DIVISION 26 – ELECTRICAL

SECTION 26 00 00 – OFF-GRID ELECTRICAL SYSTEM UPGRADE

PART 1 – GENERAL

1.1 SUMMARY

This section includes all labor, materials, equipment, supervision, and services required to provide upgrades and improvements to the existing off-grid electrical system at Pacific Valley School.

The existing off-grid system currently consists of:

- Fifteen (15) roof-mounted solar photovoltaic panels
- Existing battery bank consisting of twenty-four (24) 4-volt lead-acid batteries
- Existing primary propane generator
- Existing secondary backup generator (currently non-operational)

The existing solar array charges the battery bank, which supplies power to the school. The generators provide supplemental battery charging and backup power during periods of insufficient solar production.

Work includes, but is not limited to:

- Replacement of existing failed backup generator
- Battery energy storage system replacement
- Inverter and power control system replacement
- Solar array optimization upgrades
- Electrical system integration and upgrades

The intent of this project is to provide a complete, fully functional, and reliable off-grid power system.

1.2 PROJECT INFORMATION

- **Project Name:** Big Sur Unified Pacific Valley School Off-Grid Electrical System Upgrade
- **Location:** 69325 Hwy. 1, Big Sur, CA 93920

1.3 CONTRACTOR QUALIFICATIONS

Contractor shall demonstrate experience with:

- Off-grid electrical systems
- Battery energy storage systems
- Generator integration
- Solar photovoltaic systems

Contractor shall have experience with similar off-grid or hybrid energy systems.

1.4 SCOPE OF WORK

The Contractor shall provide a complete and operational off-grid electrical system.

Any labor, materials, equipment, programming, wiring, controls, or components not specifically listed but required for a complete and fully functional installation shall be included in the base bid.

1.5 CODES AND STANDARDS

All work shall comply with:

- California Electrical Code (CEC)
- National Electrical Code (NEC)
- California Building Code (CBC)
- California Fire Code (CFC)
- All applicable local, state, and federal regulations

1.6 FIELD VERIFICATION

Contractor shall verify all existing conditions prior to bidding.

Submission of a bid constitutes acknowledgment of site conditions and existing system conditions.

No additional compensation will be provided for conditions that could have been reasonably observed during field verification.

1.7 WORK IN OCCUPIED FACILITY

The site will remain occupied during construction.

Contractor shall:

- Coordinate all work with the District
- Minimize disruption to school operations
- Maintain continuous operation of critical systems whenever feasible

1.8 TEMPORARY POWER

Contractor shall provide temporary power and/or sequencing as required to maintain school operations during construction.

1.9 SUBMITTALS

Contractor shall provide:

- Product data for all major equipment
- Battery system specifications
- Generator specifications
- Inverter and control system specifications
- Outdoor battery cabinet specifications
- System diagrams and wiring diagrams
- Installation details
- Commissioning plan

1.10 WARRANTY

Provide minimum one (1) year warranty on labor and materials.

PART 2 – PRODUCTS

2.1 GENERATOR SYSTEM

Provide:

- New approximately 45KW propane generator suitable for off-grid continuous-duty operation
- Generator communication and integration with inverter/battery charging system

The new generator shall:

- Replace the existing failed secondary generator
- Become the new primary generator for the facility

- Fully integrate with inverter and battery charging systems

The existing operational generator shall remain in place and become the secondary backup generator.

Include:

- All wiring and controls
- Startup and commissioning
- Coordination required for complete operation

2.2 BATTERY ENERGY STORAGE SYSTEM

Provide complete battery energy storage system replacement including:

- Removal and disposal of existing twenty-four (24) 4-volt lead-acid batteries
- Demolition and removal of existing battery housing/enclosure
- New lithium-ion battery storage system with approximately 95,000 watt-hour capacity
- New outdoor battery equipment cabinet and associated equipment

Battery disposal shall comply with all applicable regulations.

2.3 OUTDOOR BATTERY EQUIPMENT CABINET

Provide a weatherproof outdoor electrical equipment cabinet suitable for installation of lithium-ion battery storage and associated power equipment.

Cabinet shall:

- Be minimum IP66 rated or equivalent
- Be lockable and vandal-resistant
- Be constructed of powder-coated steel or aluminum
- Include ventilation suitable for battery and power equipment installation
- Include cable entry provisions for power and communication wiring
- Be suitable for outdoor installation in coastal environments
- Be sized appropriately for approximately 95 kWh battery storage system and associated controls

Cabinet shall accommodate:

- Lithium-ion battery modules

- Battery management system (BMS)
- Associated disconnects and controls
- Monitoring and communication equipment

2.4 INVERTER AND POWER CONTROL SYSTEM

Provide:

- New inverter system with approximately 30KW combined capacity
- Two (2) solar charge controllers
- Monitoring and display system
- All required controls and communication interfaces

System shall:

- Integrate seamlessly with battery storage and generator systems
- Be capable of generator communication and battery charging management
- Optimize solar production from existing rooftop solar array

2.5 SOLAR PV SYSTEM OPTIMIZATION

Existing roof-mounted solar array consisting of fifteen (15) solar panels shall remain in place.

Contractor shall:

- Provide solar optimizers for existing array
- Reconfigure and optimize existing wiring as required
- Improve overall system efficiency and solar harvesting capability

System improvements shall be designed to:

- Increase usable solar production
- Improve charging efficiency
- Optimize compatibility with new inverter and battery systems

System shall be designed recognizing the site has limited solar exposure and remains generator-dependent.

2.6 ELECTRICAL SYSTEM UPGRADES

Contractor shall upgrade electrical distribution components associated with inverter output.

Work shall include:

- Replacement of existing 60A wiring between load panel and main distribution panel
- Upgrade to 100A capacity wiring and associated breakers
- Reuse of existing conduit where feasible

Approximate distance between panels is approximately fourteen (14) feet.

Contractor shall provide:

- All breakers
- Feeders
- Conductors
- Connections
- Associated electrical components required for complete installation

PART 3 – EXECUTION

3.1 GENERATOR INSTALLATION

Contractor shall:

- Remove existing failed secondary generator
- Install new approximately 45KW propane generator
- Configure new generator as primary system generator
- Reconfigure existing operational generator as backup generator

Contractor shall include:

- Coordination of all controls and communication systems
- Startup and testing
- All work required for complete system operation

Modification of existing door opening and framing may be required based on generator dimensions and installation requirements.

3.2 BATTERY SYSTEM INSTALLATION

Contractor shall:

- Remove existing lead-acid battery system

- Demolish and remove existing battery enclosure
- Install new lithium-ion battery system
- Install new outdoor battery equipment cabinet
- Complete all wiring and communication connections

Contractor shall coordinate:

- Equipment access
- Heavy equipment requirements
- Safe removal and disposal procedures

3.3 INVERTER AND CONTROL SYSTEM INSTALLATION

Contractor shall:

- Remove existing inverter and control equipment
- Install new inverter system and controls
- Install solar charge controllers
- Install monitoring/display system
- Complete all wiring and integration

3.4 SOLAR ARRAY OPTIMIZATION

Contractor shall:

- Maintain existing rooftop solar array
- Install solar optimizers
- Reconfigure existing array wiring as required
- Integrate array with new inverter and battery systems

3.5 SYSTEM INTEGRATION

Contractor shall fully integrate:

- Solar array
- Battery storage system
- Generator systems
- Inverter and controls

System shall operate as a coordinated off-grid electrical system.

3.6 TESTING AND COMMISSIONING

Provide:

- Startup and commissioning
- Functional testing
- System integration verification
- Operational testing under load conditions

3.7 TRAINING

Provide training to District personnel including:

- System operation
- Monitoring functions
- Basic troubleshooting procedures

3.8 CLOSEOUT

Provide:

- As-built documentation
- System diagrams
- Manufacturer documentation
- Warranty information

3.9 EXCLUSIONS (UNLESS NOTED)

The following are excluded unless specifically included:

- Structural engineering
- Roof structural modifications
- Tree removal or vegetation clearing
- Hazardous material abatement unrelated to battery disposal
- Utility service upgrades outside project scope

END OF SECTION 26 00 00