- TYPICAL HOME—RUN CABLE HANGER DETAIL NOTES:

 1. HOME—RUN CONDUCTORS OF DIFFERENT CIRCUITS TO BE ROUTED IN SEPARATE CHANNELS IN CABLE HANGER MESSENGER SYSTEM. THE +VE AND -VE CONDUCTORS OF A SINGLE HOME—RUN CIRCUIT MAY BE ROUTED IN THE SAME CHANNEL.

 2. INSTALL CABLE HANGERS IN REGULAR INTERVALS AS DIRECTED BY MANUFACTURERS INSTALLATION INSTRUCTIONS, OR, A DISTANCE OF NO MORE THAN 5' APART FROM EACH OTHER.

 3. IF HOME—RUNS AND STRINGS ANE ROUTED IN THE SAME CABLE HANGER MESSENGER SYSTEM, SEPARATE HOME—RUNS AND STRINGS IN SEPARATE CHAINLES.

(3) UNDERGROUND CONDUIT TO RISER POLE BY AVEC APPROVED CONTRACTOR C-3 SITE WIREWAY LAYOUT 1) TRADE SIZE OF CONDUITS SHOWN IN CONDUIT SCHEDULE ARE MINIMUM SIZES BASED ON NEC CONDUIT FILL % (CHAPTER 9 TABLE 1). USE OF CONDUIT THAT IS LARGER IN TRADE SIZE THAN SPECIFIED IN CONDUIT SCHEDULE IS PERMITTED.

(2) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM PRODUCT DIMENSIONS AND ROUTE CONDUITS TO APPROPRIATE STUB-UP AREAS.

CABLE HANGER

MESSENGER SYSTEM, TYP.

UNDERGROUND CONDUIT TO PAD MOUNT TRANSFORMER

REF DWG(S) DRAWING NO.

 $\begin{tabular}{llll} \hline $\langle 3 \rangle$ CONDUIT AND WIREWAY ROUTING SHOWN ON DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. \\ EXACT WIREWAY ROUTING TO BE DETERMINED BY CONTRACTOR ON—SITE. \\ \hline \end{tabular}$

PROJ DESIG	PROJECT: GRAYLING RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE						
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025						
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025						

DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION Consulting Engineers TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY

WIREWAY DETAILS

HEET 2 OF 5 GRRE-SS-2000

LEGEND

DC COMBINER

CABLE HANGER

BOXES (4)

MESSENGER

UG POWER

UG COMM

CONDUIT

STUB-UP

PV ARRAY

AREA

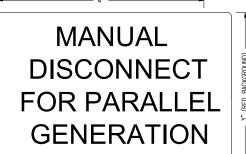
CABLE

CABLE

 \bigcirc

1 2

والمشهدات



LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. LABEL TO BE ENGRAVED PLASTIC. (1) TOTAL

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM GENERATION METER.

(1) TOTAL

NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC
DISCONNECT AND POWER SOURCE
RATED OUTPUT CURRENT: 302A
NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. (1) TOTAL

NEC 2023 705.12(B)(3)(3)

▲ WARNING

HIS EQUIPMENT FED BY MULTIPLE SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (1) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 1069VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (4) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

NOT FOR CONSTRUCTION

PROJECT: GRAYLING RENEWABLE ENERGY DESIGN

DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON

NO. DESIGN/CONSTRUCTION/ASBUILT REVISION

A ISSUED FOR 95% REVIEW

B ISSUED FOR PV CONSTRUCTION BID

GGL/10-11-2025

MED/10-11-2025

Clectric Power System

Consulting Engineers

Fix: (907) 522-1953

Fix: (907) 522-1953

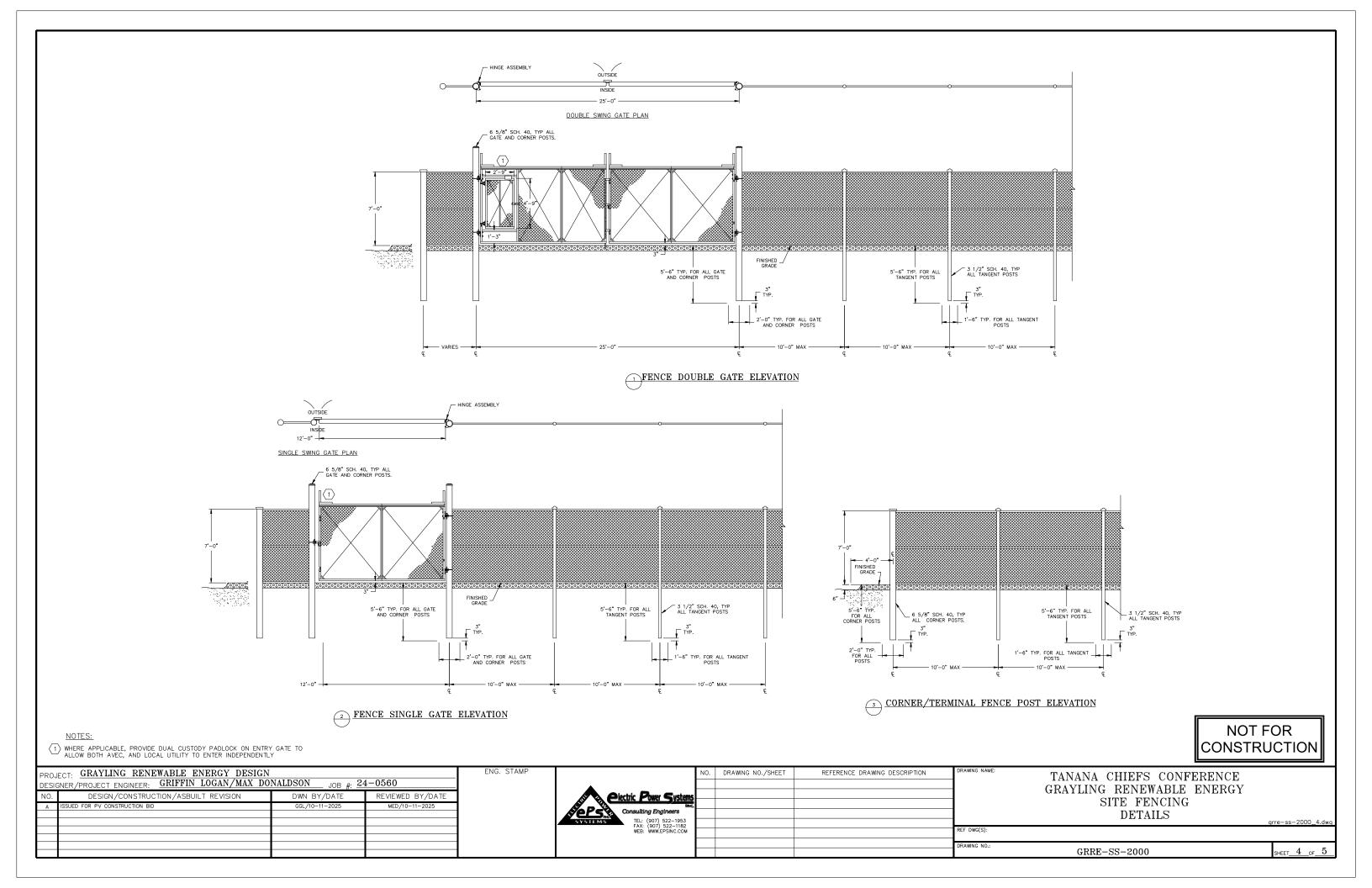
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWI
15				
~				
				REF D

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY EQUIPMENT SAFETY LABEL SCHEDULE

grre-ss-2000_3.dwg

DRAWING NO.: GRRE-SS-2000

SHEET 3 OF 5



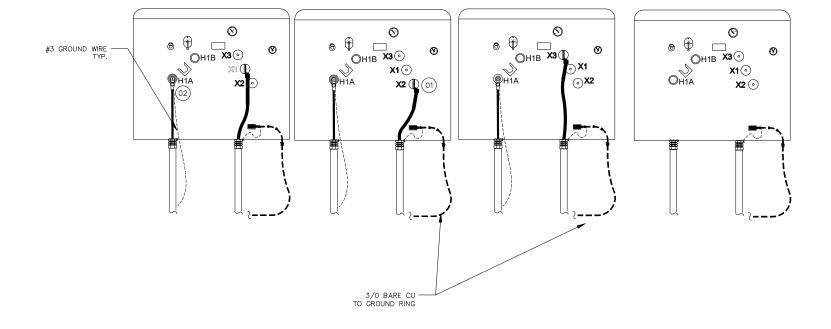
NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1			2 x 4	3/8
N101	1	INVERTER 2			2 x 4	3/8
N102	1	DC COMBINER	BOX 1		2 × 4	3/8
N103	1	DC COMBINER	BOX 2		2 x 4	3/8
N104	1	DC COMBINER	BOX 3		2 x 4	3/8
N105	1	DC COMBINER	BOX 4		2 x 4	3/8
N106	1	COMMUNICATIONS	PANEL		2 x 4	3/8
N107	1	400A	MAIN AC PANEL		2 x 4	3/8
N108	1	CB 1			1 x 3	1/8
N109	1	CB 2			1 x 3	1/8
N110	1	CB SS			1 x 3	1/8
N111	1	MCB			1 x 3	1/8
N112	1	120V STATION SERVICE PANEL			2 x 4	3/8
N113	1	DATA MANAGER			2 x 4	3/8
N114	1	METER PANEL			2 x 4	3/8
N115	1	POWER DISTRIBUTION	PANELBOARD		2 x 4	3/8
N116	1	CT ENCLOSURE			2 x 4	3/8
N117	1	METER ENCLOSURE			2 x 4	3/8

NOTES

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WTH WHITE TEXT.
- 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
- 7) ALL DIMENSIONS SHOWN IN INCHES.

NOT FOR CONSTRUCTION

HEFS CONFERENCE	
AMEPLATE SCHEDULE	
orre-es-7	000 5 dwa
gire=35=21	300_3.dwq
-2000 SHEET 5	OF 5
5	RENEWABLE ENERGY IAMEPLATE SCHEDULE -2000 SHEET_5



EF. NO.	EST. QTY.	BILL OF MATERIA	MFGR./CATALOG NO.
(01)	— QTT. —	CABLE LUG, NEMA 2—HOLE, 4/O AWG CU	BURNDY/YA282N
02		CONNECTOR, COMPRESSION, 4/0 CU TO #6-#2 CU	BURNDY/YGHC29C26
03			
(04)			
(05)			
06)			
(07)			
08			
(09)			
(10)			
11)			
(12)			
13			
(14)			
(15)			
16)			
(17)			
18			
(19)			
(20)			
(21)			
22			
23)			
(24)			
25)			
(26)			
27			
28)			
29			
30			

NOT FOR CONSTRUCTION

1) LIFT XO BUSHING BOND JUMPER AND ISOLATE ALL XO CONNECTIONS FROM ANY GROUNDING AT THE UTILITY SERVICE POLE.

PROJECT: GRAYLING RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560							
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE				
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025				

Consulting Engineers
FEL: (907) 522–1953
FAX: (907) 522–1182
WEB: WWW.EPSINC.COM

ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DIVAMINO ITAMI
15				
K				
				REF DWG(S):
				DD AMBLO NO

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY TRANSFORMER DETAILS

grre-ss-200

GRRE-SS-2000 SHEET 6 OF 6

Circuit Information		Electrical calculations								System Information										
Destination Inverter No.	Destination Combiner No.	Source Circuit No.	Modules (#)	Open Circuit Voltage (VOC)	Maximum Power Voltage (Vmp)	Short Circuit Current (Isc)	Continuous Current (1.25*Isc)	Irradiance Current (1.25*CC)	Mininum Fuse Size (A)	Selected Fuse Size (A)	Minimum Wire Ampacity (A)	Selected String Wire Size (CU 2KV PV Wire, 90°C, <2% Voltage Drop) (AWG)	Maximum Wire Distance (FT)	Voltage Drop (V)	Voltage Drop (%)		nformation rom to	Continuous Current (A)	Minimum Wire Ampacity From Selected Device (A)	Selected Wire Size (AL 2KV PV Wire, 75°C, <2% Voltage Drop)(AWG)
1	1	1	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	325	18.33	1.72	DS1	INV1	174.88	175	1/0
1	1	2	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	280	15.79	1.48	DS3	INV1	43.72	44	#8
1	1	3	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	235	13.25	1.24	DS2	INV2	174.88	175	1/0
1	1	4	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	190	10.72	1.00	DS4	INV2	43.72	44	#8
1	1	5	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	140	7.90	0.74					
1	1	6	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	95	5.36	0.50					
1	1	7	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	50	2.82	0.26					
1	1	8	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	5	0.28	0.03					
1	3	1	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	5	0.28	0.03			PANEL CHARAC	TERISTICS	
1	3	2	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	50	2.82	0.26			Voc (V)	52.58	
2	2	1	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	325	18.33	1.72			Voc Coef. (%/℃)	-0.25	
2	2	2	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	280	15.79	1.48			Vmp (V)	44.64	
2	2	3	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	235	13.25	1.24			Pmax Coef. (%/℃)	-0.3	
2	2	4	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	190	10.72	1.00					
2	2	5	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	140	7.90	0.74			SITE CHARACT	ERISTICS	
2	2	6	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	95	5.36	0.50			T_Amb Min (°C)	-33.6	
2	2	7	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	50	2.82	0.26			T_Amb Max (°C)	26	
2	2	8	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	5	0.28	0.03					
2	4	1	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	95	5.36	0.50					
2	4	2	24	1447	1068.1	13.99	17.49	21.86	21.86	25	25	10	140	7.90	0.74					

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

NOT FOR CONSTRUCTION

PROJECT: GRAYLING RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE					
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025					
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025					

ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME
15				
Ž				
				REF DWG(S):
				KEI BIIO(3).
				DRAWING NO.:

TANANA CHIEFS CONFERENCE GRAYLING RENEWABLE ENERGY PV STRING CALCULATIONS

GRRE-EL-0700

SHEET 1 OF 1

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY DESIGN

JOB NO. 24-0560 - ISSUED FOR PV CONSTRUCTION BID



MINTO POWER PLANT



	DRAWIN	G INDEX		SCOPE OF WORK		
	TITLE	DRAWING NUMBER	SHEET	REVISION	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM I N MINTO, AK.	
	GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	MNRE-EL-0000	1	С	THE SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND	
	GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	MNRE-EL-0000	2	С	2 STRING INVERTERS MOUNTED INSIDE A CONTAINER. THE SYSTEM WILL OPERATE IN PARALLEL WITH THE LOCAL UTILITY AND HAVE	
	SITE LAYOUT — OVERALL	MNRE-EL-2500	1	D	RELATED ELECTRICAL SAFETY AND METERING SYSTEMS.	
	SITE LAYOUT - PV	MNRE-EL-2500	2	D		
WING NOT -	► SITE LAYOUT - BESS	MNRE-EL-2500	2	С—		
D IN THIS WING SET	SITE LAYOUT - INTERCONNECTION	MNRE-EL-2500	4	С	SYSTEM SUMMARY	
	SITE LAYOUT - POWER CONVERSION HUT	MNRE-EL-2500	5	С	PV SYSTEM SIZE: 214.2kWdc / 250kWac	
	SITE LAYOUT - COMMUNICATIONS PANEL	MNRE-EL-2500	6	С	INTERCONNECTION VOLTAGE: 12.47kV, 3 PHASE, 4 WIRE	
	ONE LINE DIAGRAM	MNRE-EL-0010	1	D		
	THREE LINE DIAGRAM	MNRE-EL-0100	1	C	GENERAL NOTES	
	DV ADDAY DO WIDNO DI ODAY	LANDE EL COMA			ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND	
	PV ARRAY DC WIRING DIAGRAM	MNRE-EL-0011	1	D	LICENSED ELECTRICAL CONTRACTOR.	
	PV ELECTRICAL SITE PLAN	MNRE-EL-0020	1	С	CONTRACTOR WILL FOLLOW IBC 2021 AND NFPA 70 NEC 2023 AS WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY	
	GROUNDING PLAN	MNRE-SS-2000	1	С	CODES, ORDINANCES AND REGULATIONS.	
	RACEWAY DETAILS	MNRE-SS-2000	2	В	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC	
	EQUIPMENT SAFETY LABEL SCHEDULE	MNRE-SS-2000	3	В	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL	
	SITE FENCING DETAILS	MNRE-SS-2000	4	А	BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE MANNER.	
	EQUIPMENT NAMEPLATE SCHEDULE	MNRE-SS-2000	5	A	PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL	
					DRAWINGS AND PRODUCT MANUALS.	
	PV STRING CALCULATIONS	MNRE-EL-0700	1	С	ALL DESIGN AND SPECIFICATIONS OF STRUCTURAL COMPONENTS ARE OUTSIDE THE SCOPE OF THESE PLANS.	
					PROJECT ENTITIES	
					OWNER: TANANA CHIEFS CONFERENCE	
					ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.	
					ELECTRIC SERVICE PROVIDER: ALASKA VILLAGE ELECTRIC COOPERATIVE	

NOT FOR CONSTRUCTION

PROJ DESIG	ect: <u>MINTO RENEWABLE ENERGY DESIGN</u> SNER/PROJECT ENGINEER: <u>GRIFFIN LOGAN/MAX DO</u>	NALDSON JOB #: 24	1-0560
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025

١	_	L
١	Clectric Power Systems	L
١	Consulting Engineers	L
ŀ	TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM	L

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	l
Systems	L_			
ine.				
522-1953 522-1182				
PSINC.COM				REF DWG(S):

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY COVER SHEET AND INDEX

mnre-pr-0001_1.dwg

MNRE-PR-0001 SHEET 1 OF 1

ELECTRICAL SPECIFICATIONS

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION DROPOLED IN THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO ALLOW THE SYSTEM TO STATE THE MISSING ITEMS TO STATE THE MISSING THE MISSI
- ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT. CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS
- ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- ALL THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- 11. CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS (360 DEGREES) BETWEEN PULL POINTS.
- METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE EGC SYSTEM. GROUNDS SHALL BE SIZED ACCORDING TO THE NEC.
- CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE

RECORD DOCUMENTS

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNTIL THESE DRAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE

WIRING METHODS

PROJECT:

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE.
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWINGS. FOR OUTDOOR INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATION.

MINTO RENEWABLE ENERGY DESIGN

- 20. AC WRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS.
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED CRIMPING TOOL.

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS SHALL BE MADE FOR SYSTEM GROUNDING.
- 27. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT IS TO BE REMOVED.
- 28. MODULES SHALL BE BONDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS:
- SOLID CONDUCTORS: ASTM B 3.
 STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED; WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE
- 33 INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS ELECTRICALLY CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS

RACEWAYS

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS: 34.1. RIGID STEEL CONDUIT: ANSI C80.1. 34.2. EMT: ANSI C80.3. (FOR INDOOR USE ONLY).

- 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 36. COATED FITTINGS FOR PVC—COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER, EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS.
 COVER IS GASKETED WITH OIL—RESISTANT GASKET MATERIAL AND FASTENED WITH
 CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE. CONNECTIONS ARE
 FLANGED, WITH STAINLESS—STEEL SCREWS AND OIL—RESISTANT GASKETS.
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED
- 38.1. 3/4-INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF
- 38.3. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS.
 SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH T

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS INCLUDING POWER SYSTEMS AND ENERGY STORAGE SYSTEMS.
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING MEANS.

PANELBOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1 FACH TYPE OF PANELBOARD OVERCURRENT PROTECTIVE DEVICE TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED.
 INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES,
 PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- 41.2.1. BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION.
 41.2.2. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- 41.2.3. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS

FNG STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING: 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS, SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5. OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION 01 SECTION "OPERATION AND MAINTENANCE INCLUDE THE FOLLOWING:
- 41.5.1. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING
- OVERCURRENT PROTECTIVE DEVICES.

 41.5.2. TIME-CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:
- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
- PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEI INDICATED. REFER TO DIVISION 01 SECTION "PRODUCT REQUIREMENTS."
- 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- COMPLY WITH NEMA PB 1.
- 42.5. COMPLY WITH NFPA 70.
- 43. CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING CRITERIA
- 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC

- SEISME PORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISME CONTROLS FOR ELECTRICAL SYSTEMS.

 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.

 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.

 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.

 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH—MOUNTED FRONTS OVERLAP BOX FRONTS, OVERLAP BOX.
- 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT.
 DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES:
 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1. LUGS: MECHANICAL TYPE.
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES—CONNECTED SHORT—CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES-CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAL—MAGNETIC CIRCUIT BREAKERS: INVERSE TIME—CURRENT ELEMENT FOR LOW—LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT—BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS—TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT—MOUNTED, FIELD—ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP—UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING;
 FIELD—REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD—ADJUSTABLE
 SETTINGS:
 45.4.1. INSTANTANEOUS TRIP.
- 45.4.2. LONG— AND SHORT—TIME PICKUP LEVELS. 45.4.3. LONG— AND SHORT—TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30—MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC EQUIPMENT.

REQUIRED SAFETY SIGNS AND LABELS

- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21.
- THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- 3. THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH THE NEC.
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1)
- UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535 RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:
 6.1. ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.
 6.2. VISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.

- "DANGER" HEADER; RED BACKGROUND WITH WHITE LETTERING.
 "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING.
- 6.4.
- "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
 "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING.
 OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND.
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690.

NOT FOR CONSTRUCTION

ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560 DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE ISSUED FOR 95% REVIEW MED/04-29-202 JRV/04-29-202 ISSUED FOR PV CONSTRUCTION BIT GGL/10-11-2025 MED/10-11-2025



	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	ι
				l
tems				ł
inc.				l
53 32 OM				L
MO				ľ
				ī

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY GENERAL INFORMATION AND SPECIFICATIONS

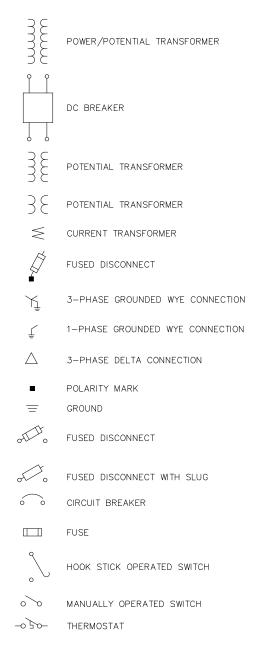
nnre-el-0000 1 d

REF DWG(S): DRAWING NO.

MNRE-EL-0000

HEET_1 OF 2

STANDARD BLOCKS - ELECTRICAL



PROTECTION, INSTRUMENTATION, OR AUTOMATION DEVICE

COIL OR ELEMENT

INPUT

VV RESISTOR

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

A AMBER LIGHT

R RED LIGHT

G GREEN LIGHT

(B) BLUE LIGHT

- INCANDESCENT LIGHT

□ SHORTING BLOCK

CONNECTION POINT

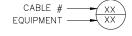
O TERMINATION CONNECTION POINT

■ POLARITY MARK (CURRENT TRANSFORMERS)

─ GROUND

STANDARD ABBREVIATIONS - ELECTRICAL

		10110					
Α	AMPERE	EIA	ELECTRONICS INDUSTRY ASSOCIATION	N	NEWTON	TIA	TELECOMMUNICATIONS INDUSTRY
ACB	AIR CIRCUIT BREAKER	EJ	EXPANSION JOINT	N	NORTH		ASSOCIATION
AB	AIR BREAK	EL	ELECTRICAL	NC	NORMALLY CLOSED	TRP	TRIP
ABV	ABOVE	ELEV	ELEVATION	NCC	NORMALLY CLOSED CONTACT	TURB	TURBINE
AC	ALTERNATING CURRENT	ENCL	ENCLOSURE	N/C	NO CONNECTION	TX	TRANSMIT
ADJ	ADJUSTABLE	EQ	EQUAL	NIC	NOT IN CONTRACT	TYP	TYPICAL
ADJT	ADJACENT	EQUIP	EQUIPMENT	NO	NORMALLY OPEN	UG	UNDERGROUND
ALT	ALTERNATE	EST	ESTIMATE	NOC	NORMALLY OPEN CONTACT	UNO	UNLESS NOTED OTHERWISE
AL	ALUMINUM	EXIST	EXISTING	NS	SYNCHRONIZING NEUTRAL	V	VOLT
APPRX	APPROXIMATE	F	FARAD	NTS	NOT TO SCALE	VA	VOLTAMPERE
В	BUS	F	FUSE	OD	OUTSIDE DIAMETER	VA	PHASE A VOLTAGE
BF	BREAKER FAIL	FREQ	FREQUENCY	OUT	OUTPUT	VAR	REACTIVE POWER
BFI	BREAKER FAIL INITIATE	FT	FEET	P	REAL POWER OR PRIMARY	VB	PHASE B VOLTAGE
BKR	BREAKER	FT	FEED THROUGH	PB	PUSH BUTTON	VAC	ALTERNATING CURRENT VOLTAGE
BLDG	BUILDING	FUT	FUTURE	PF	POWER FACTOR	VC VCB	PHASE C VOLTAGE
BLK	BLOCK	G	CONDUCTANCE OR GROUND	PLC	PROGRAMMABLE LOGIC CONTROLLER		VACUUM CIRCUIT BREAKER
BOT	ВОТТОМ	GA	GAUGE	PM	PAD-MOUNT TRANSFORMER	VDC	DIRECT CURRENT VOLTAGE
BTU	BRITISH THERMAL UNIT	GALV	GALVANIZED	PSSS	PROVIDER SWITCHYARD	VERT VIF	VERTICAL
BTWN	BETWEEN	GB	GROUND BUS	PT	POINT	VIF	VERIFY IN FIELD NEUTRAL VOLTAGE
BU	BACKUP	GCB	GAS CIRCUIT BREAKER	PT	POTENTIAL TRANSFORMER	VN VR	VOLTAGE REGULATOR
С	COLOUMB	GEN	GENERATOR	PVC	POLYVINYL CHLORIDE	VREG	
CAP	CAPACITOR OR CAPACITANCE	GI	GALVANIZED IRON	PVMT	PAVEMENT	VKEG	VOLTAGE REGULATOR
CAP	CORRUGATED ALUMINUM PIPE	GND	GROUND	PWR	POWER	V5 VT	SYNCHRONIZING VOLTAGE
CB	CENTER BREAK	GOAB	GANG OPERATED AIR-BREAK SWITCH	Q	REACTIVE POWER		VOLTAGE TRANSFORMER
CBL	CABLE	GRC	GALVANIZED RIGID CONDUIT	R	RESISTANCE OR RESISTOR	W	WEST
CEM	CEMENT	GRD	GRADE, GRADING	RCLS	RECLOSE	W	WATT
CF	CUBIC FOOT	GRSC	GALVANIZED RIGID STEEL CONDUIT	RAD	RADIUS	W/	WITH
CHK	CHECK	Н	HENERY	RAD	RADIAN	W/0	WITHOUT
CI	CAST IRON	HDPE	HIGH-DENSITY POLYETHYLENE	RD	ROAD	X	REACTANCE
CIP	CAST IRON PIPE	HLO	HOT LINE ORDER	RE	REMOTE END	XFMR	TRANSFORMER
CIPC	CAST-IN-PLACE CONCRETE	HORIZ	HORIZONTAL	REF	REFERENCE	XMSSN	TRANSMISSION
CIR	CIRCLE	HP	HORSEPOWER	REQD	REQUIRED	Υ	ADMITTANCE
CKT	CIRCUIT	HZ	HERTZ	RET	REMOTE END TRIP	YL	YELLOW
CLK	CLOCK	IA	PHASE A CURRENT	RET	RETURN	Z	IMPEDANCE
CLS	CLOSE	IB	PHASE B CURRENT	REV	REVISION	2	TIME-DELAY
CMIL	CIRCULAR MIL	IC	PHASE C CURRENT	RLY	RELAY	21	DISTANCE
CMP	CORRUGATED METAL PIPE	ID	INSIDE DIAMETER	RR	RAILROAD	25	SYNCHRONISM CHECK
COS	COSINE	IN	INPUT	ROW	RIGHT OF WAY	27	UNDERVOLTAGE
CONC	CONCRETE	IN	INCH	RTS	READY TO SEND	30	ANNUNCIATOR
CONST	CONSTRUCTION	IN	NEUTRAL CURRENT	RTU	REMOTE TERMINAL UNIT	32	DIRECTIONAL POWER
CONT	CONTINUOUS	INCL	INCLUDE(D), INCLUDING	RX	RECEIVE	37	UNDERCURRENT OR UNDERPOWER
CONTR	CONTRACTOR	IND	INDUSTRY	S	APPARENT POWER	38	BEARING
CS		INT	INTERSECTION	S	SOUTH	40	FIELD
CSP	CORRUGATED STEEL PIPE	INV	INVERT	S	SOURCE	43	MANUAL TRANSFER OR SELECTOR DEVICE
CT	CURRENT TRANSFORMER	IP	POLARIZING CURRENT	S-L	SOURCE-LOAD	46	REVERSE-PHASE
CTRL	CURROLSWITCHER OR CONTROL SWITCH	j	COMPLEX NUMBER	SA	SURGE ARRESTOR	47	PHASE-SEQUENCE VOLTAGE
CTS	CLEAR TO SEND	J	JOULE	SC	SWITCH CABINET	49	MACHINE OR TRANSFORMER THERMAL RELAY
CU	COPPER	JB	JUNCTION BOX	SEC	SECTION	50	INSTANTANEOUS OVERCURRENT
DC	DIRECT CURRENT	KA	KILOAMPRERE	SEC	SECONDARY	51	AC TIME OVERCURRENT
DCD	DATA CARRIER DETECT	KV	KILOVOLT	SVC	SERVICE	52	AC CIRCUIT BREAKER
DCE	DATA COMMUNICATIONS EQUIPMENT	KW	KILOWATT	SVC	STATIC VAR COMPENSATOR	52a	NORMALLY OPEN BREAKER CONTACT
DDE	DOUBLE DEAD END	L	INDUCTANCE	SHT	SHEET	52b	NORMALLY CLOSED BREAKER CONTACT
DE	DEAD END	L	LINE	SIM	SIMILAR	59	OVERVOLTAGE
DEM	DEMOLISH, DEMOLITION	L	LOAD	SIN	SINE	60	VOLTAGE BALANCE
DEMOB	DEMOBILIZE	LB	LOAD BREAK	SPEC	SPECIFICATION	63	PRESSURE SWITCH
DET	DETAIL	LGPP	LANDFILL GAS POWER PLANT	SPECS	SPECIFICATIONS	64	APPARATUS GROUND
DFR	DISTURBANCE FAULT RECORDER	LT	LIGHT	SPSS	SPARTAN SUBSTATION	67	AC DIRECTIONAL OVERCURRENT
DI	DIGITAL INPUT	M	METER(S)	SS	SYNCHRONIZING SWITCH	68	BLOCKING
DIA	DIAMETER	MAT	MATERIAL	STA	STATION	69	PERMISSIVE
DIAG	DIAGONAL	MAX	MAXIMUM	STD	STANDARD	71	LEVEL SWITCH
DIM	DIMENSION	MFG	MANUFACTURER	SW	SWITCH	74	ALARM
DIST	DISTRIBUTION	MI	MILE	SWGR	SWITCHGEAR	76	DC OVERCURRENT
DNP	DISTRIBUTED NETWORK PROTOCOL	MIN	MINIMUM	SYM	SYMMETRICAL	78	OUT-OF-STEP
DO	DIGITAL OUTPUT	MISC	MISCELLANEOUS	SYNCH	SYNCHRONIZE	79	RECLOSING RELAY
	D STREET SUBSTATION	MM	MILLIMETER(S)	T	TIME OR TRANSFORMER	81	FREQUENCY
DSSS		MO	MOTOR OPERATED (OR)	TAN	TANGENT	85	CARRIER OR PILOT WIRE
DSSS DTE	DATA TERMINAL EQUIPMENT						
DTE	DATA TERMINAL EQUIPMENT DRAWING			TCM	TRIP COIL MONITOR	86	LOCK OUT
DTE DWG	DRAWING	MOB MTR	MOBILIZE METER	TCM TEI	TRIP COIL MONITOR TELEPHONE	86 87	LOCK OUT DIFFERENTIAL
DTE		MOB	MOBILIZE	TCM TEL TERM	TRIP COIL MONITOR TELEPHONE TERMINAL		



CABLE TAG - WIRING DIAGRAMS & 3-LINES

NOT FOR CONSTRUCTION

PROJ DESIG	BECT: MINTO RENEWABLE ENERGY DESIGN SNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 24	1-0560
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025



ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME
ems				
inc.				
,				
2				REF DWG(S):
М				KEI DWG(3).
			l l	

TANANA CHIEFS CONFERENCE
MINTO RENEWABLE ENERGY
GENERAL INFORMATION AND SPECIFICATIONS

mnre-el-0000_2.dwd

DRAWING NO.: MNRE-EL-0000

SHEET 2 OF 2



DWN BY/DATE REVIEWED BY/DATE ISSUED FOR 35% REVIEW GGL/02-07-2025 GGL/03-07-2025 JRV/02-07-2025 JRV/03-07-2025 ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW GGL/04-29-2025 ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025

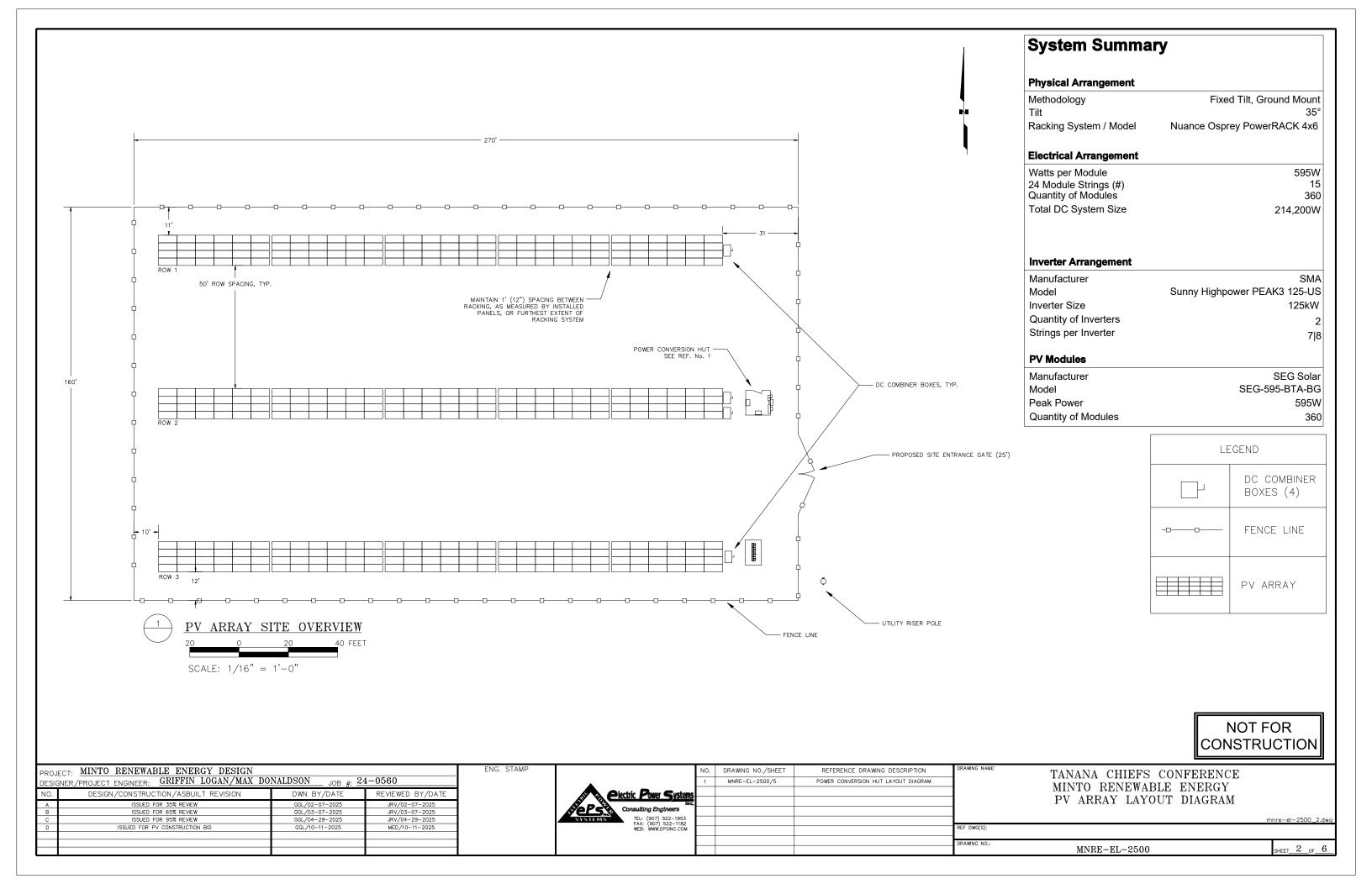


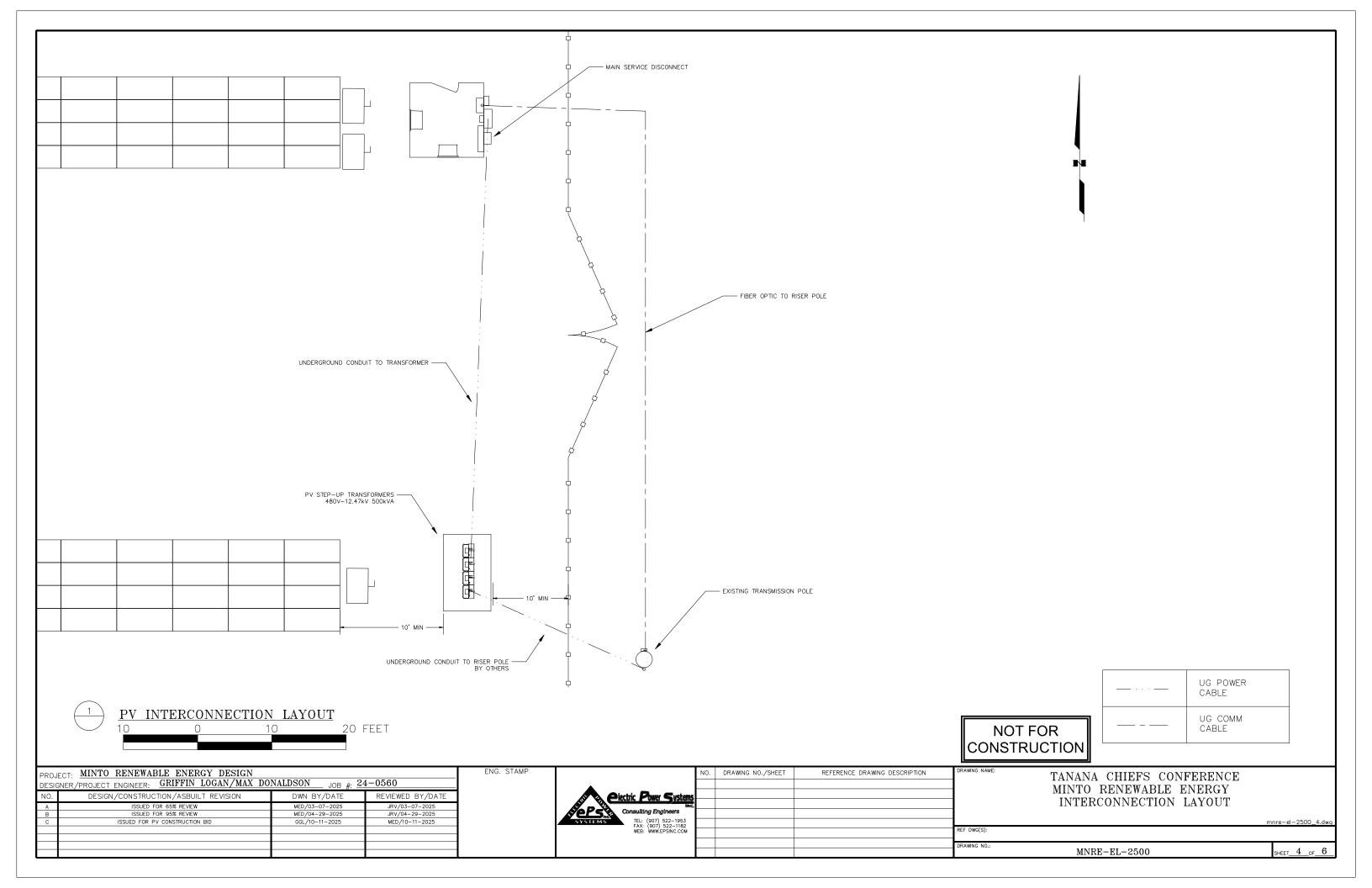
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	270711111
	1	MNRE-EL-2500/2	PV ARRAY LAYOUT DIAGRAM	1
tens	-2-	MNRE-EL-2500/3	BESS LAYOUT DIAGRAM	1
	3	MNRE-EL-2500/4	INTERCONNECTION LAYOUT]
,]
953 182				
СОМ				REF DW
				1

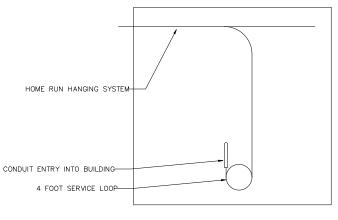
SITE LAYOUT DIAGRAM

MNRE-EL-2500

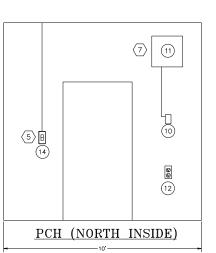
SHEET 1 OF 6

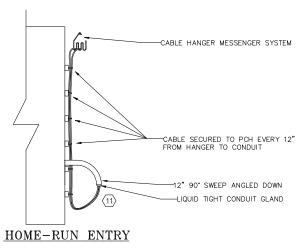


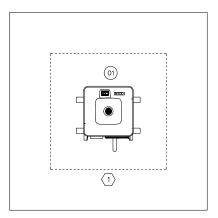




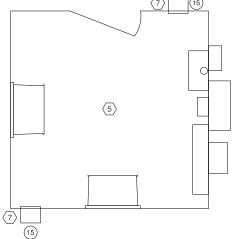
PCH (WEST OUTSIDE)

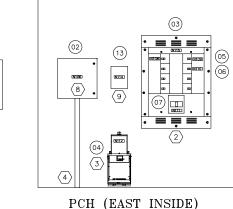


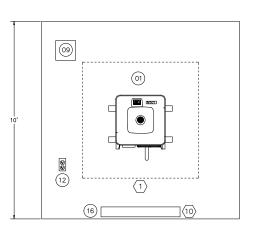




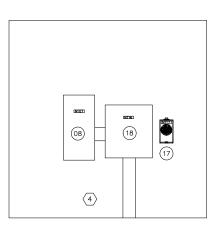
PCH (WEST INSIDE)





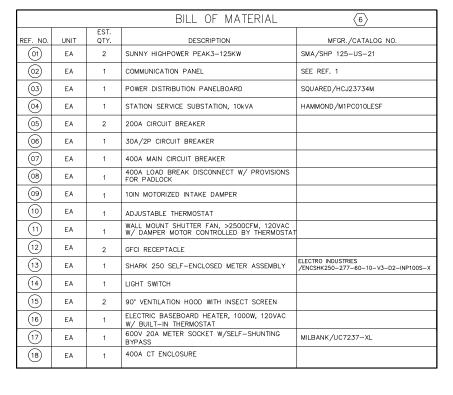


PCH (SOUTH INSIDE)



PCH (SOUTH OUTSIDE)





EF DWG(S): RAWING NO.

- (1) MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4" AWAY FROM THE WALL, AND 20" ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES. MAINTAIN 4' WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. PROVIDE A 4" X 4" WIREWAY (MINIMUM) BETWEEN INVERTERS AND PANELBOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARD SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARD AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- (3) MOUNT STATION SERVICE SUBSTATION SUCH THAT ALL MANUFACTURER RECOMMENDED CLEARANCE ZONES AWAY FROM EQUIPMENT IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE ZONE IN FRONT OF THE DEVICE, PER NEC
- $\fbox{4}$ route conduits such that the stub-up area is directly under all destination devices in the power conversion hut
- $\overleftarrow{\rm 5}$ provide ceiling mounted lighting such that 30 footcandles is maintained. Mount light switch next to door at least 40" from floor.
- (6) ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- (7) VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY A WEATHERPROOF 120VAC EXHAUST FAN WITH A MINIMUM FLOW RATE OF 2500CFM, CONTROLLED BY AN ADJUSTABLE THERMOSTAT FOR FAN OPERATION OF INTERIOR AIR TEMPERATURES OF 35°C AND ABOVE, AND BY A 10" MOTORIZED INTAKE DAMPER. EXHAUST FAN AND INTAKE DAMPER SHALL BE PROVIDED WITH A 90° EXTERIOR HOOD WITH INSECT SCREENS TO PREVENT INTRUSIONS OF WIND DRIVEN RAIN/SNOW.
- (8) MOUNT RECEPTACLES ON INSIDE WALLS OF PCH AT LEAST 18" FROM FLOOR. MOUNT ONE RECEPTACLE ON EAST SIDE OF DOOR (NORTH WALL), AND ONE RECEPTACLE NEXT TO BASEBOARD HEATER (SOUTH WALL).
- (9) CONNECT SHARK 250 CURRENT TRANSFORMERS AND POTENTIAL TRANSFORMERS TO THE 400A OUTPUT BREAKER AT POWER DISTRIBUTION PANELBOARD THROUGH A 1" CONDUIT.
- $\overleftarrow{\text{10}}$ Heating to be provided by electric baseboard heater with built—in thermostat. Heater to turn on below 10 $\overleftarrow{\text{10}}$
- (11) HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES. ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON—SITE.

-CEILING INSULATION: R30 MINIMUM

ALL INTERIOR CONDUITS SHALL BE GALVANIZED RIGID CONDUIT (GRC) OR ELECTRICAL METALLIC TUBING (EMT). EXTERIOR CONDUIT SHALL BE RIGID GALVANIZED CONDUIT ONLY. EMT TYPE COUPLERS AND FITTINGS SHALL BE RAIN-TIGHT COMPRESSION TYPE. GROUNDING BUSHINGS SHALL BE INSTALLED AT THE SOURCE END OF THE EMT CONDUIT RUNS FROM THE AC PANEL.

BUILDING MANUFACTURER TO PROVIDE PRE-FABRICATED METAL BUILDING PER FOLLOWING SPECIFICATIONS:

STRUCTURAL: -ROOF PITCH: 3:12

-ROOF DEAD LOAD 30PSF MINIMUM
-MAX WALL LOAD: 220LBS (INVERTER)

INSULATION:
-WALL INSULATION: R22 MINIMUM

-MAX FLOOR LOAD: 210LBS (STATION SERVICE SUBSTATION)

Consulting Engineers
TEL: (907) 522-1152
WEB: WWW.EPSINC.COM

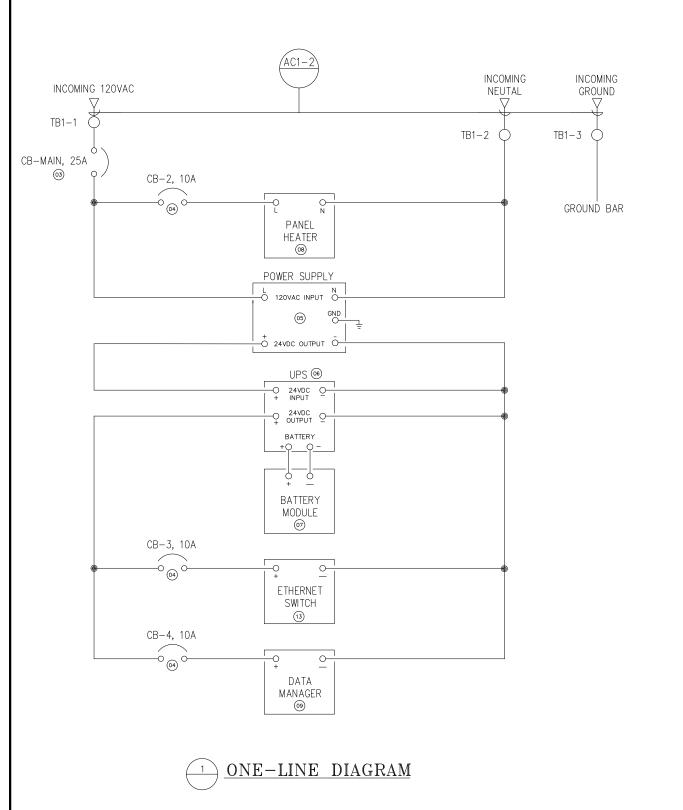
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRA
	1	MNRE-EL-2500/6	COMMUNICATIONS PANEL	
ame	1	MNRE-SS-2000/5	EQUIPMENT NAMEPLATE SCHEDULE	
310				
3 2				
M				REF

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY POWER CONVERSION HUT

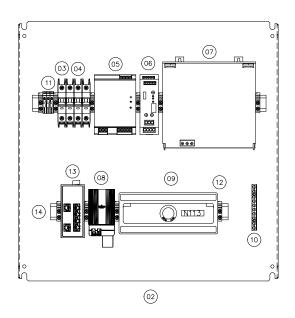
LAYOUT DIAGRAM

mnre-el-2500_5.de

MNRE-EL-2500 SHEET 5 OF 6







BILL OF MATERIAL REF. NO. UNIT QTY. DESCRIPTION

24" X 24" X 10" NEMA 1 MILD STEEL
WALL MOUNTED ENCLOSURE MFGR./CATALOG NO. 01) EA 02 EΑ INNER PANEL FOR 24X24X10 ENCLOSURE 03 25A, 600V UL489 1-POLE BREAKER 04) 05) PHOENIX CONTACT 120VAC/24VDC PS, 20 AMP PHOENIX CONTACT/ 2866776 06) EA PHOENIX CONTACT 20 AMP UPS PHOENIX CONTACT/ 2320238 07 EΑ PHOENIX CONTACT 12 Ah BATTERY PHOENIX CONTACT/ 1274119 08 09 150W PANEL HEATER W/BUILT IN REGULATION ON: 41°F - OFF: 59° EΑ STEGO/06021.0-00 EΑ SMA/EDMM-20 DATA MANAGER (10) UL 467 GROUND BAR, 6 POLE MINIMUM 11) EA 6MM DINRAIL MOUNTED TERMINAL BLOCK (12) EA 6MM DINRAIL MOUNTED TERMINAL BLOCK END STOP

EA

13)

14)

NOTES:

ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT-HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IT HE CENTER COLUMN, AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.

UNMANAGED ETHERNET SWITCH, 2 FIBER PORTS

35MM DIN MOUNTING RAIL

2 PROVIDE 1 SPARE CIRCUIT BREAKER FOR EACH SIZE (REF. NO. 3, AND REF. NO. 4) AND STORE IN BOTTOM OF ENCLOSURE



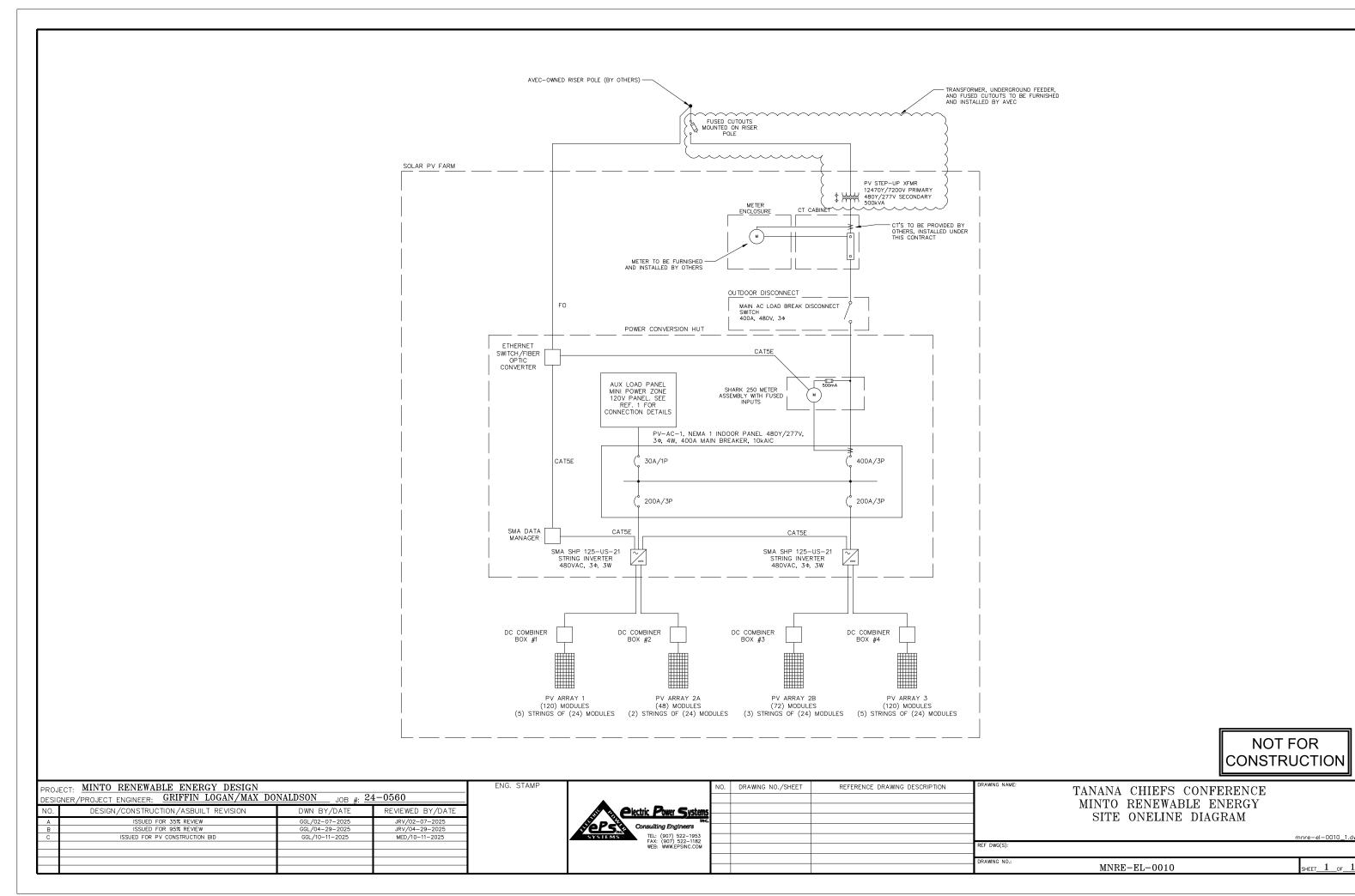


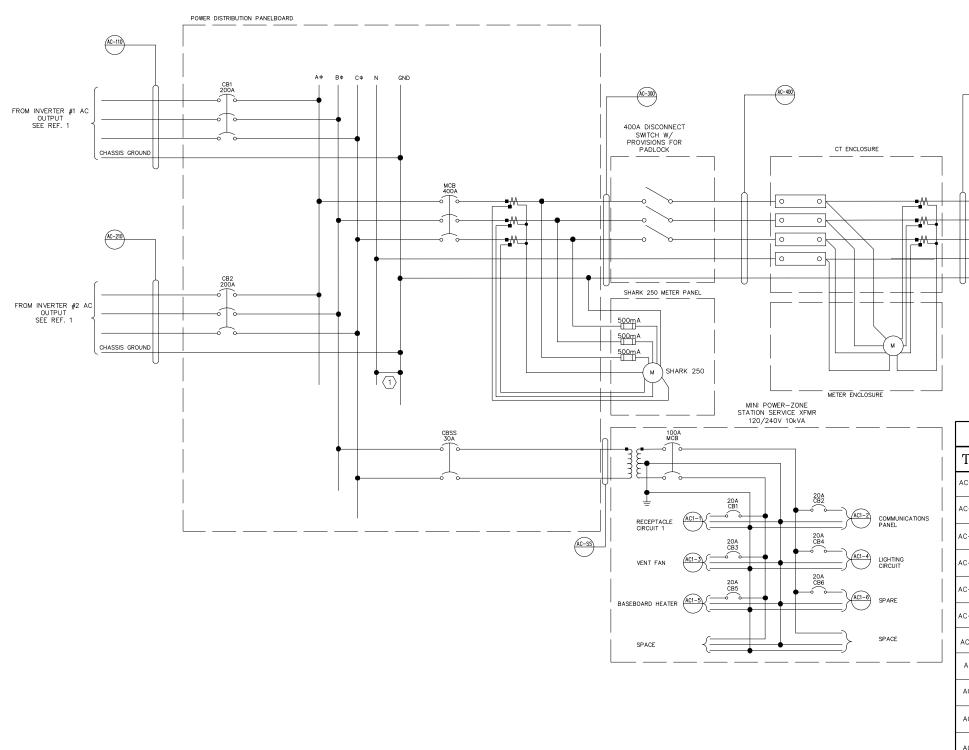
NOT FOR CONSTRUCTION

	PROJECT: MINTO RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0560				ENG. STAMP	_	NO. [DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY	
N ISSL	O. AD FOR	DESIGN/CONSTRUCTION/ASBUILT REVISION R PV CONSTRUCTION BID	DWN BY/DATE GGL/10-11-2025	REVIEWED BY/DATE MED/10-11-2025		Consulting Engineers					COMMUNICATIONS PANEL	
	#					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM				REF DWG(S):	ELEVATION AND DETAILS	mnre-el-2500_6.dwg
	+									DRAWING NO.:	MNRE-EL-2500	SHEET 6 OF 6

 $\langle 1 \rangle$

MOXA/EDS-G308-2SPF





CABLE SCHEDULE NO. CONDUCTOR RACEWAY TAG (3) 2/0 CU XHHW, (1) #6 CU GEC C-0111 (3) 2/0 CU XHHW, (1) #6 CU GEC C-0112 AC-300 2/PHASE 2/0 CU XHHW, (1) #6 CU XHHW NEUTRAL, (1) #6 CU GEC C-21 C-22 C-23 2/PHASE 2/0 CU XHHW, (1) #6 CU XHHW NEUTRAL, (1) #6 CU GEC 2/PHASE 2/0 CU XHHW, (1) #6 CU XHHW NEUTRAL, (1) #6 CU GEC AC-500 AC-600 C-2 (3) #2 CU 15KV MV-105, (1) #6 CU EGC (2) #10 CU XHHW 1/2" EMT AC-SS #12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC 1/2" EMT AC1-2 1/2" EMT #12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC AC1-3 1/2" EMT #12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC 1/2" EMT #12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC 1/2" EMT #12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC TE:

-LOW VOLTAGE AC CONDUCTOR SIZING BASED ON A TEMPERATURE RATING OF 75°C.

-MEDIUM VOLTAGE AC CABLES BASED ON A TEMPERATURE RATING OF 105°C.

-USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE TEMPERATURE RATING OF THE CONDUCTOR IS MAINTAINED.

-IF LARGER-THAN-SPECIFIED CABLE IS USED, CONFIRM THAT THE CONDUIT SIZE IN THE ASSOCIATED RACEWAY MAINTAINS A MAXIMUM 40% FILL RATIO

-SEE REF. 2 FOR CONDUIT SCHEDULE

TO DISTRIBUTION BY AVEC

REF DWG(S):

PV STEP-UP XFMR

NOT FOR CONSTRUCTION

NOTES:

(1) INSTALL N-G BOND JUMPER ONLY IN THE POWER DISTRIBUTION PANELBOARD.

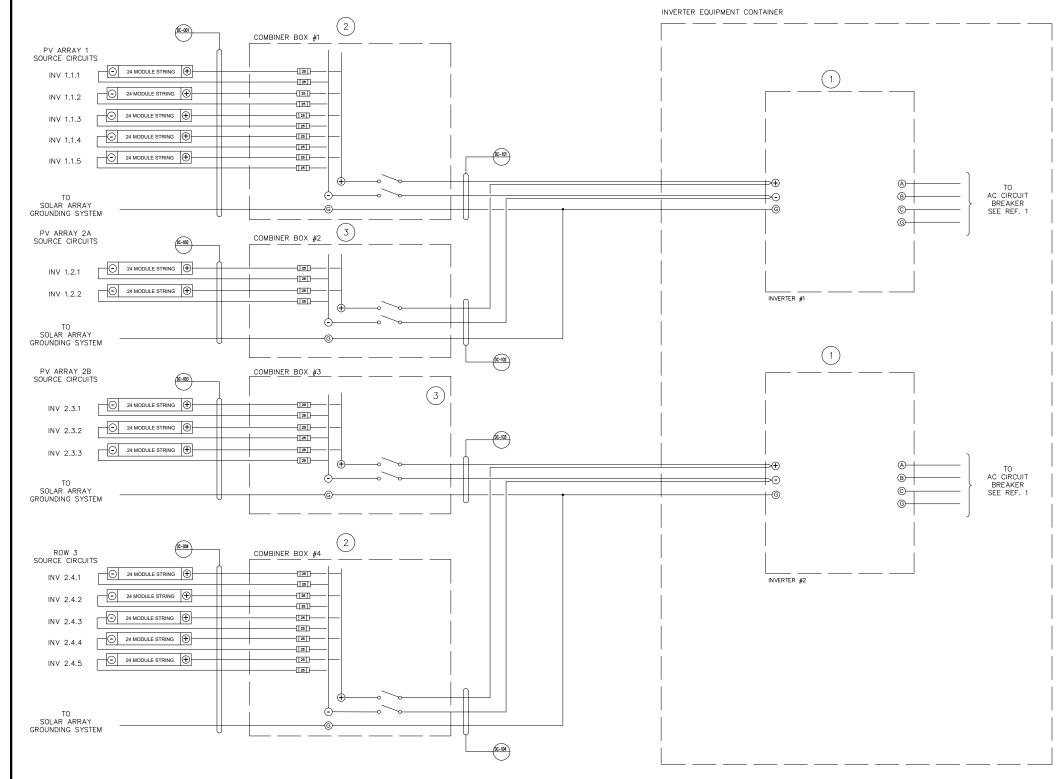
 ENG. STAMP

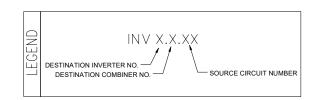
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION
A	1	MNRE-EL-0011/1	WIRING DIAGRAM
Plectric Power Systems	1	MNRE-SS-2000/2	RACEWAY DETAILS
inc			
Consulting Engineers			
TEL: (907) 522-1953 FAX: (907) 522-1182			
WEB: WWW.EPSINC.COM			

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY PV ARRAY AC THREE LINE DIAGRAM

mnre-el-0100_1.dwq







	EQUIPMENT SCHEDULE											
TAG	QUANTITY	DESCRIPTION										
1	2	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US										
2	2	10 INPUT DC COMBINER; TERRASMART FSFT275-10-25-N4-CD OR EQUIVALENT										
3	2	6 INPUT DC COMBINER; TERRASMART FSFT-275-6-25-N4-CD OR EQUIVALENT										

	CABLE SCHE	DULE
TAG	NO. CONDUCTOR	RACEWAY
DC-001	(10) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-002	(4) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-003	(6) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-004	(10) #10 CU PV WIRE, (1) #6 CU EGC	FREE AIR
DC-101	(2) #2 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-102	(2) #8 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-103	(2) #6 AL PV WIRE, (1) #6 CU EGC	FREE AIR
DC-104	(2) #2 AL PV WIRE, (1) #6 CU EGC	FREE AIR

NOTE:1) DC STRING CONDUCTOR SIZING BASED ON COPPER UL 4703 PV WIRE WITH A TEMPERATURE RATING OF 90°C

2) DC CABLE SIZING FOR HOME—RUNS BASED ON AL 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C IN FREE AIR (TABLE 310.15(B)(17)) AND A VOLTAGE DROP OF LESS THAN 2% USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE CONDUCTOR DESCRIPTION IS MAINTAINED.

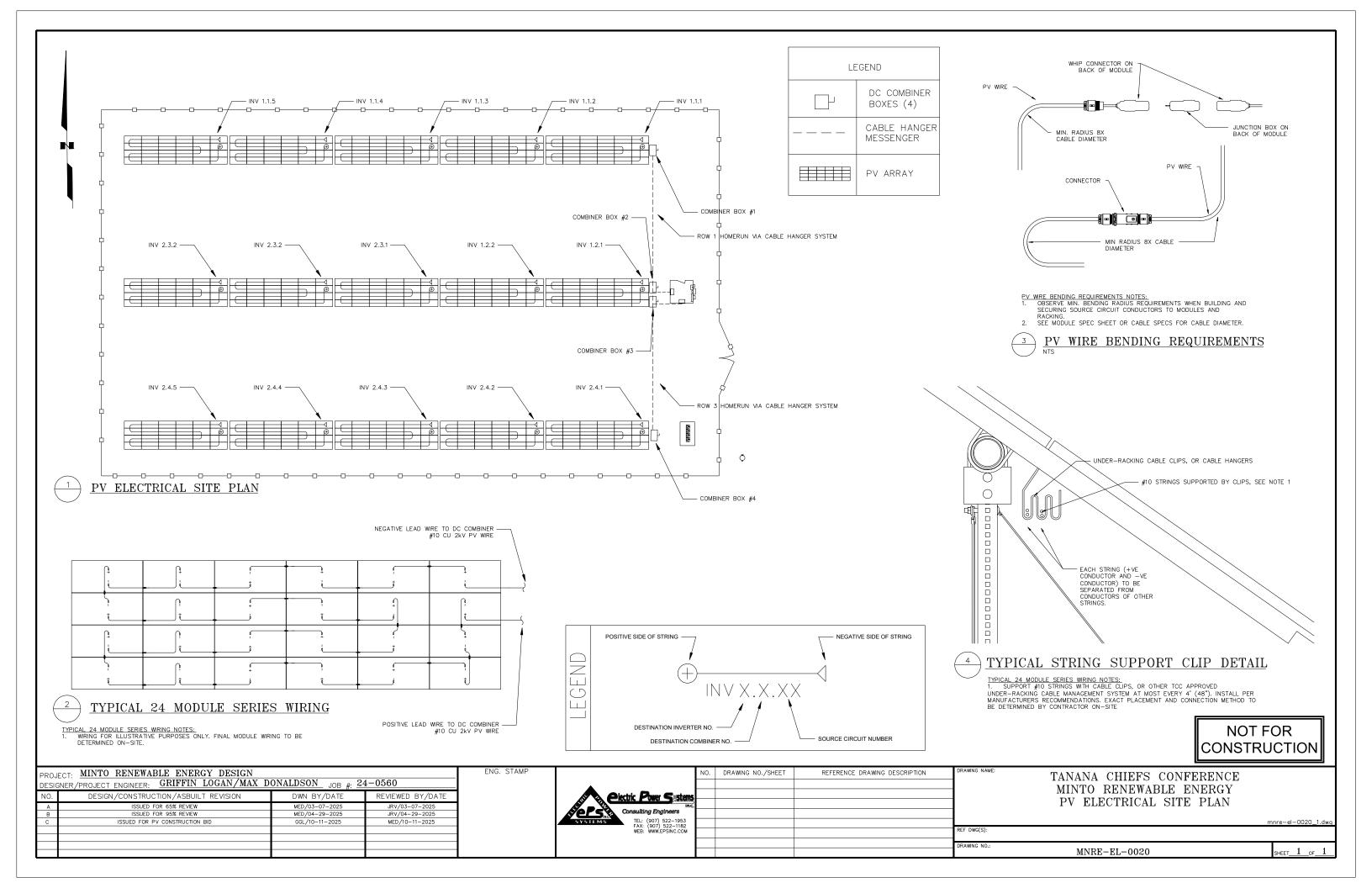
PROJ DESIG	ECT: MINTO RENEWABLE ENERGY DESIGN SHER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 24	1-0560	ENG. STAMP
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE	
Α	ISSUED FOR 35% REVIEW	GGL/02-07-2025	JRV/02-07-2025	
В	ISSUED FOR 65% REVIEW	GGL/03-07-2025	JRV/03-07-2025	
С	ISSUED FOR 95% REVIEW	GGL/04-29-2025	JRV/04-29-2025	
D	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025	
			`	

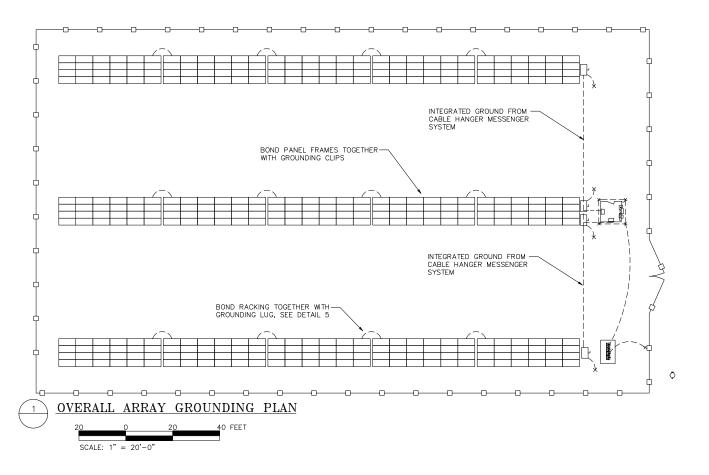
NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAMI
1	MNRE-EL-0100/1	AC THREE LINE DIAGRAM	
<u> </u>			
			REF DWG(S):
			DD LWING NO
	1	I .	DRAWING NO.:

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY PV ARRAY DC WIRING DIAGRAM

mnre-el-0011.dv

AWING NO.: MNRE-EL-0011 SHEET 1 OF 1

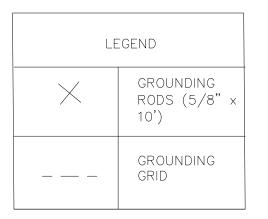


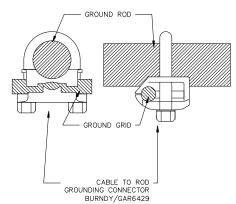


GROUNDING PLAN NOTES:

- 1. CONTRACTOR TO TEST EACH GROUNDING ELECTRODE USING THE FALL OF POTENTIAL TEST. GROUND RODS SPACED 6' MIN
- APART SHALL BE ADDED AS NECESSARY UNTIL A RESISTANCE TO GROUND VALUE OF 25 OHMS OR LESS IS ACHIEVED.

 2. MIN. BARE COPPER GROUND WIRE SIZE SHALL BE #6.

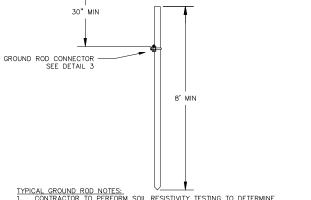




GROUND ROD CONNECTION

NTS





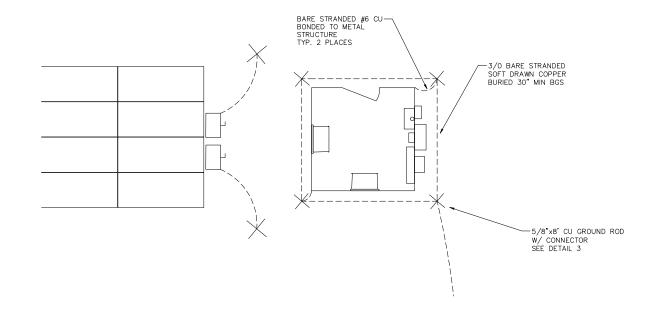
12" MIN

TYPICAL GROUND ROD NOTES:

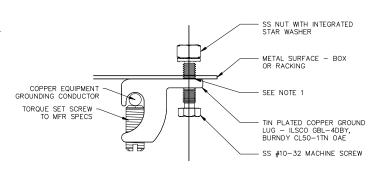
1. CONTRACTOR TO PERFORM SOIL RESISTIVITY TESTING TO DETERMINE AMOUNT OF GROUND RODS NEEDED TO KEEP RESISTANCE BELOW 5



FINISHED GRADE



HUT GROUNDING DETAIL



TYPICAL METAL RACKING GROUNDING NOTES:

1. PRIOR TO MOUNTING LUGS ON ANODIZED ALUMINUM OR PAINTED METAL SURFACES, THE SURFACE MUST BE STRIPPED AND THEN COVERED WITH BURDNY PENETROX A-13 ANTI-OXIDANT COMPOUND BELOW THE LUG TO ENSURE

- CONDUCTIVITY
 ON ANODIZED AL SURFACES, THE ANODIZATION SHALL BE GROUND OFF.
 ON PAINTED SURFACES, THE PAINT LAYER SHALL BE GROUND
 OR SCRATCHED OFF.

5 TYPICAL METAL RACKING BONDING

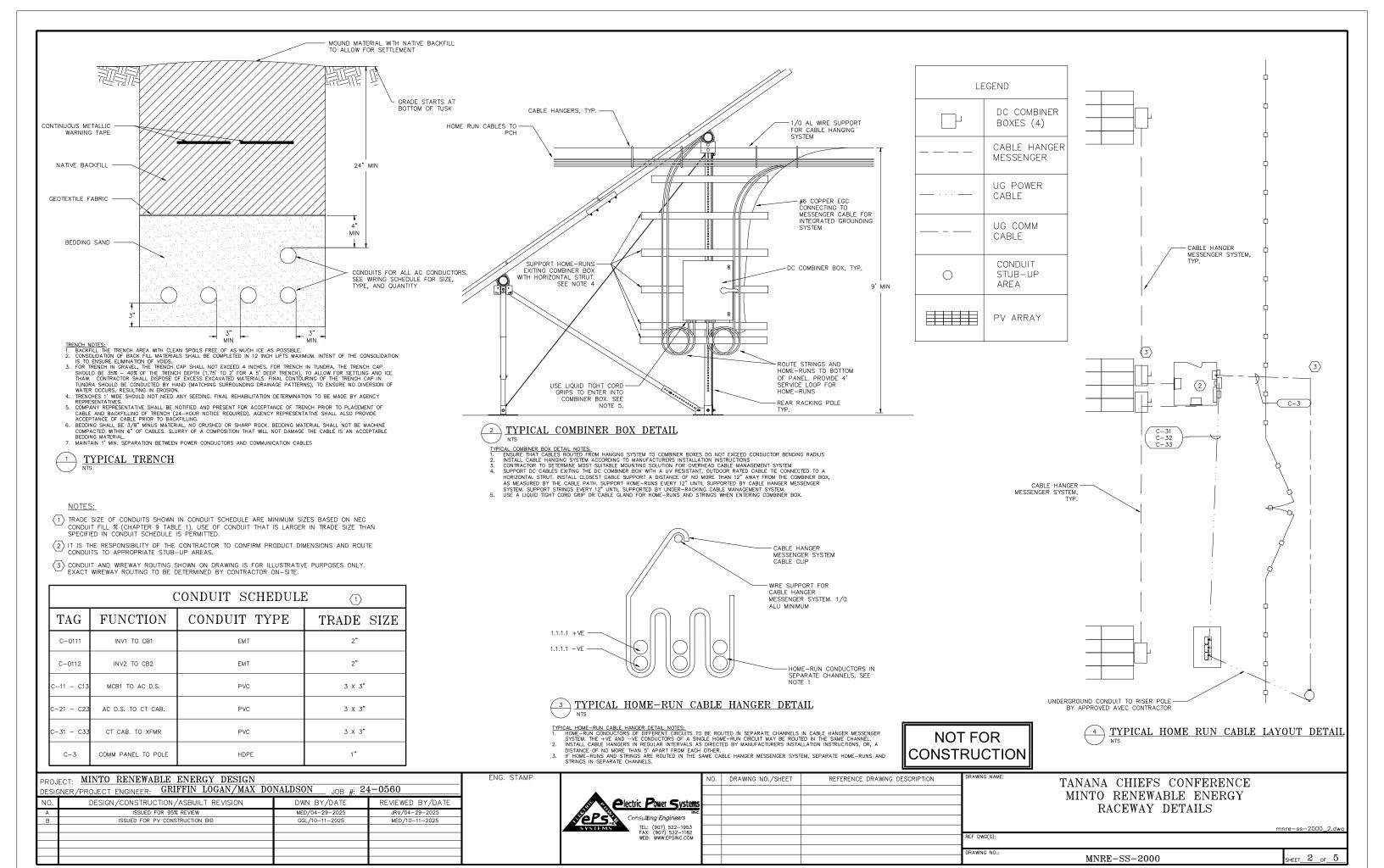
MINTO RENEWABLE ENERGY DESIGN PROJECT: DESIGNER/PROJECT ENGINEER: MAX DONALDSON/JOHN VENABLES JOB #: 24-0560 ISSUED FOR 95% REVIEW MED/04-29-2025 ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025



	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWIN
<u> 15</u>				
ž				-
				-
				REF DV
				DRAWIN

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY GROUNDING PLAN

DWG(S): SHEET 1 OF 5 MNRE-SS-2000



MANUAL DISCONNECT FOR PARALLEL **GENERATION**

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. LABEL TO BE ENGRAVED PLASTIC.

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM (1) TOTAL

NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC DISCONNECT AND POWER SOURCE RATED OUTPUT CURRENT: 302A NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. (1) TOTAL

NEC 2023 705.12(B)(3)(3)

THIS EQUIPMENT FED BY MULTIPLE SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (1) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 1069VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (4) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

> **NOT FOR** CONSTRUCTION

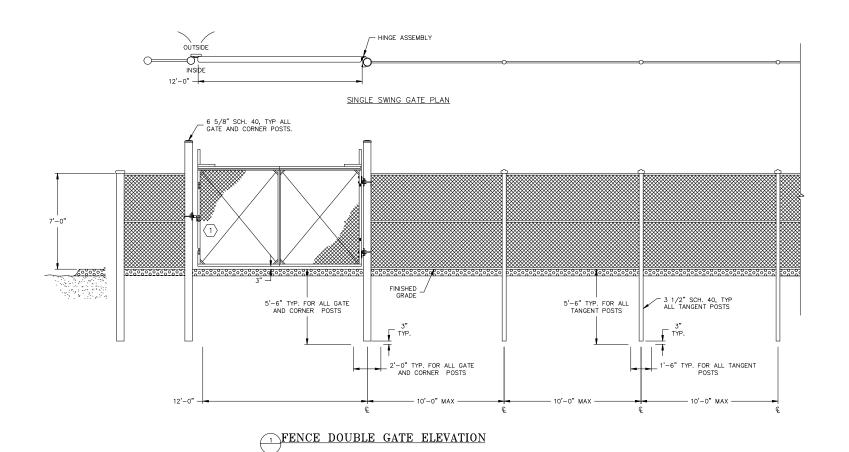
PROJECT: MINTO RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560 DESIGN/CONSTRUCTION/ASBUILT REVISION ISSUED FOR PV CONSTRUCTION BIE

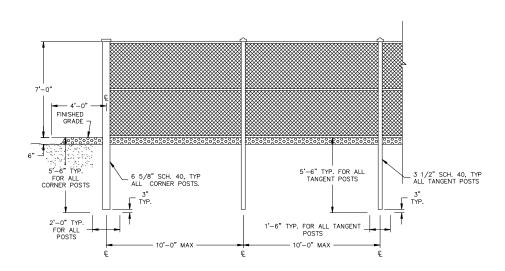
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAW
				1
5				l
2	-			-
				-
				REF D

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY EQUIPMENT SAFETY LABEL SCHEDULE

SHEET 3 OF 5

DRAWING NO.: MNRE-SS-2000





2 CORNER/TERMINAL FENCE POST ELEVATION

NOTES:

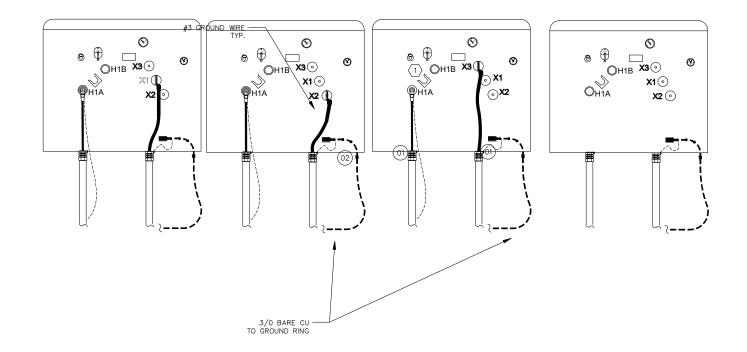
 $\fbox{1}$ provide dual custody padlock on entry gate to allow both avec, and local utility to enter independently

	ROJECT: MINTO RENEWABLE ENERGY DESIGN ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	ONALDSON JOB #: 2	24-0560	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY	
1	O. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems				SITE FENCING	
SS	AD FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers			4		
-		+						4	DETAILS	mnre-ss-2000 4.dwa
					TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		111111C 33 2000_1.dwg
								22.444.24.2		
								DRAWING NO.:	MNRE-SS-2000	SHEET 4 OF 5

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1			2 x 4	3/8
N101	1	INVERTER 2			2 × 4	3/8
N102	1	DC COMBINER	BOX 1		2 × 4	3/8
N103	1	DC COMBINER	BOX 2		2 × 4	3/8
N104	1	DC COMBINER	BOX 3		2 × 4	3/8
N105	1	DC COMBINER	BOX 4		2 × 4	3/8
N106	1	COMMUNICATIONS	PANEL		2 × 4	3/8
N107	1	200A	MAIN AC PANEL		2 x 4	3/8
N108	1	CB 1			1 × 3	1/8
N109	1	CB 2			1 x 3	1/8
N110	1	CB SS			1 × 3	1/8
N111	1	мсв			1 × 3	1/8
N112	1	120V STATION SERVICE PANEL			2 × 4	3/8
N113	1	DATA MANAGER			2 x 4	3/8
N114	1	METER PANEL			2 x 4	3/8
N115	1	POWER DISTRIBUTION	PANELBOARD		2 x 4	3/8
N116	1	CT ENCLOSURE			2 x 4	3/8
N117	1	METER ENCLOSURE			2 × 4	3/8

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WTH WHITE TEXT.
- 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
- 7) ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: MINTO RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560	ENG. STAMP	_	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY
NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE SSUAD FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025		Consulting Engineers				-	EQUIPMENT NAMEPLATE SCHEDULE
		TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM				REF DWG(S):	mnre-ss-2000_5.c
						DRAWING NO.:	MNRE-SS-2000 SHEET 5 OF 4



BILL OF MATERIAL										
REF. NO.	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO							
01)	_	CABLE LUG, NEMA 2-HOLE, 4/0 AWG CU	BURNDY/YA282N							
(02)	-	CONNECTOR, COMPRESSION, 4/0 CU TO #6-#2 CU	BURNDY/YGHC29C26							
(03)										
04)										
05)										
(06)										
07										
08										
09										
10										
11)										
(12)										
(13)										
14)										
(15)										
(16)										
17										
18										
19										
20										
21)										
22)										
23)										
(24)										
25)										
26										
27)										
28										
29										
30)										

 $\overbrace{\mbox{1}}$ Lift xo bushing bond jumper and isolate all xo connections from any grounding at the utility service pole.

	DJECT: MINTO RENEWABLE ENERGY DESIGN BIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	24-0560	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY	
NO	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems				TRANSFORMER DETAILS	
SSU A I	OR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers				TRANSFORMER DETAILS	
					TEL: (907) 522–1953 FAX: (907) 522–1182					mnre-ss-2000 6.dwa
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		111110 00 2000_0.0Wg
								DDAWNIO NO		
								DRAWING NO.:	MNRE-SS-2000	SHEET_ 6_OF_ 6

Circ	uit Informatio	n																		
Destination Inverter No.		Source Circuit No.	Modules (#)	Open Circuit Voltage (VOC)	Maximum Power Voltage (Vmp)	Short Circuit Current (Isc)	Continuous Current (1.25*Isc)	Irradiance Current (1.25*CC)	Mininum Fuse Size (A)	Selected Fuse Size (A)	Minimum Wire Ampacity (A)	Selected String Wire Size (CU 2KV PV Wire, 90°C, <2% Voltage Drop) (AWG)	Maximum Wire Distance (FT)	Voltage Drop (V)	voitage		Information from to	Continuous Current		Selected Wire Size (AL 2KV PV Wire, d 75°C, <2% Voltage Drop)(AWG)
1	1	1	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05	DS1	INV1	109.30	110.00	#2
1	1	2	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	60	3.38	0.32	DS2	INV1	43.72	44.00	#8
1	1	3	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55	DS3	INV2	65.58	66.00	#6
1	1	4	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82	DS4	INV2	109.30	110.00	#2
1	1	5	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	200	11.28	1.06					
1	2	1	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05					
1	2	2	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	60	3.38	0.32			PANEL CHARACT	ERISTICS	
2	3	1	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55			Voc (V)	52.58	
2	3	2	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82			Voc Coef. (%/℃)	-0.25	
2	3	3	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	200	11.28	1.06			Vmp (V)	44.64	
2	4	1	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	10	0.56	0.05			Pmax Coef. (%/°C)	-0.3	
2	4	2	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	60	3.38	0.32			SITE CHARACTE	RISTICS	
2	4	3	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	105	5.92	0.55			T_Amb Min (°C)	-31.6	
2	4	4	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	155	8.74	0.82			T_Amb Max (°C)	26	
2	4	5	24	1440	1068.1	13.99	17.49	21.86	21.86	25	25	10	200	11.28	1.06					

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIP
Plectric Power Systems			
(A)			
Consulting Engineers TEL: (907) 522–1953			
FAX: (907) 522-1182			
WEB: WWW.EPSINC.COM			

TANANA CHIEFS CONFERENCE MINTO RENEWABLE ENERGY PV STRING CALCULATIONS

REF DWG(S): DRAWING NO.:

NOT FOR CONSTRUCTION

MNRE-EL-0700 SHEET 1 OF 1

PROJECT: MINTO RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 24-0560							
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE				
A B	ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW	MED/03-07-2025 MED/04-29-2025	JRV/03-07-2025 JRV/04-29-2025				
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025				

TANANA CHIEFS CONFERENCE TOK PV/BESS DESIGN

EPS JOB NO. 25-0116 - ISSUED FOR PV CONSTRUCTION BID



Consulting Engineers

TEL: (907) 522–1953
FAX: (907) 522–1182

BESS DRAWINGS NOT — INCLUDED IN THIS DRAWING SET

	DRAWING INDEX								
TITLE	DRAWING NUMBER	SHEET	REVISION	SCOPE OF WORK					
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	TPBD-EL-0000	1	A	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR					
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	TPBD-EL-0000	2	А	PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM IN TOK, AK.					
				THE SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND					
SITE LAYOUT - OVERALL	TPBD-EL-2500	1	С	2 STRING INVERTERS MOUNTED INSIDE A CONTAINER. THE BATTERY MODULES AND INVERTER WILL BE HOUSED INSIDE A CONTAINER AND					
SITE LAYOUT - PV	TPBD-EL-2500	2	В	HAVE SELF-SERVING AUXILIARY LOADS. BOTH SYSTEMS WILL					
SITE LAYOUT - BESS	TPBD-EL-2500	2	С —	OPERATE IN PARALLEL WITH THE LOCAL UTILITY AND HAVE RELATED ELECTRICAL SAFETY AND METERING SYSTEMS.					
SITE LAYOUT - POWER CONVERSION HUT	TPBD-EL-2500	4	A	ELECTRICAL SALETT AND METERING STOTEMS.					
SITE LAYOUT - COMMUNICATIONS PANEL	TPBD-EL-2500	5	Α	SYSTEM SUMMARY					
				PV SYSTEM SIZE: 1.356MWdc, 999kWac					
ONE LINE DIAGRAM	TPBD-EL-0010	2	В	BESS SYSTEM SIZE: 1.5MW					
				INTERCONNECTION VOLTAGE: 12.47kV, 3 PHASE, 4 WIRE					
THREE LINE DIAGRAM	TPBD-EL-0100	1	A	GRAIDDAL NOMEG					
				GENERAL NOTES					
PV ELECTRICAL SITE PLAN	TPBD-EL-3000	1	Α	ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND					
PV ARRAY DC WIRING DIAGRAM	TPBD-EL-3000	2	А	LICENSED ELECTRICAL CONTRACTOR.					
PV ARRAY DC WIRING DIAGRAM	TPBD-EL-3000	3	Α	CONTRACTOR WILL FOLLOW IDO 2024 AND NEDA 70 NEO 2027 AC					
PV ARRAY DC WIRING DIAGRAM	TPBD-EL-3000	4	Α	CONTRACTOR WILL FOLLOW IBC 2021 AND NFPA 70 NEC 2023 AS WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY					
PV ARRAY DC WIRING DIAGRAM	TPBD-EL-3000	5	Α	CODES, ORDINANCES AND REGULATIONS.					
EQUIPMENT/CABLE SCHEDULE	TPBD-EL-3000	6	A	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC					
CONDUIT SCHEDULE	TPBD-EL-3000	7	A	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE					
				BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE MANNER.					
PV ARRAY GROUNDING PLAN	TPBD-SS-2000	1	A	DDIOD TO INCTALLATION, THE CONTRACTOR CHAIL HARDERCTAND ALL					
WIREWAY DETAILS	TPBD-SS-2000	2	A	PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL DRAWINGS AND PRODUCT MANUALS.					
EQUIPMENT SAFETY LABEL SCHEDULE	TPBD-SS-2000	3	A	ALL DECION AND ODEOISIOATIONS OF OTDIVIDING A COMPONENTS ADD					
FENCE DETAILS	TPBD-SS-2000	4	A	ALL DESIGN AND SPECIFICATIONS OF STRUCTURAL COMPONENTS ARE OUTSIDE THE SCOPE OF THESE PLANS.					
EQUIPMENT NAMEPLATE SCHEDULE	TPBD-SS-2000	5	А						
TRANSFORMER DETAILS	TPBD-SS-2000	6	А	PROJECT ENTITIES					
				OWNER: TANANA CHIEFS CONFERENCE					
PV STRING CALCULATIONS	TPBD-EL-0700	1	А						
				ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.					
				ELECTRIC SERVICE PROVIDER: ALASKA VILLAGE ELECTRIC COOPERATIVE					
		1							

PRO. DESI	ect: TOK PV/BESS DESIGN Gner/project engineer: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0116	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE TOK PV/BESS DESIGN	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		<u> </u>					
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025		Consulting Engineers			4	COVER SHEET AND INDEX	
								-		tpbd-pr-0001_1.dwg
					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM			REF DWG(S):		
								DRAWING NO.:		
								DIVAMING NO	TPBD-PR-0001	SHEET1OF1

ELECTRICAL SPECIFICATIONS

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL IT IS THE RESPONSIBILITY OF THE CONTRACTION TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION
- ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT. CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS
- ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- ALL THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- 11. CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS (360 DEGREES) BETWEEN PULL POINTS.
- METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE EGC SYSTEM. GROUNDS SHALL BE SIZED ACCORDING TO THE NEC.
- CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE

RECORD DOCUMENTS

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNTIL THESE DRAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE

WIRING METHODS

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE.
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWINGS. FOR OUTDOOR INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATION.
- 20. AC WRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS.
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED CRIMPING TOOL.

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS SHALL BE MADE FOR SYSTEM GROUNDING.
- 27. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT IS TO BE REMOVED.
- 28. MODULES SHALL BE BONDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS:
- SOLID CONDUCTORS: ASTM B 3.
 STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED; WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE
- 33 INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS ELECTRICALLY CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS

RACEWAYS

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS: 34.1. RIGID STEEL CONDUIT: ANSI C80.1. 34.2. EMT: ANSI C80.3. (FOR INDOOR USE ONLY).

- 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 36. COATED FITTINGS FOR PVC—COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER, EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS.
 COVER IS GASKETED WITH OIL—RESISTANT GASKET MATERIAL AND FASTENED WITH
 CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE. CONNECTIONS ARE
 FLANGED, WITH STAINLESS—STEEL SCREWS AND OIL—RESISTANT GASKETS.
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED
- 38.1. 3/4-INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF
- 38.3. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS.
 SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH T

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS INCLUDING POWER SYSTEMS AND ENERGY STORAGE SYSTEMS.
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING MEANS.

PANELBOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1 FACH TYPE OF PANELBOARD OVERCURRENT PROTECTIVE DEVICE TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED.
 INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES,
 PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- FOLLOWING:
 41.2.1. BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS
 BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION.
 41.2.2. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- 41.2.3. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS

FNG STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING: 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS, SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5. OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION 01 SECTION "OPERATION AND MAINTENANCE INCLUDE THE FOLLOWING:
- 41.5.1. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING
- OVERCURRENT PROTECTIVE DEVICES.

 41.5.2. TIME-CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:
- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A
- SINGLE MANUFACTURER. PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEI INDICATED. REFER TO DIVISION 01 SECTION "PRODUCT REQUIREMENTS."
- 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- COMPLY WITH NEMA PB 1.
- 42.5. COMPLY WITH NFPA 70.
- 43. CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING
- 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC

- SEISME PORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISME CONTROLS FOR ELECTRICAL SYSTEMS.

 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.

 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.

 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.

 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH—MOUNTED FRONTS OVERLAP BOX FRONTS, OVERLAP BOX.
- 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT.
 DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES:
 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1. LUGS: MECHANICAL TYPE.
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES—CONNECTED SHORT—CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES-CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAL—MAGNETIC CIRCUIT BREAKERS: INVERSE TIME—CURRENT ELEMENT FOR LOW—LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT—BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS—TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT—MOUNTED, FIELD—ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP—UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING;
 FIELD—REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD—ADJUSTABLE
 SETTINGS:
 45.4.1. INSTANTANEOUS TRIP.
- 45.4.2. LONG— AND SHORT—TIME PICKUP LEVELS. 45.4.3. LONG— AND SHORT—TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30—MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC EQUIPMENT.

REQUIRED SAFETY SIGNS AND LABELS

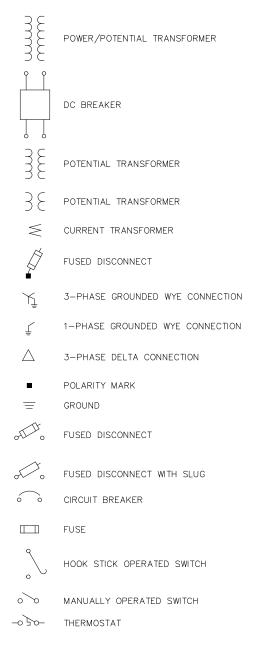
- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21.
- THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- 3. THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH THE NEC.
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1)
- UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535 RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:
 6.1. ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.
 6.2. VISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.

- "DANGER" HEADER; RED BACKGROUND WITH WHITE LETTERING.
 "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING. 6.4.
- "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
 "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING.
 OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND.
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690.

NOT FOR CONSTRUCTION

TOK PV/BESS DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION PROJECT: TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: <u>25</u>-0116 TOK PV/BESS DESIGN DESIGN/CONSTRUCTION/ASBUILT REVISIO DWN BY/DATE REVIEWED BY/DATE GENERAL INFORMATION AND SPECIFICATIONS SUED FOR PV CONSTRUCTION BIT TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM tnbd-el-0000 1 d REF DWG(S) DRAWING NO HEET_1 OF 2 TPBD-EL-0000

STANDARD BLOCKS - ELECTRICAL



PROTECTION, INSTRUMENTATION, OR AUTOMATION DEVICE COIL OR ELEMENT √√√ RESISTOR NORMALLY OPEN CONTACT NORMALLY CLOSED CONTACT AMBER LIGHT RED LIGHT GREEN LIGHT BLUE LIGHT INCANDESCENT LIGHT SHORTING BLOCK CONNECTION POINT TERMINATION CONNECTION POINT POLARITY MARK (CURRENT TRANSFORMERS) GROUND

CABLE # XX XX EQUIPMENT

CABLE TAG - WIRING DIAGRAMS & 3-LINES

STANDARD ABBREVIATIONS - ELECTRICAL

SIE	INDARD ADDREVIAL	TONS	- ELECTRICAL				
Α	AMPERE	EIA	ELECTRONICS INDUSTRY ASSOCIATION	N	NEWTON	TIA	TELECOMMUNICATIONS INDUSTRY
ACB	AIR CIRCUIT BREAKER	EJ	EXPANSION JOINT	N N	NORTH	IIA	ASSOCIATION
AB	AIR BREAK	EL	ELECTRICAL	NC NC	NORMALLY CLOSED	TRP	TRIP
ABV	ABOVE	ELEV	ELEVATION	NCC	NORMALLY CLOSED CONTACT	TURB	TURBINE
AC	ALTERNATING CURRENT	ENCL	ENCLOSURE	N/C	NO CONNECTION	TX	TRANSMIT
ADJ	ADJUSTABLE	EQ	EQUAL	NIC	NOT IN CONTRACT	TYP	TYPICAL
ADJT	ADJACENT	EQUIP	EQUIPMENT	NO	NORMALLY OPEN	UG	UNDERGROUND
ALT	ALTERNATE	EST	ESTIMATE	NOC	NORMALLY OPEN CONTACT	UNO	UNLESS NOTED OTHERWISE
AL	ALUMINUM	EXIST	EXISTING	NS	SYNCHRONIZING NEUTRAL	V	VOLT
APPRX	APPROXIMATE	F	FARAD	NTS	NOT TO SCALE	VA	VOLTAMPERE
В	BUS	F	FUSE	OD	OUTSIDE DIAMETER	VA	PHASE A VOLTAGE
BF	BREAKER FAIL	FREQ	FREQUENCY	OUT	OUTPUT	VAR	REACTIVE POWER
BFI	BREAKER FAIL INITIATE	FT	FEET	P	REAL POWER OR PRIMARY	VB	PHASE B VOLTAGE
BKR	BREAKER	FT	FEED THROUGH	PB	PUSH BUTTON	VAC	ALTERNATING CURRENT VOLTAGE
BLDG	BUILDING	FUT	FUTURE	PF	POWER FACTOR	VC	PHASE C VOLTAGE
BLK	BLOCK	G	CONDUCTANCE OR GROUND	PLC	PROGRAMMABLE LOGIC CONTROLLER	VCB	VACUUM CIRCUIT BREAKER
вот	ВОТТОМ	GA	GAUGE	PM	PAD-MOUNT TRANSFORMER	VDC	DIRECT CURRENT VOLTAGE
BTU	BRITISH THERMAL UNIT	GALV	GALVANIZED	PSSS	PROVIDER SWITCHYARD	VERT	VERTICAL
BTWN	BETWEEN	GB	GROUND BUS	PT	POINT	VIF	VERIFY IN FIELD
BU	BACKUP	GCB	GAS CIRCUIT BREAKER	PT	POTENTIAL TRANSFORMER	VN	NEUTRAL VOLTAGE
С	COLOUMB	GEN	GENERATOR	PVC	POLYVINYL CHLORIDE	VR	VOLTAGE REGULATOR
CAP	CAPACITOR OR CAPACITANCE	GI	GALVANIZED IRON	PVMT	PAVEMENT	VREG	VOLTAGE REGULATOR
CAP	CORRUGATED ALUMINUM PIPE	GND	GROUND	PWR	POWER	VS	SYNCHRONIZING VOLTAGE
CB	CENTER BREAK	GOAB	GANG OPERATED AIR-BREAK SWITCH	Q	REACTIVE POWER	VT	VOLTAGE TRANSFORMER
CBL	CABLE	GRC	GALVANIZED RIGID CONDUIT	R	RESISTANCE OR RESISTOR	W	WEST
CEM	CEMENT	GRD	GRADE, GRADING	RCLS	RECLOSE	W	WATT
CF	CUBIC FOOT	GRSC	GALVANIZED RIGID STEEL CONDUIT	RAD	RADIUS	W/	WITH
CHK	CHECK	Н	HENERY	RAD	RADIAN	W/O	WITHOUT
CI	CAST IRON	HDPE	HIGH-DENSITY POLYETHYLENE	RD	ROAD	X	REACTANCE
CIP	CAST IRON PIPE	HLO	HOT LINE ORDER	RE	REMOTE END	XFMR	TRANSFORMER
CIPC	CAST-IN-PLACE CONCRETE	HORIZ	HORIZONTAL	REF	REFERENCE	XMSSN	TRANSMISSION
CIR	CIRCLE	HP	HORSEPOWER	REQD	REQUIRED	Υ	ADMITTANCE
CKT	CIRCUIT	HZ	HERTZ	RET	REMOTE END TRIP	YL	YELLOW
CLK	CLOCK	IA	PHASE A CURRENT	RET	RETURN	Z	IMPEDANCE
CLS	CLOSE	IB	PHASE B CURRENT	REV	REVISION	2	TIME-DELAY
CMIL	CIRCULAR MIL	IC	PHASE C CURRENT	RLY	RELAY	21	DISTANCE
CMP	CORRUGATED METAL PIPE	ID	INSIDE DIAMETER	RR	RAILROAD	25	SYNCHRONISM CHECK
COS	COSINE	IN	INPUT	ROW	RIGHT OF WAY	27	UNDERVOLTAGE
CONC	CONCRETE	IN	INCH	RTS	READY TO SEND	30	ANNUNCIATOR
CONST	CONSTRUCTION	IN	NEUTRAL CURRENT	RTU	REMOTE TERMINAL UNIT	32	DIRECTIONAL POWER
CONT	CONTINUOUS	INCL	INCLUDE(D), INCLUDING	RX	RECEIVE	37	UNDERCURRENT OR UNDERPOWER
CONTR	CONTRACTOR	IND	INDUSTRY	S	APPARENT POWER	38	BEARING
CS		INT	INTERSECTION	S	SOUTH	40	FIELD
CSP	CORRUGATED STEEL PIPE	INV	INVERT	S	SOURCE	43	MANUAL TRANSFER OR SELECTOR DEVICE
CT	CURRENT TRANSFORMER	IP	POLARIZING CURRENT	S-L	SOURCE-LOAD	46	REVERSE-PHASE
CTRL	CURROLLSWITCHER OR CONTROL SWITCH	j	COMPLEX NUMBER	SA	SURGE ARRESTOR	47	PHASE-SEQUENCE VOLTAGE
CTS	CLEAR TO SEND	Ĵ	JOULE	SC	SWITCH CABINET	49	MACHINE OR TRANSFORMER THERMAL RELAY
CU	COPPER	JB	JUNCTION BOX	SEC	SECTION	50	INSTANTANEOUS OVERCURRENT
DC	DIRECT CURRENT	KA	KILOAMPRERE	SEC	SECONDARY	51	AC TIME OVERCURRENT
DCD	DATA CARRIER DETECT	KV	KILOVOLT	SVC	SERVICE	52	AC CIRCUIT BREAKER
DCE	DATA COMMUNICATIONS EQUIPMENT	KW	KILOWATT	SVC	STATIC VAR COMPENSATOR	52a	NORMALLY OPEN BREAKER CONTACT
DDE	DOUBLE DEAD END	L	INDUCTANCE	SHT	SHEET	52b	NORMALLY CLOSED BREAKER CONTACT
DE	DEAD END	L	LINE	SIM	SIMILAR	59	OVERVOLTAGE
DEM	DEMOLISH, DEMOLITION	L	LOAD	SIN	SINE	60	VOLTAGE BALANCE
DEMOB	DEMOBILIZE	LB	LOAD BREAK	SPEC	SPECIFICATION	63	PRESSURE SWITCH
DET	DETAIL	LGPP	LANDFILL GAS POWER PLANT	SPECS	SPECIFICATIONS	64	APPARATUS GROUND
DFR	DISTURBANCE FAULT RECORDER	LT	LIGHT	SPSS	SPARTAN SUBSTATION	67	AC DIRECTIONAL OVERCURRENT
DI	DIGITAL INPUT	М	METER(S)	SS	SYNCHRONIZING SWITCH	68	BLOCKING
DIA	DIAMETER	MAT	MATERIAL	STA	STATION	69	PERMISSIVE
DIAG	DIAGONAL	MAX	MAXIMUM	STD	STANDARD	71	LEVEL SWITCH
DIM	DIMENSION	MFG	MANUFACTURER	SW	SWITCH	74	ALARM
DIST	DISTRIBUTION	MI	MILE	SWGR	SWITCHGEAR	76	DC OVERCURRENT
DNP	DISTRIBUTED NETWORK PROTOCOL	MIN	MINIMUM	SYM	SYMMETRICAL	78	OUT-OF-STEP
DO	DIGITAL OUTPUT	MISC	MISCELLANEOUS	SYNCH	SYNCHRONIZE	79	RECLOSING RELAY
DSSS	D STREET SUBSTATION	MM	MILLIMETER(S)	Т	TIME OR TRANSFORMER	81	FREQUENCY
DTE	DATA TERMINAL EQUIPMENT	MO	MOTOR OPERATED (OR)	TAN	TANGENT	85	CARRIER OR PILOT WIRE
DWG	DRAWING	мов	MOBILIZE	TCM	TRIP COIL MONITOR	86	LOCK OUT
EA	EACH	MTR	METER	TEL	TELEPHONE	87	DIFFERENTIAL
		MW	MEGAWATT	TERM	TERMINAL	94	TRIPPING
		NI.	NEUTRAL	TELLO	TEMPORARY		

NOT FOR CONSTRUCTION

PROJECT: TOK PV/BESS DESIGN

DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116

NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE
A ISSUED FOR PV CONSTRUCTION BID GGL/10-13-2025

MED/10-13-2025

ENG. STAMP

ENG. STAMP



	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME
MS				
inc.				
;				
vi .				REF DWG(S):

NEUTRAL

TANANA CHIEFS CONFERENCE
TOK PV/BESS DESIGN
GENERAL INFORMATION AND SPECIFICATIONS

tpbd-el-0000_2.dwg

TPBD-EL-0000

TEMP TEMPORARY

SHEET 2 OF 2



ENG. STAMP



SHEET NOTES

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE LOCATIONS OF EXISTING PROPERTY LINES AND CORNERS PRIOR TO CONSTRUCTION.

 2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND UTILITIES MARKED PRIOR TO CONSTRUCTION.
- ALL DIMENSIONS ARE FOR REFERENCE ONLY. PLEASE
 REFER TO MANUFACTURERS DRAWINGS TO CONFIRM
 ALL DIMENSIONS.

OVERALL SITE LAYOUT SCALE: 1"=932"

BESS DRAWINGS NOT INCLUDED IN THIS DRAWING SET

NOT FOR CONSTRUCTION

SHEET 1 OF 5

PROJECT: TOK PV/BESS DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE					
A B	ISSUED FOR 35% REVIEW RE-ISSUED FOR 35% REVIEW	GGL/03-24-2025 GGL/08-22-2025	MED/04-01-2025 MED/08-22-2025					
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025					

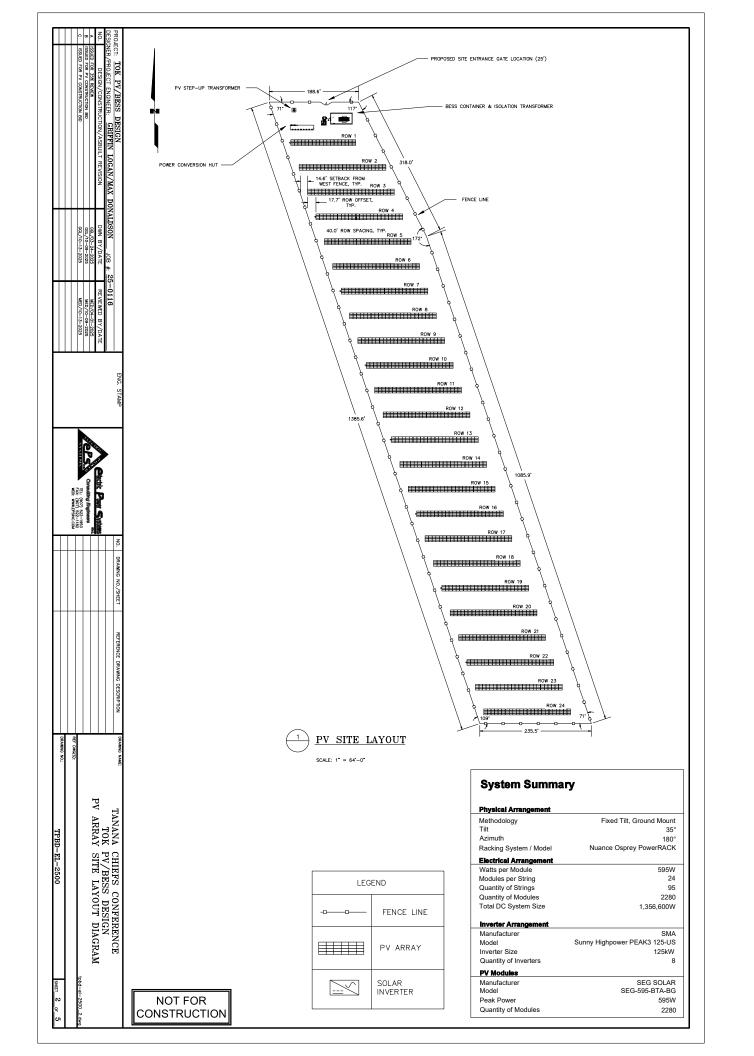
Clectric Power System	5	
Consulting Engineers TEL: (907) 522–1953 FAX: (907) 522–182 WEB: WWW.EPSINC.COM		

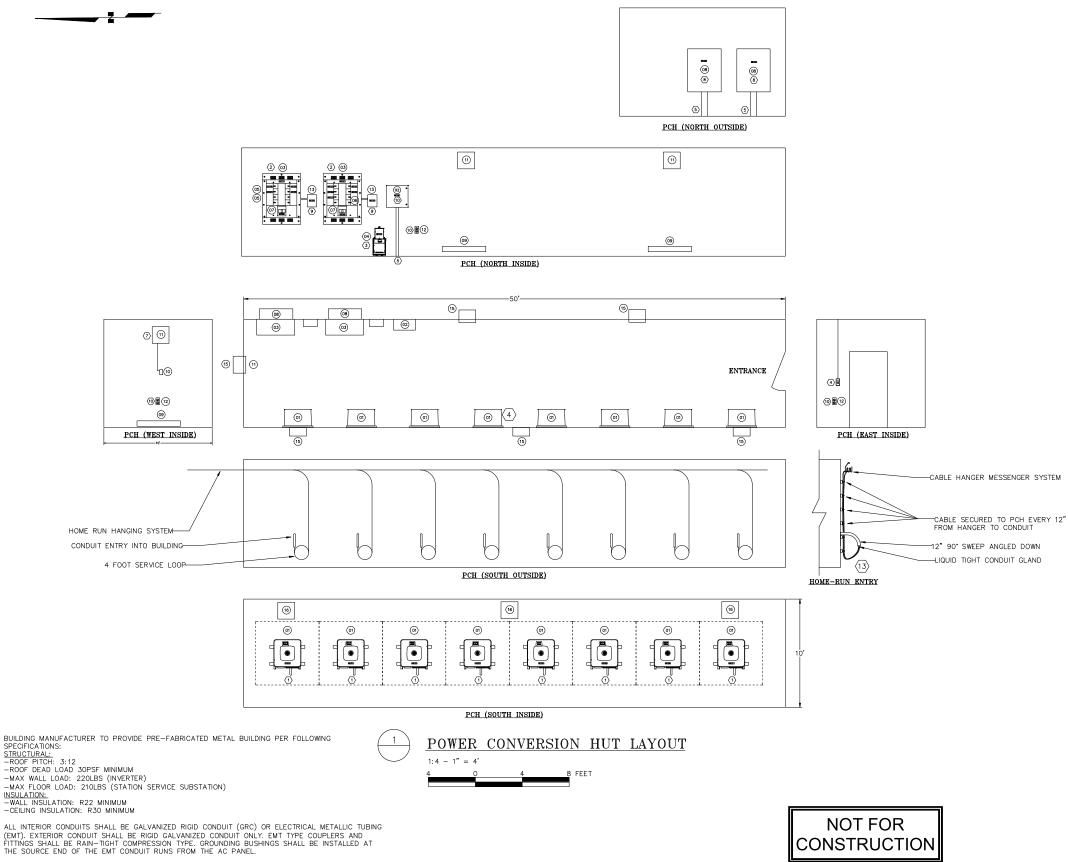
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME.
	1	TPBD-EL-2500/2	PV ARRAY LAYOUT DIAGRAM	
tens	-2	TPBD-EL-2500/3	BESS LAYOUT DIAGRAM	
53 82				
OM				REF DWG(S):

TANANA CHIEFS CONFERENCE TOK PV/BESS DESIGN SITE LAYOUT DIAGRAM

tpbd-el-2500_1.dw

TPBD-EL-2500





	BILL OF MATERIAL									
	REF. NO. UNIT QTY.			DESCRIPTION	MFGR./CATALOG NO.					
	(5)	EA	8	SUNNY HIGHPOWER PEAK3-125KW	SMA/SHP 125-US-21					
	02	EA	1	COMMUNICATION PANEL	SEE REF. 1					
	03)	EA	1	POWER DISTRIBUTION PANELBOARD W/ MAIN BREAKER, 800A, 600VAC, 10KAIC	SQUARED/HCP18688M					
	04)	EA	1	STATION SERVICE SUBSTATION, 15kVA, 480VAC-120/240V						
	05)	EA	8	200A/3P CIRCUIT BREAKER						
	06)	EA	1	50A/2P CIRCUIT BREAKER						
	07	EA	2	800A/3P MAIN CIRCUIT BREAKER						
	08)	EA	2	800A AC LOAD BREAK DISCONNECT W/ PROVISIONS FOR PADLOCK						
12	09	EA	3	ELECTRIC BASEBOARD HEATER, 1000W, 120VAC W/ BUILT-IN THERMOSTAT						
	10	EA	1	ADJUSTABLE THERMOSTAT						
12	(1)	EA	3	WALL MOUNT SHUTTER FAN, >2500CFM, 120VAC W/ DAMPER MOTOR CONTROLLED BY THERMOSTAT						
	(12)	EA	4	GFCI RECEPTACLE						
	13	EA	2	SHARK 250 SELF-ENCLOSED METER ASSEMBLY	ELECTRO INDUSTRIES /ENCSHK250-277-60-10-V3-D2-INP100S-X					
	14)	EA	1	LIGHT SWITCH						
7)	15	EA	6	90' VENTILATION HOOD WITH INSECT SCREEN						
12	16	EA	3	10IN MOTORIZED INTAKE DAMPER						

 $\langle 6 \rangle$

- MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4" AWAY FROM THE WALL, AND 20" MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4 AWAY FROM THE WALL, AND 20 ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES. MAINTAIN 4' WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. THE SUM OF CROSS-SECTIONAL AREAS OF ALL CONTAINED CONDUCTORS OR CABLES AT ANY CORSS SECTION OF THE NONMETALLIC WIREWAY SHALL NOT EXCEED 20 PERCENT OF THE INTERIOR CROSS-SECTIONAL ARE OR THE NONMETALLIC WIREWAY BETWEEN INVERTERS AND PANELBOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARDS SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARDS AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- $\overline{\left\langle 3\right\rangle }$ mount station service substation such that all manufacturer recommended clearance ZONES AWAY FROM EQUIPMENT IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE ZONE IN FRONT OF THE DEVICE, PER NEC
- 4 PROVIDE INTERIOR EMERGENCY BATTERY BACKUP LIGHTING, AS WELL AS NORMALLY SWITCHED MAIN LIGHTING, PER NFPA. PROVIDE CEILING MOUNTED LIGHTING SUCH THAT 30 FOOTCANDLES IS MAINTAINED. MOUNT LIGHT SWITCH NEXT TO DOOR AT LEAST 40" FROM FLOOR.
- $\overleftarrow{\rm 5}$ route conduits such that the stub-up area is directly under all destination devices in the power conversion hut
- 6 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT-HAND COLUMN MAY BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- TO VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY WEATHERPROOF 120VAC EXHAUST FANS WITH A MINIMUM FLOW RATE OF 2500CFM EACH, CONTROLLED BY A SINGLE ADJUSTABLE THERMOSTAT, AND BY A 10" MOTORIZED INTAKE DAMPER SHALL BE PROVIDED WITH A 90' EXTERIOR HOOD WITH INSECT SCREENS TO PREVENT INTRUSIONS OF WIND DRIVEN RAIN/SNOW.
- (B) WHERE SINGLE CONDUCTOR CABLES COMPRISING EACH PHASE, NEUTRAL, OR GROUNDED CONDUCTOR OF AN AC CIRCUIT ARE CONNECTED IN PARALLEL AS PERMITTED IN NEC 310.10(H), THE CONDUCTORS SHALL BE INSTALLED IN GROUPS CONSISTING OF NOT MORE THAN ONE CONDUCTOR PER PHASE, NEUTRAL, OR GROUNDED CONDUCTOR IN WIREWAY OR CONDUIT. NEC
- MOUNT RECEPTACLES ON INSIDE WALLS OF PCH AT LEAST 18" FROM FLOOR. MOUNT ONE RECEPTACLE ON NORTH SIDE OF DOOR (EAST WALL), ONE RECEPTACLE NEXT TO THE COMMUNICATION PANEL (NORTH WALL), ONE RECEPTACLE ON WEST WALL, AND ONE RECEPTACLE INSIDE NEMA 1 COMMUNICATIONS PANEL (LINE ITEM 2, REF. NO. 1).
- $\stackrel{\textstyle <}{\text{(11)}}$ Heating to be provided by electric baseboard heaters with built-in thermostats. Heaters to turn on below 10°F
- PROVIDE HEATING AND COOLING SUCH THAT THE TEMPERATURE INSIDE THE PCH DOES NOT EXCEED 95F, AND DOES NOT DROP BELOW 10F. QUANTITIES AND DESCRIPTIONS OF LINE ITEMS 09, 11, AND 16 ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR IS ABLE TO CHOOSE NEW PRODUCTS AND PRODUCT QUANTITIES FOR THESE LINE ITEMS, PROVIDED THAT THE MINIMUM SPECIFICATIONS AS NOTED IN THE 'DESCRIPTION' COLUMN IS MAINTAINED.
- (13) HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES.

 ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON-SITE.

TPBD-EL-2500

(NOT FO CONSTRUC	
NO	DRAWNO NO /CHEET	DEC

PROJECT: TOK PV/BESS DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116							
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE				
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025				

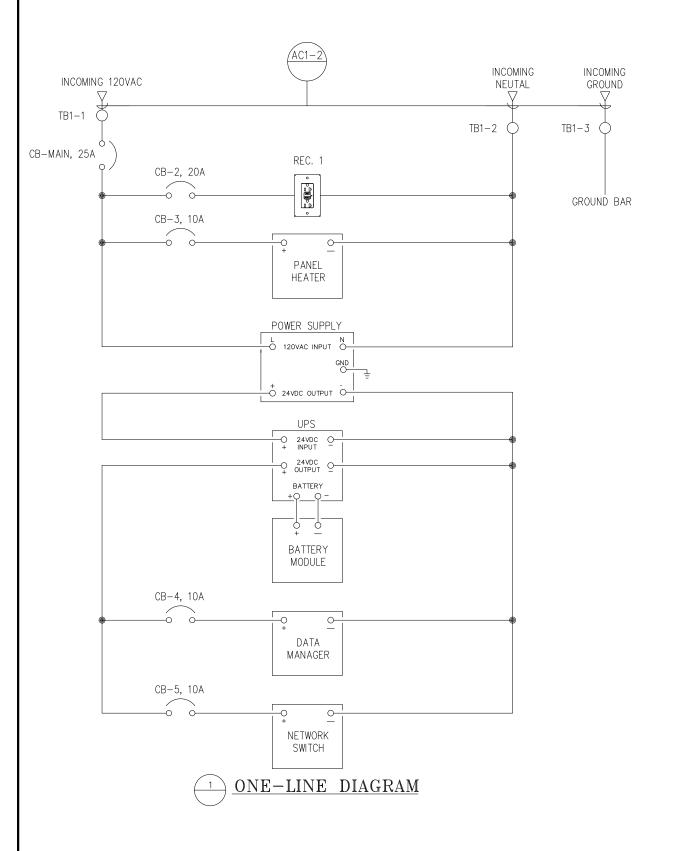


	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DF
	1	TPBD-EL-2500/5	COMMUNICATIONS PANEL ELEVATION DRAWING	1
15	2	TPBD-SS-2000/5	EQUIPMENT NAMEPLATE SCHEDULE	
ž				
				┕
				RE
				DF

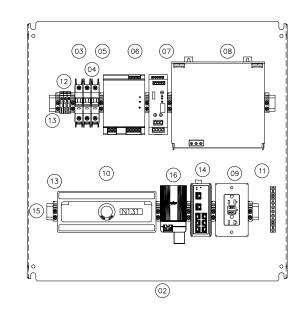
TANANA CHIEFS CONFERENCE TOK PV/BESS PCH LAYOUT

REF DWG(S) RAWING NO.:

HEET 5 OF 8









1

			BILL OF MATERIAL	
REF. NO.	UNIT	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.
(01)	EA	1	24" X 24" X 10" NEMA 1 MILD STEEL WALL MOUNTED ENCLOSURE	
02	EA	1	INNER PANEL FOR 24X24X10 ENCLOSURE	
03	EA	1	25A, 600V UL489 1-POLE BREAKER	
04)	EA	1	20A, 600V UL489 1-POLE BREAKER	
05)	EA	3	10A, 600V UL489 1-POLE BREAKER	
06)	EA	1	PHOENIX CONTACT 120VAC/24VDC PS, 20 AMP	PHOENIX CONTACT/ 2866776
07	EA	1	PHOENIX CONTACT 20 AMP UPS	PHOENIX CONTACT/ 2320238
08	EA	1	PHOENIX CONTACT 12 Ah BATTERY	PHOENIX CONTACT/ 1274119
09	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GCI	
10	EA	1	DATA MANAGER	SMA/EDMM-20
11)	EA	1	UL 467 GROUND BAR, 6 POLE MINIMUM	
12	EA	3	6MM DINRAIL MOUNTED TERMINAL BLOCK	
13)	EA	9	6MM DINRAIL MOUNTED TERMINAL BLOCK END STOP	
14)	EA	1	UNMANAGED ETHERNET SWITCH, 2 FIBER PORTS	MOXA/EDS-308-SS-SC-80
(15)	EA	1	35MM DIN MOUNTING RAIL	
16)	EA	1	150W PANEL HEATER W/BUILT IN REGULATION ON: 41°F - OFF: 59°	STEGO/06021.0-00

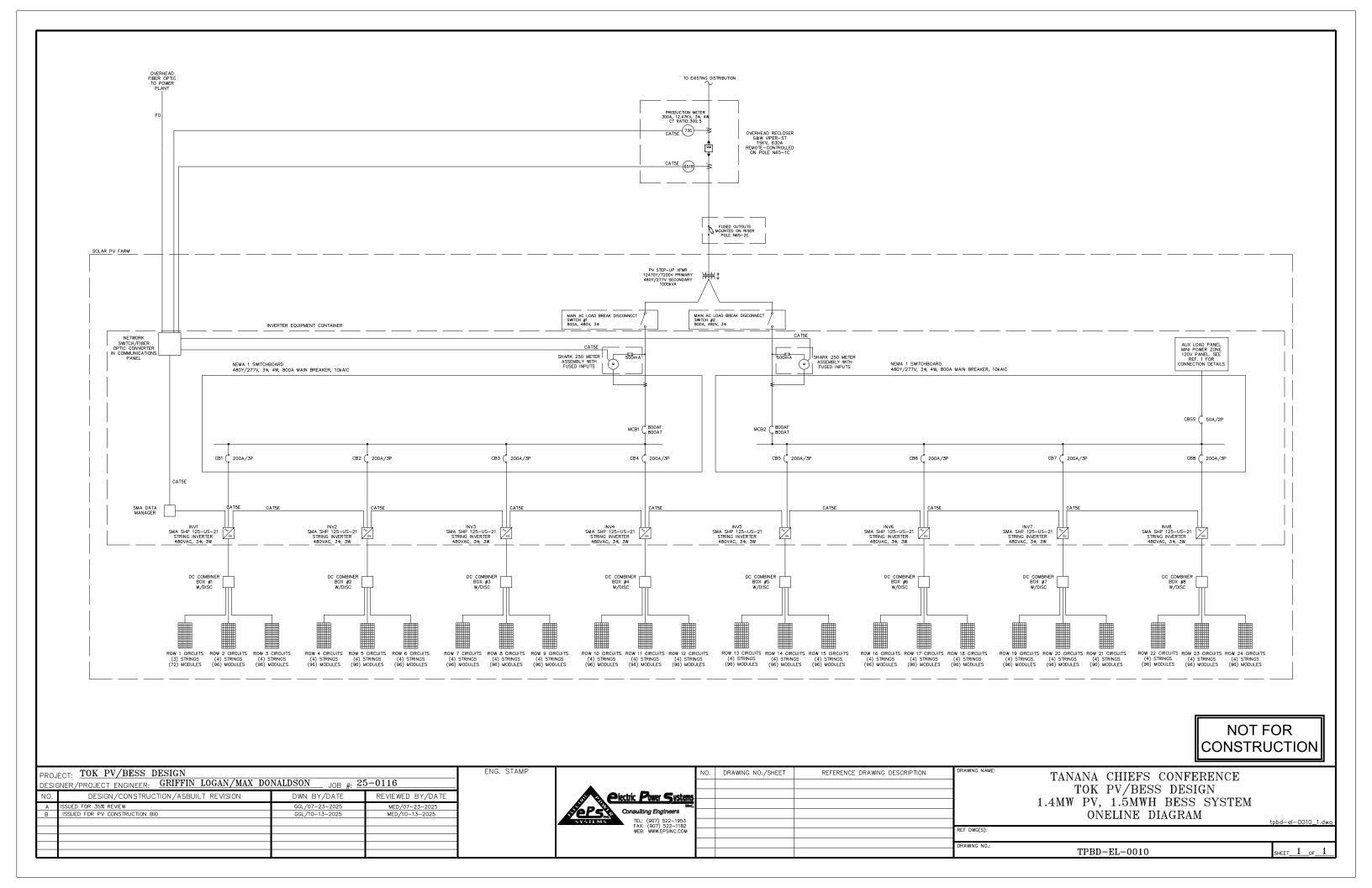
NOTES:

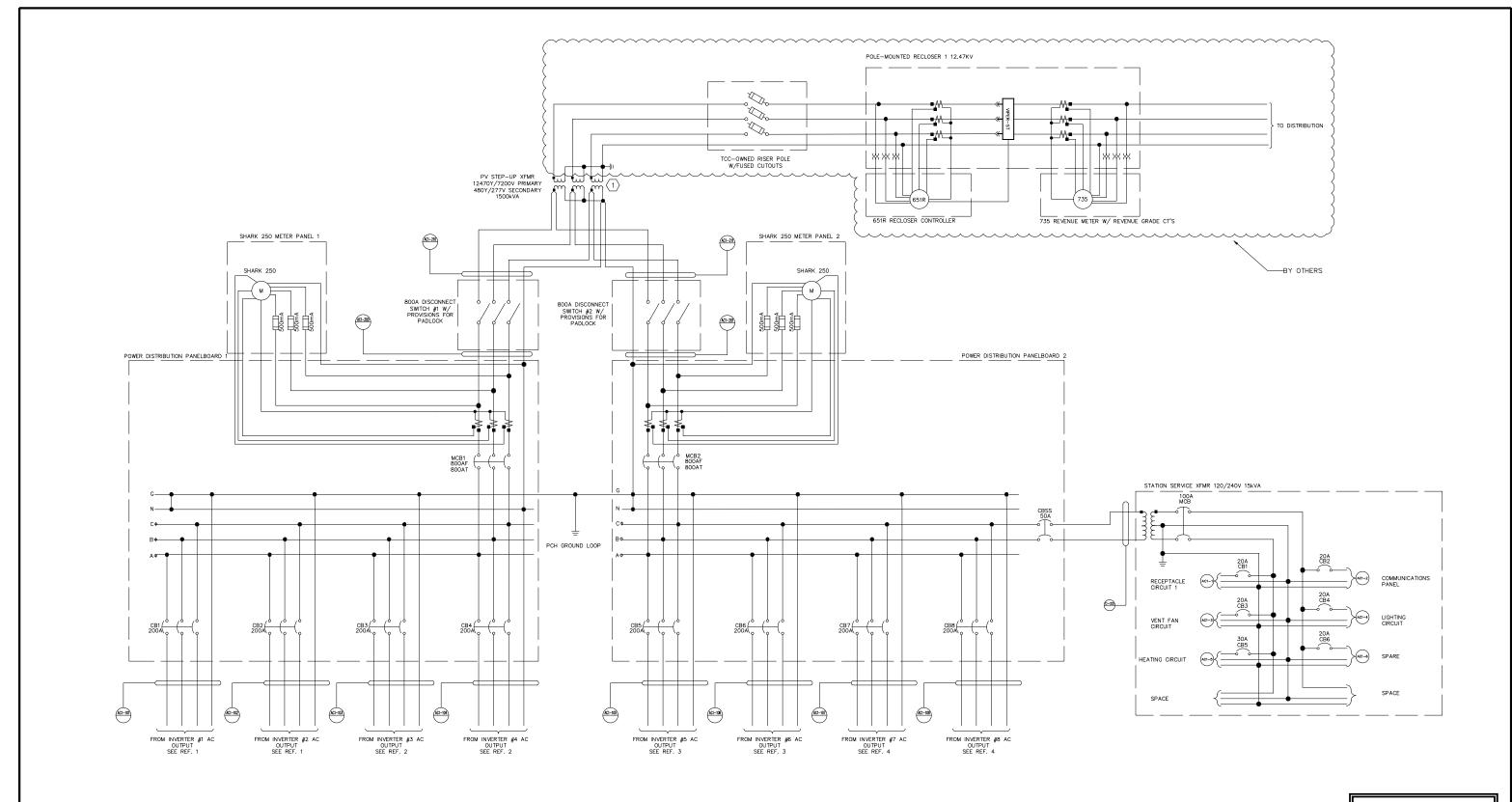
ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IN THE CENTER COLUMN, AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.



NOT FOR CONSTRUCTION

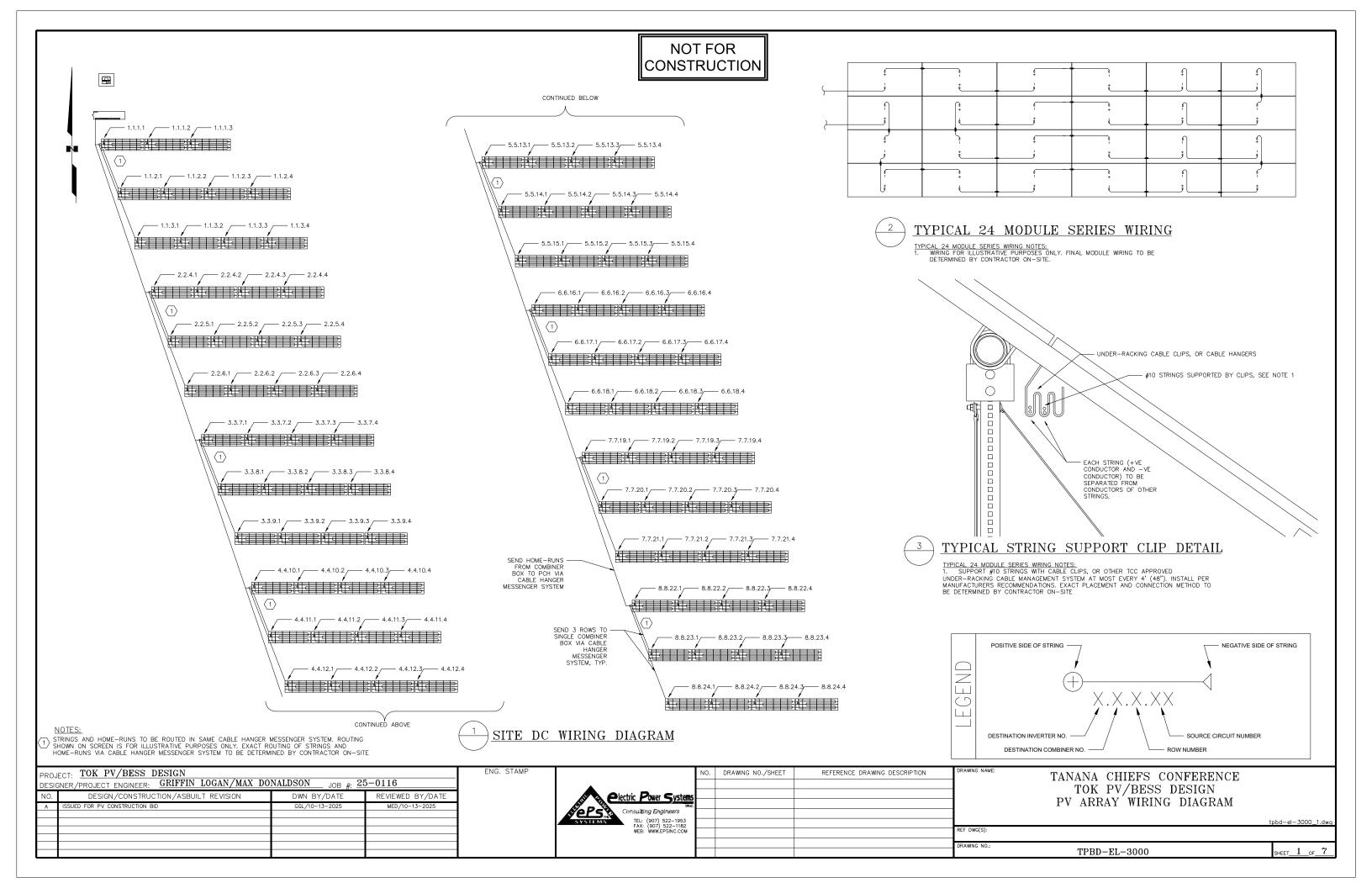
PROJECT: TOK PV/BESS DESIGN
DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON NO. DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION TANANA CHIEFS CONFERENCE JOB #: 25-0116 1 TPBD-SS-2000/5 EQUIPMENT NAMEPLATE SCHEDULE TOK PV/BESS COMMUNICATIONS PANEL PANEL ELEVATION DRAWING TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM tpbd-el-2500_6.dw REF DWG(S): DRAWING NO.: TPBD-EL-2500 SHEET 6 OF 8

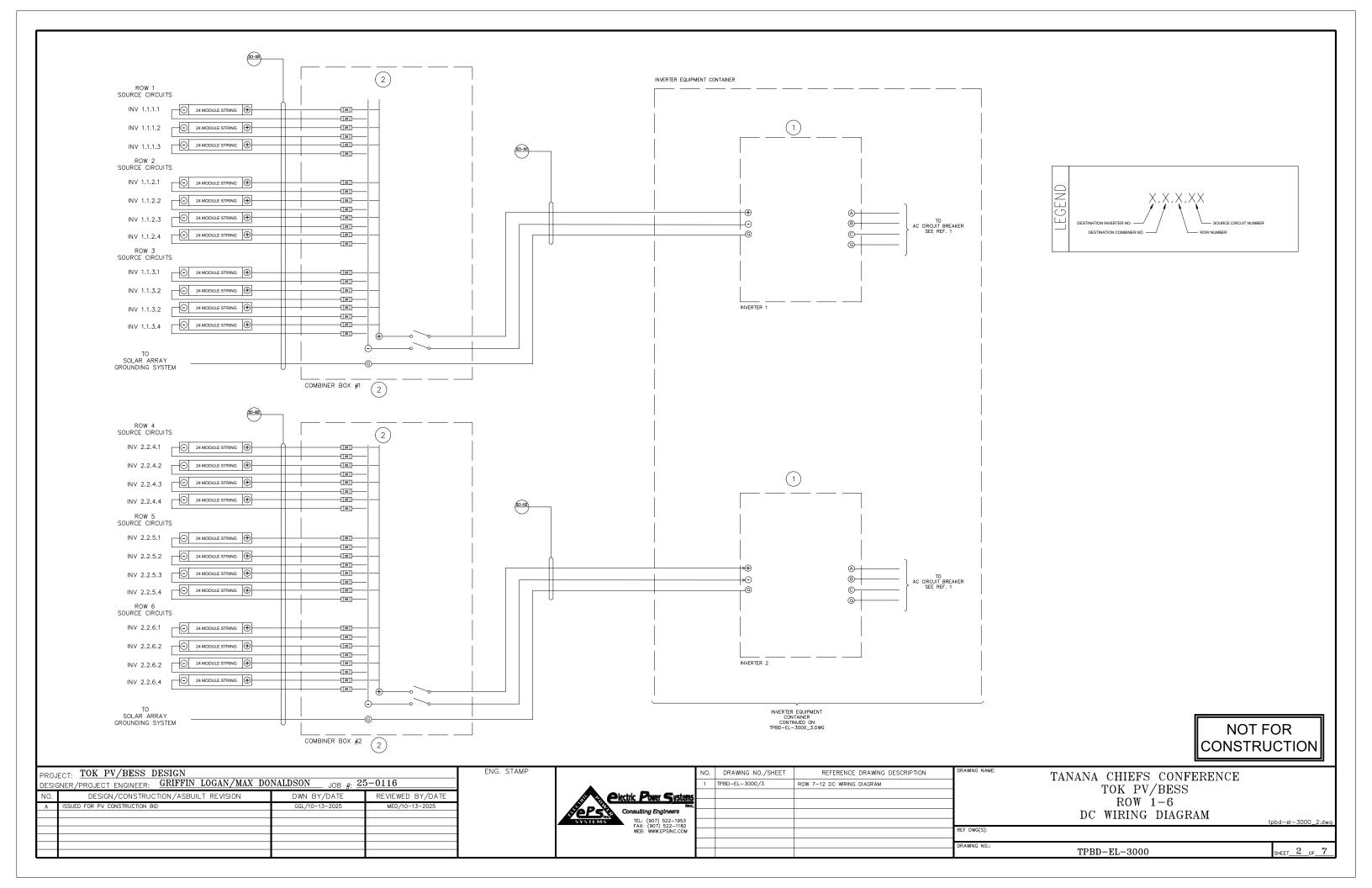


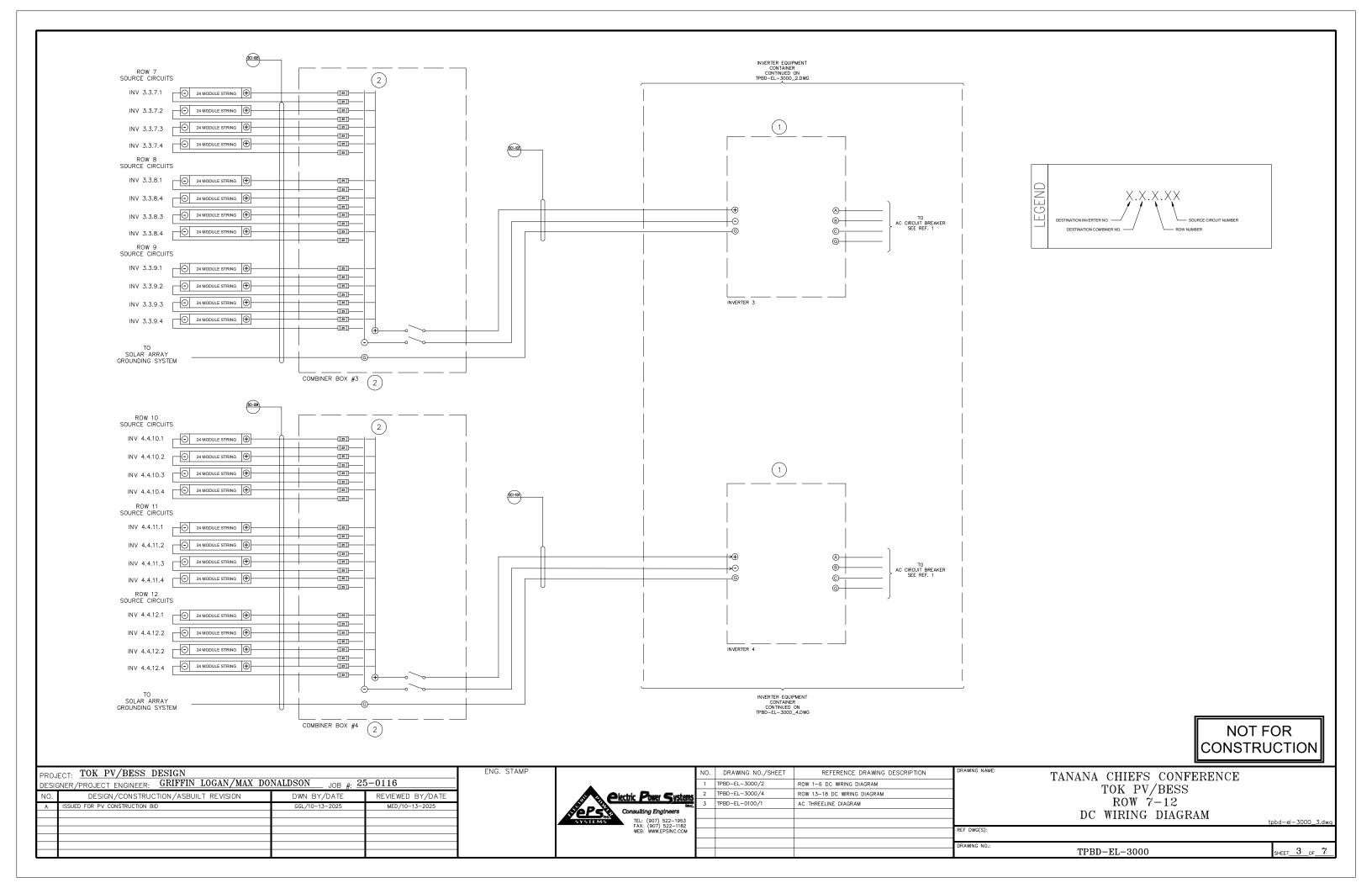


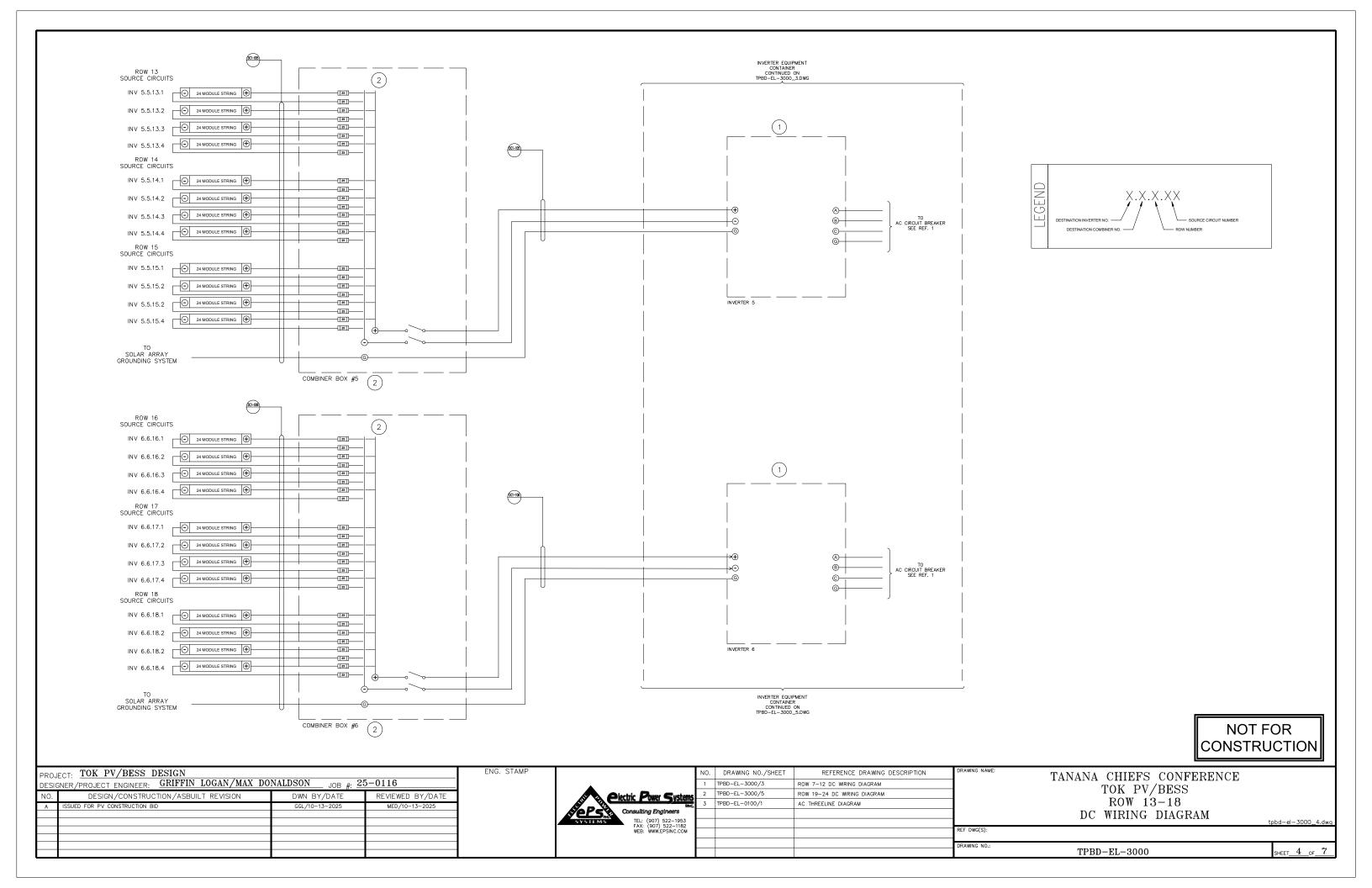
IFT XO BUSHING BOND JUMPER AND ISOLATE ALL XO CONNECTIONS FROM ANY GROUNDING AT THE UTILITY SERVICE POLE. GROUND SECONDARY OF TRANSFORMER AT PCH GROUND LOOP

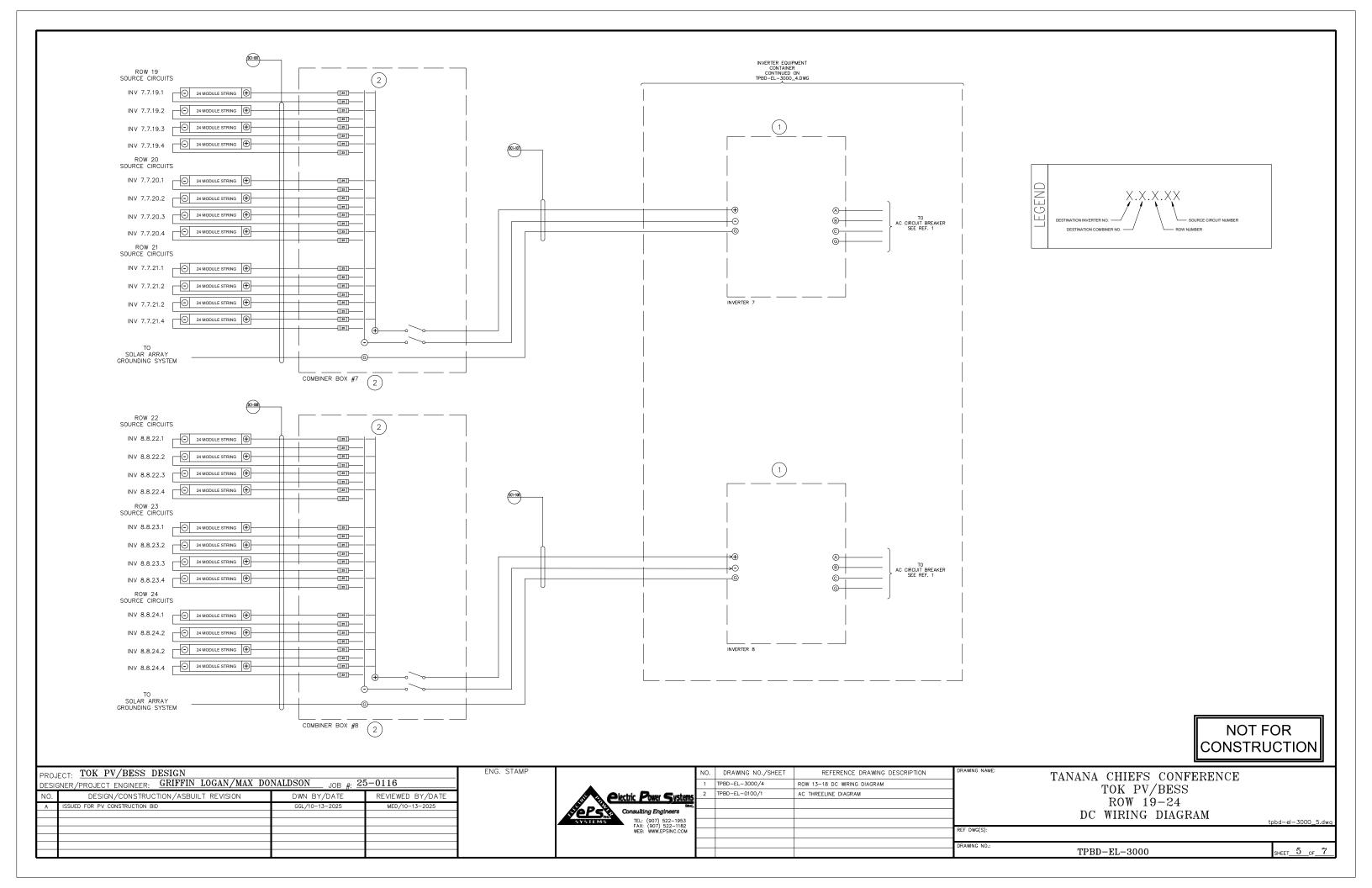
PROJEC DESIGN	ct: TOK PV/BESS DESIGN ier/project engineer: GRIFFIN LOGAN/MAX DOI	NALDSON JOB #: 2	5-0116	ENG. STAMP		NO. DRAWING NO./SHEET 1 FYRE-EL-3000/1	REFERENCE DRAWING DESCRIPTION PV ARRAY 1-2 WIRING DIAGRAM	DRAWING NAME:	TANANA CHIEFS CONFERENCE TOK PV/BESS DESIGN	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems	2 FYRE-EL-3000/1	PV ARRAY 3-4 WIRING DIAGRAM			
A I	SSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025		Consulting Engineers	· · · · · · · · · · · · · · · · · · ·	PV ARRAY 5-6 WIRING DIAGRAM		1.4MW PV	
					inc	4 FYRE-EL-3000/1	PV ARRAY 7-8 WIRING DIAGRAM		THREELINE DIAGRAM	
					TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		tpbd-el-0100_1.dwg
					WEB. WWW.EFSING.COM			-		
								DRAWING NO.:	TPBD-EL-0100	1 1
									1LDD-ET-0100	SHEETIOFI











		EQUIPMENT SCHEDULE
TAG	QUANTITY	DESCRIPTION
1	8	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US
2	8	24 INPUT DC COMBINER; TERRASMART FSFT275-24-25-N4-CD OR EQUIVALENT

		CABLE SCHEDULE			
TAG	FUNCTION	DESCRIPTION	RACEWAY		
DC1-001	ROW 1 STRING TO DS1	(22) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		
DC1-002	ROW 2 STRING TO DS1	(24) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		
DC1-003	ROW 3 STRING TO DS2	(24) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		
DC1-004	ROW 4 STRING TO DS2	(24) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		
DC1-005	ROW 5 STRING TO DS3	(24) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		
DC1-006	ROW 6 STRING TO DS3	(24) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		
DC1-007	ROW 7 STRING TO DS4	(24) #10 CU UL4703 2kV PV WRE, (1) #10 CU EGC	FREE AIR		
DC1-008	ROW 8 STRING TO DS4	(24) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR		

	CABLE SCHEDULE									
TD A C	DILLICONONI									
TAG	FUNCTION	DESCRIPTION	RACEWAY							
DC1-101	DS1 TO INV1	(2) 4/0 AL 2kV PV WRE, (1) #4 CU EGC	FREE AIR							
DC1-102	DS2 TO INV1	(2) 4/0 AL 2kV PV WRE, (1) #4 CU EGC	FREE AIR							
DC1-103	DS3 TO INV2	(2) 4/0 AL 2kV PV WRE, (1) #4 CU EGC	FREE AIR							
DC1-104	DS4 TO INV2	(2) 4/0 AL 2kV PV WRE, (1) #4 CU EGC	FREE AIR							
DC1-105	DS5 TO INV3	(2) 350MCM AL 2kV PV WIRE, (1) #2 CU EGC	FREE AIR							
DC1-106	DS6 TO INV3	(2) 350MCM AL 2kV PV WIRE, (1) #2 CU EGC	FREE AIR							
DC1-107	DS7 TO INV4	(2) 350MCM AL 2kV PV WIRE, (1) #2 CU EGC	FREE AIR							
DC1-108	DS8 TO INV4	(2) 350MCM AL 2kV PV WIRE, (1) #2 CU EGC	FREE AIR							

3

	CABLE SCHEDULE									
TAG	FUNCTION	DESCRIPTION	RACEWAY							
AC1-101	INV1 TO CB1	(3) 2/0 CU XHHW, #6 CU EGC	C-0111							
AC1-102	INV2 TO CB2	(3) 2/0 CU XHHW, #6 CU EGC	C-0112							
AC1-103	INV3 TO CB3	(3) 2/0 CU XHHW, #6 CU EGC	C-0113							
AC1-104	INV4 TO CB4	(3) 2/0 CU XHHW, #6 CU EGC	C-0114							
AC1-105	INV5 TO CB5	(3) 2/0 CU XHHW, #6 CU EGC	C-0115							
AC1-106	INV6 TO CB6	(3) 2/0 CU XHHW, #6 CU EGC	C-0116							
AC1-107	INV7 TO CB7	(3) 2/0 CU XHHW, #6 CU EGC	C-0117							
AC1-108	INV8 TO CB8	(3) 2/0 CU XHHW, #6 CU EGC	C-0118							
AC1-200	MCB1 TO DS1	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0200							
AC1-201	MCB2 TO DS2	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0201							
AC1-201	DS1 TO XFMR1	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0210							
AC1-211	DS2 TO XFMR1	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0211							
COM-500	COMM. PANEL TO POLE	MULTI-MODE FIBER OPTIC PATCH CABLE	C-0500							
AC1-SS	STATION SERVICE	(2) #8 CU XHHW	1/2" EMT							
AC1-1	RECEPTACLE CIRCUIT	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT							
AC1-2	COMMUNICATIONS PANEL	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT							
AC1-3	VENT FAN CIRCUIT	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT							
AC1-4	LIGHTING CIRCUIT	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT							
AC1-5	UNIT HEATER CIRCUIT	#10 CU XHHW, #10 CU XHHW NEUTRAL, #10 CU EGC	1/2" EMT							
		#10 CU XHHW, #10 CU XHHW								

 $\langle 1 \rangle \langle 4 \rangle$

- 1) LOW VOLTAGE AC CABLE SIZING BASED ON CLI XHHW WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C
- DC CABLE SIZING FOR STRINGS BASED ON CU UL4703 2KV PV WRE AMPACITY WITH A TEMPERATURE RATING OF 90°C AND A VOLTAGE DROP OF LESS THAN 2%
- RATING OF 90°C AND A VOLTAGE DROP OF LESS IMAN 2%

 DC CABLE SIZING FOR HOME—RUNS BASED ON AL 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C IN FREE AIR (TABLE 310.15(B)(17)) AND A VOLTAGE DROP OF LESS THAN 2% USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE CONDUCTOR DESCRIPTION IS MAINTAINED.

NOT FOR CONSTRUCTION

PF DE	OJECT: TOK PV/BESS DESIGN SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 2	5-0116	ENG. STAMP	A -	NO.	DRAWING NO./SHEET TPBD-EL-3000/6	REFERENCE DRAWING DESCRIPTION PV ARRAY CONDUIT SCHEDULE	DRAWING NAME:	TANANA CHIEFS CONFERENCE TOK PV/BESS	
N	D. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Power Systems				_	PV ARRAY	
_ A	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025		Consulting Engineers				-	EQUIPMENT/CABLE SCHEDULE	
					Consulting Engineers TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM					EQUITMENT/CADLE SCHEDULE	tpbd-el-3000_6.dwg
\vdash					WEB: WWW.EPSINC.COM				REF DWG(S):		
									DRAWING NO.:	MDDD DI 2000	e ~
										TPBD-EL-3000	SHEET 6 OF 7

NOTES:

_ (ıرل	OW	VOLTAGE	AC	CABLE	SIZING	RASED	ON	CU	XHHW	WIKE	AMPACITY	WITH A	TEMPERATURE	RATING C) F	/5 C	
	_																	

4 SEE REF. 1 FOR CONDUIT SCHEDULE

		(CONDUIT SCHEDULE			
	TAG FUNCTION		CONDUIT TYPE	TRADE SIZE		
	C-0111	INV1 TO CB1	ЕМТ	1.5"		
	C-0112	INV2 TO CB2	ЕМТ	1.5"		
	C-0113	INV3 TO CB3	ЕМТ	1.5"		
	C-0114	INV4 TO CB4	ЕМТ	1.5"		
	C-0115	INV5 TO CB5	EMT	1.5"		
	C-0116	INV6 TO CB6	EMT	1.5"		
	C-0117	INV7 TO CB7	EMT	1.5"		
	C-0118	INV8 TO CB8	EMT	1.5"		
	C-0200	MCB1 TO DS1	PVC	3 X 2.5"		
	C-0201	MCB2 TO DS2	PVC	3 X 2.5"		
	C-0210	DS1 TO XFMR1	PVC	3 X 2.5"		
	C-0211	DS2 TO XFMR1	PVC	3 X 2.5"		
	C-0300	XFMR1 TO POLE	PVC	3"		
	C-0500	NEMA4 PANEL TO POLE	PVC	1"		
1	C-0501	SPARE	PVC	1"		

1) TRADE SIZE OF CONDUITS SHOWN IN CONDUIT SCHEDULE ARE MINIMUM SIZES BASED ON NEC CONDUIT FILL % (CHAPTER 9 TABLE 1). USE OF CONDUIT THAT IS LARGER IN TRADE SIZE THAN SPECIFIED IN CONDUIT SCHEDULE IS PERMITTED.

NOT FOR CONSTRUCTION

PROJ DESIG	PROJECT: TOK PV/BESS DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE						
A	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025						

ENG. STAMP

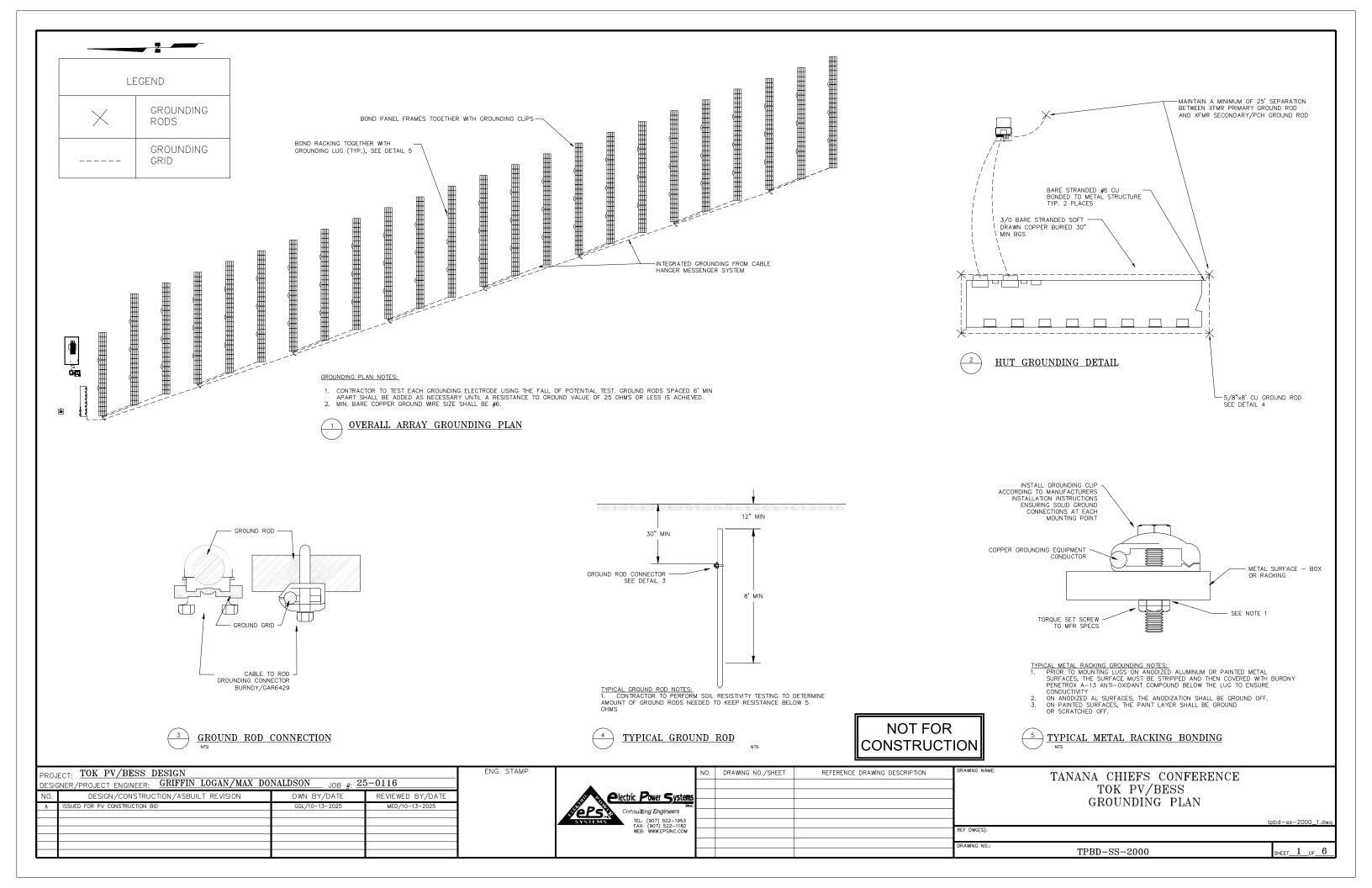
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:
:ms				
inc.				
5				
M				REF DWG(S):
				DRAWING NO.:
				5

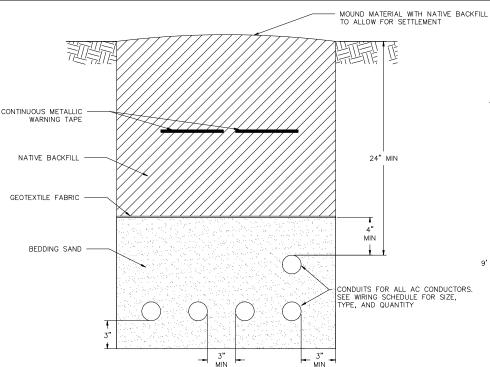
TANANA CHIEFS CONFERENCE
TOK PV/BESS
PV ARRAY
CONDUIT SCHEDULE

REF DWG(S):

tpbd-el-3000_7.dwg

TPBD-EL-3000 SHEET 7 OF 7





- IRENCH NOTES:

 1. BACKFILL THE TRENCH AREA WITH CLEAN SPOILS FREE OF AS MUCH ICE AS POSSIBLE.

 2. CONSOLIDATION OF BACK FILL MATERIALS SHALL BE COMPLETED IN 12 INCH LIFTS MAXIMUM. INTENT OF THE CONSOLIDATION IS TO ENSURE ELIMINATION OF VOIDS.

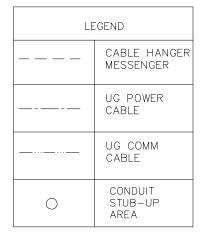
 3. POR TRENCH IN GRAVEL, THE TRENCH CAP SHALL NOT EXCEED 4 INCHES. FOR TRENCH IN TUNDRA, THE TRENCH CAP SHOULD BE 35% 40% OF THE TRENCH CAP SHOULD BE 35% 40% OF THE TRENCH CAP IN CONTRACTOR SHALL DISPOSE OF EXCESS EXCAVATED MATERIALS. FINAL CONTROLOR OF THE TRENCH CAP IN TUNDRA SHOULD BE CONDUCTED BY HAND (MATCHING SURROUNDING DRAINAGE PATTERNS), TO ENSURE NO DIVERSION OF WATER OCCURS, RESULTING IN PROSION.

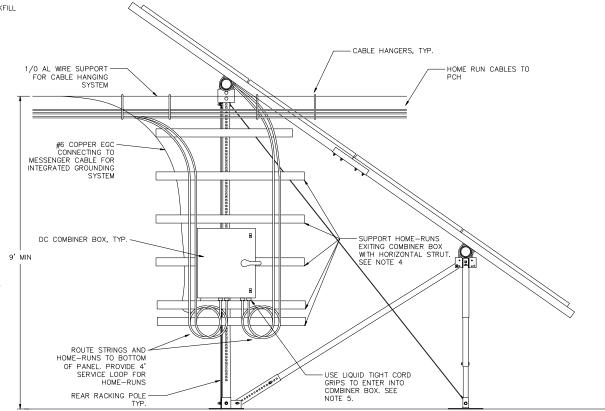
 4. TRENCHES IT WIDE SHOULD NOT NEED ANY SEEDING. FINAL REHABILITATION DETERMINATION TO BE MADE BY AGENCY REPRESENTATIVES.
- 5. COMPANY REPRESENTATIVE SHALL BE NOTIFIED AND PRESENT FOR ACCEPTANCE OF TRENCH PRIOR TO PLACEMENT OF
- 5. COMPANY REPRESENTATIVE SHALL BE NOTHED AND PRESENT FOR ACCEPTANCE OF IRENCH PRIOR TO PLACEMENT OF CABLE AND BACKFILLING OF TRENCH (24—HOUR NOTICE REQUIRED). AGENCY REPRESENTATIVE SHALL ALSO PROVIDE ACCEPTANCE OF CABLE PRIOR TO BACKFILLING.

 6. BEDDING SHALL BE 3/8" MINUS MATERIAL, NO CRUSHED OR SHARP ROCK. BEDDING MATERIAL SHALL NOT BE MACHINE COMPACTED WITHIN 6" OF CABLES. SLURRY OF A COMPOSITION THAT WILL NOT DAMAGE THE CABLE IS AN ACCEPTABLE BEDDING MATERIAL.

 7. MAINTAIN 1" MIN. SEPARATION BETWEEN POWER CONDUCTORS AND COMMUNICATION CABLES

TYPICAL CONDUIT TRENCH





2 TYPICAL COMBINER BOX DETAIL

- TYPICAL COMBINER BOX DETAIL NOTES:

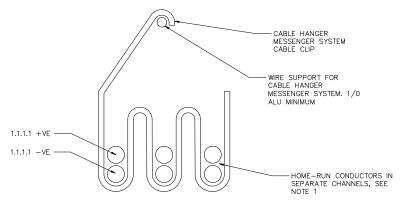
 1. ENSURE THAT CABLES ROUTED FROM HANGING SYSTEM TO COMBINER BOXES DO NOT EXCEED CONDUCTOR BENDING RADIUS

 2. INSTALL CABLE HANGING SYSTEM ACCORDING TO MANUFACTURERS INSTALLATION INSTRUCTIONS

 3. CONTRACTOR TO DETERMINE MOST SUITABLE MOUNTING SOLUTION FOR OVERHEAD CABLE MANAGEMENT SYSTEM

 4. SUPPORT DC CABLES EXITING THE DC COMBINER BOX WITH A UV RESISTANT, OUTDOOR RATED CABLE TIE CONNECTED TO A HORIZONTAL STRUT. INSTALL CLOSEST CABLE SUPPORT A DISTANCE OF NO MORE THAN 12" AWAY FROM THE COMBINER BOX, AS MEASURED BY THE CABLE PATH, SUPPORT HOME—RUNS EVERY 12" UNTIL SUPPORTED BY CABLE HANGER MESSENGER
- SYSTEM. SUPPORT STRINGS EVERY 12" UNTIL SUPPORTED BY UNDER-RACKING CABLE MANAGEMENT SYSTEM.

 5. USE A LIQUID TIGHT CORD GRIP OR CABLE GLAND FOR HOME—RUNS AND STRINGS WHEN ENTERING COMBINER BOX.



(3) TYPICAL HOME-RUN CABLE HANGER DETAIL

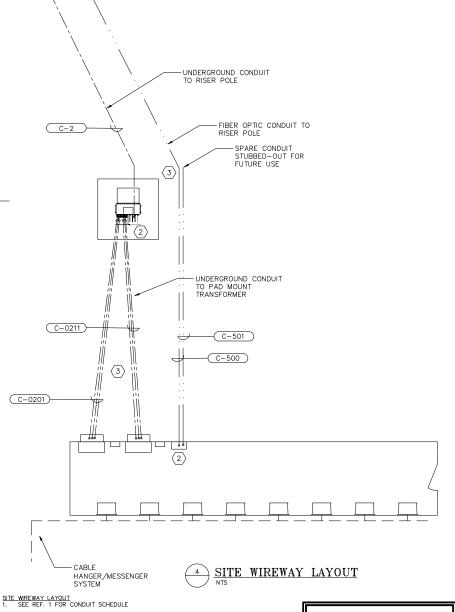
- TYPICAL HOME—RUN CABLE HANGER DETAIL NOTES:

 1. HOME—RUN CONDUCTORS oF DIFFERENT CIRCUITS TO BE ROUTED IN SEPARATE CHANNELS IN CABLE HANGER MESSENGER SYSTEM. THE +VE AND -VE CONDUCTORS OF A SINGLE HOME—RUN CIRCUIT MAY BE ROUTED IN THE SAME CHANNEL.

 2. INSTALL CABLE HANGERS IN REGULAR INTERVALS AS DIRECTED BY MANUFACTURERS INSTALLATION INSTRUCTIONS, OR, A DISTANCE OF NO MORE THAN 5' APART FROM EACH OTHER.

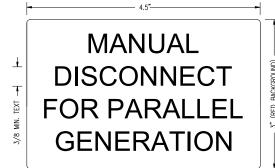
 3. IF HOME—RUNS AND STRINGS ARE ROUTED IN THE SAME CABLE HANGER MESSENGER SYSTEM, SEPARATE HOME—RUNS AND STRINGS IN SEPARATE CHANNELS.

- 1) TRADE SIZE OF CONDUITS SHOWN IN CONDUIT SCHEDULE ARE MINIMUM SIZES BASED ON NEC CONDUIT FILL % (CHAPTER 9 TABLE 1). USE OF CONDUIT THAT IS LARGER IN TRADE SIZE THAN SPECIFIED IN CONDUIT SCHEDULE IS PERMITTED.
- (2) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM PRODUCT DIMENSIONS, AND ROUTE CONDUITS TO APPROPRIATE STUB-UP AREAS.
- (3) CONDUIT AND WIREWAY ROUTING SHOWN ON DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. EXACT WIREWAY ROUTING TO BE DETERMINED BY CONTRACTOR ON-SITE.



NOT FOR CONSTRUCTION

ENG. STAME TOK PV/BESS DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116 TPBD-EL-3000/7 CONDUIT SCHEDULE TOK PV/BESS WIREWAY DETAILS Consulting Engineers TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM REF DWG(S) DRAWING NO. HEET 2 OF 6 TPBD-SS-2000



LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. LABEL TO BE ENGRAVED PLASTIC. (2) TOTAL

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM GENERATION METER. (1) TOTAL

NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC DISCONNECT AND POWER SOURCE RATED OUTPUT CURRENT: 604A NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECT. (2) TOTAL

NEC 2023 705.12(B)(3)(3)

TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (2) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 1072VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (8) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

> NOT FOR CONSTRUCTION

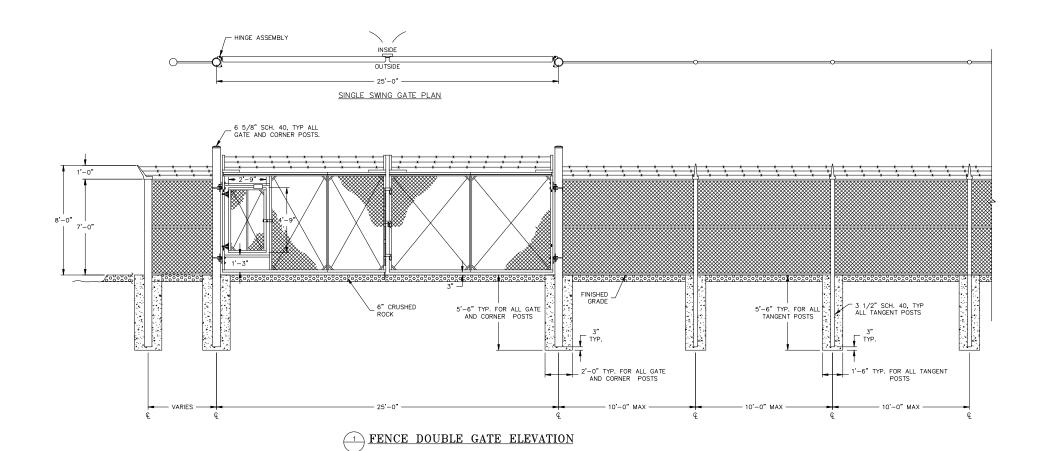
PROJECT: TOK PV/BESS DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116

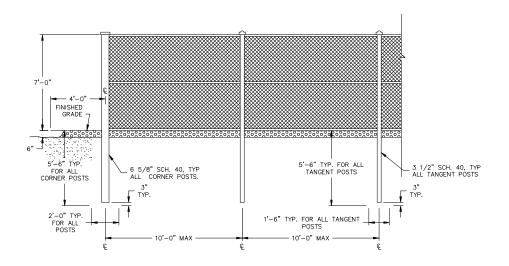
	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING N
N 5				
ĸ.				
				DEE 0.00(0)
				REF DWG(S)

TANANA CHIEFS CONFERENCE TOK PV/BESS EQUIPMENT SAFETY LABEL SCHEDULE

TPBD-SS-2000

SHEET 3 OF 6





2 CORNER/TERMINAL FENCE POST ELEVATION

NOT FOR CONSTRUCTION

PROJE DESIGN	CT: TOK PV/BESS DESIGN NER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO:	NALDSON JOB #: 2	5-0116	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE TOK PV/BESS	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			_		
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025		Consulting Engineers			4	SITE FENCING	
-					SYSTEMS IEL: (907) 522–1953 FAX: (907) 522–1182			4	DETAILS	tpbd-ss-2000 4.dwa
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		tpbd 33 2000_1.dwq
								000000000000000000000000000000000000000		
								DRAWING NO.:	TPBD-SS-2000	SHEET 4 OF 6

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1		2 x 4	3/8
N101	1	INVERTER 2		2 x 4	3/8
N102	1	INVERTER 3		2 x 4	3/8
N103	1	INVERTER 4		2 x 4	3/8
N104	1	INVERTER 5		2 x 4	3/8
N105	1	INVERTER 6		2 x 4	3/8
N106	1	INVERTER 7		2 × 4	3/8
N107	1	INVERTER 8		2 × 4	3/8
N108	1	DC COMBINER	BOX 1	2 × 4	3/8
N109	1	DC COMBINER	BOX 2	2 x 4	3/8
N110	1	DC COMBINER	BOX 3	2 x 4	3/8
N111	1	DC COMBINER	BOX 4	2 x 4	3/8
N112	1	DC COMBINER	BOX 5	2 x 4	3/8
N113	1	DC COMBINER	BOX 6	2 x 4	3/8
N114	1	DC COMBINER	BOX 7	2 × 4	3/8
N115	1	DC COMBINER	BOX 8	2 × 4	3/8

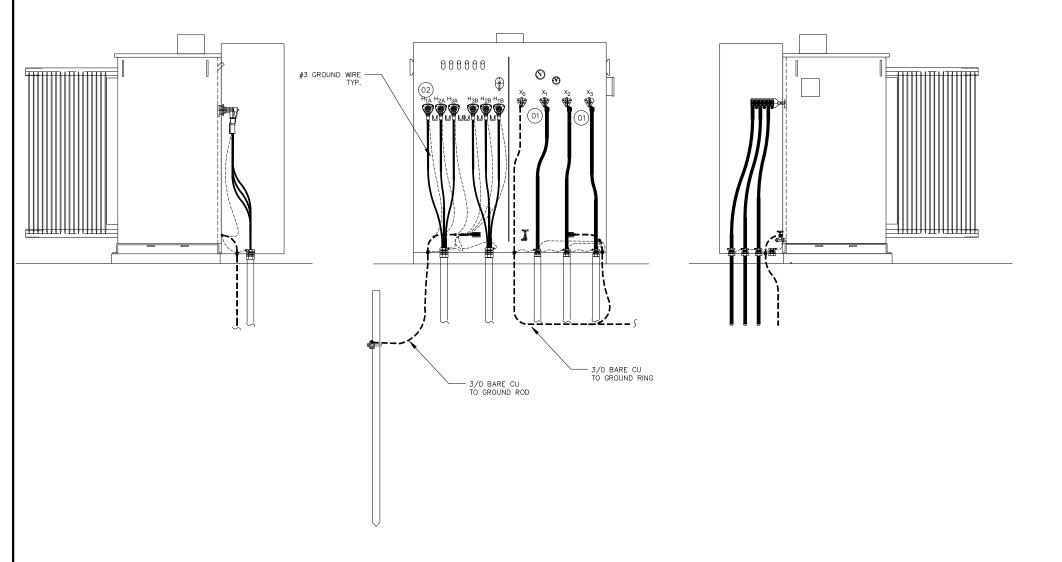
NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N116	1	COMMUNICATIONS	PANEL	2 x 4	3/8
N117	1	POWER DISTRIBUTION	PANELBOARD 1	2 x 4	3/8
N118	1	POWER DISTRIBUTION	PANELBOARD 2	2 x 4	3/8
N119	1	CB 1		1 x 3	1/8
N120	1	CB 2		1 x 3	1/8
N121	1	CB 3		1 x 3	1/8
N122	1	CB 4		1 x 3	1/8
N123	1	CB 5		1 x 3	1/8
N124	1	CB 6		1 x 3	1/8
N125	1	CB 7		1 x 3	1/8
N126	1	CB 8		1 x 3	1/8
N127	1	CB SS		1 x 3	1/8
N128	1	MCB1		2 x 4	3/8
N129	1	MCB2		2 x 4	3/8
N130	1	120V STATION SERVICE PANEL		2 x 4	3/8
N131	1	DATA MANAGER		2 x 4	3/8
N132	1	METER PANEL 1		2 × 4	3/8
N133	1	METER PANEL 2		2 × 4	3/8
N134	1	MAIN AC	PANEL 1	2 x 4	3/8
N135	1	MAIN AC	PANEL 2	2 x 4	3/8

NOTES:

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WTH WHITE TEXT.
- 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
- 7) ALL DIMENSIONS SHOWN IN INCHES.

NOT FOR CONSTRUCTION

PRO DES	PROJECT: TOK PV/BESS DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0116			ENG. STAMP	_	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE TOK PV/BESS	
NO A	DESIGN/CONSTRUCTION/ASBUILT REVISION ISSUED FOR PV CONSTRUCTION BID	DWN BY/DATE GGL/10-13-2025	REVIEWED BY/DATE MED/10-13-2025		Consulting Engineers				-	EQUIPMENT NAMEPLATE SCHEDULE	
					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM				REF DWG(S):		tpbd-ss-2000_5.dwq
									DRAWING NO.:	TPBD-SS-2000	SHEET 5 OF 6



ENG. STAMP

BILL OF MATERIAL									
REF. NO.	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.						
01	-	CABLE LUG, NEMA 2-HOLE, 4/0 AWG CU	BURNDY/YA282N						
02	-	CONNECTOR, COMPRESSION, 4/0 CU TO #6-#2 CU	BURNDY/YGHC29C26						
03)									
04)									
05)									
06)									
07									
08)									
09									
10									
11)									
12									
(13)									
14)									
(15)									
<u>(16)</u>									
17)									
18									
19									
20									
21)									
(22)									
23)									
24)									
25)									
26)									
27)									
28)									
29									
(30)									

NOT FOR CONSTRUCTION

PROJ DESIG	ECT: TOK PV/BESS DESIGN ENER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	NALDSON JOB #: 25	5-0116
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
Α	ISSUED FOR PV CONSTRUCTION BID	GGL/10-13-2025	MED/10-13-2025

Consulting Engineers

SYSTEMS

Clectric Power Systems

Inc.

Consulting Engineers

TEL: (907) 522–1953

TEL: (907) 522–1182

WEB: WWW.EPSINC.COM

NO. DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION DRAW REF	
	<u>ms</u>
REF	nc.
REF	
	1
DRAW	

TANANA CHIEFS CONFERENCE TOK PV/BESS TRANSFORMER DETAILS

tpbd-ss

TPBD-SS-2000 SHEET_6_OF_6

Switch No. 1	No. No. No. 1 1 2 2 3 3 3 4 4 1 1 2 2 3 3 4 4 1 1 1 2 2 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	(Vmp) 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	(Isc) 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	(1.25*isc) 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	(1.25*cc) 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	(A) 21.86 21.86 21.86 21.86 21.86 21.86 21.86	(A) 25 25	Voltage Drop, AWG) 25 10 25 10	(FT)	0.85 0.08	DS1				Device (A)	Drop, AWG)		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3	2 3 1 2 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 2 3 3 4 1 1 1 2 2 3 4 1 1 1 2 2 3 4 1 1 1 2 3 4 1 1 1 2 3 4 1 1 1 2 3 4 1 1 1 2 3 4 1 1 1 2 3 4 1 1 1 1 2 1 3 4 1 1 1 1 2 1 3 4 1 1 1 1 2 1 2 1 3 4 1 1 1 1 2 1 2 1 2 1 3 4 1 1 1 1 2 1 2 1 3 4 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86	25		15	1 0.00 0.00		INV1	80	240.45	241	4/0	0.36	3.85
1	1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 2 3 4 1 1 1 2 2 3 4 1 1 1 2 3 4 1 1 2 3 4 1 1 1 2 3 4 1 1 1 2 3 4 4 1 1 1 2 3 4 4 1 1 1 2 3 3 4 4 1 1 1 2 3 4 4 1 1 1 2 3 4 4 1 1 1 2 3 4 4 1 1 1 2 3 4 4 1 1 1 2 3 4 4 1 1 2 3 4 4 1 1 2 3 4 4 1 1 2 3 4 4 4 1 1 2 3 4 4 4 1 1 2 3 4 4 4 1 1 2 3 4 4 4 1 1 2 3 4 4 4 1 1 2 3 4 4 4 4 1 1 2 3 4 4 4 4 1 1 2 3 4 4 4 4 4 4 1 2 3 4 4 4 4 4 4 1 2 4 4 4 4 4 4 4 4 4 4 4 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86		25 10	60	3.38 0.32	DS2	INV2	245	262.31	263	4/0	1.20	12.85
1	2 3 4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 1 2 1 1 1 1 2 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86	25	25 10	110	6.20 0.58	DS3	INV3	410	262.31	263	4/0	2.01	21.51
1	3 4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 1 2 1 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86	21.86 21.86	25	25 10	80	4.51 0.42	DS4	INV4	575	262.31	263	4/0	2.82	30.17
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 1 2 1 1 2 1 1 1 2 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86	21.86	25	25 10	125	7.05 0.66	DS5	INV5	745	262.31	263	350	2.21	23.65
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1 2 3 4 1 2 3 4 1 2 2 3 4 1 2 2 3 4 1 1 2 2 3 4 1 1 2 2 3 4 1 1 1 1 2 1 2 1 1 1 1 2 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86		25 25	25 10 25 10	170 215	9.59 0.89 12.13 1.13	DS6 DS7	INV6 INV7	910 1075	262.31 262.31	263 263	350 350	2.70 3.18	28.88 34.12
1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49	21.86 21.86	21.86	25	25 10	135	7.61 0.71	DS8	INV8	1240	262.31	263	350	3.67	39.36
1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24	1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99	17.49 17.49		21.86	25	25 10	180	10.15 0.95								
2	1 2 3 4 1 2 3 4 1 2 3 4 1 2	24 24 24 24 24 24 24 24 24 24	1467 1467 1467 1467 1467	1071.4 1071.4 1071.4	13.99 13.99	17.49		21.86	25	25 10	225	12.69 1.18								
2	2 3 4 1 2 3 4 1 2 3 4 1 1 2	24 24 24 24 24 24 24 24	1467 1467 1467 1467	1071.4 1071.4	13.99		21.86	21.86	25	25 10	275	15.51 1.45								
2	3 4 1 2 3 4 1 2 2 3 4 1 1	24 24 24 24 24 24	1467 1467 1467	1071.4		17.49	21.86 21.86	21.86 21.86	25 25	25 10 25 10	15 60	0.85 0.08 3.38 0.32								
2	1 2 3 4 1 2 3 4 1	24 24 24 24 24	1467	1071.4		17.49	21.86	21.86	25	25 10	110	6.20 0.58								
2	2 3 4 1 2 3 4	24 24 24			13.99	17.49	21.86	21.86	25	25 10	155	8.74 0.82								
2	3 4 1 2 3 4	24 24		1071.4	13.99	17.49	21.86	21.86	25	25 10	80	4.51 0.42								
2	4 1 2 3 4	24	1467	1071.4	13.99	17.49	21.86	21.86	25	25 10 25 10	125	7.05 0.66								
2	1 2 3 4		1467	1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25	25 10 25 10	170 215	9.59 0.89 12.13 1.13								
2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 4 1		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	135	7.61 0.71								
2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4	24	1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	180	10.15 0.95								
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	225	12.69 1.18								
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	275	15.51 1.45								
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1 2		1467 1467	1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25	25 10 25 10	15 60	0.85 0.08 3.38 0.32								
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	110	6.20 0.58								
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	155	8.74 0.82	F	V MODULE CHARACTER						
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	80	4.51 0.42		Voc (V)						
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	125	7.05 0.66		Voc Coef. (%/*C)						_
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3		1467 1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	170	9.59 0.89		Vmp (V) Pmax Coef. (%/°C)						
3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1		1467	1071.4	13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25	25 10 25 10	215 135	12.13 1.13 7.61 0.71		rinux coer. (%/°C)	-0.3					
3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	2		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	180	10.15 0.95		SITE CHARACTERIST	ics					
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	3	24	1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	225	12.69 1.18		T_Amb Min (*C)						
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4	_	1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	275	15.51 1.45		T_Amb Max (℃)	25					
4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5	1		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	15	0.85 0.08								
4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5	2		1467 1467	1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25	25 10 25 10	60 110	3.38 0.32 6.20 0.58								
4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5	3 4	_	1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	155	8.74 0.82								
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5	1		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	80	4.51 0.42								
4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5	2		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	125	7.05 0.66								
4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5	3		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	170	9.59 0.89								
4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5	4		1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25	25 10 25 10	215 135	12.13 1.13 7.61 0.71								
4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	2		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	180	10.15 0.95								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	3		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	225	12.69 1.18								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	4		1467	1071.4	13.99	17.49	21.86	21.86	25	25 10	275	15.51 1.45								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1		1467	1071.4	13.99				25											
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	3		1467 1467		47.00	17.49	21.86	21.86		25 10	15	0.85 0.08								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	4				13.99	17.49	21.86	21.86 21.86	25	25 10	60	3.38 0.32								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1		1467	1071.4	13.99	17.49 17.49	21.86 21.86	21.86 21.86 21.86	25 25	25 10 25 10	60 110	3.38 0.32 6.20 0.58								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6 6	2		1467 1467			17.49	21.86	21.86 21.86	25	25 10	60	3.38 0.32								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6 6 6 6	3		1467 1467	1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25	25 10 25 10 25 10 25 10 25 10 25 10	60 110 155 80 125	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66								
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6 6		24	1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25	25 10 25 10 25 10 25 10 25 10 25 10 25 10	60 110 155 80 125 170	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89								
5	4	24 24	1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25	25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10	60 110 155 80 125 170 215	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13								
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 7	4	24 24 24	1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25	25 10 25 10 25 10 25 10 25 10 25 10 25 10	60 110 155 80 125 170	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89								
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 7	4	24 24 24 24	1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25	25 10 25 10	60 110 155 80 125 170 215	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71								
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 7 7 7 7 7	4 1 2 3 4	24 24 24 24 24 24	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10 25 10	60 110 155 80 125 170 215 135 180 225 275	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18								
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 7 7 7 7 7	4 1 2 3 4	24 24 24 24 24 24 24 24	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275	3.38 0.32 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45								
6 6 6 6 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2	24 24 24 24 24 24 24 24 24 24	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08								
6 6 6 6 6 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7	4 1 2 3 4	24 24 24 24 24 24 24 24 24 24 24 24	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08								
6 6 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110	3.38 0.32 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82								
6 6 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.089 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 10.51 1.49 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42								
6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 3	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 10.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66								
6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 215	3.38 0.32 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 2 3 4 4 1 2 4 4 1 4 4 4 4 4 4 4 4 4 4 4 4 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49 17.49	21.86 21.86	21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 10.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 3 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 3 4 4 1 1 2 3 3 4 4 3 4 3 4 3 4 3 3 4 4 3 3 3 4 4 3 3 3 3 3 3 3 4 3	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17,49 17,49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 215 139 140 125 170 125 170 125 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 0.89 12.13 1.13 1.45 0.85 0.08 0.33 0.32 6.20 0.56 9.59 0.89 12.13 1.13 1.45 0.85 0.08 3.38 0.32 6.20 0.56 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 1.15 0.95 1.18 1.15 0.15 0.95 1.18 1.15 0.15 0.15 0.25 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.56 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.2								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 3 4 4 1 1 1 1 2 3 4 4 4 1 1 1 1 2 3 4 4 4 1 1 1 2 3 4 4 4 1 3 4 4 4 1 2 3 4 4 4 4 1 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 158 80 125 170 215 135 80 225 275 15 80 225 275 275 275 275 275 275 275 275 275	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 13.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.10 0.95 12.10 0.95 12.10 0.95 12.11 1.13								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 1 2 3 4 1 1 1 2 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 3 3 4 4 1 1 1 2 3 3 4 4 1 1 1 2 3 3 4 4 1 1 1 2 3 3 4 4 1 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 3 1 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 4 4 1 1 2 3 3 3 4 4 1 2 3 3 3 4 1 2 3 3 4 1 3 1 2 3 3 3 4 4 1 2 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 129 129 130 129 130 140 155 155 180 125 135 140 125 135 140 140 140 140 140 140 140 140 140 140	3.38 0.32 (6.20 0.59 6.20 0.59 6.20 0.59 6.20 0.59 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.95 12.69 1.18 15.51 1.45 0.95 12.69 1.18 15.51 1.45 0.95 12.69 1.18 15.51 1.45 10.95 12.69 1.18 15.51 1.45 10.85 0.08								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 3 4 4 1 1 1 1 2 3 4 4 4 1 1 1 1 2 3 4 4 4 1 1 1 2 3 4 4 4 1 3 4 4 4 1 2 3 4 4 4 4 1 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 158 80 125 170 215 135 80 225 275 15 80 225 275 275 275 275 275 275 275 275 275	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 13.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.10 0.95 12.10 0.95 12.10 0.95 12.11 1.13								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 3 4 1 1 1 2 1 2 1 3 1 1 1 1 2 1 1 1 1 2 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17,49 17,49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 125 170 215 135 180 225 275 15 275 170 215 135 140 225 275 15 275 170 275 170 275 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 0.89 12.13 1.13 1.45 0.85 0.66 9.59 0.89 12.13 1.13 1.45 0.85 0.08 1.3.38 0.32 1.45 0.46 0.56 0.56 0.56 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.66 0.57 0.57 0.66 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57								
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 2 3 4 1 1 1 2 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 80 110 125 275 15 80 125 80 125 135 80 110 125 80 110 125 80 110 125 80 110 125 80 110 80 80 80 80 80 80 80 80 80 80 80 80 80	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 15.51 1.45 0.85 0.08 15.10 0.42 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.55 15.51 0.71								
7 7 7 7 7 7 7 7 7 7 7 7	4 1 2 3 4 1 2 3 4 1 2 3 3 4 1 2 3 3 4 1 2 3 3 4 1 2 3 3 4 1 1 2 2 3 3 4 1 1 2 2 3 3 4 1 1 2 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 3 4 1 1 2 3 3 3 4 1 1 2 3 3 3 4 1 3 3 3 3 3 3 3 4 3 3 3 3 3 3 3	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 225 170 215 135 60 110 155 80 225 170 215 135 60 110 155 80 125 135 135 135 135 135 135 135 135 135 13	3.38 0.32 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58								
7 7 7 7 7 7	4 1 2 3 3 4 1 1 2 2 3 4 1 1 2 2 3 3 4 4 1 1 2 2 3 3 4 4 1 1 2 2 3 3 4 4 1 1 2 2 3 3 4 4 4 1 2 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17,49 17,49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 125 170 215 127 15 60 225 275 15 60 110 125 125 170 110 125 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 6.20 0.59 0.89 12.13 1.13 1.45 0.85 0.08 0.32 6.20 0.55 12.69 1.18 15.51 0.42 7.05 0.66 9.59 0.89 0.89 0.89 0.89 0.89 0.89 0.89 0.8								
7 7	4 1 2 3 4 1 2 3 4 1 2 3 3 4 1 2 3 3 4 1 2 3 3 4 1 2 3 3 4 1 1 2 2 3 3 4 1 1 2 2 3 3 4 1 1 2 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 4 1 1 2 3 3 3 4 1 1 2 3 3 3 4 1 1 2 3 3 3 4 1 3 3 3 3 3 3 3 4 3 3 3 3 3 3 3	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 225 170 215 135 60 110 155 80 225 170 215 135 60 110 155 80 125 135 135 135 135 135 135 135 135 135 13	3.38 0.32 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58								
	4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 2 3 3 3 4 4 1 1 1 2 2 2 3 3 3 4 4 1 1 1 2 2 2 3 3 3 4 4 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 125 275 15 80 125 170 215 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.55 1 1.45 0.85 0.08 15.51 1.45 0.85 0.08 15.51 0.42 7.05 0.66 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.42 15.51 0.58 15.51 0.58 15.51 0.58 15.51 0.58 15.51 0.59 15.51 0.59 15.51 0.55 16.50 0.58 17.61 0.71 10.15 0.95 12.69 0.89 12.13 1.13 13.51 14.51 0.85 15.51 0.89 15.51 0.95 16.60 0.89 17.61 0.71 17.61 0.71 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95 18.51 0.95								
	4 1 1 1 1 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 2 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 1 2 3 3 3 4 4 1 1 1 1 1 2 3 3 3 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 218 135 180 125 170 155 80 170 215 135 180 125 170 170 180 180 180 180 180 180 180 18	3.38 0.32 6.20 0.59 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18								
8 8	4 1 1 2 2 3 3 4 4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 215 125 170 215 135 180 225 275 15 60 110 155 80 225 275 170 215 135 60 110 125 170 215 125 170 215 170 215 170 215 170 215 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 6.20 0.59 6.20 0.59 6.21 0.66 9.59 0.69 9.59 0.69 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.86 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18								
8 8	4 1 1 1 2 2 3 3 4 4 1 1 1 1 2 2 2 3 3 4 4 1 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 1 2 2 2 3 3 3 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 125 80 125 135 180 1225 275 15 60 110 155 80 125 170 215 180 125 180 180 180 180 180 180 180 180	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 1.551 1.45 0.85 0.08 15.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.551 1.45 0.85 0.08 12.69 1.18 15.51 0.42 7.05 0.66 10.85 0.08 12.13 1.13 1.15 1.551 0.85 1.620 0.58 1.74 0.82 1.761 0.71 1.761 0.75 1.761 0.75 1.761 0.75 1.761 0.75 1.761 0.75 1.761 0.77 1.761 0.77 1.761 0.77 1.761 0.79 1.								
8 8	4 1 1 2 2 3 3 4 4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 215 125 170 215 135 180 225 275 15 60 110 155 80 225 275 170 215 135 60 110 125 170 215 125 170 215 170 215 170 215 170 215 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 6.20 0.59 6.20 0.59 6.21 0.66 9.59 0.69 9.59 0.69 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.86 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18								
8 8	4 4 1 1 1 2 2 3 3 4 4 1 1 1 2 2 2 3 3 3 4 4 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 3 3 3 3 4 4 1 1 1 2 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 2 3 3 3 3 4 4 1 1 1 2 3 3 3 3 4 4 1 1 1 1 2 3 3 3 3 4 4 1 1 1 1 2 3 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 215 135 60 110 155 80 125 170 215 135 60 110 155 180 125 170 180 125 170 180 180 180 180 180 180 180 18	3.38 0.32 6.20 0.59 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 1.15 1.15 1.15 1.15 1.15 1.15								
8 8	4 1 1 1 2 2 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 1 2 2 3 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 215 125 170 215 135 180 225 275 15 60 110 155 80 225 170 215 135 180 225 170 215 135 160 225 170 215 170 215 170 170 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 6.20 0.59 6.21 0.82 4.51 0.42 4.51 0.42 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 1.65 1.45 0.85 0.08 6.20 0.58 6.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.51 1.45 0.85 0.08 1.51 0.42 1.51 0.55 0.58 1.51 0.55 0.58 1.53 0.55 0.55 1.55 0.55 0.55 1								
8 8	4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 4 4 4 1 1 1 1 1 2 2 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 215 15 80 125 170 110 125 80 125 170 110 125 135 80 125 170 180 125 180 125 180 125 180 125 180 180 180 180 180 180 180 180	3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 0.95 12.69 0.89 12.15 1.45 0.85 0.08 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.55 1.45 0.85 0.08 12.13 1.13 1.55 1.45 0.85 0.89 12.13 1.13 1.55 1.45 0.85 0.89 12.13 1.13 1.55 1.45 0.85 0.89 12.15 1.15 1.45 0.85 0.89 12.15 1.15 1.45 0.85 0.89 12.15 0.89 12.15 0.89 12.16 0.89 12.17 0.89 12.18 1.15 1.55 1.15 1.45 0.85 0.89 12.18 1.15 1.55 1.15 1.45 0.85 0.89 12.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 17.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 17.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 17.61 0.71 10.15 0.95 12.69 0.89 12.13 1.13 1.51 1.55 1.45 0.85 0.08 1.55 1.45 0.85 0.08 1.55 1.45 0.85 0.08 1.55 1.45 0.85 0.08 1.55 1.45 0.55 0.55 1.55 1.45 0.55 0.55 1.55 1.55 0.55 1.55 1.55 0.55 1.55 1.55 0.55 1.55 0								
8 8	4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 3 4 4 4 1 1 1 2 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 215 135 60 110 155 80 125 170 215 135 180 125 170 155 80 125 170 155 80 170 170 170 170 170 170 170 17	3.38 0.32 6.20 0.59 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 10.55 0.08								
8 8	4 4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 3 3 4 4 1 1 1 2 2 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 2 2 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 125 170 215 135 60 110 125 170 155 80 125 170 155 80 125 170 155 180 125 155 155 160 170 170 170 170 170 170 170 17	3.38 0.32 6.20 0.58 6.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 1.16 1.17 1.18 1.18 1.18 1.18 1.18 1.18 1.18								
8 8	4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 3 4 4 4 1 1 1 2 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 2 2 3 3 3 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 215 135 60 110 155 80 125 170 215 135 180 125 170 155 80 125 170 155 80 170 170 170 170 170 170 170 17	3.38 0.32 6.20 0.59 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 10.55 0.08								
8 8	4 4 1 1 1 2 2 3 3 4 4 1 1 1 2 2 2 3 3 4 4 4 1 1 1 2 2 2 3 3 4 4 4 1 1 1 1 2 2 2 3 3 3 4 4 4 1 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 1 2 2 2 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	24 24 24 24 24 24 24 24 24 24 24 24 24 2	1467 1467 1467 1467 1467 1467 1467 1467	1071.4 1071.4	13.99 13.99	17.49 17.49	21.86 21.86	21.86 21.86	25 25 25 25 25 25 25 25 25 25 25 25 25 2	25 10 25 10	60 110 155 80 125 170 215 135 180 225 275 15 60 110 155 80 125 170 215 135 180 1225 170 215 15 60 110 155 80 125 170 215 15 60 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 215 170 225 170 275 170 170 170 170 170 170 170 170	3.38 0.32 6.20 0.59 6.20 0.59 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 1.15 1.15 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.58 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.56 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 3.38 0.32 6.20 0.56 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71 10.15 0.95 12.69 1.18 15.51 1.45 0.85 0.08 8.74 0.82 4.51 0.42 7.05 0.66 9.59 0.89 12.13 1.13 7.61 0.71								

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

PROJECT: TOK PV/BESS DESIGN
DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAW
tems				
inc.				_
				_
53 82 OM				055
ОМ				REF

TANANA CHIEFS CONFERENCE TOK PV/BESS PV STRING CALCULATIONS

F DWG(S):

TPBD-EL-0700

NOT FOR CONSTRUCTION

TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY DESIGN ISSUED FOR PV CONSTRUCTION BID





BESS DRAWINGS NOT — INCLUDED IN THIS DRAWING SET

> UTILITY -INTERCONNECTION DRAWINGS NOT INCLUDED IN THIS DRAWING SET

	DRAWIN	IG INDEX		
TITLE	DRAWING NUMBER	SHEET	REVISION	SCOPE OF WORK
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	FYRE-EL-0000	1	С	THE PROJECT SCOPE IS TO INSTALL A GRID-TIED SOLAR
GENERAL INFORMATION AND ELECTRICAL SPECIFICATIONS	FYRE-EL-0000	2	С	PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM IN FORT YUKON. AK.
SITE LAYOUT - OVERALL	FYRE-EL-2500	1		THE SYSTEM CONSISTS OF GROUND MOUNTED SOLAR ARRAYS AND 8 STRING INVERTERS MOUNTED INSIDE A CONTAINER. THE PV
SITE LAYOUT - PV	FYRE-EL-2500	2	С	SYSTEM WILL OPERATE IN PARALLEL WITH THE LOCAL UTILITY AND
SITE LAYOUT - BESS	FYRE-EL-2500	2		HAVE RELATED ELECTRICAL SAFETY AND METERING SYSTEMS.
SITE LAYOUT - INTERCONNECTION	FYRE-EL-2500	4	С	SYSTEM SUMMARY
SITE LAYOUT - POWER CONVERSION HUT	FYRE-EL-2500	5	С	PV SYSTEM SIZE: 1,370.88kWdc / 999kWac
SITE LAYOUT - COMMUNICATIONS PANEL	FYRE-EL-2500	6	A	INTERCONNECTION VOLTAGE: 4.16kV, 3 PHASE, 4 WIRE
-RETIREMENT PLAN	FYRE-EL-2500	7	A-	
PV TAKE-OFF PLAN SHEET	FYRE-EL-2500	8	A-	
				CENEDAL NORDC
ONE LINE DIAGRAM	FYRE-EL-0010	2	D	GENERAL NOTES
				ALL ELECTRON WORK TO BE INSTALLED BY A CHAUSED AND
THREE LINE DIAGRAM	FYRE-EL-0100	1	С	ALL ELECTRICAL WORK TO BE INSTALLED BY A QUALIFIED AND LICENSED ELECTRICAL CONTRACTOR.
PV ELECTRICAL SITE PLAN	FYRE-EL-0020	1	С	CONTRACTOR WILL FOLLOW IBC 2021 AND NFPA 70 NEC 2023 AS WELL AS ALL APPLICABLE LOCAL, STATE, MUNICIPAL AND CITY
PV ARRAY DC WIRING DIAGRAM	FYRE-EL-3000	1	С	CODES, ORDINANCES AND REGULATIONS.
PV ARRAY DC WIRING DIAGRAM	FYRE-EL-3000	2	С	ALL MODULES AND INVERTERS SHALL BE UL LISTED 1703 & CEC
PV ARRAY DC WIRING DIAGRAM	FYRE-EL-3000	3	С	APPROVED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL
PV ARRAY DC WIRING DIAGRAM	FYRE-EL-3000	4	С	BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMAN LIKE MANNER.
EQUIPMENT/CABLE SCHEDULE	FYRE-EL-3000	5	С	
CONDUIT SCHEDULE	FYRE-EL-3000	6	С	PRIOR TO INSTALLATION, THE CONTRACTOR SHALL UNDERSTAND ALL DRAWINGS AND PRODUCT MANUALS.
				ALL DEGICAL AND COPPOSION TIQUE OF CITALIAN AND COMPONENTS ARE
PV ARRAY GROUNDING PLAN	FYRE-SS-2000	1	С	ALL DESIGN AND SPECIFICATIONS OF STRUCTURAL COMPONENTS ARE OUTSIDE THE SCOPE OF THESE PLANS.
SITE CONDUIT PLAN	FYRE-SS-2000	2	В	DDA IEGE ENERING
GROUNDING AND CONDUIT DETAILS	FYRE-SS-2000	3	С	PROJECT ENTITIES
FENCE DETAILS	FYRE-SS-2000	4	В	OWNER: TANANA CHIEFS CONFERENCE
EQUIPMENT SAFETY LABEL SCHEDULE	FYRE-SS-2000	5	В	
TRANSFORMER DETAILS	FYRE-SS-2000	6	А	ENGINEER OF RECORD: ELECTRIC POWER SYSTEMS, INC.
EQUIPMENT NAMEPLATE SCHEDULE	FYRE-SS-2000	7	А	ELECTRIC SERVICE PROVIDER: GWITCHYAA ZHEE CORPORATION.
-STAKING SHEETS	FYRE-SS-2001	1	Α	
-DETAILS	FYRE-SS-2001	2	A	
DETAILS	FYRE-SS-2001	3	Α	
PV STRING CALCULATIONS	FYRE-EL-0700	1	В	

NOT FOR CONSTRUCTION

PROJ	PROJECT: FT YUKON RENEWABLE ENERGY DESIGN											
DESIG	DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053											
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE									
Α	ISSUED FOR 65% REVIEW	MED/04-23-2025	JRV/04-23-2025									
В	ISSUED FOR 95% REVIEW	MED/05-02-2025	JRV/05-02-2025									
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025									

Plectric Power Systems	
Consulting Engineers	
TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM	

ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:
				ĺ
/stems				1
3 INC.				ĺ
1953				ĺ
1182 C.COM				REF DWG(S):

TANANA CHIEFS CONFERENCE FT YUKON RENEWABLE ENERGY COVER SHEET AND INDEX

fyre-pr-0001_1.dwg

VG(S):

FYRE-PR-0001 SHEET 1 OF 1

ELECTRICAL SPECIFICATIONS

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL A COMPLETE, TESTED, COMMISSIONED, AND SATISFACTORY ELECTRIC INSTALLATION IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE INTENT OF THE DRAWINGS IS NOT TO SHOW OR LIST EVERY ITEM TO BE PROVIDED BY THE CONTRACTOR. IF AN ITEM IS NOT SHOWN OR LISTED THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MISSING ITEMS TO ALLOW THE SYSTEM TO FUNCTION PROPOREDLY.
- ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS MUST BE VERIFIED PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED
- ALL CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY CHANGES IN THE FIELD.
- 4. EXACT LOCATION AND MOUNTING OF ALL EQUIPMENT SHALL BE
- THE CONTRACTOR SHALL READ AND UNDERSTAND ALL DRAWINGS AND EQUIPMENT MANUALS PRIOR TO INSTALLATION OR OPERATION OF EQUIPMENT. CONTRACTOR IS TO PROVIDE SKILLED LABOR FOR EACH TRADE WHOSE WORK RELATES TO THE DRAWINGS AND SPECIFICATIONS
- ALL OUTDOOR EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 3R
- ALL THE EQUIPMENT SHOULD BE FREE FROM ANY DEBRIS, DAMAGED COMPONENTS AND ANY CONNECTION ISSUES.
- THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS INSTALLED FROM WORK SPECIFIED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, NOTING THE ORIGIN OF THE
- SUFFICIENT ACCESS AND WORKING SPACE SHALL BE PROVIDED NEAR ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
- 10. CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- 11. CONDUIT JOINTS SHALL BE CUT SQUARE AND DE-BURRED UNTIL SMOOTH. BENDS SHALL BE MADE SO THAT THE CONDUIT IS NOT DAMAGED. THERE SHOULD NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS (360 DEGREES) BETWEEN PULL POINTS.
- METALIC CONDUIT GROUNDS SHALL BE INSULATED AND SOLIDLY GROUNDED TO THE EGC SYSTEM. GROUNDS SHALL BE SIZED ACCORDING TO THE NEC.
- CONDUCTORS SHALL BE COLOR-CODED, FACTORY OR FIELD APPLIED, WITH AN INDUSTRY STANDARD COLOR FOR EACH PHASE AND THE

RECORD DOCUMENTS

14. ON COMPLETION OF THE PROJECT, A COMPLETE SET OF MARKED-UP PRINTS SHOWING ANY DEVIATIONS SHALL BE DELIVERED TO THE ENGINEER OF RECORD. UNITL THESE DRAWINGS ARE REVIEWED BY THE ENGINEER, THE CONTRACT SHALL REMAIN INCOMPLETE.

WIRING METHODS

- 15. EXPOSED PV WIRING SHALL BE PV WIRE TYPE, 90 DEGREE C, WET RATED AND UV RESISTANT.
- 16. PV SOURCE AND OUTPUT CIRCUIT CONDUCTORS SHALL BE RED FOR POSITIVE, BLACK FOR NEGATIVE, AND GREEN FOR GROUND. FIELD WIRING THAT IS NOT COLOR CODED SHALL BE MARKED AT BOTH ENDS SHOWING
- 17. DC EQUIPMENT SHALL BE LISTED WITH A DC VOLTAGE GREATER THAN OR EQUAL TO THE MAXIMUM DC SYSTEM VOLTAGE.
- 18. INTERCONNECT WIRING AND POWER CONDUCTORS MUST BE IN ACCORDANCE WITH NEC NFPA 70. CONDUCTORS MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE SPECIFIC NEC ARTICLE. WIRE BUNDLES SHALL BE KEPT AWAY FROM SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. CONDUCTORS SHALL BE COPPER RATED AT 90
 DEGREES C UNLESS OTHERWISE NOTED IN THE DRAWINGS. FOR OUTDOOR
 INSTALLATIONS, CONDUITS AND FITTINGS SHALL BE PROPERLY NEMA RATED AS REQUIRED BY THE NEC.
- 19. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATION.
- 20. AC WIRING SHALL BE COPPER RATED AT 90 DEGREES C, RATED 600VAC UNLESS OTHERWISE NOTED IN THE DRAWINGS
- 21. PV SOURCE CIRCUITS IN FREE AIR SHALL BE PROPERLY SUPPORTED AND SEPARATED TO MAINTAIN AMPACITY RATINGS AND INSULATION INTEGRITY

25. FIELD MADE CONNECTORS FOR PV QUICK CONNECTS SHALL BE THE SAME TYPE AND MANUFACTURER AS THE PV MODULES AND USE THE MANUFACTURER SPECIFIED CRIMPING TOOL.

- 26. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS SHALL BE MADE FOR SYSTEM GROUNDING.
- 27. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER EQUIPMENT GROUNDING TO ENSURE THE TERMINAL LUG IS PROPERTY BOLTED AND METAL-METAL CONTACT IS MADE. PAINT AND/OR FINISH AT THE POINT OF CONTACT IS TO BE REMOVED.
- 28. MODULES SHALL BE BONDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 29. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
- 30. GROUNDING CONDUCTORS SHALL MEET THE FOLLOW SPECIFICATIONS:
- SOLID CONDUCTORS: ASTM B 3.
 STRANDED CONDUCTORS: ASTM B 8.
- 30.3. TINNED CONDUCTORS: ASTM B 33.
- 31. GROUNDING BUS WHERE SPECIFIED SHALL BE RECTANGULAR BARS OF ANNEALED COPPER, CROSS SECTION SIZED FOR APPLICATION PER NEC, UNLESS OTHERWISE INDICATED; WITH INSULATORS.
- 32. GROUNDING CONDUCTORS SHALL BE ROUTED ALONG THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE
- 33 INSTALL A GROUND CONDUCTOR LOOP AND GROUND RODS ELECTRICALLY CONNECTED TO BUILDING STRUCTURE, GROUND RODS, AND EXTERIOR EQUIPMENT AS

RACEWAYS

- 34. METAL CONDUIT AND TUBING SHALL MEET THE FOLLOWING STANDARDS:
- RIGID STEEL CONDUIT: ANSI C80.1. EMT: ANSI C80.3.
- 34.3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 35. FITTINGS FOR CONDUIT SHALL BE LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 36. COATED FITTINGS FOR PVC-COATED CONDUIT SHALL HAVE MINIMUM THICKNESS OF 0.040 INCHES WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS
- 37. NONMETALIC WIREWAY SHALL BE PROVIDED AS FIBERGLASS POLYESTER, EXTRUDED AND FABRICATED TO SIZE AND SHAPE INDICATED, WITH NO HOLES OR KNOCKOUTS. COVER IS GASKETED WITH OIL-RESISTANT GASKET MATERIAL AND FASTENED WITH CAPTIVE SCREWS TREATED FOR CORROSION RESISTANCE FLANGED, WITH STAINLESS-STEEL SCREWS AND OIL-RESISTANT GASKETS.
- 38. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CIRCUITS SHALL BE INSTALLED.
- 38.1. 3/4-INCH TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS
- 38.2. 1-INCH TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF

DISCONNECTING MEANS

- 39. MEANS SHALL BE PROVIDED TO DISCONNECT THE PV SYSTEM FROM WIRING SYSTEMS INCLUDING POWER SYSTEMS AND ENERGY STORAGE SYSTEMS.
- 40. PV DISCONNECTS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH ARTICLE 690 PART III: DISCONNECTING MEANS.

PANEL BOARDS

- 41. CONTRACTOR SHALL PROVIDE THE FOLLOWING SUBMITTALS:
- 41.1. EACH TYPE OF PANELBOARD, OVERCURRENT PROTECTIVE DEVICE, TRANSIENT VOLTAGE SUPPRESSION DEVICE, ACCESSORY, AND COMPONENT INDICATED.
 INCLUDE DIMENSIONS AND MANUFACTURERS' TECHNICAL DATA ON FEATURES,
 PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
- 41.2. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS" INCLUDE THE
- WINDAMING:

 1. BASIS OF CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS
 BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION.

 2. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF GRAVITY AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE
- PROVISIONS.

 41.2.3. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.

FNG STAME

- 41.3. FIELD QUALITY-CONTROL TEST REPORTS INCLUDING THE FOLLOWING: 41.3.1. TEST PROCEDURES USED.
 41.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
- 41.4. PANELBOARD SCHEDULES: FOR INSTALLATION IN PANELBOARDS, SUBMIT FINAL VERSIONS AFTER LOAD BALANCING.
- 41.5. OPERATION AND MAINTENANCE DATA: FOR PANELBOARDS AND COMPONENTS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS. IN ADDITION TO ITEMS SPECIFIED IN DIVISION 01 SECTION "OPERATION AND MAINTENANCE INCLUDE THE FOLLOWING:
- 41.5.1. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING AND ADJUSTING
- OVERCURRENT PROTECTIVE DEVICES.

 41.5.2. TIME-CURRENT CURVES, INCLUDING SELECTABLE RANGES FOR EACH TYPE OF OVERCURRENT PROTECTIVE DEVICE
- 42. CONTRACTOR SHALL MEET THE FOLLOWING QUALITY ASSURANCE STANDARDS:
- 42.1. SOURCE LIMITATIONS: OBTAIN PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
- PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF PANELBOARDS AND ARE BASED ON THE SPECIFIC SYSTEI INDICATED. REFER TO DIVISION 01 SECTION "PRODUCT REQUIREMENTS."
- 42.3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- COMPLY WITH NEMA PB 1.
- 42.5 COMPLY WITH NEPA 70
- 43. CONTRACTOR SHALL COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS.
- 44. CONTRACTOR SHALL PROVIDE PANELBOARD PRODUCTS THAT MEET THE FOLLOWING
- CRITERIA
 44.1. MANUFACTURER SHALL BE AS SHOWN ON DRAWINGS OR EQUAL.
 44.2. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND
 SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC

- SEISME PORCES DEFINED IN DIVISION 26 SECTION VIBRATION AND SEISME CONTROLS FOR ELECTRICAL SYSTEMS.

 44.3. ENCLOSURES: SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1.

 44.3.1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

 44.3.2. OUTDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS.

 44.3.3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X.

 44.3.4. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE—MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH—MOUNTED FRONTS OVERLAP BOX FRONTS, OVERLAP BOX.
- 44.3.5. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER
- CORROSION-RESISTANT TREATMENT OR PRIMER COAT.
 DIRECTORY CARD: WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME, INSIDE PANELBOARD DOOR
- 44.4. PHASE AND GROUND BUSES:
 44.4.1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
 44.4.2. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS; BONDED TO BOX.
- 44.5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL. 44.5.1. LUGS: MECHANICAL TYPE.
- 44.6. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.
- 44.7. UL LABEL INDICATING SERIES—CONNECTED RATING WITH INTEGRAL OR REMOTE UPSTREAM OVERCURENT PROTECTIVE DEVICES. INCLUDE SIZE AND TYPE OF UPSTREAM DEVICE ALLOWABLE, BRANCH DEVICES ALLOWABLE, AND UL SERIES—CONNECTED SHORT—CIRCUIT RATING.
- 45. CONTRACTOR SHALL PROVIDE OVERCURRENT PROTECTIVE DEVICES THAT MEET THE
- 45.1. MOLDED-CASE CIRCUIT BREAKER: PROVIDE BREAKERS FROM PANELBOARD MANUFACTURER. UL 489, WITH SERIES-CONNECTED RATING TO MEET AVAILABLE FAULT CURRENTS
- 45.2. THERMAL—MAGNETIC CIRCUIT BREAKERS: INVERSE TIME—CURRENT ELEMENT FOR LOW—LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT—BREAKER FRAME SIZES 250 A AND LARGER
- 45.3. ADJUSTABLE INSTANTANEOUS—TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT—MOUNTED, FIELD—ADJUSTABLE TRIP SETTING.
- 45.4. ELECTRONIC TRIP—UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING;
 FIELD—REPLACEABLE RATING PLUG; AND WITH THE FOLLOWING FIELD—ADJUSTABLE
 SETTINGS:
 45.4.1. INSTANTANEOUS TRIP.
- 45.4.2. LONG— AND SHORT—TIME PICKUP LEVELS. 45.4.3. LONG— AND SHORT—TIME TIME ADJUSTMENTS.
- 45.4.4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND 12/T RESPONSE.
- 45.5. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA WHERE INSTALLED PROTECTION OF GENERAL USE RECEPTACLES. WHERE REQUIRED, 30—MA TRIP SENSITIVITY FOR CIRCUITS INSTALLED TO SUPPLY SPECIFIC EQUIPMENT.

REQUIRED SAFETY SIGNS AND LABELS

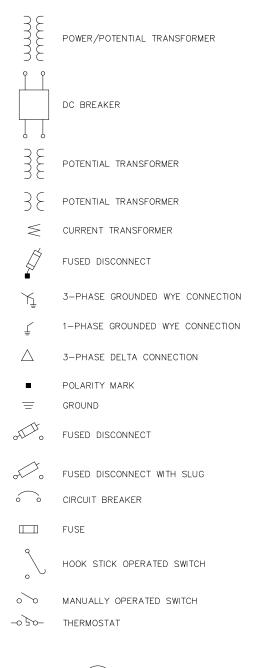
- 1. THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLORS AND/OR SYMBOLS PER NEC 110.21.
- THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN PER NEC 110.21.
- 3. THE LABEL SHALL BE OF SUFFICIENT DURABILITY ABLE TO WITHSTAND THE ENVIRONMENT
- 4. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH THE NEC.
- 5. PV MODULES AND INVERTERS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH PRE-APPLIED MARKINGS TO MEET THE REQUIREMENTS OF NEC 690.51 & 690.41(B)(1)
- UNLESS OTHERWISE SPECIFIED ON THE LABELING SHEET, OSHA 1910.145 AND ANSI Z535 RECOMMENDED SPECIFICATIONS ARE AS FOLLOWS:
 6.1. ROUNDED OR BLUNT CORNERS FREE OF SHARP EDGES.
 6.2. VISIBLE AT A MINIMUM DISTANCE OF 5FT. OR GREATER.

- "DANGER" HEADER; RED BACKGROUND WITH WHITE LETTERING.
 "WARNING" HEADER; ORANGE BACKGROUND WITH BLACK LETTERING.
- 6.4.
- "CAUTION" HEADER; YELLOW BACKGROUND WITH BLACK LETTERING.
 "NOTICE" LABEL HEADER TO BE IN BLUE WITH WHITE LETTERING. OTHER TEXT TO BE BLACK ON A WHITE BACKGROUND
- ALL RELEVANT COMPONENTS OF THE PHOTOVOLTAIC SYSTEM SHALL BE CLEARLY MARKED AND LABELED IN ACCORDANCE WITH NEC ARTICLE 690.

NOT FOR CONSTRUCTION

FORT YUKON RENEWABLE ENERGY DESIGN DRAWING NO./SHEET REFERENCE DRAWING DESCRIPTION PROJECT: TANANA CHIEFS CONFERENCE ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053 FORT YUKON RENEWABLE ENERGY DWN BY/DATE REVIEWED BY/DATE GENERAL INFORMATION AND SPECIFICATIONS SSUED FOR 65% REVIEW MED /04-23-202 JRV/04-23-202 Consulting Engineers SSUED FOR 95% REVIEW MED/05-02-2025 JRV/05-02-2025 TEL: (907) 522-1953 FAX: (907) 522-1182 WFB: WWW.FPSING.COM ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025 fvre-el-0000 1 d REF DWG(S) DRAWING NO HEET_1 OF 3 FYRE-EL-0000

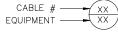
STANDARD BLOCKS - ELECTRICAL



PROTECTION, INSTRUMENTATION, OR AUTOMATION DEVICE COIL OR ELEMENT √√√ RESISTOR NORMALLY OPEN CONTACT NORMALLY CLOSED CONTACT AMBER LIGHT RED LIGHT GREEN LIGHT BLUE LIGHT INCANDESCENT LIGHT SHORTING BLOCK CONNECTION POINT TERMINATION CONNECTION POINT POLARITY MARK (CURRENT TRANSFORMERS) GROUND

STANDARD ABBREVIATIONS - ELECTRICAL

DIE	INDAIND ADDINEVIAL	TOTIO	ELECTRICAL				
Α	AMPERE	EIA	ELECTRONICS INDUSTRY ASSOCIATION	N	NEWTON	TIA	TELECOMMUNICATIONS INDUSTRY
ACB	AIR CIRCUIT BREAKER	EJ	EXPANSION JOINT	N	NORTH		ASSOCIATION
AB	AIR BREAK	EL	ELECTRICAL	NC	NORMALLY CLOSED	TRP	TRIP
ABV	ABOVE	ELEV	ELEVATION	NCC	NORMALLY CLOSED CONTACT	TURB	TURBINE
AC	ALTERNATING CURRENT	ENCL	ENCLOSURE	N/C	NO CONNECTION	TX	TRANSMIT
ADJ	ADJUSTABLE	EQ	EQUAL	NIC	NOT IN CONTRACT	TYP	TYPICAL
ADJT	ADJACENT	EQUIP	EQUIPMENT	NO	NORMALLY OPEN	UG	UNDERGROUND
ALT	ALTERNATE	EST	ESTIMATE	NOC	NORMALLY OPEN CONTACT	UNO	UNLESS NOTED OTHERWISE
AL	ALUMINUM	EXIST F	EXISTING	NS	SYNCHRONIZING NEUTRAL	V VA	VOLT VOLTAMPERE
APPRX	APPROXIMATE	F	FARAD	NTS	NOT TO SCALE	VA VA	PHASE A VOLTAGE
В	BUS		FUSE	OD	OUTSIDE DIAMETER	VAR	REACTIVE POWER
BF	BREAKER FAIL	FREQ	FREQUENCY	OUT P	OUTPUT	VAR VB	PHASE B VOLTAGE
BFI BKR	BREAKER FAIL INITIATE BREAKER	FT FT	FEET FEED THROUGH	PB	REAL POWER OR PRIMARY PUSH BUTTON	VAC	ALTERNATING CURRENT VOLTAGE
BLDG	BUILDING	FUT	FUTURE	PCH PCH	POSH BUTTON POWER CONVERSION HUT	VC	PHASE C VOLTAGE
BLK	BLOCK	G	CONDUCTANCE OR GROUND	PF PF	POWER FACTOR	VCB	VACUUM CIRCUIT BREAKER
BOT	BOTTOM	GA	GAUGE	PLC	PROGRAMMABLE LOGIC CONTROLLER	VDC	DIRECT CURRENT VOLTAGE
BTU	BRITISH THERMAL UNIT	GALV	GALVANIZED	PM	PAD-MOUNT TRANSFORMER	VERT	VERTICAL
BTWN	BETWEEN	GB	GROUND BUS	PSSS	PROVIDER SWITCHYARD	VIF	VERIFY IN FIELD
BU	BACKUP	GCB	GAS CIRCUIT BREAKER	PT	POINT	VN	NEUTRAL VOLTAGE
C	COLOUMB	GEN	GENERATOR	PT	POTENTIAL TRANSFORMER	VR	VOLTAGE REGULATOR
CAP	CAPACITOR OR CAPACITANCE	GLIN	GALVANIZED IRON	PVC	POLYVINYL CHLORIDE	VREG	VOLTAGE REGULATOR
CAP	CORRUGATED ALUMINUM PIPE	GND	GROUND	PVMT	PAVEMENT	VS	SYNCHRONIZING VOLTAGE
CB	CENTER BREAK	GOAB	GANG OPERATED AIR-BREAK SWITCH	PWR	POWER	VT	VOLTAGE TRANSFORMER
CBL	CABLE	GRC	GALVANIZED RIGID CONDUIT	Q	REACTIVE POWER	W	WEST
CEM	CEMENT	GRD	GRADE, GRADING	Ř	RESISTANCE OR RESISTOR	W	WATT
CF	CUBIC FOOT	GRSC	GALVANIZED RIGID STEEL CONDUIT	RCLS	RECLOSE	W/	WITH
CHK	CHECK	Н	HENERY	RAD	RADIUS	W/0	WITHOUT
CI	CAST IRON	HDPE	HIGH-DENSITY POLYETHYLENE	RAD	RADIAN	X	REACTANCE
CIP	CAST IRON PIPE	HLO	HOT LINE ORDER	RD	ROAD	XFMR	TRANSFORMER
CIPC	CAST-IN-PLACE CONCRETE	HORIZ	HORIZONTAL	RE	REMOTE END	XMSSN	TRANSMISSION
CIR	CIRCLE	HP	HORSEPOWER	REF	REFERENCE	Υ	ADMITTANCE
CKT	CIRCUIT	HZ	HERTZ	REQD	REQUIRED	YL	YELLOW
CLK	CLOCK	IA	PHASE A CURRENT	RET	REMOTE END TRIP	Z	IMPEDANCE
CLS	CLOSE	IB	PHASE B CURRENT	RET	RETURN	2	TIME-DELAY
CMIL	CIRCULAR MIL	IC	PHASE C CURRENT	REV	REVISION	21	DISTANCE
CMP	CORRUGATED METAL PIPE	ID	INSIDE DIAMETER	RLY	RELAY	25	SYNCHRONISM CHECK
COS	COSINE	IN	INPUT	RR	RAILROAD	27	UNDERVOLTAGE
CONC	CONCRETE	IN	INCH	ROW	RIGHT OF WAY	30	ANNUNCIATOR
CONST	CONSTRUCTION	IN	NEUTRAL CURRENT	RTS	READY TO SEND	32	DIRECTIONAL POWER
CONT	CONTINUOUS	INCL	INCLUDE(D), INCLUDING	RTU	REMOTE TERMINAL UNIT	37	UNDERCURRENT OR UNDERPOWER
CONTR	CONTRACTOR	IND	INDUSTRY	RX	RECEIVE	38	BEARING
CS		INT	INTERSECTION	S	APPARENT POWER	40	FIELD
CSP	CORRUGATED STEEL PIPE	INV	INVERT	S	SOUTH	43	MANUAL TRANSFER OR SELECTOR DEVICE
CT	CURRENT TRANSFORMER	IP	POLARIZING CURRENT	S	SOURCE	46 47	REVERSE-PHASE
CTRL	CURCUROLSWITCHER OR CONTROL SWITCH	j _.	COMPLEX NUMBER	S-L	SOURCE-LOAD	47	PHASE—SEQUENCE VOLTAGE MACHINE OR TRANSFORMER THERMAL RELAY
CTS	CLEAR TO SEND	J	JOULE BOY	SA	SURGE ARRESTOR	50	INSTANTANEOUS OVERCURRENT
CU	COPPER	JB	JUNCTION BOX	SC	SWITCH CABINET	51	AC TIME OVERCURRENT
DC	DIRECT CURRENT	KA KV	KILOAMPRERE	SEC	SECTION	52	AC CIRCUIT BREAKER
DCD	DATA COMMUNICATIONS FOLUBATION	KV KW	KILOVOLT	SEC SVC	SECONDARY	52 52a	NORMALLY OPEN BREAKER CONTACT
DCE DDE	DATA COMMUNICATIONS EQUIPMENT DOUBLE DEAD END	KW L	KILOWATT INDUCTANCE	SVC	SERVICE STATIC VAR COMPENSATOR	52b	NORMALLY CLOSED BREAKER CONTACT
DE	DEAD END	L	LINE	SVC	STATIC VAR COMPENSATOR SHEET	59	OVERVOLTAGE
DEM	DEMOLISH, DEMOLITION	L	LOAD	SHI	SHEET SIMILAR	60	VOLTAGE BALANCE
DEMOB	DEMOLISH, DEMOLITION DEMOBILIZE	L LB	LOAD BREAK	SIM	SINE	63	PRESSURE SWITCH
DET	DETAIL	LB	LANDFILL GAS POWER PLANT	SPEC	SPECIFICATION	64	APPARATUS GROUND
DFR	DISTURBANCE FAULT RECORDER	LGFF	LIGHT	SPECS	SPECIFICATIONS	67	AC DIRECTIONAL OVERCURRENT
DI	DIGITAL INPUT	M	METER(S)	SPSS	SPARTAN SUBSTATION	68	BLOCKING
DIA	DIAMETER	MAT	MATERIAL	SS	SYNCHRONIZING SWITCH	69	PERMISSIVE
DIAG	DIAGONAL	MAX	MAXIMUM	STA	STATION	71	LEVEL SWITCH
DIM	DIMENSION	MEG	MANUFACTURER	STD	STANDARD	74	ALARM
DIST	DISTRIBUTION	MI	MILE	SW	SWITCH	76	DC OVERCURRENT
DNP	DISTRIBUTED NETWORK PROTOCOL	MIN	MINIMUM	SWGR	SWITCHGEAR	78	OUT-OF-STEP
DO	DIGITAL OUTPUT	MISC	MISCELLANEOUS	SYM	SYMMETRICAL	79	RECLOSING RELAY
DSSS	D STREET SUBSTATION	MM	MILLIMETER(S)	SYNCH	SYNCHRONIZE	81	FREQUENCY
DTE	DATA TERMINAL EQUIPMENT	MO	MOTOR OPERATED (OR)	T	TIME OR TRANSFORMER	85	CARRIER OR PILOT WIRE
DWG	DRAWING	MOB	MOBILIZE	TAN	TANGENT	86	LOCK OUT
EA	EACH	MTR	METER	TCM	TRIP COIL MONITOR	87	DIFFERENTIAL
		MW	MEGAWATT	TEL	TELEPHONE	94	TRIPPING
		N	NEUTRAL	TERM	TERMINAL		
				TEMP	TEMPORARY		



CABLE TAG - WIRING DIAGRAMS & 3-LINES

NOT FOR CONSTRUCTION

PROJ DESIG	PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE						
Α	ISSUED FOR 65% REVIEW	MED/04-23-2025	JRV/04-23-2025						
В	ISSUED FOR 95% REVIEW	MED/05-02-2025	JRV/05-02-2025						
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025						



ENG. STAMP

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAM
s				
ē				
				REF DWG(S):
				DD AMBIO NO

TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY GENERAL INFORMATION AND SPECIFICATIONS

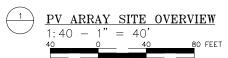
fyre-el-0000_2.dwd

NO:: FYRE-EL-0000

TEMP TEMPORARY

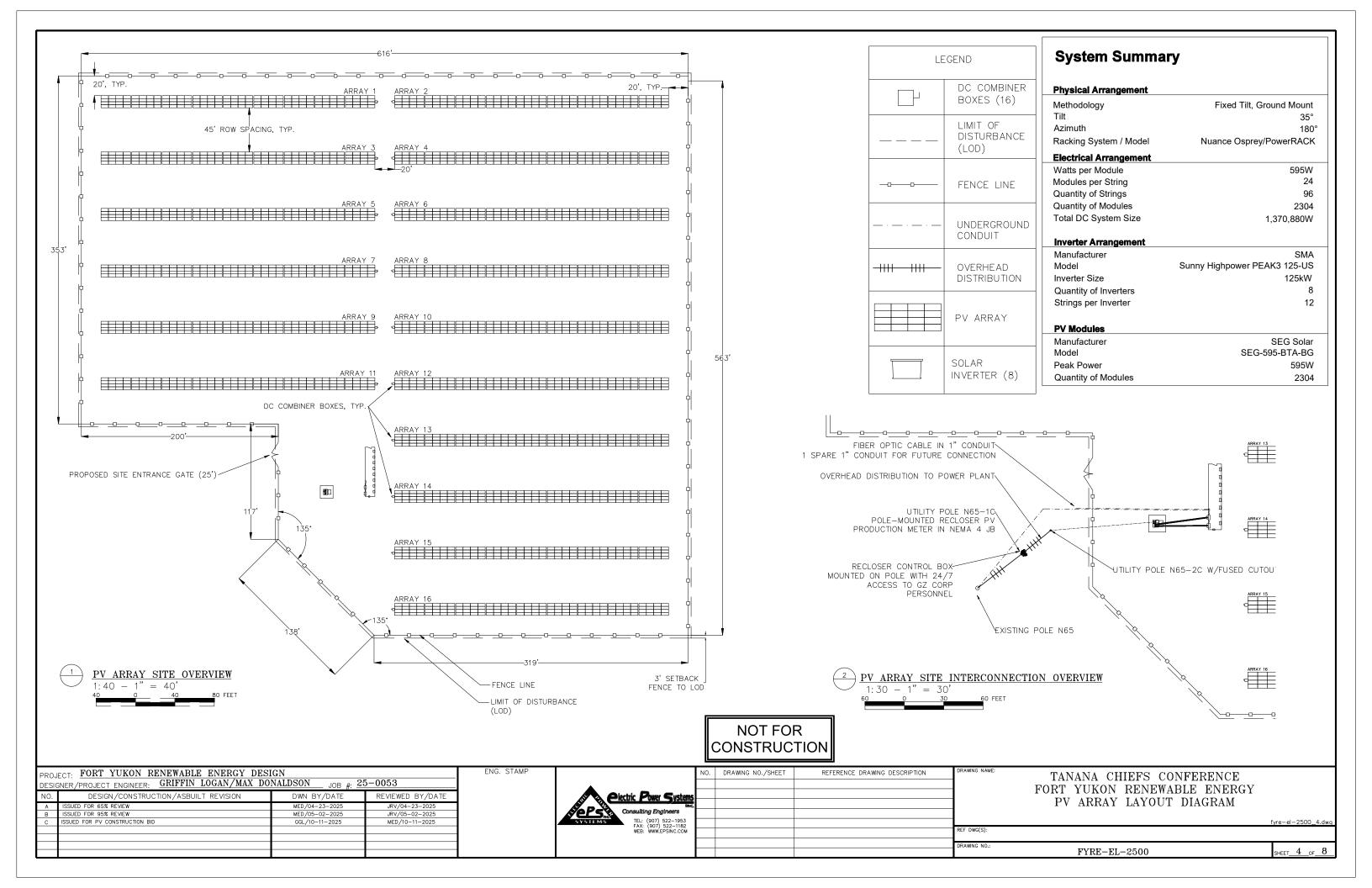
SHEET 2 OF 3

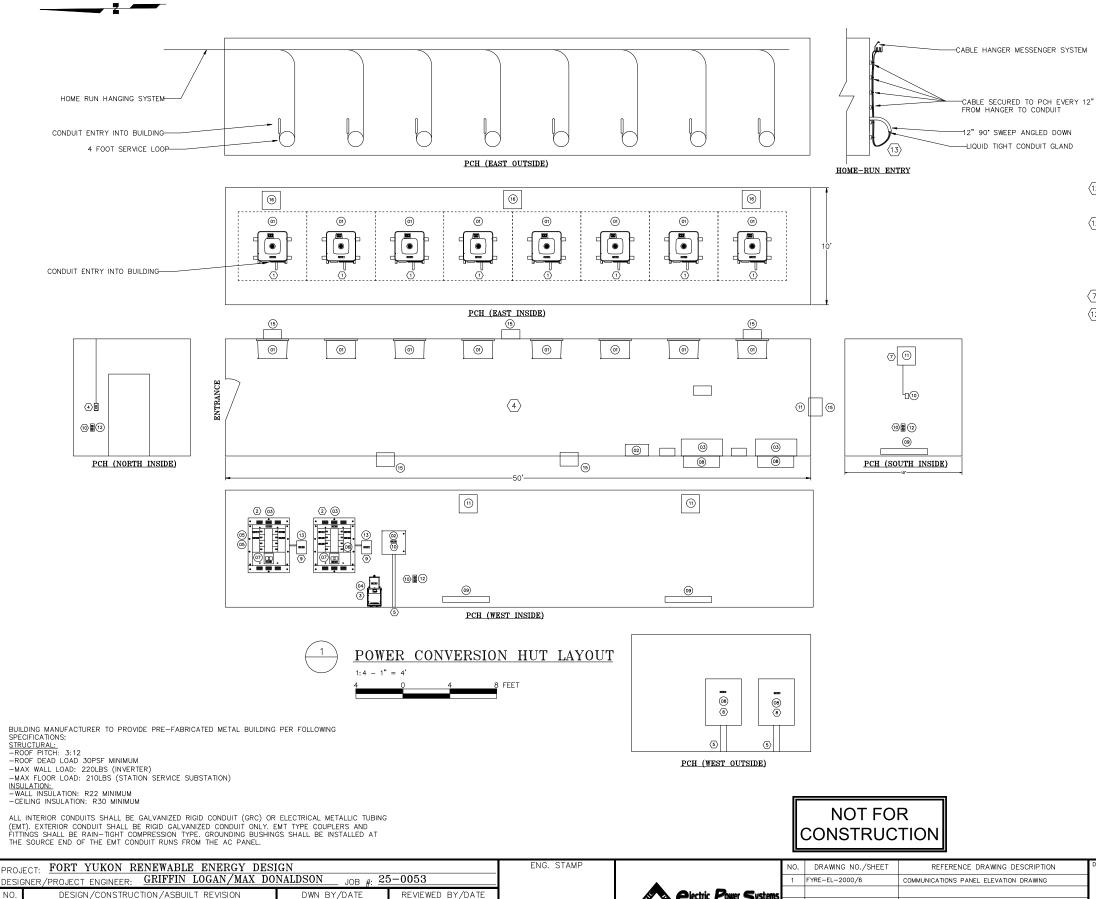




NOT FOR CONSTRUCTION

PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053			ENG. STAMP	_	NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems			4	PV ARRAY SITE LAYOUT DIAGRAM	
Α	ISSUED FOR 35% REVIEW	MED/04-04-2025	JRV/04-04-2025		Consulting Engineers			-	IV ARRAI SILE LAIOUI DIAGRAM	
B C	ISSUED FOR 95% REVIEW ISSUED FOR PV CONSTRUCTION BID	MED/05-02-2025 GGL/10-11-2025	JRV/05-02-2025 MED/10-11-2025					-		fyre-el-2500_2.dwg
	1330ED FOR FV CONSTRUCTION BID	GGE/10-11-2025	MED/10-11-2025		TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM			REF DWG(S):		Tyre-el-2500_2.dwg
					TEE. WITHER SING.COM					
								DRAWING NO.:	FYRE-EL-2500	2 Q
									FIRE-EL-2500	SHEET & OF U





MED /04-23-2025

MED/05-02-2025

GGL/10-11-2025

SSUED FOR 95% REVIEW

ISSUED FOR PV CONSTRUCTION BID

JRV/4-23-2025

JRV/05-02-2025

MED/10-11-2025

		BILL OF MATERIAL						
	REF. NO.	UNIT	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.			
	(01)	EA	8	SUNNY HIGHPOWER PEAK3-125KW	SMA/SHP 125-US-21			
	02	EA	1	COMMUNICATION PANEL	SEE REF. 1			
	03	EA	1	POWER DISTRIBUTION PANELBOARD W/ MAIN BREAKER, 800A, 600VAC, 10KAIC	SQUARED/HCP18688M			
,	(04)	EA	1	STATION SERVICE SUBSTATION, 15kVA, 480VAC-120/240V				
	05)	EA	8	200A/3P CIRCUIT BREAKER				
	06	EA	1	50A/2P CIRCUIT BREAKER				
	07	EA	2	800A/3P MAIN CIRCUIT BREAKER				
	08)	EA	2	800A AC LOAD BREAK DISCONNECT W/ PROVISIONS FOR PADLOCK				
12	09	EA	3	ELECTRIC BASEBOARD HEATER, 1000W, 120VAC W/ BUILT-IN THERMOSTAT				
	10	EA	1	ADJUSTABLE THERMOSTAT				
12	11)	EA	3	WALL MOUNT SHUTTER FAN, >2500CFM, 120VAC W/ DAMPER MOTOR CONTROLLED BY THERMOSTAT				
	(12)	EA	4	GFCI RECEPTACLE				
	(13)	EA	2	SHARK 250 SELF-ENCLOSED METER ASSEMBLY	ELECTRO INDUSTRIES /ENCSHK250-277-60-10-V3-D2-INP100S-X			
	14)	EA	1	LIGHT SWITCH				
7>	15)	EA	6	90' VENTILATION HOOD WITH INSECT SCREEN				
2	16	EA	3	10IN MOTORIZED INTAKE DAMPER				

 $\langle 6 \rangle$

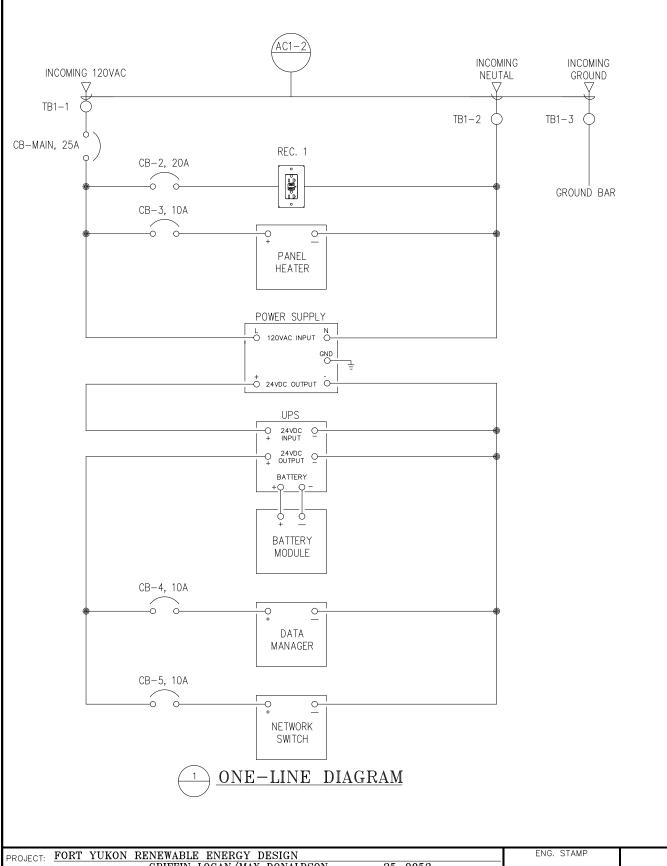
NOTES:

- MOUNT SMA SHP-125-US INVERTERS SUCH THAT THEY ARE 4" AWAY FROM THE WALL, AND 20" ON ALL OTHER SIDES FROM WALLS, FLOORS, CEILINGS, AND OTHER DEVICES. MAINTAIN 4" WORKING CLEARANCE ZONE IN FRONT OF INVERTERS, PER NEC. THE SUM OF CROSS-SECTIONAL AREAS OF ALL CONTAINED CONDUCTORS OR CABLES AT ANY CORSS SECTION OF THE NONMETALLIC WIREWAY SHALL NOT EXCEED 20 PERCENT OF THE INTERIOR CROSS-SECTIONAL ARE OR THE NONMETALLIC WIREWAY BETWEEN INVERTERS AND PANCLEDOARD
- (2) MOUNT POWER DISTRIBUTION PANELBOARDS SUCH THAT MANUFACTURER RECOMMENDED CLEARANCE DISTANCES BETWEEN THE PANELBOARDS AND WALLS, FLOORS, CEILINGS, AND OTHER DEVICES IS MAINTAINED, AS WELL AS A 4' WORKING CLEARANCE IN FRONT OF THE PANELBOARD, PER NEC
- 4 PROVIDE INTERIOR EMERGENCY BATTERY BACKUP LIGHTING, AS WELL AS NORMALLY SWITCHED MAIN LIGHTING, PER NFPA. PROVIDE CEILING MOUNTED LIGHTING SUCH THAT 30 FOOTCANDLES IS MAINTAINED. MOUNT LIGHT SWITCH NEXT TO DOOR AT LEAST 40" FROM FLOOR.
- $\fbox{65}$ route conduits such that the stub-up area is directly under all destination devices in the power conversion hut
- 6 ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO. IN THE RIGHT—HAND COLUMN MAY BE CONTRACTOR DETERMINED, PROVIDED THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.
- (7) VENTILATION FOR THE ENCLOSURE SHALL BE PROVIDED BY WEATHERPROOF 120VAC EXHAUST FANS WITH A MINIMUM FLOW RATE OF 2500CFM EACH, CONTROLLED BY A SINGLE ADJUSTABLE THERMOSTAT, AND BY A 10" MOTORIZED INTAKE DAMPER. EXHAUST FAN AND INTAKE DAMPER SHALL BE PROVIDED WITH A 90' EXTERIOR HOOD WITH INSECT SCREENS TO PREVENT INTRUSIONS OF WIND DRIVEN RAIN/SNOW.
- (8) WHERE SINGLE CONDUCTOR CABLES COMPRISING EACH PHASE, NEUTRAL, OR GROUNDED CONDUCTOR OF AN AC CIRCUIT ARE CONNECTED IN PARALLEL AS PERMITTED IN NEC 310.10(H), THE CONDUCTORS SHALL BE INSTALLED IN GROUPS CONSISTING OF NOT MORE THAN ONE CONDUCTOR PER PHASE, NEUTRAL, OR GROUNDED CONDUCTOR IN WIREWAY OR CONDUIT. NEC 378.20
- (9) CONNECT SHARK 250 CURRENT TRANSFORMERS AND POTENTIAL TRANSFORMERS TO THE 800A OUTPUT BREAKER AT POWER DISTRIBUTION PANELBOARDS THROUGH A 1" CONDUIT.
- (10) MOUNT RECEPTACLES ON INSIDE WALLS OF PCH AT LEAST 18" FROM FLOOR. MOUNT ONE RECEPTACLE ON WEST SIDE OF DOOR (NORTH WALL), ONE RECEPTACLE NEXT TO THE COMMUNICATION PANEL (SOUTH WALL), AND ONE RECEPTACLE INSIDE NEMA 1 COMMUNICATIONS PANEL (LINE ITEM 2, REF. NO. 1).
- $\stackrel{\frown}{\mbox{(11)}}$ HEATING TO BE PROVIDED BY ELECTRIC BASEBOARD HEATERS WITH BUILT—IN THERMOSTATS. HEATERS TO TURN ON BELOW 10°F
- PROVIDE HEATING AND COOLING SUCH THAT THE TEMPERATURE INSIDE THE PCH DOES NOT EXCEED 95F, AND DOES NOT DROP BELOW 10'F. QUANTITIES AND DESCRIPTIONS OF LINE ITEMS 09, 11, AND 16 ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR IS ABLE TO CHOOSE NEW PRODUCTS AND PRODUCT QUANTITIES FOR THESE LINE ITEMS, PROVIDED THAT THE MINIMUM SPECIFICATIONS AS NOTED IN THE 'DESCRIPTION' COLUMN IS MAINTAINED.
- (13) HOME-RUN CABLES TO ENTER INTO PCH VIA CONDUIT SWEEP ANGLED DOWN. MIN CONDUIT RADIUS TO BE 8 X THE DIAMETER OF THE LARGEST CABLE. SUPPORT CABLES EVERY 12"AS MEASURED BY THE CABLES PATH FROM HANGER, TO CONDUIT WITH UV RESISTANT, OUTDOOR RATED CABLE TIES. ADD IN A 4FT SERVICE LOOP BEFORE ENTERING INTO THE CONDUIT. EXACT HEIGHT AND PLACEMENT OF CONDUIT TO BE DETERMINED BY CONTRACTOR ON—SITE.

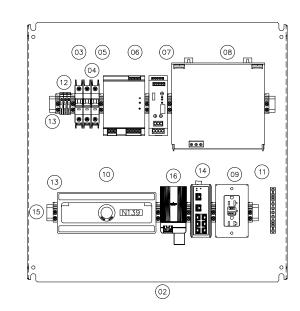
	1	FYRE-EL-2000/6	COMMUNICATIONS PANEL ELEVATION DRAWING	
:ms				
inc.				
2				055 000
М				REF DW
				DRAWING

TAN	NANA (CHIEF	S CON	FERENCE	3
FORT	YUK0	N RE	NEWABI	E ENER	CGY
	I	PCH I	AYOUT		

_	PCH LAYOUT				
-		fyre-el-	-250	0_5	.dwg
	REF DWG(S):				
	DRAWING NO.: FYRE-EL-2500	SHEET_	5	OF_	8









NOT FOR CONSTRUCTION

				1				
	BILL OF MATERIAL							
REF. NO.	UNIT	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.				
(01)	EA	1	24" X 24" X 10" NEMA 1 MILD STEEL WALL MOUNTED ENCLOSURE					
02	EA	1	INNER PANEL FOR 24X24X10 ENCLOSURE					
03	EA	1	25A, 600V UL489 1-POLE BREAKER					
04)	EA	1	20A, 600V UL489 1-POLE BREAKER					
05	EA	3	10A, 600V UL489 1-POLE BREAKER					
06	EA	1	PHOENIX CONTACT 120VAC/24VDC PS, 20 AMP	PHOENIX CONTACT/ 2866776				
07	EA	1	PHOENIX CONTACT 20 AMP UPS	PHOENIX CONTACT/ 2320238				
08	EA	1	PHOENIX CONTACT 12 Ah BATTERY	PHOENIX CONTACT/ 1274119				
09	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GCI					
10	EA	1	DATA MANAGER	SMA/EDMM-20				
11)	EA	1	UL 467 GROUND BAR, 6 POLE MINIMUM					
12	EA	3	6MM DINRAIL MOUNTED TERMINAL BLOCK					
13	EA	9	6MM DINRAIL MOUNTED TERMINAL BLOCK END STOP					
14)	EA	1	UNMANAGED ETHERNET SWITCH, 2 FIBER PORTS	MOXA/EDS-308-SS-SC-80				
15	EA	1	35MM DIN MOUNTING RAIL					
16	EA	1	150W PANEL HEATER W/BUILT IN REGULATION ON: 41°F - OFF: 59°	STEGO/06021.0-00				

ANY LINE ITEM ON THE BILL OF MATERIAL THAT DOES NOT HAVE A SPECIFIED MFGR./CATALOG NO.

IN THE RIGHT-HAND COLUMN CAN BE CONTRACTOR DETERMINED, PROVIDED THAT THE
CONTRACTOR DETERMINED PRODUCT MATCHES THE PRODUCT DESCRIPTION IN THE CENTER COLUMN,
AND THAT ALL CONDITIONS SPECIFIED IN THE GENERAL PROJECT NOTES ARE MET.



PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN
DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAW
5				
2				
				REF D
				KEF D
				DDAW

TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY COMMUNICATIONS PANEL

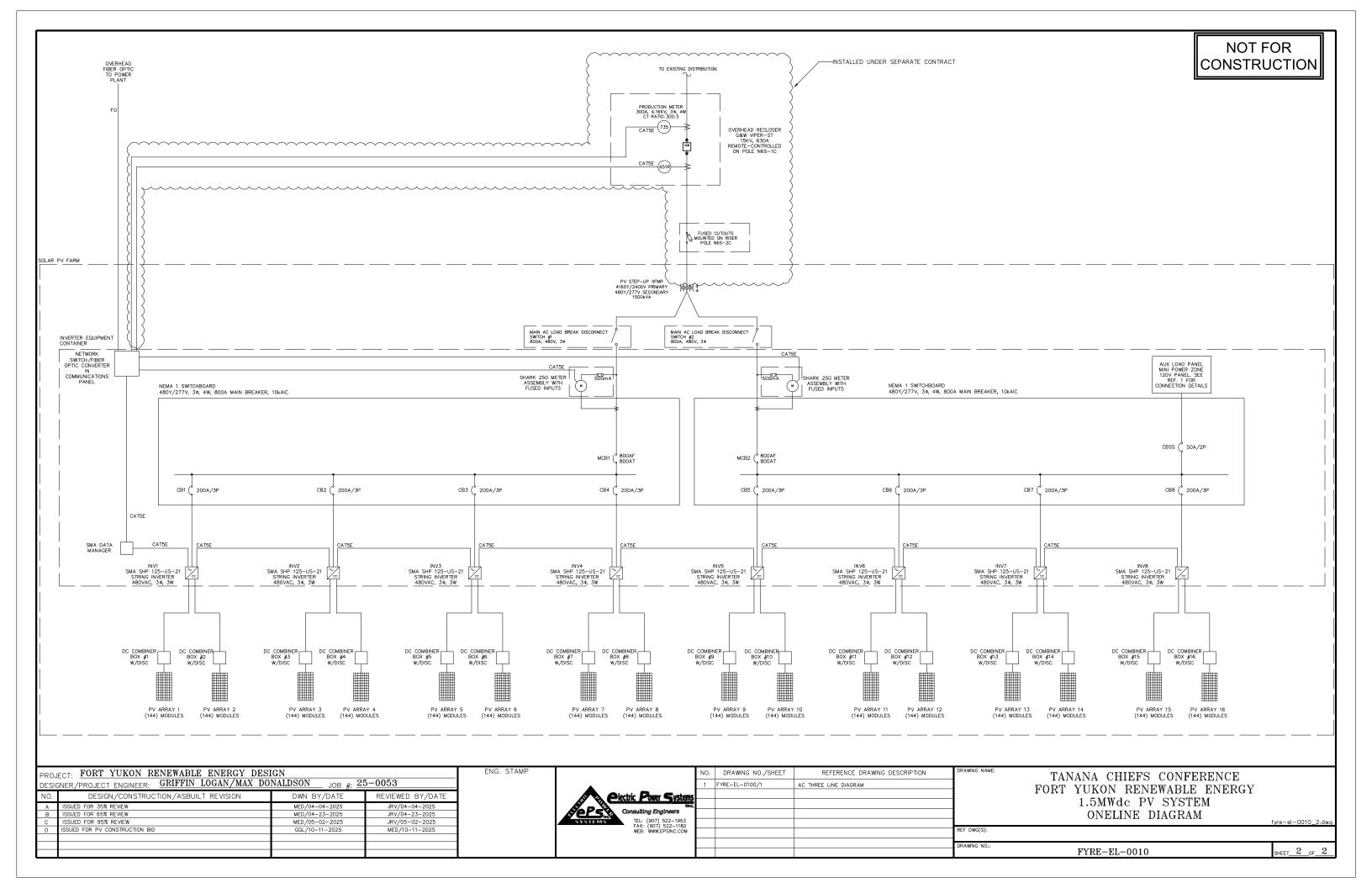
PANEL ELEVATION DRAWING

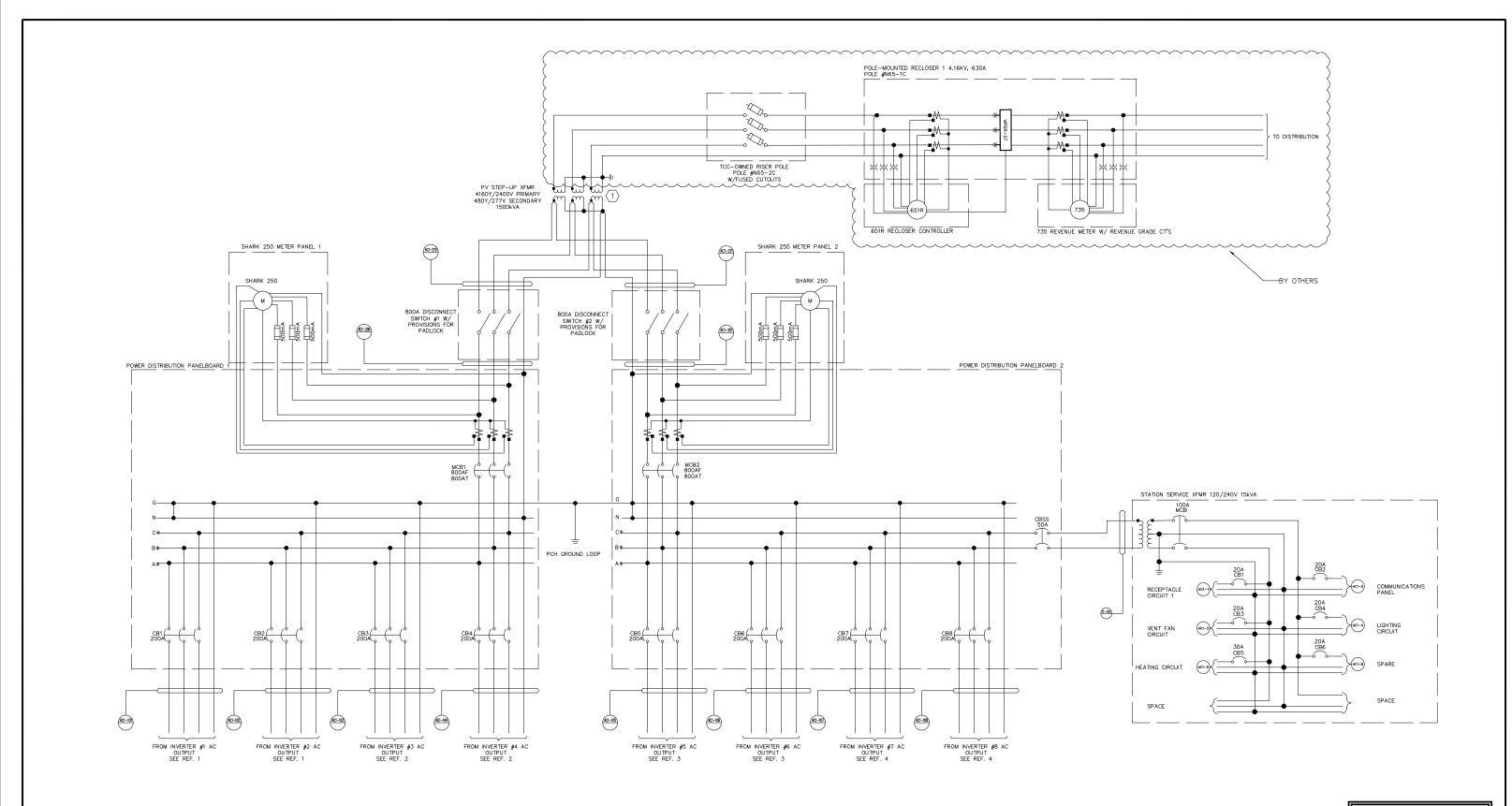
DWG(S):

FYRE-EL-2500

SHEET 6 OF 8

fyre-el-2500_6.dwd



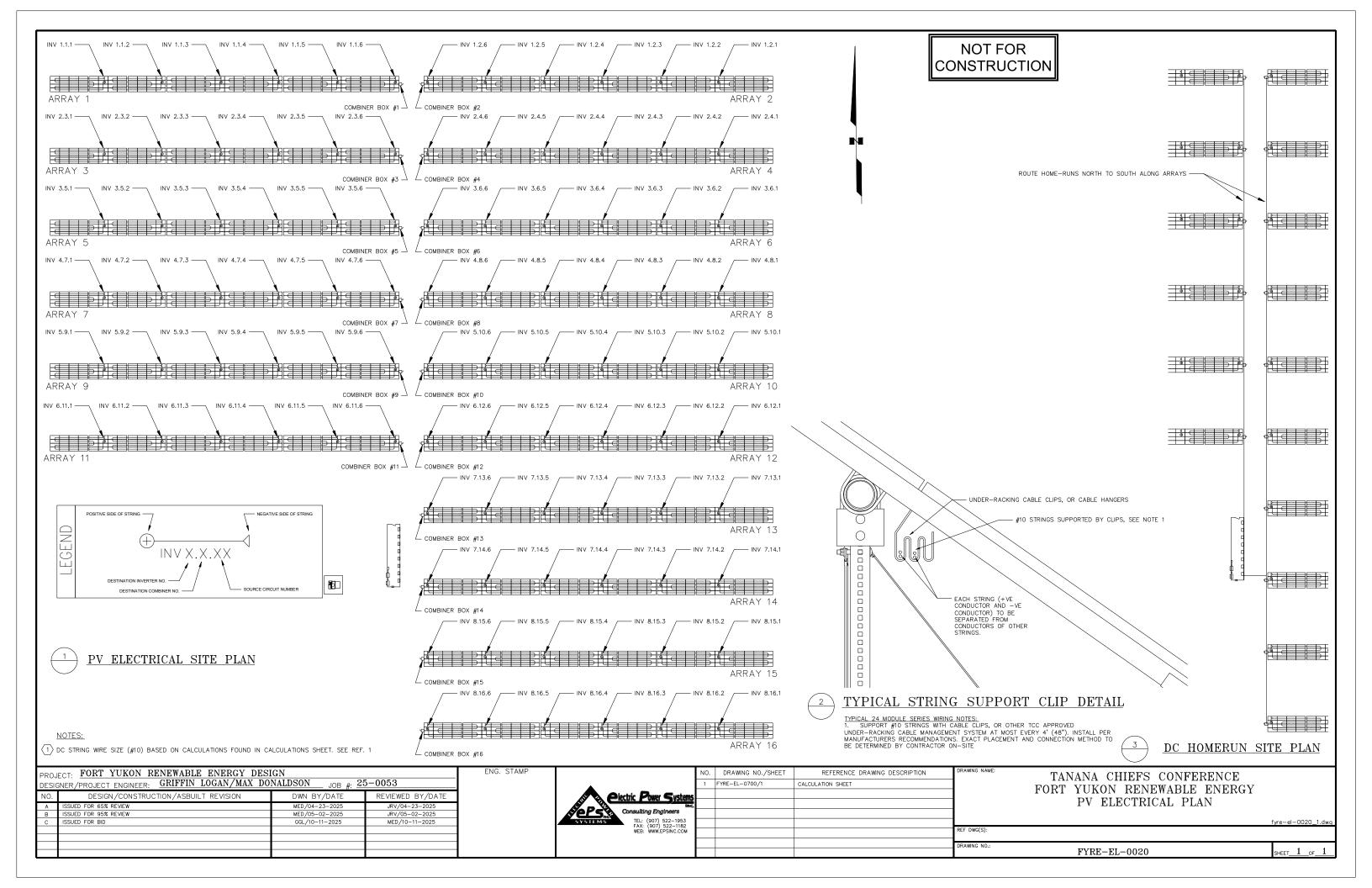


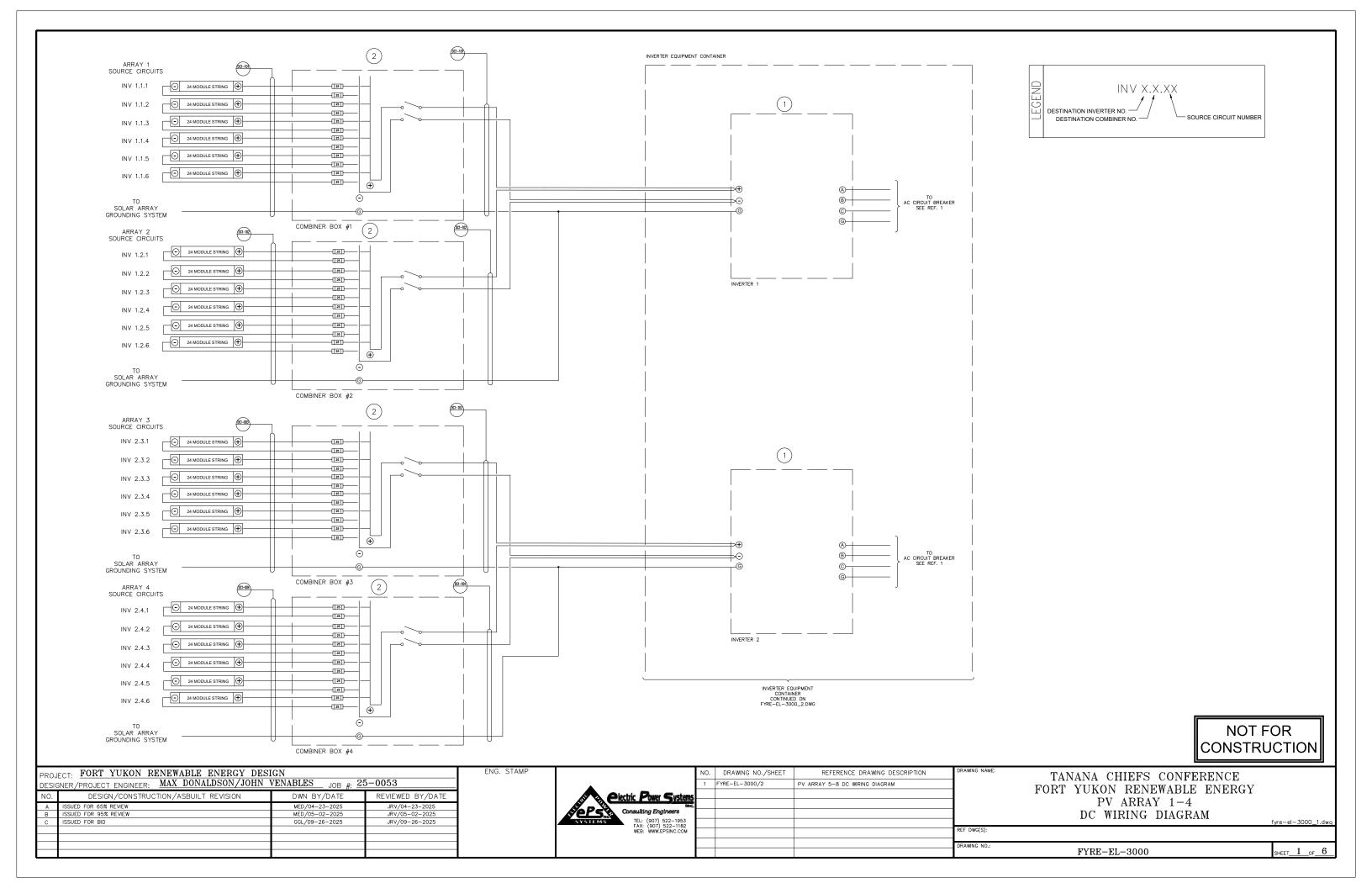
NOTES:

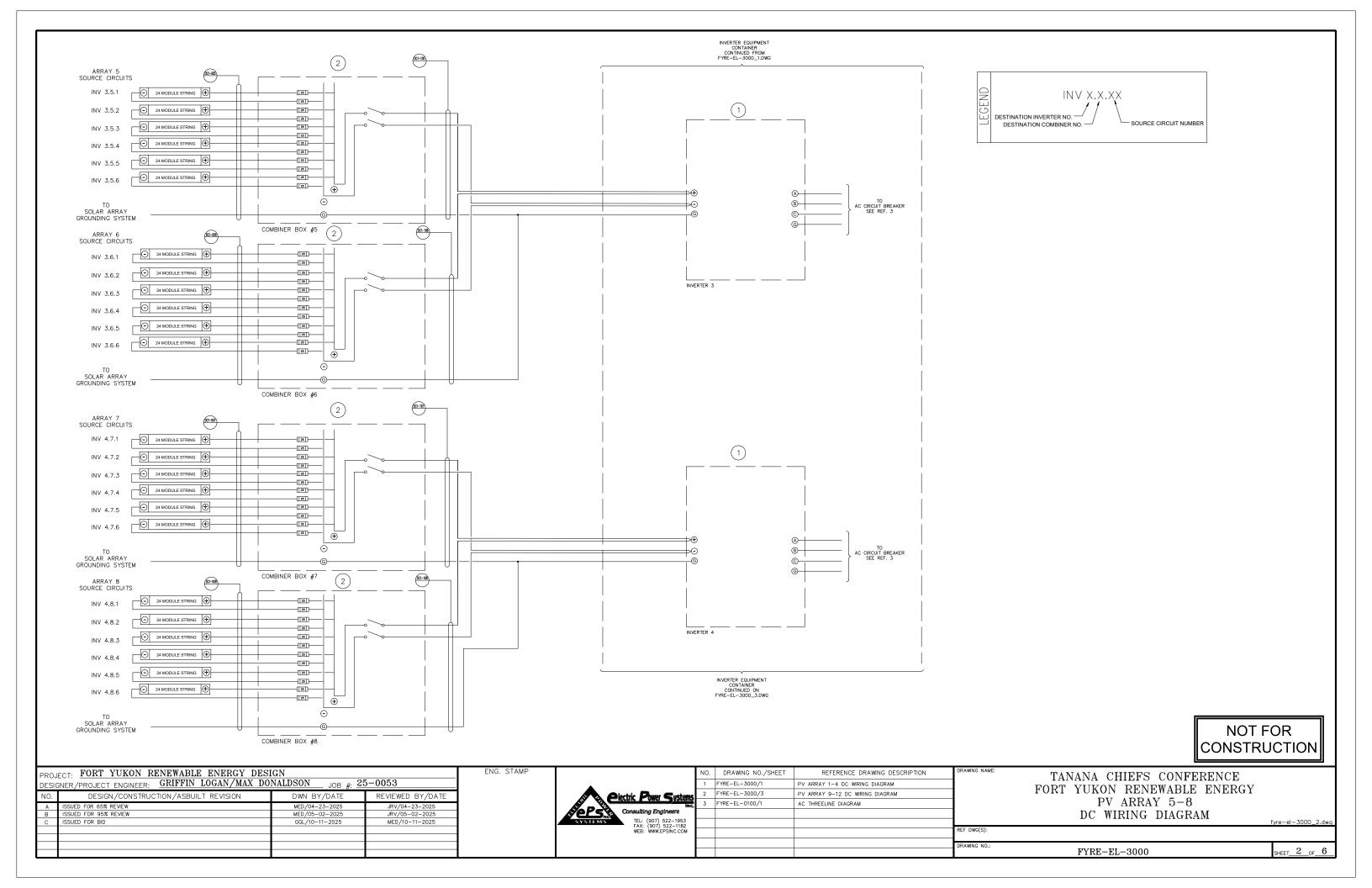
LIFT XO BUSHING BOND JUMPER AND ISOLATE ALL XO CONNECTIONS FROM ANY GROUNDING AT THE UTILITY SERVICE POLE. GROUND SECONDARY OF TRANSFORMER AT PCH GROUND LOOP

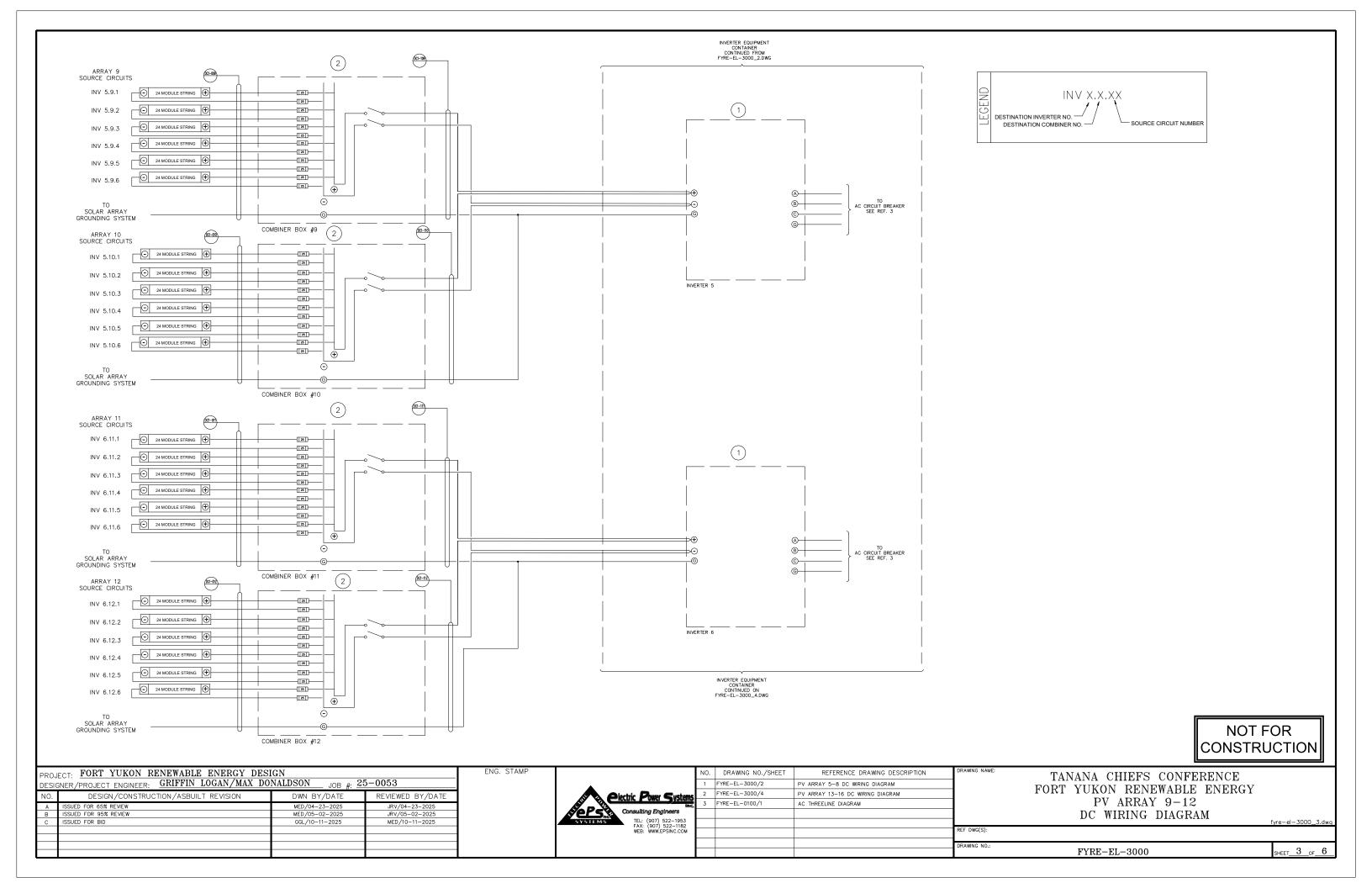
NOT FOR CONSTRUCTION

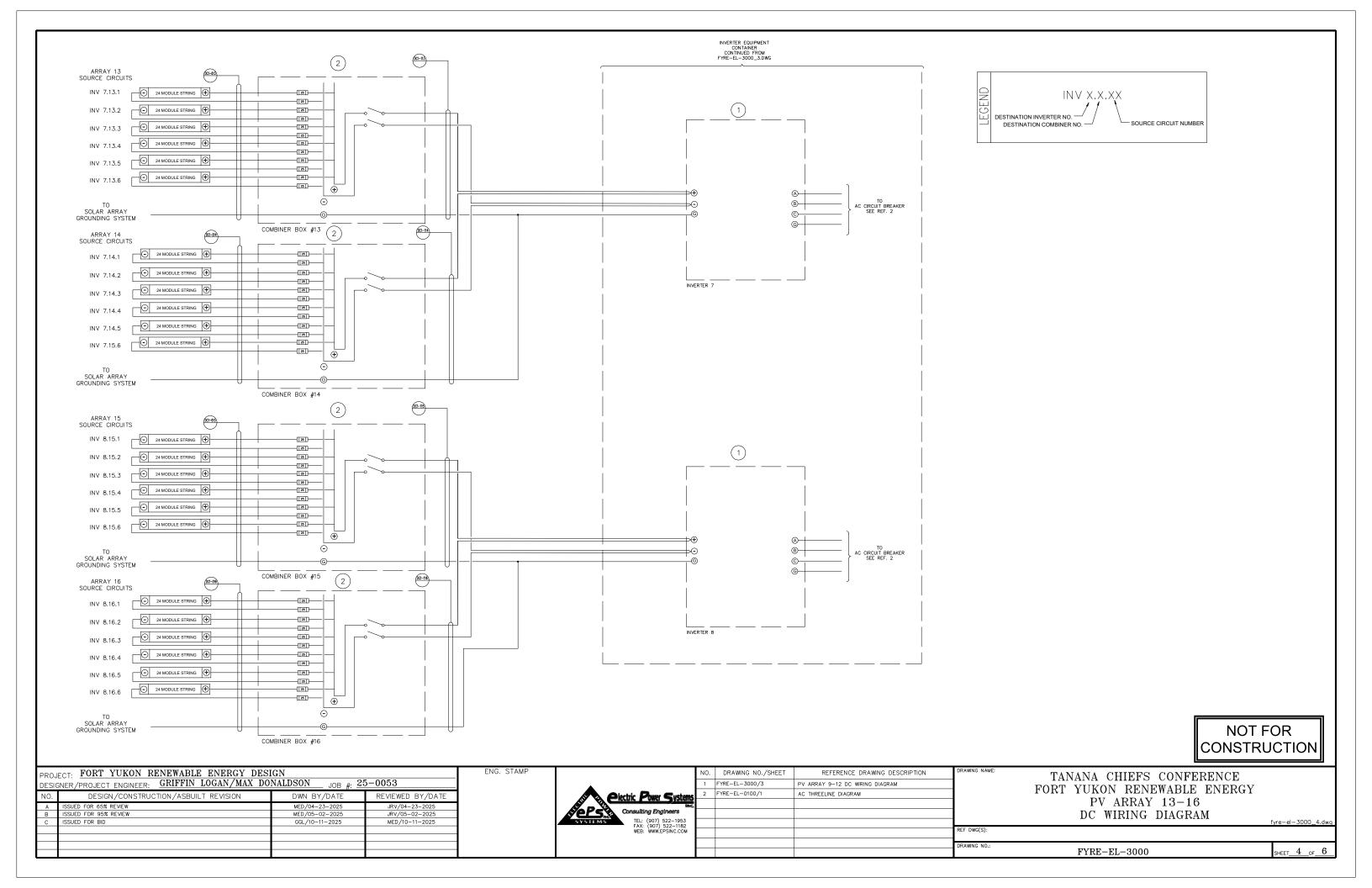
	JECT: FORT YUKON RENEWABLE ENERGY DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	IGN NALDSON JOB #: 2	5-0053	ENG. STAMP			NO.	DRAWING NO./SHEET FYRE-EL-3000/1	REFERENCE DRAWING DESCRIPTION PV ARRAY 1-2 WIRING DIAGRAM	DRAWING NAME:	TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems	2	FYRE-EL-3000/1	PV ARRAY 3-4 WIRING DIAGRAM	4			
А	ISSUED FOR 65% REVIEW	MED/04-23-2025	JRV/04-23-2025		A	3	FYRE-EL-3000/1	PV ARRAY 5-6 WIRING DIAGRAM		AC THREELINE		
В	ISSUED FOR 65% REVIEW	MED/05-02-2025	JRV/05-02-2025		Consulting Engineers	4	FYRE-EL-3000/1	PV ARRAY 7-8 WIRING DIAGRAM				
С	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		TEL: (907) 522–1953 FAX: (907) 522–1182						fyre-el-0100_1.dwg	
					WEB: WWW.EPSINC.COM				REF DWG(S):			
									DRAWING NO.:		1	
									BRANING NO.:	FYRE-EL-0100	SHEET 1 OF 1	











		EQUIPMENT SCHEDULE
TAG	QUANTITY	DESCRIPTION
1	8	PV INVERTER; SMA SUNNY HIGHPOWER PEAK3 125-US
2	16	12 INPUT DC COMBINER; TERRASMART FSFT275-12-25-N4-CD OR EQUIVALENT

	CABLE SCHEDULE						
TAG	FUNCTION	DESCRIPTION	RACEWAY				
DC1-001	ROW 1 STRING TO DS1	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-002	ROW 2 STRING TO DS1	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-003	ROW 3 STRING TO DS2	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-004	ROW 4 STRING TO DS2	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-005	ROW 5 STRING TO DS3	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-006	ROW 6 STRING TO DS3	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-007	ROW 7 STRING TO DS4	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-008	ROW 8 STRING TO DS4	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-009	ROW 9 STRING TO DS5	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-010	ROW 10 STRING TO DS5	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-011	ROW 11 STRING TO DS6	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-012	ROW 12 STRING TO DS6	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-013	ROW 13 STRING TO DS7	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-014	ROW 14 STRING TO DS7	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-015	ROW 15 STRING TO DS8	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				
DC1-016	ROW 16 STRING TO DS8	(12) #10 CU UL4703 2kV PV WIRE, (1) #10 CU EGC	FREE AIR				

	CABLE SCHEDULE						
TAG	FUNCTION	DESCRIPTION	RACEWAY				
DC1-101	DS1 TO INV1	(2) 1/0 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-102	DS2 TO INV1	(2) 1/0 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-103	DS3 TO INV2	(2) 1/0 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-104	DS4 TO INV2	(2) 1/0 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-105	DS5 TO INV3	(2) 1/0 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-106	DS6 TO INV3	(2) 1/0 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-107	DS7 TO INV4	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-108	DS8 TO INV4	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-109	DS9 TO INV5	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-110	DS10 TO INV5	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-111	DS11 TO INV6	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-112	DS12 TO INV6	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-113	DS13 TO INV7	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-114	DS14 TO INV7	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-115	DS15 TO INV8	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				
DC1-116	DS16 TO INV8	(2) #2 AL 2kV PV WIRE, (1) #8 CU EGC	FREE AIR				

	CABLE SCHEDULE							
TAG	FUNCTION	DESCRIPTION	RACEWAY					
AC1-101	INV1 TO CB1	(3) 2/0 CU XHHW, #6 CU EGC	C-0111					
AC1-102	INV2 TO CB2	(3) 2/0 CU XHHW, #6 CU EGC	C-0112					
AC1-103	INV3 TO CB3	(3) 2/0 CU XHHW, #6 CU EGC	C-0113					
AC1-104	INV4 TO CB4	(3) 2/0 CU XHHW, #6 CU EGC	C-0114					
AC1-105	INV5 TO CB5	(3) 2/0 CU XHHW, #6 CU EGC	C-0115					
AC1-106	INV6 TO CB6	(3) 2/0 CU XHHW, #6 CU EGC	C-0116					
AC1-107	INV7 TO CB7	(3) 2/0 CU XHHW, #6 CU EGC	C-0117					
AC1-108	INV8 TO CB8	(3) 2/0 CU XHHW, #6 CU EGC	C-0118					
AC1-200	MCB1 TO DS1	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0200					
AC1-201	MCB2 TO DS2	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0201					
AC1-201	DS1 TO XFMR1	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0210					
AC1-211	DS2 TO XFMR1	3/PHASE 4/0 CU XHHW, (1) 3/0 CU XHHW NEUTRAL, (1) 3/0 CU EGC	C-0211					
COM-500	COMM. PANEL TO POLE	MULTI-MODE FIBER OPTIC PATCH CABLE	C-0500					
AC1-SS	STATION SERVICE	(2) #8 CU XHHW	1/2" EMT					
AC1-1	RECEPTACLE CIRCUIT	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT					
AC1-2	COMMUNICATIONS PANEL	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT					
AC1-3	VENT FAN CIRCUIT	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT					
AC1-4	LIGHTING CIRCUIT	#12 CU XHHW, #12 CU XHHW NEUTRAL, #12 CU EGC	1/2" EMT					
AC1-5	UNIT HEATER CIRCUIT	#10 CU XHHW, #10 CU XHHW NEUTRAL, #10 CU EGC	1/2" EMT					

1 LOW VOLTAGE AC CABLE SIZING BASED ON CU XHHW WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C

DC CABLE SIZING FOR STRINGS BASED ON CU UL4703 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 90°C AND A VOLTAGE DROP OF LESS THAN 2%

OD CABLE SIZING FOR HOME-RUNS BASED ON AL 2KV PV WIRE AMPACITY WITH A TEMPERATURE RATING OF 75°C IN FREE AIR (TABLE 310.15(B)(17)) AND A VOLTAGE DROP OF LESS THAN 2% USE OF CABLE LARGER THAN SPECIFIED IN THE CABLE SCHEDULE IS ALLOWED, PROVIDED THAT THE CONDUCTOR DESCRIPTION IS MAINTAINED.

4 SEE REF. 1 FOR CONDUIT SCHEDULE

NOT FOR

PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN
DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON
JOB #: 25-0053 ISSUED FOR 65% REVIEW ISSUED FOR 95% REVIEW MED/04-23-2025 MED/05-02-2025 JRV/04-23-2025 JRV/05-02-2025 ISSUED FOR BID GGL/10-11-2025 MED/10-11-2025

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWIN
	1	FYRE-EL-3000/6	PV ARRAY CONDUIT SCHEDULE	
MS				
BC.				
				REF DW

 $\langle 1 \rangle \langle 4 \rangle$

TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY PV ARRAY EQUIPMENT/CABLE SCHEDULE

fyre-el-3000_5.dwd

CONSTRUCTION

SHEET 5 OF 6

FYRE-EL-3000

	CONDUIT SCHEDULE							
	TAG	FUNCTION	CONDUIT TYPE	TRADE SIZE				
	C-0111	INV1 TO CB1	ЕМТ	1.5"				
	C-0112	INV2 TO CB2	ЕМТ	1.5"				
	C-0113	INV3 TO CB3	ЕМТ	1.5"				
	C-0114	INV4 TO CB4	ЕМТ	1.5"				
	C-0115	INV5 TO CB5	EMT	1.5"				
	C-0116	INV6 TO CB6	ЕМТ	1.5"				
	C-0117	INV7 TO CB7	ЕМТ	1.5"				
	C-0118	INV8 TO CB8	EMT	1.5"				
	C-0200	MCB1 TO DS1	PVC	3 X 2.5"				
	C-0201	MCB2 TO DS2	PVC	3 X 2.5"				
	C-0210	DS1 TO XFMR1	PVC	3 X 2.5"				
	C-0211	DS2 TO XFMR1	PVC	3 X 2.5"				
	C-0300	XFMR1 TO POLE	PVC	3"				
	C-0500	NEMA4 PANEL TO POLE	PVC	1"				
1	C-0501	SPARE	PVC	1"				

1) TRADE SIZE OF CONDUITS SHOWN IN CONDUIT SCHEDULE ARE MINIMUM SIZES BASED ON NEC CONDUIT FILL % (CHAPTER 9 TABLE 1). USE OF CONDUIT THAT IS LARGER IN TRADE SIZE THAN SPECIFIED IN CONDUIT SCHEDULE IS PERMITTED.

NOT FOR CONSTRUCTION

PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053								
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE					
A B	ISSUED FOR 95% REVIEW ISSUED FOR BID	MED/05-02-2025 GGL/10-11-2025	JRV/05-02-2025 MED/10-11-2025					

Clectric Power Systems
Consulting Engineers
TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:
ems				
inc.				
3				
2)M				REF DWG(S):
				DRAWING NO.:

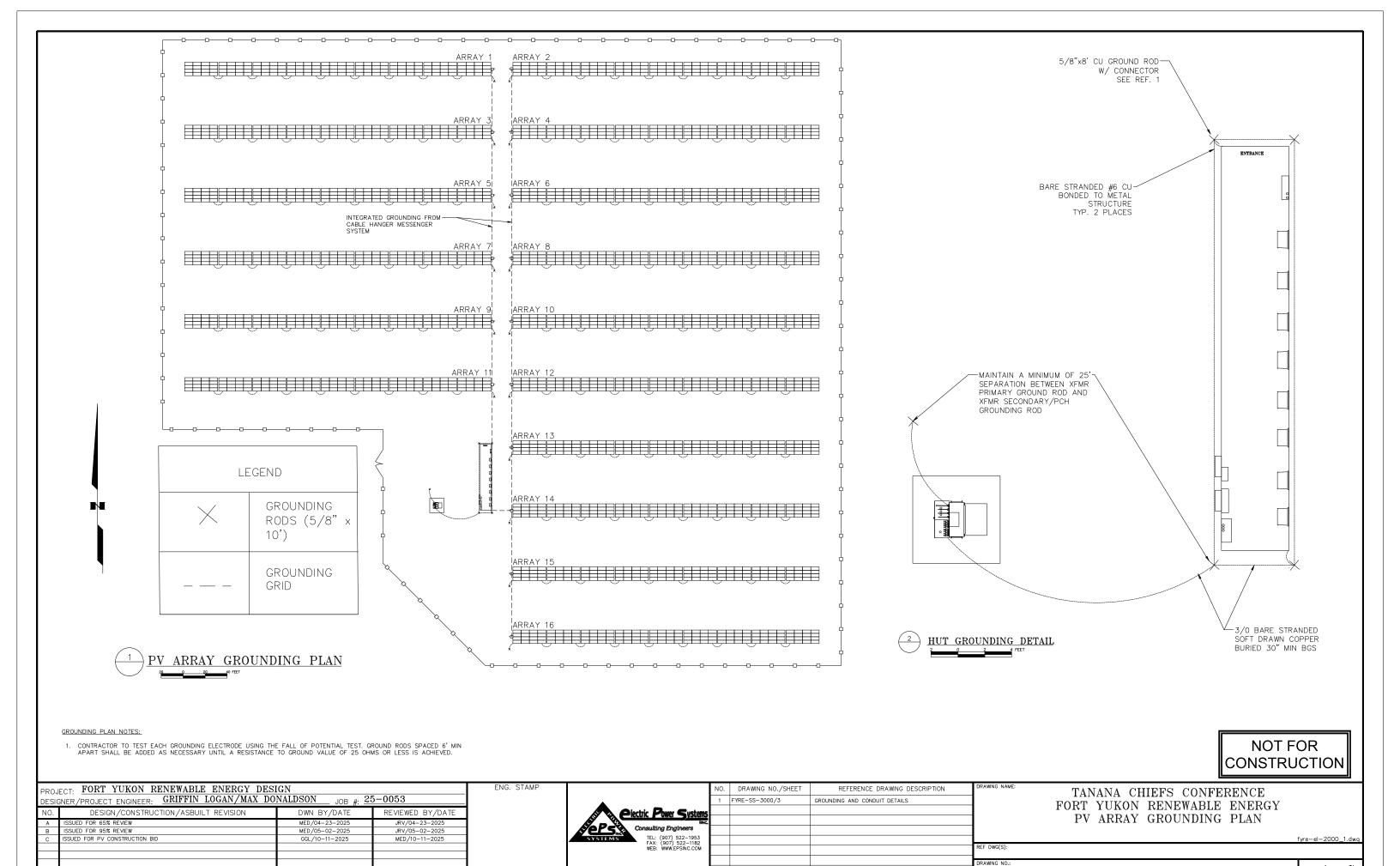
TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY PV ARRAY CONDUIT SCHEDULE

F DWG(S):

FYRE-EL-3000

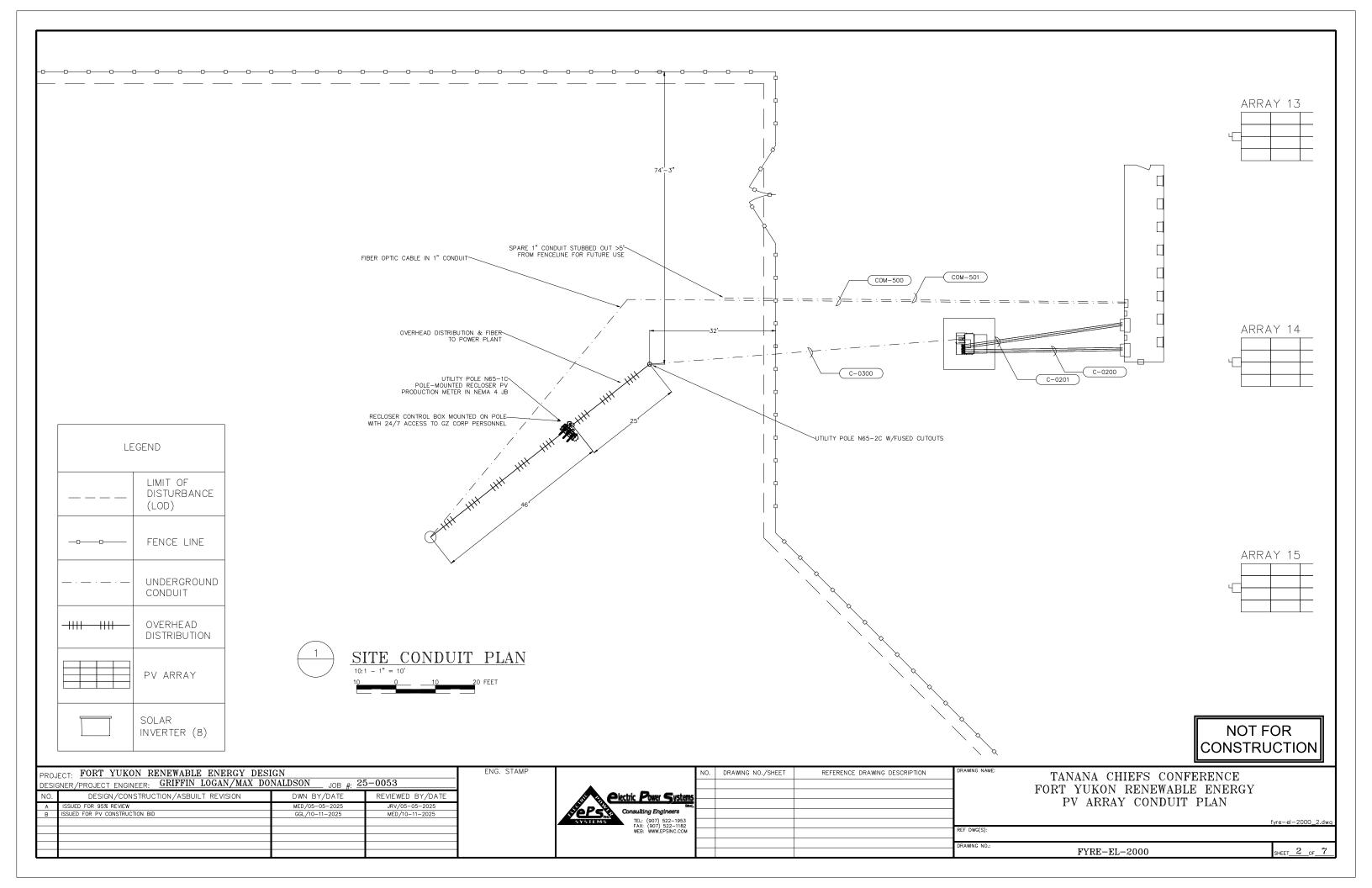
fyre-el-3000_6.dwg

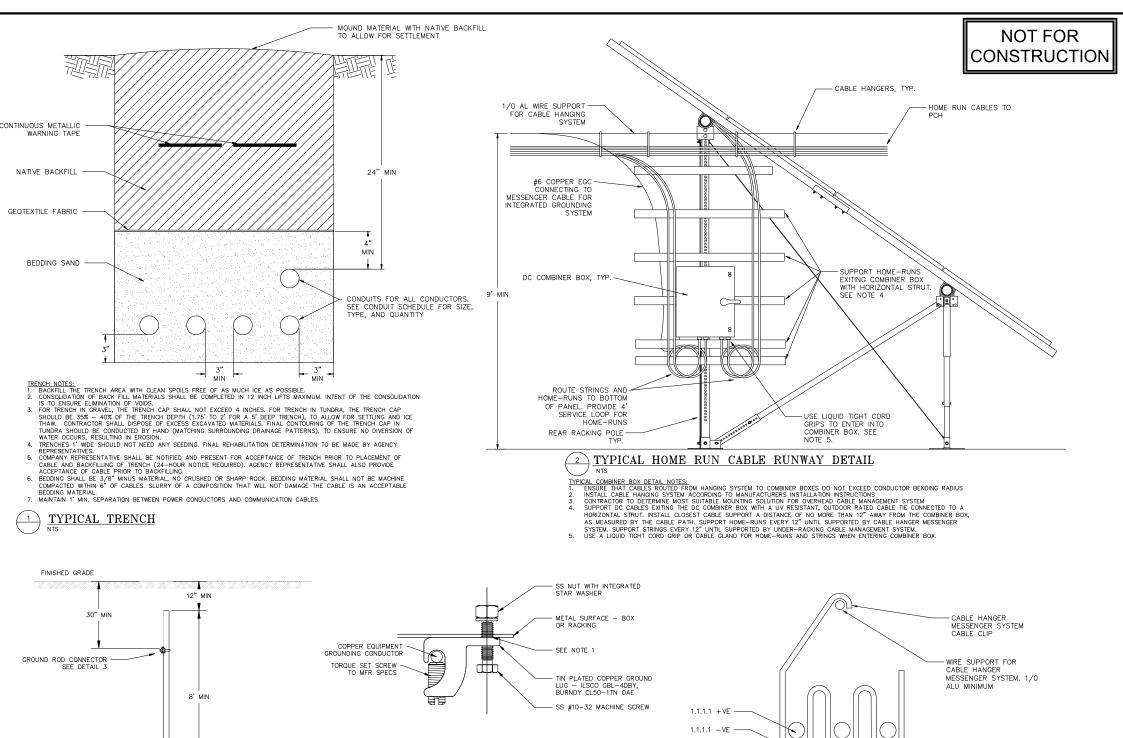
SHEET 6 OF 6



FYRE-EL-2000

SHEET 1 OF 7

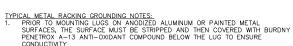






TYPICAL GROUND ROD. NOTES:
1. CONTRACTOR TO PERFORM SOIL RESISTIVITY TESTING TO DETERMINE AMOUNT OF GROUND RODS NEEDED TO KEEP RESISTANCE BELOW 5

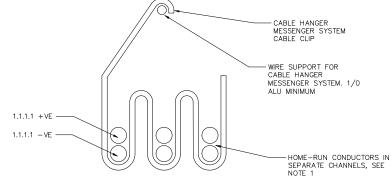
(5) TYPICAL GROUND ROD



ENG. STAM

CONDUCTIVITY
ON ANODIZED AL SURFACES, THE ANODIZATION SHALL BE GROUND OFF.
ON PAINTED SURFACES, THE PAINT LAYER SHALL BE GROUND
OR SCRATCHED OFF.

(6) TYPICAL METAL RACKING BONDING



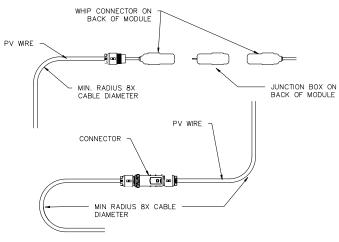
7 TYPICAL HOME-RUN CABLE HANGER DETAIL

TYPICAL HOME—RUN CABLE HANGER DETAIL NOTES:

1. HOWE—RUN CONDUCTORS OF DIFFERENT CIRCUITS TO BE ROUTED IN SEPARATE CHANNELS IN CABLE HANGER MESSENGER SYSTEM. THE +VE AND - VE CONDUCTORS OF A SINGLE HOME—RUN CIRCUIT MAY BE ROUTED IN THE SAME CHANNEL.

2. INSTALL CABLE HANGERS IN REGULAR INTERVALS AS DIRECTED BY MANUFACTURERS INSTALLATION INSTRUCTIONS, OR, A DISTANCE OF NO MORE THAN 5' APART FROM EACH OTHER.

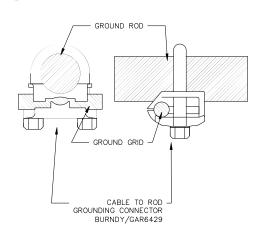
3. IF HOME—RUNS AND STRINGS ARE ROUTED IN THE SAME CABLE HANGER MESSENGER SYSTEM, SEPARATE HOME—RUNS AND STRINGS IN SEPARATE CHANNELS.



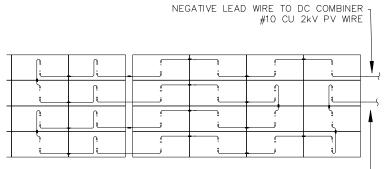
- PV WRE BENDING REQUIREMENTS NOTES:

 1. OBSERVE MIN. BENDING RADIUS REQUIREMENTS WHEN BUILDING AND SECURING SOURCE CIRCUIT CONDUCTORS TO MODULES AND
- 2. SEE MODULE SPEC SHEET OR CABLE SPECS FOR CABLE DIAMETER.





GROUND ROD CONNECTION



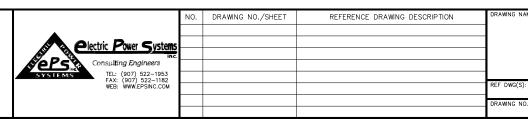
POSITIVE LEAD WIRE TO DC COMBINER -#10 CU 2kV PV WIRE

TYPICAL 24 MODULE SERIES WIRING NOTES:

1. WIRING FOR ILLUSTRATIVE PURPOSES ONLY. FINAL MODULE WIRING TO BE DETERMINED IN FIELD

(8) TYPICAL 24 MODULE SERIES WIRING

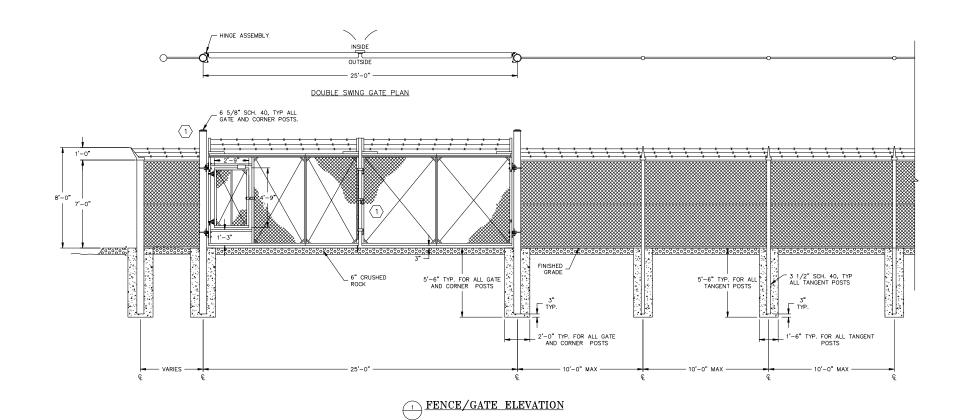
PROJECT: FT YUKON RENEWABLE ENERGY DESIGN ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053 ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025

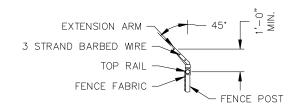


TANANA CHIEFS CONFERENCE FT YUKON RENEWABLE ENERGY GROUNDING AND CONDUIT DETAILS

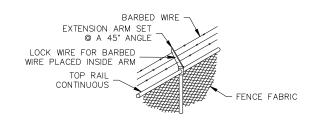
fvre-el-2000 3 de

SHEET 3 OF 7 FYRE-EL-2000



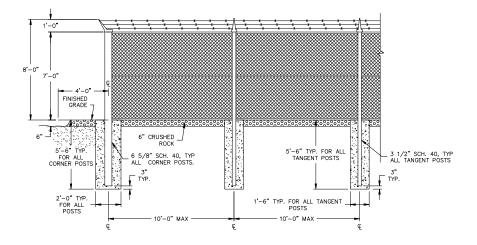


3 "V" TYPE EXTENSION ARM



POST EXTENSION WITH BARBED WIRE

N.T.S.



2 CORNER/TERMINAL FENCE POST ELEVATION

NOTES:

 $\overbrace{\mbox{\ \ 1)}}$ provide dual custody padlock on entry gate to allow both avec, and local utility to enter independently

NOT FOR CONSTRUCTION

	PROJECT: FORT YUKON RENEWABLE ENERGY DES DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	SIGN DNALDSON JOB #: 2	25-0053	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY	
	NO. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems				FENCE DETAILS	
	A ISSUED FOR 95% REVIEW	MED/04-29-2025	JRV/04-29-2025		inc			4	FENCE DETAILS	
	B ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers					
					SYSTEMS TEL: (907) 522-1953					fyre-ss-2000_4.dwg
					FAX: (907) 522-1182 WEB: WWW.EPSINC.COM			REF DWG(S):		
								DRAWING NO.:	EVDE CC 9000	1 7
l		I	1						FYRE-SS-2000	SHEET 4 OF /

MANUAL DISCONNECT FOR PARALLEL **GENERATION**

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECTS. LABEL TO BE ENGRAVED PLASTIC

NOTICE

PHOTOVOLTAIC SYSTEM GENERATION METER

LABEL TO BE LOCATED ON THE PV SYSTEM GENERATION METER. (1) TOTAL

NEC 2023 690.13(B), 690.54

NOTICE

PHOTOVOLTAIC SYSTEM AC DISCONNECT AND POWER SOURCE RATED OUTPUT CURRENT: 604A NOMINAL OPERATING VOLTAGE: 480VAC

LABEL TO BE LOCATED ON THE PV SYSTEM AC DISCONNECTS (2) TOTAL

NEC 2023 705.12(B)(3)(3)

THIS EQUIPMENT FED BY MULTIPLE SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

PERMANENT WARNING LABEL SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT WHERE THE PV SYSTEM INTERCONNECTS. (2) TOTAL

NEC 2023 690.7(D)

MAXIMUM DC VOLTAGE OF PV SYSTEM

MAXIMUM VOLTAGE: 1065VDC

LABEL TO BE LOCATED ON COVER OF DC DISCONNECTING MEANS. (16) TOTAL

NEC 2023 690.31(D)(2)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL SHALL BE LOCATED ON ALL EXPOSED RACEWAYS, CABLE TRAYS, OTHER WIRING METHODS, COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES AND ON CONDUIT BODIES IN WHICH ANY OF THE AVAILABLE CONDUIT OPENINGS ARE UNUSED. LABEL SHALL BE REFLECTIVE, AND ALL LETTERS CAPITALIZED AND SHALL BE MINIMUM HEIGHT OF 3/8" IN WHITE ON A RED BACKGROUND. SPACING BETWEEN LABELS OR MARKINGS, OR BETWEEN A LABEL AND MARKING, SHALL NOT BE MORE

> **NOT FOR** CONSTRUCTION

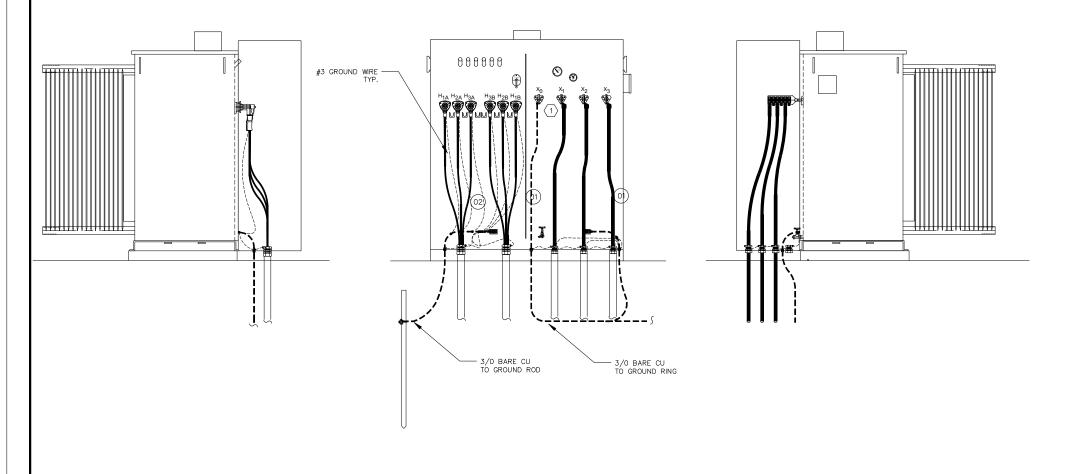
PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: <u>25-</u>0053 ISSUED FOR PV CONSTRUCTION BI

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWIN
				1
MS				
AC.				4
				4
				REF DW
				_

TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY EQUIPMENT SAFETY LABEL SCHEDULE

FYRE-SS-2000

SHEET 5 OF 7



		BILL OF MATERIA	L
REF. NO.	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.
01)	-	CABLE LUG, NEMA 2-HOLE, 4/O AWG CU	BURNDY/YA282N
(02)	-	CONNECTOR, COMPRESSION, 4/0 CU TO #6-#2 CU	BURNDY/YGHC29C26
(03)			
(04)			
05)			
06)			
07			
08			
09			
10			
(11)			
(12)			
(13)			
(14)			
(15)			
16)			
17)			
18			
(19)			
20			
21)			
22)			
(23)			
24)			
25)			
26)			
27)			
28)			
29			
(30)			

NOTES:

 $\stackrel{\textstyle \frown}{}$ Lift xo bushing bond jumper and isolate all xo connections from any grounding at the utility service pole.

NOT FOR CONSTRUCTION

PI Di	OJECT: FORT YUKON RENEWABLE ENERGY DES SIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX D	SIGN ONALDSON JOB #: 2	25-0053	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY	
N	D. DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		Plectric Power Systems				TRANSFORMER DETAILS	
-	ISSUED FOR PV CONSTRUCTION BID	GGL/10-11-2025	MED/10-11-2025		Consulting Engineers TEL: (907) 522–1953				TWATES STREET	
					TEL: (907) 522-1953 FAX: (907) 522-1182 WEB: WWW.EPSINC.COM					fyre-ss-2000_6.dwg
					WEB: WWW.EPSINC.COM			REF DWG(S):		
								DRAWING NO.:	FYRE-SS-2000	6 7
L									FIRE-55-2000	SHEET O OF 1

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	INVERTER 1		2 x 4	3/8
N101	1	INVERTER 2		2 x 4	3/8
N102	1	INVERTER 3		2 x 4	3/8
N103	1	INVERTER 4		2 x 4	3/8
N104	1	INVERTER 5		2 x 4	3/8
N105	1	INVERTER 6		2 × 4	3/8
N106	1	INVERTER 7		2 × 4	3/8
N107	1	INVERTER 8		2 × 4	3/8
N108	1	DC COMBINER	BOX 1	2 × 4	3/8
N109	1	DC COMBINER	BOX 2	2 x 4	3/8
N110	1	DC COMBINER	BOX 3	2 × 4	3/8
N111	1	DC COMBINER	BOX 4	2 x 4	3/8
N112	1	DC COMBINER	BOX 5	2 × 4	3/8
N113	1	DC COMBINER	BOX 6	2 x 4	3/8
N114	1	DC COMBINER	BOX 7	2 × 4	3/8
N115	1	DC COMBINER	BOX 8	2 × 4	3/8
N116	1	DC COMBINER	BOX 9	2 x 4	3/8
N117	1	DC COMBINER	BOX 10	2 × 4	3/8
N118	1	DC COMBINER	BOX 11	2 x 4	3/8
N119	1	DC COMBINER	B0X 12	2 × 4	3/8
N120	1	DC COMBINER	B0X 13	2 x 4	3/8
N121	1	DC COMBINER	BOX 14	2 × 4	3/8
N122	1	DC COMBINER	B0X 15	2 × 4	3/8
N123	1	DC COMBINER	BOX 16	2 × 4	3/8

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N124	1	COMMUNICATIONS	PANEL	2 x 4	3/8
N125	1	POWER DISTRIBUTION	PANELBOARD 1	2 x 4	3/8
N126	1	POWER DISTRIBUTION	PANELBOARD 2	2 x 4	3/8
N127	1	CB 1		1 x 3	1/8
N128	1	CB 2		1 x 3	1/8
N129	1	CB 3		1 x 3	1/8
N130	1	CB 4		1 x 3	1/8
N131	1	CB 5		1 x 3	1/8
N132	1	CB 6		1 x 3	1/8
N133	1	CB 7		1 x 3	1/8
N134	1	CB 8		1 x 3	1/8
N135	1	CB SS		1 x 3	1/8
N136	1	MCB1		2 x 4	3/8
N137	1	MCB2		2 x 4	3/8
N138	1	120V STATION SERVICE PANEL		2 x 4	3/8
N139	1	DATA MANAGER		2 x 4	3/8
N140	1	METER PANEL 1		2 x 4	3/8
N141	1	METER PANEL 2		2 x 4	3/8
N142	1	MAIN AC	PANEL 1	2 x 4	3/8
N143	1	MAIN AC	PANEL 2	2 x 4	3/8
			I	1	

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WTH WHITE TEXT.
- 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- ALL TEXT SHALL BE UPPER CASE.

 ALL DIMENSIONS SHOWN IN INCHES.

NOT FOR CONSTRUCTION

F	ROJECT: FORT YUKON RENEWABLE ENERGY DES ESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DO	IGN NALDSON JOB #: 2	5-0053	ENG. STAMP		NO. DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING NAME:	TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY	
ľ	IO. DESIGN/CONSTRUCTION/ASBUILT REVISION A ISSUED FOR PV CONSTRUCTION BID	DWN BY/DATE GGL/10-11-2025	REVIEWED BY/DATE MED/10-11-2025		Consulting Engineers			_	EQUIPMENT NAMEPLATE SCHEDULE	
E					TEL: (907) 522–1953 FAX: (907) 522–1182 WEB: WWW.EPSINC.COM			REF DWG(S):		fyre-ss-2000_7.dwg
E								DRAWING NO.:	FYRE-SS-2000	SHEET 7 OF 7

Destination Destination Destination Destination Section Processing Processin		Circuit Info	ormation						EL	ECTRICAL CAI	LCULATIONS									RESULT	rs			
See	Destination	Destination	Source		Open Circuit	Maximum Power	Short		Irradiance	Mininum	Selected	Minimum Wire	Selected String	Maximum Wire	Voltage	Voltage	Circuit	Information FROM			Minimum Wire	Selected Wire Size	Voltage	Voltage
1	Inverter No.		Circuit	Modules (#)	Voltage (VOC)	Voltage	Current				Fuse Size (A)	Ampacity (A)	PV Wire, 90°C, <2%	Distance	Drop (V)	Drop (%)	Circuit	TO	Distance (ft)	Current (A)	From Selected	75°C, <2% Voltage	Drop (%)	Drop (\
1	1	1	1	24	1467			17.49	21.86	21.86	25	25			13.54	1.27	DS1	INVI	380	131.16			1.88	20.04
No. Color	1	1	2								25			195		1.03								21.62
	-																							16.87
1	_																							17.66
1																								14.76
1																								17.15
1	1		2																					18.41
1	1	2	3	24	1467	1064.9	13.99	17.49	21.86	21.86	25		10		8.46			INV5	150	131.16	132			12.55
1					-																			13.8
The color The	· ·																							7.53
2	$\overline{}$																							9.20
1	-		_																					7.53
1																								12.55
1	2	3	4	24	1467	1064.9	13.99	17.49	21.86	21.86			10	100	5.64	0.53	DS16	INV8	205	131.16		#2	1.61	17.15
1	$\overline{}$																							
1																								_
1	$\overline{}$																							+-
The content of the	$\overline{}$																							+
1	2	4	4				13.99		21.86		25		10											
1			_																					\perp
3	-																							+-
1	$\overline{}$																							_
3 5 74																		V MODULE CHARACTE	RISTICS					
1	$\overline{}$				-																			
1			_																					_
1																								+-
3	$\overline{}$		_															rmax Loet. (%/°C)	-0.3					+-
3																		SITE CHARACTERIST	TICS					†
1	3	6	4	24	1467	1064.9	13.99	17.49	21.86	21.86	25	25	10	100	5.64	0.53		T_Amb Min (°C)	-40					
4 7 7 1 5 2 197 944 320 197 944 320 197 944 320 197 94 198 95 95 95 95 95 95 95 95 95 95 95 95 95			_															T_Amb Max (*C)	27					
4 7 7 2 2 8 10 147 1643 159 1740 2.06 2.06 2.06 2.06 2.06 2.06 2.06 2.0			_																					₩
The color of the	-		_																					+
4 7 7 3 7 4 167 1962 1589 1740 2780 2780 2780 2780 29 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	_																							-
4 7 7 8 2 24 1467 19842 1339 1740 2788 128 27 28 29 29 19 10 10 10 10 10 10 10 10 10 10 10 10 10	_																							
4 8 1 7 24 1407 19643 1399 7.40 7.80 7.80 7.40 7.40 7.40 7.40 7.40 7.40 7.40 7.4																								_
4 8 2 2 14 1407 19643 1399 7.60 7.60 7.60 7.60 7.60 7.60 7.60 7.60																								+
4 8 2 24 14 1607 1604.3 1369 77.60 78.00 72.00 7			_																					+-
4 8 6 24 1447 19640 1358 1748 2968 218 228 128 138 138 138 1487 14	4																							
4																								
S																								+
S																								+
5 9 4 24 24 1447 1044 1389 1748 2188 238 28 10 100 56 3.0 1<	$\overline{}$		2																					-
S																								
9 8 6 24 1467 106.0 1399 17.49 22.86 21.86 29 29 10 5 0.00 2.24 1467 106.0 13.99 17.49 22.86 21.86 29 20 19 20 15.50 1 24 1467 106.0 13.99 17.49 22.86 21.86 29 20 10 19 10.00 15.00 1.00 15.00 1.00 15.00 1.00 15.00 1.00 15.00 1.00 15.00 1.00 15.00 1.00 15.00 1.00 15.00 1.00																								-
S	_																							+
5 10 3 24 1467 10649 1399 17-09 21.86 21.06 25 25 10 100 5.44 14.07 10462 1359 17-09 21.86 21.06 225 25 10 10 5.54 10.16 10.10 10.10 21.06 21.06 225 25 10 10 5.54 10.16 11.06 13.09 17-09 21.86 22.06 25 25 10 6.53 3.01 22.06 10 10 24.0 11.06 1			_																					_
5 10 4 24 1467 1044 3.199 17.49 21.86 22 25 10 50 50 41 1407 1044 3.199 17.49 21.86 22.96 25 10 63 3.70 20.29 3 0.28 0.03 4 4.447 1044 3.199 17.49 21.86 22.95 10 63 3.10 0.299 3 0.28 0.03 4 4.447 1044 3.190 17.49 21.86 22.86 25 25 10 23 0.03 4 0.03 0.03 0.03	$\overline{}$																							
5 10 5 24 1467 10644 13.99 17.40 22.86																								
5 10 6 24 1467 10449 13.99 17.49 21.86 25.8 25 10 S 0.28 0.03 </td <td></td> <td></td> <td>_</td> <td></td> <td>+</td>			_																					+
6 11 2 2 24 1467 10649 1399 1749 21.86 21.85 23 23 10 150 150 1.03																								+-
6 11 3 2 24 1467 10649 1399 1740 2186 2186 22 25 25 10 150 850 450 5	6													240										1
6 11 4 24 1467 1064.0 13.99 17.40 22.86 22.88 25 25 10 10 50 5.64 0.33																								₩
6 11 5 5 24 1467 10649 13.99 17.49 21.86 21.86 22 25 25 10 55 3.10 0.29																								+
6 11 6 24 1467 10649 1399 17.49 21.86 22.88 25 25 10 20 13.94 17.40 21.86 21.86 25 25 10 20 13.94 17.40 21.86 21.86 25 25 10 20 13.94 17.40 21.86 21.86 25 25 10 10 10 10 10 10 10 1	$\overline{}$																							+-
6 12 2 2 24 1467 10649 13.99 17.49 21.86 21.86 25 25 10 19 195 11.00 10.3																								
6 12 4 2 4 1467 10649 13.99 17.49 21.86 21.86 25 25 10 150 8.46 0.79	6		1																					
6 12 4 24 1467 10649 13.99 17.49 21.86 21.86 25 25 10 100 5.64 0.33																								+
6 12 5 24 1467 10649 13.99 17.49 21.86 21.86 25 25 10 55 3.10 0.29	$\overline{}$																							+-
7 13 1 24 1467 1064.9 15.99 17.49 21.86 21.88 25 25 10 240 15.54 1.27 1 7 13 2 24 1467 1064.9 15.99 17.49 21.86 21.86 25 25 10 195 11.00 1.00 1.04 1.00 1.00 1.03 1 1.00 </td <td>6</td> <td>12</td> <td>5</td> <td>24</td> <td>1467</td> <td>1064.9</td> <td>13.99</td> <td>17.49</td> <td></td> <td>21.86</td> <td>25</td> <td>25</td> <td>10</td> <td>55</td> <td>3.10</td> <td>0.29</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	6	12	5	24	1467	1064.9	13.99	17.49		21.86	25	25	10	55	3.10	0.29								
7																								\perp
7 13 3 24 1467 1064.9 13.99 17.49 21.86 21.86 25 25 10 150 8.46 0.79 1 7 13 4 24 1467 1064.9 13.99 17.49 21.86 25 25 10 150 8.64 0.79 1 7 13 5 24 1467 1064.9 13.99 17.49 21.86 25 25 10 55 3.10 0.29 1 4 1.74 1.74 21.86 25 25 10 5 0.28 0.03 1 4 1.74 1.74 21.86 25 25 10 5 0.28 0.03 1 4 1.74 1.74 21.86 21.86 25 25 10 195 10.03 1 4 1.74 1.74 21.86 25 25 10 195 11.00 1.03 1 1 1.74																								+
7 13 4 24 1467 1064.9 13.99 17.49 21.86 21.86 25 25 10 100 5.64 0.53																								+-
7 13 5 24 1467 1064.9 13.99 17.49 21.86 21.86 25 25 10 55 3.10 0.29 Image: Control of the control of	7											25												
7 14 1 24 1467 1064.9 13.99 17.49 21.86 25 25 10 240 13.54 1.27		13		24	1467	1064.9	13.99	17.49	21.86	21.86	25	25	10	55	3.10	0.29								
7 14 2 24 1467 1064,9 13.99 17.49 21.86 25 25 10 195 11.00 1.03																								+
7 14 3 25 1528 1109.3 13.99 17.49 21.86 25 25 10 150 8.46 0.76																								+-
7 14 4 26 1589 115.7 13.99 17.49 21.86 25 25 10 100 5.64 0.49																								T
7		14	4	26	1589	1153.7	13.99	17.49	21.86	21.86	25	25	10	100	5.64	0.49								
8 15 1 29 1773 1286.8 13.99 17.49 21.86 25 25 10 240 13.54 1.05																								_
8 15 2 30 1834 13312 13.99 17.49 21.86 22.86 25 25 10 195 11.00 0.83	$\overline{}$																							+-
8 15 3 31 1895 1375.5 13.99 17.49 21.86 25 25 10 150 8.46 0.62																								+
8 15 5 33 2017 1464.3 13.99 17.49 21.86 21.86 25 25 10 55 3.10 0.21			_																					
8 15 6 34 2078 1508.7 13.99 17.49 21.86 21.86 25 25 10 5 0.28 0.02 8 1508.7 13.99 17.49 21.86 21.86 25 25 10 240 13.54 0.87 8 16 2 36 2200 1597.4 13.99 17.49 21.86 21.86 25 25 10 240 13.54 0.87 8 16 3 3.7 2262 1641.8 13.99 17.49 21.86 21.86 25 25 10 195 11.00 0.69 8 16 4 38 2323 1686.1 13.99 17.49 21.86 21.86 25 25 10 150 150 8.46 0.52 8 16 4 38 2323 1686.1 13.99 17.49 21.86 21.86 25 25 10 10 150 8.46 0.52 8 16 10 150 150 150 150 150 150 150 150 150		15	4	32	1956	1419.9	13.99	17.49	21.86	21.86	25	25	10	100	5.64	0.40								
8 16 1 35 2139 1553.0 13.99 17.49 21.86 21.86 25 25 10 240 13.54 0.87 0.87 0.87 8 16 2 36 2200 1597.4 13.99 17.49 21.86 25 25 10 195 11.00 0.69 0.69 8 16 3 37 2262 1641.8 13.99 17.49 21.86 25 25 10 150 8.46 0.52 8 16 4 38 2323 1686.1 13.99 17.49 21.86 21.86 25 25 10 100 5.64 0.33 8 16 5 39 2384 1730.5 13.99 17.49 21.86 25 25 10 100 5.64 0.33 8 16 5 39 2384 1730.5 13.99 17.49 21.86 25 25 10 55 3.10 0.18	-																							+-
8 16 2 36 2200 1597.4 13.99 17.49 21.86 25 25 10 195 11.00 0.69 11.00 0.69 8 16 3 37 2262 1641.8 13.99 17.49 21.86 25 25 10 150 8.46 0.52 8 16 4 38 2323 1686.1 13.99 17.49 21.86 25 25 10 100 5.64 0.33 8 16 5 39 2384 1730.5 13.99 17.49 21.86 25 25 10 100 5.64 0.33 8 16 5 39 2384 1730.5 13.99 17.49 21.86 25 25 10 55 3.10 0.18	$\overline{}$																							+-
8 16 3 37 2262 1641.8 13.99 17.49 21.86 21.86 25 25 10 150 8.46 0.52 8.46 0.	_																							_
8 16 5 39 2384 1730.5 13.99 17.49 21.86 21.86 25 25 10 55 3.10 0.18		16	3	37	2262	1641.8	13.99	17.49	21.86	21.86	25	25	10	150	8.46	0.52								
	_		_																					_
	$\overline{}$																							+-
	_ 0 _	10	ı "	1 40	2440	1774.9	10.88	17.49	21.00	21.00	1 23	1 20	1 10		J.20	0.02		<u> </u>	I	1	İ	1		

IOTES.

1) TEMPERATURE CORRECTED OPEN CIRCUIT VOLTAGE CALCULATIONS ARE AS FOLLOWS: VOC = ((Voc * # MODULES) * (1 + ((T_AMB MIN - T_AMB MAX) * (VOC COEF.))

PROJECT: FORT YUKON RENEWABLE ENERGY DESIGN

DESIGNER/PROJECT ENGINEER: GRIFFIN LOGAN/MAX DONALDSON JOB #: 25-0053

NO. DESIGN/CONSTRUCTION/ASBUILT REVISION DWN BY/DATE REVIEWED BY/DATE

A ISSUED FOR 95% REVIEW MED/05-02-2025 JRV/05-02-2025

B ISSUED FOR PV CONSTRUCTION BID GGL/10-11-2025 MED/10-11-2025

Consulting Engineers

TEL: (907) 522–1953
FAX: (907) 522–1182

	NO.	DRAWING NO./SHEET	REFERENCE DRAWING DESCRIPTION	DRAWING
ems				
inc.				
.				
3 32				REF DWG
MC				KEF DWG

TANANA CHIEFS CONFERENCE FORT YUKON RENEWABLE ENERGY PV STRING CALCULATIONS

fyre-el-0700_1.dwg

NOT FOR CONSTRUCTION

RAWING NO.: FYRE-EL-0700

Tyre=ei=0700_i.dw

SHEET 1 OF 1