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

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1. Project Overview

The Contractor shall provide all labor, materials, supervision, equipment, permits, and incidentals necessary to design and install a complete photovoltaic (PV) solar power system capable of delivering approximately **50 amps of electrical service** to the Outworks Restroom, a designated historic structure located in San Juan, Puerto Rico.

All work shall comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and National Park Service preservation policies.

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2. 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 shall be reviewed and approved by the NPS Historic Preservation Office 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 for approval prior to full installation.

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3. Site Assessment and Design

The Contractor shall:

1. Conduct a detailed site investigation including:
    - Structural capacity of roof framing
    - Historic roofing materials assessment
    - Electrical load analysis confirming 50-amp service needs
2. Develop stamped design drawings by a licensed Professional Engineer registered in Puerto Rico.
3. Ensure system is designed for:
    - Coastal marine environment
    - High humidity and salt exposure
    - Hurricane wind loads per Puerto Rico Building Code
4. Provide renderings or visual simulations demonstrating minimal visual impact to the historic setting.

Government approval is required before installation begins.

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4. 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

All required inspections shall be coordinated and passed.

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5. Materials and Equipment

Provide and install:

- High-efficiency, low-profile photovoltaic panels
- Corrosion-resistant (marine-grade aluminum or stainless steel) racking
- Hurricane-rated attachment system

- Inverter(s) sized to deliver 50-amp service
- Disconnects, grounding, and overcurrent protection
- Conduit systems routed to minimize visual and structural impact
- Monitoring system
- Battery storage system (if required by final design)

All equipment shall be UL-listed and appropriate for coastal historic environments.

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6. Installation

1. Install roof-mounted solar array in approved location.
2. Ensure all penetrations are properly flashed and waterproofed using preservation-approved methods.
3. Protect adjacent historic fabric at all times.
4. Install 50-amp service connection to restroom distribution panel.
5. Label all components per NEC.
6. Restore all disturbed areas to original condition.

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7. Testing and Commissioning

1. Perform startup and system commissioning.
2. Verify electrical output meets design requirements.
3. Conduct final inspection with NPS Facilities and Cultural Resource staff.
4. Provide written commissioning report.

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8. Documentation and Training

Provide:

- As-built drawings
- Product data and warranties
- O&M manuals
- Photo documentation of installation
- Staff training on system operation and maintenance

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9. Warranty

- Solar Panels: Minimum 25-year performance warranty
- Inverters: Minimum 10-year warranty
- Workmanship: Minimum 1-year warranty

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10. Period of Performance

Work shall be completed within ___ calendar days from Notice to Proceed.

Important Consideration for This Location

Given the structure is located in San Juan within a historic fortification setting associated with San Juan National Historic Site, visual impacts, masonry anchoring, and hurricane resistance will be especially critical.

Battery Storage Requirements
Battery storage is mandatory. The project's intent is to provide an off-grid photovoltaic system because commercial utility power is not currently available. The system shall include battery storage and an inverter sufficient to support restroom operations as the primary power source. The system should support restroom operations for a minimum of eight (8) hours per day.

System Intent
The system shall be designed as an off-grid system.

Period of Performance
All work shall be completed within 180 calendar days from Notice to Proceed.

Structural Assessment and Reinforcement
The Contractor shall perform a structural assessment and provide stamped drawings by a Professional Engineer licensed in Puerto Rico. Structural drawings are not available. Any reinforcement determined necessary by the design shall be included in the scope.

Existing Electrical Conditions
The facility consists of one male restroom, one female restroom, and one storage room. Commercial utility power is not available. This is not a replacement of an existing solar system.

System Sizing
The Contractor shall provide a system capable of supporting restroom operations for a minimum of eight hours per day utilizing the existing 50-amp distribution panel.

Historic Preservation Reviews
Compliance reviews are in progress. No specific review timeline is available. All attachment methods and designs require Government approval.

Monitoring System
Remote monitoring and subscription services are not required.

Hurricane Design Requirements
The Contractor shall design in accordance with the current Puerto Rico Building Code. Structural calculations and drawings shall be signed and sealed by a Professional Engineer licensed in Puerto Rico.

Warranty Requirements
The one-year workmanship warranty begins upon Government acceptance. Contractor labor shall be included for warranty repairs. Preventive maintenance is required during the warranty period.

Required Deliverables

Provide stamped structural calculations, stamped electrical drawings, permit closeout documentation, one-line diagrams, emergency shutdown procedures, training documentation, and all deliverables identified in Section 8 of the SOW.

Site Conditions

No roof drawings are available. No known asbestos, lead paint, or hazardous materials concerns have been identified. The restroom shall remain operational during construction to the maximum extent practicable.

Professional Engineer and Experience Requirements

Design drawings shall be stamped by a Professional Engineer licensed in Puerto Rico. Experience with historic structures is required.