Balgran-A Charitable Home For Destitute Children

Tender Document for Installation of Solar Power Plant

1 Bid Information Sheet

S. No	Description	Details
1.	Job Description	Design, supply, installation, testing, and commissioning of a solar power plant with a capacity of 40 kW (2X20kW) with net-metering
2.	Place of submission of tender documents (hard copy only) and address for communication	Secretary Balgran – A Charitable Home for Destitute Children Channi Rama, Jammu – 180015 Email: - Balgran.charitablehome@gmail.com
3.	Date of availability of bid Document	To be downloaded from website https://www.balgran.in/ from 20-07-2024 to 10-08-2024.
4.	Last date & time of submission of bids (in Hard copy only) in Balgran office.	Date: 12-08-2024 Time: 2.00 pm
5.	Date & time of opening of (Techno-commercial Bids)	Date: 14-08-2024 Time: 12 Noon
6.	Date & time of opening of Price-Bid	Shall be notified separately
7.	Cost of bid document (Non-refundable)	Rs 1000/-Rupees One Thousand only to be deposited in account of Balgran **Bank Account Details:** J&K Bank A/C No.: 0247040100012254 IFSC Code.: JAKA0CHERRY Bid application without the cost of bid document would be rejected.
8.	Earnest Money & its validity. (Refundable)	Bids shall be accompanied with earnest money equal to Rs.40,000 (Rupees Forty Thousand only) in the form of CDR/FDR/DD/BG pledged to the Secretary (Balgran – A Charitable Home for Destitute Children). This shall remain valid for 3 months from the date of submission of bids.
9.	Validity of offer	The offer shall remain valid for a period of three (03) months from the date of bid submission

2 Introduction

Balgran-A Charitable Home for Destitute Children invites sealed proposals in two envelops system (Envelop A marked Technical and Envelop B marked Financial) from eligible and experienced vendors for the installation of a solar power plant at our premises located in Channi Rama, Jammu-180015, India. The aim is to provide sustainable and renewable energy to support our operations and reduce electricity costs.

3 Broad Scope of Work

The scope of work for this project includes but is not limited to the following:

- Design, supply, installation, testing, and commissioning of a solar power plant with a capacity of 40 kW (2 X 20 kW).
- Provision of all necessary materials, equipment, and labor for the complete installation of the solar power system
- Integration of the solar power system with the existing electrical infrastructure at the transformer LT level.
- Installation of Bidirectional Energy Meter including liasoning with the department.
- Training of Balgran staff on the operation and maintenance of the solar power system
- Provision of maintenance support for a period of [5 years] post-installation.

4 Eligibility Criteria

Interested bidder must meet the following criteria to be eligible for bidding:

4.1 General

- The bidder should either be a body incorporated in India, under the Companies Act, 1956 or Companies Act, 2013 including any amendment there to and engaged either in manufacturing and or as a system integrator in the business of Solar Power, OR under the Limited Liability Partnership Act 2008, proprietorship, Partnership Firm, and engaged in the business of Solar Power /Solar Plant System Integrators. A certified copy of the registration certificate of the Bidder for any of the above and the requisite tax payee number TIN & GST etc. from competent government authority with whom the bidder is registered shall be enclosed with the tender.
- The company should have a registered office in Jammu city with service center.

4.2 Technical

- Bidders must have a project in their portfolio which has been in working condition from past 5 years.
- The bidder must have experience of having successfully completed works for Design, Supply, Installation and Commissioning of Grid Connected Solar Photovoltaic Power Plants of at least 100 kW with completion during 1st April 2023 to 31st March, 2024 through JAKEDA/Government

Organizations/Government Agencies/SNAs/PSUs of State or Central Government or under MNRE sponsored programs.

- Bidder must have at least one grid connected solar rooftop project completed for JAKEDA.

4.3 Financial Criteria

The bidder must have an Average Annual Financial Turnover of Rs.50 Lakhs during the last 3 financial years, ending 31st March 2024.

5 Detailed Scope of Work

Item 1	**Solar Power Plant**
	Design, Supply, Installation and Commissioning of 3 Phase On-grid Solar Plant *Solar Panels & Inverter* *Mounting Structure on RCC roof* *Balance of System - Circuit Breakers, Wires*
Item 2	**Metering and Discom Liasoning** - Supply of 1 No. of Bidirectional Energy Meter, Its installation and liasoning with the department.
Item 3	**Leakage Prevention Package** -Chemical Anchoring with Thread rods (HILTI) and Polyurethane (PU) Coating for enhanced strength and waterproofing
Item 4	**Low Downtime via. Remote Monitoring System** - GPRS Dongle with 2 No. Sim Card with 2 Years Internet Data Pack Validity to ensure quick identification of faults, troubleshooting and low downtime of plant.
Item 5	Annual Maintenance Contract - 1 Year (including cleaning of solar panels and spares)
Item 6	Operation & Maintenance for 5 Years

5.1 Technical Specifications

Item Description	Make	Technical Specification	Qty
Solar Panels with 15 years warranty against manufacturing defect	Adani/Tata/Waaree/ Ibsolar/ Citizen/ Axitec	144 halfcell, monocrystalline XXL HC Performance Nominal Output: 550 Wp Frontside: 3.2 mm hardened, low-reflection white glass Cells: 144 monocrystalline high efficiency cells Backside: Composite film Frame: 35 mm silver aluminum frame L x W x H: 2278 x 1134 x 35 mm Weight: 28.5 kg with frame	40 kW

Solar Inverter – 20 KW with with 7 years warranty	Sungrow/ SMA/ Growatt	1. Three Phase Inverters with synergy technology for the 400V Grid specifically designed to work with power optimizers. 2. Integrated connection unit with optional integrated DC SAFETY SWITCH - eliminates the need for external DC isolators. 3. Greater energy production and design flexibility by pairing with SolarEdge Power Optimizers. 4. Lower O&M costs by pinpointing issues using panel-level monitoring and remote troubleshooting 5. Advanced safety, such as arc fault protection and emergency voltage shutdown	2 Nos.
GPRS Antenna	Same as inverter company or equivalent.	Module-level system monitoring enabling pinpointed fault detection and remote, time-saving troubleshooting	2
Sim Card		For remote monitoring including recharge of the sim card.	2
Module Mounting Structure with height above parapet walls and avoiding shadows.	Reputed Make with STAAD Report Approved by Engineer	Material:Hot Dip Galvanized Structure Wind speed: 150 km/hr.	1.3 Ton
Fasteners	Reputed	Stainless Steel – 304 Material with minimum 4.8 Grade.	As required
Injectable Mortar	HILTI	For chemical anchoring of mourning structure.	As Required
Anchor Rods	HILTI	For chemical anchoring of mourning structure.	As Required
Electrical Enclosures	Fibox/ Hensel	With Full Poly carbonateFiBox Enclosure – Fire Resistant	As required

DCDB	Phoenix/ Mersen/ L&T	DCDB controls the DC power from Solar Panels with 25A Fuses and with having necessary surge protection device (SPD) and fuses to protect the solar panels strings and solar inverter from any type of damage. All switches at the circuit breakers, connectors confirm to IEC 60947, part I, II and III.	2
ACDB	L&T/ABB/Havells	1 in 1 out 40 Amps with surge protections, Aluminium Bus Bar. ACDB / LT Panel: LT Panel(s) is used to combine the output of string inverters on to a common conductor after offering adequate protection with Protection, individual breakers, meter(s).	2 Nos.
ACDB – Combiner Box	L&T/ABB/Havells	**1 in 1 out for combining power of both inverters with surge protections, Aluminum Bus Bar.**	**1 No.**
MC4 Connector	Staubli	PV Solar Panel connectors are applicable for panel mounting connection. They are constructed using flame retardant engineering thermoplastic suitable for exposure to UV rays and for application in PV power generation system. Rated Voltage1500VDC Rated Current25 A(2.5 mm²), 30A (4.0 mm², 6.0 mm²) Degree of Protection IP 68Ambient Temperature - 45°C to +85°C	As per site requirement
DC Cable - Panels to Inverter	Polycab/ Havells/KEI	1C 4 sqmm	As per site requirement
AC Cable 1 - Inverter to ACDB	Polycab/ Havells/KEI	4C 6 sqmm Copper Cable	As per site requirem

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AC Cable 2 - ACDB to LT Panel	Polycab/ Havells/KEI	4C 10 Sqmm Aluminum Cable	As per site requirement
AC Cable 3 - ACDB to LT Panel	Polycab/ Havells/KEI	4C 25 sqmm Aluminum Cable	As per site requirement
Earthing Cable 1 - Lightning Arrestor	HDGI	25X 3 GI strip/Equivalent	As per site requirement
Earthing Strip 1 - Inverter Earthing	HDGI	25X 3 GI strip/Equivalent	As per site requirement
Earthing Strip 2 Structure Earthing	HDGI	25X 3 GI strip/Equivalent	As per site requirement
Laying of Cable	Job	As per standard	120 meters
Chemical	True Power /JMV	CPRI tested and certified copper	6

Earthing		bonded rod earth electrodes are made of low-carbon steel of superior grade and quality. 250 microns of copper is molecularly	Nos.
Conventional LA	True Power /JMV	Copper Bonded Rod	2
Fire Extinguisher	Reputed	ABC Type	As per design
Safety Mats	Reputed	For inverters, LT Panels etc.	As per design
Danger Boards/Signages	Reputed	As required as per Voltage Level/ Electrical Safety	As per design
Name Plate	Reputed	Project Details	As per design
Prodigy Meter	Secure/HPL		1 Each

5.2 Annual Maintenance Contract

Component	**Activity**	**Description**	**Interval**
PV Array	Cleaning	Cleaning of solar panels	Every 2 months
PV Array	Inspection	Check the PV modules and rack for any damage. Note down location and serial number of damaged modules.	Semi-Annual
	Inspection	Determine if any new objects, such as vegetation growth, are causing shading of the, array and move them if possible.	Semi-Annual
	Vermin Removal	Remove bird nests or Vermin from array and rack area.	Need basis

Component	Activity	Description	Interval
Junction Boxes	Inspection	Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. Check position of switches andbreakers. Check operation of all protection devices.	Semi-Annual
Wiring	Inspection	Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Semi-Annual
Inverter	Inspection	Observe Instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. Inspect Inverter housing or shelter for physical maintenance, if required.	Quarterly
	Service	Clean or replace any air filters.	As needed
Plant	Monitoring	Daily Operation and Performance Monitoring	Weekly
Inverter	Inspection	Observe instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions.	Quarterly
		Inspect Inverter housing or shelter for physical maintenance, if required.	
	Service	Clean or replace any air filters.	As needed

5.3 Operation and Maintenance

The scope for Operation and Maintenance (O&M) of the solar plant is crucial for ensuring its long-term performance, maximizing energy generation, and maintaining the system's efficiency. Below are key activities for the scope of Operation and Maintenance for the rooftop solar plant on the shed-type roof:

- **Regular Online Performance Monitoring:** Implement a comprehensive monitoring system to track the solar plant's performance in real-time. This includes monitoring energy production, system efficiency, and any potential

issues. Conduct regular data analysis to identify trends and patterns in energy generation, allowing for early detection of performance degradation.

- **Periodic Inspections and Maintenance:** Conduct monthly routine inspections and maintenance to keep the solar plant in optimal condition. Inspect the solar panels, inverters, mounting structures, and electrical components for any signs of damage, wear, or malfunctions
- **Proactive Fault Detection and Troubleshooting:** 24 hours proactive response to detect and address faults or issues in the solar system promptly.
- **Compliance and Reporting:** Maintain detailed records of all maintenance activities, inspections, and repairs performed. Generate periodic reports for the company's management, providing insights into the solar plant's performance, maintenance activities, and any recommendations for improvement.

6 Project Timeline

Task Description	Duration (Days)
Project Initiation	0
Re-assessment Survey as per actual site condition	7
Final Design and Engineering with Construction Drawings	7
Procurement of Solar Panels, Structure and other Equipment	30
Installation of Project	30
Testing and Commissioning	7
Performance Monitoring System Setup	7
Training and Handover with As-built Drawings	5
Project Closure	7
Total Project Timeline	**100**

7 Payment Schedule

7.1 Milestones

Milestone 1	Supply of Material including Solar Panels	60%
Milestone 2	Installation and Commissioning	35%
Milestone 3	1 year from the date of successful commissioning subject to condition that plant is functional.	5%

7.2 Criteria for project commissioning (Milestone 2)

Performance Ratio (PR) Demonstration: As part of the commissioning process, conduct a Performance Ratio (PR) test to assess the efficiency of the solar plant. The Performance Ratio is a measure of how efficiently the solar panels convert sunlight into electricity and is calculated as the actual energy output divided by the expected energy output under standard test conditions.

For a high-quality solar plant, a PR of 75% or higher is expected at the time of commissioning. To demonstrate the PR, perform the following steps:

- Measure the solar energy irradiation using Handheld Pyranometer
- Take live reading of the actual energy output from inverter display instantaneously.
- PR will be estimated using following formula

$$\text{Instantaneous PR(\%)} = \frac{(OutputActivePower[kWp] * 1000[W/m2]) * 100}{((PlantCapacity[kWp] * SolarIrradiation[W/m2])}$$

- Ensure that the PR meets or exceeds the target value of 80%.

If the PR falls below the target value, investigate and rectify any potential issues, such as shading, suboptimal orientation, faulty components, or incorrect system configurations, and retest until the desired PR is achieved.

8 Bid Submission

8.1 Offer 1: Techno-commercial Offer (Offline Mode only)

The bid documents shall contain: -

a) Receipt of payment of tender fee.
b) A certified copy of the registration certificate of the Bidder for any of the above and the requisite tax payee number TIN& GST.
c) Proof of work experience (Work Order and Completion Certificates)
d) Proof of work experience with JAKEDA (Work Order and Completion Certificates)
e) Financial turnover of the company certified by CA.
f) Cover Letter
g) Information about the Bidder
h) The bidder shall furnish the check list as per Annexure IX
i) Authority Letter for Signing Bid Document
j) Vendors should provide a detailed proposal that includes the following technical specifications:
   - Type and model of solar panels and inverters.
   - System capacity and expected energy output.
   - Mounting structure details with STAAD Report
   - Monitoring and control system specifications.
   - Warranty details for all components.

8.2 Offer 2: Price Bid

The format for price schedule can be found Annexure I: Format for Submitting the Price Schedule. The price shall only be submitted as per NIT. Price bid of only those bidders shall be opened who successfully qualify in the techno-commercial stage.

8.3 Submission Deadline

All proposals must be submitted in sealed envelopes, clearly marked "Tender for Solar Power Plant Installation" and delivered to the following address by date as mentioned in

Bid Information Sheet Balgran-A Charitable Home For Destitute Children located in Channi Rama, Jammu-180015, India

8.4 Contact Information

For any queries or further information, please contact:

Secretary
Balgran – A Charitable Home for Destitute Children
Channi Rama, Jammu – 180015
Email: - balgran.charitablehome@gmail.com

8.5 Note

Balgran reserves the right to reject any or all proposals without assigning any reason thereof.

9 Annexures

9.1 Annexure-I: Format for Submitting the Price Bid in separate sealed Envelop B marked Price Bid.

(To be strictly submitted in a separate envelope in Hard copy only)

Items	**Description**	**Quoted Cost**
Item 1	**Solar Power Plant with Net-metering** *Design, Supply, Installation and Commissioning of 3 Phase On-grid Solar Plant* *Solar Panels & Inverter with outdoor stand* *Mounting Structure on RCC roof* *Balance of System - Circuit Breakers, Wires* *Laying of 150 meters cable for evacuation*	Quote total cumulative cost in Indian Rupees.
Item 2	**Metering and Discom Liasoning** - Supply of 1 No. of Bidirectional Energy Meter, Its installation and liasoning with the department.	
Item 3	**Leakage Prevention Package -**Chemical Anchoring with Thread rods (HILTI) and Polyurethane (PU) Coating for enhanced strength and waterproofing	
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Item 5	Annual Maintenance Contract - 1 Year (including cleaning of solar panels and spares)	
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Above quoted price for Solar Power Plants is complete in all respects as per Technical Specifications inclusive of all Central/State/Local taxes* & duties, packing, forwarding, transit insurance, loading & unloading, transportation & other charges etc. FOR Balgran Premises in Channi Rama Jammu (Jammu and Kashmir UT) and inclusive of installation, testing & commissioning and also including five years operation & maintenance.