

This tender document is prepared for installation of 1.02 MW Solar Power Plant (roof top and ground mounted) in the command area of CCL for captive power consumption. This tender document pertains to design, supply, and construction, commissioning and testing and operation & maintenance (O&M) for a period of five years.

DISCLAIMER

Though adequate care has been taken while preparing the Bidding documents, the Bidders/Applicants shall satisfy themselves that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within the prescribed time from the date of notification of NIT/ Issue of the NIT documents, it shall be considered that the NIT documents are complete in all respects has been received by the Bidder.

Employer, reserves the right to modify, amend or supplement this NIT documents including all formats and Annexures.

While this bidding documents have been prepared in good faith, neither Employer or its authorized representatives nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this bidding documents, even if any loss or damage is caused by any act or omission on their part.

CHAPTER-II

SCOPE OF WORK

1.0 SCOPE OF WORK

The scope of the proposal includes the design, engineering, supply, construction, storage at site, associated civil works, services, permits, licenses, installation, insurance at all stages, erection, testing and commissioning including five (05) years Operation and Maintenance (O&M) from the date of Operational Acceptance of roof top installation of 860kWp (Barka-Sayal Area – 378kWp, Ramgarh Area – 394kWp, Barkakana Area – 88kWp) and ground mounted installation of 160kWp in Mine Rescue Station (MRS), Ramgarh. Solar Power Plant completely covering the following activities and services in respect of all the equipment & works specified and covered under the specifications.

The satisfactory operation of the Solar Power Plant and its integration with the power evacuation system shall be included in the scope of work of the Contractor and shall not be limited to the following:

- a) Basic and detailed design Engineering including civil and other allied works of the plant including power evacuation system.
- b) Review and approval of engineering drawings, calculations, structural design calculations, Equipment layout, Civil structural/architectural Drawings, Performance & Guarantee Test procedure etc.
- c) Operation & Maintenance/ instruction manuals, as built drawings and other required information.
- d) Providing training of Employer's personnel.
- e) Packing and transportation from the manufacturer's works to the site including customs clearance & port clearance, port charges, (if any).
- f) Reliability and Functional guarantee tests after successful completion of trial operation.
- g) Satisfactory completion of the contract.
- h) Supply of spares.
- i) Special tools and tackles if any required for maintenance of the plant.

2.0 DESIGN AND ENGINEERING

- 2.1 The Contractor shall prepare the detailed design basis report along with relevant standards (with respective clause description) and PERT Chart. The Contractor shall submit a copy to Employer for review and approval prior to detail engineering.

- 2.2 Documents, drawings and design calculations shall be submitted to the Employer both in soft as well as hard copies (4 nos.) for review and approval. The Employer shall return, as suitable, either soft or hard copies to the Contractor with category of approval marked thereon. The drawings/documents shall be approved in any one of the following categories based on nature of the comments/ type of drawing or document.

Sl. No.	Category	Status
1.	Category-I	Approved and Approved subject to incorporation of comments.
2.	Category-II	Commented and required resubmission for approval after incorporation of comments.
3.	Category-III	Vendor drawing kept for record/ reference.
4.	Category-IV	Resubmission for record/ reference after incorporation of Comments.

- 2.3 Approval of document/drawing/vendor drawing neither relieves the vendor/ contractor of his contractual obligations and responsibilities for correctness of design, drawings, dimensions, quality & specifications of materials, weights, quantities, assembly fits, systems/ performance requirement and conformity of supplies with Technical Specifications, Indian statutory laws as may be applicable, nor does it limit the Employer/ Purchaser's rights under the contract.

Submission of basic design data, design documents, drawings and engineering information including GTP and test reports to Employer or its authorized representative for review and approval in hard copy and soft copy from time to time as per project schedule. The documents typically include, but not limited to, the following:

- Detailed general technical specifications (GTP) of all the equipment.
- General arrangement and assembly drawings of all major equipment
- Schematic diagram for entire electrical system (DC, AC and auxiliary systems)
- GTP & G.A. drawings for all types of structures/ components, switchgears & other interfacing panels.
- Test reports
- Design calculations and sheets
- Quality assurance plans for manufacturing (MQP), Standard Operating procedure (SOP).
- O&M Instruction's and maintenance manuals for major equipment.
- As-built drawings / documents.

- 2.4 Design of associated civil, structural, electrical & mechanical auxiliary systems includes preparation of single line diagrams and installation drawings, manuals, electrical layouts etc., GTP and GA drawings for the major equipment (module,

inverter etc.) design basis & calculation sheets, and other relevant drawings and documents required for engineering of all facilities within the periphery to be provided under this contract.

- 2.5 All drawings shall be fully corrected to match with the actual "As – Built" site conditions and submitted to Employer after commissioning of the project for record purpose. All as-built drawings must include the Good for Construction deviation list.

3.0 PROCUREMENT AND SUPPLY

- 3.1 Roof top Solar PV modules with minimum 860 kWp DC capacity.
- 3.2 Ground Solar PV modules with minimum 160 kWp DC capacity.
- 3.3 Module Mounting Structure (MMS) suitable for mounting PV modules.
- 3.4 Minimum clearance of module from ground shall be 300 mm.
- 3.5 Solar cables along with lugs, glands, ferrules, straight/Y-connectors, LT Power and Control Cables, DC and AC cables of appropriate sizes with termination kits and other materials required proper cable termination at both the ends.
- 3.6 Power Conditioning Units of suitable rating.
- 3.7 Indoor/Outdoor switchgear panels with complete protection.
- 3.8 All necessary metering provisions at the plant take off point as well as at the substation as per CEA Metering Regulation 2006 as amended time to time and state metering code.
- 3.9 Earth strip/cables, earth electrodes, earth enhancing compound and all other associated materials for complete earthing of the plant as per the relevant standards and Lightning Protection System for all the locations.
- 3.10 Testing instruments as required.
- 3.11 Mandatory spares as required.
- 3.12 Power evacuation arrangement in the nearest suitable switchboard.
- 3.13 Protection, metering and communication equipment and other associated equipment /materials required for evacuation of power.
- 3.14 Materials and accessories, which are required for satisfactory and trouble-free operation and maintenance of the above equipment like module cleaning system, supply of spares for all equipment, supply of tools and tackles etc.
- 3.15 All safety equipment for safe working environment.
- 3.16 Any other equipment / material not mentioned but required to complete the Solar Power Plant facilities in all respect.

4.0 INSTALLATION, TESTING AND COMMISSIONING

The scope of installation, testing and commissioning for the plant facilities shall include, but not limited, to the following.

- 4.1 Installation of PV Modules on Module Mounting Structures and interconnection of PV Modules as per system requirement.
- 4.2 Laying of solar cables through HDPE conduits from PV Modules to PCU along with termination at both the ends.

- 4.3 Installation, Testing and Commissioning of String Monitoring Units.
- 4.4 Installation, Testing and Commissioning of Power Conditioning Units.
- 4.5 Installation, Testing and Commissioning of data acquisition system.
- 4.6 Earthing and lightning protection system of PV Modules, Module Mounting Structures, PCU, switchgear panels and all other electrical equipment.
- 4.7 Pre-commissioning checks and tests for all equipment.
- 4.8 Synchronization and Commissioning of plant as per DISCOM / TRANSCO requirements.
- 4.9 Any other works related to installation, testing and commissioning not mentioned but required to complete the Solar Power Plant facilities in all respect.

5.0 CIVIL WORK

- 5.1 Earthwork for site as required.
- 5.2 Construction of foundation for Module Mounting Structures (MMS) and erection of MMS.
- 5.3 Construction of foundation for lightning mast, lighting poles as required.
- 5.4 Construction of plumbing network for cleaning of PV Modules including O&M period.
- 5.5 Roof treatment shall be done by the bidder to ensure that no seepage occurs from the roof due to the installation of roof-top solar power plant.
- 5.6 All approvals, equipment, items and works, which are not otherwise specifically mentioned in this document but are required for successful completion of the work in all aspects, including construction, commissioning, O&M of Solar PV Power Plant and guaranteed performance are deemed to be included in the scope of the contractor.

6.0 STATUTORY APPROVAL

- 6.1 Obtaining statutory approvals / clearances / compliances on behalf of the Employer from various Government Departments, not limited to, the following:
 - Pollution control board clearance, if required
 - Mining Department, if required
 - Forest Department, if required
 - All other approvals as and when necessary for setting up of a solar power plant, power evacuation, railways, power line crossing, panchayat, NHAI etc. as per the suggested guidelines.
- 6.2 All statutory approvals / permissions and/or No Objection Certificates (NoC) etc. from DISCOM / TRANSCO for obtaining connectivity at the substation as per Project Particulars provided above.
- 6.3 All other statutory approvals and permissions and their respective compliances, not mentioned specifically but are required to carry out hassle free Construction and O&M of the plant.

- 6.4 Adequate and seamless insurance coverage during EPC and O&M period to mitigate all risks related to construction and O&M of the plant to indemnify the Employer.
- 6.5 The Contractor shall comply with the provision of all relevant acts of Central or State Governments including payment of Wages Act 1936, Minimum Wages Act 1948, Employer's Liability Act 1938, Workmen's Compensation Act 1923, Industrial Dispute Act 1947, Maturity Benefit Act 1961, Mines Act 1952, Employees State Insurance Act 1948, Contract Labour (Regulations & Abolishment) Act 1970, Electricity Act 2003, Grid Code, Metering Code, MNRE guidelines or any modification thereof or any other law relating thereto and rules made there under or amended from time to time.

7.0 OPERATION AND MAINTENANCE

- 7.1 Total Operation & Maintenance of the SPV Plant shall be with the Contractor, after operational acceptance of the plant till culmination of the O&M period. No other extra charges whatsoever will be paid later on during O&M Period.
- 7.2 To maintain accurate and up-to-date operating logs, records and monthly Operation & Maintenance reports at the facility. Contractor shall keep the measured daily data at regular intervals and provide the same to Employer in electronic form, compatible in CSV format. The right to use the data shall remain with the Employer.
- 7.3 Breakdown maintenance, Preventive maintenance to maximize the availability of the solar power plant.
- 7.4 Cleaning of the module regularly but not less than 2 times in a month.
- 7.5 Bidder is required to maintain the spare during the O&M contract period of the solar power plant so that to maximize availability and generation of the plant.
- 7.6 Replacement of spares shall be as per the OEM recommendations. Equipment/spare parts/updation of software being phased out or not being supported by OEM's is also included in bidder's scope.
- 7.7 To carry out periodic overhauls or maintenance required as per the recommendations of the original equipment manufacturer (OEM) and to furnish all such periodic maintenance schedules at the time of plant commissioning/ start of O&M contract.
- 7.8 The contractor shall ensure that all safety measures are taken at the site to avoid accidents to his employees associated in the project. The Contractor shall immediately report the accidents, if any, to the Engineer in charge and all the concerned authorities as per prevailing laws of the state.
- 7.9 The Contractor shall comply with the provision of all relevant Acts of Central or State Governments including payment of Wages Act 1936, Minimum Wages Act 1948, Maturity Benefit Act 1961, Employer's Liability Act 1938, Workmen's Compensation Act 1923, Industrial Dispute Act 1947, Employees State Insurance Act 1948, Contract Labour (Regulations & Abolishment) Act 1970 or any modification thereof and rules made there under from time to time.