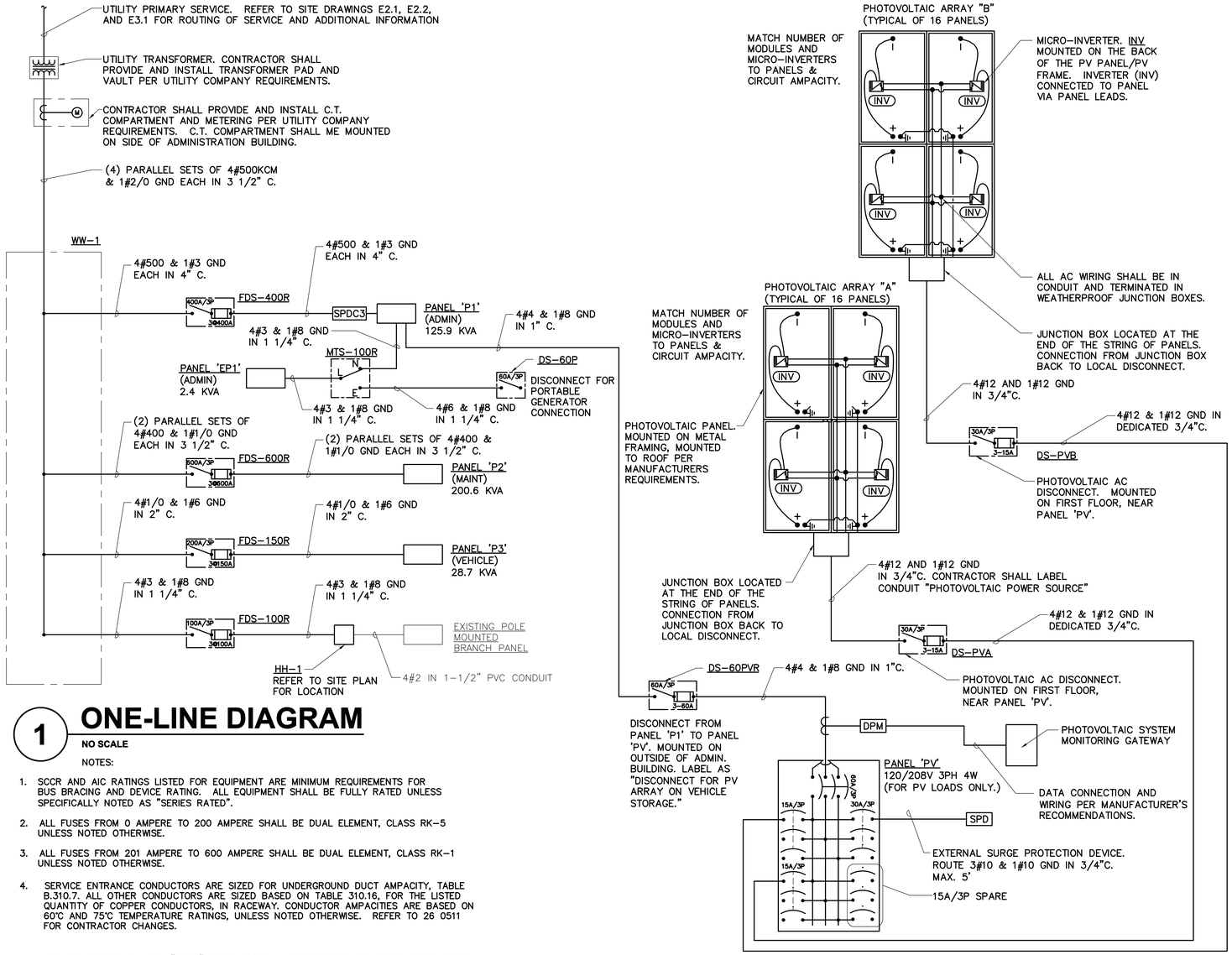

1 ONE-LINE DIAGRAM

NO SCALE

NOTES:

1. SCCR AND AIC RATINGS LISTED FOR EQUIPMENT ARE MINIMUM REQUIREMENTS FOR BUS BRACING AND DEVICE RATING. ALL EQUIPMENT SHALL BE FULLY RATED UNLESS SPECIFICALLY NOTED AS "SERIES RATED".
2. ALL FUSES FROM 0 AMPERE TO 200 AMPERE SHALL BE DUAL ELEMENT, CLASS RK-5 UNLESS NOTED OTHERWISE.
3. ALL FUSES FROM 201 AMPERE TO 600 AMPERE SHALL BE DUAL ELEMENT, CLASS RK-1 UNLESS NOTED OTHERWISE.
4. SERVICE ENTRANCE CONDUCTORS ARE SIZED FOR UNDERGROUND DUCT AMPACITY, TABLE B.310.7. ALL OTHER CONDUCTORS ARE SIZED BASED ON TABLE 310.16, FOR THE LISTED QUANTITY OF COPPER CONDUCTORS, IN RACEWAY. CONDUCTOR AMPACITIES ARE BASED ON 60°C AND 75°C TEMPERATURE RATINGS, UNLESS NOTED OTHERWISE. REFER TO 26 0511 FOR CONTRACTOR CHANGES.
5. ALL WIRE SHALL BE TYPE "THHN" ABOVE GRADE. FEEDERS LOCATED BELOW FLOOR SLAB OR UNDERGROUND SHALL BE TYPE "THWN".
6. ALL CONDUIT LOCATED BELOW FLOOR SLAB OR UNDERGROUND SHALL BE PVC SCHEDULE 40 UNLESS NOTED OTHERWISE.
7. CONDUCTOR AND CONDUIT SIZES ON THE LINE AND LOAD SIDES OF ALL NON-FUSIBLE DISCONNECT SWITCHES SHALL BE IDENTICAL UNLESS NOTED OTHERWISE.
8. (M) INDICATES KILOWATT-HOUR METER AS SUPPLIED BY UTILITY COMPANY.
9. (INDICATES CURRENT TRANSFORMER, SIZE AS SPECIFIED.

2 RENEWABLE ENERGY - PV ONE-LINE DIAGRAM

NO SCALE

DISCONNECT AND STARTER SCHEDULE

REMARKS:

STARTER TYPE:
- FV - FULL VOLTAGE
- YD - WYE - DELTA
- RE - REVERSING
- TW - 2 SPEED, 2 WINDING
- SW - 2 SPEED, 1 WINDING
- RV - REDUCED VOLTAGE AUTOXFMR
- SS - SOLID STATE
- MS - MANUAL STARTER
- MX - MANUAL SWITCH
- FS - FUSED SWITCH

- SA - STANDARD ACCESSORIES (INCLUDES * ITEMS)
- *CT - CONTROL TRANSFORMER, FUSED 120V
- *EO - ELECTRONIC OVERLOAD
- *HA - HAND-OFF-AUTO IN DOOR
- *RP - RED (RUN) PILOT LIGHT IN DOOR
- *TA - TWO CONVERTIBLE AUXILIARY CONTACTS
- S/N - INSULATED NEUTRAL ASSEMBLY
- PF - PHASE FAILURE RELAY (5 HP OR GREATER)
- TO - MELTING THERMAL OVERLOADS
- TS - 2 SPEED SELECTOR SWITCH IN DOOR
- GP - GREEN (OFF) PILOT LIGHT IN DOOR
- FA - 4-CONVERTIBLE AUXILIARY CONTACTS
- EI - ELECTRICAL INTERLOCK (2)-N.O.& (2)-N.C
- SS - START-STOP PUSHBUTTON IN DOOR
- HL - HANDLE PADLOCK HASP

NOTE: ALL DISCONNECTS (EXCEPT MANUAL STARTERS) SHALL BE HEAVY DUTY TYPE.

	DISCONNECT TYPE & RATING					STARTER				
	HEAVY DUTY SWITCH									
ITEM	FUSED	NON-FUSED	CIRCUIT BREAKER	VOLTAGE	POLES	NEMA SIZE	TYPE	NEMA ENCLOSURE	REMARKS	APPROVED MANUFACTURERS
FDS-100R	100A									
FDS-150R	200A			600	3			3R	**SERVICE ENTRANCE RATED**	SQUARE D 3110 H363RB CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
FDS-400R	400A			600	3			3R	**SERVICE ENTRANCE RATED**	SQUARE D 3110 H365R CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
FDS-600R	600A			600	3			3R	**SERVICE ENTRANCE RATED**	SQUARE D 3110 H365R CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-60P		60A		600	3			3R	**DISCONNECT FOR PORTABLE GENERATOR PROVIDE WITH THREADED HUB AND REMOVABLE CAP**	SQUARE D 3110 HU362 CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HNF
DS-60PVR	60A			600	3			3R	**S/N**	SQUARE D 3110 HU362 CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HNF
DS-PVA	60A			600	3			1		SQUARE D 3110 HU362 CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HNF
DS-PVB	60A			600	3			1		SQUARE D 3110 HU362 CUTLER-HAMMER TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HNF

PHOTOVOLTAIC EQUIPMENT SCHEDULE

THE SYMBOLS AND THE EQUIPMENT SCHEDULE ARE FOR THE CONVENIENCE OF THE CONTRACTOR. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF QUANTITIES AND SHALL FURNISH ALL MATERIAL REQUIRED, WHETHER SPECIFIED OR NOT, TO PRODUCE A SATISFACTORY WORKING SYSTEM.

CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE BUT ARE GIVEN ONLY TO AID THE CONTRACTOR IN THE SEARCH FOR MATERIAL. NO MATERIAL SHALL BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. EACH CONTRACTOR SHALL FIRST READ THE COMPLETE DESCRIPTION OF THE MATERIAL ON THESE DRAWINGS AND SPECIFICATIONS. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN. "STANDARD COLOR" INDICATES FACTORY FINISH AVAILABLE AT NO ADDITIONAL CHARGE.

ITEM NO.	SYMBOL	DESCRIPTION	APPROVED MANUFACTURERS
1	PV-1	PHOTOVOLTAIC MODULE, 235 WATTS RATED OUTPUT, LAMINATED GLASS COVER, ALUMINUM MOUNTING FRAME. FIELD INSTALLED FACTORY PROVIDED CONNECTIONS AND TERMINATIONS. NATIONALLY RECOGNIZED TESTING LABORATORY LISTED. COORDINATE EXACT MOUNTING WITH ROOFING MANUFACTURER AND INSTALLER. SEE PLANS FOR CONFIGURATIONS. REFER TO SPECIFICATION SECTION 26 30 05 FOR ADDITIONAL INFORMATION.	KYOCERA KD235GX-LPB SCHOTT SOLAR POLY 235 SUN WORLD SUN MODULE SW235
2	INV	PHOTOVOLTAIC MICRO-INVERTER, MOUNTED TO FRAME RAIL OF PHOTOVOLTAIC FRAME, RATED APPROXIMATELY 210 WATTS, ONE INVERTER PER PANEL, MOUNTING BRACKET INCLUDED TO MOUNT TO FRAME, 60 HZ, 208V 3ϕ OUTPUT VOLTAGE, NOMINAL OUTPUT CURRENT 1.00A, POWER FACTOR >0.95, MINIMUM 15 YEAR WARRANTY, NATIONALLY RECOGNIZED TESTING LABORATORY LISTED.	ENPHASE ENERGY M210
3	DPM	METER, ELECTRON TYPE MOUNTED IN SURFACE CABINET, DIGITAL READOUT OF VOLTS, AMPS, KW, KWH. METER SHALL BE COMPATIBLE WITH PV MONITORING SYSTEM.	POWER MEASUREMENTS 3300 ACM SQUARE-D POWER LOGIC CUTLER-HAMMER IQ DATA PLUS
4	▬	PANEL 'PV', SURFACE MOUNT, 208/120 VOLT, 3 PHASE, 4 WIRE, S/N, COPPER BUS, 16 POLE SPACES, BOLT-ON BREAKERS, GROUND BUS, NEMA 1 ENCLOSURE, REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION. SCCR RATING OF 42,000; ENGRAVED NAME PLATE ON FRONT OF PANEL; ADDITIONAL NAME PLATE TO READ "FOR PHOTOVOLTAIC ARRAYS ONLY. NO ADDITIONAL LOADS SHALL BE USED FROM PANEL". MAIN CIRCUIT BREAKER.	SQUARE D NQ18L1 GENERAL ELECTRIC AQ SIEMENS P1 CUTLER-HAMMER PRL1

BID DOCUMENTS 7/1/2011

Revisions	Date

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I hearby certify that this Plan, Specification, or Report was prepared by me, or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Oregon.
Signature:
Name: Lee D. VanOpdorp
Discipline: Electrical
Oregon Registration No. 78702PE Expiration date: 06.30.12
Date Issued: **.**.**

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NATIONAL CEMETERY ADMINISTRATION

Drawing Title: ELECTRICAL ONE-LINE DIAGRAM AND DISCONNECTS
Approved: Director, Office of Construction Management
Approved: Director, Project Management Service

Project Title: REPLACE ADMINISTRATION AND MAINTENANCE BUILDING AND SITE IMPROVEMENTS
Building Number
Checked: JOHMcG
Drawn: BRAWIT
Location: EAGLE POINT NATIONAL CEMETERY, 2763 RILEY ROAD, EAGLE POINT, OR 97524

Date: 7-1-2011
Project No.: 906CM3009
DRAWING NO.: E-4.1
Dwg. 60 Of 181