Scope of Works

INSTALLATION OF SOLAR MINI GRID FOR 300HH (266KWP/150KVA/768KWh)

Project Title: Construction of Proposed Solar mini Grid

Project Location: Safana (12°41'32.90"N 7°44'59.84"E), Charanchi LGA, Katsina State.

Client/Owner: Cooperazione Internazionale (COOPI)

Contractor: …….

Date: October 26th, 2026

1. Introduction and Objectives

The objective of this Scope of Work is to define the extent of works, materials, equipment, and services required for the complete construction and installation of a fully functional, solar mini grid for 300nr households in accordance to the specifications and unit as described in the attached drawings and Bill of Quantities.

2. General Scope and Deliverables

The Contractor shall provide and place all items included in the BOQ and Design Drawings. The works shall include provision of items and labour to deliver a complete, ready-to-use solar mini grid, including:

- Site preparation.
- Construction of 5mx5m Power house and 3.5mx3.5m security house with wash
- Construction of 5mx3.5m RCC BESS Base
- Construction of RCC base for PV supports
- Installation of PV support structure
- Construction of perimeter fencing
- Installation of BESS, PV, Inverters, Gears and protection and monitoring equipment
- Installation of RCC poles and distribution network
- Installation of smart meters
- Installation of security lights
- Final finishing and clean-up.
- Testing, commissioning and training

3. Detailed Scope of Work

3.1 Site Preparation

3.1.1 Clearing and Setting out

The general area of the facility measuring approximately 2975 sq. meters to be cleared in preparation for general excavation and sett out according to designed levels and plan for fence, power house and PVs support foundations.

3.1.2 Earthworks

The Foundations and buildings footprint shall be excavated as shown on the drawings. All earthworks; cut, fill, provision and disposal shall be as provided in the approved BOQ except otherwise revised and approved by the infrastructure Development Engineer/Project Manager.

3.2 Structural Works

3.2.1 Structural Steel works

Structural steel joists shall be fabricated, coated, painted (Grey color) and erected with Bolted connections as shown on drawing and provide welds where applicable to Engineers' approval.

3.2.2 Foundation and Concrete works

Provide place and properly cure RCC in-situ Concrete mix 1:2:4 – 20mm aggregate to foundations, pedestals, plinth beams and slabs of power and security house in quantities and grade as shown on drawing and BOQ

3.2.3 Roof Framing

Provide and install SADEF-Z lightweight galvanized purlins including all jointing and connections (packing piece, bolts etc.) as necessary in Framing.

3.2.4 Roof Sheeting

Supply and fix High-Quality Sheets 0.7mm Queensway aluminum long span corrugated roofing sheet or equal approved roofing sheets from an approved manufacturer; sheets fixed to light gauge purlins with galvanized hook nails and bituminous washers (all in accordance with the manufacture's detail's) - measured net rate to include fixing bolts, ridge caps and gutters.

3.2.5 PV mounting structure

Supply and assemble Pv support structure; Light-Gauge Cold-Formed Steel Lip Channels (C-Channels / U-Channels) with a Hot-Dip Galvanized (HDG) coating with connection clamps and bolts to manufacturer specifications and Engineer's approved.

3.3 Electrical Works

Provide and install all electrical fittings itemized on the BoQ including Electrical Wiring and Installations, Lighting (LED) bulbs, Lighting (Florescence) bulbs, Lamp holders, PVC Conduit pipes, Electrical Sockets, Electrical Switches in power house and security house.

Provide and install fully functional 150KVA solar system excepted otherwise reviewed and approved by the Project Engineer/ Project manager.

3.4 Plumbing and Sanitation Works

Provide and install all plumbing fittings as specified on the BoQ including Water Closet System Installations, Wash hand basin Installations, Shower installations, 4" Pvc floor drain installations.

Provide water borehole with sum pump, stanchion support and 2500L tank for security house

Sanitary works also include the safe and healthy evacuation of all filled-up soak away pit for security house

3.5 Finishes

3.5.1 Painting

Painting and wall decoration shall not apply to brick walls.

3.5.2 Ceiling

An approved Perforated aluminum ceiling shall be provided and placed in powerhouse.

3.5.3 Flooring

450mmx450mm porcelain floor tiles shall be provided on floors (where applicable) to power house, security rooms and wash rooms as shown on drawing.

3.6 External works

3.6.1 Perimeter fencing

Provide and place perimeter fencing; 3mm low carbon steel Mesh fencing panels pvc coated with all accessories to manufacturer's details. Fence shall not be less than 1.5m height from NGL.

3.6.2 Apron

Provide reinforced concrete apron as shown on drawing to Engineer's approval; in-situ Concrete mix 1:2:4 – 20mm aggregate

3.6.3 Ballast

Provide gravely ballast on compacted polyethylene sheet on compacted earth to Engineer's approval to protect PV soffits from moisture and vegetative growth as shown on drawing and Bill

3.7 Equipment Installation

3.7.1 Photovoltaic Panels (PVs)

Provide and install module 740 Wp n-type bifacial, Tier-1, IEC 61215/61730740W PV bifacial panels with clamps and all fittings as required by design upon inspection and approval by COOPI' s electrical engineer and certification by COOPI's Infrastructure Development Engineers.

3.7.2 Battery Energy storage system (BESS Compartments)

Procure and install $LiFePO_4$ battery, outdoor HV cabinets, IEC 62619, BMS, HVAC, fire suppression, 6,000 cycles weather proof Energy Storage System Compartments as specified in the Bill of Quantities and place as directed.

BESS must be verified and certified by COOPI's Electrical Engineer and Infrastructure Development Engineer before installation.

Test running of the equipment shall be carried out to ascertain their functionality.

3.7.3 Inverters

Procure and install Grid-forming battery inverters 3x50 kW, 3-phase, parallel-capable, black start, and PV string inverters 2x 100 kW, 3-phase, IP66, anti-PID quantities as shown in BOQ

3.7.4 Distribution network poles

Procure and install 8m, grade C30 Reinforce Concrete poles.

3.7.5 Distribution network poles

Procure and install auxiliary items required for the mini grid installation and operation. Such items included but not limited to:

- PV string cable 6 mm² H1Z2Z2-K 1.5 kV with UV clips
- MC4-compatible connector pairs, 1,500 V
- PV inverter AC cable 4 × 95 mm² Al XLPE/SWA 0.6/1 kV
- Battery DC breaker / isolator 1,000 V DC with fuses
- BMS / inverter / EMS communication cabling
- LV main switchboard 400 V, single bus, 3 motorized feeders, Type 1+2 SPD, metering
- Inverter-to-switchboard AC cabling, Cu single cores + PE

- Microgrid EMS: inverter-native control, street rota, service-window timer
- Earth conductor 70 mm² bare Cu
- Copper-bonded earth rods 2.4 m with clamps and enhancement compound
- Lightning protection: 12 m galvanized mast, air terminal, down conductor
- Equipotential bonding conductors and clamps
- ABC suspension clamps with pole brackets
- ABC anchoring / dead-end clamps with brackets
- Riser fuse-switch-disconnector 250 A, NH fuses, Type 2 SPD, IP55 box, pole guard
- LV cable termination and joint kits (heat-shrink, lugs, glands
- PEN re-earthing electrode sets
- Pole number plates and danger notices
- 40 W LED street light, 5,200 lm, IP66, Type II optic, dimming driver, bracket

1.1 Deliverables and Reporting

The Contractor shall submit the following reports and documents to COOPI:

- Construction Report: Progress reports with geotagged pictures.
- Invoice based on the approved Bill of Quantities (BoQ) and actual works completed or projected by COOPI's infrastructure Development Engineer.
- Supplier Invoice and receipts.
- Final Invoice based on the approved Bill of Quantities (BoQ) and actual works completed.

1.2 Training

Upon completion, the contractor shall provide Operations and maintenance guidelines, manuals and train operators.

2. Exclusions (Items NOT in Scope)

Any Item within the scope of works can be excluded or reviewed by the employer. However, the following items are explicitly excluded from this Scope of Work and are the sole responsibilities of COOPI:

a. Connection to external electricity meter or main grid supply.

b. Site handing over to the contractor and taking over from the contractor.

3. Cash for Work

a. The contractor shall only mobilize to site with his qualified skilled engineers and technicians

b. All unskilled works shall be carried out through the cash for work modality engaging program participants to ensure community participation, ownership and improve livelihood except otherwise approved by the employer.

c. The scope of unskilled works includes but not limited to excavation works, mason support, carpenter support, iron bender support, security guard on site etc.

4. HSE, CESMP QC and Completion

The contractor shall provide Construction Environmental and Social Management Plan and shall follow the approved plan alongside Health and safety measure

a. Safety of the contractor's personnel and equipment/materials on site is the exclusive preserve and responsibility of the contractor.

b. The Contractor shall not employ under age children as part of a local workforce.

c. The Contractor will ensure full compliance with all safety measures, policies and protocols by all site workers and visitors to the site; including use of PPEs by all workers on site, and also employ control measures for unauthorized access to site inclusive of children.

d. **Inspection and Quality control**: Works completed at milestones shall be inspected, quantified and certified by the employer's Infrastructure Development Engineer.

e. **Defects Liability Period (DLP):** The Contractor shall be responsible for addressing the Engineer's snag list and rectifying any defects identified in items or workmanship for a period of 3 months following the issuance of the Certificate of Practical Completion. Retention fee (10% of the total contract sum) shall be released to the contractor after the expiration of the DLP upon certification by COOPI's Infrastructure Development Engineer.

f. **Environmental Management**: The Contractor shall provide and follow the Construction Environmental and Social Management plan (CESMP) before initiating any activity on site.

The contractor shall also remove all debris, surplus materials, and construction waste and leave the site clean and tidy upon completion and also ensure reclamation of borrow pits.

