Philadelphia University

Tender Documents for the
Photovoltaic Power Station project

January, 2014
1. **Introduction**

1.1. **About Philadelphia**

PHU is located in the middle Region of Jordan along the high way which connects Amman with Jerash since its foundation PHU has witnessed rapid expansion. Number of students is around (6200) and academic and administration staff are around 600.
1.2. Project Overview

PHU energy vision aims at utilizing renewable energy and implementing energy efficiency measures to achieve in phases net zero energy consumption and minimum carbon emissions at its campus. In stages the mission of this strategy is to provide suitable energy management, apply conservation of energy opportunities, and utilize available renewable energy resources. Management of water consumption, resources and facilities at the university to achieve smarter and environmentally friendly campus will be through applying advanced scientific and technological approaches and by encouraging and supporting research and development in relevant fields.

PHU is proposing to build a 1.5 MW PV power plant in 3 equal phases at its campus. The proposed PV station will supply 25%-30% of PHU total electricity consumption. This step will be added to the already steps taken by the university to conserve energy using efficient electrical systems and minimize unnecessary use of electricity.

The interested bidders shall submit their technical and financial offers along with their solution (design) into the following two methods of construction only.

1.2.1 Design, Build, Operate and Transfer (D. BOT):
The winning bidder will design and build a (0.5MW PV) power plant without using storage system, operate it for the period that offered by the bidder and then transfer the full ownership back to (PHU) once the offer period is over. During the operating period PHU will buy all of the electricity produced by the station through an agreement "Power Purchase Agreement". The price of the kWh should be (0.174 JD/KWH). This price will be used as a guideline for evaluation different offers. Thus, the time of transfer should be part of the offer. The remaining expected life of the station should be covered by “The Performance guarantee agreement” as stated in Annex 2.
1.2.2. Engineering, Procurement and Construct (EPC)

The winning bidder will design and construct in accordance with His accepted financial offer a (0.5MW PV) power plant, test, operate and handing Over successfully to (PHU) in one year from the date of commencement followed By a three years of maintenance period including spare parts free of charge from the Date of completion to the final handing over as stated in these documents, e.g. Annex 5.

2. General Terms and Conditions

2.1. It will be the bidder’s sole responsibility and on his own expenses to understand the site nature, environment and all requirements that are related to the tender or that may influence its pricing.

2.2. The bidder will be fully responsible for verifying any information that may be made available to him. Under no circumstances will PHU be deemed responsible for the consequences of any such offered information.

2.3. Bidders requiring further information or clarifications may notify PHU in Writing to Central Tendering Department. PHU will respond in writing to any request for information or clarification of the bid.

2.4. To assist in the examination, evaluation and comparison of bids, PHU may ask In writing the bidder for a clarification of the bid. No change in the price or substance of the bid shall be sought offered or permitted.

2.5. PHU will determine to its satisfaction whether the bidder selected as having submitted the lowest-evaluated responsive bid is qualified to satisfactorily perform the project.

2.6. The determination of winning offer will take into account the bidder’s financial, Technical and production capabilities and the life time of the proposed project. The determination of the winning offer will also take into consideration the documentary evidences of the bidder’s qualifications and any other information that PHU deems necessary and appropriate.

2.7. PHU will award the tender to the successful bidder whose bid has been determined to be the most proper responsive bid, provided further that the bidders is determined to be qualified to satisfactorily perform the Contract.
2.8. Bidder / Bidders should submit two offers. One offer should be based on D-BOT and one offer based on EPC. Failure to submit any of these two methods the bidder will be disqualified.

2.9. The Tender will be awarded as one lot for “design and construct” in one of the two methods of construction referred to in this document that considered to be the most suitable technical and financial offer to PHU.

2.10. The bidder may consider the specifications in the technical specifications sections as a guideline for the minimum requirements for building the solution that achieve the goal.

2.11. The bidders must quote clustered prices for all components referred to in their submitted solution (Design) including bill of quantities (B.O.Q) along with description, specifications, country of origin, and manufacturer of equipments, materials, tools … etc.

2.12. In any offer, if any item needed during the installation and was not stated in the offer; then it is the bidder’s responsibility to provide it at no cost in the case of (EPC) method, and without affecting the offer time or price in the case of (BOT). However, any omission of any part of the (BOQ) shall be deducted from the price in (EPC) offers, whereby In (BOT) offers, the cost of omitted material/Items will be deducted directly from PHU payments.

3. **Tender Format**

The tender proposals have to be developed based on PMI standards and shall include but not limited to the following sections:

3.1 Overview.
3.2 Detailed hardware and software description.
3.3 Comprehensives and full design, specifications, calculations, drawings, technical details … etc.
3.4 Prices: All prices (itemized bill of quantities (BOQ)) should be in JD, clear, itemized and include all customs and taxes. If an item is not priced then the offer may be considered not satisfactory, and / or considered to be zero price.
3.5 Bidder qualifications: as requested later in this document.
3.6 Training: as requested later in this document.
3.7 Installation and testing plan: as requested later in this document.
3.8 Operation
3.9 Warrantee, maintenance and technical support.
4. **Tender Bond**

The bidder / bidders offer shall not be considered unless it is accompanied by a tender bond equal to (10%) of contract sum as stated in the form annexed here to (Annex 4).

This guarantee should be:

4.1. Issued by a licensed local bank, approved by the client.

4.2. Issued in the name of PHU. This amount will be paid by the guarantor, on first demand if it becomes evident that information given by the Contractor contained false statements.

4.3. Valid for 90 days from date of submission of offers and be renewable for future periods as the (PHU) deems necessary.

4.4. Returned after signing the agreement and a performance security (Bond) has been duly entered into and executed.

4.5. If the accepted bidder fails to provide a performance bond and signed performance Guarantee Agreement within (14) days of being requested by the client (PHU) to do so the full amount of tender bond shall become payable to the client as compensation for such default.

5. **Performance Bond (Security)**

5.1. The bidder / bidders who win the contract (Contractor) is required to obtain guarantee of performance bond from a bank operating in Jordan and approved by the client (Employer) in respect of performance of the contract in the form of a bond annexed here to (Annex 5) or any other form approved by the client in sum of (10%) of the contract price.

5.2. The Contractor shall present the approved performance bond within (14) days of being notified by registered letter that he has been awarded the contract and in any case prior to signing the contract agreement and the awarding decision.

6. **Evaluation Criteria**

The evaluation for each offer will go through three steps.
6.1. **Evaluation Step 1:** The compliance with specifications will be examined. Thus, each offer must provide a compliance sheet. Any offer must pass this step to move to the next evaluation step.

6.2. **Evaluation Step 2:** To move to the final evaluation step, the offer must pass the minimum requirements described in SOW and get a score more than (70%). The following scale will be used to calculate the scores:

- 6.2.1. Design Compliance. 35%
- 6.2.2. Quality of proposed products. 25%
- 6.2.3. Bidder Qualification. 25%
- 6.2.4. Warrantee, maintenance and technical support. 5%
- 6.2.5. Training. 5%
- 6.2.6. Installation and testing plans. 5%

6.3. **Evaluation Step 3:** In this step, the Economic aspects (pricing and/or transfer period) will be evaluated. Though, the minimum requirements in the Scope of Work (SOW) stated that the efficiency of the PV modules should not be less than 15%, using higher efficiency modules and thus less land use for the project will be appreciated. The cost of land will be used to evaluate the final price of each bidder. The less land used the less final cost. No roof tops of existing buildings can be used.

7. **Bidders Qualifications**

The following are the minimum qualifications required for any bidder. The bidder experience shall be considered in the evaluation of the technical and financial offers. References, when it applies, should be included in the offer.

7.1. Bidder should have enough experience and certified technical staff to do the design, installation and support.

7.2. Name, experience, certificates and CVs of the engineering staff who will supervise the installation and support should be included.

7.3. The bidder must nominate in the offer a **certified project manager** who will lead the company project team during the implementation of the project.
7.4.  Experience and capability to supply solar technology and the successful supply such solar technology for at least one (1) power plant with a total production capacity of not less than (1 MW) installed capacity, connected to a grid and operating consecutively for the last two (2) years.

7.5.  Operating and maintaining of at least one (1) currently operating solar PV power plant with a total production capacity of not less than (1 MW) installed capacity, connected to a grid and operating for the last two (2) years.

7.6.  Served as EPC contractor in the design, construction and supply / purchase of at least one similar system technology.

8.  Training

8.1  The offer should include site training for PHU technical staff. Training must focus on, but not limited to, the following:

8.1.1  Operation
8.1.2  Problems and fault analysis
8.1.3  Software installation and administration for the Associated software modules (if any)
8.1.4  Configuration
8.1.5  Data acquisition and monitoring system
8.1.6  Management
8.1.7  Preventive and routine maintenance

8.2  The training has to meet the following requirements:

8.2.1  Offered by a certified instructor
8.2.2  Training dates must be listed in the offer
8.2.3  Training must be completed before the final acceptance of the project
9. Implementation, Installation and Testing Plan

More details about the testing and transfer agreements are presented in the SOW (Scope of Work). The following rules must be satisfied

9.1 The bidders must provide an implementation/installation plan in accordance with the required standard for project management. It must have clear milestones timetable.

9.2 All components and equipment must be tested and certified by TUV or equivalent. The complete system must be tested and certified by a third party as described in SOW document and in other parts of the tender document.

9.3 The successful bidder must develop reports for all serial numbers, manufacturer, country of origin … etc, of all awarded and delivered equipments, materials … etc. These reports must be submitted during the installation process and before the final acceptance of the project.

10. Maintenance Guarantee

10.1 For EPC offer:

10.1.1 The EPC contractor must provide PHU with “Performance Guarantee Agreement” signed as described in Annex 2.

10.1.2 All work should be maintained for three years starting from the date of acceptance, against bank guarantee issued in the name of PHU by a licensed a local bank in Jordan, accepted by PHU and equal to (5%) of contract sum which should be submitted by the contractor prior to taking over certificate in a form submitted by the contractor and approved by client.
10.1.3 Maintenance offer should include a maintenance contract with Detailed terms for technical support, response time and spare parts Needed.

10.1.4 Offer must include a clear way and contact information that PHU Technical team can use in case of emergencies.

10.1.5 Offer of warrantee service must be clear and bidder must show his Commitment for doing the following:

**10.1.5.1** Response time for problem call.
**10.1.5.2** Response time for problem solving.
**10.1.5.3** Response time for software/configuration support call if any.
**10.1.5.4** Response time for solving software/configuration support call if Any.
**10.1.5.5** Response time for (hardware/software) failure of the system or Any other components related.
**10.1.5.6** Actions that will be taken during failure.
**10.1.5.7** Response time for failed equipments or any other components Replacements.

For (D.B.O.T.) offer:

10. Same as Item 10.1 above excluded the (5%) bank guarantee.

11. **Design Specifications**

The Design Specifications for the PV Station are detailed in the SOW annex. These specs are the minimum requirements, and considered to be as guideline only, however, bidders must offer comprehensive and full design requirements in accordance with international codes and standards. The location of the proposed PV power plant(s) must be provided by the bidder. The PV power plant(s) station could be located in several locations; each location must be comply with conditions stated in section 5.7.11 of Annex1.

11.1 bidders must quote in their offers if all other items (Equipments Machine, Technical components) are needed to make the setup functional. If any item needed during the installation or at any stage of testing and or commissioning and was not stated in the offer; then it is the bidder’s responsibility to provide at no cost.
11.2 It is the bidder sole responsibility to make sure that the offered design is complete, checked and approved by a third party specialist. And to make sure that the devices and modules are compatible with each other and compatible with the existed structure for connection purposes. If the bidder found a need for modifications in the existed structure he must also highlight in his offer. Thus it is the bidder responsibility to inspect and examine the local distribution grid and connection.

11.3 PHU has the right of excluding items and changing the quantities when awarding this tender, in order not to exceed the available budget without Effecting the technical requirements and actual need.

11.4 The bidder who wins the tender shall be responsible and on his cost for Nominating a third party specialist to be accepted by (PHU) or its representatives to carry on the testing and commissioning of the project at completion, and submit his technical report prior to handing over.

12. Scope of Work

Preparation of submission of complete and comprehensive design and all technical documents for photovoltaic generating stations at PHU campus. More details about design specifications and other requirements are presented in Annex 1. However, the work shall include but not be limited to the following:-

12.1 Preparation of the site layout plan for the university site for the purposes of this project with an area as requested by bidders including but not limited to storm water management, service roads, pictorial indications of key equipment features (e.g. access doors for power stations, control enclosures, and switchgears, orientation of foundations and equipments required on site.

12.2 Preparation and submission of tender drawings and tender documents for the photovoltaic generating stations site including infrastructure including roads and footpath network, rainwater mains, electrical network, and lighting.

12.3 Preparation and submission of all tender documents for construct, test, operate and maintain of the photovoltaic power station(s) project including, but not limited to:-

12.3.1 General specifications

12.3.2 technical specifications

12.3.3 Bills of quantities
12.3.4 Special conditions
12.3.5 Drawings.
12.3.6 Design calculation.
12.3.7 List of codes and standards.
12.3.8 List of manufacturers and country of origin for all proposed equipments, material, tools … etc, that are related to the design requirements and specifications.

13. Performance

The offer shall be evaluated depending on the design that clarifies the work plan, interaction with relation between the different elements. Special attention shall be paid to:

13.1 The overall installed capacity of PV Modules and Invertors shall not be less than 0.5MW based on 1000 w/m² solar irradiation.

13.2 The bidder should provide an anticipated annual generation table for the PV station installed at PHU during the expected lifetime of the station. The expected life time should not be less than 25 years. This table shall be used as a base line in the Performance Guarantee Agreement.

13.3 In all circumstances the winning bidder should be able to provide PHU with a signed copy of the Performance Grantee Agreement. The Bidder should clearly state in his offer that he is capable of providing a signed copy of Performance Guarantee Agreement. The failure of providing a signed copy of Performance Guarantee Agreement PHU will apply section 4.5.

14. Method of Payment (Term of Payment)

14.1 The bidders shall submit a proposed PHU the method of payment within this construct (tender) when submitting their financial offers which must be for the two method of construction referred to in this documents separately for PHU study and evaluation.

14.2 Bidder that not including financial offers for the two method of construction shall be rejected.

14.3 The winning bidder (Contractor) shall be paid by the client in a monthly statements which shall be in an approved form within (28) days from the date of submission.
15. Penalties

The expected time for project completion is (180) calendar days unless agreed otherwise. There will be a penalty for every unjustified delay. For EPC contract, there will be 250 JD/day for every unjustified delay. In the case of DBOT, the unjustified delay days will not be added to the transfer agreement. The delayed days will be counted as if the contractor is fully utilizing the station. The maximum period of delay for DBOT track will not be more than one year, after that PHU has the right to do any necessary actions.

16. Additional Special Conditions:-

16.1 This agreement includes two parties, the first party is the client (PHU), and the second party is the bidder who wins the bid. The local contractor is the leader of the J.V Joint Venture.

16.2 The bidder / bidders has no right to object to the technical and financial evaluation criteria applicable to this tender.

16.3 The bidder should take into consideration that his price includes all fees, taxes and social security and /or any other fees or taxes, including the value added tax (VAT), ( Sales Tax ).

16.4 The bidder must submit all the original documents, authenticated and stamped by the signature of the firm.

16.5 The client has the right to terminate the tender without declaring the reasons.

16.6 The J.V. parties must submit their agreement with the tender documents, signed and sealed by both parties and duly legalized by a notary public prior to the award of the contract.

16.7 The bidder who wins the bid remunerated for all works within this contract to the named leader of the J.V. and not separately for each party.

16.8 The Evaluation of the submitted offers is only for the purpose of this tender.

16.9 Any un- authenticated documents will not be considered for the Evaluation.

16.10 The Technical Offer should not contain any hint to the financial offer.

16.11 The design shall comply in full with all international safety codes in respect of life safety and construction site safety.
16.12 The bidder shall design a well integrated security monitoring and control system for the safety and security of the property and its occupant.

16.13 The bidder shall make presentations to the client representatives if requested at the conclusion during the stage evaluation, using power point soft ware or similar electronic format.

16.14 All drawings shall conform to the standard sizes of A0, A1 and A2 and their reduced size of A3. All drawings shall be in accordance with the requirements within this T.O.R. and shall be prepared using arch. CADD such as auto cad and arch. CAD. The working drawings shall be saved in CD’s and the CD’s shall be submitted to the clients per requirements of this T.O.R. and shall become the property of the client. Drawings should be well organized and easy to identify using file names and access codes.

16.15 The bidder shall submit design documents fully in compliance with the requirements of the following authorities:
- Ministry of Public Work and Housing.
- Civil Defense Directorate.
- Electricity Regulatory Commission.
16.16 The bidder and along with the bills of quantities, shall provide detailed calculations of the quantities stated therein. These shall include one copy of quantity take-off’s abstract sheets etc. As indexed, files and readily understandable. One copy of take-off drawings marked up to explain detail calculations shall be provided.

16.17 The bidder who wins the bid shall submit monthly progress report during the period of this contract.

16.18 This report shall identify progress on works tasks, estimated completion date of tasks in comparing with the contract working program, issues and problems etc.

16.19 The bidder and prior to awarding the contract with the successful bidder and upon the client request should submit the break down for both methods of construction referred to within this separately.

16.20 The bidder who wins the bid (Contractor) shall submit and within (14) days of commencement date a working program showing the planned duration for all activities using a primavera program.

17. General Conditions of The Engineering Services Agreement

The general conditions of the contract shall be the condition of contract for works of civil Engineering contraction (FIDIC) issued by the ministry of public work and housing at Jordan (2010). Tenderers (Bidders) must undertake that they are in possession of their own copy of this document. Any conflict between the tender document conditions and FIDIC (if any), these tender document conditions shall prevail.

18. ADDITIONAL GENERAL CONDITIONS:

18.1. TERMS OF REFERENCE: The services to be performed by the contractor under this agreement (herein after called the services) relating to works (herein after called the works) described in these Terms of Reference.

18.2. Contract Language: All descriptions, reports, specifications, technical data, tender documents and correspondence between the two parties shall be in English and (or) Arabic unless otherwise agreed upon between the contractor and the client.

18.3. Law Governing Agreement: The Agreement shall be governed and construed in accordance with the laws in Jordan.

18.4. Agreement in Force: The agreement shall become operative immediately upon signing the contract by the two parties.

18.5. Commencement Date: The contractor shall commence the works
Within (14) fourteen days after the agreement has come into force.

18.6. **Completion Date:** The contractor shall complete all works referred to in this contract, including testing, commissioning and taking over within the period of time of (180) calendar days from the commencement date issued by the client or his representative.

18.7. **Liquidated Damages:** The contractor shall pay liquidated damages at the rate as follows:

18.7.1. In case of design and build method of construction the (L.D) shall be (250) two hundred fifty JD per day. The total liquidated
damages shall not exceed a ceiling of 15% of the contract Sum in the use of (EPC) remuneration of each relevant part of the works.

18.7.2. In the case of (D.B.O.T) method of construction (see item 15 in this T.O.R).

188.8. Variations, Alternations and Additional Works

18.8.1. PHU preserves the right to alter the volume of the works by 25%, and maintain the original prices and rates of the agreement.

18.8.2. Should circumstances arise which call for modifications during the implementation of the works, these may be made with mutual consent of both parties and given in writing.

18.8.3. The contractor is obliged to carry out all modifications in due time after receiving the client’s written order.

188.9. Default of the Contractor (J.V): All disputes and differences shall be handled through arbitration.

188.10. Termination of the Agreement by the Client: The client has the right to terminate the agreement for any reason whatsoever, by written order from the client. In such a case the contractor will continue to complete the requirements of the agreement and submit them to the client. The client will give written notice to the contractor stating his intention to terminate the contract giving the contractor at least thirty (30) days time to take appropriate steps to bring works to a close in an orderly manner and to reduce expenditure to a minimum. The client will compensate the consultant according to a mutual agreement or in accordance with the articles stated at general condition (FIDIC).

188.11. Settlement of Disputes between the Client and the Contractor: Any disputes or differences arising out of this agreement between the two parties shall be settled either through amicable settlement or by arbitration described in general conditions of this contract and in accordance with the Jordan Law of Arbitration. Otherwise disputes shall be settled under the jurisdiction of the relevant courts of the Hashemite Kingdom of Jordan.

18.12. TAXES

18.12.1 Value Added Tax, (VAT): The contractor is required to fill in the specified space of the remuneration schedule for the provisional sum designated to the sales tax which constitutes 16% of the total contract sum. If PHU received
A sale tax exemption, this money will be deducted from the Financial offer.

18.12.2 The contractor shall be responsible for all taxes, duties and Fees born by this project.

18.13. Labor Laws: The contractor shall follow the labor laws and Regulations valid in Jordan for the employment of his staff working in Jordan.

18.14. Registration in the Jordanian Engineering Syndicate: The Contractor (J.V.) shall register with the Jordanian Engineering Syndicate as required by for the performance of the services under this Agreement.

18.15. Currency: The remuneration of the contractor will be in Jordanian Dinars.

18.16. Insurance: The contractor shall take out and maintain adequate Insurance against third party liability and against loss or damage to Works performed by him, and in favor of the University (PHU). The Required insurance is meant for professional liability. The insurance Company may be Jordanian or non-Jordanian but must be operating in Jordan.

18.17. Performance Bond: The contractor shall provide a Performance Bond for a sum equivalent to Ten Percent (10%) of the total Agreement value for the due performance of the Agreement under the terms of the Conditions of Agreement. As stated at Annex 5 (Performance Bond Form)

18.18. General Provisions: The contractor specifications given in this Agreements in a conceptual form are to be used as guidelines only. The Contractor is expected to optimize these requirements in accordance With state of the art modern PV Station design with respect to Functionality, work ability, performance and good utilization and land Use and good utilization of space. The contractor shall secure approvals of all documents and drawings of the project by the Directorate of Civil Defense.
Annex 1; scope of work

1. INTRODUCTION

This Scope of Work (the “SOW”) is to develop, permit, engineer, design, procure, construct, interconnection to PHU -supplied transformer, commission, startup and test a turnkey photovoltaic facility which is built to a nameplate capacity of 0.5 MW (DC) and which performs to an agreed upon Performance Guarantee (the “Facility” or the “Project”).

It is required from each bidder “called hereafter The Contractor” to provide two envelopes; one containing EPC offer and one containing BOT offer for the same 0.5MW solar station.

The Contractor will design all aspects of the Facility, including the layout, civil, electrical and structural components. All final design drawings shall be issued by the Contractor for this Project.

The Contractor will procure, or have procured by Subcontractors, all Materials required to build and commission the Facility according to this SOW and the Project drawings and all applicable codes and standards, with the exception of equipment and materials which are required to be procured, installed or tested by PHU pursuant to the Interconnection Agreement.

Except as otherwise expressly provided in the Contract, PHU is not responsible for providing any material, labor or services of any kind during the Contractor’s execution of the Work. The Contractor is fully responsible for all development, permitting, engineering, procurement, construction, interconnection, startup and testing activities and will deliver a complete, operational and reliable turnkey photovoltaic Project to PHU.

2. PROJECT DESIGN

The Contractor shall design and build a photovoltaic solar energy generation facility. The Project will be designed and built to operate at a maximum DC voltage of 1000-volts (DC).

2.1. Equipment

2.1.1. Solar modules: The Contractor shall supply and install all required PV Modules to satisfy a minimum of 0.5 MW power plant at solar radiation of
1000 W/m². The efficiency of any module should not be less than 15%. All modules must be TUV certified or equivalent.

2.1.2. Mounting system: The Contractor shall supply and install the racking as the mounting system for the solar modules. The system shall be composed of galvanized steel and/or aluminum. The racking manufacturer will supply a suitable warranty for the installed structure and the racking design will be certified by the solar module manufacturer. The inverters should have a combined nameplate capacity of at least 500 kilowatts. The size of each inverter should permit to have one or two invertors in stock.

2.1.3. Inverters: The Contractor shall supply and install inverters (with their pads) wiring/cabling to those pads in accordance with the national/international standards. Connecting the system to the grid. PHU will facilitate providing any information in this regard.

2.1.4. Metering systems: The Contractor shall install or have installed appropriate equipment that allows for the metering of the energy delivered by the Facility to the local electric distribution system in order to meet the requirements of PJM.

2.1.5. Electrical Interconnection: The Contractor shall assure that the Facility is properly interconnected at the point of delivery to the step-up transformer and shall provide all interconnection equipment and structures up to this point of delivery.

2.1.6. Control and Monitoring System: The Contractor shall supply and install monitoring hardware and software, including interconnection communications, as described in Segment 1B Solicitation – Additional Requirements, Section 9.5 and elsewhere. The monitoring system shall be configured for automatic reporting of generation statistics required by PJMGATS.

2.1.7. Any available drawings and data that describe the existing Site and the design and construction of the Project shall be provided by PHU.

2.2. Applicable Codes and Standards

The Project’s engineering, design, construction, startup and testing shall follow the applicable codes, standards and publications that are in effect on the NTP Date and which are consistent with Industry Standards.

2.3 Interconnection

The design of the interconnection, as specified in the Interconnection Agreement, will be furnished by the contractor and approved by PHU. Notwithstanding the above, The Contractor shall be responsible for all design, procurement, construction and startup of any and all equipment or services required to be provided under the this project. The Contractor shall also be fully responsible for integrating and coordinating his design to properly interconnect to the Interconnection Provider’s facilities.
3. PERMITS
All Permits required to execute the Work are the responsibility of the Contractor. The contractor shall identify known Permit requirements. The cost of preparing, filing and obtaining the Permits shall be included in the Contract Price. The Contractor shall provide PHU copies of all approved Permits and applications for Permits still in process on the effective date of this Contract.

4. PROJECT MANAGEMENT
The Contractor shall have project management responsibilities for the duration of the Work. The Contractor shall appoint a single representative as its Project Manager. The primary project management deliverables are described here:

4.1. Monthly progress reports shall be provided by EPC Contractor by the second Monday of every month covering the prior month’s activities and progress. The report shall cover each of the major areas of responsibility as follows: Engineering, Permitting / Environmental, Procurement, Safety, Construction Startup and Testing. For each major area of responsibility (i.e. engineering, permitting / environmental, procurement, safety, construction, startup and testing) and for the completion status of the Project in general, EPC Contractor shall provide a progress versus planned report. The reports shall outline areas of concern and plans for corrective action to maintain the project schedule.

4.2. Monthly progress reports will commence on the second Monday of the month following the month in which NTP is granted.

4.3. A weekly status meeting or conference call will be held with PHU and EPC Contractor to discuss current and planned activities or significant issues. Contractor shall issue an Agenda and a Weekly Report / Action Items List at least one day prior to the weekly status meeting or conference call.

5. ENGINEERING

5.1. The Contractor is responsible for all engineering and design. Where required by PHU, drawings and documentation shall be signed and sealed by a registered engineering consultation office.

5.2. The Contractor will submit to PHU design drawings, data and documents for review and comment. The drawings, data and documents will be submitted to PHU when they are deemed 90% complete by The Contractor. PHU will review and comment.

5.3. The Contractor shall provide copies of the following studies and reports as they are completed and issued in final form:
   • Geotechnical Report and Test Ramming Report
   • Solar Production Studies
5.4. Detailed Site Layout and Design

5.4.1. It is the responsibility of The Contractor to generate a site layout that specifies a Project with a nameplate AC capacity of 0.5 MW, which means the sum of the nameplate AC capacities of the inverters, shall be 0.5 MW. The DC portion of the Facility which is defined as the sum of the nameplate capacities of the solar modules under Standard Test Conditions shall not be less than 500 kW (DC).

5.4.2. The site layout shall include the location of photovoltaic arrays, inverters, transformers, switchgear, fencing, laydown / staging areas, site access roads and any other permanent features of the Project such as landscaping and storm water management provisions, if applicable. The site layout shall include dimensions of key site features to existing landmarks or survey monuments. Once the site layout drawings are approved by PHU, The Contractor shall not make changes to the site layout drawings without PHU prior review and written approval. The site layout shall include pictorial indications of key equipment features (e.g. access doors for power stations, control enclosures and switchgear) so that the detailed designers and construction subcontractors can determine how the equipment and foundations are to be oriented on site.

5.4.3. The Contractor shall generate a site plan, which indicates the civil, structural and electrical Work that is required for the successful completion of the Project and for permitting.

5.5. Structural Engineering

5.5.1. Structural analysis and design of the photovoltaic arrays, mounting systems, concrete foundations, piers and storm water management provisions (if applicable) are the responsibility of The Contractor. The design shall be
based upon the requirements of the applicable codes, standards and Permits as well as the data supplied by the module, inverter, transformer, switchgear and racking suppliers.

5.5.2. The contractor shall provide a sealed a Professional report describing and confirming the structural integrity, remaining useful life.

5.6. Civil Engineering

5.6.1. All civil engineering and design requirements will be completed by The Contractor.

5.6.2. The Contractor shall design and install all systems for the containment of storm water, as required by codes, standards and permits.

5.7. Electrical Engineering

5.7.1. Electrical engineering and design shall be based upon meeting Industry Standards, the National Electric Code, IEEE 1547-2003 “IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.” and other applicable codes and standards.

5.7.2. The engineering and design shall include the appropriate sizing of all cabling (above and below ground) that will connect the modules, arrays, inverters, transformer and switchgear to the point of interconnection.

5.7.3. All underground wiring and cables shall be installed with a minimum of 90cm of cover.

5.7.4. All protection equipment throughout the system shall be sized and specified to reduce damage on all components and the interconnection point in case of electrical failure.

5.7.5. The above ground portion of the electrical systems shall be neatly routed to facilitate access, troubleshooting, maintenance, lawn mowing, etc.

5.7.6. The electrical design shall include the design of equipment grounding, and lightning / surge protection for the entire site.

5.7.7. All monitoring communication equipment and cabling shall be designed and specified.

5.7.8. The design of the interconnection is described in the Interconnection Agreement. The Contractor shall design, procure and install all the equipment which is needed to connect the plant to the local grid at PHU.

5.7.9. The Contractor shall design and specify all communications hardware and software required for system protection and remote monitoring.

5.7.10. The Contractor shall design, procure and install any necessary power, communications and internet facilities required for solar system operation, control remote monitoring, and the plant security system. This shall include all initial service provider’s initial setup and installation.
charges, as well as all usage charges through the Substantial Completion Date. Usage charges shall pass to PHU after the Substantial Completion Date.

5.7.11. The security system for all ground mounted equipment, to be provided by The Contractor, shall include the following:

- Fencing: 2m high chain link fence with 0.3m high top guard with 3 strands of 9 gage barbed wire.
- Locked Gates
- Locked Combiner Boxes
- Locked Power Stations
- The following signage to be provided along the perimeter fence (Details of the signage to be determined during project execution):
  - PHU Property
  - Danger High Voltage
  - No Trespassing
  - Security / Surveillance
- All as-built drawings shall be provided by The Contractor upon Final Acceptance

6. PROCUREMENT

6.1. Procurement and expediting tasks for all equipment and Materials are the responsibility of The Contractor. Such equipment includes the items listed in Section 2.1, and the Materials include such items as wire, cable, conduit, imported fill, rip-rap, concrete, imported rock, fencing and gates.

6.2. The equipment and Materials shall be purchased by The Contractor, and it is understood that the cost of this equipment and Materials, including the risk of any escalation in the price of such equipment and Materials, is included in the Contract Price.

6.3. PHU does not have a preferred vendor for the communications and diagnostic equipment, but PHU will review the list of subcontractors and suppliers that bidders intend to use.

6.4. The Contractor shall submit to PHU the key vendor drawings and documents for information, review and comment. PHU will review and comment on such drawings. Vendor drawings that shall be submitted to PHU when received by The Contractor include, but are not limited to:

6.4.1. Solar Panels
6.4.2. Racking and Mounting System
6.4.3. Power Stations
6.4.4. Inverters
6.4.5. Switchgear
6.4.6. Metering and Communications System
6.4.7. Control and Monitoring System
6.4.8. Security System

7. CONSTRUCTION

It is the responsibility of The Contractor or its Subcontractors to build all aspects of the Project as depicted in the Project drawings and documents. This includes the electrical system from the modules through the point of delivery to PHU. The Contractor shall also provide all temporary equipment, materials or facilities required to construct the Project and place it into operation.

7.1. Construction Management and Quality Control

7.1.1. Construction management shall be provided by The Contractor with an on-site construction management team.

7.1.2. The Contractor shall implement its standard Quality Assurance / Quality Control plan for construction activities on the Project Site. At least 15 days prior to the planned commencement of construction, The Contractor shall submit a copy of the Quality Assurance / Quality Control plan for review, comment and approval by PHU.

7.1.3. Quality control shall include inspection of the electrical collection trench system, electrical cabling placement, module placement, racking layout and assembly, foundation excavation, concrete forms (including dimensional checks and embedment placement) concrete strength and slump testing and appropriate soil compaction testing. Inspections and testing shall be in accordance with The Contractor’s QA/QC procedures and applicable code requirements.

7.1.4. The Contractor shall develop, present and implement a complete Health and Safety Plan (HASP) which must be approved by the Civil Defense Directorate.

7.1.5. The Contractor shall supply all labor, tools, machinery, equipment and equipment transportation for all Work.

7.1.6. The Contractor shall supply all temporary office space, temporary power, sanitary facilities, communications, and drinking water for The Contractor’s personnel on the Site. The Contractor shall provide two desks in a separate office trailer for use by PHU. PHU’s site representative shall be provided with electrical power, HVAC, one telephone, one bookcase, one file cabinet and access to sanitary facilities in a manner similar to The Contractor’s office trailers.
7.1.7. The Contractor shall keep the Site clean and orderly throughout the duration of construction. All trash and rubbish shall be disposed of off-site by licensed waste disposal companies and in accordance with applicable Law.

7.1.8. The Contractor shall maintain a copy of all drawings, specifications, permits and vendor installation manuals at the Site.

7.1.9. The Contractor shall be responsible for storage and maintenance of all installed equipment. Copies of all installed equipment maintenance records shall be kept at the Site and included in the turnover packages. The Contractor shall be responsible for obtaining any required off-Site warehouse space, temporary parking, staging or laydown areas.

7.1.10. The Contractor shall provide permanent equipment marking, labeling and signage for the Project. Warning signs shall be placed at key areas near equipment, at Project entrances, along the perimeter fence, and where required by PHU.

7.1.11. The Contractor, during Project development, shall identify any environmentally sensitive areas on or adjacent to the Site. The Contractor shall erect temporary construction fences and silt barriers to protect these environmentally sensitive areas prior to performing any other construction Work. The fences and silt barriers shall be inspected and maintained throughout the duration of construction to prevent any unauthorized discharge to the environmentally sensitive areas.

7.1.12. The Contractor shall recognize and respect any properties adjacent to the Site and shall use reasonable efforts to minimize disruption to respect the integrity of the university campus (e.g., sediment control, dust control, traffic control, trash control, noise control, etc.)

7.1.13. The Contractor shall fully comply with all applicable notification, safety and Work rules when working on or near the facilities of PHU.

7.1.14. It is intended that The Contractor re-use all excavated soils in other areas of the site via re-grading and incorporation into final site grading. Should any excess soils be unsuitable for re-use on site, that soil shall be stockpiled, sampled, and covered in accordance with applicable Law. Once characterized, the excess soils shall be disposed of off-site by licensed disposal companies and in accordance with applicable Law.

7.1.15. The Contractor shall route all field routed electrical collection system in a neat and orderly fashion and in accordance with all applicable code requirements. All cable terminations, excluding module-to-module and module-to-cable harness connections, shall be permanently labeled.

7.1.16. The Contractor shall provide all temporary road and warning signs, flagmen or equipment as required to safely execute the Work. Street sweeping services shall also be provided as required to keep any dirt, soil, mud, etc. off of roads.
7.2. Project Site

7.2.1. All photovoltaic arrays, structures, shall be built in the locations and orientations set forth in the site plan and site layout drawings and in accordance with the design specifications.

7.2.2. The Contractor shall clear grub and otherwise prepare the Site, as necessary, to install the Work.

7.2.3. Excavated material and/or imported fill material shall be used on site, as needed, to complete the Work.

7.2.4. Continuous monitoring and maintenance of erosion control measures shall be performed during all construction activities as per the environmental permits, best management practices and Project documents.

7.2.5. Dust control shall be performed as needed during construction.

7.2.6. Mowing of the site shall be completed on an as-needed basis.

7.2.7. Control, monitoring, communications, security systems and equipment (fencing for ground mounted equipment, security cameras etc) shall be installed according to the engineering and design documents.

7.2.8. Coordination with property owner/occupier

7.3. Solar Installation

7.3.1. Structural solar array works shall be performed in accordance with technical specifications and drawings, which includes installation of the primary post, header, binder, crossbeam, and cable tray.

7.3.2. Electrical solar array works shall be performed in accordance with technical specifications and drawings, which include installation of modules, wire harness, termination boxes, array feeders, ground grid, power stations and all electrical connections.

8. PERFORMANCE TESTING

8.1. The Acceptance Test shall be performed by a third party nominated by the contractor and accepted by PHU.

8.2. The Contractor shall give PHU at least 30 days’ notice of the planned Acceptance Test date.

8.3. After the Acceptance Test has been completed, The Contractor shall provide a copy of the Acceptance Test report for PHU review. PHU shall notify the Contractor of any material deficiencies. Once all comments have been
addressed, The Contractor shall provide three (3) hard copies of the final report and one (1) electronic copy.

8.4. The Contractor shall provide all test instrument calibration records prior to the start of the Acceptance test. The instruments must be calibrated within six (6) months of the Acceptance Test.

8.5. The performance test report must include the anticipated annual power production for the power plant along its life time based on the reference year.

9. COMMISSIONING
All commissioning procedures will be carried out according to the Interconnection Agreement and The Contractor’s standard protocol. For any aspect of commissioning for which the Interconnection Agreement does not specify a procedure, The Contractor shall develop and carry out the procedure in accordance with Industry Standards.

10. SUBSTANTIAL COMPLETION
The Contractor shall develop, permit, construct and commission the Project such that it achieves Substantial Completion and performs at or above the agreed upon Performance Guarantee.

11. FINAL COMPLETION
11.1. The Contractor shall arrange for and facilitate final construction inspections and certifications by the local authorities having jurisdiction. Copies of all final approvals and certifications shall be provided to PHU.

11.2. The Contractor shall complete any Punch List items, clean up the construction site and remove any temporary structures, equipment or services, and construction debris. The Contractor shall finish landscaping the Site according to the project specifications, and submit record drawings to PHU.

11.3. The Contractor shall provide six (6) hard copy sets of the final Project as-built documentation including:
   11.3.1. All as-built engineering drawings and specifications
   11.3.2. Vendor Drawings and Data
   11.3.3. Instruction Manuals
   11.3.4. Installation, Operation and Maintenance Manuals
   11.3.5. All Permits with copies of close-out records as required
   11.3.6. Control system software.
   11.3.7. Spare Parts Lists

11.4. The Contractor shall provide one (1) CD of the electronic as-built documentation, including executable CADD files and “.pdf” versions of all design drawings.
11.5. The Contractor shall provide six (6) copies of an as-built site survey documenting the Solar Project as-built conditions in relation to the Site, easement areas and right of way areas.

11.6. Final Acceptance will be declared once all of the above Work and Punch List items have been completed. A Certificate of Final Acceptance will be issued by The Contractor to PHU at that time in accordance with the Contract.

Annex 2: Performance Guarantee Agreement

This is a draft agreement.

For value received, and in consideration of, and in order to induce Philadelphia University (PHU) to enter into Contract ………………. for the EPC of solar PV station at PHU (the “Contract”) dated __________, by and between the PHU and ……………………. (Contractor), the undersigned, ………………, (Guarantor), a corporation incorporated in Jordan with its principal place of business at (main office address)………………….hereby unconditionally guarantees to PHU (a) the full and prompt payment and performance of all obligations, accrued and executory, which Contractor presently or hereafter may have to PHU under the Contract, and (b) the full and prompt payment and performance by Contractor of all other obligations and liabilities of Contractor to PHU, fixed or contingent, due or to become due, direct or indirect, now existing or hereafter and howsoever arising or incurred under the Contract, and Guarantor further agrees to indemnify PHU against any losses PHU may sustain and expenses it may incur as a result of the enforcement or attempted enforcement by PHU of any of its rights and remedies under the Contract, in the event of a default by Contractor there under, and/or as a result of the enforcement or attempted enforcement by PHU of any of its rights against Guarantor hereunder.

Guarantor has read and consents to the signing of the Contract. Guarantor further agrees that Contractor shall have the full right, without any notice to or consent from Guarantor, to make any and all modifications or amendments to the Contract without affecting, impairing, or discharging, in whole or in part, the liability of Guarantor hereunder. Guarantor hereby expressly waives all defenses which might constitute a legal or equitable discharge of a surety or guarantor, and agrees that this Performance Guarantee Agreement shall be valid and unconditionally binding upon Guarantor regardless of (i) the reorganization, merger, or consolidation of Contractor into or with another entity, corporate or otherwise, or the liquidation or dissolution of Contractor, or the sale or other disposition of all or substantially all of the capital stock, business or assets of Contractor to any other person or party, or (ii) the institution of any bankruptcy, reorganization, insolvency, debt agreement, or receivership proceedings by or against Contractor, or adjudication of Contractor as a bankrupt, or (iii) the assertion by PHU against Contractor of any of PHU rights and remedies provided for under the Contract, including any modifications or amendments thereto, or under any other document(s) or instrument(s) executed by Contractor, or existing in PHU favor in law, equity, or bankruptcy.

Guarantor further agrees that its liability under this Performance Guarantee Agreement shall be continuing, absolute, primary, and direct, and that PHU shall not be required to pursue any right or remedy it may have against Contractor or other Guarantors under the
Contract, or any modifications or amendments thereto, or any other document(s) or instrument(s) executed by Contractor, or otherwise. Guarantor affirms that PHU shall not be required to first commence any action or obtain any judgment against Contractor before enforcing this Performance Guarantee Agreement against Guarantor, and that Guarantor will, upon demand, pay PHU any amount, the payment of which is guaranteed hereunder and the payment of which by Contractor is in default under the Contract or under any other document(s) or instrument(s) executed by Contractor as aforesaid, and that Guarantor will, upon demand, perform all other obligations of Contractor, the performance of which by Contractor is guaranteed hereunder.

Guarantor agrees to assure that it shall cause this Performance Guarantee Agreement to be unconditionally binding upon any successor(s) to its interests regardless of (i) the reorganization, merger, or consolidation of Guarantor into or with another entity, corporate or otherwise, or the liquidation or dissolution of Guarantor, or the sale or other disposition of all or substantially all of the capital stock, business, or assets of Guarantor to any other person or party, or (ii) the institution of any bankruptcy, reorganization, insolvency, debt agreement, or receivership proceedings by or against Guarantor, or adjudication of Guarantor as a bankrupt.

Guarantor further warrants and represents to PHU that the execution and delivery of this Performance Guarantee Agreement is not in contravention of Guarantor's Articles of Organization, Charter, by-laws, and applicable law; that the execution and delivery of this Performance Guarantee Agreement, and the performance thereof, has been duly authorized by the Guarantor's Board of Directors, Trustees, or any other management board which is required to participate in such decisions; and that the execution, delivery, and performance of this Performance Guarantee Agreement will not result in a breach of, or constitute a default under, any loan agreement, indenture, or contract to which Guarantor is a party or by or under which it is bound.

No express or implied provision, warranty, representation or term of this Performance Guarantee Agreement is intended, or is to be construed, to confer upon any third person(s) any rights or remedies whatsoever, except as expressly provided in this Performance Guarantee Agreement.

In witness thereof, Guarantor has caused this Performance Guarantee Agreement to be executed by its duly authorized officer, and its corporate seal to be affixed hereto on (DATE of Signing)

Guarantor

Attest
Annex 3: TENDER OFFER FORM

To:
The President,
Philadelphia University,
Amman - Jordan,

Sirs,

1. Having examined the "Instructions to Applicants" Form of Agreement, Conditions of Agreement and other offer documents for the proposed Design and Construct of The PV Station Project, and having examined the Scope of Works and Services required by a competent and reliable person on our behalf, and having acquired all requisite information relating thereto as affecting this offer, we, the undersigned, hereby offer to enter into a Contract Agreement with the Employer in conformity with the said Documents for the sum of:

In Words…………………………………………………………………...(Jordan Dinars) in Figures JD ……………………………………………...or such other sum as may be ascertained in accordance with the said documents.

2. We hereby undertake without reserve whatsoever to enter into a Contract Agreement in conformity with the conditions contained in all the documents having understood the meaning and scope of all such documents precisely and clearly, and having considered them as an indivisible whole and the various conditions and clauses as mutually complementary and explanatory and this after having evaluated for ourselves and at our entire responsibility the nature and quality of the said work and services.

3. We have inserted in "Remuneration and Payment" section attached to this offer and other Agreement Documents all the required and relevant information and enclosed herewith all the information requested in the Instructions to Applicants and other Documents.

4. If this offer is accepted we agree to provide a Performance Bond for a sum equivalent to Ten Percent (10%) of the total Agreement value for the due performance of the Agreement under the terms of the Conditions of Agreement.

5. We hereby undertake to abide by this offer for a period of Ninety (90) days from the date fixed for receiving the same and it shall remain binding upon us may be accepted at any time before the expiration of that period.

6. We undertake in the event of this offer being accepted to execute an Agreement in the form annexed hereto which may be altered and added to in such manner as you may require for the purpose of adapting it to the circumstances of this offer, that this offer together with your written acceptance thereof, shall constitute a binding agreement between us.
7. We enclose a Tender Bond in the sum of Jordan Dinars (JD …………………..) which is equal to Two Percent (5 %) of the Agreement value, in accordance with the approved form.

8. We accept that you are not bound to accept the lowest or any offer you may receive.

Dated this .................. day of ................ Two Thousand and fourteen

Name ......................................................
Signature (Sgd.) .................................
acting in the capacity of: .........................
duly authorized to sign offers for and on behalf of:
Full Name of the Firm:

Witness:

Address:
Annex 4: Tender Bond Form

The President,
Philadelphia University
Amman - Jordan.

Sirs,
We have the honour to inform you that we guarantee Messrs.
……………………………………………………………………………………………………of
………………………………………………………………………………………….......
………………………………………………………………………………………….......
………………………………………………………………………………………….......
for the amount of Jordanian Dinars…………………………………………….. in order to
allow them to submit an offer for the Design and Construct of The PV Station Project as
specified in the Agreement Requirements and Conditions in Terms of Reference.

This Guarantee shall remain valid for a period of Ninety (90) days starting on the date
fixed for submission of offers to the Employer, i.e., 2014.

In the event of Messrs…………………………………………………………………........
………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
withdrawning their offer before the expiry of validity of this Letter of Guarantee or failing
to provide a Performance Bond when being requested to do so by the Employer,
whichever date is the earlier, we hereby undertake to deposit with the Employer, upon the
Employer's demand and notwithstanding any objection
whatsoever on the part of the said Messrs…………………………………………...
………………………………………………………………………………………………
………………………………………………………………………………………………
the aforesaid sum of (In Words)………………………………………………………
Jordanian Dinars, (In Figures) (JD…………………………… ) in cash.
Annex 5: Performance Bond Form

By this bond (1) We……………………………………………………………………………of
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Annex 6: Warrantee, Guarantee Maintenance Form

See Item 10.1 Pages (11, 12)
# List Existing PHU Buildings Cross Area

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<th>AREA, M$^2$</th>
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<td>FACULTY OF INFORMATION TECHNOLOGY</td>
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<td>MAINTENANCE &amp; BUS DRIVER REST AREA</td>
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<td>FACULTY OF ENGINEERING WORKSHOP</td>
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