Sol 140P5426R0014, Amendment 0001, Attachment 0003-Updated SOW replaces Attachment 0001-SOW in its entirety.

Scope of Work (SOW)

Solar Power Installation – Outworks Restroom

San Juan National Historic Site

PMIS 352569

501 Calle Norzagaray
San Juan, Puerto Rico
National Park Service

1. Project Overview

The Contractor shall provide all labor, materials, supervision, equipment, permits, engineering, testing, commissioning, and incidentals necessary to design and install a complete off-grid photovoltaic (PV) solar power system with battery storage for the Outworks Restroom, a designated historic structure located within San Juan National Historic Site, San Juan, Puerto Rico.

The intent of this project is to provide a reliable off-grid electrical power system because commercial utility power is not currently available at the facility. The system shall include photovoltaic generation, battery energy storage, inverter equipment, controls, and all associated components necessary to support restroom operations as the primary power source.

The system shall be designed to provide approximately 50 amps of electrical service utilizing the existing distribution panel and shall support restroom operations for a minimum of eight (8) hours per day.

All work shall comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties, National Park Service preservation policies, and all applicable federal, territorial, and local regulations.

2. Existing Conditions

The facility consists of:

- One male restroom
- One female restroom
- One storage room

Commercial utility power is not available at the site.

This project is not a replacement for an existing photovoltaic system.

No roof drawings or structural drawings are available.

No known asbestos-containing materials, lead-based paint, or other hazardous materials concerns have been identified.

The restroom facility shall remain operational during construction to the maximum extent practicable.

3. Historic Preservation Requirements

1. No irreversible alteration to character-defining features of the structure shall occur.
2. Solar panels shall be installed in a manner that:
    - Minimizes visibility from primary public viewpoints.
    - Preserves historic rooflines and architectural character.
    - Avoids removal or permanent damage to historic masonry, stone, or roofing materials.
3. Roof penetrations shall be minimized and fully reversible where feasible.
4. Mounting systems shall avoid anchoring into historic masonry unless specifically approved.

5. All attachment methods and designs shall be reviewed and approved by the Government prior to installation.
6. Contractor shall coordinate with:
    - NPS Cultural Resources Staff
    - Historic Architect (if assigned)
    - State Historic Preservation Office (if required)
7. Mock-up installation may be required prior to full installation.

Historic Preservation Reviews

Historic preservation compliance reviews are currently in progress. No specific review timeline is available. The Contractor shall coordinate with the Government and shall not proceed with installation activities requiring preservation approval until written approval is received.

4. Site Assessment, Engineering, and Design

The Contractor shall:

1. Conduct a detailed site investigation including:
    - Structural evaluation of the existing roof and supporting framing.
    - Assessment of existing roofing materials.
    - Electrical load analysis.
    - Verification of existing 50-amp distribution panel configuration.
    - Evaluation of battery storage and inverter requirements.
2. Perform a complete structural assessment of the building.
3. Prepare structural calculations and drawings signed and sealed by a Professional Engineer licensed in Puerto Rico.
4. Develop complete electrical design drawings signed and sealed by a Professional Engineer licensed in Puerto Rico.
5. Design the system for:
    - Coastal marine exposure.

- High humidity and salt-air conditions.
- Hurricane wind loads.
- Current Puerto Rico Building Code requirements.
- Historic preservation requirements.

6. Provide visual simulations or renderings demonstrating minimal visual impact to the historic setting if requested by the Government.

Government approval of design documents shall be obtained prior to construction.

Structural Reinforcement

Any structural reinforcement determined necessary by the Contractor's engineering analysis shall be included within the project scope and contract price.

5. System Requirements

System Intent

The photovoltaic system shall be designed and installed as a completely off-grid electrical power system.

System Sizing

The Contractor shall provide a photovoltaic system, battery storage system, and inverter system capable of supporting restroom operations for a minimum of eight (8) hours per day utilizing the existing 50-amp distribution panel.

The Contractor shall determine final system sizing based on field-verified loads, operational requirements, battery autonomy requirements, and site conditions.

Battery Storage Requirements

Battery storage is mandatory.

The system shall include battery storage and inverter equipment sufficient to support restroom operations as the primary electrical power source.

The battery storage system shall be integrated with the photovoltaic system and sized to support restroom operations for a minimum of eight (8) hours per day.

6. Permitting and Compliance

The Contractor shall obtain all required permits and ensure compliance with:

- National Electrical Code (NEC)
- Puerto Rico Building Code
- National Historic Preservation Act (NHPA)
- Secretary of the Interior's Standards
- NPS Director's Order 28 (Cultural Resource Management)
- OSHA regulations
- Applicable utility and permitting requirements

All inspections shall be coordinated by the Contractor and successfully completed.

Permit closeout documentation shall be provided to the Government.

7. Materials and Equipment

Provide and install:

- High-efficiency photovoltaic modules
- Battery energy storage system
- Inverter system sized to support required loads
- Corrosion-resistant mounting systems
- Hurricane-rated attachment systems
- Disconnect switches
- Grounding systems
- Overcurrent protection devices
- Conduit and wiring systems
- Equipment labels and signage
- Emergency shutdown equipment

Remote monitoring systems and subscription-based monitoring services are not required.

All equipment shall be UL-listed and suitable for coastal marine environments.

8. Installation

The Contractor shall:

1. Install the photovoltaic array in approved locations.
2. Install battery storage equipment and inverter equipment.
3. Protect all historic materials during construction.
4. Utilize preservation-approved flashing and waterproofing methods.
5. Connect the system to the existing 50-amp distribution panel.
6. Label all equipment in accordance with NEC requirements.
7. Restore all disturbed areas to original condition.

9. Testing and Commissioning

The Contractor shall:

1. Perform complete startup and commissioning.
2. Verify proper operation of photovoltaic, inverter, battery, and distribution systems.
3. Verify electrical output meets design requirements.
4. Conduct final inspections with NPS personnel.
5. Submit a written commissioning report.

10. Required Deliverables

The Contractor shall provide:

- Stamped structural calculations
- Stamped structural drawings
- Stamped electrical drawings
- One-line electrical diagrams

- Permit documentation
- Permit closeout documentation
- Equipment submittals
- Product data sheets
- As-built drawings
- Operations and Maintenance manuals
- Emergency shutdown procedures
- Training documentation
- Commissioning reports
- Warranty documentation
- Photo documentation of installation
- Any additional deliverables identified in Section 8 of this Scope of Work

11. Training

The Contractor shall provide training to Government personnel covering:

- System operation
- Battery system operation
- Safety procedures
- Emergency shutdown procedures
- Preventive maintenance requirements

Training documentation shall be provided.

12. Warranty and Maintenance

Minimum warranty requirements are:

- Solar Panels: 25-year performance warranty
- Inverters: 10-year manufacturer warranty

- Workmanship: One (1) year minimum

The workmanship warranty period shall begin upon Government acceptance of the completed project.

Contractor labor shall be included for all warranty repairs during the warranty period.

Preventive maintenance services shall be performed during the warranty period and included in the contract price.

13. Professional Engineer and Experience Requirements

Design drawings and calculations shall be signed and sealed by a Professional Engineer licensed in Puerto Rico.

The Contractor shall demonstrate experience designing and installing photovoltaic systems on historic structures and facilities requiring historic preservation coordination.

Experience working with historic buildings and preservation-sensitive construction methods is required.

14. Hurricane Design Requirements

The Contractor shall design all structural, electrical, and mounting systems in accordance with the current Puerto Rico Building Code and all applicable wind-load requirements.

Structural calculations and drawings shall be signed and sealed by a Professional Engineer licensed in Puerto Rico.

All mounting systems shall be designed for coastal hurricane exposure and long-term durability.

15. Period of Performance

All work, including design, permitting, installation, testing, commissioning, training, and closeout documentation, shall be completed within one hundred twenty (120) calendar days from Notice to Proceed (NTP).

Important Site Consideration

Because the Outworks Restroom is located within the historic fortification setting of San Juan National Historic Site, visual impacts, attachment methods, preservation of historic materials, hurricane resistance, and long-term durability within a coastal marine environment are critical project requirements.