Technical Specifications: Supply and Installation of Six (6) Standalone Solar Power Stations (Without Pumps) – Aswan Governorate

1. Introduction

This document outlines the required technical standards and conditions for procuring, delivering, installing, and commissioning six (6) independent solar photovoltaic (PV) power stations. The stations are intended for standalone operation and will not include integrated water pumps.

2. General Scope

The scope involves:

- Supplying and installing complete solar PV stations, including all required modules, support structures, inverters, protection and control equipment, wiring, and all necessary ancillary items.
- Ensuring each system is fully operational, robust, and suitable for off-grid, independent use in Aswan's climate.

- For irrigation with a power of 10 horsepower (7.5 kilowatts) per pump.

3. Solar PV Array

- Each system must use mono-crystalline PV modules with a minimum rated output of 550 W per panel at standard test conditions.
- Modules should deliver at least 20% efficiency, with a fill factor exceeding 72%.
- Panels must be certified under IEC 61730 (parts I & II) or equivalent international safety and performance standards.
- The array capacity for each station should provide a continuous total DC output For irrigation with a power of 10 horsepower (7.5 kilowatts) per pump..
- Each module’s technical data must include the manufacturer's details, product serial, electrical specifications (Im, Vm, FF), manufacturing month/year, performance curves, and compliance certificates.
- The supplier shall provide annual simulated energy yields and system performance projections.

- Tier-1 PV Module brand such as JA Solar / Jinko / Trina / Longi / Canadian Solar or equivalent

4. Inverter, Controls, and Protection Devices

- An inverter with MPPT (Maximum Power Point Tracking) must be installed at each station, guaranteeing a conversion efficiency of not less than 95%.
- Inverters should be IP65-rated or housed within an enclosure offering at least IP54 protection and adequate cooling.
- Pre-installed safety features shall include:
  - Overload, short-circuit, and reverse-polarity protection
  - Over/under voltage and phase failure protection (where applicable)
  - Surge and lightning protection
- Visual displays for electrical parameters (voltage, current, energy output, operation status, etc.) must be readily accessible.

- Inverter brand shall be Tier-1 such as Fronius, SMA, ABB/Fimer, Huawei, Sungrow, Growatt or equivalent.

5. Cabling and Connections

- All electrical cables must conform to relevant Egyptian or international standards, produced by ISO 9001 certified manufacturers.
- PV cables should safely handle at least 125% of maximum expected current, be UV and weather-resistant, and minimize voltage drop to below 2%.
- All wiring shall be suitable for continuous outdoor exposure and be flexible to prevent mechanical damage.

- Marine AC cable (sized according to actual distance)

- DC solar cables — UV resistant

- Original MC4 connectors and fuses

6. Mounting Structures

- PV panels are to be securely mounted on weather-resistant structures designed for wind speeds up to 120 km/h.
- Structures shall be made from hot-dip galvanized steel (minimum coating 60 microns) or aluminum alloys of Grade 6061/6063, or approved equivalents.
- Modules shall face true south with inclination matching the Aswan latitude to maximize solar harvest.
- Foundations must be reinforced concrete with partial submersion below ground for stability.

7. System Grounding

- Comprehensive grounding of all metallic frames, PV structures, and major electrical equipment is mandatory.
- The grounding system must limit earth resistance below 5 ohms, employing NEC/BS-compliant earthing practices.
- Cables and accessories for grounding, along with testing tools, should be provided and installed.

8. Documentation and Training

- The contractor must supply a detailed Operation and Maintenance manual in both Arabic and English, including:
  - Manufacturer datasheets for all components
  - Detailed wiring diagrams
  - Commissioning, maintenance and troubleshooting instructions
- A user training session should be conducted to familiarize local personnel with operational procedures and routine safety checks.

9. Warranty and After-sales Support

- The entire system, including all equipment and installation workmanship, must be covered by at least a one-year comprehensive warranty.
- The supplier should operate or contract with a certified service center in Egypt,

supporting maintenance and parts replacement as needed.

Evaluation Criteria for Tenders (100 Points System)

Category	Description / Basis of Evaluation	Weight
Technical Compliance	Conformity of the submitted offer with the technical specifications, datasheets, standards, methodology of implementation	**30**
Supplier / Contractor Experience	Previous related work in similar projects, references, project completion certificates	**10**
Quality of Proposed Materials / Equipment	Origin, Tier-1 brands, efficiency, warranty terms, certification (IEC / ISO)	**10**
Delivery & Execution Schedule	Proposed time plan, feasibility, availability of resources, site readiness	**10**
Warranty & After-Sales Support	Local service, response time, commitment to support after installation	**10**
Financial Offer (Price Competitiveness)	Value for money, price reasonableness, cost-effectiveness compared to market price	**30**
Total	**100 points**	