

AREA MAP

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SYSTEM DESCRIPTION				
MODULE TYPE	JA SOLAR 'JAM72D30-535'			
MODULE QUANTITY	3,744			
MODULE WATTAGE	535W			
DC SYSTEM SIZE (kW DC)	2,003.04			
AC SYSTEM SIZE (kW AC)	1,500			
DC / AC RATIO	1.335			
INVERTER TYPE	(12) CHINT CPS125KTL-DO/US-600 (125kW)			
# MODULES / STRING	26			
# STRINGS	144			
SAT / TILT	25° FIXED TILT			
RACKING MFG / MODEL	APA			
MODULE ORIENTATION	2 IN PORTRAIT			
ROW SPACING	14.54' CLEAR			
GCR	53.10			

SIDNEY SOLAR



LOCATION MAP

GENERAL NOTES

- ACTOR SHALL FIELD VERIFY ALL DIMENSIONS, CONDITIONS, ING TO THE ENGINEER'S ATTENTION ANY DISCREPANCY VED IMMEDIATELY.
- ACTOR SHALL COORDINATE OBTAINING ALL REQUIRED 5.
- ACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING, IG, AND PROTECTING ALL WORK DURING CONSTRUCTION T DAMAGE, BREAKAGE, COLLAPSE, DISTORTIONS, AND SNMENT. SUCH TEMPORARY BRACING AND SHORING SHALL IN-PLACE UNTIL PERMANENT CONSTRUCTION HAS BEEN ETED.
- NTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS ETY.

GOVERNING CODES

TOWN OF SIDNEY KENNEBEC COUNTY, MAINE

- NTERNATIONAL BUILDING CODE (2018)
- 70: NEC NATIONAL ELECTRICAL CODE (2020) WITH MAINE DMENTS

PRECISION SOLAR RENEWABLES JOB NUMBER: 658
22018
SHEET TITLE:
COVER SHEET
STAMP:
ME PROFESSIONAL ENGINEER LIC. NO. 13412, EXP. 12-31-23
DATE: C
DRAWN BY:
APPROVED BY:
NO. REVISION
- ISSUE FOR PERMIT
PROJECT PHASE: ISSUE FOR PERMIT
SCALE:
NO SCALE
0 ½" 1"
ORIGINAL SIZE 24"X36"
E-000

ELECTRICAL NOTES FOR NEW PHOTOVOLTAIC SYSTEM:

- 1. THIS PROPOSED SOLAR ELECTRIC SYSTEM IS INTENDED TO OPERATE IN PARALLEL WITH POWER RECEIVED FROM THE UTILITY SERVICE PROVIDER.
- 2. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE IDENTIFIED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS, BE EQUIPPED WITH ANTI-ISLANDING CIRCUITRY, DC GROUND FAULT PROTECTIONS, AND SHALL BE UL APPROVED.
- 3. THIS SYSTEM IS INTENDED TO CONNECT TO THE EXISTING FACILITY POWER SYSTEM AT A SINGLE POINT, POINT OF COMMON COUPLING (POCC). THIS CONNECTION SHALL BE IN COMPLIANCE WITH THE NEC ARTICLE 705.12 "POINT OF CONNECTION"
- 4. ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION FOR TESTING AND ISOLATION. 5. ALL SYSTEM DISCONNECTING MEANS SHALL BE SECURED FROM UNAUTHORIZED/UNQUALIFIED PERSONNEL

WIRING AND WIRING METHODS:

ALL WIRING METHODS AND INSTALLATION PRACTICES SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES.

1. EXPOSED PV SOLAR MODULE WIRING WILL BE PV WIRE, 90°C, WET RATED AND UV RESISTANT - NO EXCEPTIONS. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED WITH HEYCO CLIPS OR SUNBUNDLERS. THE USE OF PLASTIC ZIP TIES IS NOT AN APPROVED METHOD TO SUPPORT WIRE OR TO ATTACH WIRE TO A STRUCTURE.

2. WIRE COLOR SPECIFICATIONS

BY LOCK OR LOCATION.

	AC CONDUCTORS		
	600 VOLT	120 / 208 VOLT	
PHASE A	BROWN	BLACK	
PHASE B	ORANGE	RED	
PHASE C	YELLOW	BLUE	
GROUNDED CONDUCTOR	GRAY OR WHITE	WHITE	
GROUNDING CONDUCTOR	GREEN OR BARE	GREEN OR BARE	
GROUNDING ELECTRODE CONDUCTOR	GREEN W/ ORANGE	GREEN W/ ORANGE	
	DC CONDUCTORS		
UNGROUNDED SOURCE CIRCUIT CONDUCTORS	(+) FROM MODULE FACTORY DYED RED WHITE NOT PERMITTED	(-) FROM MODULE FACTORY DYED BLACK WHITE NOT PERMITTED	
GROUNDING CONDUCTOR	GREEN OR BARE	GREEN OR BARE	

- 3. LIQUID TIGHT FLEXIBLE METAL CONDUIT IS GENERALLY SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART (NEC 350.30).
- 4. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE CONTAINED IN THE SAME RACEWAY, CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER. SEPARATE SECTIONS IN CAB-WIRE HANGERS SHALL BE CONSIDERED SEPARATED BY A PARTITION.
- 5. UNLESS MARKED AS UV RESISTANT, PVC IS NOT APPROVED FOR INSTALLATION IN LOCATIONS SUBJECTED TO DIRECT SUNLIGHT AND SHALL NOT BE EMPLOYED IN ANY SUCH LOCATION.
- 6. ALL D.C. MATERIALS SHALL BE UL LISTED FOR 1500V DC.
- 7. WHEN TRANSITIONING UNDERGROUND PVC CONDUIT TO ABOVE GROUND RMC OR IMC CONDUIT, USE 20 MIL PIPE WRAP TAPE HALF-LAPPED FROM 6" PAST TRANSITION POINT ON PVC TO 6" ABOVE GROUND ON METALLIC CONDUIT. AN EXPANSION JOINT SHALL BE USED IN THE TRANSITION TO ABOVE GROUND CONDUIT WHERE REQUIRED BY NEC 300.5(J).
- 8. ANY METAL DEBRIS RESULTING FROM SITE WORK SHALL BE CLEANED FROM ENCLOSURE INTERIORS, TOP CONDUCTIVE METAL DEBRIS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUIT OR OTHER DAMAGE.
- 9. CONDUITS LONGER THAN 200' WITH NEGATIVE SLOPE TOWARD ELECTRICAL EQUIPMENT SHALL HAVE A PULL BOX OR VAULT ADJACENT TO THE ENTRY POINT INTO THE ELECTRICAL EQUIPMENT.
- 10. WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT, A LISTED FITTING AND DRIP LOOP SHALL BE USED TO PREVENT THE ENTRY OF MOISTURE.
- 11. METALLIC L AND T CONDUIT BODIES SHALL NOT BE USED FOR POWER CONDUCTORS.
- 12. MEGGER TESTING SHALL BE PERFORMED AT 1500 VDC FOR ALL AC CIRCUITS 600 V OR BELOW AND DC CIRCUITS 600 V OR BELOW. MEGGER TESTING WILL BE PERFORMED AT 1500 VDC FOR DC CIRCUITS IN 1500 VDC SYSTEMS. A MINIMUM OF 250 MEGAOHMS RESISTANCE TO GROUND IS REQUIRED. DO NOT MEGGER THE SOLAR MODULES AS IT WILL LIKELY DAMAGE THEIR INTERNAL DIODES.
- 13. BENDS SHALL NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAY.
- 14. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS. CONNECTORS ARE TO BE MARKED WITH PERMANENT MARKING PAINT, AFTER TORQUING.
- 15. ALL BARE CU WIRES SHALL BE INSTALLED TO NOT COME INTO CONTACT WITH DISSIMILAR METALS . 16. SPLICES/CONNECTORS SHALL BE INSULATED AND WILL REQUIRE PROJECT ENGINEER APPROVAL. UL LISTED
- ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATION MEANS. FOLLOW MANUFACTURERS INSTRUCTIONS FOR INSTALLATION, AND APPLICATION OF INSULATING PRODUCT.
- 17. USE MEYERS HUB LISTED TO PROVIDE MOISTURE PROTECTION FOR CONDUIT ENTRANCES IN EXTERIOR ABOVE GRADE ENCLOSURES AS REQUIRED BY NEC 314.15.
- 18. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPLIT LOOM OR EDGE-GUARD AS APPROPRIATE FOR THE CONDITIONS.
- 19. MODULE LEAD CONNECTORS SHALL BE INSTALLED SUCH THAT THEY ARE EASILY ACCESSIBLE AND PROTECTED FROM EXPOSURE TO DIRECT SUNLIGHT OR RAIN.
- 20. THE STRING SOURCE CIRCUIT WIRING NEEDS TO BE SUPPORTED ADEQUATELY IN LENGTHS NOT TO EXCEED 36". THE MODULE TO MODULE INTERCONNECTION LEADS NEED TO BE SUPPORTED AT A MINIMUM OF 12" FROM THE J-BOX AND THE MODULE TO MODULE CONNECTION POINT.
- 21. POLARIS (OR SIMILAR) POWER DISTRIBUTION BLOCKS ARE NOT TO BE USED TO CONNECT CURRENT CARRYING CONDUCTORS. INSULATED POLARIS (OR SIMILAR) CABLE CONNECTORS / TAP BLOCKS AND REDUCERS ARE PERMITTED.
- 22. THE CONNECTION TO SOURCE CIRCUITS MUST BE PER THE MODULE MANUFACTURER AND CONNECTOR MANUFACTURER INSTRUCTIONS. CONTRACTOR TO VERIFY THAT THE STRING CONDUCTOR DIAMETER IS COMPATIBLE WITH THE STRING CIRCUIT HOME-RUN CONNECTORS.
- 23. ALL FITTING FOR METALLIC RACEWAYS SHALL BE THREADED / COMPRESSION TYPE. NO SET-SCREW FITTINGS PERMITTED.

DAMAGE PROTECTION:

- 1. THE ELECTRICAL CONTRACTOR SHALL CONSIDER THE WEATHERING OF EQUIPMENT OVER TIME AND ELIMINATE THE POSSIBILITY OF DEGRADATION DUE TO CORROSION, WATER ENTRY AND UV EXPOSURE. AS A RESULT, THE USE OF UNISTRUT OR SIMILAR MOUNTING SYSTEMS IS REQUIRED TO MOUNT ENCLOSURES, PULL BOXES, LOAD CENTERS, FUSE BOXES, OR OTHER EQUIPMENT.
- 2. ALL NEMA 4 BOXES SHALL BE EQUIPPED WITH LISTED DRAIN PLUGS TO ALLOW WATER TO DRAIN. ANY MODIFICATION TO AS-MANUFACTURED EQUIPMENT SHOULD BE DONE IN SUCH A WAY AS TO MAINTAIN ALL LISTED RATINGS.
- 3. ALL NEMA 3R BOXES SHALL BE EQUIPPED WITH A WEEP HOLE OR LISTED DRAIN PLUGS TO ALLOW WATER TO DRAIN.
- 4. ALL CIRCUIT BREAKERS INSTALLED THAT ARE SUBJECT TO REVERSE POWER FLOW SHALL BE LISTED AND LABELED AS BACKFEED COMPATIBLE.

LOW VOLTAGE (</= 2000V) CONDUCTOR INSTALLATION **NOTES:**

- 1. MINIMUM WIRE SIZE FOR CURRENT CARRYING CONDUCTORS WHEN IMPLEMENTING ALUMINUM AS A CONDUCTOR SHALL BE 1/0 AWG STRANDED, COMPACT ELECTRICAL GRADE AA-8000 SERIES ALLOY.
- 2. ALUMINUM POWER CONDUCTORS, WIRE CONNECTORS, AND INSULATING AND CODING TAPE MANUFACTURERS SHALL BE APPROVED PRIOR TO USAGE.
- USE OF A "ONE-SHOT" CRIMPER OR "DIE-LESS CRIMPERS" WILL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER.
- COMPRESSION STYLE LUGS AND TERMINATIONS SHALL BE RATED FOR THE MAXIMUM DC and AC VOLTAGE OF THE SYSTEM.
- 4.1. MUST BE PRE-FILLED WITH OXIDE INHIBITOR. IMMEDIATELY PRIOR TO LUG INSTALLATION.
- 4.2. WIRE STRIPPING AND BRUSHING OF CONDUCTOR IN ACCORDANCE WITH VENDOR SPECS IS REQUIRED
- 4.3. OXIDE INHIBITOR MUST BE APPLIED TO EXPOSED CONDUCTOR IMMEDIATELY AFTER STRIPPING AND BRUSHING AND IMMEDIATELY PRIOR TO INSTALLATION OF THE LUG. 4.4. USE COMPRESSION TOOL LISTED FOR USE WITH SELECTED COMPRESSION CONNECTOR 4.5. A MINIMUM 6" LENGTH OF COLD OR HEAT SHRINK WITH A VOLTAGE RATING EQUAL TO THE CONDUCTOR
- THE STRAIGHT SECTION OF THE CRIMP.
- APPLICATION.
- INSULATING AND COLOR CODING TAPE SHALL BE PREMIUM GRADE PRESSURE SENSITIVE VINYL. HEAT/COLD/MOISTURE/SUNLIGHT/ RESISTANT. INSULATING TAPE SHALL BE BLACK AND COLOR CODING TAPE SHALL BE FADE RESISTANT.
- 6. DIRECT LANDING OF ALUMINUM CONDUCTORS IS ONLY ALLOWED TO BREAKERS OR TERMINATIONS WHICH ARE SPECIFICALLY RATED FOR ALUMINUM CONDUCTORS
- 7. WHERE MV CONDUCTORS ARE USED, THE GUIDELINES IN THIS SECTION, PLUS GENERAL REQUIREMENTS FOR MV CONDUCTOR INSTALLATION, SHALL APPLY.

GROUNDING:

SEE ELECTRICAL DIAGRAM AND ELECTRICAL DETAILS FOR MORE GROUNDING INFORMATION.

- 1. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS WILL BE USED FOR SYSTEM GROUNDING (NEC 690.42) (REFERENCED TO THE SAME POINT).
- 2. EQUIPMENT GROUNDING CONDUCTORS AND SYSTEM GROUNDING CONDUCTORS WILL HAVE AS SHORT A DISTANCE TO GROUND AS POSSIBLE AND A MINIMUM NUMBER OF TURNS.
- 3. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER GROUNDING; NOTING THAT TERMINAL LUGS BOLTED ON AN ENCLOSURE'S FINISHED SURFACE MAY BE INSULATED BECAUSE OF PAINT/FINISH. PAINT/FINISH AT POINT OF CONTACT SHALL BE PROPERLY REMOVED.
- 4. RACKING COMPONENTS AND STRUCTURAL SUPPORTS MUST BE ELECTRICALLY BONDED TOGETHER BY AN ACCEPTABLE MEANS.
- MODULES SHALL BE GROUNDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.
- 6. THE CONNECTION TO THE MODULE OR PANEL OF THIS PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE SO ARRANGED THAT REMOVAL OF A MODULE OR A PANEL FROM THE PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT. SETS OF MODULES INTERCONNECTED AS SYSTEMS RATED AT 50 VOLTS OR LESS WITH OR WITHOUT BLOCKING DIODES, AND HAVING A SINGLE OVER CURRENT DEVICE SHALL BE CONSIDERED AS A SINGLE SOURCE CIRCUIT.
- 7. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC.
- 8. ALL GROUNDING CONNECTIONS BELOW GRADE SHALL BE RATED FOR DIRECT BURIAL (DB RATED). CONTRACTOR IS TO SUPPLY DOCUMENTATION PROVING THIS DURING PRODUCT SUBMITTALS.
- 9. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE NOTED.

DISCONNECTING MEANS:

- MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER EXISTING CONDUCTORS.
- 2. WHERE A CIRCUIT GROUNDING CONNECTION IS NOT DESIGNED TO BE AUTOMATICALLY INTERRUPTED AS PART OF THE GROUND-FAULT PROTECTION SYSTEM REQUIRED BY SECTION 690.5. A SWITCH OR CIRCUIT BREAKER USED AS A DISCONNECTING MEANS SHALL NOT HAVE A POLE IN THE GROUNDED CONDUCTOR. 3. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW
- MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
- 4. UNLESS THE PV SYSTEM DISCONNECT IS SERVICING A SUPPLY-SIDE TAP, THE DISCONNECTING MEANS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH SECTION 690.17.
- 5. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS. OVER CURRENT DEVICES. AND BLOCKING DIODES SHALL BE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.
- 6. MEANS SHALL BE PROVIDED TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND THE LIKE FROM ALL UNGROUNDED CONDUCTORS OF ALL SOURCES. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS SHALL BE GROUPED AND IDENTIFIED.
- A SINGLE DISCONNECTING MEANS SHALL BE PERMITTED FOR THE COMBINED A.C. OUTPUT OF ONE OR MORE INVERTERS IN AN INTERACTIVE SYSTEM, PROVIDED EACH INVERTER ASSOCIATED WITH THE DISCONNECT HAS ITS OWN INTERNAL AC DISCONNECT.
- 8. MEANS SHALL BE PROVIDED TO DISCONNECT A FUSE FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS AND IS ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS. SUCH A FUSE IN A PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.

CONDUCTORS:

- SPLICES ARE NOT PERMITTED IN POWER OR CONTROL CONDUCTORS UNLESS INDICATED ON THE DRAWINGS OR APPROVED IN ADVANCE OF INSTALLATION BY ENGINEER.
- 2. ALL MECHANICAL CONNECTIONS SHALL BE MADE USING NRTL-LISTED TIN-PLATED COPPER CIRCUMFERENTIAL COMPRESSION LUGS. LUGS SHALL BE LONG-BARREL WITH NEMA TWO-HOLE DRILLING, BURNDY HYLUG MODEL YAZ OR EQUIVALENT CONNECTED WITH HIGH-STRENGTH SILICON BRONZE BUS BOLTS, NUTS AND LOCK WASHERS. LUGS TO MATCH CONDUCTOR TYPE. SHORT BARREL WITCH NEMA ONE-HOLE DRILLING MAY BE USED IN EQUIPMENT DESIGNED FOR SINGLE STUD OR BOLT CONNECTION.
- 3. VERIFY PROPER TORQUE OF ALL BOLTED CONNECTIONS USING A CALIBRATED TORQUE WRENCH AND MARK EACH BOLT HEAD TO INDICATE VERIFICATION IS COMPLETE.
- 4. CLEAN AND LUBRICATE ALL SURFACES PER MANUFACTURER'S INSTRUCTIONS BEFORE FINAL CONNECTION.
- 5. ALL 600 VOLT CLASS AC WIRING SHALL BE COPPER WIRE, TYPE THHN/THWN-2 RATED AT 90°C, AND RATED FOR 600V, OR APPROVED EQUAL. ALUMINUM SHALL ONLY BE USED WHERE EXPRESSLY PERMITTED ON DRAWINGS.
- 6. COMPLETELY INSTALL ALL CONDUIT RUNS AND BACKFILL DUCTBANKS BEFORE PULLING CABLE. INSTALL A 1/4" DIAMETER NYLON PULL ROPE IN ALL SPARE CONDUITS.
- 7. INSTALL HANDHOLES AS REQUIRED TO MINIMIZE MAXIMUM ALLOWABLE CABLE TENSION PER CABLE MANUFACTURER.

- SHALL BE APPLIED TO COVER THE CONNECTION BETWEEN CRIMP AND THE CONDUCTOR BEGINNING AT 4.6. ALL CONNECTORS AND CORRESPONDING CRIMPING TOOLS SHALL BE UL LISTED FOR THEIR SPECIFIC

EQUIPMENT:

- 1. EQUIPMENT AND COMPONENTS SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING LABORATORY (NRTL) SUCH AS UL OR ETL, WHERE SUCH LISTING IS AVAILABLE FOR THE APPLICATION.
- 2. DOORS PROVIDING ACCESS TO PARTS NORMALLY ENERGIZED AT OVER 600V SHALL BE PADLOCKABLE CLOSED. REMOVABLE PANELS PROVIDING ACCESS TO PARTS NORMALLY ENERGIZED AT OVER 600V SHALL REQUIRE TOOLS FOR REMOVAL OR BE PADLOCKABLE CLOSED.
- 3. WHERE REQUIRED, EQUIPMENT SHALL BE ANCHORED TO CONCRETE PADS PER MANUFACTURER'S INSTRUCTIONS. ANCHOR BOLT SIZE PER MANUFACTURER RECOMMENDATION.
- 4. ALL EXPOSED OPENINGS INTO EQUIPMENT SHALL BE SEALED WITH GALVANIZED STEEL PLATE OR SCREEN TO PREVENT ENTRY OF INSECTS AND RODENTS.
- 5. CAULK ALONG BOTTOM PERIMETER OF EQUIPMENT MOUNTED ON CONCRETE PADS TO PREVENT WATER ENTRY BETWEEN ENCLOSURE AND MOUNTING SURFACE.
- 6. PROVIDE MIN. 6 INCHES OF CLASS 5 GRAVEL DRAINAGE BEDDING IN THE BOTTOM OF ALL BOTTOM CONDUIT ENTRIES TO OPEN CABLE COMPARTMENTS.
- 7. ALL CONDUCTORS SHALL BE ROUTED TO MAINTAIN ACCESS TO INDICATORS, VALVES, SAMPLE PORTS, SWITCHES, TAP CHANGES, FUSE WELLS, AND OTHER COMPONENTS AND ACCESSORIES REQUIRING OPERATOR ACCESS.
- 8. PROVIDE NEMA 4 ENCLOSURE WHERE AVAILABLE FOR EXTERIOR DC AND LV EQUIPMENT. PROVIDE NEMA 3R ENCLOSURES WHERE NEMA 4 IS NOT AVAILABLE.
- 9. MEDIUM VOLTAGE EQUIPMENT INSTALLED OUTSIDE OF FENCES WHERE ACCESSIBLE TO THE PUBLIC SHALL COMPLY WITH NESC REQUIREMENTS FOR TAMPER-PROOF CONSTRUCTION.

GENERAL NOTES FOR CHINT POWER SYSTEMS GRID-TIED PHOTOVOLTAIC INVERTERS:

- SYSTEM GROUNDING MEANS: CHINT POWER SYSTEM INVERTERS ARE INTENDED TO BE INSTALLED AS PART OF A PERMANENTLY GROUNDED ELECTRICAL SYSTEM PER THE NEC ANSI/NFPA 70. AN ENGINEERED GROUND CONNECTION FOR THE INVERTER MUST BE INSTALLED AND CONNECTED TO THE UNIT AS DESCRIBED IN THE INSTALLATION MANUAL. CONNECT THE GROUND WIRE WITH A M5 NUT AT THE MARKED PLACE AT THE LOWER RIGHT SIDE OF THE WIRING BOX. GROUND CONNECTION MUST BE MADE PRIOR TO OPERATING THE UNIT.
- 2. CONDUITS AND CONDUCTORS: ALL INTERCONNECT WIRING AND POWER CONDUCTORS INTERFACING THE UNIT MUST BE IN ACCORDANCE WITH THE NEC ANSI/NFPA 70 AND ANY APPLICABLE LOCAL CODES. LARGE GAUGE WIRE MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE NEC, ARTICLE 300.34. KEEP ALL WIRE BUNDLES AWAY FROM ANY SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. ALL INTERCONNECT CONDUITS AND FITTINGS MUST BE NEMA-4 RATED AS REQUIRED BY THE NEC. FOR WIRE GAUGE, BOLT SIZE, AND TORQUE VALUES FOR THE DC & AC TERMINALS, SEE THE INSTALLATION MANUAL.
- 3. OPERATOR INTERFACE CONTROLS: OPERATOR INTERFACE CONTROLS ARE LOCATED ON THE FRONT OF THE MAIN INVERTER ENCLOSURE. CONSULT THE OPERATIONS AND MAINTENANCE MANUAL FOR INSTRUCTIONS AND CODE REFERENCES.
- 4. ELECTRICAL SAFETY FEATURES:

ABRASION.

- a. TWO (2) DISCONNECTING DEVICES BETWEEN THE SOLAR ARRAY PANELS, THE UTILITY, AND THE UNIT ARE PROVIDED FOR THE INVERTER ENCLOSURE. THESE DISCONNECT SWITCHES ARE TO BE USED FOR ISOLATING THE SOLAR ARRAY PANELS FROM THE UNIT FOR MAINTENANCE PURPOSES AND ARE TO BE USED AS A NO-LOAD DISCONNECTING DEVICE ONLY.
- b. THE ANTI-ISLANDING TRIP TIME IS LESS THAN TWO (2) SECONDS PER UL 1741 STANDARDS. THE INVERTER UNIT WILL AUTOMATICALLY SHUT DOWN WHEN LOSS OF GRID POWER IS DETECTED.
- 7. PV PROTECTION DEVICE: WHEN THE CHINT POWER SYSTEM INVERTER IS NOT OPERATING. EACH PV ARRAY IS GROUNDED THROUGH A FUSED CONNECTION. THIS FUSE BLOWS WHEN A GROUND FAULT CURRENT FLOWS. WHEN THE CHINT POWER SYSTEM INVERTER IS OPERATING. THE GROUND FAULT CONTACTOR PLACES THE POSITIVE AND NEGATIVE PV ARRAYS IN SERIES TO PRODUCE +/- VDC MAXIMUM OPEN CIRCUIT
- 8. ANY ALTERATIONS TO THE CHINT POWER SYSTEM INVERTERS MUST BE CLEARED THROUGH MANUFACTURER TO MAINTAIN UL LISTING AND WARRANTY OF THE DEVICE

CONDUITS AND DUCTBANKS:

- 1. CONDUITS ABOVE GRADE OR FOR DIRECT-BURIAL OR CONCRETE ENCASEMENT SHALL BE SCHEDULE 40 PVC WHERE SUBJECT TO DAMAGE OR ROUTED BENEATH ROADS, CONDUIT SHALL BE SCHEDULE 80 PVC OR RMC.
- 2. ALL MEDIUM VOLTAGE CONDUITS SHALL HAVE MINIMUM 60 INCH RADIUS SWEEPS EXCEPT 36 INCH MINIMUM RADIUS IS REQUIRED FOR VERTICAL SWEEPS UP TO EQUIPMENT.
- 3. MAINTAIN MINIMUM 6 INCHES OF SPACING HORIZONTALLY AND VERTICALLY AT CROSSINGS BETWEEN MEDIUM VOLTAGE CONDUITS OR DUCTBANKS AND LOW-VOLTAGE OR COMMUNICATIONS CONDUITS.
- 4. MAINTAIN MINIMUM 4 FOOT SPACING BETWEEN MEDIUM VOLTAGE CONDUCTORS AND POWER CIRCUITS OF OTHER SYSTEMS WHEN RUN PARALLEL FOR DISTANCES OF OVER 10 PERCENT OF THE RUN OF EITHER CIRCUIT UNLESS THE DUCTBANK SECTIONS INDICATE CLOSER SPACINGS WHICH HAVE BEEN CONSIDERED IN AMPACITY CALCULATIONS.
- 5. MAINTAIN ALL CONDUIT ENTRIES TO EQUIPMENT WITHIN MANUFACTURER'S DESIGNATED CONDUIT ENTRY SPACE AND ARRANGE CONDUITS TO PERMIT THE MOST DIRECT ROUTING OF CABLES TO TERMINALS AND TO ALLOW ADEQUATE SLACK FOR DISCONNECTION AND PARKING OF LOADBREAK AND DEADBREAK ELBOW CONNECTORS.
- 6. TOPS OF CONDUIT SHALL BE A MINIMUM OF 4 INCHES ABOVE THE CONCRETE PAD OR GRAVEL BEDDING TO PREVENT INGRESS OF WATER. SEAL ALL CONDUITS TO PREVENT TRANSMISSION OF HUMID AIR BETWEEN INTERIOR AND EXTERIOR OF EQUIPMENT
- 7. ALL CONDUITS ENTERING EQUIPMENT TO BE EQUIPPED WITH END BELLS OR SWINGS TO PREVENT

PROPOSED SEL-651R2 RECLOSER CONTROLLER SETTINGS						
ELEMENT	DESCRIPTION		RELAY TIME DIAL (TD), DELAY TIME (DT), OPERATION		SETTING (300:1 CT's, 10,000 LEA's)	CLEARING TIME
51P	INV. TIME OVERCURRE PHASE	NT	U3 CURVE TIME DIAL = 0.	5	TBD	TBD
50P	INST. OVERCURREN PHASE	Т	DELAY TIME = 0.1 CYCLES		TBD	TBD
51G	INV. TIME OVERCURRE GROUND	NT	U3 CURVE TIME DIAL = 0.5		TBD	TBD
50G	INST. OVERCURREN GROUND	Г	DELAY TIME = 10 CYCLES		TBD	TBD
79	AUTOMATIC RESTOR	E	27, 59, 810/U ELEMENTS		3 ATTEMPTS	300 s DELAY
86	AUTOMATIC LOCKOU (BLOCK CLOSE)	IT	50/51P, 50/51G, 5 ELEMENTS & ALA	51N RMS	MANUAL RESET	PER ELEMENT
ALARMS	FAIL-SAFE DETECTION: R FAILURE, DC VOLTAG OVER/UNDER, CONTR CABLE DISCONNECTE	AFE DETECTION: RELAY NILURE, DC VOLTAGE ER/UNDER, CONTROL BLE DISCONNECTED		TION E RIP &	MANUAL RESET	2.0 s DELAY (MAX.)
ELEMENT	DESCRIPTION	V (BASI	/OLTAGE RANGEVOLTAGE SETTINGE=12.47kV(10,000:1 LEA's)		CLEARING TIME (s)	
07	UNDERVOLTAGE, UV2		0.0 < V _{PU} ≤ 0.50 V _{PU} =0		0.50: 3,600 V _{L-N} (0.360 V _{L-N})	1.10
27	UNDERVOLTAGE, UV1		$0.0 < V_{PU} \le 0.88$ $V_{PU} = 0.88: 6,33$		0.88: 6,336 V _{L-N} (0.634 V _{L-N})	2.00
50	OVERVOLTAGE, OV1		1.10 ≤ V _{PU} < 1.20	V _{PU} =	1.10: 7,920 V _{L-N} (0.792 V _{L-N})	1.00
59	OVERVOLTAGE, OV2	V	_{PU} = 1.20 (FIXED)	V _{PU} =	1.20: 8,640 V _{L-N} (0.864 V _{L-N})	0.16
59N	3V0		V _{PU} > 0.10 V _{PU} =(=0.10: 720 V _{L-N} (0.072 V _{L-N})	1.00
ELEMENT	DESCRIPTION		FREQUENCY RANGE (Hz)		FREQUENCY SETTING	CLEARING TIME (s)
0411	UNDER FREQUENCY, UF2		50.0 < f ≤ 56.5		56.5 Hz	0.16
810	UNDER FREQUENCY, U	F1	50.0 < f ≤ 58.5		58.5 Hz	300.0
040	OVER FREQUENCY, OF	1	61.2 ≤ f < 66.0		61.2 Hz	300.0
810	OVER FREQUENCY, OF2		62 ≤ f < 66.0		62.0 Hz	0.16

CHINT PV INVERTER ANTI-ISLANDING SETTINGS TABLE (IEEE 1547-2018, 2nd Ed.)					
ELEMENT	DESCRIPTION	VOLTAGE RANGE (BASE = 600V _{L-L})	VOLTAGE SETTING	CLEARING TIME (s)	
27	UNDERVOLTAGE, UV2	$0.0 < V_{PU} \le 0.50$	V _{PU} =0.50: 300.0 V _{L-L}	1.10	
	UNDERVOLTAGE, UV1	$0.0 < V_{PU} \le 0.88$	V _{PU} =0.88: 528.0 V _{L-L}	2.00	
59	OVERVOLTAGE, OV1	1.10 ≤ V _{PU} < 1.20	V _{PU} =1.10: 660.0 V _{L-L} SEE NOTE	2.00	
	OVERVOLTAGE, OV2	V _{PU} = 1.20 (FIXED)	V _{PU} =1.20: 720.0 V _{L-L}	0.16	
ELEMENT	DESCRIPTION	FREQUENCY RANGE (Hz)	FREQUENCY SETTINGS (SEE NOTE 1)	CLEARING TIME (s)	
81U	UNDER FREQUENCY, UF2	50.0 < f ≤ 57.0	56.5 Hz	0.16	
	UNDER FREQUENCY, UF1	50.0 < f ≤ 59.0	58.5 Hz	300.0	
810	OVER FREQUENCY, OF1	61.0 ≤ f < 66.0	61.2 Hz	300.0	
	OVER FREQUENCY, OF2	61.8 ≤ f < 66.0	62.0 Hz	0.16	

PRECISION SOLAR RENEWABLES JOB NUMBER:

658

22018

NOTES AND

SETTINGS

ME PROFESSIONAL ENGINEER

LIC. NO. 13412, EXP. 12-31-23

HHA JOB NUMBER

SHEET TITLE:

STAMP:

DATE:

DRAWN BY:

ENGINEER:

APPROVED BY:

PROJECT PHASE:

SCALE

SHEET NO

ISSUE F(

NO S

ORIGINAL SIZE 24"X36"

REVIS

ISSUE FOR

NOTE: IN THE PERMISSIVE OPERATION REGION 1.10 > V_{PI1} ≤ 1.2, INVERTERS SHALL RIDE-THROUGH IN MOMENTARY CESSATION MODE: SEE INVERTER RIDE-THROUGH CAPABILITY TABLE ON THIS SHEET.

CHINT PV INVERTER RIDE-THROUGH CAPABILITY (IEEE 1547-2018, 2nd Ed.)				
DESCRIPTION	VOLTAGE RANGE (BASE VOLTAGE VARIES BY INVERTER TYPE)	OPERATING MODE/ RESPONSE	MIN. RIDE-THRU TIME (s)	MAX. RESPONSE TIME (s)
VOLT. RIDE-THRU, V_{RT9}	V _{PU} < 0.30	CEASE TO ENERGIZE	N/A	0.16
VOLT. RIDE-THRU, V_{RT8}	$0.30 \le V_{PU} < 0.45$	PERMISSIVE OPERATION	0.16	N/A
VOLT. RIDE-THRU, V_{RT7}	$0.45 \le V_{PU} \le 0.65$	PERMISSIVE OPERATION	0.32	N/A
VOLT. RIDE-THRU, V_{RT6}	$0.65 \le V_{PU} \le 0.88$	MANDATORY OPERATION	SEE NOTE	N/A
VOLT. RIDE-THRU, V_{RT5}	0.88 ≤ V _{PU} ≤ 1.10	CONTINUOUS OPERATION	INFINITE	N/A
VOLT. RIDE-THRU, V _{RT4}	1.10 < V _{PU} ≤ 1.15	PERMISSIVE OPERATION	1	N/A
VOLT. RIDE-THRU, V_{RT3}	1.15 < V _{PU} ≤ 1.175	PERMISSIVE OPERATION	0.5	N/A
VOLT. RIDE-THRU, V_{RT2}	1.175 < V _{PU} ≤ 1.20	PERMISSIVE OPERATION	0.2	N/A
VOLT. RIDE-THRU, V _{RT1}	V _{PU} > 1.20	CEASE TO ENERGIZE	N/A	0.16
DESCRIPTION	FREQUENCY RANGE	OPRATING MODE	MIN. TIME (CRITI	s) (DESIGN ERIA)
FREQ. RIDE-THRU, F _{RT5}	REQ. RIDE-THRU, F _{RT5} f < 57.0 NO RIDE-THRU REQUIREMENTS APPLY TO THIS RANGE			THIS RANGE
FREQ. RIDE-THRU, F _{RT4}	57.0 ≤ f < 58.8	MANDATORY OPERATION	29	99
FREQ. RIDE-THRU, F _{RT3}	58.8 ≤ f ≤ 61.2	CONTINUOUS OPERATION	INFI	NITE
FREQ. RIDE-THRU, F _{RT2}	61.2 < f ≤ 61.8	MANDATORY OPERATION	29	99
FREQ. RIDE-THRU, F _{RT1}	f > 62.0	NO RIDE-THRU REQUIREM	ENTS APPLY TO	THIS RANGE

NOTE: IEEE STD 1547-2018 VOLTAGE RIDE-THROUGH RAMP RATE FOR DER ABNORMAL OPERATING PERFORMANCE IN THE SPECIFIED VOLTAGE RANGE ($0.65 \le V_{PLI} \le 0.88$) IS:

> LINEAR SLOPE OF 8.7 s/1 PU VOLTAGE STARTING AT 3 s @ 0.65 PU

 $T_{VRT} = 3.0 \text{ s} + \frac{0.7 \text{ s}}{1 \text{ PU}} (V - 0.65 \text{ PU})$

- 20' VEGETATIVE BUFFER FROM PROPERTY LINE TO FENCE INV 1-05 ¶ INV 1-06 INV 1-07 INV 1-08¶ ++++++++ INV 1-09 INV 1-10 INV 1-11 12' VEGETATIVE BUFFER FROM — PROPERTY LINE TO FENCE INV 1-12¶ ROUTE DC HOMERUN STRINGS 1-12-6 THRU 1-12-12 IN EAST-WEST RACKING Z-PURLIN SITE PLAN Scale: 1"=50' E-002





SYSTEM DESCRIPTION				
MODULE TYPE	JA SOLAR 'JAM72D30-535'			
MODULE QUANTITY	3,744			
MODULE WATTAGE	535W			
DC SYSTEM SIZE (kW DC)	2,003.04			
AC SYSTEM SIZE (kW AC)	1,500			
DC / AC RATIO	1.335			
INVERTER TYPE	(12) CHINT CPS125KTL-DO/US-600 (125kW)			
# MODULES / STRING	26			
# STRINGS	144			
SAT / TILT	25° FIXED TILT			
RACKING MFG / MODEL	APA			
MODULE ORIENTATION	2 IN PORTRAIT			
ROW SPACING	14.54' CLEAR			

LEGEND UNDERGROUND AC / COMM CONDUIT IN TRENCH, RE: E-INV-1 & E-COM-1
UNDERGROUND AC / COMM CONDUIT IN TRENCH, RE: E-INV-1 & E-COM-1
OVERHEAD MV CONDUCTOR, RE: E-MV-2
UNDERGROUND MV CONDUIT, RE: E-MV-1
—— – – —— INVERTER GROUP BOUNDARY
— — — — CAB MESSENGER WIRE
INVERTER, RACK MOUNTED, RE: E-INV-1
FENCE LINE WITH 15' SETBACK
FENCE LINE GROUNDING LOCATION, RE: E-GND-1
CAB ANCHOR POST, RE: DETAIL A / E-CAB-2



PRECISION SOLAR RENEWABLES JOB NUMBER:



A INTERCONNECTION THREE-LINE DIAGRAM

Fast Rat

---(25 ^G_T)

PRE	CISION SOLAR RENEWABLES JOB 1	NUMBER:
HHA	22018	
SHE		_
	I HREE-LIN DIAGRAM	E
STA	MP:	
	ME PROFESSIONAL ENGINEE LIC. NO. 13412, EXP. 12-31-23	R
DATE:	04	-28-2022
DRAW	/N BY:	IS
		СК
NO.	REVISION	DATE
-	ISSUE FOR PERMIT	04-28-22
PRO		
SCA	ALE:	
	0 ½" 1"	
SHE	DRIGINAL SIZE 24"	<u>X36"</u>
	E-003	8

SEQUENCE	R (Ohms)	X (Ohms)
POSITIVE	0.0540	0.0433
ZERO	0.0676	0.1294

O/H (#1/0 ASCR, 250') U/G (#1/0 AL MV-90, 230')

SEQUENCE	R (Ohms)	X (Ohms)
POSITIVE	0.0231	0.0050
ZERO	0.0367	0.0126

I/C CONDUCTOR IMPEDANCE MATRIX

INV 1-07 INV 1-089 INV 1-094 INV 1-10 9 INV 1-11 INV 1-12 $\mp \mp \mp \mp \mp \mp 6$ CAB SUPPORT PLAN E-CAB-1 Scale: 1"=40'

SCALE: 1" = 40'

LEGEND

CAB MESSENGER WIRE, APPROXIMATE LENGTH 750' RACKING SUPPORT POST WITH:

(3)

CAB MESSENGER PULL POINT (ANCHOR) SUPPORT PILE WITH: (1) END-PIER HARDWARE (9607)

SHEET NOTES

- 1. PLAN INTENDED TO SHOW MESSENGER ROUTING AND BRACKET LOCATIONS. DETAILS INTENDED TO SHOW TYPICAL INSTALLATION DESIGN AND VARY BY LOCATION.
- 2. REFER TO E-CAB-2 FOR HANGER, L-BRACKET, AND END-PIER HARDWARE SPECIFICATIONS.
- 3. CONTRACTOR SHALL VERIFY EQUIPMENT REQUIRED PRIOR TO PURCHASE.
- 4. END PIER BRACKET (9607) TYPICAL OF XX; MID PIER L-BRACKET (9703) TYPICAL OF XX.
- 5. CAB SYSTEM DESIGNED TO ACCOMMODATE SNOW LOAD.
- 6. INSTALL END PIER FOR PULL POINT OF CAB SYSTEM AT LOCATIONS SHOWN. END PIER PILE SHOULD BE A MINIMUM W6X7 SECTION DRIVEN TO A MINIMUM DEPTH OF 10FT AND THE PULL POINT CONNECTION SHOULD BE NO HIGHER THAN 24" FROM GRADE. REFER TO DETAIL A ON SHEET E-CAB-2.
- 7. WHERE ANGLE OF CAB MESSENGER WIRE AT MID-PIER SUPPORT EXCEEDS 15 DEGREES, UTILIZE TWO END-PIER BRACKETS AND BOND AS SHOWN ON DETAIL B, SHEET E-GND-1.

PRECISION SOLAR RENEWABLES JOB NUMBER: 658

HHA JOB NUMBER: 22018

SHEET TITLE:

CAB SUPPORT PLAN

STAMP:

ME PROFESSIONAL ENGINEER LIC. NO. 13412, EXP. 12-31-23

DING CONDUCTOR. THE DC EGC IS ALSO PERMITTED TO SERVE AS THE PV EGC CONNECTION TO THE DE SYSTEM REQUIRED BY NEC 690.47(A) IN ACCORDANCE WITH NEC 250.121, EXCEPTION. OUNDING CONDUCTOR SHALL ALSO SERVE AS THE COMBINED DC GROUNDING ELECTRODE CONDUCTOR. SEE ND TABLE A, SHEET E-003 AND E-INV-2. DING CONDUCTOR. SEE ONE-LINE DIAGRAM AND TABLE A, SHEET E-003 AND E-INV-2. YS ENCLOSING CONDUCTORS AND ALL STRUCTURES SUPPORTING EXPOSED CONDUCTORS OR ELECTRICAL ADE ELECTRICALLY CONTINUOUS BY BONDING TO THE EQUIPMENT GROUNDING CONDUCTOR, OR BY JUMPER USING LISTED GROUNDING COMPONENTS. AND DC GEC SIZE, WHERE EXPOSED TO PHYSICAL DAMAGE, IS #6 AWG CU. SHALL BE UTILIZED AS AC AND DC EQUIPMENT GROUNDING CONDUCTOR, SEE NOTE 2. WHERE CURRENT & ARE RUN UNDERGROUND IN CONDUIT, SEPARATE EGC CONDUCTORS ARE REQUIRED FOR EACH RACEWAY AND	
IWN IN TABLE A, SHEET E-INV-2.	
	PRECISION SOLAR RENEWABLES JOB NUMBER: 658 HHA JOB NUMBER: 22018 SHEET TITLE: ARRAY GROUNDING DETAILS
NOT USED Scale: NTS	STAMP:
	ME PROFESSIONAL ENGINEER LIC. NO. 13412, EXP. 12-31-23
	INU. - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <
	SCALE: 0 ½" 1" ORIGINAL SIZE 24"X36" SHEET NO.: E-GND-2

INV 1-05 ¶ INV 1-06 INV 1-07 ¢-{15} INV 1-089 INV 1-094 INV 1-10 ¶ <u></u>+⊕ INV 1-11 • (3) INV 1-12 **INVERTER AC OUTPUT** Scale: 1"=40' E-INV-1

SCALE: 1" = 40'

E-INV-1

NOTES:

E-INV-2/ Scale: NTS

1. WHERE CONDUCTORS TERMINATE IN A WEATHER-TIGHT ENCLOSURE,

TABLE A: INVERTER OUTPUT CIRCUIT & FEEDER CONDUCTOR/CONDUIT & VDROP SCHEDULE (SWITCHBOARD 'SWBD-1')

				ыхог									
	75° C TEMP	90° C	CC	75° C	90° C			MIN. WRE S	SIZE		CAR		
)	CORR. FACTOR	CORR. FACTOR	PER RACEWAY CORR. FACTOR	ADJUSTED AMPACITY	ADJUSTED AMPACITY	TYPE (SEE NOTE 3)	SETS	PHASE	EGC	CAB SYSTEM LENGTH	SEGMENT VD%	GROUND LENGTH	G
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	317'	<mark>1.10%</mark>	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	225'	0.78%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	156'	0.54%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	100'	0.35%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	110'	0.38%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	140'	0.49%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	198'	0.69%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	254'	0.88%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	282'	0.98%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	338'	1.18%	25'	2-
	0.94	0.96	0.70	147 A	176 A	USE-2	1	(3) #4/0 AL	SEE NOTE 2	394'	1.37%	25'	2-
	0.94	0.96	0.70	205 A	245 A	USE-2	1	(3) 350kCMIL AL	SEE NOTE 2	423'	0.90%	25'	2-

ORIGINAL SIZE 24"X36" SHEET NO .:

0 1⁄2" 1"

- REQUIRED BY STATE AND LOCAL CODES.

- EQUIPMENT ENCLOSURES, DOORS, ACCESS, PLATES AND BARRIERS AND LABEL ALL MEDIUM VOLTAGE EQUIPMENT WITH THE OPERATING VOLTAGE.
- ENCLOSURE, WITH CIRCUIT AND PHASE IDENTIFICATION.
- TERMINAL BOARDS. LABEL ALL WIRES WITH TERMINAL BOARD AND TERMINAL NUMBER AT BOTH ENDS.

				- XX - X		l	
STRING	QTY	STRING	QTY	STRING	QTY	STRING	QTY
LABELS		LABELS	(IVIIIN)	LABELS		LABELS	
1.01.02	4	1-04-01	4	1-07-01	4	1 10 02	4
1 01 02	4	1-04-02	4	1-07-02	4	1 10 02	4
1.01.04	4	1-04-03	4	1-07-03	4	1 10 04	4
1 01 05	4	1.04.05	4	1.07.05	4	1 10 05	4
1-01-05	4	1-04-05	4	1-07-05	4	1-10-05	4
1-01-07	4	1-04-07	4	1-07-00	4	1-10-07	4
1-01-07	4	1-04-07	4	1-07-07	4	1-10-07	4
1_01_09	4	1-04-00	4	1-07-00	4	1-10-09	4
1-01-10	4	1-04-09	4	1-07-09	4	1-10-10	4
1-01-10	4	1-04-10	4	1-07-10	4	1-10-11	4
1-01-11	4	1-04-11	4	1-07-12	4	1-10-12	4
1-02-01	4	1-04-12	4	1-07-12	4	1-11-01	4
1-02-01	4	1-05-07	4	1-08-02	4	1-11-02	4
1-02-03	4	1-05-03	4	1-08-03	4	1-11-03	4
1-02-04	4	1-05-04	4	1-08-04	4	1-11-04	4
1-02-05	4	1-05-05	4	1-08-05	4	1-11-05	4
1-02-06	4	1-05-06	4	1-08-06	4	1-11-06	4
1-02-07	4	1-05-07	4	1-08-07	4	1-11-07	4
1-02-08	4	1-05-08	4	1-08-08	4	1-11-08	4
1-02-09	4	1-05-09	4	1-08-09	4	1-11-09	4
1-02-10	4	1-05-10	4	1-08-10	4	1-11-10	4
1-02-11	4	1-05-11	4	1-08-11	4	1-11-11	4
1-02-12	4	1-05-12	4	1-08-12	4	1-11-12	4
1-03-01	4	1-06-01	4	1-09-01	4	1-12-01	4
1-03-02	4	1-06-02	4	1-09-02	4	1-12-02	4
1-03-03	4	1-06-03	4	1-09-03	4	1-12-03	4
1-03-04	4	1-06-04	4	1-09-04	4	1-12-04	4
1-03-05	4	1-06-05	4	1-09-05	4	1-12-05	4
1-03-06	4	1-06-06	4	1-09-06	4	1-12-06	4
1-03-07	4	1-06-07	4	1-09-07	4	1-12-07	4
1-03-08	4	1-06-08	4	1-09-08	4	1-12-08	4
1-03-09	4	1-06-09	4	1-09-09	4	1-12-09	4
1-03-10	4	1-06-10	4	1-09-10	4	1-12-10	4
1-03-11	4	1-06-11	4	1-09-11	4	1-12-11	4
1-03-12	4	1-06-12	4	1-09-12	4	1-12-12	4

DC RA	TINGS		
I _{мрр мах} <А>	I _{MAX} 	QTY (MIN)	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	
165.6	221.4	1	

LOCATION(S): STICKER SHALL BE APPLIED TO INVERTER. APPEARANCE: WHITE TEXT ON RED BACKGROUND

^		
ппа	22018	
SHE	ET TITLE:	
	LABELS AND MARKINGS	
STA	MP:	
	ME PROFESSIONAL ENGINEER LIC. NO. 13412, EXP. 12-31-23	
DATE:		
DRAWI	N BY:	
	EER: DVED BY	
NO.		
-	IS	
PRO	JECT PHASE:	
	ISSUE FOR PERMIT	
SCA	LE:	

NDU	CTOR/CO	NDUIT & V _{DF}	ROP SCHE	DULE		
	CONT.	MIN. CIRCUIT	OCPD	MIN.	WIRE SIZE	SEGMENT
AGE	CURRENT	AMPACITY	RATING	PHASE	NEUTRAL	VD
kV	69.4 A	86.8 A	100 A	#1/0 AL, 15kV, MV-90, 133% IL	1/3 CONCENTRIC NEUT.	0.01%
kV	69.4 A	86.8 A	100 A	#1/0 "RAVEN" ACSR	#1/0 "RAVEN" ACSR	0.00%
kV	69.4 A	86.8 A	100 A	#1/0 "RAVEN" ACSR	#1/0 "RAVEN" ACSR	0.00%

ITEM	QTY.	DESCRIPTION				
1	-	NOT USED				
2	3	WOODEN POLE, 45' HIGH, CLASS 2				
3 -		NOT USED				
4	1	CPT INCLUDED WITH RECLOSER, 7200/12470 GY:120V, 60:1				
5	TBD FT x 3	EPR CU TAP CONDUCTOR, #1/0 AWG				
6	3	CABLE TERMINATION, 15kV, OUTDOOR, COLD SHRINK				
7	6	10kV-8.4kV MCOV DISTRIBUTION CLASS ARRESTER				
8	TBD FT x 4	#1/0 AWG, PIGEON, ACSR BARE CABLE				
9	90 FT	#4 AWG SOLID COPPER BARE GROUND WIRE				
10	3	VERTICAL POST INSULATOR, 15kV, POLYMER				
11	21	15kV POLYMER DEAD-END STRAIN INSULATOR				
12	3	3/4" x 10' COPPER CLAD GROUND ROD				
13	20 FT	4" RIGID GALVANIZED CONDUIT, 90° ELBOW AND COUPLING				
14	5	4" CONDUIT CLAMP				
15 20 FT 16 4		1-1/2" RIGID GALVANIZED CONDUIT				
		1-1/2" CONDUIT CLAMP				
17	14	FLAT WOODEN CROSSARM BRACE				
18	4	PLATE POLE EYE, 15,000 LBS.				
19	7	3-1/2" x 4-1/2" x 10' WOODEN CROSSARM				
20	TBD	STEEL GUY WIRE 3/8" - EHS (KIT)				
21	3	15kV CUTOUT, 300A SOLID BLADE LINKS				
22	1	15kV CUTOUT FOR CPT PRIMARY, 100A RATED, 1A FUSE LINK,				
23	7	SECONDARY RACK, 1-WIRE				
24	7	SPOOL INSULATOR, 600V, ANSI 53-2				
25	1	15kV RECLOSER, 630A; ABB GRIDSHIELD #A1231BS4NSS1C1GN				
26	1	RECLOSER CONTROLLER, SEL651R (INCLUDED W/ RECLOSER)				
27	-	NOT USED				
28	1	15kV LOAD-BREAK SWITCH, HORIZONTAL UPRIGHT, 900A; HUBBELL #AR111SF OR APPROVED EQUAL				
29	2	ANCHOR, 8" DIA x 5-1/2" LENGTH				
30	1	1-1/2" RIGID GALVANIZED WEATHERHEAD				
31	TBD	AL CABLE, 250KCMIL, XLPE INSULATION, 1/3 CU CONC NEUTRAL				
32	-	NOT USED				

SHEET NOTES:

- POLES ARE SHOWN AS CONCEPTUAL AND ARE FOR DIAGRAMMATIC PURPOSES ONLY. ACTUAL EQUIPMENT AND CONFIGURATION SHALL BE COORDINATED WITH THE UTILITY.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MISCELLANEOUS CONNECTORS TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
- . CONTRACTOR SHALL PROVIDE ALL POLE LINE AND MISCELLANEOUS HARDWARE FOR INSTALLING EQUIPMENT. ALL POLE LINE HARDWARE SHALL BE RATED FOR 10,000 LBS MINIMUM.
- 4. ALL EQUIPMENT AND MATERIALS SHALL BE LISTED FOR THE PURPOSE AND INSTALLED IN ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRIC SAFETY CODE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL NECESSARY MATERIAL, HARDWARE, EQUIPMENT, ETC. COMMON WITHIN THE INDUSTRY TO PROVIDE THE CUSTOMER WITH A COMPLETE AND OPERABLE SYSTEM AS INTENDED BY THESE CONTRACT DOCUMENTS.
- 6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HELICAL ANCHORS WHERE DOWN GUYS ARE REQUIRED. GUY WIRES SHALL BE MINIMUM OF 3/8" STEEL. ANCHORS SHALL BE GALVANIZED SQUARE SHAFT, HELICAL, WITH A MINIMUM DIAMETER OF 8 INCHES. INSTALLATION OF ANCHORS SHALL BE BY EITHER ELECTRICAL OR HYDRAULIC ROTARY TYPE TORQUE MOTOR.
- RTU PANEL, IF REQUIRED, SHALL BE SUPPLIED BY OWNER. CONTRACTOR SHALL INSTALL AND MAKE ALL ELECTRICAL AND COMMUNICATION CONNECTIONS AS SHOWN ON THESE CONTRACT DOCUMENTS.
- 8. ALL CONDUITS RISERS SHALL BE RIGID STEEL CONDUIT AND EXTEND ABOVE GRADE A MINIMUM OF 8 FEET. EXPOSED CONDUIT ENDS SHALL BE SEALED TO PREVENT INGRESS OF MOISTURE.
- 9. ALL UTILITY POLES SHALL CONFORM TO ANSI 05.1, AWPA C4, ANSI C2, AND ANY OTHER APPLICABLE CODES AND STANDARDS.
- 10. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND IN ACCORDANCE WITH THE CURRENT VERSION OF THE NEC AND ALL LOCAL APPLICABLE CODES AND STANDARDS. ALL EQUIPMENT SHALL BE INSTALLED PER NESC AND NEC.
- 11. LIGHTNING ARRESTERS INSTALLED ON RISER POLES SHALL BE RATED FOR RISER INSTALLATIONS. ROUTE SEPARATE GROUNDING CONDUCTOR DOWN POLE FOR ARRESTERS.
- 12. GOAB SWITCH SHALL BE RATED NESC "HEAVY" AND SHALL BE CAPABLE OF OPENING UNDER 1/2" ICE LOADING CONDITIONS.
- 13. MAINTAIN MINIMUM OF 6 FT DISTANCE BETWEEN DRIVEN GROUND RODS.
- 14. GUY WIRES SHALL BE MINIMUM OF 25FT LEAD WITH FIBERGLASS INSULATOR RODS TO MAINTAIN PROPER CLEARANCES. FINAL LOCATION SHALL BE DETERMINED AT SITE. INSULATOR SHALL BE INSTALLED SUCH THAT WIRE IS 12" BELOW ANY LIVE PART WHEN LAYING SLACK AGAINST POLE AND A MINIMUM OF 54" LONG.

(15) (15) TOP VIEW SECTION A-A

STRING SUMMARY						
	PV SWITC	HBOARD 1				
INVERTER	STRINGS	AVG DC LENGTH	AV V			
1-01	12	165'	0.			
1-02	12	134'	0.			
1-03	12	162'	0.			
1-04	12	126'	0.			
1-05	12	265'	0.			
1-06	12	195'	0.			
1-07	12	198'	0.			
1-08	12	205'	0.			
1-09	12	182'	0.			
1-10	12	172'	0.			
1-11	12	156'	0.			
1-12	12	329'	1.			
TOTAL	144	AVERAGE	0.			

E-STR-1

2	S					
ł	TEMP DERATE (90°C PV WIRE)	CC CONDUCTOR PER RACEWAY DERATE	AMPACITY 310.15(B)(16)	TYPE	MAX LENGTH (AVERAGE ALL INVERTERS)	SEGMENT VD
	1.00	0.50	27.5 A	2000V TYPE PV	190'	0.63%
-	NOLU ATED CON	DUIOTODO IN EDEE		45(0)(47))		