Tender № (87/2017)

Tender for Design, Engineering, Supply, Delivery, Installation, Testing, Commissioning, Cleaning and Maintenance of Grid-Connected 16 MW AC Photovoltaic Systems at the University of Jordan

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Amman, Jordan

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PART ONE

SECTION ONE – THE UNIVERSITY OF JORDAN

The University of Jordan (UoJ) is both a modern as well as historic institution of Higher Education in Jordan. Established in 1962, the University has since then dedicated itself to the advancement and dissemination of knowledge and science.

In its capacity as a comprehensive teaching, research and community-service institution, the University of Jordan enables its students to choose from a wide range of programs- more than 3,500 different courses are offered by some 18 faculties.

Many current and former staff members head important academic, administrative, and political establishments in the Kingdom; many have served as ministers in a number of government cabinets, top advisers to the Jordanian leadership, members of Parliament, and presidents of Jordanian public and private universities. Among its more than 1500 faculty members are freelance writers in the national newspapers and magazines as well as consultants for the radio and TV stations, poets, novelists, short-story writers, and literary critics. Many have also offered their services to some neighboring Arab and Muslim countries, and many teach or have taught at a number of prestigious universities all over the world. Most faculty members are active participants in conferences, workshops, and symposia abroad; and most take advantage of the various research and exchange awards. Given the global outlook, the progressive thinking and diverse background, these faculty members shoulder the responsibility of delivering a quality education to the 44,000 students who are pursuing a wide variety of undergraduate and graduate programs.

At the undergraduate level, students have the choice to select from among 94 different programs in the Arts, Business Administration, Science, Shari'a (Islamic Studies), Medicine, Nursing, Agriculture, Educational Sciences, Engineering and Technology, Law, Physical Education, Pharmacy, Dentistry, Humanities and Social Sciences, Rehabilitation Sciences, Information Technology and, most recently, Arts and Design.

For those interested in graduate education, the University offers 38 doctoral programs, 111 Master's programs, 16 programs in Higher Specialization in Medicine, one program in Higher Specialization in Dentistry, 3 Professional Diploma Programs.

From an international perspective, the University offers 94 international programs at the undergraduate level, and 169 international programs at the graduate level and in all fields of specializations.

All programs offered by the University combine traditional academic lecturing with the more liberal methodologies of instruction which are based on dialogue, research and creative thinking. Theoretical instruction is further assisted with interactive multimedia teaching techniques and computer-based instructional materials to support, and eventually discard, traditional teaching methodologies. Field work, practical training, and applied research are

essential components of most of the programs offered by the University. For sometime, UoJ has been introducing and implementing the principles of Total Quality Management (TQM). With respect to Information Technologies, UoJ is very well-positioned.

Figure 1A: Location of the University of Jordan in Northern Amman, Capital of Jordan

Figure 1B: Location of the University of Jordan's Sports City Campus, Amman, Capital of Jordan (Blue Boxes identifies suggested rooftop area to be utilized)

SECTION TWO – PROJECT OVERVIEW

The UoJ has adopted Renewable Energy and Energy Efficiency (RE & EE) as one of its strategic objectives for the coming decade. The university has set forth an ambitious goal to achieve 100% electrical energy independence, relying mainly on renewable solar energy using photovoltaic (PV) panels.

Hence, the overall objective of this tender is the design, engineering, supply, delivery, installation, testing, commissioning, cleaning and three year maintenance a grid-connected PV solar systems. All available and identified rooftops of buildings and the car parks at the UoJ will be used for the generation of the overall annual electricity requirements, as well as the application of thermal insulation on rooftops to mitigate energy loss, and increase energy efficiency. It is estimated that around 80 rooftops and 25 car park areas are available to be used for this purpose. A list of these areas is available in the appendix. In addition, one page summary showing a picture of each rooftop and car park is also available in the appendix.

The proposed design must have a nameplate of 16 MW AC generated using PV panel arrays without using any storage system. Two types of systems will be used mainly: rooftops with 12 MW AC capacity, and carparks with 4 MW AC capacity. The metering scheme at the University metering points is "regular" tariff meters (JD 0.256/kWh). The total university consumption (sum of all its distributed meters) is about 29 GWh annually.

This project is divided into three separate zones:

1. Zone 1: Rooftops Zone 1 with 6 MW AC capacity (Net Metering)
2. Zone 2: Rooftops Zone 2 with 6 MW AC capacity (Net Metering)
3. Zone 3: Carparks Zone with 4 MW AC capacity (Net Metering)

This document is an invitation for suitably qualified Jordanian bidders for the comprehensive design, engineering, supply, delivery, installation, testing, commissioning, cleaning and three year maintenance a grid-connected PV solar systems (PV Stations).

The FIDIC conditions of Contract for Design, Build and Operate (DBO) Projects shall be followed. The interested bidders shall submit their technical and financial offers using the financial offer criteria detailed in this document.

The UoJ will finance the entire project. No bidder is to supply any financing plans from entities other than UoJ. It must be stressed here that there will not be, at any point of the building or operation of the project, any transfer of the ownership to the winning bidder. The UoJ will maintain ownership of the land, structures and equipment throughout the lifespan of the project. Once the Contract is signed with the selected bidder(s), all design, engineering data, drawings, information, calculations, and any data and intellectual property related to the project shall be the sole property of UoJ.

All interested bidders will submit a complete and final design of any of the three zones of the PV stations. Interested bidders wishing to bid for more than one zone are requested to submit a separate technical and financial offer for each zone, with the university retaining the right to award the contract to one or more bidders, based on the evaluation criteria and financial status of each bidder, among other factors.

The successful bidder(s) will construct in accordance with their accepted technical and financial offer, test, operate and hand over successfully to UoJ in (52) weeks from the date of awarding the contract. This is followed by three years of maintenance including spare parts, labor, remedy of defects, and reporting, free of charge, from the date of final acceptance to the final handing over and grid connection of each rooftop or car park system as stated in these document.

Appendix I contains a tentative project roadmap.

Abbreviations

AC	: Alternating Current
ASD	: Allowable Stress Design
AWS	: American Welding Society
BM	: Bench Mark
BOQ	: Bill of Quantities
CDD	: Civil Defense Department
CoC	: Conditions of Contract
DAB	: Dispute Adjudication Board
DBO	: Design Build and Operation
DC	: Direct Current
EE	: Energy Efficiency
EMRC	: Energy and Mineral Regulatory Commission
FIDIC	: International Federation of Consulting Engineers (commonly known as FIDIC, acronym for its French name Fédération Internationale Des Ingénieurs-Conseils)
GAM	: Greater Amman Municipality
HSE	: Health Safety and Environment
ID	: Identity Document
JCCA	: Jordan Construction Contractors Association
JEA	: Jordan Engineers Association
JEPCO	: Jordan Electrical Power Company
JNBC	: Jordan National Building Council
MoENV	: Ministry of Environment
MPI	: Magnetic Particle Testing
PPE	: Personnel Protection Equipment
PV	: Photovoltaic
QA	: Quality Assurance
QC	: Quality Control
RE	: Renewable Energy
RE	: Renewable Energy
RT	: Radiographic Testing
TOP	: Turn Over Package
UoJ	: University of Jordan
UT	: Ultrasonic Testing

PART TWO

SECTION ONE – INSTRUCTIONS TO BIDDERS

2.1.1 General Instructions

2.1.1.1 In submitting a tender, the bidder accepts in full and in its entirety, the content of this tender document, including subsequent Clarifications issued by the Government of the Hashemite Kingdom of Jordan, whatever their own corresponding conditions may be, which they hereby waive. Bidders are expected to examine carefully and comply with all instructions, forms, contract provisions and specifications, and subsequent amendments and clarification of ambiguities, contained in this tender document.

No account can be taken of any reservation in the tender as regards the tender document; any disagreement, contradiction, alteration or deviation shall lead to the tender offer not being considered any further.

The Technical Evaluation Committee shall, after having obtained approval by the Central Contracting Committee at UoJ request rectifications in respect of incomplete/non-submitted information pertinent to the documentation as outlined in Section 2.3.3.1 (a), 2.3.3.1 (b), and 2.3.3.1 (c) of these Instructions to Bidders. Such rectification(s) must be submitted within two (2) working days from notification. Failure to comply shall result in the tender offer not being considered any further.

No rectification shall be allowed in respect of the documentation as outlined in Section 2.3.3.1 (d), 2.3.3.1 (e), and 2.3.3.1 (f) of these Instructions to Bidders. Only clarifications on the submitted information in respect of the latter may be eventually requested.

2.1.1.2 The subject of the contract is the design, engineering, supply, delivery, installation, testing, commissioning, cleaning and three year maintenance of 16 MW AC low-voltage grid-connected photovoltaic systems at UoJ rooftops and car parking lots,.

2.1.1.3 The installation of the systems will be in 3 zones: Rooftops Zone 1 with 6 MW AC capacity, Rooftops Zone 2 with 6 MW AC capacity, and Carparks Zone with 4 MW AC capacity

2.1.1.4 Bidders should submit their financial offer based on DBO.

2.1.1.5 Bidders should submit their technical and financial offers for a clearly marked zone. Bidders are allowed to submit offers for any of the three zones. Bidders are allowed to submit offers for more than one zone in separate, clearly–marked packages. However, awarding more than one zone to the same bidder will be subjected, among other considerations, to the technical capability, named technical team, and the financial competence of the bidder for each zone separately.

2.1.1.6 The tender will be awarded as one lot for each zone using FIDIC DBO Conditions of Contract to the most suitable technical and financial bidder as determined by the evaluation process, as outlined in Section 2.5.4.

2.1.1.7 The place of acceptance of the supplies shall be at the detailed locations at the UoJ, Amman, Jordan. The time limits for design, engineering, supply, delivery, installation, testing, and commissioning shall be within fifty-two (52) calendar weeks (364 calendar days) from the date of the Awarding of the Contract. The INCOTERM 2010 applicable, shall be Delivery Duty Paid (DDP) at the said locations at the UoJ.

2.1.1.8 Bidders shall provide unit price BOQ for the Works as further amplified in the Bills of Quantities (Appendix IV).

2.1.1.9 The bidder will bear all costs associated with the preparation and submission of the tender. The UoJ or the Government of Jordan will in no case be responsible or liable for such costs, whatever the conduct or outcome of the procedure.

2.1.1.10 The UoJ retains ownership of all tenders received under this tender procedure. Consequently, bidders have no right to have their tenders returned to them.

2.1.2 Important Dates

	Period	Time
Call for Tender Closing Date and Last Date to Purchase a Copy of the Tender Documents	(Week 0)	Monday, May 22nd, 2017 1:00 PM
Orientation Meeting/Site Visits (Including land and rooftop surveys)	Week 3 Week 6 Week 8	Monday, June 12th, 2017 Monday, July 3rd, 2017 Monday, July 17th, 2017 Time and Location of Visits will be Provided on the Tender's Dedicated Website (Section 2.2.2.2)
Deadline for request for any additional information or request for clarification of ambiguities from the Central Contracting Committee at UoJ	Week 9	Monday, July 24th, 2017 At 15:00 PM
Last date on which additional information are issued by the Central Contracting Committee	Week 10	Monday, July 31st 2017
Deadline for submission of Offers	End of Week 12	Monday, August 14th, 2017 At 11:59 AM

All indicated times are Jordan Local Time

2.1.3 Lots

Tenders must be for the whole of the quantities indicated. Tenders will not be accepted for incomplete quantities. Nevertheless, the Central Contracting Committee at UoJ reserves the right of accepting any tender wholly or in part, or of dividing the contract among two or more bidders.

2.1.4 Financing and Method of Payment

2.1.4.1 The bidders shall submit a proposed method of payment for DBO within this tender.

2.1.4.2 The proposed payment method should consider the installation divided by quantities, milestone deliverables, or percentage of completion, as further amplified by the Bills of Quantities, and taking into consideration the following milestones:

- Down payment at Contract signing (should not exceed 15%)
- Mobilization and Site Preparation
- Delivery of Materials (Modules, Inverters, Mounting Structures)
- Percentage of Completion (Work Packages) including partial handing-over
- Testing
- Commissioning and Connection to the Grid
- Annually divided O&M

2.1.4.3 Performance Bond (Section 2.6.5) will be released only at Final Handover. Partial Handover will not be considered for the release of Performance Bond.

2.1.4.4 Method of payment shall include JEPCO's requirements. All incurring fees for JEPCO's:

- Preliminary study
- Grid impact study
- Implementation of grid impact requirements
- Commissioning
- Connection

shall be covered through the provisional sum included in the BoQ in Appendix IV.

2.1.5 Certification of Installation, Testing, and Commissioning

2.1.5.1 The certification of the installation, testing, and commissioning of the PV stations will be performed by an approved third party certified to issue the IEC 62446-2016 Certificate: Photovoltaic (PV) systems. The tests will be witnessed by UoJ Consultant, UoJ's assigned supervisors, and it is the responsibility of the Contractor to rectify all the comments and deficiencies with no changes in the tender prices.

2.1.5.2 UoJ will provide the payments to the winning bidder based on the approved financing and payment method, as described in Section 2.1.4, after certification of the completion of each stage (divided by quantities, deliverables, or percentage of completion) by the Consultant.

2.1.6 Eligibility

2.1.6.1 Participation in tendering is open on equal terms to all natural persons in Jordan. Foreign Participants who wish to be considered for evaluation for the purposes of this tender must form a joint venture (JV) or consortium with a local company in Jordan, with the Jordanian company named Lead Partner (details in Section 2.1.6.4).

2.1.6.2 The Jordanian partner must be a registered company/firm/corporation with the applicable licensure as Category A from the Energy and Minerals Regulatory Commission (EMRC) to provide services in the Renewable Energy field.

2.1.6.3 The bidders must provide the documentary proof or statements required to show that they are not bankrupt or under an administration appointed by the Court, or under proceedings leading to a declaration of bankruptcy. They should also declare that they have not been convicted criminally, or found guilty of professional misconduct. The above-mentioned documents must be submitted by every member of a Joint Venture/Consortium (if applicable). Natural persons, companies or undertakings who have been convicted of legal misconduct shall be excluded from participation in and the award of contracts.

2.1.6.4 Tenders submitted by companies forming a joint venture or consortium must also fulfill the following requirements:

a. One local Jordanian partner must be appointed Lead Partner, and that appointment confirmed by submission of powers of attorney signed by legally empowered signatories representing all the individual partners. The tender must include a preliminary agreement or Letter of Intent (duly notarized) stating that all partners assume joint and several liability for the execution of the contract, that the Lead Partner is authorized to bind, and receive instructions for and on behalf of, all partners, individually and collectively.
b. All partners in the joint venture or consortium are bound to remain in the joint venture or consortium until the conclusion of the contracting procedure (Project close out after the maintenance period and issuing the Performance Certificate). The joint venture or consortium winning this contract must include the same partners as per FIDIC DBO Conditions of Contract.

2.1.6.5 All materials, equipment and services to be supplied under the contract must originate in an eligible country. For these purposes, "origin" means the place where the materials and/or equipment are manufactured.

2.1.6.6 Special conditions for eligibility and qualifications of the Bidders are detailed in Section 2.8.

2.1.7 Mandatory Eligibility Criteria

In order to be considered eligible for the award of the contract, bidders (joint venture as a whole) must provide evidence that they meet or exceed certain minimum qualification criteria described hereunder. This is considered a Responsiveness Test for all bidders.

2.1.7.1 Audited Financial Statement for (2016, 2015, and 2014) and economic standing (Bank Account records for three years) is required.

2.1.7.2 Registration with the Ministry of Industry and Trade in Jordan, with minimum capital of JD 100,000.

2.1.7.3 Registration License as Category A Renewable Energy Service Provider with the Energy and Minerals Regulatory Commission (EMRC).

2.1.7.4 Information about the bidder's technical capacity.

1. Evidence that the Photovoltaic (PV) units are supplied through a Tier-1 manufacturer, and the manufacturer has been operating in the business of solar panel and photovoltaic (PV) modules manufacture for, at least, the past ten (10) years [between 2008 and 2017] as a minimum.
2. To provide a self-recommendation report, technical capability of the bidder should be shown through a list of deliveries of the same nature [minimum of 1] supplied during the last four (4) years 2013-2017 (Appendix II, Form 1).
3. The minimum value of deliveries of the same nature completed:
    a. For rooftops: shall not be less than 4 MWp in combined capacity delivered in Jordan in the last four (4) years, connected to a grid and operating consecutively for at least 6 months, with a minimum of 1 project with 500 kWp as one lot.
    b. For carports: shall not be less than 500 kWp in combined capacity delivered in Jordan in the last four (4) years, connected to a grid and operating consecutively for at least 6 months, with a minimum of 1 project with 200 kWp as one lot.
4. In so listing the end clients, the bidder is giving his consent to the Central Contracting Committee at UoJ, so that the latter may, if it deems necessary, contact the relevant clients, with a view to obtaining from them an opinion on the works provided to them by the bidder. The Central Contracting Committee reserves the right to request additional documentation in respect of the deliveries listed.
5. Warranty proposals as specifically requested in the Design Criteria and amplified in Section 2.8.6 of the Special Conditions.

2.1.8 One Tender per Bidder

With the option reserved for each bidder to submit technical and financial offers for one or more zones in this tender, this option is admissible as one tender per bidder. However, the following must be followed and accounted for:

2.1.8.1 Submission or participation by a bidder in more than one tender for a contract will result in the disqualification of all those tenders in which the party is involved.

2.1.8.2 A company may not bid for a given tender both individually and as a partner in a joint venture/consortium.

2.1.8.3 A company may not bid for a given tender both individually/partner in a joint venture/consortium, and at the same time be nominated as a subcontractor by any another bidders, or joint ventures/consortia.

2.1.8.4 A company may act as a subcontractor for any number of bidders, and joint ventures/consortia, provided that it does not participate individually or as part of a joint venture/consortium, and that the nominations do not lead to a conflict of interest, collusion, or improper practice.

2.1.9 Tender Expenses

2.1.9.1 The bidder will bear all costs associated with the preparation and submission of the tender.

2.1.9.2 The winning bidder will incur all the expenses associated with the announcements for Call for Proposal.

2.1.9.3 The Central Contracting Committee at UoJ will neither be responsible for, nor cover, any expenses or losses incurred by the bidder through site visits and inspections or any other aspect of his tender.

2.1.10 Orientation Meeting/Site Visits

2.1.10.1 Three (3) Orientation meetings with site visits are scheduled to be held at the UoJ on the dates and times detailed in Section 2.1.2 – Important Dates. The orientation meeting will be held to answer any questions on the tender documents which have been forwarded in writing or raised at the meeting.

Minutes will be taken during the meeting and these will be communicated – together with any clarifications in response to written requests that are not addressed during the meeting – in writing to all bidders.

It must be stressed herein that only written answers, provided as amendments to this document, constitute the contractually-binding updates, rectifications, or explanations. Bidders are encouraged to provide their questions in writing as detailed in Section 2.2.2.

2.1.10.2 All costs of attending this meeting will be borne by the bidders.

2.1.10.3 Prospective bidders are to confirm their intention to attend to the site visit at least one (1) week before the date of the site visit, by confirming their attendance via e-mail to tedner@ju.edu.jo.

2.1.10.4 Site visits of the identified locations of the solar carparks and rooftop locations will be held after the Orientation Meetings. The duration of the meeting and visits will be no longer than seven (7) hours.

2.1.10.5 Conducting measurements, land surveys and topography maps of the proposed sites are the responsibility of the bidder. Such visits must be done in prior coordination with the Central Contracting Committee or with the appointed UoJ representative(s). All expenses of these visits will be borne by the bidder.

2.1.10.6 Meetings/visits by individual prospective bidders during the tender period other than these meeting/site visits for all prospective bidders is not be permitted, unless a prior approval by the Central Contracting Committee is requested and secured at least 7 days before the intended visit date.

2.1.10.7 Only individuals wearing full Personal Protective Equipment (PPE) will be allowed on campus for site visits. Each person will have his ID and company badge.

SECTION TWO – TENDER DOCUMENTS

2.2.1 Content of Tender Document

2.2.1.1 This tender comprises the instruction to the bidders, bidding process, general and special conditions, technical specifications, draft contract, compliance sheets, and related appendices. The documents should be read in conjunction with any clarification notes, clarification of ambiguities, and subsequent amendments.

2.2.1.2 Bidders bear sole liability for examining with appropriate care the tender documents, including those design documents available for inspection, and any clarification notes to the tender documents issued during the tendering period, and for obtaining reliable information with respect to conditions and obligations that may in any way affect the amount or nature of the tender or the execution of the works. In the event that the bidder is successful, no claim for alteration of the tender amount will be considered on the grounds of errors or omissions in the obligations of the bidder described above.

2.2.1.3 The bidder must provide all documents required by the provisions of the tender document. All such documents, without exception, must comply strictly with these conditions and provisions and contain no alterations made by the bidder.

2.2.2 Explanations/Clarification of Ambiguities

2.2.2.1 Bidders may submit questions in writing to the Central Contracting Committee through sending an email to tender@ju.edu.jo, or a sending a written request to fax number +96265355530, up to 21 calendar days before the deadline for submission of tenders, as detailed in Section 2.1.2. Central Contracting Committee must reply to all bidders' questions, and amend the tender documents by publishing clarification notes, at least 14 calendar days before the deadline for submission of tenders.

2.2.2.2 Questions and answers, and alterations to the tender document will be provided to all bidders via e-mail or fax, and will be published as a clarification note on the website of the UoJ (http://tenders.ju.edu.jo/Pages/PVProject) within the respective tender's page, under the subheading "Amendments and Clarifications". Clarification notes will constitute an integral part of the tender documentation, and it is the responsibility of bidders to visit this website and be aware of the latest information published online prior to submitting their Tender. Each bidder will be provided with a username and password to access the website.

2.2.2.3 The Central Contracting Committee may, at its own discretion, as necessary and in accordance with Section 2.4.2, extend the deadline for submission of tenders to give bidders sufficient time to take clarification notes into account when preparing their tenders.

2.2.3 Adherence to the Laws and Regulations of the Jordanian Government

2.2.3.1 By submitting their tenders, bidders are accepting that this procedure is regulated by tender regulations at the University of Jordan, and are deemed to know and accept all relevant laws, acts and regulations of Jordan that may in any way affect or govern the operations and activities covered by the tender and the resulting contract. Special care should be taken to the ENA G59/2 regulations, which are the framework used for connecting the electricity generation systems to the national grid in Jordan.

2.2.3.2 Particular attention is drawn to the conditions concerning the employment of labor in Jordan and the obligation to comply with all regulations, rules or instructions concerning the conditions of employment of any class of employee.

2.2.3.3 Bidder/ Each entity on Joint Venture Clearance from the Tax Department up to March 2017.

2.2.3.4 Bidder/ Each entity on Joint Venture Clearance from the Social Security Department up to April 2017.

2.2.3.5 Bidder/ Each entity on Joint Venture Commercial Registration valid up to end 2017.

2.2.3.6 Bidder/ Each entity on Joint Venture Career Licensees from Greater Amman Municipality or equivalent up to end 2017.

2.2.3.7 Bidder/ Each entity on Joint Venture Company Registration at the Ministry of Industry and Trade recently issued in 2017 showing purpose of company as provider of PV systems.

2.2.3.8 Bidder/ Each entity registered at the Energy and Mineral Regulatory Commission (EMRC) Category A as service provider up to April 2017.

2.2.3.9 Bidder/ Each entity Engineers registered at the Ministry of Energy and Mineral Resources as service provider up to April 2017 is a plus.

2.2.3.10 Bidder/ Each entity Engineers (contractor or subcontractor) registered at the Jordan Construction Contractors Association as service provider in civil and electromechanical works up to end 2017.

2.2.3.11 Jordan Electric Power Company (JEPCO) requirements (technical and financial) are the full responsibility of the Bidder.

2.2.3.12 Ministry of Environment requirements (technical and financial) is the full responsibility of the Bidder

2.2.3.13 Greater Amman Municipality requirements (technical and financial) is the full responsibility of the Bidder.

2.2.3.14 Jordan Engineers Association (technical and financial) is the full responsibility of the Bidder.

2.2.3.15 Jordan Construction Contractors Associations Requirements (technical and financial) is the full responsibility of the Bidder.

2.2.3.16 The bidder is required to abide to the latest laws and regulations regarding customs and sales tax, and must be adhered to in the Financial Offer. Any changes in the laws and regulations regarding customs and sales tax after Signing of the Contract shall be responsibility of UoJ.

SECTION THREE – TENDER PREPARATION

2.3.1 Language of Tenders

2.3.1.1 The tender and all correspondence and documents related to the tender exchanged by the bidder and the Central Contracting Committee must be written in English. Cover letters and communication with the authorities is in Arabic Language.

2.3.1.2 Supporting documents and printed literature furnished by the bidder may be in another language, provided they are accompanied by an accurate translation into English. For the purposes of interpretation of the tender, the English language will prevail.

2.3.2 Presentation of Tenders (Single-Envelop System)

Tenders must satisfy all of the following conditions for each zone they are bidding for:

(a) The Technical and Financial offers must be separated into two different packages, then included in a sealed envelope, clearly marked as follows:

i. Package 1 includes all the supporting documents, as per Sections 2.3.3.1 (a)-(d)
ii. Package 2 includes the "Technical Offer" with the tender documents all stamped on all pages by the bidder, as per Section 2.3.3.1 (e)
iii. Package 3 includes the "Financial Offer", as per Section 2.3.3.1 (f)

(b) All tenders must be submitted in two sets: an original, clearly marked "ORIGINAL", and an identical copy (including all documentation as in the original) signed in the same way as the original and clearly marked "COPY".

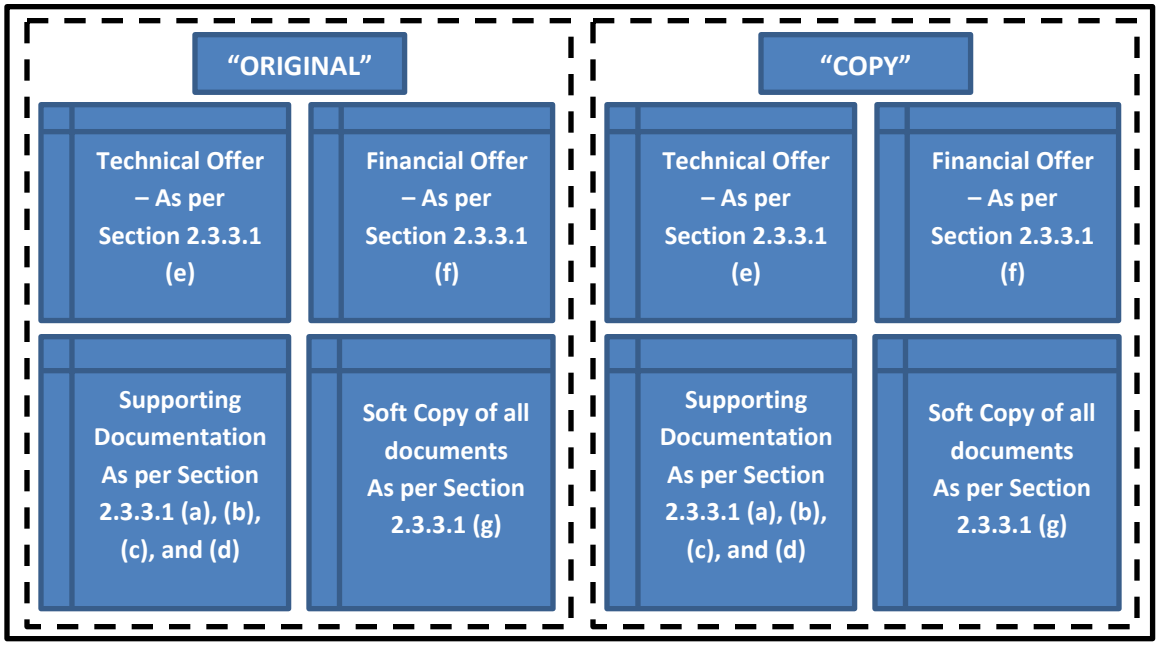


Figure 2: Contents and Packaging of the Tender Documents for Each Clearly Marked Zone

(c) Both documents (original and copy) are to be separately sealed and placed in another sealed envelope so that the bid can be identified as one tender submission (refer to Figure 2). Following the tender opening session, the copy shall be kept, unopened, at the Department of Central Contracts, for verification purposes only should the need arise.

(d) Where sealing is required, sealing wax is to be used to insure security of information and transparency of procedure.

(e) All tenders must be received by hand by the date and time indicated in the Call for Tenders, and deposited in the tender box in the Department of Central Contracts, UoJ, Amman, Jordan.

(f) All tender packages, as per (c) above, must bear only (no special markings or additional information):

i. Care of: Department of Central Contracts, UoJ, Amman, Jordan;
ii. Tender № (87/2017);
iii. The name of the bidder.

2.3.3 Content of Tender

2.3.3.1 The tender must comprise the following precisely completed documents, inserted in a single, sealed envelope (unless their volume requires a separate submission):

(a) An original bid-bond for the amount of JD 400,000, in the form provided in Appendix II, form 2 and further detailed in Section 2.3.7.

(Bidders will be requested to clarify/rectify, within two working days from notification, the bid-bond only in the following two circumstances: either incorrect validity date, and/or incorrect value).

(b) General/Administrative Information:

1. Proof of Purchase of Tendering Document (Provided by the UoJ)
2. Power of Attorney (Appendix II, Form 3).
3. Data on Joint Venture/Consortium (if applicable).
4. All the registration documents must be available
5. EMRC registration certificate
6. Agreement with a design firm(s) specialized in the works
7. Social Security Clearance
8. Tax Clearance
9. Information required in Section 2.2.3

(Bidders will be requested to either clarify/rectify any incorrect and/or incomplete documentation, and/or submit any missing documents within two working days from notification).

(c) Financial and Economic Standing as provided by:

i. Audited Financial Statement for (FY 2016, FY 2015, and FY 2014)
ii. Economic standing (Bank Account records for three years)
iii. Financial solvency statement
iv. A list of current fiscal obligations and on-going projects (Appendix II, Form 4)

(Bidders will be requested to either clarify/rectify any incorrect and/or incomplete documentation, and/or submit any missing documents within two working days from notification).

(d) Technical Capacity

i. Evidence that the Photovoltaic (PV) units are supplied through a Tier-1 manufacturer, and the manufacturer has been operating in the business of Solar panel and Photovoltaic (PV) modules manufacture for, at least, the past ten (10) years [between 2008 and 2017] as a minimum.
ii. List of deliveries of the same nature [minimum of 1] supplied during the years 2013- 2017. The minimum value of deliveries of the same nature completed:
    a. For rooftops: shall not be less than 4 MWp in combined capacity delivered in Jordan in the last four (4) years, connected to a grid and operating consecutively for at least 6 months, with a minimum of 1 project with 500 kWp as one lot.
    b. For carports: shall not be less than 500 kWp in combined capacity delivered in Jordan in the last four (4) years, connected to a grid and operating consecutively for at least 6 months, with a minimum of 1 project with 200 kWp as one lot.
iii. Warranty proposals as specifically requested in the Design Criteria and amplified in Section 2.8.6 of the Special Conditions.

(No rectification shall be allowed. Only clarifications on the submitted information may be requested).

(e) Technical Offer Table

i. Bidder's Technical Offer in response to specifications (PART THREE of this tender document).

ii. Complete study and calculations of the electrical capacity of the system (AC power output of the system), efficiencies and operational scenarios, as detailed in Section 3.2.3.
iii. Original catalogues, warranties and datasheets provided by the supplier of the equipment as per the technical specifications.
iv. Architect's or Civil Engineer's certification confirming the suitability of the proposed PV support structure to carry the proposed PV System.
v. Precisely completed Deliverable List as detailed in Section 3.2.9, and provided as a soft copy heretical folder set in the tender package.

(No rectification shall be allowed. Only clarifications on the submitted information may be requested).

(f) Financial Offer/Bill of Quantities
   a. The Letter of Tender Form for the specific Zone (1, 2, or 3) in accordance with the form provided in Appendix III (one form must be provided for each offer per zone).

   b. Amplified Bill of Quantities:

      The bidder shall supply detailed Bill of Quantities (Appendix IV), itemized by the unit prices, quantities, total price for each item, in the Financial Offer in the item above. The BoQ shall reflect the total bidding price (VAT) for each of zone. It must be noted that the BoQ shall be detailed per location of work. A summary BoQ must be provided, as per forms and tables in Appendix IV.

   c. Suggested payment method, as shown in Section 2.1.4.

   All items in this section shall be sealed in one separate package, and marked as "Financial Offer".

(No rectification shall be allowed. Only clarifications on the submitted information may be requested).

(g) Soft copy (on a CD or flash drive) of the above mentioned documents (a)–(e). The financial offer in (f) must NOT be included as a soft copy, Also, the amplified Bills-of-Quantities (BoQs) that include the unit price and total price must not be included as a soft copy. However, the unpriced BoQs should be included within the technical offer and as a soft-copy.

2.3.3.2 Bidders must indicate where the above documentation is to be found in their offer by using an Table of Contents. All documentation is to be securely bounded.

2.3.3.3 Bidders are NOT required NOR expected to submit, with their offer, any components of the tender document except those specifically mentioned in 2.3.3.1.

2.3.3.4 The bidder must provide all documents signed and stamped by the official ink stamp of the Lead Partner on every page submitted in the technical and financial offers.

2.3.3.5 The bidder must provide a cover sheet, stating the following:

- all the documents included in the offer are correct
- the bidder's responsibility for any misinformation.

2.3.4 Tender Prices

2.3.4.1 Bidders will be deemed to have satisfied themselves, before submitting their tender, to its correctness and completeness, to have taken account of all that is required for the full and proper performance of the contract, and to have included all costs in their rates and prices.

2.3.4.2 The tender must be submitted in Jordanian Dinar.

2.3.4.3 Bidders must quote all components of the price inclusive of taxes, customs and import duties, and any discounts. Except as may otherwise be provided for in the contract, no payment will be made for items which have not been priced.

2.3.4.4 If the bidder offers a discount, the discount must be absorbed in the rates of the Bill of Quantities/Financial Statement.

2.3.4.5 The prices for the contract must include all of the works to be provided. The prices quoted are fixed and not subject to revision or escalation in costs, unless otherwise provided for in the Special Conditions.

2.3.5 Currencies of Tender and Payments

2.3.5.1 The currency of the tender is the Jordanian Dinar (JD). All sums in the breakdown of the overall price, in the questionnaire and in other documents must be expressed in Jordanian Dinar (JD), with the possible exception of originals of bank and annual financial statements.

2.3.5.2 Payments will be made upon certification of supplies by the Consultant, as appointed by the Central Contracting Committee, based on the invoice issued by the Contractor, in accordance with the timeframes, terms and conditions of the contract.

2.3.5.3 All correspondence relating to payments, including invoices and interim and final statements must be submitted as outlined in the contract.

2.3.6 Period of Validity of Tenders

2.3.6.1 Tender Offers and Bid Bond must remain valid for a period of 180 days after the deadline for submission of tender offers indicated in the Call for Tender, the tender document or as modified in accordance with Section 2.2.2 and/or 2.4.2. Any bidder who quotes a shorter validity period will be rejected.

2.3.6.2 In exceptional circumstances the Central Contracting Committee may request that bidders extend the validity of tenders and Bid Bond for a specific period. Such requests and the responses to them must be made in writing. A bidder may refuse to comply with such a request without forfeiting their tender guarantee (Bid Bond). However, their tender will no longer be considered for award. If the bidder decides to accede to the extension, they may not modify their tender.

2.3.7 Tender Security (Bid Bond)

2.3.7.1 The tender security (bid bond) is set at JD 400,000 and must be an original and valid guarantee presented in the form specified in Appendix III. The tender security must be issued by a local bank or a financial institution licensed by the recognized Financial Regulator in the Jordan, and who assumes responsibility for claims and payments to the amount as stated above. It must remain valid up to 180 days after the deadline for submission of tender offers indicated in the Call for Tender, the tender document or as modified in accordance with Section 2.2.2 and/or 2.4.2. The tender guarantee must be drawn up in the name of the University of Jordan, Jordan.

2.3.7.2 The tender security is intended as a pledge that the bidder will not retract his offer up to the expiry date of the security and, if successful, that the bidder will enter into a contract with the UoJ on the terms and conditions stated in the tender document.

2.3.7.3 The tender security shall be forfeited if the bidder withdraws their tender before the above-mentioned validity date or if the bidder fails to provide the Performance Security.

2.3.7.4 Tender securities provided by bidders who have not been selected shall be released within 30 calendar days from the signing of the contract. The tender security of the successful bidder shall be released on the signing of the contract, and on submission of a valid Performance Security.

2.3.7.5 Offers that are not accompanied with the mandatory Tender Security (Bid Bond) by the Closing Date and Time of the tender will be automatically disqualified.

2.3.7.6 Bidders will be requested to clarify/rectify, within two working days from notification, the tender security submitted, only in the following two circumstances: either incorrect validity date, and/or incorrect value. Such rectification(s) must be submitted within two (2) working days. Failure to comply shall result in the tender offer not being considered any further.

2.3.8 Variant Solutions

No variant solutions will be accepted. Bidders must submit a tender in accordance with the requirements of this tender document, and subsequent amendments issued by UoJ.

2.3.9 Preparation and Signing of Tenders

2.3.9.1 All tenders must be submitted in one original, clearly marked "ORIGINAL", and one identical copy (including all documentation as in the original) signed in the same way as the original and clearly marked "COPY". Tenders must comprise the documents specified in Section 2.3.3.1 above.

It is the responsibility of the bidders to ensure that both the original and the copy are an identical representation of one another.

It is the responsibility of the bidder to ensure that they clearly mark the zones' packages.

2.3.9.2 The bidder's submission must be provided as a hard copy, with the all the documentations provided as a soft copy on a CD or a Flash Drive. Any pages on which entries or corrections to his submission have been made must be initialed by the person or persons signing the tender. All pages must be numbered consecutively, signed and stamped by bidder seal. A table of content for quick referencing must be provided.

2.3.9.3 The tender must contain no changes or alterations, other than those made in accordance with instructions issued by the Central Contracting Committee (issued as clarification notes) or necessitated by errors on the part of the bidder. In the latter case, corrections must be initialed by the person signing the tender.

2.3.9.4 The tender will be rejected if it contains any alteration, tampering, addition or deletion to the tender documents not specified in a clarification note issued by the Central Contracting Committee.

2.3.9.4 The bidder shall include a copy of the tender (and all subsequent amendments, if any) stamped by the bidder's seal.

SECTION FOUR – TENDER SUBMISSION

2.4.1 Sealing and Marking of Tenders

2.4.1.1 The tenders must be submitted in English and received/deposited in Department's tender box before the deadline indicated in the Call for Tender, the tender document or as modified in accordance with Section 2.2.2 and/or 2.4.2. They must be delivered by hand to:

Tenders Deposit Box
Central Contracts Office,
PV tender
University of Jordan
Amman
Jordan

Tenders submitted by any other means will not be considered. Tenders submitted after the specified deadline will not be considered.

2.4.1.2 Bidders must seal the original and the copy of their tender as outlined in Section 2.3.2.

2.4.1.3 If the outer envelope is not sealed and marked as required in Section 2.3.2 the Central Contracting Committee will assume no responsibility for the misplacement or premature opening of the tender.

2.4.2 Extension of Deadline for Submission of Tenders

The Central Contracting Committee may, at its own discretion, extend the deadline for submission of tenders by issuing a clarification note in accordance with Section 2.2.2. In such cases, all rights and obligations of the Central Contracting Committee and the bidder regarding the original date specified in the contract notice will be subject to the new date.

2.4.3 Late Tenders

2.4.3.1 All tenders received after the deadline for submission specified in the contract notice or these instructions will be returned to the bidders. The associated guarantees will be returned to the bidders.

2.4.3.2 No liability can be accepted for late delivery of tenders. Late tenders will be rejected and will not be evaluated.

2.4.4 Alterations and Withdrawal of Tenders

2.4.4.1 Bidders may alter or withdraw their tenders by written notification prior to the deadline for submission of tenders. No tender may be altered after the deadline for submission.

2.4.4.2 Any notification of alteration or withdrawal must be prepared, sealed, marked and submitted in accordance with Section 2.4.1, and the envelope must also be marked with "alteration" or "withdrawal".

2.4.4.3 The withdrawal of a tender in the period between the deadline for submission and the date of expiry of the validity of the tender will result in forfeiture of the tender guarantee provided for in Section 2.3.7.

SECTION FIVE – OPENING AND EVALUATION OF OFFERS

2.5.1 Opening of Tenders

2.5.1.1 Tenders will be opened in public session on the date and time indicated in the Timetable detailed in Section 2.1.2 or as otherwise specified in accordance with Section 2.2.2 and/or 2.4.2, at the Central Contracts Department, UoJ, by the Central Contracting Committee.

They will draw up a 'Summary of Tenders Received – divided by Zone –which will be published on the Notice Board at the Department of Central Contracts and shall also be available to view on the project's dedicated website.

2.5.1.2 At the tender opening, the bidders' names, variants, written notification of alterations and withdrawals, the presence of the requisite tender guarantee and any other information the Central Contracting Committee may consider appropriate will be published.

2.5.1.3 Envelopes marked "withdrawal" will be read out first and returned to the bidder.

2.5.1.4 Reductions or alterations to tender prices made by bidders after submission will not be taken into consideration during the analysis and evaluation of tenders.

2.5.2 Secrecy of the Procedure

2.5.2.1 After the opening of the tenders, no information about the examination, clarification, evaluation or comparison of tenders or decisions about the contract award may be disclosed before the notification of award.

2.5.2.2 Information concerning checking, explanation, opinions and comparison of tenders and recommendations concerning the award of contract, may not be disclosed to bidders or any other person not officially involved in the process unless otherwise permitted or required by law.

2.5.2.3 Any attempt by a bidder to approach any member of the Technical Evaluation Committee/Central Contracting Committee directly during the evaluation period will be considered legitimate grounds for disqualifying his tender.

2.5.3 Clarification of Tenders

2.5.3.1 When checking and comparing tenders, the evaluation committee may, after obtaining approval from the Central Contracting Committee, ask a bidder to clarify any aspect of his tender.

2.5.3.2 Such requests and the responses to them must be made by e-mail, fax, or courier service. They may in no circumstances alter or try to change the price or content of the

tender, except to correct arithmetical errors discovered by the evaluation committee when analyzing tenders, in accordance with Section 2.5.5.

2.5.4 Tender Evaluation Process

2.5.4.1 The following should be read in conjunction with Section 2.5.1.

2.5.4.2 *Part 1: Administrative Compliance*

The Technical Evaluation Committee will check the compliance of tenders with the instructions given in the tender document, and in particular the documentation submitted in respect of Section 2.3.3.

The Technical Evaluation Committee shall, after having obtained approval by the Central Contracting Committee, request rectifications in respect of incomplete/non-submitted information pertinent to the documentation as outlined in Section 2.3.3.1 (a), 2.3.3.1 (b), and 2.3.3.1 (c) of these Instructions to Bidders.

Such rectification(s) must be submitted within two (2) working days from notification. Failure to comply shall result in the tender offer not being considered any further.

No rectification shall be allowed in respect of the documentation as outlined in Section 2.3.3.1 (d), 2.3.3.1 (e), and 2.3.3.1 (f) of these Instructions to Bidders. Only clarifications on the submitted information in respect of the latter may be eventually requested.

2.5.4.3 *Part 2: Eligibility Compliance (Admissibility)*

Tenders which have been considered administratively compliant shall be evaluated for admissibility as outlined below:

- Eligibility (Section 2.1.6)
- Mandatory Eligibility Criteria (Section 2.1.7)

Only tenders that pass the minimum requirement for the abovementioned criteria, as outlined in Sections 2.1.6 and 2.1.7, will be considered for the next step of evaluation.

2.5.4.4 *Part 3: Technical Compliance*

At this step of the evaluation process, the Technical Evaluation Committee will analyze the administratively-compliant tenders' technical conformity in relation to the technical specifications, classifying them technically compliant or noncompliant.

The Technical Evaluation Committee will evaluate the technical conformity of the offer based on the criteria laid out in the technical specifications and related clauses.

The design of the rooftops is deemed technically compliant if it scores 75% or more based on the following criteria:

- Design Compliance 30 %
- Quality of proposed products 20 %
- Bidder Qualification & expertise 30 %
- Warranty, maintenance and technical support 5 %
- Training 5 %
- Installation plans 10 %

Breakdown of each the technical compliance categories mentioned above is detailed in Appendix VI.

The design of the carparks is deemed technically compliant if it scores 75% or more based on the following criteria:

- Design Compliance 35 %
- Quality of proposed products 20 %
- Bidder Qualification & expertise 25 %
- Warranty, maintenance and technical support 5 %
- Training 5 %
- Installation plans 10 %

Breakdown of each the technical compliance categories mentioned above is detailed in Appendix VII.

2.5.4.5 *Part 4: Financial Evaluation*

1. The tenders which scored 75% or more during the technical evaluation phase (i.e., those found to be technically compliant) will be evaluated based on their financial offers. All technical offers that scored below 75% will be excluded from further evaluation.
2. The financial offers for the technically compliant tenders will be opened in a special session, and the bidders will be invited to the financial offer opening session.
3. The BoQ should include the following provisions:
    a. Cost per system at each location shall be itemized in Table 1, Appendix IV.
    b. Costs that are applicable on the overall project shall be itemized in Table 2, Appendix IV.
    c. The Bidder should include the provisional sums as itemized in Table 2, Appendix IV.
4. The Evaluation Committee will check that the financial offers contain no arithmetical errors, as outlined in Section 2.5.5.
5. The bidder with the financial offer having the least price for the Car Parks station (Zone 3) will be awarded this part.

6. The bidders with the financial offer having the least price for the rooftops zones (Zone 1 and Zone 2) will be awarded this part.
7. Based on the above-mentioned award criteria, one or more bidders (up to three different bidders) can be awarded this tender.

2.5.5 Correction of Arithmetical Errors

2.5.5.1 Admissible tenders will be checked for arithmetical (calculation) errors by the Technical Evaluation Committee. Errors will be corrected as follows:

(a) where there is a discrepancy between amounts in figures and in words, the amount in words will prevail;

(b) where there is a discrepancy between a unit price and the total amount derived from the multiplication of the unit price and the quantity, the unit price as quoted will prevail.

2.5.5.2 The amount stated in the tender will be adjusted by the Technical Evaluation Committee in the event of error, and the bidder will be bound by that adjusted amount. In this regard, the Technical Evaluation Committee shall seek the prior approval of the Central Contracting Committee to communicate the revised price to the bidder. If the bidder does not accept the adjustment, his tender will be rejected and his tender guarantee forfeited.

2.5.5.3 When analyzing the tender, the Technical Evaluation Committee will determine the final tender price after adjusting it on the basis of Section 2.5.5.1.

SECTION SIX – CONTRACT AWARD

2.6.1 Criteria for Award

The criteria for award follows the evaluation process detailed in Section 2.5.4. The tender that receives 75% or more in the Technical Evaluation, and has the lowest Financial Offer will be awarded the tender, as detailed Section 2.5.4.5.

2.6.2 Right of the UoJ to Accept or Reject Any Tender

2.6.2.1 The Central Contracting Committee reserves the right to accept or reject any tender and/or to cancel the whole tender procedure and reject all tenders, without further prejudice. The Central Contracting Committee reserves the right to initiate a new invitation to tender.

2.6.2.2 In the event of a tender procedure's cancellation, bidders will be notified by the Central Contracting Committee. If the tender procedure is cancelled before the outer envelope of any tender has been opened, the sealed envelopes will be returned, unopened, to the bidders.

2.6.2.3 Cancellation may occur where:

i. the tender procedure has been unsuccessful, namely where no qualitatively or financially worthwhile tender has been received or there has been no response at all;
ii. the economic or technical parameters of the project have been fundamentally altered;
iii. exceptional circumstances or force majeure render normal performance of the project impossible;
iv. all technically compliant tenders far exceed the feasibility study available;
v. there have been irregularities in the procedure, in particular where these have prevented fair competition.

In no circumstances will the Central Contracting Committee, the UoJ, or the Government of Jordan, be liable for damages, whatever their nature (in particular damages for loss of profits) or relationship to the cancellation of a tender, even if the Central Contracting Committee has been advised of the possibility of damages. The publication of a contract notice does not commit the Central Contracting Committee to implement the program or project announced.

2.6.3 Notification of Award, Contract Clarifications

2.6.3.1 Prior to the expiration of the period of validity of tenders, the Central Contracting Committee will notify the successful bidder, in writing, that their tender has been recommended for award by the Central Contracting Committee.

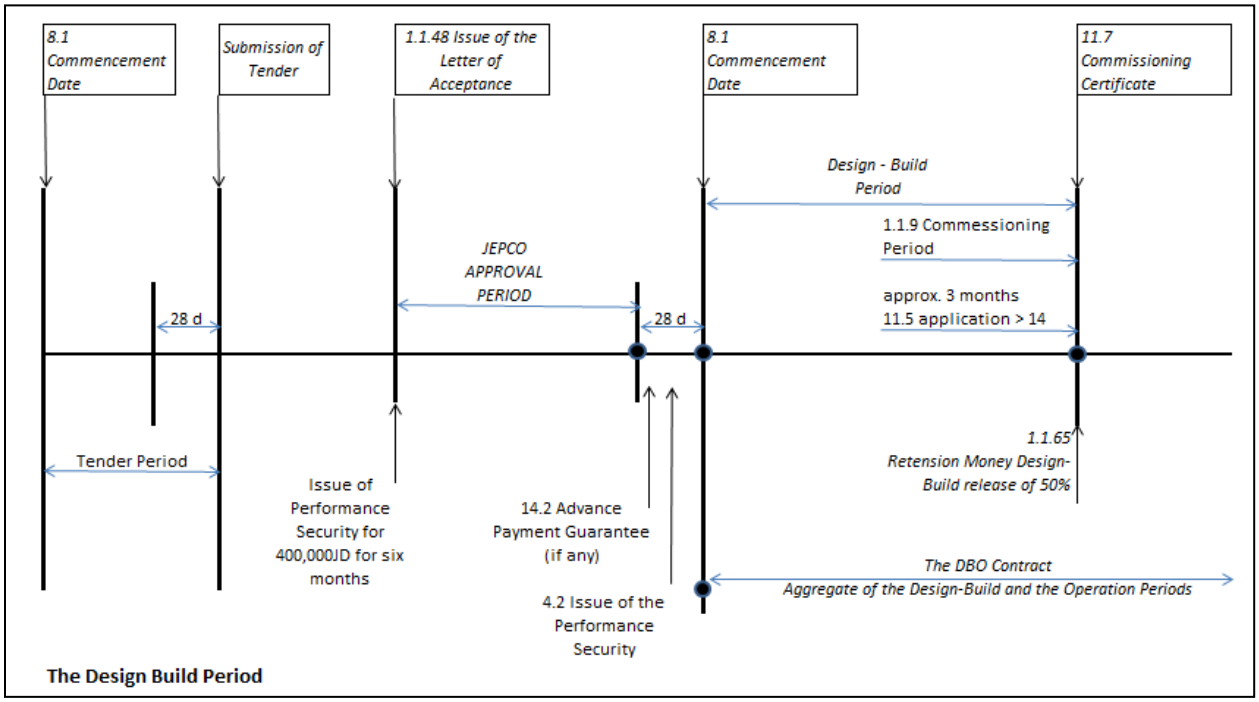
2.6.3.2 Unsuccessful bidders shall be notified with the outcome of the evaluation process, and will be provided the following information:

i. the criteria for award.
ii. the name of the successful bidder.
iii. the reasons why the bidder did not meet the technical specifications/notification that the offer was not the cheapest (if applicable).

2.6.3.3 The recommendations of the Central Contracting Committee shall be published on the Notice Board of the Department of Contracts, and published online on the Department's website.

2.6.4 Contract Signing and Performance Guarantee

2.6.4.1 Within 28 calendar days of receiving the Letter of Intent "LOI" (against acknowledgment of receipt) from the UoJ, the successful bidder will sign and date the LOI and return it to the UoJ Department of Central Contracts. The Contract shall be signed and the selected Contractor shall submit a performance guarantee for the amount of JD 400,000 for the duration of six months. The form for this guarantee shall be identical to the bid bond. The Contractor will have six month to submit all necessary application to all regulatory entities and secure the approvals to connect to grid for the scope of work in the Contract. The UoJ has the full right to terminate the contract if JEPCO's approval for the Scope of Work is not secured within the six months period. The figure below is showing the tendering stage, the JEPCO Approval stage and the Design-Build Stage.



2.6.4.2 The Awardee shall work with all the regulatory bodies to secure the Grid-Connection Agreement with JEPCO. UoJ's LOI shall include the required authorization for the Awardee to represent UoJ in this process. UoJ shall carry the financial responsibilities for the application fee, the preliminary study, grid-impact study, and other fees mandated by regulators, through the provisional sums. Duration of this phase should not exceed 180 days required in JEPCO regulations.

2.6.4.3 Once the Grid-Connection Agreement is duly secured, and on signing of the contract by the UoJ with JEPCO, the Contractor will submit the performance security and the advance payment guarantee. If the Grid Connection Agreement is not signed, the Contract shall be terminated without prejudice. The Contractor will not have the right to claim for any expenses, delays, loss of opportunity, or any other claim whatsoever.

2.6.4.4 The overall Contract duration shall be 540 days. The allowed duration for JEPCO Approval is no more than 180 days. Date of Delivery of each zone is set to (360 days), after Commencement Date.

2.6.4.5 Before the UoJ signs the contract with the successful bidder, the successful bidder may be requested to provide all documents requested in Section 2.1.6 and 2.1.7 with validity up to the date of Contract Signing.

2.6.4.6 If the selected bidder fails to sign and return the Letter of Intent, other required documentation, and any guarantees required within the prescribed 28 calendar days, the UoJ may consider the acceptance of the tender to be cancelled without prejudice to the UoJ right to seize the guarantee, claim compensation or pursue any other remedy in respect of such failure, and the successful bidder will have no claim whatsoever on the UoJ.

The bidder whose tender has been evaluated as second place may be recommended for award, and so on and so forth.

2.6.4.7 Only the signed contract will constitute an official commitment on the part of the UoJ, and activities may not begin until the contract has been signed by the UoJ and the successful bidder.

2.6.4.8 Tender guarantees (bid bonds) provided by bidders who have not been selected shall be released within 30 calendar days from the signing of the contract. The tender guarantee of the successful bidder shall be released on the signing of the contract, and on submission of a valid performance guarantee.

2.6.5 Performance Security

The winning bidder (Contractor) shall provide a Performance Security (Guarantee) for a sum equivalent to ten percent (10%) of the total Contract Amount for the due performance of the Agreement under the terms of the Conditions of Agreement, as stated in Appendix III

(Performance Security Form). Release of the Performance Bond against partial handing over is not allowed.

2.6.6 Design-Build Period

2.6.6.1 The period of delivery indicated in Section 2.1.1.3 of the Instructions to Bidders commences from the signing of the contract by both parties, and issuing a letter by the supervising engineer stating the Commencement Date. That period is three hundred and sixty five (365) calendar days.

2.6.6.2 The Contractor must inform the UoJ's Consultant and Appointed Supervisors by return that he has received the notice.

2.6.6.3 In the case that the Contractor commissions any partial systems ahead of the Contractual Period of 365 days, the Contractor will receive financial incentives with the amount of JD 25,000 per 1GWh produced, with 1 GWh as a minimum. For higher production, incentives shall be calculated proportionally. This will be calculated as a positive variation order (VO) at the end of the design-build period. This value will be aggregated from the inverter readings for that specific zone, and certified by the Consultant.

2.6.6.4 Any unjustified delay after the date of delivery (end of design-build period) stated in the Signed Contract will be penalized in the amount of JD 6,000/day for each rooftop zones, and JD 4,000/day for the carpark zone, separately. This amount will be deduced from the total tendering price. The number of days will be calculated starting the stated date of delivery as agreed at the contract signing document (or the Commencement Date, whichever comes earlier), until the day the Final Acceptance Certificate is provided. The max delay penalty is 15% of the Contract Amount.

2.6.6.5 In all cases, such delay shall not exceed 120 calendar days; in which case, the UoJ has the right and will take any and all necessary legal and fiscal actions it deems appropriate.

2.6.7 Annual Yield Guarantee Agreement

2.6.7.1 The Contractor shall sign the Annual Yield Guarantee Agreement, for their respective zone, as part of the Contract.

2.6.7.2 The guaranteed annual yield (kWh / year) - as measured by the overall kWh inverter meters shall be guaranteed by the Contractor for the duration of the three-year operation period.

2.6.7.3 The annual yield shall be computed based on simulations of the stations' design using latest version of PVsyst (or equivalent software), after all modification required by JEPCO and/or Consultant are implemented. The simulations shall be based on the latest METEONORM 7.1 data, and stations' degradation shall be taken into consideration.

2.6.7.4 The Contractor will perform all required monitoring, maintenance and cleaning of the stations to achieve the annual yield as a minimum. Unforeseen and uncontrolled factors affecting the annual yield (such as intermittence of electric power supply, excessive cloudy days, etc.) shall be assessed accordingly.

2.6.7.5 Any decrease in the performance of the system, as a deviation from the measured annual yield compared to the expected annual yield at each metered point of connection, will be the responsibility of the Contractor. This is a financial responsibility. The Contractor shall pay the overall negative difference in kWh cost to the UoJ, based on the named tariff(during the year under consideration) and clauses in the Annual Yield Guarantee Agreement.

2.6.7.6 Assessment of the annual yield shall be done at the end of December for the year under consideration.

2.6.7.7 The Agreement will come into force at the end of the Design-Build Period. Taken into consideration Section 2.6.6.3 (partial completion incentives), any power generated through partial completion of the stations before the Design-Build period, will not be covered by the Annual Yield Guarantee Agreement.

SECTION SEVEN – GENERAL CLAUSES

2.7.1 It will be the bidder's sole responsibility and on their own expense to understand the site nature, environment and all requirements that are related to the tender or that may influence its pricing.

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

2.7.3 Bidders requiring further information or clarifications may notify UoJ in writing to Central Contracting Committee. UoJ will respond in writing to any request for information or clarification and provide them to all qualified bidders.

2.7.4 To assist in the examination, evaluation and comparison of bids, UoJ 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.

2.7.5 UoJ will determine to its satisfaction whether the bidder selected as having submitted the best-evaluated responsive bid is qualified to satisfactorily perform the project.

2.7.6 The subject of the contract is two-fold: the design, engineering, procurement, construction, testing and commissioning, cleaning and maintenance of car park systems and Rooftop systems to cover the annual electricity needs of the university .

2.7.7 Bidders are permitted to submit up to three offers: rooftop zone 1, rooftop zone 2, or carpark zone. Bidders must specify on the offer packages which zone they are bidding for. Interchangeability between offers for rooftop zones 1 and 2 is not allowed.

2.7.8 The Tender will be awarded as one lot for "design, build, and operate" for the Contractor considered to have passed the Technical Evaluation and have the lowest financial offer for each zone under evaluation. The UoJ reserves the right to divide the tender awarding between two or more Contractors if it deems it beneficial to the University.

2.7.9 The determination of winning offer will take into account the bidder's financial, technical and production capabilities and the lifetime 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 UoJ deems necessary and appropriate.

2.7.10 UoJ will award the tender to the successful bidder whose bid has been determined to be the most properly responsive bid in the Evaluation Process, provided further that the bidder is determined to be qualified to satisfactorily perform the Contract.

2.7.11 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.

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

2.7.13 In any offer, if any item needed during the installation, and is required to successfully complete the works in this tender, and was not stated in the offer; then it is the bidder's responsibility to provide it without affecting the offer time and price. However, any omission of any part of the (BOQ) shall be, the cost of omitted materials/Items will be deduced directly from the tender financial offer.

2.7.14 Engineering Services Agreement

The general conditions of the contract shall be the FIDIC Condition of Contract for Design, Build and Operate Projects, DBO, first edition 2008. 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.

2.7.15 Variations, Alternations and Additional Works

i. As part of the tendering regulatory bylaws of UoJ, the UoJ reserves the right to alter the volume of the works by 25%, and maintain the original prices and maintains the rates of the agreement.
ii. 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.
iii. The contactor is obliged to carry out all modifications in due time after receiving the client's written order, with explicit agreement on the number of working days needed to fulfill these modifications.
iv. Any delay occurring due to the client's written order will be considered as a justified delay, given that it is timely and justified.

2.7.16 Default of the Contractor

All disputes and differences shall be handled through arbitration. 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.

2.7.17 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. The Contractor shall be responsible for all taxes, duties and fees borne by this project.

If UoJ received a sale tax exemption, this amount will be deduced from the financial offer. The Contractor shall provide all the paper work and regulatory due process to secure and certify any tax exemptions.

2.7.18 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 UoJ. The required insurance is meant for professional liability. The insurance company may be Jordanian or non-Jordanian but must be operating in Jordan. Refer to Appendix II, Form 6.

SECTION EIGHT – SPECIAL CONDITIONS

2.8.1 This agreement includes two parties, the first party is the client (UoJ), and the second party is the bidder who wins the bid (hereafter Contractor). The UoJ shall assign a third party consultation firm (Consultant) for the purposes of the certification of the installation, testing, and commissioning of the PV stations.

2.8.2 The bidder experience shall be considered in the evaluation of the technical offer. References, when it applies, should be included in the offer. The minimum qualifications required for any bidder to be considered in the evaluation process are detailed in 2.1.6 and 2.1.7. Also, the bidder should show the following:

i. Bidder should have enough experience and certified technical staff to do the design, installation and maintenance of the Works.
ii. Name, experience, qualifications, certification, awards and CVs of the engineering staff who will supervise the installation and support should be included.
iii. The bidder must assign in the offer a certified project manager who will lead the company project team during the implementation of the project.

2.8.3 The bidders have no right to object to the technical and financial evaluation criteria applicable to this tender.

2.8.4 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).

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

2.8.6 Warranty

i. The Contractor shall warrant that the supplies are new, unused, of the most recent models and incorporate all recent improvements in design and materials.
ii. The Contractor shall further warrant that none of the supplies have any defect arising from design, materials and workmanship. This warranty, covering but not limited to, defects in material or workmanship, shall remain valid for ten (10) years after provisional acceptance of the installed, tested, commissioned and certified photovoltaic stations.
iii. The PV panels shall be further guaranteed by the manufacturer to remain at 90% performance, or better, of the original conversion efficiency and nominal peak power rating for at least the first ten (10) years and to remain at 80% or better for at least the following 15 years. The PV panels shall be guaranteed to have an operational life of at least twenty five (25) years.
iv. The PV Mounting system and hardware shall be warranted to be free from defects in material and workmanship for a period of ten (10) years.

v. Per Article 788 of the Jordanian Civil Code, the architect/engineer who designed a structure and the contractor who built it, are jointly liable to UoJ for any complete or partial collapse and for every defect which threatens the strength and safety of the structure, for a period of ten years from the date of taking over the works at each location.

2.8.7 The client (UoJ) has the right to terminate the tender without declaring the reasons whatsoever, by written order from the client. In such a case the Consultant and 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 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) DBO book.

2.8.8 The joint venture/consortium parties must submit their agreement with the tender documents, signed and sealed by all parties and duly legalized by a notary public prior to the award of the contract.

2.8.9 The bidder who wins the bid will be compensated for all works within this contract to the named leader of the joint venture/consortium and not separately for each party.

2.8.10 The evaluation of the submitted offers is only for the purpose of this tender.

2.8.11 Any unauthenticated documents will not be considered for the evaluation.

2.8.12 The Technical Offers should not contain any hint to the financial offers.

2.8.13 The design shall comply in full with all international safety codes in respect of life safety and construction site safety.

2.8.14 The bidder shall design a well-integrated security monitoring and control system for the safety and security of the property and its occupant.

2.8.15 The bidder shall make presentations to the client representatives, if requested, during the technical evaluation stage, using power point software or similar electronic format.

2.8.16 All drawings shall conform to the standard sizes of A0, A1 and A2 and their reduced size of A3. All drawings shall be provided in electronic softcopy format using a recognized CAD format. All hardcopies and softcopies shall become the property of the UoJ. Drawings should be well organized and easy to identify using file names and access codes.

2.8.17 The bidder shall submit design documents fully in compliance with the requirements of the following authorities:

- University of Jordan
- Ministry of Public Work and Housing – Jordan National Building Codes;
- Civil Defense Directorate; (CDD)
- Ministry of Environment (MoENV)
- Greater Amman Municipality (GAM)
- Jordan Engineers Association (JEA)
- Jordan Construction Contractors Association (JCCA)
- Ministry of Labor
- Energy and Minerals Regulatory Commission. (EMRC)
- Jordan Electric Power Company (JEPCO).

2.8.18 The bidder who wins the bid shall submit monthly progress report to Consultant and the Central Contracting Committee during the period of this contract. This report shall identify progress on works tasks, estimated completion date of tasks in comparing with the contract working program, issues and problems etc.

2.8.19 The bidder who wins the bid shall submit and within (14) days of commencement date a working program showing the planned duration for all activities using a Primavera program, MS Projects, or a similar program.

SECTION NINE – MISCELLANEOUS

2.9.1 Ethics Clauses

2.9.1.1 Any attempt by a candidate or bidder to obtain confidential information, enter into unlawful agreements with competitors or influence the committee or the UoJ during the process of examining, clarifying, evaluating and comparing tenders will lead to the rejection of his candidacy or tender.

2.9.1.2 Without the UoJ's prior written authorization, the Contractor and their staff or any other company with which the Contractor is associated or linked may not, even on an ancillary or subcontracting basis, supply other services, carry out works or supply equipment for the project. This prohibition also applies to any other programs or projects that could, owing to the nature of the contract, give rise to a conflict of interest on the part of the Contractor.

2.9.1.3 When putting forward a candidacy or tender, the candidate or bidder must declare that they are affected by no potential conflict of interest, and that they have no particular link with other bidders or parties involved in the project. Clause 15 in FIDIC Gold Book is the guidance regarding Conflict of Interest.

2.9.1.4 The Contractor must at all times act impartially and as a faithful adviser in accordance with the code of conduct of their profession. They must refrain from making public statements about the project or services without the UoJ's prior approval. The Contractor may not commit the UoJ in any way without its prior written consent.

2.9.1.5 For the duration of the contract, the Contractor and their staff must respect human rights and undertake not to offend the political, cultural and religious morals of the Hashemite Kingdom of Jordan.

2.9.1.6 The Contractor may accept no payment connected with the contract other than that provided for therein. The Contractor and their staff must not exercise any activity or receive any advantage inconsistent with their obligations to the UoJ.

2.9.1.7 The Contractor and their staff are obliged to maintain professional secrecy for the entire duration of the contract and after its completion. All reports and documents drawn up or received by the Contractor are confidential.

2.9.1.8 The Contractor shall refrain from any relationship likely to compromise his independence or that of their staff. If the Contractor ceases to be independent, the UoJ may, regardless of injury, terminate the contract without further notice and without the Contractor having any claim to compensation.

2.9.1.9 The tender(s) concerned will be rejected or the contract terminated if it emerges that the award or execution of a contract has given rise to unusual commercial expenses. Such unusual commercial expenses are commissions not mentioned in the main contract or not

stemming from a properly concluded contract referring to the main contract, commissions not paid in return for any actual and legitimate service, commissions remitted to a tax haven, commissions paid to a recipient who is not clearly identified or commissions paid to a company which has every appearance of being a front company.

2.9.2 Gender Equality

In carrying out their obligations in pursuance of this contract, the bidder shall ensure the application of the principle of gender equality and shall thus 'inter alia' refrain from discriminating on the grounds of gender, marital status or family responsibilities. Bidders are to ensure that these principles are manifested in the organigram of the company where the principles aforementioned, including the selection criteria for access to all jobs or posts, at all levels of the occupation hierarchy are amply proven. In this document words importing one gender shall also include the other gender.

SECTION TEN – CONTRACT DATA

Sub-Clause	Data to be given	Data
1.1.24……	Where the Contract allows for Cost Plus Profit, percentage profit to be added to the Cost:……	5 %
1.1.26……	Cut-Off Date (number of days after the Time for Completion of Design-Build):…….	0 days
1.1.32…	Employer's name and address…….	University of Jordan Aljubeiha, Amman, Jordan
1.1.35……	Employer's Representative's name and address…… …	
1.1.70……	Parts of the Works that shall be designated a Section for the purpose of the Contract:….	Roof Tops Zone 1 Roof Tops Zone 2 Car Parks
1.1.78……	Time for Completion of Design-Build…….	180 days for JEPCO Approvals 365 days for Completion of Scope of Design-Build Works and Connection to Grid
1.3……	Agreed methods of electronic transmission:..	Project Email
1.3……	Address of Employer for communication:….	To be determine
1.3……	Address of Employer's Representative for communication:……	To be determine
1.4……	Contract shall be governed by the law of:…..	The Hashemite Kingdom of Jordan
1.4……	Ruling Language	Arabic and English
1.4……	Language for communications:……..	Arabic and English
2.1……	After receiving the Letter of Acceptance, the Contractor shall be given right of access to all or part of the Site within:……..	14 days
4.2……	Performance Security (as percentages of Accepted Contract Amount in Currencies): Percent…….. Currency……...	10% Jordanian Dinars
4.2……	Reduction in Performance Security at the end of the Retention Period:……..	50%
5.1……	Period for notification of errors, faults and other defects is: ……..	1095 days
5.2……	Contractor's Documents requiring approval	Electrical, Mechanical, Structural, Architectural Designs and Engineering Material Submittals

		Program of Works Quality Plan Safety Plan Test Reports Commissioning
6.5……	Normal working hours on the Site: ……	8 hours/day
8.2……	Period of the Operation Service: ……	03 years
9.2……	Time for Completion of Design-Built:……..	180 days for JEPCO Approvals 365 days for Completion of Scope of Design-Build Works and Connection to Grid
9.2……	Time for completion of each section: Section: …Roof Top Zone 1 PV systems.. Section: …Roof Top Zone 2 PV systems. Section: …Car Parks PV systems……..	180 days for JEPCO Approvals 365 days for Completion of Scope of Design-Build Works and Connection to Grid
9.6……	Delay damages (percent of final Contract Price per day of delay):…….. Roof Top PV systems Zone 1: Roof Top PV systems Zone 2: Car Parks PV systems:	- - 6000JD/day 6000JD/day 4000JD/day
9.6……	Maximum amount of delay damages (percent of final Contract Price):……	15%
10.6a……	Maximum compensation payable by Contractor:…… .	_Electricity Tariff applicable during that period x KWh lost during that period
10.6b……	Maximum compensation payable by Employer: ……..	None
10.7……	Performance damages: Failure…….. Damages…….. Failure …… Damages ……..	Electricity Tariff applicable during that period x KWh lost during that period
10.7……	Rights of Employer if failure continues for more than 84 days:……	Termination of Contract
10.7……	Minimum production outputs required (give details):……	Per approved performance for each Zone
13.5……	Percentage rate to be applied to Provisional Sums:……	05%

14.2……	Amount of Advance Payment (percent of Accepted Contract Amount)…….	To be Agreed%
14.2……	Currencies of payment if different to the currencies quoted in the Contract…….	Jordanian Dinars
14.2……	Percentage of deductions for the repayment of the Advance Payment: …..…….	To be Agreed %
14.3……	Percentage of Retention: ……..……	05%
14.3……	Limit of Retention Money: …….	05%
14.6(b)(i)…	Plant and Material for payment when Shipped: ……	To be Agreed
14.6(c)(i)…	Plant and Material for payment when delivered to the Site: ……	To be Agreed
14.7(b)…	Minimum Amount of Interim Payment Certificate: ……	To be Agreed
14.9……	Financing Charges for delayed payment (percent points above discount rate):…….	04%
14.17…	Currencies for payment of Contract Price:….	Jordanian Dinars
14.17…	Proportions of Local and Foreign Currencies are: Local…….. Foreign..……..	Not applicable
14.17…	Rate of Exchange…….	Not applicable
14.17…	Payment of damages shall be: Currency…….. Proportion..…….. Currency…….. Proportion..……..	Jordanian Dinars
14.19…	Amount of Maintenance Retention Fund:……	05% of Final Contract Amount
17.1…	Operation of forces of nature allocated to the Contractor:…… ….	Wind, Dust, and Snow
17.8…	Total liability of the Contractor shall not exceed:…… ……	15% of the Final Contract Price
19.2(a(i))…	Permitted deductible limits: ……...	_100_%
19.2(a(ii))…	Additional Sum to be insured:……	15%

19.2(a)4…	Additional Sum to be insured:……	Used Provisional Sum Amounts
19.2(a)5…	Employer's Risks to be insured if different to Sub-Clause 17.1…….	
19.2(b) …	Exceptional Risks to be insured if different to Sub-Clause 18.1…….	
19.2(c) …	Insurance of Contractor's Equipment (amount required):…… …..	100%
19.2(c) …	Amount of professional liability insurance required:…… ……	100% of final contract price
19.2(d) …	Period for which professional liability insurance required:……	03 years
19.2(f) …	Amount of insurance required for injury to persons and damage to property:……	250,000 Jordanian Dinars
19.3(a) …	Other insurances required from the Contractor (give details):……..	
19.3(d) …	Amount of fire extended cover insurance required:…… …..	
19.3(e) …	Other insurances required by law from the Contractor (give details):……..	
20.3……	Other optional insurances required form the Contractor (give details):……..	
20.3……	Date for appointment of DAB:……..	60 days from Commencement Date
20.4……	The DAB shall comprise: …….	03 members
20.8……	Appointing entity (official) for DAB members, if not agreed, shall be the President of FIDIC or person appointed by him Language of arbitration:……..	Arabic

PART THREE – TECHNICAL SPECIFICATIONS

SECTION ONE – GENERAL REQUIREMENTS

Where in this tender document a standard is quoted, it is to be understood that the Contracting Authority will accept equivalent standards. However, it will be the responsibility of the respective bidders to prove that the standards they quoted are equivalent to the standards requested by this tender.

3.1.1 Scope of Work

The successful bidder shall design, engineer, supply, deliver, installation, test, commission, clean and maintain for three years all equipment and materials required for the successful completion of the project as specified and scheduled in this tender. The system has a nameplate of 16MW AC generated using PV panel arrays without using storage system (Appendix VIII shows UoJ power consumption over the last 12 months).

The system is divided into three major sections:

1. Zone 1: Rooftops Zone 1 with 6 MW AC capacity
2. Zone 2: Rooftops Zone 2 with 6 MW AC capacity
3. Zone 3: Car Parks Zone with 4 MW AC capacity

The complete 16 MW AC nameplate design is to be completed by the bidder or bidders who have shown technical and financial competency through the evaluation process.

The method of financing this project is DBO contract. The objective is the design, engineering, supply, delivery, installation, testing, commissioning, and three year cleaning and maintenance of Grid-Connected Photovoltaic Stations with no storage with the abovementioned implementation and financial scheme. All requirements provided throughout the document are to be read as specific for each zone, unless mentioned otherwise.

A centralized supervisory control and data acquisition (SCADA) system must be provided to allow manual and autonomous control of the installed power stations.

Energy audit and thermal insulation of rooftops of all listed buildings in Zones 1 and 2 is required as part of the scope of work of this tender.

Sufficient training of university personnel to operate the system post-delivery shall be provided by the Contractor.

The PV plants shall conform to Renewable Energy and Energy Efficiency Law Number 13 of the Year 2012. The PV plants shall also conform to all applicable building codes and Environmental Protection standards stated in Jordan Law Number 52 of the Year 2006.

Except otherwise expressed in the Contract, UoJ 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 UoJ (turnkey project).

The grid-connected PV Solar systems shall be designed for outdoor exposure to weather and UV irradiation for a minimum of 25 years, in an ambient temperature range of –20ºC to 50ºC, Basic Wind Speed is 160 km/hr, and static and dynamic forces including snow loading. The efficiency of the system at the end of the 25 years must be shown to not drop by more than 20% of its initial nameplate value.

The identified locations at the UoJ Campus, Amman, Jordan, are (and not limited to) the lists provided in Appendix V, divided by zone. Maps of zones (size A0) and .DWG files are included as a softcopy within the tender package.

It must be stressed that the system installed at the location at the Faculty of Physical Education (Zone 2), located at east of Al-Hussain Sports City (4 km south of UoJ campus) should be designed to generate 550,000 kWh annually.

The Contractor(s) must coordinate the local zoning of the project works with the project Supervisors and allow for parallel execution of the works.

Construction of all stations must have minimal interruption of teaching activities on campus. Any heavy machinery, transportation of equipment, or activities including loud noises must be performed after the campus normal working hours. Accessibility plans and routes to and from the campus must be approved by the project Supervisors, and in coordination with UoJ named officials.

The PV solar systems shall be designed and manufactured for high reliability and maintainability.

The integration with the electrical grid for the low-voltage systems shall be by means of a connection to the existing distribution board/s at the closest local building site. Additional circuit breakers (provided by the bidder) shall be used in conjunction with the already existing distribution boards (Appendix IX shows a list of the distribution panels around UoJ campus). Upgrade of several existing distribution boards, as listed in Appendix IX is the responsibility of the contractor.

The UoJ will coordinate with the respected parties to facilitate the approval for 16 MW AC grid-connected station at its campus from Jordan Electric Power Company (JEPCO). The successful bidder(s), on behalf of the UoJ, shall provide for the provision and processing of all necessary documentation and application forms from JEPCO for connection of the PV systems to the grid, following the ENA G59/2 guidelines, including payment of all relevant fees. Generation meters are required at the points of power connection to the electric grid.

3.1.2 Site Familiarization

Bidders are requested to note the layout of the buildings (avoiding shading effect), pedestrian walkways, and the locations where the various items of equipment are to be installed and the proposed routing of cable trays, etc. The Bidders are also to ensure that the equipment offered is suitable for operation within the physical restrictions imposed on it by the building layout, and the local environment of the UoJ location.

Physical positioning of panels and peripheral equipment must be implemented in consultation with the Consultant and the Supervisors at the UoJ.

Site visits, detailed in Section 2.1.10, are organized during the bidding and design stage, to give the bidders the chance to create topography maps and needed site surveys for the station installation sites. Individual site visits by the bidders for further measurements and surveys are allowed after securing written approval from UoJ appointed officials, and through the Office of Central Contracts.

3.1.3 Electrical System

The PV plants are to be connected to a 3-phase electrical system and be compliant to the national network code. The low-voltage system in the Jordan is a three-phase, 4-wire, 400/230 V, 50 Hz system. The grid inside the UoJ campus is connected via 52 low voltage meters to the medium-voltage network through 11 kV substations, distributed around the campus (45 meters inside UoJ campus, 5 meters for the UoJ Hospital, and 2 meters for the Faculty of Physical Education at the Sports City). The medium-voltage system in the Jordan is a three-phase, 4-wire, 33 kV system. The acceptable tolerance on the voltage level for consumers is ±10%. The current supplied to the utility grid shall be sinusoidal at nearly a unity power factor (not less than 0.9 PF) and with a Total Harmonic Distortion (THD) less than 3%. The tolerance for frequency deviation is ±1%.

In all cases, the PV systems connected to the inverters will be designed and built to operate at an absolute maximum DC voltage of 1000 V DC.

3.1.4 Optimization of AC Power Output

The design of the photovoltaic stations must adhere to the best practices used in photovoltaic stations' design, including the geographical location of the university, the latitude at which the university is located at (32.0°N), achieving the required overall AC capacity of 16 MW AC (summation of the specific power generation of each zone separately). Special care must be taken into account regarding row-to-row distance, shading effect, and tilt angle to optimize AC power output and real estate utilization.

3.1.5 Real Estate Utilization

The design must consider the total area utilized for the complete installation of the photovoltaic stations, taking in consideration the design of photovoltaic stations as outlined

in Section 3.1.4. The suggested locations to be utilized for rooftops (Zones 1 and 2) and car parks (Zone 3) are included in Appendix V. The Bidder showing a design with complete coverage of the annual energy yield for their respective zone with minimum real estate utilization will be given higher evaluation points for this item in the Evaluation Criteria.

3.1.6 Sample of Materials

Before installation, samples of materials considered appropriate by the successful bidder or as requested by the UoJ, shall be provided to re-confirm their technicalities with the tendered offer, in consultation with UoJ Consultant.

Rejections of any submitted samples shall not reduce the responsibility of the successful bidder for completing the works.

The UoJ shall also reserve the right to call for samples of specified equipment and other related material. Failure to submit such samples shall enable the UoJ to enforce the replacement of any such item, even after its installation has been complete.

3.1.7 Spare Parts and Measurement Equipment

3.1.7.1 At the end of the operation service period and before the release of funds remaining in the maintenance retention fund, the Contractor must provide the following:

- At least three new inverters or 3% of each inverter size installed (whichever is higher).
- At least 1% of the total sum of PV panels installed.
- At least 1% of the total number clamps, bolts, nuts and washers used in the project.
- At least 3% of each circuit break size, with at least 1 of each size.
- At least 500 meter of DC cable of each size used in the project.
- At least 1% of the total MC4 connections used in the project, and original Multi-Contact (STÄUBLI) MC4 crimping kit.
- Brand new Measurement equipment: industrial-grade low and medium voltage voltmeter, industrial-grade power analyzer, IR camera (minimum of 500 kilo pixel, Thermal Sensitivity < 0.05 °C), Insolation Tester (Megger), Injection Tester, Installation Tester.

3.1.7.2 The Contractor, at the commissioning date, must provide three (3) years of maintenance and cleaning of the system, including spare parts and manpower, after securing approval from the Consultant. Usage of spare parts from 3.1.7.1 during the three-year maintenance period is not allowed. The contractor shall provide all the measurement equipment before commissioning date.

3.1.7.3 Providing an easily accessible, on-campus storage areas for the spare parts items listed in 3.1.7.1 are the responsibility of the Contractor.

3.1.8 Builder's Bill of Quantities

There shall be NO hint to the prices of the equipment or services in the technical offer. The Bill of Quantities (BoQ) shall include for all carriage and hoisting equipment, provision of any civil works, trenches, reinstating or fixing any changes to real estate, bases, structural platforms and supporting frames, and all necessary items to render a complete and functional installation.

3.1.9 Installation

The installation process at the identified sites must be carried out in consultation with the Consultant and Supervisors at the UoJ, and following the approved planning, logistics, circulation, zoning, and project management plans.

SECTION TWO – DESIGN CRITERIA

The design criteria given in this agreement 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, workability, performance, good utilization of real estate use, and good utilization of space a circulation. The Contractor shall secure approvals of all documents and drawings of the project from all official entities.

3.2.1 Low-Voltage Grid-Connected Equipment for Car Parks

3.2.1.1 PV modules:

- The PV module shall be of thin film, polycrystalline or monocrystalline silicon technology.
- Module's efficiency at Standard Test Conditions (STC) must be at least 13% for thin film, at least 16% for polycrystalline, and at least 18% for monocrystalline.
- Minimum cell thickness 150μm.
- Modules must also carry a European CE mark and come with protective electrical insulation to Class II.
- Modules shall also comply with UV test standards.
- The modules shall only have positive tolerance of the rated power at STC.
- Modules shall have a frame consisting of anodized aluminum alloy with a coating, ensuring high corrosion resistance and a service life of at least 25 years.
- Modules shall have high transmissivity, non-reflective low-iron tempered glass cover, with thickness of at least 3.2 mm for 60-cell modules (or equivalent size) and at least 4 mm for 72-cell modules (or equivalent size). The glass should also be weather proof, including hail resistance, which shall be specified by the manufacturer. Thin film modules should have glass of thickness of at least 4.0 mm.
- The inter-connected cells shall be embedded between EVA (ethyl vinyl acetate) or equivalent sheets in order to protect them from mechanical stress.
- The back-side shall be covered by a polyvinyl fluoride (PVF) polymer or equivalent durable 'plastic' rear film or equivalent, to protect modules from moisture and ensuring cooling of solar cells. Transparent backing is allowed.
- Modules shall have an IEC/EN approved minimum of IP65 PV terminal junction box with installed Bypass Diodes and tested accordingly.
- Modules shall have built-in plug connectors rated at min of IP65. These shall be positioned under the panel and be watertight. Modules shall also include the relevant pre-confectioned solar cables.
- Modules shall be rated for a minimum of 600 V DC system voltage.
- Open circuit voltage (V_{oc}) shall be within 10% of the data sheet at STC.
- Operating temperature of: –20˚C to +50˚C.
- Each module shall be marked with a serial number, including date of manufacture and country of origin.

- Bidder must provide evidence that the PV manufacturer must have been operating in the business of Solar panels and PV units manufacture for, at least, the past ten (10) years.
- The PV panels shall be fully guaranteed by a manufacturer generic guarantee for 25 years.
- The PV panels shall be further guaranteed by the manufacturer to remain at least 80% performance after twenty five (25) years of operation. The PV panels shall be guaranteed to have an operational life of at least twenty five (25) years.
- All modules must be TUV certified or equivalent.

3.2.1.2 Mounting structures:

The bidder is expected, after finishing the site visits, to provide a unified concept design and structure that encompasses the campus distributed solar canopy locations (Figure 5 shows some examples of solar canopies. Note that some of these examples use See-Thru solar panels).

The design must adhere to the following minimum requirements:

- The design should be iconic, recommending using elements from the environment, where possible.
- The structures shall be composed of hot-dipped galvanized (HDG) steel or equivalent rigid and durable material approved by UoJ Consultant and Supervisors.
- In case the that the design requires a thematic color scheme for the car parks, the mounting structures shall have the following treatment system:
    - Shop painting with shot blast to Sa $2\ ^1/_2$
    - Two layers Zinc-rich primer with total thickness 150 microns dry-film thickness (DFT).
    - Final finish of polyurethane 50 microns, color according to design, approved by UoJ Consultant.
    - Paint system shall have at least 15 year warranty
    - Site painting is prohibited
- The racking manufacturer shall supply a suitable warranty for the installed structure and the racking design shall certified by the solar module manufacturer.
- The structure bolts, beams and spacing between panels must withstand the local environmental conditions at the UoJ, including large temperature span (– 20˚C to +50˚C), dust, rain, icing, snow accumulations at an altitude of 1,100 meter, and basic wind design speed of 160 km/hr.
- Load combination shall be calculated as per Jordanian National Building Codes.
- Any civil work, material transportation, ground cabling, cement mixtures, and covering tiles needed to complete the design must be provided by the Contractor, and must not interfere with teaching activities on campus.
- Rain and cleaning water drainage must be accounted for.

- Fixation of Modules with Middle and End Clamps:
  - Clamps must be German origin;
  - All modules are fixed at minimum four locations
  - All clamps and screws are installed with European or USA origin stainless steel M8 Bolt, nut, washer and spring washer as a minimum
- Thermal expansion and contraction of the system must be taken into account;

Figure 5 – Examples that illustrate the concept of solar canopies. These images are used as visual illustrations. The Contractor must submit his own structure design concept.

3.2.1.3 Inverters:

The Contractor shall supply and install all inverters (with their pads and/or enclosures, shading from direct sunlight and heat sources) and wiring/cabling to the inverters in accordance with the national/international standards. It is the responsibility of the Contractor to know the distribution of transformers, electrical meters, electrical distribution boards and their loads to the different campus buildings. UoJ will facilitate providing any information in this regard, as detailed in Appendix IX.

The Contractor shall supply all DC to AC inverters, and will be responsible for connections from the inverter(s) to the grid.

All inverters must have the following minimum requirements:

- The inverters must have an absolute maximum DC input voltage of 1000 V;
- The inverters must have a maximum DC input current of 250 A;
- The efficiency of the inverter must not be less than 97.5%;
- Total Harmonic Distortion (THD) must not exceed 3%;
- Multiple MPPT;
- The inverter shall have adjustable power factor (PF) 0.9 lead – 0.9 lag, and shall disconnect if Power Factor (PF) drop below 0.9;
- All weather protection and ambient temperature between –20°C to +50 °C;
- The inverter shall be warranted to be free from defects in material and workmanship for a period of ten (10) years and bidder would have to provide the manufacturer's warranty in this respect;
- Environmental protection from temperature, wind, rain, and dust;
- Suitable for outside installation: Housing, protection, cooling and on- and off-site monitoring of the inverters must be provided;
- Efficient means of cooling for summer weather conditions. If any fans are used, an effective means of indication should be available to indicate any required maintenance of the fan;
- Contractor to provide protection from heat or direct sunlight;
- Contractor to install inverters at locations not accessible to campus users, and provide for means of safety and protection otherwise.
- Combination of 1 or more inverters per location can be offered, depending on the system and installation proposed;
- The PV generator system will supply the output into a three-phase grid system. Thus three-phase inverters are required;
- The inverters shall be installed in as close proximity to the solar panels as possible to minimize cabling and DC losses;
- The chosen inverter for each array must be capable of withstanding the maximum array voltage and current.
- Inverters shall not be capable of feeding DC failure currents to the grid.

- Inverter shall have anti-islanding protection to prevent back-feeding inverter-generated power to the grid in the event of a utility outage. It should also include a delayed auto-start on mains supply return.
- Ingress with a minimum of IP65 protection;
- Marked with European Conformity, (CE) label;
- Three-phase grid monitoring;
- Phase sequence monitoring and control;
- AC and DC over-voltage (surge) protection (minimum Type 2), change of frequency protection, and short-circuit protection;
- Shall be programmed to have output AC voltage in accordance with local national electricity standards;
- Shall have an RS485 communication port or equivalent serial communication port;
- Ability to store parameters in its internal memory for data logging purposes and incorporate communication capabilities and relevant software to allow communication and transmission of parameters remotely to a PC via Ethernet (for subsequent SCADA monitoring and uploading to a web site);
- Necessary hardware and software to convert RS485 (or serial equivalent) to Ethernet must be provided. (Can be provided as an external stand-alone peripheral).

3.2.1.4 Metering, Control and Monitoring System:

1. The Contractor shall install appropriate equipment that allows for the metering of the energy delivered by the distributed PV systems to the local electric distribution systems (detailing the performance and operation of each sub-system), and back to the grid. The Contractor is required to provide a stand-alone supervisory control and data acquisition (SCADA) centralized room/facility for this purpose.
2. The Contractor shall supply and install monitoring hardware and software, including interconnection communications. The monitoring system shall be configured for automatic reporting of generation statistics.
3. The SCADA system must allow for manual or automatic partial or complete shutdown of the system. PV strings must be connected in a way that can allow such control.
4. Sufficient training to operate SCADA must be provided by the Contractor.
5. Sufficient training to develop and modify the SCADA software must be provided by the Contractor.
6. Criteria for SCADA will be developed in cooperation with the Project Supervisors at the UoJ. The minimum requirements for the criteria should include the following:
    a. For each solar location/station at UoJ, there should be a local controller that has a number of inputs (digital and analog) and outputs (digital and analog) as required by the design.
    b. Inputs of the local controller must allow for local sensor attachments, and to be able to read measurements made by the inverters.
    c. Sensors used for the local controller are: DC and AC voltages and currents, DC and AC power generated, ambient and cell temperature, and solar insolation.

d. The local controller is responsible to operate and monitor the solar location/station autonomously according to some program and algorithm determined by UoJ.
e. There should be a master controller (centralized control station or room) to monitor all local controllers and have the ability to send commands, as well.
f. Expandability for future plans.
g. Local controllers should communicate with the central control station wirelessly, and UoJ should have access to the system through the internet. Internet infrastructure and local area network (LAN) shall be provided by the Contractor. Internet connectivity shall be provided by the Contractor for the duration of the maintenance period.
h. Monitor and control of the solar plant must have internet accessibility.
i. Each solar location should be embedded in one GUI.
j. Weather station (Section 3.6.1.24) input should be integrated within this system for simultaneous recording and measurement.

3.2.1.5 Cabling:

- All AC and DC cables and earthing design, sizing, installation and testing must adhere to JEPCO's requirements as a minimum.
- The cables used for wiring the DC section of the grid-connected PV system need to be selected to ensure that they can withstand the environmental, voltage and current conditions at which they may be expected to operate. This includes heating effect of both current and solar gain.
- Cables must be selected so as to minimize the risk of earth-faults and short-circuits.
- External cables should be UV stable, water resistant and flexible.
- Cables routed behind the PV array must be rated for a minimum of 80˚C.
- Any cable trays used shall be of galvanized steel type and UV protected when installed outdoors. The cable tray installations shall be electrically continuous and bonded to the main earth terminal.
- Separate cable trays shall used for DC and AC routing at all locations. Separate stainless steel rigid metal conduits shall be used for data cables.
- Spacing between cables in cable tray shall be a minimum of 1D. No bundling of cables is allowed.
- All cable ties must be stainless steel.
- String Cables shall be as provided by the module manufacturer or approved equivalent.
- Main DC Cables:
    - Cables to be used should be equivalent to the purposely designed "PV cables" that allow simple and safe connections via purposely made PV plug and socket connectors or cables as per IEC 60228 – (Class 5 or 6). Cables must be TUV and UL 4703 certified;
    - Cables must be rated, as a minimum, to the voltage and current ratings derived using the safety factors:-
        - Voltage: V_{oc} × Number of modules in series × 1.15 × 1.25;

        - Current: I_{sc} × Number of parallel strings × 1.25 × 1.25;
    - Adequate labeling on each cable must be provided identifying string and corresponding inverter.
    - The cables shall be protected and supported in such a way as to prevent mechanical wear and stress on the cables and their electrical connections.
- Main AC Cables:
    - Cables shall be multi-core and of the 600/1000 V grade and where applicable armored cables shall be used.
    - Cables shall be installed in one length between equipment and no joints shall be allowed. All cables are to be properly and permanently marked at intervals showing the name of the source and destination Distribution Board they are connected to.
    - These cables shall be rated according to IEE 17th Edition. Such information shall be provided by the bidder.
    - The cables shall be protected and supported in such a way as to prevent mechanical wear and stress on the cables and their electrical connections.

3.2.2 Low-Voltage Grid-Connected Equipment for Rooftops

3.2.2.1 PV modules:

Similar to specifications detailed in Section 3.2.1.1. However, each module's efficiency at Standard Test Conditions (STC) must be at least 18%.

3.2.2.2 Mounting structures:

1. The Contractor shall supply and install the racking as the mounting system for the solar modules. The system shall be composed of hot-dipped galvanized (HDG) 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.
2. Special care must be taken into account in the design and spacing of the structures to eliminate shading effect between rows of panels.
3. A circulation clearance around the structures (for maintenance and cleaning operations) with 0.5 m width should be accounted for in the design. Layout of the design should follow best practice methods regarding aesthetics and cleaning.
4. Portrait layout in the design is preferred.
5. The structure bolts, beams and spacing between panels must withstand the local environmental conditions at the UoJ, including large temperature span (– 20˚C to +50˚C), dust, rain, icing, snow accumulations at 1100 meter height, and basic wind design speed of 160 km/hr.
6. Load combination shall be calculated as per Jordanian National Building Codes.
7. Fixation of Modules with Middle and End Clamps
   - Clamps must be German origin;
   - All modules are fixed at minimum four locations
   - All clamps and screws are installed with European or USA origin stainless steel M8 Bolt, nut, washer and spring washer as a minimum
8. Thermal expansion and contraction of the system must be taken into account in the design.

3.2.2.3 Inverters:

Similar to specifications detailed in Section 3.2.1.3.

3.2.2.4 Metering, Control and Monitoring System:

A separate system for each roof top zone (Zones 1 and 2), with identical specifications to those detailed in Section 3.2.1.4.

3.2.2.5 Cabling:

Identical specifications to those detailed in Section 3.2.1.5.

3.2.3 Calculations

It is the Contractor's responsibility to provide complete study and calculations showing, but not limited to, the following:

1. The weather data used in the energy simulation shall be solar radiation and ambient temperature data according to the figures shown in the table below (all other required simulation information should be based on METEONORM 7.1):

Month	Solar Radiation on Horizontal Surface (kWh/m²/day)	Ambient Temperature ˚C
1	3.23	8
2	3.87	8.7
3	5.19	11.8
4	6.52	16.3
5	7.77	21.4
6	8.63	23.9
7	8.54	26.4
8	7.74	25.7
9	6.78	23.4
10	5.32	19.8
11	3.87	14.4
12	3.01	10
Average	5.88	17.5

2. The electrical capacity of the system (AC power output of the system).
3. The calculations of all DC and AC losses, including PV panel efficiency, wiring losses, and inverter efficiency.
4. The software to be used in these calculations should be PVsyst latest version in the market.
5. The following parameters must be fixed in the simulation:
    a. Availability of the network: –0.5%
    b. Soiling losses: –3.0%
    c. Transformer losses to be included (if any)
    d. Inverter DC:AC ratio between 100-115%. (If the submitted inverter manufacturer permits higher DC to AC ratio, a technical proof shall be provided in the technical offer, and after Contract Award).
    e. Site altitude 1,100 m above sea level
    f. Albedo 0.2
    g. Maximum operating module temperature for inverter selection should be 65°C, and minimum operating module temperature for inverter selection should be 5°C.
6. Calculations of the efficiency of the stations over the next twenty-five (25) years, along with different illustrative scenarios of output power variations versus ambient temperature, wind, clouds, etc.

3.2.4 Applicable Codes and Standards

The Project's design, engineering, supply, delivery, installation, testing, and commissioning, cleaning and three year maintenance shall follow the applicable codes, standards and publications that are currently in effect and which are consistent with Industry Standards.

This shall include, but not limited to local Codes:

- Loads and Weights Code;
- Solar Energy Code;
- Steel Structure Design Code;
- Standards for Galvanization;
- Earthquake Resisting Structures Code;
- Reinforced Concrete Structures Code;
- Foundation and Retaining Walls Code;
- Electrical Wire Code;
- Electrical Earthing Code;
- IEC 60364-7-712:2002 Electrical installations of buildings - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems;
- IEC 61215 standard "Crystalline silicone terrestrial photovoltaic (PV) Modules - Design qualification and type approval";
- IEC 61646 "Thin-film terrestrial photovoltaic (PV) Modules - Design qualification and type approval";
- IEC 61724 Photovoltaic system performance monitoring – Guidelines for measurement, data exchange and analysis;
- IEC PAS 62545:2008 Environmental Information on Electrical and Electronic Equipment (EIEEE);
- Environmental information on Electrical and Electronic Equipment (EIEEE);
- IEC 62446-2016, PHOTOVOLTAIC (PV) SYSTEMS – REQUIREMENTS FOR TESTING, DOCUMENTATION AND MAINTENANCE – Part 1: Grid connected systems – Documentation, commissioning tests and inspection;
- IEC 60364-6, Low-voltage electrical installations – Part 6: Verification;
- IEC TS 62548:2013, Photovoltaic (PV) arrays – Design requirements;
- IEC 61730 (all parts), Photovoltaic (PV) module safety qualification;
  IEC 61557 (all parts), Electrical safety in low voltage distribution systems up to 1,000 V AC, and 1,500 V DC – Equipment for testing, measuring or monitoring of protective measures;
- IEC 61010 (all parts), Safety requirements for electrical equipment for measurement, control, and laboratory use;
- AISC ASD89. AISC Manual of Steel Construction: Allowable Stress Design, 9th edition;
- AWS D1.1/D1.1M:2015, Structural Welding Code;

3.2.5 Interconnection

The design of the interconnection will be furnished by the Contractor and approved by UoJ and its appointed Consultant. Notwithstanding the above, the Contractor shall be responsible for all design, procurement, construction and startup of all equipment or services required to be provided under this project. The Contractor shall also be fully responsible for integrating and coordinating his design to properly interconnect to the National Grid Provider's facilities.

All interconnections must adhere to the following as a minimum requirement:

- All MDBs, SDBs, and SMDBs shall be designed by a specialist electrical engineer with at least 15 year experience.
- All MDBs, SDBs, and SMDBs shall be designed with the minimum requirements for JEPCO.
- All interconnection components shall be US or European origin.
- Design must be reviewed by the Consultant before the assembly.
- Assembly of all MDBs, SDBs, and SMDBs shall be done at an electrical engineering manufacturing firm with at least 10 years of proven experience, subject to approval of Consultant.
- All components and enclosures shall be brand new.
- All enclosures shall be at least IP65.
- Complete on-site sealing of openings must be performed by the Contractor.
- All designs must allow for 25% extra space for future expansion.
- Labeling and marking shall be from an approved supplier.
- Paper copy of the SLD shall provided in a protected socket inside the enclosure.
- Quarter-turn cam key lock latch with Allen key.
- Enclosure shall be constructed on reinforced concrete foundation 80 cm above ground, with stainless steel bolts used to anchor the enclosure to the foundation.
- In case placement is in common use area accessible to campus users, proper safety caging for all MDBs, SDBs, SMDBs, and inverters shall be provided as a safety precaution to the campus users.
- In cases where enclosures are subject to wind or combined load, it is preferred to design the enclosure in landscape position.
- All assembled MDBs. SDBs, and SMDBs shall be IR tested after installation at full load by a third party approved by the consultant.

3.2.6 Energy Audits

Contractor(s) for Zone 1 and Zone 2 are required to perform comprehensive energy audits for the buildings listed in their respective zones. The energy audits are a mandatory requirement in the Scope of Work of this tender.

3.2.6.1 Technical compliance

- Contractor shall be licensed by the Ministry of Energy and Mineral Resources (MEMR) to provide energy auditing service. The minimum requirements are outlined in the "Instructions for licensing energy auditing services for year 2015, issued according to article (6) of Bylaw (73) year 2012 for regulating energy conservation and efficiency pathways."
- Submit CVs and valid Certifications of qualified engineers to perform the Energy Audits.
- Submit updated reference list for completed energy audits
- Submit equipment list with valid calibration certificates

3.2.6.2 Energy Audit Level II Required Tasks:

- Conduct preliminary energy use analysis
- Conduct walk through survey
- Identify Low cost / no cost recommendations
- Identify capital improvements
- Review mechanical and electrical design and condition and O&M practices
- Measure key parameters
- Analyze capital measures (savings and costs, including interactions)
- Meet with owner/ operators to review recommendations

3.2.6.3 Energy Audit Level II Required Report

- Compare Energy Use Intensity (EUI) to other EUIs of International Universities
- Compare EUI of buildings on University of Jordan Campus
- Summarize Utility data
- Estimate savings if EUI were to meet target (international norms)
- Estimate Low cost / no cost savings
- Calculate detailed end use breakdown
- Estimate capital project costs and savings
- Complete building description and equipment inventory
- Document general description of considered measures
- Recommend measurement and verification (M&V) method
- Perform financial analysis of Energy Efficiency Measures (EEMs)

3.2.6.4 Deliverables:

- Submit an energy audit plan to complete the energy audit level II for all buildings on campus within 90 days
- Audit Reports shall be submitted in soft and hard copies
- Two hour presentation to Owner project team
- Submit of all the data in Excel

3.2.7 Self-Cleaning Solar Panels (Optional)

This is an optional technical requirement in the tender. Failure to provide this section will not disqualify the bidder from being considered for evaluation.

The bidder can provide a list of PV modules (Sections 3.2.1.1 and 3.2.2.1) that are treated with self-cleaning coating, or that have special glass that protects the panel from dust, mud, and bird droppings.

It is the responsibility of the Contractor to show the effect of using such coating or glass on the overall performance of the stations, wherever used. Such study must account for the possible reduced amount of transparency of the glass, and possible reduced efficiency of the PV module. It also needs to take account of the reduction of the overall cost of cleaning the modules, and the lifetime of the coating or glass.

Pricing of this item should be separate than the financial offer. It is UoJ's right to award this option to the selected Contractor.

3.2.8 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 UoJ copies of all approved Permits and applications for Permits still in process on the effective date of this Contract.

3.2.9 Deliverables at Tendering Stage (Required)

3.2.9.1 At the tendering stage, the bidder shall provide the following datasheets, certificates and warranties (if applicable), within the technical offer the following system components, provided in soft and hardcopies in the same order and numbering scheme as follows:

1. PV Modules
    - 1-A. Datasheets
    - 1-B. Certificates
    - 1-C. Warranties
2. Inverters
    - 2-A. Datasheets
    - 2-B. Certificates
    - 2-C. Warranties
3. Combiner Box
    - 3-A. Datasheets
    - 3-B. Certificates
4. Supporting Structure
    - 4-A. Datasheets
    - 4-B. Certificates

5. Paint
    5-A. Datasheets
    5-B. Certificates
    5-C. Warranties
6. Touch Up Paint
    6-A. Datasheets
    6-B. Certificates
    6-C. Warranties
7. HDG Bolts, Nut and Washers
    7-A. Datasheets
    7-B. Certificates
8. Calibrated Torque Wrench
    8-A. Datasheets
    8-B. Certificates
9. Anchor Bolts
    9-A. Datasheets
    9-B. Certificates
10. Concrete for Foundations
    10-A. Datasheets
    10-B. Certificates
11. Reinforcement Steel for Foundations
    11-A. Datasheets
    11-B. Certificates
12. Grout
    12-A. Datasheets
    12-B. Certificates
13. Foam sealant for penetrations and conduit openings
    13-A. Datasheets
    13-B. Certificates
14. Cables; DC, AC, Data, earthing
    14-A. Datasheets
    14-B. Certificates
    14-C. Warranties
15. Cable Ties
    15-A. Datasheets
    15-B. Certificates
16. Cable connections MC4
    16-A. Datasheets
    16-B. Certificates
17. Clamps
    17-A. Datasheets
    17-B. Certificates
18. Stainless Steel Bolts, Nuts, Washers, and Spring Washer for Clamps
    18-A. Datasheets
    18-B. Certificates
19. Cable Trays
    19-A. Datasheets
    19-B. Certificates

20. AC Enclosures
    - 20-A. Datasheets
    - 20-B. Certificates
21. AC Circuit Breakers
    - 21-A. Datasheets
    - 21-B. Certificates
    - 21-C. Warranties
22. AC Panel Assembly Manufacturing Company
    - 22-A. Company Profile
    - 22-B. Minimum 10 year of operation Certificate
23. Weather Station
    - 23-A. Datasheets
    - 23-B. Certificates
    - 23-C. Warranties
24. Monitoring Station
    - 24-A. Datasheets
    - 24-B. Certificates
25. Signage
    - 25-A. Datasheets
    - 25-B. Certificates
26. Cleaning Equipment
    - 26-A. Datasheets
    - 26-B. Certificates
    - 26-C. Warranties
27. 3rd Party IR Testing
    - 27-A. Company Profile
    - 27-B. Certificates
    - 28-C. Warranties
28. 3rd Party 62446 Certification
    - 28-A. Company Profile
    - 28-B. Certificates
    - 28-C. Warranties

3.2.9.2 The bidder shall submit the following information per system:

- Architectural:
  - 3D images
- Civil:
  - Mounting structures, main frames and secondary frames
  - Layout
  - Cross-sections in both directions
  - Foundation details
  - Detail of Connection of PV modules to mounting structures (clamps and earthing)
  - Trenches and cable trays
  - Typical joint detail

- Mechanical
  - Typical cleaning water network
  - Rain water drainage, if applicable
- Electrical
  - Energy Simulation Report (As per Section 3.2.3)
  - Single Line Diagram
  - PV Module Layout Drawings
  - 3D Images
  - Shading Images
  - The following data in Excel format (supplied within the Tender package):

Parameter	Unit	Value
Country		
Latitude		
Longitude		
Altitude		
Albedo		
Meteo data		
Tilt		
Azimuth		
Module		
Manufacturer of Module		
Origin		
Module Model		
Module Rated Power	Wp	
No of Modules	Pc	
Area of Module	(m^2)	
Total DC	KWp	
Inverter		
Country of Origin		
Inverter Manufacturer		
Inverter Model		
Warranty	Years	
Inverter Size	KW AC	
No of Inverters	Pc	
Total AC	KW AC	
DC:AC Ratio		
System Losses (as per Section 3.2.3)		
Soiling Loss Factor	%	
PV Loss due to Irradiance Level	%	
PV Loss due to temperature	%	
Module Quality Loss	%	
LID Induced Degradation	%	

Module array mismatch loss	%	
Ohmic Wiring Loss	%	
Inverter Loss during Operation	%	
AC Ohmic Loss	%	
System unavailability	%	
Auxiliaries (fans, others)	%	
Soiling Loss Factor	%	
PV Loss due to Irradiance Level	%	
PV Module Characteristics		
Electrical Data at STC		
Model Number		
Max Power (Pmax)		
Voltage at Pmax (Vmp)		
Current at Pmax (Imp)		
Open Circuit Voltage (Voc)		
Short Circuit Current (Isc)		
Power Tolerance		
Mechanical Characteristics		
Solar Cell type		
No of Cells		
Dimensions		
Weight (kg)		
Front Cover		
Frame Material		
J-Box		
Warranty		
Degradation		
Electrical Data at NOCT		
Max Power (P_{max})		
Voltage at Pmax (V_{mp})		
Current at Pmax (I_{mp})		
Open Circuit Voltage (V_{oc})		
Short Circuit Current (I_{sc})		
Temperature Characteristics		
Temperature Coefficient (P_{max})		
Temperature Coefficient (V_{oc})		
Temperature Coefficient (I_{sc})		
Nominal Operating Cell Temperature		
Temperature Coefficient (V_{oc})		
Temperature Coefficient (P_{max})		

SECTION THREE – PROJECT MANAGEMENT

The Contractor shall have project management responsibilities for the duration of the work. The named staff and project management duties are stated herein for each zone separately. Bidders who are slated to be awarded more than one zone based on the technical and financial evaluation shall verify (in writing) their understanding of this clause.

3.3.1 Minimum Staff Requirements:

3.3.1.1 The Contractor shall appoint a single representative as its Project Manager (PM).

The PM must have the following minimum qualifications (supported with an updated CV, original certifications, and suitable letters of reference):

1. At least two (2) years solar project management experience including projects of at least 100 kWp rooftop and carparks;
2. At least ten (10) years previous experience in project management and/or construction operations;
3. Experience and understanding of Distributed Generation Solar projects;
4. PV Installation professional certification;
5. Solid understanding of Project Management process (MBA or PMP or equivalent);
6. Ability to problem solve both personnel issues and project issues;
7. Good record keeping, communication, and organizational skills.

3.3.1.2 The Contractor shall appoint the following staff, with at least 2 years of PV installation experience (supported with an updated CV, original certifications, and suitable letters of reference):

1. Civil Site Engineer (2 Nos)
2. Electrical Site Engineer (2 Nos)
3. Civil Site Supervisor (2 Nos)
4. Electrical Site Supervisor (2 Nos)
5. HSE Site Engineer (1 Nos)
6. HSE Site Supervisor (1 Nos)
7. Document Controller (1 Nos)
8. Planning Engineer (1 Nos)
9. Quality Control Engineer (1 Nos)
10. Store Keeper (1 Nos)

3.3.1.3 The Bidder at the tendering stage shall provide a program of works that includes manpower and equipment list to complete the works of the zone within the project duration. This program shall be the minimum mandatory requirement during construction.

3.3.2 Project Manager Responsibilities

The primary project management deliverables are described herein:

1. The project will start with a kick off meeting between the two parties (Contractor and UoJ Supervisory team and Consultant). This meeting will be attended by the major stakeholders and top management from both sides.
2. The Two parties will have a few subsequent meetings in order to prepare the list of stakeholders and the communication matrix.
3. The Contractor will prepare the Program of Works with the necessary resources (manpower, material, equipment).
4. The design and submittal for JEPCO applications will be submitted.
5. Once the JEPCO approval is secured, the Contractor will proceed with mobilization and ordering the required equipment
6. Civil works will commence on all Car Park PV systems approved by UoJ and JEPCO, according to the approved plan and zoning.
7. Civil and relocation works shall start on all works at the roof levels approved by UoJ and JEPCO, according to the approved plan and zoning.
8. Monthly Progress Reports shall be provided by Contractor by the second Monday of every month covering the prior month's activities, percentage progress based on cash flow and commissioned work packages, remaining tasks, and major challenges, delays, and expected completion of work.
9. 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 and for the completion status of the Project in general, 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.
10. Monthly Progress Reports will commence on the second Monday of the month following the month in which the contract is granted.
11. A bi-weekly status meeting or conference call will be held with UoJ's appointed Supervisors and the Contractor to discuss current and planned activities or significant issues.
12. Contractor shall issue an Agenda and a bi-weekly Report/Action Items List at least one day prior to the bi-weekly status meeting or conference call.
13. Once installation is complete at any location, this will be communicated to JEPCO for commission, testing and connecting the subsystem to grid.

3.3.3 Program of Works Requirements

The contractor must submit a program of works within 28 days from the Commencement Date. The program of works shall include as a minimum the following:

Detailed information about the following

a. Material Submittals
b. Shop Drawings Submittals
c. Procurement
d. Construction activities and sequence for each location
    1. Civil Works
    2. Structural Steel Works
    3. Electrical Works
    4. Balance of Plant Works
e. Testing and Commissioning
f. Works with Authorities
    1. JEPCO Fees
    2. Preliminary Study
    3. Grid Impact Study
    4. Connection to Grid
    5. Municipalities approvals
    6. Ministry of Environment Approvals
    7. Others as necessary

3.3.4 Mobilization

3.3.4.1 Contractor is requested to complete mobilization within 14 days from Commencement Date. Mobilization plan shall include

a. Fence enclosure around area with 2 m height white new corrugated sheets 0.5 mm thick with proper project signage
b. Temporary lighting
c. Temporary porta-cabins
d. Temporary offices
e. Temporary bathrooms
f. Temporary Parking Areas
g. Laydown area
h. Closed storage area
i. Supervising Engineer Offices
j. All office stationary, computers, furniture, utilities for the duration of the Project is included

3.3.4.2 Temporary offices and staging and storage areas' locations should not interfere with the daily activities on campus, and must be approved by the Consultant.

3.3.4.3 Zone 3 Contractor (Car Parks) must provide temporary fencing around car park locations that are under construction until all works at location are complete. The fencing must be movable, 2 meter height white new corrugated sheets 0.5 mm thick with proper project signage, supported by HDG metal posts.

3.3.4.4 Under all circumstances, no work shall be allowed without prior approval of the supervising engineer on the construction method and safety plan.

3.3.5 Report Contents

The report shall cover each of the major Areas of Responsibility as follows:

a. Executive Summary: The reports shall outline areas of concern and plans for corrective action to maintain the project schedule.
b. The Monthly Report table of content shall include as a minimum:
    1. Organization Chart Update
    2. Stakeholder List Update
    3. Communication List Update
    4. Shop Drawings Schedule Update
    5. Material Submittals Schedule Update
    6. Procurement Schedule Update
    7. Program of Works (in Primavera or MS Project) with Updated progress percentage, the program of works must include the following division:
        i. Authorities Submittals
        ii. Material Submittals
        iii. Shop Drawings Submittals
        iv. Procurement
        v. Construction
        vi. Commissioning and Testing
        vii. Handing Over Package
    8. Quality Control (Testing) Results
    9. Health and Safety Report
    10. Financial Summary
    11. Pending Issues List
    12. Change orders list

3.3.6 Bi-Weekly Meeting Agenda (Minimum Requirements):

Project Manager shall issue an Agenda and a bi-weekly Report/Action Items List at least one day prior to the bi-weekly status meeting or conference call. The agenda shall include as a minimum:

a. Review of Design completion for each area
b. Review of Engineering Calculations for each area
c. Review of Engineering Shop Drawings for each area
d. Status of Permits
e. Status of Procurement
f. Update on the Program of Works
g. Status of Testing of material at site

h. Status of Invoicing
i. Variations, Issues, and obstacles
j. Status of invoicing
k. Site inspection reports summary

SECTION FOUR – ENGINEERING

3.4.1 Contractor Engineering Responsibility

3.4.1.1 The Contractor is responsible for all engineering and design. Where required by UoJ, and in the case that the Contractor does not have a certified design engineers, drawings and documentation shall be signed and sealed by a registered engineering consultation office.

3.4.1.2 The Contractor will submit to UoJ and its Consultant design drawings, data and documents for review and comment. The Contractor shall submit the drawings, data and documents to UoJ and its Consultant when they are deemed 90% complete. UoJ and its Consultant will review and comment.

3.4.1.3 The Contractor shall provide copies of the following studies and reports as they are completed and issued in final form for each system:

- Geotechnical Report
- Energy Simulation Report
- Shading Studies

3.4.1.4 One Geotechnical Lab shall be submitted for approval on the project to conduct all the lab testing works according to Jordan National Building Codes requirements

3.4.1.5 Any replacement of services or equipment deemed necessary for the completion of the works is the responsibility of the contractor. The contractor must include the price of the replacement works in their offer. Hence, site visits are crucially important for the bidders before submitting their final offers. Any replaced item must be turned over to UoJ Engineering and Maintenance Department premises, supported in an official log.

3.4.1.6 All systems (mechanical, civil, structural, and electrical) must be tested by an UoJ Consultant-approved third party according to the Jordanian National Building Codes mandatory requirements.

3.4.2 Detailed Site Layout and Design

3.4.2.1 It is the responsibility of the Contractor to generate a detailed site layout that specifies the project requirements at each location.

3.4.2.2 The site layout shall include the location of photovoltaic arrays used in the solar canopies, inverters, switchgear, fencing (if applicable), 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 UoJ and its Consultant, the Contractor shall not make changes to the site layout drawings without UoJ 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 detail designers and construction subcontractors can determine how the equipment and foundations are to be oriented on site.

3.4.2.3 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.

3.4.2.4 The responsibilities of Contractor for the site layout and design include and not limited to:

a. Perform Site Survey
b. Get approvals on all studies from JEA and all other Authorities
c. Water proofing repair and damages due to contractor works
d. Backfilling with excavated material (if approved by geotechnical lab) is allowed. Compaction is a must.
e. Embedded steel structure items shall be hot dip galvanized.
f. No Casting of reinforced concrete shall be allowed without minimum reinforcement steel.

3.4.3 Structural Engineering

3.4.3.1 Structural analysis and design of the photovoltaic arrays, mounting systems, concrete foundations, piers, storm water management provisions (if applicable), and wind and wind gusts requirements are the responsibility of the Contractor.

3.4.3.2 Structural analysis must be completed by the Contractor. Thermal contraction and expansion and structural separators must be accounted for in the design and implementation.

3.4.3.3 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.

3.4.3.4 The Contractor shall provide a sealed professional report, from the named structural engineering designing firm, describing and confirming the structural integrity, and remaining useful life.

3.4.3.5 Design of structures should adhere to the following minimum requirements:

- Fixation of Modules with Middle and End Clamps
  - Clamps must be German origin
  - All modules are fixed at minimum four locations
  - All clamps and screws are installed with European or USA origin stainless steel M8 Bolt, nut, washer and spring washer as a minimum

- Carparks
  - Parking spaces are to be designed with minimum width of 2.5 m and minimum depth of 5.5 m. A standard area of 15 m^2 for each parking space should be used as a guideline.
  - The height clearing of any structure must never be less than 2.8 m.
  - The height clearing for 30-seat bus (Coaster) car park must never be less than 3.5 m.
  - The height clearing for 50-seat bus (MAN) car park must never be less than 4.3 m.
- Rooftops:
  - A circulation clearance around the structures (for maintenance and cleaning operations) with 0.6 m width should be accounted for in the design.
  - Layout of the design should follow best practice methods regarding aesthetics and cleaning.

3.4.3.6 Analysis of Mounting Structure:

a. This shall be done by a licensed engineering office, with structural steel specialty, and stamped by the JEA. Complete Design and Calculation to be submitted in soft and hard copies.
b. Submit, for each area, complete computer output tables and drawings showing:
   1. Nodes (tables and drawings)
   2. Elements (tables and drawings)
   3. Properties
   4. Load values
   5. Dead Load
   6. Live load
   7. Basic Wind Speed(160 km/hr)
   8. Snow Load at 1,100 m
   9. Earthquake Load
   10. Impact Load
   11. Load Directions on drawings
   12. Load combinations
   13. Support types
   14. Results for reactions

3.4.4 Civil Engineering

3.4.4.1 All civil engineering design requirements will be completed by the Contractor.

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

3.4.4.3 Leveling work to create terraces to accommodate the foundation and posts for the structure carrying the PV arrays and substations is the responsibility of the Contractor.

3.4.4.4 Safe access roads for both vehicular and pedestrian movement must be provided by the Contractor, with necessary safety signs and temporary lighting.

3.4.4.5 Design of Steel Works

- Design and construction of the steel structure to be in accordance with the AISC-89 – steel construction manual.
- Design of Cold Formed Sections shall be done according to AISI standards.
- Steel Weight for each system mounting structure shall be indicated in the offer.
- Design of steel for PV Supporting System to be approved by UoJ and its Consultant.
- Steel for PV Car Park shall be Cold Formed, hot rolled or Pre-Engineered. All Connections material HDG or stainless steel, Structural Steel Bolts, Nuts and Washers shall be made in USA or Europe.
- Submit detailed calculation notes for main member, secondary members and joints.
- Submit design and detailing drawings for the steel structure and the civil works by registered Engineering Office and structural engineer with 15 years' experience, this shall be part of the approved design package.
- If secondary members (or rails) material is different than the PV module material, then a separator (UV resistant material) shall be used to prevent corrosion.

3.4.4.6 Manufacturing of the Steel Structure

- Steel for the PV Supporting System shall be shop fabricated and treated at an approved manufacturing steel plant by UoJ and its Consultant.
- All fabricated items shall be marked at the fabrication shop according to approved shop drawings.
- In the event that the supporting structure for the PV system is pre-fabricated, then a calculation note shall be submitted. All calculations shall achieve the requirements of the Jordanian Codes.
- Touch up paint shall be applied to cold formed sections after cutting them and drilling them.
- Touch up paint procedure shall be according to recommended approved paint supplier procedure and approval of engineer
- No steel fabrication or welding is allowed at site whatsoever
- Minimum two bolts are allowed in each connection
- Steel shall be Hot Dip Galvanized according to Jordanian standards and ASTM A123
- All welding joints shall achieve 100% MPI, 100% UT, and 10% RT

3.4.4.7 Design of Other Types of Metal Works (Aluminum or others)

- Design Code shall be specified

- Latest Design Code shall be submitted (soft copy) to UoJ and its consultant
- Full analysis shall be submitted
- Software for analysis shall be purchased and supplied to UoJ Free of Charge
- Training on Software shall be conducted to several UoJ engineers and the Consultant
- Soft copies of all latest standards mentioned in the software shall be submitted free of charge to UoJ.
- Load and Weights used shall be according to Jordan National Building Code Requirements
- Analysis of structure shall show the following
  - Node Number
  - Element Number
  - Loads in 3D at each node
  - Displacement in 3D at each node
  - Reactions
  - Stresses in each element
  - Deflection in each element
- Design of members shall show compliance of actual stresses and deflection to allowable stresses (axial, shear, and bending) and deflections (in 3 dimensions)
- Design of Joints, loads at each joint to comply with code requirements.

3.4.4.8 Car Park Systems:

- Contractor shall conduct a site survey, shading analysis and Geotechnical study.
- Energy Simulation Report shall be submitted with the Plant Layout for each car park.
- Calculation note shall be submitted of the mounting structure, structural frame support, anchor bolts, and foundations.
- Detailed drawings shall be submitted for approval after approval of calculation note by UoJ supervising engineers
- Construction can commence after JEPCO approval. All Bottom of Foundation Level shall be at least 1.2m below natural ground level, unless otherwise approved by the supervising engineer.
- All reinstatement works shall be done by the contractor. Construction works up to the Base Plate level shall be done at the earliest with the minimum disturbance to the parking lots.
- All Columns will have concrete stub column height of 800 mm above street level. The edges will be beveled. Finish of concrete shall be fair face. HDG anchor bolts shall be used. Concrete paint shall be included in the price with color identical to the curbstone at that location
- No waterproofing of foundation is required
- Backfilling shall be done in layers according to best engineering practices.

- Leveling work to create terraces to accommodate the foundation and posts for the structure carrying the PV carparks and substations is the responsibility of the Contractor.
- Car parks must be include complete works where needed: base coarse (2 layer compaction 95% with 25 cm of each layer, 50 mm paving thickness with MC layer), line marking (10 cm wide) and wheel stoppers with anchoring (min L×W×H of 180×15×15cm).
- In the cases that the Contractor is requested to install isolated pedestrian walkways or congregation spots covered with PV canopies in suitable areas, the Contractor should design the system in the same guidelines stated in this document. Electrical design should adhere to a size that is a multiple of the average inverter size adopted for the Project.
- Frostline shall be accounted for and calculated at –1.2 m from finished level.

3.4.4.9 Rooftop Systems:

- Rooftop system mounting structure shall be designed according to applicable standards.
- Thermal insulation and water proofing system of roofs shall be installed by the Contractor on all roofs of buildings receiving solar PV rooftop systems. The thermal insulation system must abide by the Jordanian Thermal Insulation Code Requirement for roof, achieving U-value less than 0.55W/m^2.K with no thermal bridges, and shall consist of the following (from bottom to top layer):
    - Layer 1: 50 mm extruded polystyrene with U-value = 0.028 (density 28-35 kg/m^3)
    - Layer 2: Nylon sheet 250 micron
    - Layer 3: foam concrete with minimum thickness 50 mm at gutter with 1% slope (density 480 kg/m^3)
    - Layer 4: Screed 20 mm, with 50 mm fillet at parapets
    - Layer 5: Torch-applied Bituminous Water Proofing Rolls (180 g/m^2), with 10 cm overlap, and “simsimyeh” white finish, with 30 cm rollup to parapet finished into a groove 2 cm deep into parapet with UV mastic and 1.5 thick galvanized plate cover.
- No Roof penetration to waterproofing is permitted.
- Concrete block using at roof level shall have minimum steel ratio in it.
- Any relocation of electromechanical services (including water tanks, HVAC equipment, lighting fixtures, flag poles, pipes, etc.) at roof level shall be the responsibility of the contractor and included in the contract price.
- Any required replacement of the electromechanical works at the roof level, shall be included in the financial offer. Hence, site visits are crucially important for the bidders before submitting their final offers. Any replaced item must be turned over to UoJ Engineering and Maintenance Department premises, supported in an official log

- Access to proof shall be coordinated with each building supervisor.
- Storage, and lifting of the material to roof level shall be coordinated with building supervisor.
- Minimum disruption to ongoing UoJ activities shall be maintained.
- In case skylight are present in the rooftops, the Contractor is required to remove the existing skylights and replace them with a sealed see-through Building-Integrated PV (BIPV). The Contractor is to present detailed mechanical, structural, and electrical drawings and layout, for the approval of UoJ Consultant.

3.4.4.10 Reinstatement of works to its original condition, including trenches, cut to pedestrian tiled walks ways, curb stones, paved roads, and penetration of walls and roofs. Any location requiring cabling through the building to the electrical board shall be done in manner that conceals the cables and cable tray using same material present in the ceiling. If ceiling cover is not present in the path of tray, proper concealment shall be used, as approved by the Consultant.

3.4.4.11 All the reinstatement works works shall be presented in the technical offer as a result of the site visits to all proposed locations. The cost of all reinstatement of works shall be shown in the BoQ for each system under the balance of plant item.

3.4.4.12 Demolition of existing works to achieve required design must include providing all reinstatements with the approval of the Consultant.

3.4.5 Electrical Engineering

3.4.5.1 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", ENA G59/2, other recent applicable codes and standards.

3.4.5.2 The engineering and design shall include the appropriate sizing of all cabling (above and below ground) that will connect the modules, arrays, inverters, transformers and switchgears to the points of interconnection.

3.4.5.3 All underground wiring and cables shall be installed with a minimum of 1 m of cover for heavy traffic, and 70 cm for other areas, with wiring covered by concrete blocks, followed by "Swaileh" sand, laid on top of it a continuous warning tape, then compacted with approved materials by the Consultant. In case of unarmored cables, conduits with proper size and material must be used, as approved by the Consultant.

3.4.5.4 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.

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

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

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

3.4.5.8 The Contractor shall design, procure and install all the equipment which is needed to connect the plant to the local grid and transformers at UoJ.

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

3.4.5.10 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 service provider's initial setup and installation charges, as well as all usage charges through the Final Handover Date at the end of the three-year maintenance period. Usage charges after that shall pass to UoJ.

3.4.5.11 Design, procure and install outdoor lighting fixture (min. IP65) under car parks to achieve min. lux of 30 lux/m^2 at 1.5m height from the ground. Earthing of light fixture must be separate from the DC earthing of the structure. Lighting fixtures must be controlled through a street light photo- or LDR-sensor.

3.4.5.12 The Contractor shall design, procure and install lightning protection system (LPS) for all installation locations. The Contractor shall follow the IEC 61024-1-2 and applicable Jordanian Codes.

3.4.5.13 In the design and implementation, the maximum DC to AC ratio must not exceed 115% at all locations. If the submitted inverter manufacturer permits higher DC to AC ratio, a technical submittal shall be provided for review.

3.4.5.14 Flash test report for all modules shall be submitted and reviewed by the Consultant before shipping of modules.

3.4.5.15 In case of points of connection of low voltage distribution with aerial network, the Contractor is required to replace the aerial wiring from transformer to distribution board with underground cabling. This work will be compensated through the provisional sum, after going through the Design-Build process.

SECTION FIVE – PROCUREMENT

Procurement and expediting tasks for all equipment and materials are the responsibility of the Contractor. Such equipment includes the items listed in Section 3.2, and the materials include such items as wire, cable, conduit, , concrete, , fencing and gates.

The equipment and materials shall be purchased by the Contractor, and it is understood that the cost of these equipment and materials, including the risk of any escalation in the price of such equipment and materials, is included in the financial offer. UoJ will bear no extra expenses due to any changes in the prices of these equipment and materials.

Procurement schedule shall be submitted on a monthly basis showing quantities required, ordered, Estimated Date of Arrival, Quantities already at site, and balance quantities to arrive.

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

- Solar Panels
- Structure and Mounting Systems
- Power Stations
- Inverters
- Switchgears
- Metering and Communications Systems
- Control and Monitoring Systems
- Security Systems

SECTION SIX – 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 points of delivery to UoJ buildings and transformers. The Contractor shall also provide all temporary equipment, materials or facilities required to construct the Project and place it into operation.

3.6.1 Construction Management and Quality Control

3.6.1.1 Construction management shall be provided by the Contractor with an on-site construction management team.

3.6.1.2 The Contractor shall implement its standard Quality Assurance/Quality Control (QA/QC) 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 QA/QC plan for review, comment and approval by UoJ.

3.6.1.3 Quality control shall include inspection of the electrical collection trench and tray 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.

3.6.1.4 The Contractor shall develop, present and implement a complete Health, Safety and Environment Plan (HSE) which must be approved by the Civil Defense Directorate. Submission of this plan to the Civil Defense Directorate must be at least 14 days prior to the planned commencement of construction. UoJ and its Consultant must be provided with a copy of the approved plan.

3.6.1.5 Health and Safety at site:

Full Personnel Protection Equipment must be used at site for all personnel:

- Hard Hats
- Gloves
- Protective Goggles
- Safety Vest
- Safety Shoes
- ID Badges
- Full body harness for workers working above 1.8meters
- Working areas shall be equipped with the following as a minimum
- Warning Tape
- Signs at all sides in Arabic and English
- First Aid Kits

3.6.1.6 Contractor shall submit Health Safety and Environmental plan for the execution of the work at site. This will show clearly the entrance and exit to site, the required storage areas, areas for loading and unloading, areas for staff at site, areas for technicians at site, source of electricity for completion of works, sequence of work during working hours, sequence of work after the working hours.

3.6.1.7 UoJ will have the right to stop the work immediately in case of any violation to the Health, Safety and Environment at site or for any observed and documented "near miss". Contractor will take corrective and preventive action before the re-start of the work.

3.6.1.8 UoJ will have the right to stop the work immediately in case of conflict with school schedule. Contractor will not claim cost whatsoever. Time compensation will be considered proportionally.

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

3.6.1.10 Labor provided by the Contractor must be composed of at least 50% Jordanian laborers, with especial care to hire UoJ's PV engineering and technician students. All other non-Jordanian workers shall be with valid permits throughout the construction and until closeout of the project.

3.6.1.11 The Contractor is encouraged to engage labor provided by UoJ students and student technicians. Such labor must be done after proper training, as detailed in Section 3.11, and approved by UoJ. The Contractor must provide transportation and meals to the students. Such labor is considered free of charge; however, students must be covered in the labor insurance policy and on-site services.

3.6.1.12 The Contractor shall supply all temporary office space, temporary power, sanitary facilities, communications, and drinking water for the Contractor's personnel on campus for the duration of the project and maintenance period.

3.6.1.13 The Contractor shall provide two desks in a separate office trailer for use by UoJ. UoJ's appointed Supervisors' office shall be provided with electrical power, HVAC, five (5) iPhone 7 mobile handsets with paid plan for 18 months (calls and internet), one bookcase, one file cabinet and access to sanitary facilities in a manner similar to the Contractor's office trailers. The offices must be equipped with five (5) LaserJet printers, one colored printer, five (5) desktop computers connected to the internet. Minimum requirements for the computers are:

- Processor - dual core 2.4 GHz+ (i7 series Intel processor or equivalent AMD)
- RAM - 8 GB
- Hard Drive - 1 TB or larger
- Graphics Card - any with DisplayPort/HDMI or DVI support
- Monitor - 23" widescreen LCD with DisplayPort/HDMI or DVI support

- Operating System - Windows 10 or 7 with Service Pack 1, Home or Professional editions
- Warranty - 3 year warranty
- Backup Device - External hard drive, USB Flash Drive, and DVD+/-RW drive

3.6.1.14 The Contractor shall keep the site clean and orderly throughout the duration of construction. All trash and rubbish shall be disposed of off-site in accordance with applicable law.

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

3.6.1.16 The Contractor shall be responsible for storage and maintenance of all installed equipment. Copies of all installed equipment maintenance and safety incidence records shall be kept at the site and included in the turnover packages. The Contractor shall be responsible for acquiring any required off-site warehouse space, temporary parking, and staging or laydown areas. On-site storage and staging areas shall be identified and approved of by the Consultant.

3.6.1.17 The Contractor shall provide permanent equipment marking, labeling (stainless steel for all outside 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 UoJ. Labels having the material chemistry and adhesives to withstand harsh solar applications (http://www.hellermann.tyton.com/ or equivalent).

3.6.1.18 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.

3.6.1.19 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.).

3.6.1.20 Construction of all stations must have minimal interruption of teaching activities on campus. Any heavy machinery, transportation of equipment, or activities including loud noises must be performed after the campus normal working hours.

3.6.1.21 The Contractor shall assure that any installed and operating solar systems, must be properly cleaned and maintained, to avoid any loss of output power generation.

3.6.1.22 The Contractor shall install, where appropriate, bird spikes, to minimize and prevent bird nesting and droppings from affecting the performance of the solar panels and systems.

3.6.1.23 The Contractor shall fully comply with all applicable notification, safety and work rules when working on or near the facilities of UoJ.

3.6.1.24 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 in accordance with applicable law.

3.6.1.25 The Contractor shall route all field routed electrical collection system in a neat and orderly fashion and in accordance with all applicable code requirements.

3.6.1.26 All cable terminations, excluding module-to-module and module-to-cable harness connections, shall be permanently labeled. Only MC4 DC cable ends are acceptable. Installation of MC4 shall abide by the supplier clear steps already available on the internet.

3.6.1.27 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.

3.6.1.28 The Contractor must provide a complete weather station , to measure metrological conditions, such as: solar radiation, ambient temperature, humidity, air pollution, visibility, wind direction and speed, barometric pressure and instantaneous and accumulative precipitation. This station must allow for SCADA and off-site internet monitoring.

3.6.1.29 In the cases where trees are needed to be cut or trimmed, Contractor must follow the approved procedure in place at UoJ in accordance with Ministry of Environment regulations. Any costs for tree cutting or trimming will be incurred by the Contractor.

3.6.2 Project Site

3.6.2.1 All roads, photovoltaic arrays, solar canopy structures, storage yard, and fencing 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.

3.6.2.2 The Contractor shall clear grub and otherwise prepare the locations, as necessary, to install the work.

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

3.6.2.4 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.

3.6.2.5 Dust control shall be performed as needed during construction.

3.6.2.6 All road features shall be designed and constructed to allow delivery, access and egress of all Project components and construction equipment to their respective design and working locations.

3.6.2.7 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. Security cameras for carparks (minimum of 250 camera) must be compatible with existing infrastructure at campus, with minimum requirements meeting the existing CCTV cameras. Any required upgrade of the server storage, data rate, and licensing is the responsibility of the Contractor.

3.6.3 Solar Installation

3.6.3.1 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.

3.6.3.2 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.

3.6.3.3 Special care must be taken into account in the design and spacing of the structures to eliminate shading effect between rows of panels and shading posed by buildings and trees.

SECTION SEVEN – PERFORMANCE TESTING

3.7.1 The Acceptance Test shall be performed by an approved 3rd party certified to issue the IEC 62446-2016 Certificate: Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance - Part 1: Grid connected systems - Documentation, commissioning tests and inspection.

3.7.2 The Contractor shall give UoJ at least 30 days' notice of the planned Acceptance Test date. At the same time JEPCO will be notified as well.

3.7.3 The 3rd party shall provide all test instrument calibration certificates prior to the start of the Acceptance test. The instruments must be calibrated within six (6) months of the Acceptance Test.

3.7.4 The Acceptance Test must be performed in the presence of UoJ Supervisors and witnessed by UoJ's appointed Consultant firm.

3.7.5 After the Acceptance Test has been completed, the 3rd party shall provide a copy of the Acceptance Test report for UoJ's Supervisors' review. UoJ shall notify the Contractor of any material or performance deficiencies. All comments must be addressed and rectified.

3.7.6 JEPCO acceptance of the installed system and the installation of the meter and commencement of official metering to grid is the final acceptance and shall be the acceptable milestone on the project.

3.7.7 Tender package includes a presentation detailing all mandatory requirements for IEC 62446-2016 Mandatory requirements.

3.7.8 Civil works testing shall be according to Jordanian National Building Codes Mandatory Requirements.

SECTION EIGHT – COMMISSIONING

All commissioning procedures will be carried out according to the IEC 62446-2016 PHOTOVOLTAIC (PV) SYSTEMS – REQUIREMENTS FOR TESTING,

DOCUMENTATION AND MAINTENANCE – Part 1: Grid connected systems – Documentation, commissioning tests and inspection, category 2 test regime

The contractor shall provide the UoJ with an original soft copy of the latest edition of the standard and the references mentioned in this standard (total six standards)

- IEC 60364-6, *Low-voltage electrical installations – Part 6: Verification*
- IEC TS 62548:2013, *Photovoltaic (PV) arrays – Design requirements*
- IEC 61730 (all parts), *Photovoltaic (PV) module safety qualification*
- IEC 61557 (all parts), *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures*
- IEC 61010 (all parts), *Safety requirements for electrical equipment for measurement, control, and laboratory use*

The Contractor shall develop and carry out the procedure in accordance with Industry Standards as approved by UoJ and its Consultant.

SECTION NINE – 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.

At this stage of the Project timeline, Substantial Completion is considered to be the 90% completion threshold.

In the case of Phase One construction, UoJ shall notify the Contractor of its decision to initiate Phase Two of the Project.

SECTION TEN – FINAL COMPLETION

3.10.1 Contractor Obligations

3.10.1.1 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 UoJ.

3.10.1.2 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 UoJ.

3.10.2 Final Project Documentation

3.10.2.1 The Contractor shall provide six (6) hard copy sets of the final Project as-built documentation including:

- All as-built engineering drawings (Civil, Structural, Electrical, and Mechanical) and specifications
- All approved Material Submittals - Vendor Drawings and Data
- All approved Quality testing reports
- Instruction Manuals
- Installation, Operation and Maintenance Manuals
- All Permits with copies of close-out records as required
- Control system software and source code
- Spare Parts handed over to the UoJ

3.10.2.2 The Contractor shall provide one (1) CD of the electronic as-built documentation, including executable CADD files and ".PDF" versions of all design drawings.

3.10.2.3 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.

3.10.3 Final Acceptance

3.10.3.1 The 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 UoJ at that time in accordance with the Contract.

3.10.3.2 Once Final Acceptance is declared, UoJ will release the 10% Performance Guarantee to the Contractor within 60 days.

SECTION ELEVEN – TRAINING

3.11.1 Training Scope

The offer should include site and off-site training. The training should be divided into the following categories:

- Design engineers
- Construction engineers
- Operation Engineers
- Operating Technicians
- Students Engineers
- Student Technicians

Training must focus on, but not limited to, the following:

- Operation
- Problems and fault analysis
- Software installation and administration for the associated software modules (if any)
- Configuration
- Data acquisition and monitoring system
- Management
- Preventive and routine maintenance
- Dust and mud cleaning and prevention
- Performing the washing and cleaning tasks of the PV modules and structures

3.11.2 Training Requirements

The training has to meet the following requirements:

- Offered by a certified instructors
- Training dates must be listed in the offer
- Training must be completed during the construction and before the Final Acceptance of the Project
- The Contractor must issue certifications of completion of training and on-job experience, if applicable, to all parties involved.

3.11.3 Training Commencement

- The Contractor will submit a comprehensive training material for review and approval and will distribute the material in soft and hard copies to the attendees.
- Soft copy of training material
- Training for engineers and engineering students shall be in English. Training for technicians and technician students shall be in both English and Arabic.

- Total 100 UoJ students will be trained as part of the mandatory field engineering training requirement for BSc students.
- Total of 50 UoJ student technicians shall be trained as part of their curriculum.
- Total of 20 UoJ staff and faculty members shall be trained by the completion of the works

SECTION TWELVE – PV PANELS WASHING AND CLEANING

Cleaning and washing of PV panels during the three-year maintenance period are the sole responsibility of the Contractor.

Substantial accumulation of dust and mud rain might affect the overall performance and efficiency of the PV panels. Routine cleaning and washing of the PV panels will be needed to assure maximum power output.

Design shall allow easy access to modules for cleaning purposes.

- Hose with low pressure counter-brushes
- Use water only
- Cleaning shall be done early in the morning or late in the day. No cleaning shall be permitted Mid-Day.
- Use sponge, broom or brush to scrub the dirt off the PV Modules
- No scratching of the PV Module
- No pressure washer is allowed
- No Chemicals is allowed
- PV Modules cleaning equipment for the complete modules at each location shall be capable of cleaning the modules within no more than 48 hours period.

The design must include clear plans for washing and cleaning the PV panels when they are finally installed. Plans must account for cleaning at least 18 times a year (2 times a month between March and November). However, performance guarantee shall require the Contractor to perform cleaning whenever necessary to maintain annual energy yield.

Routes of water trucks and water piping, ducts and pumps and cleaning machine racks must be designed and installed by the Contractor, after gaining approval of UoJ and its Consultant.

Providing all equipment, including water trucks, cleaning machinery, towing trucks for the machinery, and cranes/lifts, is the responsibility of the Contractor. The total cost of such equipment must be included in the Financial Offer.

Providing the water, water piping, water tanks, water pumps, and water usage metering is the responsibility of the Contractor, and must be included in the Financial Offer.

Proper training on performing the washing and cleaning tasks of the panels must be provided by the Contractor, and must be included in the Financial Offer.

At the end of the O&M period, the Contractor shall provide UoJ with brand new consumables for cleaning equipment, assuring complete working conditions for the cleaning set.

SECTION THIRTEEN – MAINTENANCE RETENTION GUARANTEE

3.13.1 The Contractor must provide UoJ with "Performance Retention Guarantee Agreement" signed and sealed.

3.13.2 All work should be maintained for the first three (3) years of operation of the systems, after the Final Acceptance date. Maintenance of the system, and the duration of such maintenance, after the three (3) year period, can be negotiated prior or after the awarding of the contract, or after the complete handover of the system, whichever UoJ deems appropriate.

3.13.3 Maintenance offer should include a maintenance contract with detailed terms for technical support, response time and spare parts needed.

3.13.4 Offer must include a clear check-list and contact information that UoJ's appointed Supervisors and technical team can use in case of emergencies.

3.13.5 Offer of Maintenance Retention Guarantee must be clear and the bidder must show their commitment for doing the following (Appendix III):

- Response time for problem call.
- Response time for problem solving.
- Response time for software/configuration support call if any.
- Response time for providing software/configuration support call if any.
- Response time for (hardware/software) failure of the system or any other components related.
- Actions that will be taken during failure.
- Response time for failed equipment or any other components replacements.

APPENDICES

APPENDIX I – TENTATIVE PROJECT ROADMAP

Week #	Activity
1-4	Call of Tenders
Closing Call of Tenders Period	
5-16	Tender Preparation and Submission (12 weeks, can be extended) Includes: • Orientation and Site Visits • Explanations/Clarification Notes Concerning Tender Documents • Topography Maps and Land Surveys
Closing Tender Submission Period	
17-24	Tender Evaluation (8 weeks, can be extended for tenderer presentations, if needed)
Contract Award LOI	
25-28	Award Notice and Contract Signing (4 weeks, cannot be extended)
29-54	JEPCO's Approval (Maximum 180 days)
55-58	Submittal of Performance Security and Advanced Payment Guarantees
Design-Build Period	
59-110	Implementation Period (52 weeks)
Completion and Commissioning	
111-266	Cleaning and Maintenance Period (156 weeks)
Project Close Out	

APPENDIX II – BIDDER'S STATEMENT

Form 1: List of deliveries of the same nature [minimum of 1] supplied during the years 2013, 2014, 2015 and 2016

List of all completed PV Projects List of all completed PV Rooftop projects

List of all completed PV Car park projects

Title of PV Project	Size of PV Project (Kwp)	Total Value of Supplies (JD)	Date of Connection to Grid	Client*/Contracting Authority*
				Contact Person: Mobile: Email:
				Contact Person: Mobile: Email:
				Contact Person: Mobile: Email:
				Contact Person: Mobile: Email:
				Contact Person: Mobile: Email:

* In so listing the end clients, I am giving my consent to the Evaluation Committee, so that the latter may, if it deems necessary, contact the relevant clients, with a view to obtain from them an opinion on the supplies provided to them.

Signature: .....

(the person or persons authorized to sign on behalf of the bidder)

Date: .....

Form 2: Bid Bond

نموذج كفالة دخول العطاء

عطاء رقم **2017/87** الخاص ب **الخاص بتصميم وتوريد وتركيب وفحص وتشغيل و صيانة وتنظيف محطة توليد كهرباء بإستخدام الطاقة الشمسية استطاعة 16 ميجاواط AC**

الطرف الاول: الجامعة الاردنية

الطرف الثاني: المناقص

الطرف الثالث: بنك .....

الى السادة الجامعة الاردنية

لقد تم اعلامنا بان الطرف الثاني ..... سيتقدم بعرض اسعار للعطاء المنوه اعلاه استجابة الى دعوة العطاء، ولما كانت شروط العطاء تنص على ان يقدم الطرف الثاني بكفالة عطاء مع عرضة، وبناء على طلبه، فان مصرف بنك ..... يكفل بتعهد لا رجعة عنه ان يدفع لكم مبلغ 400,000 اربعمائة الف دينار اردني. عند ورود اول طلب خطي منكم دون حاجة الى تنسيب. وتجدد الكفالة تلقائيا وبنفس المدة ودون حد ادنى ولا تلغى الا بناء على طلب خطي منكم, كما ان هذه الكفالة تحكمها القوانين المعمول بها في الاردن.

توقيع الكفيل/ البنك :.....

المفوض بالتوقيع : .....

التاريخ : .....

Form 3: Power of Attorney

Please attach here the power of attorney empowering the signatory of the tender and all related documentation in case of joint venture/consortium as per Section 2.1.6.4 of this Tender document.

Signature: .....

(the person or persons authorized to sign on behalf of the bidder)

Date: .....

Form 4: Current Fiscal Obligations

نموذج التزامات المقاول
Contractors Commitments

1- المقاول: .....
2- المدير العام : .....
3- رقم ملف التصنيف في دائرة العطاءات : .....
4- فئة التصنيف : .....
5- سقف الالتزام : .....
6- المشاريع الملتزم بها: .....

الرقم	اسم المشروع	رقم العطاء	قيمة الإحالة بالدينار	قيمة الأعمال المتبقية دينار	مدة التنفيذ	تاريخ أمر المباشرة	ملاحظات
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
المجموع:							

APPENDIX III – FIDIC GOLD SAMPLE FORMS

LETTER OF TENDER

Name of Contract: ……

Contract No. : ……

To: ……

We have examined the Condition of Contract, Employer's Requirements, Schedules, Contract Data, and the attached Appendices and Addenda Nos …… for the above named Contract. We have understood and checked these documents and have ascertained that they contain no errors or other defects except as identified in our Tender. We accordingly offer to design, execute and complete the Works and remedy and defects therein so that they are fit for the purposes defined in the Contract, and to operate and maintain the facility under license from the Employer for the period and in conformity with the terms and conditions contained in the Contract for the lump sum amount of : ……

(currency and amount in figures)

……

(currency and amount in words)

Or such other amount as may be determined in accordance with the Contract

This amount is made up of the following components:

For the Design-Build of the Works, the amount of : : ……

(currency and amount in figures)

……

(currency and amount in words)

For the Operation Service, the amount of : ……

(currency and amount in figures)

……

(currency and amount in words)

For the Asset Replacement Fund, the amount of : ……

(currency and amount in figures)

……

(currency and amount in words)

We agree to abide by this Tender until …… (date) and it shall remain binding upon us and may be accepted at any time before that date.

If this offer is accepted, we will provide the required Performance Security, and commence and complete the Works, and provide the Operation Service, in accordance with the above-named documents and the agreed programme.

We further undertake, together with the Employer, to jointly appoint the DAB and the Auditing Body in accordance with the requirements of the Contract.

Unless and until a formal Contract Agreement is prepared and executed, this Letter of Tender, together with your written acceptance thereof, shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest or any tender you may receive.

Signed by: ……
(signature)

In the capacity of: ……
Duly authorized to sign tenders for and on behalf of: ……..……..
Address: ……....
……..
……..

Date: ……..

LETTER OF ACCEPTANCE

Name of Contract: ……
Contract No. : ……
To: ……
Date: ……
Your Reference: ……
Our Reference: ……

We thank you for your Tender dated …… for the design, execution and completion of the Works comprising the above-named Contract and remedying of defects therein so that they are fit for the purposes defined in the Contract, and for the operation and maintenance thereof under license for the period of …… year, all in conformity with the terms and condition contained in the Contract as amended by the attached Memorandum, signed by you and ourselves.

We have pleasure in accepting your Tender (as corrected/adjusted in accordance with the Memorandum) for the Accepted Contract Amount of of : ……

(currency and amount in figures)

……

(currency and amount in words)

This amount is made up of the following components:

For the Design-Build of the Works, the amount of: ……

(currency and amount in figures)

……

(currency and amount in words)

For the Operation Service, the amount of:

……

(currency and amount in figures)

……

(currency and amount in words)

For the Asset Replacement Fund, the amount of:

……

(currency and amount in figures)

……

(currency and amount in words)

In consideration of you properly and tryly performing the Contract, we agree to pay you the Accepted Contract Amount or such other sums to which you may become entitled under the terms of the Contract, at such times and as prescribed by the Contract.

We acknowledge that this Letter of Acceptance creates a binding Contract between us, and we undertake to fulfill all our obligations and duties in accordance with the terms of this Contract.

Signed by: ……
For and behalf of: ……
Date: ……

CONTRACT AGREEMENT

This Agreement made the …….. day of ……., 20……..,
Between

……
… (*name of Employer*)
Of

……
(*address of Employer*)
(herein called "the Employer"), of the one part,

And

……
(*name of Contractor*)
Of

……
(*address of Contractor*)
(herein called "the Contractor"), of the other part:

Whereas the Employer desires that the Works known as ……

(*name of Contract*)
Should be design, executed and operated by the Contractor and has accepted a Tender form the Contractor for the design, execution, completion and operation and maintenance of these Works, and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement, the words and expressions shall have the same meansing as are respectively assigned to them in the Condition of Contract herinafer referred to.

2. The following documents shall be deemed to form and be read and construed as a part of this Agreement
   (a) The Letter of Acceptance dated …….
   (b) The Letter of Tender dated …….
   (c) The Addenda Nos. …….
   (d) The Conditions of Contract
   (e) The Employer's Requirements
   (f) The completed Schedules
   (g) The Operating Licence, and
   (h) The Contractor's Proposal
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to design, execute, complete, operate and maintain the Works and remedy and defects therein in conformity with the provisions of the Contract and the Operating Licence granted by the Employer.

4. The Employer hereby covenants to pay the Contractor, in consideration of the design, execution, completion, operation and maintenance of the Works and the remedying of defects therein, the Contract Price at the times and in the manner prescribed by the Contract, and to grant the Contractor a royalty-free licence to enable him to operate and maintain the works during the Operation Service Period.

In witness whereof the Parties hereto have caused this Agreement to be executed on the day and year first above written.

Signed by: ……. Signed by: ……..

(signature)

(signature)

for and on behalf of the Employer in the presence of for and on behalf of the Employer in the presence of

Witness: …….

Witness:……..……..

(signature)

(signature)

Name : ……. Name : …….

Address : ……. Address : …….

Date : ……. Date : …….

AGREEMENT FOR DISPUTE ADJUDICATION BOARD MEMBERS

[All italicized text and any enclosing square brackets is for use in preparing the form and should be deleted from the final product.]

Name of Contract: ……

This Agreement made the ……day of ……, 20……., between

Name and Address of Employer:……
Name and Address of Contractor:……
Name and Address of DAB Member:……

Whereas the Employer and the Contractor have entered into a Contract and desire jointly to appoint the above-named Member to act on the DAB as [*delete where not applicable*] sole adjudicator/ one of three adjudicators/ chairman of the DAB.

And whereas the Member accepts the appointment.

The Employer, Contractor and Member jointly agree as follows:

1. The conditions of this Dispute Adjudication Agreement comprise the "General Conditions of Dispute Adjudication Agreement" which are appended hereto, and the following provisions. In these provisions, which include amendments and additions to the "General Condition of Dispute Adjudication Agreement", words and expressions shall have the same meanings as are assigned to them in the "General Conditions of Dispute Adjudication Agreement".

2. [*Details of any amendments or additions or deletions from the "General Conditions of Dispute Adjudication Agreement" should be given here or in an attachment hereto.*]

3. In accordance with Clause 6 of the "General Conditions of Dispute Adjudication Agreement", the Member shall be paid as follows: A retainer fee of _____ per Calendar month, and
   A daily fee of _____ per day spent on site visits, hearings, and other time connection with submissions to the DAB made in accordance with the provisions of the Contract between the Employer and the Contractor

4. In consideration of these fees and other payments to be made by the Employer and the Contractor in accordance with Clause 6 of the "General Conditions of dispute Adjudication Agreement", the Member undertakes to act as the DAB Member in the capacity above-mentioned in accordance with the terms of this Dispute Adjudication Agreement.
5. The Employer and the Contractor jointly and severally undertake to pay the Member in consideration for his acting as the DAB Member as aforementioned in accordance with this Dispute Adjudication Agreement.

6. The Dispute Adjudication Agreement shall be governed by the law of: ……..

Signed by: ……..	Signed by: ……..	Signed by: ……..
(*signature*)	(*signature*)	(*signature*)
For and on behalf of the Employer in the presence of	For and on behalf of the Contractor in the presence of	The Member in the presence of
Witness: …….	Witness: ……	Witness: ……
(*signature*)	(*signature*)	(*signature*)
Name: ……	Name: ……	Name: ……
Address: ……	Address: ……	Address: ……
Date: ……	Date: ……	Date: ……

AGREEMENT FOR OPERATION SERVICE DISPUTE ADJUDICATION BOARD MEMBERS

[All italicized text and any enclosing square brackets is for use in preparing the form and should be deleted from the final product.]

Name of Contract: ……

This Agreement made the ……day of ……., 20……., between

Name and Address of Employer: ……
Name and Address of Contractor: ……
Name and Address of DAB Member: ……

Whereas the Employer and the Contractor have entered into a Contract and desire jointly to appoint the above-named Member to act as the sole adjudicator on the Operation Service DAB for a period of five (5) years from the date of this Agreement,

And whereas the Member accepts the appointment.

The Employer, Contractor and Member jointly agree as follows:

1. The conditions of this Dispute Adjudication Agreement comprise the "General Conditions of Dispute Adjudication Agreement" which are appended hereto, and the following provisions. In these provisions, which include amendments and additions to the "General Condition of Dispute Adjudication Agreement", words and expressions shall have the same meanings as are assigned to them in the "General Conditions of Dispute Adjudication Agreement".

2. [*Details of any amendments or additions or deletions from the "General Conditions of Dispute Adjudication Agreement" should be given here or in an attachment hereto.*]

3. In accordance with Clause 6 of the "General Conditions of Dispute Adjudication Agreement", the Member shall be paid as follows: A retainer fee of _____ per Calendar month, and
   A daily fee of _____ per day spent on site visits, hearings, and other time connection with submissions to the DAB made in accordance with the provisions of the Contract between the Employer and the Contractor

4. In consideration of these fees and other payments to be made by the Employer and the Contractor in accordance with Clause 6 of the "General Conditions of dispute Adjudication Agreement", the Member undertakes to act as the DAB Member in the capacity above-mentioned in accordance with the terms of this Dispute Adjudication Agreement.

5. The Employer and the Contractor jointly and severally undertake to pay the Member in consideration for his acting as the DAB Member as aforementioned in accordance with this Dispute Adjudication Agreement.
6. The Dispute Adjudication Agreement shall be governed by the law of: ……..

Signed by: ……..	Signed by: ……..	Signed by: ……..
(*signature*)	(*signature*)	(*signature*)
For and on behalf of the Employer in the presence of	For and on behalf of the Contractor in the presence of	For and behalf of the Member in the presence of
Witness: ……	Witness: ……	Witness: ……
(*signature*)	(*signature*)	(*signature*)
Name: ……	Name: ……	Name: ……
Address: ……	Address: ……	Address: ……
Date: ……	Date: ……	Date: ……

OPERATING LICENCE

Aide Memoire

The Operating license is a document which is issued by the Employer to the Contractor at the time of issuing the Letter of Acceptance in accordance with Sub-Clause 1.7 [*Operating Licence*] of the Conditions of Contract, although it will not come into effect until the issue of the Commissioning Certificate.

The purpose of the Operating Licence is to give the Contractor unhindered legal access to the Works and the facility, and the legal right to operate the facility during the Operation Service Period in compliance with his obligation under his Contract with the Employer.

The terms of the licence must ensure that it is royalty-free and is issued without cost to the Contractor. It will automatically come into full force and effect upon the issue of the Commissioning Certificate, and it shall remain in full force and effect until the issue of the Contract Completion Certificate.

The proposed format and wording of the licence should be included in the tender documents so that tenderers know how it will function during the Operation Service Period.

The nature and format of the Operating Licence must clearly define the requirements of the Employer and must be a legally secure commitment from the Employer to allow the Contractor unhindered access to the facility for the duration of the Operation Service Period. Whatever the name or status of the document which the Employer provides for this purpose, all references in the Contract to the Operating Licence shall be deemed to refer to that document

Sample Forms of Security and Guarantee

TENDER SECURITY

Name of Contract/ Contract No.:
……
Name and address of Beneficiary ("the Employer"):
……
We have been informed that:
……
(name of Tenderer)
(hereinafter called the "Principal" is submitting an offer for the above-named Contract in response to your invitation, and the conditions of your invitation require that his offer is supported by a tender security.

At the request of the Principal, we:
……..
(name of Bank)
Hereby irrevocably undertake to pay you, the Beneficiary/ Employer, any sums not exceeding in total the amount of …… (in words:……..) upon receipt by us f your demand in writing and your written statement (in the demand) stating that:

(a) The Principal has, without your agreement, withdrawn his offer after the latest time specified for its submission and before the expiry of its period of validity, or
(b) The Principal has refused to accept the correction of errors in his offer in accordance with the conditions of your invitation, or
(c) You awarded the Contract to the Principal and he has failed to comply with Sub-Clause 1.6 [Contract Agreement] of the conditions of Contract.
(d) You awarded the Contract to the Principal and he has failed to comply with Sub-Clause 4.2 [Performance Security] of the Condition of Contract.

Any demand for payment must contain your signature(s) which must be authenticated by your bankers or by a notary public. The authenticated demand and statement must be received by us at this office on or before …… (the date 35 days after the expiry of the validity of the Letter of Tender) ……, when this guarantee shall expire and shall be returned to us.

This guarantee is subject to the Uniform Rules for Demand Guarantees, published as number 458 by the International Chamber of Commerce, except as stated above.

Signed by: …… Signed by: ……..
(signature)
(signature)

……
……..
(name)

(name)

Date : …….

PARENT COMPANY GUARANTEE

Name of Contract/ Contract No.:
……
Name and address of Employer :
……
……..(together with successors and assigns).
We have been informed that:
……
(name of Contractor)
(hereinafter called the "Contractor" is submitting an offer for such Contract in response to your invitation, and that the conditions of your invitation require his offer to be supported by a parent company guarantee.

In consideration of you, the Employer, awarding the Contract to the Contractor, we
……
……
……
(name of parent company)
Irrevocably and unconditionally guarantee to you, as a primary obligation, the due performance of all the Contractor's obligation and liabilities under the Contract, including the Contractor's compliance with all its terms and conditions according to their intent and meaning.

If the Contractor fails to so perform his obligation and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) which arise from any such failure for which the Contractor is liable to the Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force and effect. If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter into the Contract with the Contractor, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Contractor's obligations and liabilities under the Contract have been discharged, when this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemented to the Contract as amended or varied by the Employer and the Contractor from time to time. We hereby authorize them to agree any such amendment or variation, the due performance of which and compliance with which by the Contractor are likewise guaranteed hereunder. Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Contractor, or by an variation or suspension of the works to be executed under the Contract, or by an amendments to the Contract or to the constitution of

the Contractor or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) as that which governs the Contract and any dispute under this guarantee shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with such Rules. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by: ……. Signed by: ……..
(signature) *(signature)*

……. ……..
(name) *(name)*

……. ……..
(position in parent company) *(position in parent company)*

Date : …….

PERFORMANCE SECURITY – DEMAND GUARANTEE

NOTE: This form is suitable during the Design- Build Period. If a security is required during the Operation Service Period (either in the form envisaged in the Contract, or in another form), this must be carefully prepared with professional and legal help.

Name of Contract/ Contract No.:
……
Name and address of Beneficiary ("the Employer"):
……
We have been informed that:
……
(name of Contractor)
(hereinafter called the "Principal" is your contractor for the above-named Contract which requires him to obtain a performance security.

At the request of the Principal, we:
……
(name of bank)
Undertake to pay you the Beneficiary/ Employer, any sum or sums not exceeding in total the amount of …… (amount in words: ……) (the "guaranteed amount") upon receipt by us of your demand in writing with your written statement stating:

(a) That the Principal is in breach of his obligation under the Contract, and
(b) The respect in which the Principal is in breach.

Any demand for payment must contain your signature(s) which must be authenticated by your bankers or by a notary public. The authenticated demand and statement must be received by us at this office on or before …….. (*the date 70 days after the expected date issue of the Commissioning Certificate*) (the "expiry date"), when this guarantee shall expire and shall be returned to us.

We have been informed that the Beneficiary may require the Principal to extend this guarantee if the Commissioning Certificate has not been issued 28 days prior to such expiry date and we hereby undertake to extend this guarantee until the date 70 days after the actual date of issue of the Commissioning Certificate upon receipt of your written statement advising us of the actual date of issue, and that the late issue was for reasons attributable to the Principal. In such a case, the expiry date shall be adjusted accordingly.

This guarantee shall be governed by the laws of ……., and shall be subject to the Uniform Rules for Demand Guarantees, published as number 458 by the International Chamber of Commerce, except as stated above.

Signed by: ……. Signed by: ……..

(signature)

(signature)

Date : …….

PERFORMANCE SECURITY – SURETY BOND

NOTE: This form is suitable during the Design- Build Period. If a security is required during the Operation Service Period (either in the form envisaged in the Contract, or in another form), this must be carefully prepared with professional and legal help.

Name of Contract/ Contract No.:
……
Name and address of Beneficiary ("the Employer"):
……
We have been informed that:
……
(name of Contractor)
(hereinafter called the "Principal" is your contractor for the above-named Contract which required him to obtain a performance security.

By this Bond,
……
……
……
……
(name and address of Contractor)
Who is the Contractor under the above named Contract, as Principal and
……
……
(name and address of Guarantor)
As Guarantor, are irrevocably held and firmly bound to the Beneficiary in the total amount of ……. (amount in works:
……..) (the "Bond Amount") for the due performance of all the Principal's obligation and liabilities under the above named Contract.

The Bond shall become effective on the Commencement Date defined in the Contract.

Upon default by the Principal to perform any contractual obligation, or upon the occurrence of any of the event and circumstances listed in Sub-Clause 15.2 of the Conditions of Contract, the Guarantor shall satisfy and discharge the damages sustained by the Beneficiary due to such default, event or circumstance. However, the total liability of the Guarantor shall not exceed the Bond Amount.

The obligations and liabilities of the Guarantor shall not be discharged by any allowance of time or other indulgence whatsoever by the Beneficiary to the Principal, or by an variation or suspension of the Works to be executed under the Contact, or by any amendments to the Contract or to the constitution of the Principal or the Beneficiary, or by any other matters, whether with or without the knowledge or consent of the Guarantor.

Any claim under this Bond must be received by the Guarantor on or before …….. (*the date six months after the expected date of issue of the*

Commissioning Certificate), (the "expiry date"), when this Bond shall expiry and be returned to the Guarantor.

The benefits of this Bond may be assigned, subject to the provisions for assignment of the Contract, and subject to receipt by the Guarantor of evidence of full compliance with such provisions.

This Bond shall be governed by the laws of …….. being the same country (or other jurisdiction) as that which governs the Contract). The Bond incorporates and be subject to the Uniform Rules for Contract Bonds, published as number 524 by the International Chamber of Commerce, and words used in this Bond shall ber the meanings set out in such Rules.

Whereas this Bond has been issued by the Principal and the Guarantor on this …….. day of ……., 20……..

Signatures for an on behalf of the Principal:

…….
……..
(signature)
(signature)

…….
……..
(name)
(name)

Signatures for an on behalf of the Guarantor:

…….
……..
(signature)
(signature)

…….
……..
(name)
(name)

ADVANCE PAYMENT GUARANTEE

Name of Contract/ Contract No.:

……

Name and address of Beneficiary ("the Employer"):

……

We have been informed that:

……

(name of Contractor)

(hereinafter called the "Principal" is your contractor for the above-named Contract and wishes to receive an advance payment, for which the Contract requires him to obtain a gurantee.

At the request of the Principal, we:

……

(name of Bank)

Hereby irrevocably undertake to pay you, the Beneficiary/Employer, any sum or sums not exceeding in total the amount of …….. (amount in words: ……) (the "guaranteed amount") upon receipt by us of your demand in writing with your written statement stating:

(a) That the Principal has failed to repay the advance payment in accordance with the Condition of Contract, and
(b) The amount which the Principal has failed to repay.

This guarantee shall become effective upon receipt of the advance payment, or, where applicable, the first installment thereof, by the Principal. Such guaranteed amount shall be reduced by the amounts of the advance payment repaid to you from time to time as evidenced by the Interim Payment Certificates issued under Sub-Clause 14.7 of the Condition of Contract. Following receipt by us from the Principal of each Interim Payment Certificates, we shall promptly notify you of the revised guaranteed amount.

Any demand for payment must contain your signature(s) which must be authenticated by your bankers or by a notary public. The authenticated demand and statement must be received by us at this office on or before (the date 70 days after the expected date of completion of the Design-Build) …… (the "expiry date"), when this guarantee shall expire and be returned to us.

If the advance payment has not been fully repaid 28 days prior to the expiry date, we undertake, upon receipt of yoru written demand and statement that the advance payment has not been repaid, to pay you the guaranteed amount within 28 days if your demand.

This guarantee shall be governed by the laws of ……., and shall be subject to the Uniform Rules for Demand Guarantees, published as number 458 by the International Chamber of Commerce, except as stated above.

Signed by: …… Signed by: ……

(signature)

(signature)

……
……..
(name)

(name)

Date : …….

MAINTENANCE RETENTION GUARANTEE

Name of Contract/ Contract No.:

……

Name and address of Beneficiary ("the Employer"):

……

We have been informed that:

……

(name of Contractor)

(hereinafter called the "Principal" is your contractor for the above-named Contract and has chosen to provide a Maintenance Retention Guarantee

At the request of the Principal, we:

……

(name of Bank)

Hereby irrevocably undertake to pay you, the Beneficiary/Employer, any sum or sums not exceeding 5% of the total amount of all interim payments indicated on interim payment certificates that have been presented to us (the "guaranteed amount"), subject to the maximum guaranteed amount of …….. *(insert maximum amount stated in the Contract data, in words and indicate currency).*

Any demand presented under this guarantee shall be in writing and shall be supported by a written statement (whether in the demand itself or in a separate document accompanying and referring to the demand) stating:

(a) That the Principal has failed to carry out his maintenance obligation(s) under the Contract after having received due Notice (as defined in the Contract) to do so, and
(b) The nature of such failure(s)

Any demand for payment, and the written statement if in a separate document, must contain your signature(s) which must be authenticated by your bankers or by a notary public. The authenticated demand and statement must be received by us at this office on or before …… (*the date 70 days after the expected date of completion of the Operation Service Period*) (the "expiry date"_, when this guarantee shall expire and shall be returned to us.

We have been informed that the Beneficiary/ Employer may require the Principal to extend this guarantee if the Contract Completion Certificate under the Contract has not been issued by the date 28 days prior to such expiry date. We undertake to pay you such guaranteed amount upon receipt by us, within such period of 28 days, of your demand in writing and your written statement that the Contract Completion Certificate has not been issued, for reason attributable to the Principal, and this guarantee has not been extended.

This guarantee shall be governed by the laws of ……
And shall be subject to the Uniform Rules for Demand Guarantees, published as number 758 by the International Chamber of Commerce, except as stated above

Signed by: ……. Signed by: ……..

(signature)

(signature)

.....

.....

(name)

(name)

Date : .....

APPENDIX IV – BILLS OF QUANTITIES (BOQS)

The following are the bills of quantities for the project. Bidders must clearly state the zone or zones they are bidding for, and provide the BOQ for that zone or zones separately.

1. Detailed location BOQ

In reference to the locations chosen by the bidder to implement the systems, bidder shall submit a BOQ for each location, clearly marked with location name and code (as listed in Appendix V). The BOQ shall be submitted as a hard copy, and in EXCEL format. All location BOQs must be included in the sealed financial offer. The BOQ will be divided into the following divisions.

Name of Location: _____

A	B	C	D	E	F
Division	**Description**	**Unit**	**QTY**	**Unit Price (JD)**	**Total Price (JD) = D×E**
I	**Civil Works**				
	Including all necessary Design, Construction, manpower, equipment and material, testing, submittals, samples				
I.a.	(to be completed for Zone 3, car parking PV systems)				
1	Survey Works				
2	Geotechnical Study including Testing				
3	Excavation in all types of soil including removal of material to approved disposal grounds.				
4	Blinding concrete (grade 150)				
5	Concrete (Grade 250) for Foundations, Column necks (Fair Face Finish with 2cmx2cm chamfered edges) and Slab on Grade; including formwork, de-shuttering curing and cleaning.				
6	Reinforcement (Grade 420) for Foundation, Column necks, Slab on Grade				
7	Backfilling around foundations and substructure.				
8	Reinstatement of original finished surface (asphalt, slab on grade, walkways)				
9	base coarse (2 layer compaction 95% with 25 cm of each layer)				
10	Asphalt Paving (50 mm paving thickness with MC layer)				
11	Line Marking (10 cm wide)				

12	wheel stoppers with anchoring (min L×W×H of 180×15×15cm).				
13	Curb Stone (30 cm height) with all necessary work for installation and painting				
I.b.	(to be completed for Zones 1 and 2, rooftop PV systems)				
1	Survey Works				
2	Reinforced concrete blocks				
I.c.	Trenching				
1	Survey Works				
2	Excavation				
3	Sweileh Sand layer				
4	Cable Laying				
5	Backfilling				
6	Warning Tape				
7	Concrete Blocks				
8	Backfilling and reinstatement of finish surfaced				
II	**Mounting Structure - Structural Steel or Aluminum Works**				
1	Main Members				
2	Secondary Members				
3	Bracing				
4	HDG Bolts, nuts, and washers & anchor bolts with grouting				
5	PV Rails				
6	PV Clamps (middle and edge)				
7	SS Bolts, nuts, washers and lock washers				
III	**Electrical Works**				
1	PV Modules				
2	PV module transport				
3	Inverters				
4	Inverters transport				
5	PV Distribution Board including Breakers				
6	PV Cables				
7	AC Cables				
8	Junction Boxes				
9	HDG Cable trays, SS cable Ties, Conduits				
10	Executing all necessary penetration in walls and slabs with sleeves grouting and making the penetrations air tight				
11	Earthing system				
12	Lightening System (if necessary)				
13	Manholes and hand-holes				
IV	**Balance of Plant**				

IV.a.	**Thermal Insulation of Roofs (for Zones 1 & 2 only)**				
1	Dismantling of all electromechanical works, cleaning of roof surfaces of all items and preparation of surface to receive the Thermal Insulation.				
2	Casting of concrete threshold were necessary				
3	50mm thick Extruded Polystyrene sheets interlocked and joints sealed.				
4	Nylon sheet 250 microns thick placed over extruded polystyrene				
5	Foam concrete (480Kg/m^3 density) at roof level with 1% slope towards drain and minimum thickness at drain of 3cm reinforced with wire mesh around drain				
6	Screed 2cm				
7	Fillet 5cmx5cm at all vertical elements				
8	Waterproofing using 4mm bituminous sheets (with 2 layers primer) with fiber reinforced polyester, (180gr/m^2) with white granular finish. This include covering of vertical surfaces minimum 300mm with 1cmx2cm grove and placing the bituminous sheet into the groove, sealing it with mastic, covering the grove with 1.5cm thick galvanize sheet and UV solar resistant mastic.				
IV.b.	**CCTV system (for Zone 3 only)**				
IV.c.	**External Lighting (for Zone 3 only)**				
IV.d.	**Signage, this included signs in English and Arabic on each System**				
IV.e.	**Cleaning**				
1	Cleaning Equipment				
2	Water				
3	Water network				
4	Manpower				
IV.f.	**Building Energy Audit**				
Summation of Column F (Carried over to Collection Page)					

2. Zone's overall BOQ:

In reference to the locations' detailed BOQs completed in the table above, bidder shall submit a BOQ for works and items required to complete the Scope of Work for their zone(s).

A carryover from the summation of each location's detailed BOQ is to be included herein. All other items in the overall BOQ shall be completed. The BOQ shall be submitted as a hard copy, and in EXCEL format. This BOQ must be included in the sealed financial offer. The BOQ will be divided into the following divisions.

Zone (1, 2, or 3) Overall BOQ

The bidder shall provide cost of maintenance for three years in a detailed BOQ

A	B	C	D	E	F
Division	**Description**	**Unit**	**QTY**	**Unit Price (JD)**	**Total Price (JD) = D×E**
V	**Summation of Locations' Collection Page**				
VI	**Training (As per Section 3.12)**				
VII	**Maintenance (Operate Phase):** including equipment maintenance repair or replacement, labor, supervision, management, reporting and all other costs (3years)				
VIII	**Spare Parts and Measurement Equipment (As per Section 3.1.7)**				
1	PV Modules				
2	Solar Cables				
3	MC4				
4	Inverters				
5	SS Cable Ties				
6	Middle Clamps				
7	Edge Clamps				
8	Breakers				
9	HDG Bolts, Nuts and Wasters				
10	Measurement Equipment				
IX	**General Fees:** Items that the bidder is considering to be necessary for this project (Provisional Sum) – 5% overhead and profit pair on amounts				400,000
	All Risk Insurance				
	Structure Design by Registered Office				
	GAM				
	MoENV				
	JEA				

	3rd Party Testing of Material (Civil, Electrical, Mechanical)				
	Testing and Commissioning according to IEC 62446-2016				
	PV Plants Certification according to IEC 62446-2016				
	3rd Party IR Testing				
	JEPCO Application fees				
	JEPCO Grid Impact Study fees				
	JEPCO Inspection Fees				
	JEPCO Connection Fees				
	JEPCO (any other) Fees				
	JEPCO Grid Impact Study Requirement Supply and Installation				
X	**Supervision and University Representatives Offices:** Supply, install and maintain and office for the Supervising Engineer and the Employer Representative for the duration of the Contract (Design, Build) and two months after the end of the Contract. This shall include				
1	Furniture of the office				
2	Computers				
3	Printer				
4	Telephone				
5	Internet				
6	Consumables for computers, printers, phones, internet.				
7	Consumables for staff including papers, pens, folders, all stationary				
8	Service for offices (office boy) including consumables (water, tea, coffee, etc, and all material for cleaning, etc)				
Zone _____ 's Financial Offer (Summation of Column F in this Table)					

APPENDIX V - LIST OF SUGGESTED LOCATIONS PER ZONE

The following are a list of suggested locations to implement the PV stations, divided by zone. Softcopy of the maps (size A0), with the given names and numbering of location, are included in the tender package.

Rooftop PV – Zone 1

No.	building Name of	Total Approximate Roof Area (m²)	PV Approximate Area (m²)
Z1-1	مسجد الجامعة	2,170	220
Z1-2	المركز الثقافي الإسلامي	354	130
Z1-3	مجمع اللغات	1,844	890
Z1-4	كلية الدراسات الدولية	1,897	800
Z1-5	مركز الاستشارات1	760	250
Z1-6	مركز الاستشارات	660	250
Z1-7	إدارة الجامعة	2,212	860
Z1-8	كلية اللغات الاجنبية	1,564	1,000
Z1-9	كلية الآداب1	2,909	1,070
Z1-10	كلية الآداب	1,147	220
Z1-11	مجمع القاعات التدريسية للكليات الانسانية	3,071	1,350
12-Z1	كلية الاعمال مبنى ج	2,200	1,200
Z1-13	مجمع القاعات التدريسية للكليات الانسانية 1	1,216	520
Z1-14	مبنى التقنيات التعليمية	543	240
Z1-15	كلية الحقوق	1,970	810
Z1-16	كلية الاعمال عمادة الكلية والكافتيريا	1,156	580
Z1-17	Student.com	907	370
Z1-18	كلية الشريعة	1,031	700
Z1-19	كلية ادارة الاعمال	1,063	560
Z1-20	متحف الاثار	953	520
Z1-21	متحف التراث الشعبي	915	500
Z1-22	كلية العلوم التربوية	6,186	2710
Z1-23	المدرسة النموذجية	1,547	570
Z1-24	سكن الموظفين (12 وحدة)	3,080	1,140
Z1-25	سكن عمون	1,400	490
Z1-26	منزل الأندلس	2,380	1,200
Z1-27	منزل الزهراء	2,300	1,200
Z1-28	مكتبة الجامعة	3,200	1,860
Z1-29	دائرة المطاعم والمقاصف	2,330	1,200
Z1-30	مدرج الحسن بن طلال	1,612	870
Z1-31	كلية الأثار	658	410
Z1-32	عمادة شؤون الطلبة	1,230	580
Z1-33	العيادات المركز الصحي الشامل	745	370
Z1-34	مركز قبض الرسوم 2	232	150

Z1-35	كليه الملك عبد الله الثاني لتكنولوجيا المعلومات	4,056	2,180
Z1-36	مجمع العلمية	1,208	720
Z1-37	مركز الحاسوب	439	220
Z1-38	مركز حمدي منكو للبحوث العلمية	1,798	900
Z1-39	سكن جرش	1,338	500
Z1-40	المصلى	300	130
Z1-41	نادي الجامعة الأردنية	663	360
Z1-42	مركز الدراسات الاستراجية	451	220
Z1-43	مبنى المخطوطات		400
Z1-44	المبنى الاستثماري 1		800
Z1-45	مبنى الاستثماري 2		1,200
Z1-46	مدرج سمير الرفاعي		300
Z1-47	السوق التجاري		800
	Approximate Total Area (m^2)	67,696	34,520

Rooftop PV – Zone 2

No.	Name of Building	Total Approximate Roof Area (m²)	PV Approximate Area (m²)
Z2-1	مجمع النشاطات الرياضية	1,783	950
Z2-2	الرياضيات	883	560
Z2-3	الفيزياء	1,802	1,130
Z2-4	العلوم الحياتية	1,879	1,100
Z2-5	مركز تكنولوجيا البذور	604	350
Z2-6	الجيولوجيا	1,068	720
Z2-7	الإنتاج الحيواني التابع للعلوم الحياتية	578	330
Z2-8	مدرج وصفي التل	644	280
Z2-9	الكيمياء	1,545	550
Z2-10	عمادة البحث العلمي	1,006	530
Z2-11	كلية الزراعة	5,721	2,420
Z2-12	مختبر الأصول الوراثية	567	400
Z2-13	كلية الهندسة KADBB	14,740	6,720
Z2-14	مبنى التجارب الحيوانية	726	290
Z2-15	مجمع القاعات التدريسية للكليات الطبية	2,631	1,500
Z2-16	مبنى البيوت الزجاجية	595	180
Z2-17	مختبر التصنيع الغذائي	1,183	770
Z2-18	مبنى القبول والتسجيل	3,364	1,130
Z2-19	كلية الطب	3,200	1,150
Z2-20	كلية التمريض	1,500	690
Z2-21	اذاعة الجامعة	1,337	740
Z2-22	كلية الصيدلة	1,300	600
Z2-23	كلية طب الأسنان	1,400	200
Z2-24	كلية العلوم والتأهيل	2,400	790
Z2-25	مستشفى الجامعة الأردنية	10,300	3,170
Z2-26	دائرة اللوازم والمشتريات	1,700	610
Z2-27	مبنى كلية الفنون	5,843	2,410
Z2-28	مبنى الصيانة والمستودعات	7,278	2,020
Z2-29	وحدة الخدمات المساندة	2,459	1,260
Z2-30	المستشفى قسم الولاده	3,000	1,300
	Approximate Total Area (m²)	83,036	34,850

Car Park PV – Zone 3

No.	Name of Building	Total Approximate Area (m²)	PV Approximate Area (m²)
Z3-1	Parking مسجد الجامعة	4,238	1,056
Z3-2	Parking مركز الاستشارات	2,870	1,584
Z3-3	Parking الحقوق	1,054	455
Z3-4	Parking الاداب	2,349	843
Z3-5	Parking كلية العلوم التربوية	3,750	2,226
Z3-6	Parking مقابل كلية العلوم التربوية (1)	3,737	1,950
Z3-8	Parking جنوب مركز حمدي منكو		731
Z3-9	Parking مركز الحاسوب		492
Z3-10	parking عيادات المركز الصحي		517
Z3-11	parking شمال كلية التكنولوجيا		503
Z3-13	Parking الفيزياء		454
Z3-14	Parking الرياضيات		489
Z3-15	Parking مبنى العلوم الحياتية		666
Z3-16	Parking عمادة البحث العلمي	1,199	312
Z3-17	South Parking Engineering building	1,903	796
Z3-19	Parking in back of Glasshouses	976	369
Z3-20	Parking in front of Glasshouses	686	440
Z3-21	Parking كلية العلوم والتأهيل	800	151
Z3-22	Parking الصيانة	3,000	1,303
Z3-23	Parking المستودعات	3,100	1,314
Z3-24	موقف كلية الهندسة	2,900	1,160
Z3-25	موقف القبول والتسجيل	3,000	1,200
Z3-26	موقف كلية الدراسات الدولية	620	248
Z3-27	منطقة ارضية مستودعات الصيانة	3,000	1,200
Z3-28	موقف الاستشارات	2,700	1,080
Z3-29	موقف التمريض	1,800	720
Z3-30	منطقة ارضية عند البوابة الجنوبية	2,000	800
Z3-31	موقف الفنون	8,600	3,440
	Approximate Total Area (m^2)	54,282	26,498

APPENDIX VI – TECHNICAL EVALUATION CRITERIA

for the Rooftops station design

This Appendix contains the amplified evaluation criteria for design of the 6 MW AC stations in Zones 1 and 2. The design is deemed technically compliant if it scores 75% or more.

Evaluation Criteria	Score
Design Compliance	30 %
1- PV modules compliance	5 %
2- Mounting structures	4 %
3- Inverters	5 %
4- Metering, control and monitoring System	5 %
5- Cabling, wires and interconnections	2 %
6- Minimal utilization of land	2 %
7- Expected year round AC output delivered to UoJ (MWh)	7 %
Quality of Proposed Products	20 %
1- Quality Certificates of the products	4 %
2- Production capacity and market share of the equipment suppliers over the last 5 years, broken down by year	6%
3- Evidence that the PV units manufacturer has been operating in the business of solar panel and PV units manufacture for the past (10) years	6%
4- Structural integrity quality and testing of the mounting structures	4%
Bidder Qualification & Expertise	30 %
1- Bidder's list of deliveries of the same nature within the last (4) years	6 %
2- Bidder's references	5 %
3- Bidder's in-house expertise and CVs	5 %
4- Bidder's International Certificates and Awards (e.g. ISO)	2 %
5- Years of bidder in operation in PV stations deliveries • 0-1 years in operation (0 %) • 1-2 years in operation (1 %) • 2-3 years in operation (2 %) • 2-3 years in operation (3 %) • 2-3 years in operation (4 %) • More than 5 years in operation (5 %)	5%
6- Financial standing of the bidder • Bidder's bank statement for the last fiscal year • Bidder's current fiscal responsibilities and on-going projects • Aggregate annual weighted average (for the last 3 years) of turnover has been at least equal to the tender price	5 %
7- Size of overall full-time employment of the bidder	2 %

Warranty, Maintenance and Technical support	5 %
1- Warranty of equipment, structures, and plant performance 2- Maintenance plan 3- Technical support personnel and documentation	2 % 2 % 1 %
Training	5 %
1- Training Plans for UoJ faculty, personnel, and students 2- Certification of instructors	3 % 2 %
Installation Plans	10 %
1- Installation plans methodology 2- Clear timeline and bench marks of installation, commissioning and delivery 3- Safety, environmental mitigation, and noise-reduction measures 4- Quality Control plans	3 % 3 % 2 % 2 %
Total Points	100 %

APPENDIX VII – TECHNICAL EVALUATION CRITERIA

for the car parks station design

This Appendix contains the amplified evaluation criteria for design of the 4 MW AC carparks stations. The design is deemed technically compliant if it scores 75% or more.

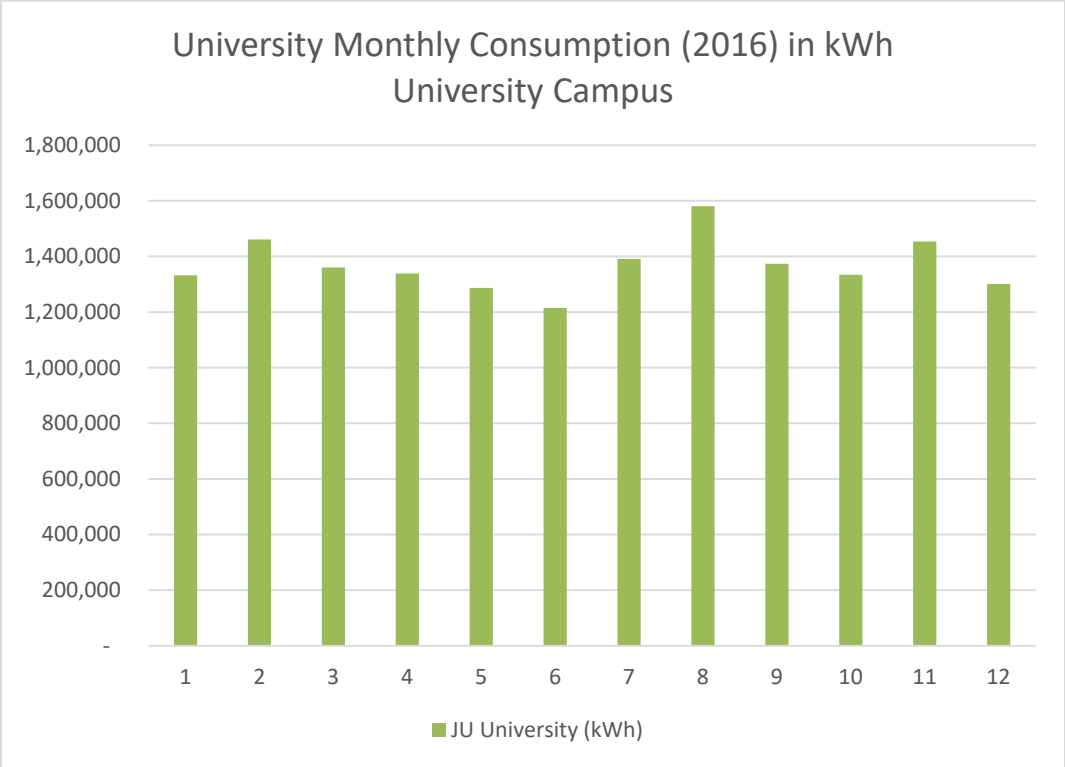
Evaluation Criteria	Score
Design Compliance	35 %
1- Iconic design (including number of car parking lots and total shaded area for pedestrians)	6 %
2- PV modules compliance	5 %
3- Mounting structures	5 %
4- Inverters	5 %
5- Metering, control and monitoring System	5 %
6- Cabling, wires and interconnections	2 %
7- Expected year round AC output delivered to UoJ (MWh)	7 %
Quality of Proposed Products	20 %
1- Quality Certificates of the products	4 %
2- Production capacity and market share of the equipment suppliers over the last 5 years, broken down by year	6%
3- Evidence that the PV units manufacturer has been operating in the business of solar panel and PV units manufacture for the past (10) years	6%
4- Structural integrity quality and testing of the mounting structures (stress, shear, vibration, loading, wind, etc)	4%
Bidder Qualification & Expertise	25 %
1- Bidder's list of deliveries of the same nature within the last (4) years	4 %
2- Bidder's references	4 %
3- Bidder's in-house expertise and CVs	4 %
4- Bidder's International Certificates and Awards (e.g. ISO)	2 %
5- Years of bidder in operation in PV stations deliveries • 0-1 years in operation (0 %) • 1-2 years in operation (1 %) • 2-3 years in operation (2 %) • 2-3 years in operation (3 %) • 2-3 years in operation (4 %) • More than 5 years in operation (5 %)	5%
6- Financial standing of the bidder • Bidder's bank statement for the last fiscal year • Bidder's current fiscal responsibilities and on-going projects • Aggregate annual weighted average (for the last 3 years) of turnover has been at least equal to the tender price	4 %
7- Size of overall full-time employment of the bidder	2 %

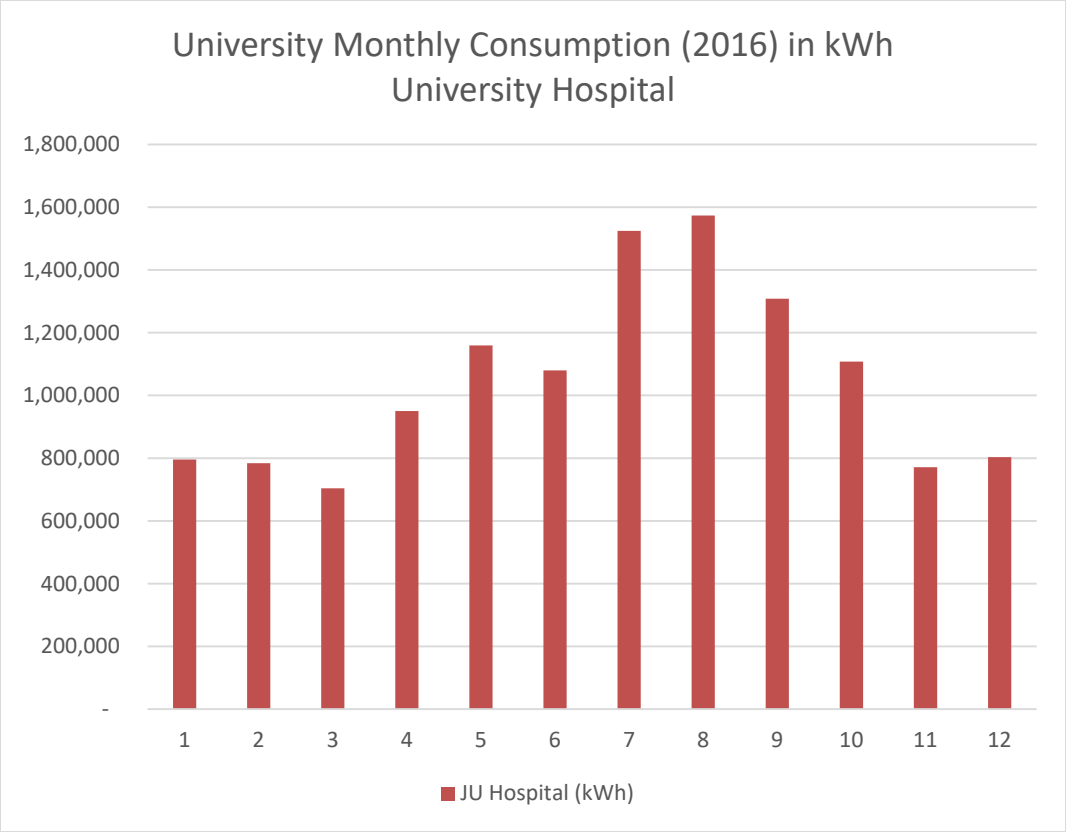
Warranty, Maintenance and Technical Support	5 %
1- Warranty of equipment, structures, and plant performance 2- Maintenance plan 3- Technical support personnel and documentation	2 % 2 % 1 %
Training	5 %
1- Training Plans for UoJ faculty, personnel, and students 2- Certification of instructors	3 % 2 %
Installation Plans	10 %
1- Installation plans methodology 2- Clear timeline and bench marks of installation, commissioning and delivery 3- Safety, environmental mitigation, and noise-reduction measures 4- Quality Control plans	3 % 3 % 2 % 2 %
Total Points	100 %

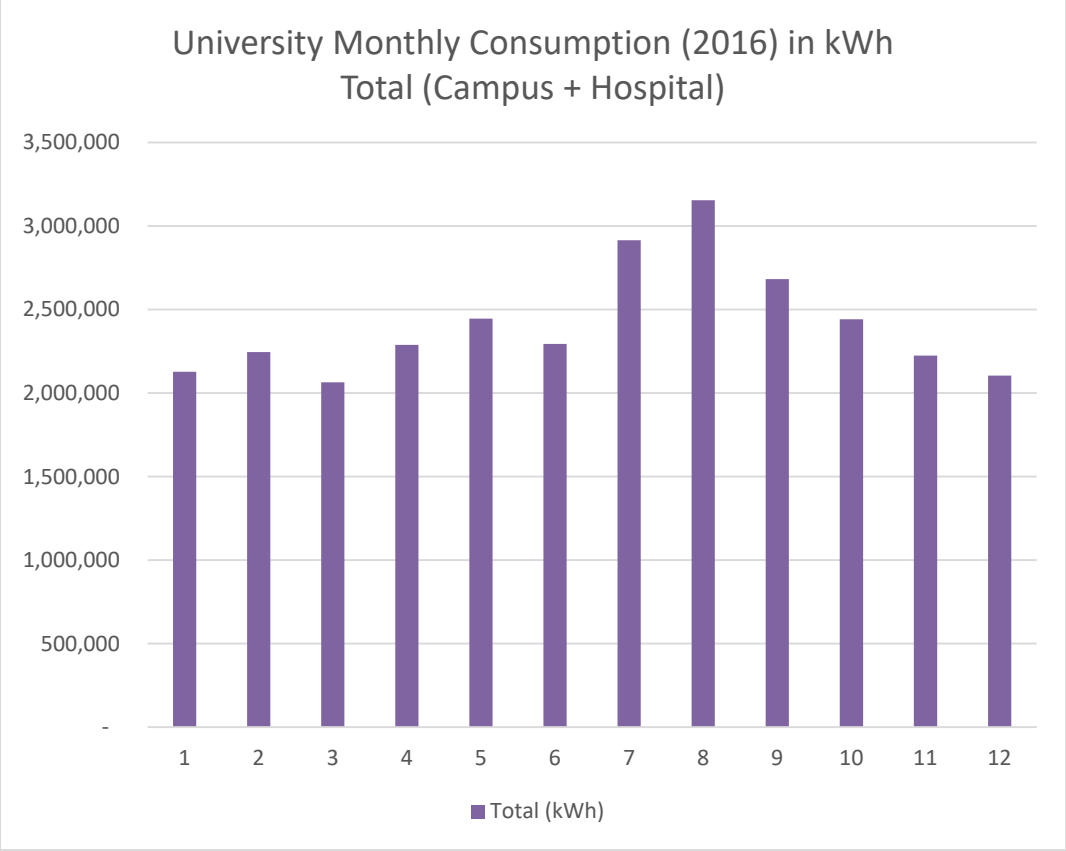
APPENDIX VIII – POWER CONSUMPTION ON CAMPUS OVER 12 MONTHS (KWH)

Month	UoJ Hospital (kWh)	UoJ University (kWh)	Total (kWh)
1	795,576	1,332,161	2,127,737
2	783,839	1,461,238	2,245,077
3	704,010	1,360,516	2,064,526
4	950,191	1,338,256	2,288,447
5	1,159,212	1,286,532	2,445,744
6	1,079,894	1,214,603	2,294,497
7	1,524,425	1,390,609	2,915,034
8	1,573,753	1,580,653	3,154,406
9	1,308,197	1,373,735	2,681,932
10	1,107,700	1,334,001	2,441,701
11	771,131	1,453,286	2,224,417
12	803,316	1,301,043	2,104,359
Total	**12,561,246**	**16,426,633**	**28,987,879**

The figures below show the monthly electricity consumption with the total annual consumption of 29.99 GWh




University Monthly Consumption (2016) in kWh
University Hospital
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
-
1
2
3
4
5
6
7
8
9
10
11
12
JU Hospital (kWh)


University Monthly Consumption (2016) in kWh
Total (Campus + Hospital)
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
-
1
2
3
4
5
6
7
8
9
10
11
12
Total (kWh)

APPENDIX IX – LIST OF DISTRIBUTION PANELS ON CAMPUS

	Panel Data				
of building Name	location description	manufacturer	rated current A	type	energy
روضة الجامعة	بهو المبنى		200	3	
الحضانة	بهو المبنى		100	3	
محترف الخزف	مدخل المبنى		200	3	
مركز الوثائق	طابق التسوية2		500	3	
مسجد الجامعة	الطابق الارضي		400	3	
دائرة العطاءات	الطابق الارضي		125-160	3	
مدرج سمير الرفاعي	الطابق الارضي		250	3	
المركز الثقافي الإسلامي	الطابق الارضي		125	3	
مجمع اللغات	طابق التسوية		400	3	
كلية الامير حسين	طابق التسوية		1600+1000 للتكيف	3	
كلية الفنون					
مركز الاستشارات	طابق التسوية		400	3	
إدارة الجامعة	طابق التسوية		1600		
كلية اللغات الاجنبية/قسم اللغويات	بهو المبنى		250	3	
كلية اللغات الاجنبية	طابق التسوية		400	3	
كلية الآداب					
كلية الآداب	الطابق الارضي		600		
مجمع القاعات التدريسية للكليات الانسانية					
كلية الاعمال مبنى ج	طابق التسوية		225	3	
Village					
مبنى التقنيات التعليمية					
كلية الحقوق	طابق التسوية		250	3	
كلية الاعمال عمادة الكلية والكافتيريا	غرفة خارج المبنى		200	3	
Student.com	طابق التسوية		800	3	
كلية الشريعة	بيت الدرج		400	3	
كلية ادارة الاعمال	طابق التسوية		400		
متحف الاثار	الطابق الارضي		100		
متحف التراث الشعبي					
ATM (بنك الأسكان)					
كلية العلوم التربوية	الطابق الارضي		400	3	
الغرفة الصغيرة					
المدرسة النموذجية	طابق التسوية		400	3	
سكن الموظفين (12 وحدة)	الطابق الارضي		100	3	
سكن عمون	طابق التسوية		160	3	

منزل الأندلس	طابق التسوية		2400	3	
منزل الزهراء	الطابق الارضى		2400		
مكتبة الجامعة	الطابق الارضى		630		
دائرة الأمن الجامعي					
دائرة المطاعم والمقاصف	تحت الدرج	Cutler hammer	800	3	
مدرج الحسن بن طلال					
كلية الأثار	الطابق الارضى	Legrand	250	3	
عمادة شؤون الطلبة	الطابق الارضي		800	3	
بنك القاهرة عمان	الطابق الارضي		200	3	
العيادات المركز الصحي الشامل	الطابق الارضى		100	3	
مركز قبض الرسوم 2					
كليه الملك عبد الله الثاني لتكنولوجيا المعلومات	الطابق الارضي	Legrand	2500	3	
مجمع العلمية	الطابق الارضي	Cutler hammer	400	3	
مركز الحاسوب	الطابق الارضى	Westinghouse	1600	3	
مركز حمدي منكو للبحوث العلمية	الطابق الارضي	ABB	630	3	
سكن جرش	طابق التسوية	Cutler hammer	1600	3	
ستاد الجامعة	داخل الاستاد		630	3	
ستاد الجامعة	الطابق الارضى		400	3	
مجمع النشاطات الرياضية	طابق التسوية		1800	3	
البوابة الرئيسية	البوابة		100	3	
المصلى					
السوق التجاري	داخل غرفة البويلر	Cutler hammer	1200	3	
شعبة النظافة			100	3	
شعبة الامن					
مكتب امين المستودع					
مستودع 1					
مستودع 2					
نادي الجامعة الأردنية			100	3	
مكتب الدراسات الاستشارية	الطابق الارضى	Westinghouse	250	3	
الرياضيات	الطابق الارضي		2600	3	
الفيزياء					
عمادة العلوم	غرفة البويلر	ABB	400	3	
العلوم الحياتية	غرفة البويلر	ABB	400	3	
مبنى البذور					
الجيولوجيا	غرفة البويلر	Merlin Gerin	1200	3	

الإنتاج الحيواني التابع للعلوم الحياتية					
مدرج وصفي التل					
البيوت الزجاجية/العلوم	المدخل	Merlin Gerin	160	3	
الكيمياء	تحت الدرج	Westinghouse	1000	3	
عمادة البحث العلمي	الطابق الارضى		250	3	
كلية الزراعة	طابق التسوية		630	3	
مختبر الأصول الوراثية					
KADBB					
كلية الهندسة	طابق تسوية/فرع كلية الصيانة		1000	3	
مشاغل كلية الهندسة	خزانة رئيسى داخا المشاغل		630	3	
كلية الهندسة	طابق التسوية /فرع المدني		1000	3	
مبنى التجارب الحيوانية	الطابق الارضى		250	3	
مجمع القاعات التدريسية للكليات الطبية	الطابق الاول		400	3	
مبنى البيوت الزجاجية	الطابق الارضى		250	3	
مختبر التصنيع الغذائي	الطابق الارضى		250	3	
مبنى القبول والتسجيل	طابق التسوية		630	3	
البوابة الجنوبية			100		
كلية الطب/المشارح	طابق التسوية		400	3	
كلية الطب	الطابق الارضي		320	3	
كلية التمريض	الطابق الارضى		250	3	
اذاعة الجامعة	طابق التسوية		200-400	3	
كلية الصيدلة	الطابق الارضي		250-630	3	
كلية طب الأسنان	التسوية		500	3	
كلية العلوم والتأهيل	الطابق الارضى		1600	3	
مستشفى الجامعة الأردنية					
دائرة اللوازم والمشتريات	داخل المصلى		1200	3	
مبنى كلية الفنون	الطابق الارضى	Mitsubishi	1600	3	
مبنى الصيانة والمستودعات	الطابق الارضي		1200	3	
وحدة الخدمات المساندة	الطابق الارضي		100	3	
قسم صيانة الاجهزة	الطابق الارضى		100	3	
قسم الحركة	الطابق الارضي		100	3	
مستودع الصيدلة	الطابق الارضى		100	3	
قسم المحددة	الطابق الارضى		100	3	
مستودع العلوم	الطابق الارضي		100	3	
مستودع الحركة	الطابق الارضي		100	3	

الدفاع المدني	الطابق الارضي	Legrand	80	3	
Parking مسجد الجامعة					
Parking مركز الاستشارات					
Parking الحقوق					
Parking معهد الأثار					
Parking كلية العلوم التربوية					
Parking مقابل كلية العلوم التربوية (1)	الطابق الارضي		250	3	

APPENDIX X – GLOSSARY

Note: the present definitions are given here for convenience only, in the context of the tender procedure. The definitions set out in the contract as concluded are determining for the relations between the parties to the contract.

Administrative order: Any instruction or order issued by the Project Manager to the Contractor in writing regarding the execution of the contract.

Breakdown of the overall price: A heading-by-heading list of the rates and costs making up the price for a lump-sum contract.

Conflict of interest: Any event influencing the capacity of a candidate, bidder or supplier to give an objective and impartial professional opinion, or preventing him, at any moment, from giving priority to the interests of the UoJ and the Contracting Authority. Any consideration relating to possible contracts in the future or conflict with other commitments, past or present, of a candidate, bidder or supplier, or any conflict with his own interests. These restrictions also apply to subcontractors and employees of the candidate, bidder or supplier.

Contractor: The successful bidder, once all parties have signed the contract.

Consultant: Third party consultation firm assigned by UoJ for the certification of the installation, testing, and commissioning of the PV stations.

Day: Calendar day.

Dayworks: Varied work inputs subject to payment on an hourly basis for the Contractor's employees and plant.

Defects Notification Period: The period stated in the contract immediately following the date of provisional acceptance, during which the Contractor is required to complete the works and to remedy defects or faults as instructed by the Engineer.

Drawings: Drawings provided by the Contracting Authority and/or the Engineer, and/or drawings provided by the Contractor and approved by the Engineer, for the carrying out of the works.

Engineer's representative: Any natural or legal person, designated by the Engineer as such under the contract, and empowered to represent the Engineer in the performance of his functions, and in exercising such rights and/or powers as have been delegated to him. In this case, references to the Engineer will include his representative.

Equipment: Machinery, apparatus, components and any other articles intended for use in the works.

Final acceptance certificate: Certificate(s) issued by the Engineer to the Contractor at the end of the defects notification period stating that the Contractor has completed his obligations to construct, complete, and maintain the works concerned.

General conditions: The general contractual provisions setting out the administrative, financial, legal and technical clauses governing the execution of contracts.

General damages: The sum not stated beforehand in the contract, which is awarded by a court or an arbitration tribunal, or agreed between the parties, as compensation payable to an injured party for a breach of the contract by the other party.

UoJ: The University of Jordan.

In writing: This includes any hand-written, typed or printed communication, including fax transmissions and electronic mail (e-mail).

Liquidated damages: The sum stated in the contract as compensation payable by the Contractor to the Contracting Authority for failure to complete the contract or part thereof within the periods under the contract, or as payable by either party to the other for any specific breach identified in the contract.

Modification: An instruction given by the Engineer which modifies the works.

Period: A period begins the day after the act or event chosen as its starting point. Where the last day of a period is not a working day, the period expires at the end of the next working day.

Plant: appliances and other machinery, and, where applicable under the law and/or practice of the state of the Contracting Authority, the temporary structures on the site required to carry out the works but excluding equipment or other items required to form part of the permanent works.

Project Manager: The legal or natural person responsible for monitoring the execution of the contract on behalf of the UoJ.

Provisional sum: A sum included in the contract and so designated for the execution of works or the supply of goods, materials, plant or services, or for contingencies, which sum may be used in whole or in part, or not at all, as instructed by the Engineer.

Site: The places provided by the Contracting Authority where the works are to be carried out and other places stated in the contract as forming part of the site.

Special conditions: The special conditions laid down by the Central Contracting Committee as an integral part of the tender document, amplifying and supplementing the general conditions, clauses specific to the contract and the terms of reference (for a service contract) or technical specifications (for a supply or works contract).

Substantial Completion Date: Date certified by the Project Manager on which the project (or a specified portion) is complete to the extent it can be operated or used for its intended purpose in accordance with contract and/or regulatory requirements.

Supervisors: The legal or natural persons responsible for administering the contract appointed by and on behalf of the UoJ.

Tender document/s: The dossier compiled by the Contracting Authority and containing all the documents needed to prepare and submit a tender.

Tender price: The sum stated by the bidder in his tender for carrying out the contract.

Works: Works of a permanent or temporary nature executed under the contract.

Written communications: Certificates, notices, orders and instructions issued in writing under the contract.