GOVERNMENT OF SAINT LUCIA

Ministry of Economic Development, Housing, Urban Renewal, Transport and Civil Aviation

DEPARTMENT OF ECONOMIC DEVELOPMENT, TRANSPORT AND CIVIL AVIATION

Project Coordination Unit

March 5, 2018

Dear Potential Bidders

Reference: Addendum #004 to ICB Bidding Document
 # #SLU-PVSOLSYS-GOODS-ICB-01-17
Supply and Installation of Solar-Photovoltaic (PV) Array for the EU Owen King Hospital (National Hospital) Millennium Highway, Castries, Saint Lucia
Saint Lucia –SOLAR PV Demonstration and Scale Up Project

Addendum #004 to ***ICB Bidding Document # #SLU-PVSOLSYS-GOODS-ICB-01-17***

Item #1

Clause 4.1 of Subsection 4.0 PURCHASER PROVIDED FACILITIES AND SERVICES of Section VII Schedule of Requirements, is amended to read as follows:

4.1 The arrays interconnection, Point of Common Coupling (POCC) should be in the penthouse electrical panels. Purchaser will be responsible for all work associated with providing a POCC for Supplier connection. Connection to any "essential load" panel that is backed up by a genset shall have a reverse-current relay control system engineered and installed by Bidder to ensure backfeeding the backup genset is eliminated.

Bidder can propose POCC wherever deemed most beneficial and cost effective taking into account the entirety of the tender requirements.

The Distribution panels are between 10-30 feet from the roofs where the solar Panels will be installed. Each wing has a distribution panel for connecting the solar.

Item #2.

Section VII Schedule of Requirements is amended to include the Structural Assessment Report and Drawings related to the Roofing system.

Drawing #	Drawing Description
S1	As built Design for the National Hospital Roof
S2	As built Design for the National Hospital Roof
R1 – R3	Roof Reinforcement Details for the National Hospital Roof

Item #3.
Section VII Schedule of Requirements, Sub Section 6.7 Monitoring and Communication has been amended to include Clause I.

6.7 Monitoring and Communication

A. Monitoring / SCADA system data sheet shall be included in proposal submittal, and utilized for all engineering calculations. Monitoring system shall comply with all items in this section.

B. Supplier shall supply, install, and commission the monitoring and communication system hardware at the site.

C. At least one (1) human machine interface (HMI) shall be present on site.

D. System shall display data in real time and record and log performance data at regular intervals. Fifteen (15)-minute data capture or higher resolution is preferred. The data shall be directed through Purchaser's interface and then to the internet for remote access, monitoring and archiving.

E. Minimum local data storage to be five (5) days.

F. Monitoring System shall provide an online graphic user interface (GUI) that can be viewed on a web site or embedded in the Purchaser's web site. If a subscription-based program, Proposal shall include at least a 20-year subscription for online monitoring, with notation on whether that service is included for the service life of the system.

G. All monitoring systems on the project shall be the same manufacture and model to ensure compatibility in operational procedures.

H. Supplier shall be prepared to install an LCD monitor display in the main hospital lobby that is capable of displaying the inverter manufacturer's GUI and real-time energy production of the PV System, as well as a static slide show produced by the Purchaser. Supplier shall coordinate with the Purchaser's IT Department to commission this monitoring display. The cost for this work will be negotiated separately from this tender and should not be included in the Bidder's Schedule-A worksheet.

I. Purchaser will provide an industry standard Ethernet internet point of connection in the penthouse.

Item #4.
Section VII Schedule of Requirements, sub section 6.3 Inverters has been amended to include Clause M.

6.3 Inverters

A. Inverter data sheet shall be included in proposal submittal, and utilized for all engineering calculations. Inverters shall comply with all items in this section.

B. Acceptable inverter types: string, microinverters. Central inverters will not be considered due to array layouts.

C. The inverter manufacturer and specific model will be considered acceptable if that make and model is included in the 2017 version of the California Energy Commission database as published at www.gosolarcalifornia.ca.gov.

D. Inverter or module-level electronics enclosure(s) shall be rated NEMA-6 if potentially exposed to wind-driven water or salt spray. Enclosure shall be NEMA-3R for all other applications.

E. Inverter minimum CEC efficiency is 97%.

F. Output current harmonics must be <3% THD

G. Capable of full rated output at 50°C ambient.

H. Shall be IEEE-1547 compliant.

I. DC input voltage of 800 VDC minimum, 1000 VDC or higher preferred if allowable by the AHJ and approved by the Purchaser.

J. Inverter warranty shall be at least ten (10) years.

K. All inverters on the project shall be the same manufacture and brand series to ensure compatibility in operational and maintenance procedures.

L. Inverters sized such that DC-AC Derate Factor is no greater than 1.15 or 115%.

M. Inverters shall be mounted in the mechanical penthouse, and not under the roof structure. There is sufficient wall space for mounting inverters near the electrical panels in each wing penthouse. This can be a painted-white plywood backer board attached to the drywall, or a unistrut frame on the exposed wall purlins.

Item #5.
Clause A POWER CAPACITY of Sub section 2.5 PV SYSTEM DESCRIPTION, of Section VII Schedule of Requirements, has been amended to read:

A. POWER CAPACITY. The PV System shall have a power capacity of **200 kW DC STC**, total among all arrays, based on the conceptual layout, module power rating, and purchasing efficiencies.

Item #6.
Clause 2.5 E. of Subsection 2.0 DESCRIPTION OF THE WORK of Section VII Schedule of Requirements has been amended to read:

E. EQUIPMENT STORAGE AND STAGING. Refer to the attached layout and structural drawings for limitations on roof loading. Temporary storage for pallet placement on the roof for pallets of up to 2,000 lbs, if desired, shall be the responsibility of the Contractor. The penthouse mechanical rooms can be used for storage and staging equipment, however, there should not be obstruction to access existing equipment. Space will be allocated behind the building for two 40' shipping containers. Supplier shall coordinate with Building Engineer.

Item #7.
Clause A. General of Sub Section 5.0 Design and Operational Criteria of Section VII Schedule of Requirements is amended to read as follows

Supplier shall always consider the four goals of the installation being safety, long life, performance, and appearance.

Project and individual components shall have the individual and system warranties stated herein.

Project shall be designed for fully automatic unattended operation.

Project electrical design will be in compliance with applicable codes and standards listed herein, unless otherwise noted.

Clause J. of Sub Section 6.3 Inverters of Section VII Schedule of Requirements is amended to read as follows

J. Inverter warranty shall be at least ten (10) years.

Safety, Power Capacity, & Energy Production Test, Sub section 3. Wrap Warranty has been amended to read as follows:

WRAP WARRANTY

By submitting a Proposal, Contractor warrants that the PV System shall be free from all defects in design, labor, workmanship, equipment and materials for a period of three (3) years following the date of Final Payment ("Wrap Warranty Term").

Pursuant to the Wrap Warranty, Contractor shall, at Owner's option, either (a) re-perform any defective work or replace any defective equipment or materials, both at Contractor's sole cost and expense, or (b) reimburse Owner for the costs and expenses incurred by Owner to re-perform any defective work or replace defective equipment or materials.

In connection with providing these remedies and if Contractor reasonably determines that a defect may relate to any component subject to a manufacturer's warranty, Contractor shall initiate and process a warranty claim to the manufacturer, working together with Owner and/or its operation and maintenance provider.

If the manufacturer accepts the claim as a valid warranty claim, the Contractor's obligation will remain in effect to be partially offset by the compensation or replacement equipment offered by the manufacturer. However, if the manufacturer rejects the warranty claim for any reason other than for the fault of Owner and/or its operations and maintenance provider, or if manufacturer does not respond to the warranty claim within 45 days, then the Wrap Warranty shall apply fully to the PV System.

GCC 28. 3 is amended to read as follows:
Warranty, the place of final destination shall be: **Department of Sustainable Development, Ground Floor Norman Francis Building, Union, Castries, Saint Lucia**

The period of validity of the Warranty shall be:

Modules shall have a minimum 10-year workmanship warranty, and minimum 25-year power-production warranty be warranted for twenty-five (25) years, with linear degradation warranty starting at no less than 97% of rated capacity and degrading no more than 0.7% for all subsequent years.

Minimum for installation workmanship: For thirty six (36) months from the successful completion of acceptance and verification tests.

Inverters: For ten (10) years after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination, or for Ten and a half (10.5) years after the date of shipment from the port or place of loading in the country of origin, whichever period concludes earlier.

Solar module racking: For material, ten (10) years after the date of shipment from the port or place of loading in the country of origin. For roofing and solar module mounting installation, five (5) years from successful completion of acceptance and verification tests.

Photovoltaic modules power output: At least ninety percent (90%) of the rated power after 10 years or eighty percent (80%) power output for twenty (25) years from date of shipment from the port or place of loading in the country of origin.

Item #8.
Sub Section 5.3 Operating Criteria of Section VII Schedule of Requirements is amended to delete Clause C and add Clause F.

A. The nominal grid characteristics are: 415/230 VAC, 50 Hz.

B. DC Arc Fault Circuit Detection. DC Source Circuits and DC Output Circuits shall be protected by inverter circuitry.

C. ~~Rapid Shutdown of PV Systems on Buildings. DC Source Circuits and DC Output Circuits extending more than 10' from the array or more than 5' within a building shall~~

~~be controllable to less than 30 V and 240 VA within 10 seconds of actuation of rapid shutdown controls, unless local code requires more stringent measures, and all components shall be listed and identified.~~

D. DC source circuit or DC output circuit voltage shall be limited to 1,000 VDC, and no intentionally grounded phase conductor (employing isolated, "floating" inverter architecture).

E. Communications network: Ethernet or daisy chain via wiring in conduit is preferred. Other options may be acceptable with Independent Engineer approval.

F. **Rapid shutdown not required**

Sub section Safety Placarding of Section VII Schedule of Requirements is amended delete Clause 11.

SAFETY PLACARDING

The following are minimum requirements for labeling the PV System components. Additional signage may be appropriate to address other considerations and local Code.

The marking shall adequately warn of the hazard using effective words and/or colors and/or symbols. Refer to "ANSI Z535.4-2011, Product Safety Signs and Labels" for guidelines for suitable font sizes, words, colors, symbols, and location requirements for labels.

The label shall be permanently affixed to the equipment or wiring method and shall not be hand written. The exception applies to portions of labels or markings that are variable, or that could be subject to changes, shall be permitted to be hand written and shall be legible. The label shall be of sufficient durability to withstand the environment involved in the location where they are installed.

1. Equipment

Each inverter, converter, rectifier, panelboard, disconnect, or other component shall have a placard identifying it that matches the description on the single-line diagram, array plan, site plan, and other drawings.

2. Conduits or wireways containing DC Source Circuits and DC Output Circuits

PV Source Circuits. PV source circuits shall be identified at all points of termination, connection, and splices.

The labels or markings shall be reflective and shall be a minimum height of 9.5 mm (3/8") in white on a red background. Labels shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceilings, or floors. Spacing between labels or markings, or between a label and a marking, shall not be more than 3 m (10').

WARNING: PHOTOVOLTAIC POWER SOURCE

3. Utility-interactive inverter, near the ground-fault indicator at a visible location

WARNING
ELECTRIC SHOCK HAZARD
IF A GROUND FAULT IS INDICATED, NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

4. **Disconnect switch where both sides of the circuit could be energized at the same time**

WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

5. **Any wireway or other enclosure where ungrounded wiring may be exposed**

WARNING
ELECTRIC SHOCK HAZARD.
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED.

6. **DC Disconnect**

PHOTOVOLTAIC DC DISCONNECT
RATED MAXIMUM POWER-POINT CURRENT, Impp = List
RATED MAXIMUM POWER-POINT VOLTAGE, Vmpp = List
MAXIMUM SYSTEM VOLTAGE, Voc = List
MAXIMUM CIRCUIT CURRENT, Isc = List
MAXIMUM RATED OUTPUT CURRENT = List (for a charge controller, if installed)

7. **Point of Common Coupling (POCC)**

WARNING
DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

8. **AC Panel that serves as POCC, and the PV AC output is connected at the opposite end of the busbar from the primary power source due to busbar amperage limitations**

WARNING:
POWER SOURCE OUTPUT CONNECTION —
DO NOT RELOCATE THIS OVERCURRENT DEVICE

9. **AC Panel that serves as POCC, and the busbar amperage limitation is based on the total amperage rating of all overcurrent protection devices connected to the busbar**

WARNING:
THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR

10. **AC Combiner Panel and AC Disconnect**

PHOTOVOLTAIC AC DISCONNECT
MAXIMUM AC OPERATING CURRENT = List
NOMINAL AC VOLTAGE = List

Item #9.
Subsection 6.6 Racking System of Section VII Schedule of Requirements has been amended to update Clause E and add Clause G

6.6 Racking System

A. Racking system data sheet shall be included in proposal submittal, and utilized for all engineering calculations. Racking system shall comply with all items in this section.

B. Racking components shall be fabricated from aluminum or stainless steel.

C. The racking shall be designed and constructed to provide a stable support system for the PV modules that will remain effective throughout the design life of the Project. Module support structures shall meet all applicable codes and standards.

D. The racking, module attachment method, and roof attachment method shall comply with IBC 2009, ASCE 7-10, and local codes for wind speed, as specified herein.

E. Module mounting shall be bottom bolting or frame slots. Top clamping may be employed provided that each module is individually clamped using "end-clamps." and not using "mid-clamps" where one clamp is attached to two adjacent modules. If there is a manufactured mid-clamp that would allow one module to be removed without compromising the attachment integrity of the adjacent module(s), while adhering to the wind code, then that would accomplish the intent of this requirement. Structural Engineer analysis and certification during the engineering phase shall be furnished to document.

F. Structure shall be designed in accordance with the local site environmental data provided in Section 4

G. Roof attachment and hardware type shall be aluminum or stainless steel, and manufacturer engineered for the specific use. Water seal methodology shall be engineered as integral to the attachment foot. Attachment and water sealing shall not be "invented" by the bidder

Item #10
Clause C of sub clause 5.4 Codes, Regulations and Standards of Section VII Schedule of Requirements has been amended to read:

A. In the event that any Applicable Law or Industry Standard does not govern specific features of any item of equipment and materials, Temporary Work or system, Original

B. Equipment Manufacturer (OEM) standards shall be applied, with Purchasers approval. Where local codes or ordinances will have an impact on the design, Purchaser and Supplier shall jointly address these with the local authorities having jurisdiction.

C. Listed herein are the principal codes and standards applicable in the design, fabrication and installation of the Project; these are not intended to be all inclusive. Where local codes or ordinances will have an impact on the design, Supplier shall be responsible for meeting the codes or obtaining variances from local authorities having jurisdiction.

D. Supplier shall design and construct the Project in accordance with the following standards, as applicable.

Electricity Supply Act Cap 9.02, 2008

IBC – International Building Code

IFC – International Fire Code

IEEE – Institute of Electrical and Electronics Engineers

ISA – Instrumentation Society of America

NEC – National Electric Code

NEMA – National Electrical Manufacturers Association

NESC – National Electrical Safety Code

NFPA – National Fire Protection Association

UL – Underwriters' Laboratories

In the case where standards have conflicting requirements, Purchaser and Supplier will develop a mutual agreement of the prevailing standards.

Implies adherence to applicable local codes.

Item #11.
Clause 8.4 Grounding of Sub section 8.0 Electrical Installation of Section VII Schedule of Requirements, has been amended to include Clause E.

8.4 Grounding

A. All ground conductors and grounding systems shall be UL listed for the intended use, and shall meet all NEC and code requirements.

B. Grounding conductors (GEC or EGC) shall be green with yellow stripe or bare copper.

C. Conduit or other raceway shall not be used as the Equipment Grounding Conductor (EGC). This restricts the ability of the over-current protection device (OCPD) to clear a fault and can result in inconsistent grounding in cases of corrosion.

D. All inverters shall be grounded. Inverters with an intentionally grounded DC conductor shall employ a DC Grounding Electrode Conductor (DC-GEC) and an Equipment Grounding Conductor (EGC). The DC-GEC and EGC may be combined into one conductor, provided that installation follows the more strict requirements for either conductor. Inverters with no intentionally grounded DC conductor shall employ a (EGC) only.

E. The solar array shall have its own dedicated ground, whether Grounding Electrode Conductor or Equipment Grounding Conductor terminated and bonded to the POCC for each array.

Item #12.
Sub Clause C of Clause 6.3 Inverters of Sub Section 6.0 Equipment and Materials of Section VII Schedule of Requirements, amended to read:

C. Inverters shall be listed by manufacturer and type (not necessarily model number) if that make and model is included in the 2017 version of the California Energy Commission database as published at www.gosolarcalifornia.ca.gov. Inverter shall be UL listed, or other national test listing standard.

Item #13.
Sub Clause A, of Clause 8.7 Lighting Protection and Transient Voltage Surge Suppression (TVSS) of sub Section 8.0 Electrical Installation of Section VII Schedule of Requirements has been amended to read:
Inverter sub-panels shall have a Category-B TVSS, integral or located within six conduit-feet of the panel to which they are connected. The enclosure shall have a green indicator light that is lit when the unit is operable and useable. The TVSS shall be removable and replaceable without disabling the protected electrical panel.

Item #14.
Section VII Schedule of Requirements is amended to include a) images and drawings of the existing distribution panels b) the schematic electrical drawing of the project site and c) images of the GenSet at the project site as follows:

Eight (8) images of the Distribution Panels
The electrical schematic drawings and
Six (6) images of the GenSet,

Item #15
Sub Clause F of Clause 2.5 PV System Description of sub section 2.0 Description of the Works of Section VII Schedule and Requirements PV System Description has been amended to read:

F. ROOF PROTECTION. Supplier shall participate in an independent pre and post roofing survey with the Purchaser and authorized representatives. Any roof repairs necessary prior to the Project will be the responsibility of the Purchaser. During Installation, the Contractor shall observe all roof-protection requirements described by the survey or the Purchaser's Agent, and shall be responsible for all repairs required as a result of the Project. Supplier shall use the Purchaser's roofing Supplier or warranty provider for all corrective work at the expense of the **Supplier.**

Item #16
Sub Section 3.0 Supplier Requirements of Section VII Schedule of Requirements had been amended to add Clause 3.6.

Proposed Roof works description
The Rood strengthening will be primarily concerned with the securing of

1. **Ridge cap**
   This involves replacing existing TEK stitch screws at the ridge with nut and bolt that penetrate through the insulated panel. Each building has 95 feet of ridge cap flashing,

2. **Hip corner flashing**
   This involves placing additional TEK screws both sides into the hip corner flashing and into the underlying purlin. Each building has 60 feet of Hip corner flashing.

3. **Gable end flashing**
   This involves placing of additional TEK stitch screws on the top side at the Gable end to secure the existing riveted flashing. Each building has 60 feet of gable end flashing

Thank you for your interest in this Project.

Yours faithfully

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Philip Dalsou (Mr.)
Permanent Secretary