

DAYA GENERAL HOSPITAL LIMITED THRISSUR

(SHORTLY WRITTEN AS “DGHLT “)

**PROJECT: 3 MWP (3000KWP) DGHLT SOLAR CAPTIVE
POWER PLANTS (CPP)**

FOR DAYA GENERAL HOSPITAL THRISSUR

KALLADIKODE, PALAKKAD

TENDER DOCUMENT

22-4-2026

CLIENT:



DAYA GENERAL HOSPITAL LTD
No. V/302 & 303, Shoranur Road, Near
Viyyur Bridge, Thiruvambadi P O,
Thrissur - 680 022. Kerala.

E-mail: daya.hospital.com

Website:- www.dayageneralhospital.com

Tel : 0487-2475100 (30 Lines),

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SECTION – I
NOTICE INVITING TENDER

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NOTICE INVITING TENDER

DAYA GENERAL HOSPITAL LIMITED

Thrissur, Kerala **Tender No: 3MWCPP/DAYA/2026** Date: 21-04-2026

DAYA GENERAL HOSPITAL LIMITED, Thrissur (hereinafter referred to as DGHLT) invites sealed competitive bids from eligible bidders for the Appointment of an Engineering, Procurement and Construction (EPC) Contractor for the design, supply, installation, testing, and commissioning of a 3 MWp Grid-Tied Ground Mounted Solar PV Power Plant at DGHLT owned site in Palakkayam Village, Mannarkkad Taluk, Palakkad District {Survey (No. 1) 2259/179, (2) 2259/214, (3) 2259/73 for an extant of 3 Hectare 64 Are 37 Sq. Meter.}, including Defect Liability & Comprehensive Operation & Maintenance for five (5) years from the date of successful handing over of the project.

Item	Description
Name of Work	Appointment of EPC Contractor for Design as per site conditions, Supply, Installation, Testing & Commissioning of Grid-Tied Ground Mounted Solar PV Power Plant of capacity 3 MWp at Palakkad site of DGHLT, including Operation & Maintenance for 5 years from date of handing over.
Date of Publication of Bids	22-4-2026
Last Date for Receiving Queries	28-4-26
Pre-Bid Meeting	29-4-26
Pre Bid Clarifications	30-4-26
Last Date & Time for Submission of Bids	5-5-2026 , up to 1530 hrs (Password Protected PDF format bids in two Part (Technical & Price Bids Separately)) Bid submission to Email ID: <u>haseeb@dayageneralhospital.com</u>
Date of Opening of Bids	6-5-2026 1200PM
Time for Completion	3 Months from the Date of Handing Over of Locations /LOA
Earnest Money Deposit along with Bid submission	Rs10 Lakhs (Bank Guarantee/FD/Cash)

- The tender document can be downloaded from the official website: WWW.DAYAGENERALHOSPITAL.COM or obtained in email from Electrical Department of Daya Hospital **electricaldept@dayageneralhospital.com**.
Office of the Head of the Department (HOD) of Engineering, Daya General Hospital, Thrissur
- The bids shall remain valid for 90 days from the date of opening.
- Note: No queries will be entertained after the pre-bid meeting.
- Prospective bidders are advised to visit the project site prior to submission of their bids, preferably before the pre-bid meeting date.
- DGHLT reserves the right to modify or cancel any or all bids without assigning any reason thereof.

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SECTION – II
GENERAL CONDITIONS OF CONTRACT

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DEFINITIONS AND INTERPRETATIONS

1. **‘Accepted Schedule’** means the schedule of items of work containing the agreed rates, based on which the agreement is executed for carrying out the work.
2. **‘Agreed Rates’** shall mean the rates accepted by and agreed upon between DGHLT and the Contractor, which are provided in the schedule forming part of the contract agreement and valid throughout the contract period.
3. **‘Agreement Authority’** shall mean the Managing Director of DGHLT or any person authorized to execute the agreement on behalf of DGHLT.
4. **‘Bid’** and **‘Tender’** shall have the same meaning and may be used interchangeably throughout these documents.
5. **‘Bid Amount’ / ‘Bid Price’** means the total amount quoted by the bidder in the Schedule of Quantities (or Bill of Quantities) in the price bid of the bid documents.
6. **‘Bidder’** shall mean any individual, company, corporation, association, group of persons, joint venture, or partnership from India or abroad who submits a bid, including their legal heirs, executors, administrators, successors, and assigns.
7. **‘DGHLT’** shall mean *Daya General Hospital Limited, Thrissur*.
8. **‘Commissioning and Commercial Operation Date (COD)’** means the date on which the solar plant is connected to the utility grid at the interconnection point, after obtaining energisation sanction from the Electrical Inspectorate and final approval from KSEBL, including successful testing and clearance of all snag lists, ensuring stable grid synchronization.
9. **‘Construction Plant’** means all equipment, appliances, or tools of any nature required for execution, completion, and maintenance of the works, excluding materials intended to form part of the permanent works.
10. **‘Contract’** shall mean and include all bid conditions, specifications, drawings, annexures, letters of application, accepted price schedule, and the formal agreement signed between the Contractor and DGHLT.
11. **‘Contract Agreement’** shall mean the legally binding agreement entered into between DGHLT and the Contractor for execution of the project.
12. **‘Contractor’** shall mean the bidder whose bid has been accepted by DGHLT and includes their legal representatives, successors, and permitted assignees.
13. **‘Contractor’s Representative’** means the person authorized in writing by the Contractor and approved by Head, Engineering, DGHLT, to act on behalf of the Contractor for specific purposes under the contract.
14. **‘Contractor’s Personnel’** includes all individuals, whether staff, labourers, or subcontractors, authorized by the Contractor to be deployed at the site for execution of work.
15. **‘Defect’** means any part of the work not completed or not performing in accordance with the contract specifications.
16. **‘Defects Liability Period’** refers to the five-year period from the date of handing over of the solar plant to DGHLT, during which the Contractor is responsible for correcting any defects or damages free of cost, as per the Engineer-in-Charge’s notifications, and after demonstrating the desired Performance Ratio.
17. **‘Drawing’** means all relevant drawings issued under the contract, including revisions and modifications approved by the Engineer-in-Charge, and drawings submitted by the Contractor and accepted by DGHLT.

18. **‘Elevation / Reduced Level’** shall refer to the height in metres based on the benchmark(s) established by DGHLT at the site.
19. **‘Engineer-in-Charge’** refers to the Engineer authorized by Head, Engineering, DGHLT, responsible for supervising and certifying the work.
20. **‘EPC Integrator’** means the Contractor who has entered into an agreement with DGHLT for Engineering, Procurement, and Construction on a composite supply basis including operation and maintenance as specified.
21. **‘Financial Year’** means the period from April 1st to March 31st of the following year.
22. **‘Handing Over’** means the formal transfer of the Solar Plant to DGHLT after successful commissioning, clearing of snag lists, and achievement of the specified Performance Ratio as per the bid document.
23. **‘I.S.’** means Indian Standards issued by the Bureau of Indian Standards (BIS).
24. **‘Labourer’** means all categories of workforce engaged directly or through subcontractors by the Contractor. These shall be deemed employed by the Contractor even if DGHL is considered the principal employer for statutory compliance.
25. **‘Letter of Award (LOA)’** means the formal letter issued by the bidding authority confirming the acceptance of bid and award of Contract as per terms specified in LOA/Tender.
26. **‘Letter of Application’** means the covering letter submitted by the bidder with the signed bid, offering to execute the work under the terms set out in the bid documents.
27. **‘Month’ / ‘Calendar Month’** refers to a period starting from any given date in one month to the corresponding date in the following month, unless otherwise stated.
28. **‘Obligations of DGHLT’** are limited to those explicitly stated in the contract agreement.
29. **‘Part Bill’** refers to any interim bill submitted during execution, prior to submission of the final bill.
30. **‘Performance Certificate’** is the certificate issued by the Engineer-in-Charge upon satisfactory fulfilment of the Contractor's obligations, marking the formal acceptance of the completed works.
31. **‘Performance Security Deposit’** means the Bank Guarantee submitted by the Contractor as security for fulfilment of contract obligations, amounting to 10% of the total contract value, rounded up to the nearest ₹1000.
32. **‘Period of Contract’** means the duration from the date of contract execution until final handing over, including all approved extensions, the 5-year Defects Liability Period, and any AMC period.
33. **‘Permanent Works’** refers to all works to be executed and completed by the Contractor as part of the scope under the contract.
34. **‘Project’** means the end-to-end lifecycle of the solar plant, including design, engineering, construction, commissioning, and maintenance for five years.
35. **‘Schedules’** are the completed documents submitted by the Contractor, including itemized quantities, prices, and technical particulars.
36. **‘Site’** means the location(s) provided by DGHLT for execution of the works.
37. **‘Specification’** means the technical requirements, including BIS codes, contract clauses, and drawings that define the nature and scope of the works.
38. **‘Sub-contractor’** refers to a party designated in the bid/agreement to execute part of the work on behalf of the Contractor, including their successors.
39. **‘Temporary Works’** are works set up at the site to assist in the construction of the permanent works, which are not eligible for separate payment.
40. **‘Tender’ / ‘Bid’** includes all documents submitted by the bidder as part of the proposal and shall form part of the final contract.

41. **‘Tendering Authority / Bidding Authority’** means the Managing Director of DGHLT responsible for inviting bids and issuing documents.
42. **‘Test’** means any trial, examination, or verification stipulated in the contract or by regulatory authorities before, during, or after execution.
43. **‘Time of Completion’** refers to the stipulated date for satisfactory completion of all contract work, including approved extensions.
44. **‘Titles of Clauses’** are for reference only and shall not affect interpretation of contractual clauses.
45. **‘Words’** in singular include plural and vice versa; masculine includes feminine and neutral, unless context indicates otherwise.
46. **‘Work’** refers to all tasks the Contractor must perform under the contract, including supply, installation, commissioning, and maintenance on a composite basis.
47. **‘Writing’** includes any handwritten, typed, printed, or digitally signed communication.
48. **‘Performance Ratio (PR)’** measures the efficiency of the PV system, accounting for temperature, solar irradiation, climate variations, and grid availability. It determines the actual energy output in relation to the expected performance under ideal conditions.
49. **‘Date of Handing Over’** means the date on which the solar plant is formally transferred to DGHLT after demonstration of the required Performance Ratio and resolution of all punch points or snag lists.

Information to the Bidders

General Information

About Kerala and the Project Site

The proposed solar project site is located at Karimba North, Palakkayam Village, Mannarkad Taluk, Palakkad District, Kerala. Palakkad is renowned for its favourable solar insolation, making it ideal for solar energy generation. The location spans approximately 9 acres and offers excellent connectivity:

- **Road:** The site is well connected via National Highway 966, facilitating easy transport of materials and access for construction and maintenance activities.
- **Rail:** The nearest major railway station is Palakkad Junction, situated approximately 28 km from the site.
- **Airport:** The nearest airport is Coimbatore International Airport, located about 75 km away, offering convenient regional and national air connectivity.

The region’s natural suitability for solar generation and its robust logistical access make it an optimal choice for a utility-scale solar power project.

About Daya General Hospital Limited, Thrissur (DGHLT)

Daya General Hospital Limited (DGHL), headquartered in Thrissur, Kerala, is a prominent multispecialty healthcare institution. With a network of advanced medical facilities in Thrissur, Kunnankulam, and Palakkad, DGHLT is recognized for its commitment to patient care, medical innovation, and community service.

As part of its vision for a sustainable future, DGHLT has launched a green energy initiative aligned with its long-term growth and environmental responsibility goals.

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SOLAR POWER PLANT TENDER DOCUMENT – DAYA GENERAL HOSPITAL LIMITED

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Project Information

This project involves the design, engineering, construction, and grid commissioning of a 3 MWp ground-mounted solar photovoltaic (PV) power plant under captive power generation mode. The energy generated will be consumed by Daya General Hospital, Thrissur and its associated healthcare facilities situated in Kerala. The proposed installation will be located on DGHLT-owned land at Palakkayam Village, Kalladikode, Palakkad.

Project Scope

The scope includes the appointment of an EPC contractor for design (as per site conditions), supply, erection, testing, and commissioning of a 3.0 MWp (3000KWp) Grid-Tied Ground Mounted Solar PV Power Plant on a composite supply basis. The scope also covers Operation & Maintenance (O&M) for the first five years from the date of handing over, with provisions for a subsequent AMC agreement. The contractor must ensure a minimum Performance Ratio (PR) of 90% at each location.

This is a composite supply project, covering all the following works:

- Site investigation, survey, design, engineering, planning, and procurement.
- Manufacturer's quality assurance and shop testing (including type testing where applicable).
- Transportation, handling, storage, and erection of equipment.
- All associated civil and structural works.
- Electrical works including cabling, instrumentation, piping, installation, testing, and commissioning.
- Integration with SCADA system to ensure real-time monitoring with visibility at:
 - Load Dispatch Centre, Kalamassery
 - Renewable Energy Data Centre, Vydyuthi Bhavanam, Thiruvananthapuram
- Power evacuation including cost of transformers, HT metering, and interfacing.
- Providing compatible hardware/software for plant-level and string-level monitoring.
- Arranging all required permits, consents, clearances (including Electrical Inspectorate), PWD, and KSEBL approvals.
- Training of personnel and insurance coverage during all phases.

Upon completion, the plant shall be handed over to DGHLT after proving the AC-side Performance Ratio (PR) of 90%, verified through sampling over 7 consecutive days at the end of each year of the O&M period.

If the PR is not met:

- The EPC contractor must repeat the performance test within an additional 7-day period.
- Failure in the second attempt will require the contractor to upgrade/replace underperforming modules, components, or systems at no additional cost to DGHLT until the PR requirement is met.

Note: Performance tests must comply with IEC 61724 standards and be conducted in the presence of DGHLT's authorized officials.

The PR (AC) may be re-evaluated at any time by the Engineer-in-Charge. If the target PR is not met in any year, O&M period will be extended until compliance is achieved. O&M charges shall be released annually after successful demonstration of PR.

The generated power at low voltage shall be stepped up and grid-tied at the appropriate voltage level as per grid requirements. The EPC contractor shall also:

- Be fully responsible for securing grid connection and energization approvals.
- Operate and maintain the plant for the initial 5 years post-commissioning.
- Transfer all relevant records, data, and spares during handover.

Design Undertaken must be in conformance with the requirements of DAYA General Hospital Thrissur or its Sister Concerns /Hospitals at Kunnankulam etc. Design shall also be in conformance with the CEA standards, CERC/KSERC standards /regulations applicable and relevant Grid codes . The bidder shall after ascertaining the Site details/Survey , appraise the potential and commercially best viable solutions to make use of the capacity possible at site and that is in requirement as per applicable regulations. The bidder shall have a very good understanding of regulations in force and match the requirements of DAYA Hospital to that is possible under Captive power model. Commercially feasible and viable and technically matching Hybrid solutions using Battery Energy Storage also need to be explored and suggested . The design shall have the flexibility to accommodate such options in future and also enable Daya Group to augment the capacity subject to the Feasibility/Open Access allowed by KSEB Ltd. KSEB Ltd has already issued feasibility and suggested evacuation options. Bidders shall familiarize themselves with such requirements and suggest suitable business models like EPC/Annuity/RESCO as is viable/Applicable under the permissible regulations and rules.

Project Design Life:

The solar PV plant and associated technologies shall be designed for **a minimum operational life of 25 years.** Post the initial O&M period, DGHLT may choose to extend the maintenance contract at mutually agreed terms.

Period of Commencement and Commissioning

The project installation & commissioning is scheduled for a period of **3 months** from the date of site handover or issue of the Letter of Award (LOA), whichever is later.

The entire scope of work shall be completed in all respects, tested, and commissioned within this 3 months from the date of commencement of work. The project shall be handed over to DGHLT only after successful demonstration of the required Performance Ratio (PR), as specified in this bid document.

Location

The project site is located on land owned by Daya General Hospital Limited, with the following site details:

Sl. No.	Description	Details
1	Location Details	Karimba
2	Village	Palakkayam
3	Taluk	Mannarkad
4	District	Palakkad
5	Panchayat	Karimba
6	Survey No. & Extent of Land	2259/179, 214, 73
7	Other Details : Site Map will be shared/ Site is approximately 4.5 KM on Thuppand-Meenvallom Road from the Main Mannarkkad-Palakkad Highway	

Associated Civil Engineering Works

The EPC contractor shall be responsible for executing all associated civil and structural works, including but not limited to:

- Earthwork: Site grading, cutting, filling, leveling, and compaction.
- Creating of pathways and internal roads for movement of equipment's, man , materials etc
- Foundation construction and installation of SPV mounting structures.
- Installation of fire safety equipment CCTV systems for security surveillance.
- Installation of fencing and security gates for plant protection.
- Provision of permanent water supply for module cleaning and daily use.
- Construction of drains, culverts, and canals for rainwater flow including rainwater harvesting if required.
- Any other works required for the safe, reliable, and secure functioning of the plant.

Bidding Details

The bidding process comprises two stages:

1. Pre-Qualification (PQ):

Bidders must submit a PQ bid in the prescribed format, demonstrating their:

- Financial capability
- Technical expertise
- Relevant experience in similar projects

Required documents include:

- Filled PQ formats
- Supporting documentation and certificates
- Audited financial statements for the last three years
- Photographs and other evidence as requested

After evaluation, qualified bidders will be shortlisted for the next stage.

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2. Final Selection:

Among the pre-qualified bidders, the final selection will be based on the evaluation criteria prescribed by DGHLT. The DGHLT reserves the right to:

- Accept or reject any bid
- Disqualify any bidder without assigning reasons

Execution of Agreement

The successful bidder shall sign an agreement with DGHLT for the execution of the project and the 5-year O&M services within 15 days from the date of issue of the Letter of Award (LOA) after submitting Performance Security as prescribed.

Upon signing the agreement, the bidder shall be designated as the EPC Integrator/ Project Developer for and on behalf of DGHLT according to the model of service contract.

Bid Documents

The bid documents include the following:

1. Pre-Qualification Bid

- PQ questionnaire
- Financial and technical capability details

2. Technical Specifications

Divided into three parts:

- Part I: Supply, erection, and commissioning of the solar plant
- Part II: Operation and maintenance
- Part III: Guaranteed Technical Particulars (GTP)

The bidder shall also submit:

- Schedule of technical particulars
- Construction program
- Sketch/schematic diagrams of proposed plants
- Unpriced list of materials/equipment/works for 5-year O&M

3. Price Bid

- All-inclusive price (supply, installation, testing, commissioning, O&M for 5 years)
- Inclusive of all taxes, duties, cess, freight, GST, and insurance
- Prices must cover:
 1. Supply, Installation, Testing & Commissioning
 2. Operation & Maintenance – Year-wise cost breakdown

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The total quoted amount shall be the sum of the above two components as reflected in the BOQ.
The Price bid also mandate quoting of prices for other Project /business /service delivery models as indicated in Price Bids.

Other Conditions

- Bidders must thoroughly examine all bid documents, including:
 - Instructions, terms, and conditions
 - Site-specific details: terrain, access, labour, seasonality, climate
- Site visit is highly recommended before bid submission.
- The bidder is responsible for quoting rates after evaluating all foreseeable factors.
- Rates shall be firm and at the bidder's risk; no claims for escalation shall be entertained during the contract period.

Law Governing the Bid

This bid is governed by the laws of India and the State of Kerala.
All disputes arising from or related to this bid shall fall under the exclusive jurisdiction of the Civil Courts at Thrissur.

Bid Validity

The bid shall remain valid for a period of 60 days from the date of opening of the bid.
In exceptional cases, DGHLT may request an extension of the validity period. Bidders shall comply without claim for compensation.

Amendments, Additions, and Alterations

DGHLT reserves the right to modify or amend any part of the bid document by issuing an **addendum or corrigenda at any time prior to the last date** of submission.

Payment Terms

A. EPC Part

To be detailed in the contract – typically linked to milestones such as:

- Mobilization advance (if applicable)
- Completion of supply
- Completion of installation
- Successful testing and commissioning
- Final handover after PR validation

B. Operation & Maintenance Part

- O&M charges will be released at the end of each year, contingent upon:
 - Demonstration of minimum 90% Performance Ratio (AC)
 - Compliance with all service and reporting obligations

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- Rectification of defects, if any, during the year

Defects Liability Period

The Contractor shall be fully liable to rectify, at his own cost, any defect or damage in the works as notified by the Engineer-in-Charge during the Defects Liability Period, which shall be five (5) years from the date of handing over the project to DGHLT. This period shall cover the entire Operation & Maintenance (O&M) period.

The Contractor shall guarantee the performance of the entire project and its components throughout this period. If any defects, cracks, shrinkage, or other faults are observed before the expiry of the Defects Liability Period, the Engineer-in-Charge shall issue directions for rectification, which the Contractor must comply with immediately.

In case the Contractor fails to rectify such defects within a reasonable time, DGHLT shall be entitled to make alternate arrangements to rectify the issues at the Contractor's risk and cost, and recover the cost incurred plus 21% overhead from any dues payable to the Contractor, including forfeiture of the Performance Security Deposit.

If any material or work that is essential for the proper completion of the project is missing from the drawings or specifications but is reasonably implied, such material or work shall be provided and executed by the Contractor without any additional claim or cost.

In case of unusual defects (such as a significant drop in Performance Ratio), the Contractor must attend to the issue within 24 hours of notification. Failure to do so shall lead to forfeiture of the Performance Security by DGHLT.

The Contractor shall provide, upon request, data or justification supporting their quoted amount during tender evaluation or contract execution.

If the Contractor fails to demonstrate the required Performance Ratio (PR) during any operational year, the annual O&M period shall be automatically extended until the required PR is successfully achieved.

Performance Security deposit

Bidder shall submit **Performance Security deposit amounting to Rupees One Crores** in the form of Bank Guarantee at the time of Agreement execution towards satisfactory performance of Contract and project operations including O&M. Performance Security will be reimbursed on expiry of Contract Period covering Defect Liability Period & 5 Year O&M.

Tools, Plant, and Equipment

The Contractor shall, at his own expense, arrange all tools, plant, and equipment necessary for executing and completing the works as per the contract. Adequate insurance coverage must be taken for all equipment mobilized for the project.

The Contractor shall submit a list of all equipment mobilized, with mobilization dates, to the Engineer-in-Charge. No demobilization of plant and machinery shall be carried out without written permission from the Engineer-in-Charge.

Force Majeure

“Force Majeure” refers to unforeseeable events beyond the reasonable control of either DGHLT or the Contractor that prevent the performance of contractual obligations. These include, but are not limited to:

1. Natural calamities: Earthquake, volcanic eruption, cyclone, flood, drought.
2. Civil disturbances: War, invasion, rebellion, terrorism, riots.
3. Health crises: Epidemics, pandemics, or similar disruptions.

No party shall be held liable for loss or damage caused due to such events. However, force majeure does not absolve either party from payment obligations already due under the contract.

A written notice must be submitted to the Engineer-in-Charge within 14 days of awareness of such an event. The Engineer-in-Charge shall determine any delay attributable to the force majeure event.

Contractor’s equipment and materials at the site must be insured by the Contractor to cover losses arising from force majeure. DGHLT shall not provide financial assistance in this regard.

All plant, equipment, and installations handed over to DGHLT must also be insured for the entire contract period. Losses or damages shall be restored at the Contractor’s risk and cost.

Liquidated Damages / Penalty

Timely commissioning of the project is essential for DGHLT’s operational planning. Any delay in completion shall attract liquidated damages (not as a penalty), to be recovered at the end of the scheduled project period.

- Rate: 1% of the contract value or accepted amount, whichever is higher, per week of delay.
- Maximum Cap: 10% of the contract value or accepted amount, whichever is higher.
- Any penalties imposed during execution shall be adjusted against the liquidated damages.

If the delay exceeds 200 days from the originally agreed completion date, the contract is liable to be terminated, and the balance work shall be executed at the Contractor’s risk and cost.

The Contractor shall demonstrate the acceptable Performance Ratio (PR) at the end of each year during the O&M/Defects Liability Period. If the PR is not achieved:

- A second evaluation will be conducted over 7 consecutive days.
- If unsuccessful again, the Contractor shall undertake corrective actions at his own cost.

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- The O&M period shall continue until the PR compliance is met.

Termination of Contract

If the Contractor fails to take corrective action within 14 days of receiving notice from the Engineer-in-Charge, DGHLT shall serve a 7-day termination notice following recommendations from the Engineer-in-Charge. The notice shall seek justification for not terminating the contract.

If no satisfactory reply is received within the stipulated time, the Agreement Authority shall terminate the contract wholly or partially. The remaining work will be arranged and executed at the risk and cost of the Contractor.

From the date of termination notice:

- No plant, machinery, materials, or scaffolding shall be removed from the site without written approval.
- A joint inventory of equipment and tools at the site shall be made and signed by both parties.
- DGHLT may confiscate and sell such equipment to recover losses.
- Any surplus, if available, shall not be automatically payable to the Contractor.

DGHLT may take over the site, works, plant, equipment, and materials, and complete the balance work through other agencies. The contract value of such executed work will be credited to the Contractor.

If the cost incurred exceeds the credited value, DGHLT shall recover the balance from:

- Performance security
- Retention money
- Any other dues

If these are insufficient, legal proceedings shall be initiated to recover the remaining liabilities.

In such cases, all Bank Guarantees and security bonds must be extended or encashed to safeguard DGHLT's interest.

Upon termination, the Contractor must:

- Vacate all working areas within 30 days.
- Return any tools and plant supplied by DGHLT.
- Surrender possession of all sites and access routes occupied during execution.

Termination shall constitute sufficient grounds for DGHLT to demand discharge of obligations from the Contractor's performance guarantors.

Power, Water, Fuel, and Lubricants

The Contractor shall make independent arrangements for availing power, water, fuel, and other necessary utilities required for construction, camps, colonies, street lighting, and all associated works at his own cost. DGHLT shall extend necessary assistance for obtaining power supply from the utility, but the cost and responsibility rest with the Contractor.

The use of trees from the project site or adjacent forest land for firewood or fuel is strictly prohibited.

Reassignment of Work

The Contractor shall not reassign, transfer, or sublet the whole or any part of the work without prior **written consent** from the Agreement Authority of Daya General Hospital.

Quality Assurance

The Contractor shall establish and maintain a comprehensive Quality Assurance (QA) System to demonstrate compliance with contractual and technical specifications. This QA system must be approved by the Engineer-in-Charge and shall be aligned with BIS standards unless otherwise specified.

- QA documentation shall be periodically submitted for review.
- The cost of implementing the QA system, including sampling, testing, and compliance reporting, shall be borne by the Contractor and shall be included in the quoted price.
- If technical documents lack specific procedures, applicable BIS standards shall apply.
- The Contractor shall provide necessary samples and cooperate in testing without any additional charges.

Supervision

DGHLT will deploy supervisory personnel or consultants at the project site. The Contractor shall provide access and support to these personnel for inspection, measurement, and quality verification.

- Supervisory staff act on behalf of the Engineer-in-Charge but cannot alter contract conditions.
- They may issue instructions to suspend work or reject materials pending decisions from the Engineer-in-Charge.
- The Engineer-in-Charge and his representatives shall have unrestricted access to:
 - Storage yards
 - Manufacturing units
 - Fabrication shops
 - Installation sites

Work that does not conform to specifications, standards, or workmanship shall be rectified or replaced by the Contractor at no additional cost. Failure to comply within seven days of notice may result in DGHLT executing remedial actions at the Contractor's risk and cost.

Security of the Site

Unless otherwise stated in the Special Conditions:

- The Contractor shall be responsible for securing the site and all equipment.
- Only authorized personnel — including Contractor's staff and those identified by DGHLT — shall be permitted access.

Fencing and Lighting

The Contractor shall ensure adequate fencing, guarding, lighting, and protection of the works. This includes temporary roads, footpaths, guardrails, and barriers as necessary to ensure the safety of:

- Pedestrians
- Vehicular traffic
- Adjacent property owners and residents

Site Investigations and Representations

The Contractor is expected to assess the site conditions thoroughly, including:

- Topography and sub-surface characteristics
- Accessibility, transport, labour, and materials availability
- Weather, water sources, and environmental conditions

Any failure to understand these factors shall not exempt the Contractor from executing the project per contract terms.

If specifications or drawings lack essential details that are logically necessary, such materials or works must be executed without additional charge. Upon request, DGHLT shall provide relevant clarifications in a timely manner.

Liability for Damage to Works or Plant

During the execution of works, the Contractor shall protect the works and associated equipment against all risks including weather, vandalism, flood, or natural calamities.

The Contractor shall remain liable for:

- Damage or accidents arising from his staff, subcontractors, or defective workmanship
- Losses incurred due to failure to safeguard works or plant

Until the project is officially handed over to DGHLT, the Contractor shall bear full responsibility for any loss, injury, or damage — whether to DGHLT property, public property, or third parties — arising from project activities.

Accidents

The Contractor is responsible for accident prevention measures at the work site and shall indemnify DGHLT against all liabilities arising from:

- Worker or third-party injuries
- Property damage
- Violations under the Workmen's Compensation Act

The Contractor shall:

- Obtain and maintain a Contractor's All Risk (CAR) insurance policy
- Present proof of such insurance to the Engineer-in-Charge before execution

In case of fatal or serious accidents:

- A written report with full details must be submitted within 24 hours to:
 - Engineer-in-Charge
 - Labour Commissioner
 - Other relevant authorities

The Contractor shall notify the Commissioner for Workmen Compensation of any fatal accident and state whether liability is accepted.

All other incidents must also be reported immediately to the Engineer-in-Charge.

DGHLT reserves the right to:

- Withhold payments to cover potential compensation liabilities
- Deduct losses or penalties from contractor dues if claims arise from non-compliance with safety obligations

The Contractor is solely responsible for compliance with:

- The Workmen's Compensation Act
- Labour regulations in force or amended in the future

Environmental Protection

The Contractor shall strictly comply with all relevant environmental laws, rules, and regulations at his own cost, including:

- Avoiding damage to existing trees or vegetation unless authorised
- Preventing pollution, spillage, or harmful activities
- Ensuring minimal environmental impact during construction

Careful felling of trees (only if permitted) must be conducted to avoid collateral damage to standing trees, property, or existing solar infrastructure. No unauthorised cutting or stockpiling of materials on grasslands or green zones is permitted.

Insurance

The Contractor shall procure and maintain appropriate insurance coverage throughout the duration of the Contract, including:

Mandatory Insurance Types:

1. **Work Insurance:**
For works, materials, and plant up to full replacement value.
2. **Third-Party Liability Insurance:**
To cover injury or damage to third parties, including DGHLT staff and property.
3. **Additional 15% Coverage:**
To account for incidental expenses, demolition, debris clearance, and professional services for rectification.
4. **Contractor's Equipment Insurance:**
For all tools, plant, and equipment brought to site, to cover full replacement value.
5. **Joint Insurance:**
Policies shall be in joint names of the Contractor and DGHLT for:
 - Loss or damage during execution and until final handing over
 - Any damage during the Defects Liability Period
6. **Project Insurance during the running of project**
7. **Any other Coverage under Insurance as is required under Statutes / regulations and not specifically mentioned above.**

In Case of Non-Compliance:

If the Contractor fails to secure required insurance, DGHLT reserves the right to:

- Procure the insurance on the Contractor's behalf
- Deduct the premiums paid from any amount due to the Contractor
- Recover such payments as debt if necessary

Collusion and Bribery

If any bribe, commission, gift, or advantage is given, promised, or offered by or on behalf of the Contractor (including their partner, agent, or employee) to any officer, employee, representative, or agent of DGHLT in relation to the obtaining or execution of this or any other contract, DGHLT shall have the right to:

- Cancel this and any other contract(s) with the Contractor.
- Recover losses or damages resulting from such cancellation, as per the provisions of this agreement.

This is in addition to any applicable criminal liability.

DGHLT's decision on whether such an act has occurred shall be final and conclusive.

Observance of Local Rules and Laws

The Contractor shall strictly adhere to all relevant laws, rules, regulations, and bye-laws of:

- The Government of Kerala
- The Government of India
- Local Authorities, Municipal Corporations, and Self-Government bodies

Safety Aspects

- The Contractor shall provide all required personal protective equipment (PPE) and enforce safety measures at the work site.
- All costs related to safety measures are deemed included in the contract price.
- Safety instructions must be prominently displayed at the work site.
- A designated person shall be assigned to oversee compliance with the safety code.

Inspection by Officers

- DGHLT's Engineer-in-Charge, Labour Officer, or their authorised representatives may inspect safety arrangements at any time.
- The Contractor shall fully cooperate with inspections and take immediate remedial action if required.

SECTION - III
SPECIAL CONDITIONS OF CONTRACT

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Special Conditions of Contract for Supply, Erection, Commissioning, and Operation & Maintenance

Technical Requirements

- The stabilized output of the Solar PV plant shall be not less than 3 MWp or as revised and confirmed as per LOA based on final design conformance.
- The Contractor shall design the plant using an adequate number of PV panels to achieve the required capacity on the available land using advanced software studies and design methods and design process and methodology shall be explained and reconciled with Daya Engineering Team. Suitable approvals as required to be obtained from concerned authorities in this regard before proceeding on implementing the design.
- The Solar PV plant must be a complete system meeting all technical specifications of the bid and in conformance to the requirements of regulation, act, rules, and requirements of KSEB, Electrical Inspectorate etc .

Incomplete offers lacking any component of the scope of work will be rejected.

Bidder's Qualification

Technical Experience

The bidder must be a System Integrator cum EPC Contractor and should have:

- Successfully designed, supplied, erected, and commissioned solar PV plants (off-grid or on-grid) with an aggregate capacity of **at least 4 MWp in the last 3 years** from the date of NIT.
- At least **one of these projects must be a Grid-Connected SPV Plant of 2 MWp or more, operational in India for at least six months.**

Required Documents

- Copies of work orders/contracts and completion certificates.
- Performance certificates from users for at least six months of successful operation.

Financial Criteria

- **Solvency Certificate**: Equal to or greater than the Probable Amount of Contract, issued within 6 months of the bid date by a nationalized/scheduled bank or a Tahsildar. Alternatively, a Net Worth Certificate from a registered Chartered Accountant is acceptable.
- **Annual Turnover**: Minimum 50% of the Probable Contract Value (**Min 5Cr**) for at least 3 out of the last 5 financial years, supported by audited financial statements.

Performance of the SPV Plant

- PV modules and inverters used must meet the specifications in the bid and be approved by DGHLT and meeting requirements of regulations, rules, supply code . KSEB/Inspectorate requirements as applicable.

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- Degradation of output should not exceed:
 - 5% in 5 years
 - 10% in 10 years
 - Minimum 85% output at the end of 25 years

Annual Maintenance Contract (AMC)

- Begins after the 5-year O&M period & DLP.
- Can be awarded to the EPC contractor for an additional 5 years or more at mutually agreed terms.
- Must cover:
 - Spares for panels, inverters, and all major equipment
 - Transportation and insurance
 - Consumables and general maintenance

Documents to be Submitted by Awarded Contractor

Within **15 days** of the Letter of Award, the Contractor must submit:

- Detailed engineering and design drawings as per site feasibility, DAYA requirements and in conformance to the applicable regulations.
- Structural designs for Civil/Module Mounting Structures and detailed electrical designs . Structural designs for MMS shall be based on soil test done by bidder and designed by accredited Structural Consultant. Structural Stability certification shall be given for the entire installation including MMS etc based on the geographic conditions , wind speed etc. All such designs shall be got approved by Daya Engg department.
- Technical data sheets, including Guaranteed Technical Particulars (GTP)
- List of materials, make/model/specifications
- Unpriced and priced BOQs
- Test reports and list of spares
- O&M manual
- Project Execution Schedule

The submitted design and materials must **match the specifications** and guarantees provided in the successful bid.

Specifications / Brand -

Panels: Mono PERC Half cut bifacial /TOP CON bifacial as per standards prescribed. Make: Adani/Renewsys/ Vikram/Goldi/Anchor Panasonic

Inverter: String Inverters of standards and specifications prescribed – Make : Solar Edge/ Fronius/Solis/ Goodwe/Sungrow/Growatt

Structures: Meeting the IS standards and galvanizing requirements prescribed.

Transformers: Meeting required ISI/IEC standards. Make: Voltamps/Intrans/Hamond/Transcon/ ABB India/Siemens

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Cables: Meeting required IS/IEC standards as prescribed : Make: Polycab/APAR/KEI/Havells

Panels and bus bars: Meeting required ISI/IEC standards and in requirement of Electrical Inspectorate requirements & KSEB requirements. Designs / Specifications to be got approved by concerned agencies as required including Daya Engineering department.

Warranty / Guaranty to be specified separately for following items

Panels, Inverter, Structures, Transformers, Cables, Panels and bus bars and any other Components of Project / Installation. Preference will be given to those brands having longest warranty/Guarantee periods and provisions for extended warranty/Guarantee.

Project Review Meetings

Weekly Review Meetings

- **Participants:** Engineer-in-Charge, Contractor's Site In-Charge, Job Engineers
- **Agenda:**
 - Weekly progress vs planned schedule
 - Issues/hold-ups and remedial actions
 - Pending queries and approvals

Monthly Review Meetings

- **Participants:** Senior DGHLT/KSEBL officials and Contractor
- **Agenda:**
 - Overall project progress and critical path analysis
 - Major issues/slippages
 - Assistance required
 - Client feedback and finalisation

Operation and Maintenance

- O&M for 5 years (Defects Liability Period) is the Contractor's responsibility.
- Scope includes:
 - Maintaining plant shadow-free (trimming trees under DGHLT supervision)
 - Preventive and breakdown maintenance
 - Comprehensive insurance (fire, earthquake, etc.)
 - Supply of spares and consumables
 - Engaging Suryamitra-trained personnel (MNRE programme) or competent/qualified personnel's in Shift for running the plant. (Qualification/Persons appointed to be got approved by Daya Management)
 - Monthly MIS reports with generation and downtime analysis
 - Training DGHLT-nominated personnel on daily monitoring

The Contractor shall not misuse the project land and shall ensure safety and integrity of machinery and components throughout the O&M period.

Time Schedule

The bidder shall submit a Project Time Schedule in bar chart format along with the bid. It shall include:

- Procurement, manufacturing, delivery timelines
- Subcontracting activities
- DGHLT interface dependencies

If the schedule does not align with the project's overall completion timeline, DGHLT reserves the right to disqualify the bidder.

General Note on Materials and Workmanship

- All materials, workmanship, and design shall conform to the latest applicable standards and codes (Indian or International).
- In case of conflict, or in absence of clear specifications, the Engineer-in-Charge's instructions shall be final and binding.

SECTION-IV
TECHNICAL SPECIFICATION

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Technical Particulars and Standards

Sl. No.	Description	Details
1	Project Name	<i>3MW (Max) Solar Photovoltaic Captive Power Plant for Daya Group of Hospitals</i>
2	Place of Installation	<i>Karimab Paanchayat, Palakkayam Village, Mannarkkad Taluk, Palakkad taluk</i>
3	Project Promoter	Daya General Hospital Thrissur Ltd. (DGHLT)
4	Land Details & Extent of Land	<i><u>DGHLT owned site in Palakkayam Village, Mannarkkad Taluk, Palakkad District [Survey (No. 1) 2259/179, (2) 2259/214. (3) 2259/73 for an extant of 3 Hectare 64 Are 37 Sq. Meter.],</u></i>
5	Type of PV Modules Considered	Mono-PERC Half cut / TOPCon Bifacial
6	Proposed Capacity of Plant	<i>3 MWp(3000KWp)</i>
7	Capacity of Each Module	580 Wp and above
8	SCADA System for Monitoring	Shall provide real-time monitoring and diagnostics as per KSEBL requirements, visible at the Load Dispatch Centre, Kalamassery and DGHLT's Data Centre at Thrissur. Data reporting shall comply with IEC 61724-1:2017 and IEC 61829:2015 standards.
9	Grid-Tie Inverter	String Inverter with: <ul style="list-style-type: none"> • Voltage ripple < 3% • Power factor > 0.98 at nominal load • THD < 3% • Nominal frequency: 50 Hz • Compliance with IEEE 519-2014
10	Mounting Structures	Hot-dip galvanized steel structures as per IS 4759
11	Solar Insolation	5.44 kWh/m ² /day (Average Global Horizontal Irradiance). Bidder shall ascertain actual Irradiation levels for accurate designs.
12	Expected Life of Plant	25 Years
—	—	—
14	Plant Commissioning Period	Within 3 months from the date of site handover or issuance of LOA, whichever is later

Site Visit and Power Evacuation Provisions

Prior to submitting the bid, the Contractor shall invariably conduct a site visit to all designated project locations to assess actual conditions.

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The quoted price shall be inclusive of all components required for successful power evacuation, including but not limited to:

- Power cables (AC & DC)
- Ring Main Units (RMUs)
- Isolation transformers
- HT transformers
- Switchgear and protection systems

The detailed power evacuation layout and schematic shall be finalized at the time of issuance of the Letter of Award (LOA). The Bidder shall quote separately the for construction, testing & Commissioning of evacuation Systems up to KSEB grid @ substation as specified in Price Bid in this bid document.

The Contractor shall anticipate and include in their financial proposal the complete cost of power injection at the 110 kV Substation, Kalladikode, including:

- Suitable metering systems and connected cubicles as per KSEB/Electrical Inspectorate requirements.
- Protection panels in compliance with KSEB regulations/ Electrical Inspectorate requirements.
- Cost of underground (UG) cable laying including all approval costs and restoration charges to be paid to concerned authorities.
- All associated civil, electrical, and statutory compliance costs

The bidder shall ensure that all components and infrastructure are designed to meet the applicable grid connectivity standards and enable reliable, compliant evacuation of generated power.

System Design Requirements

The bidder shall design the solar power system such that the system controller of the Grid-Tie Inverters has the capability to harvest the maximum possible solar power for export to the State Transmission Utility (STU) Grid/ Distribution System as required.

The primary objective of the system design is to ensure high availability and reliability of the solar power plant. To achieve this, the following principles shall be adopted during the system design:

Technology Selection

The bidder shall propose a suitable, proven, and efficient technology, incorporating the latest advancements. The system shall utilize Mono-Crystalline /Mono PERC Half cut Bifacial /TOPCon or superior bifacial solar modules, with demonstrated efficiency and reliability under similar service conditions.

Design Documentation and Approvals

The Contractor shall specify and submit the following, within 15 days of receipt of the Letter of Award (LOA):

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1. Basic Design Details

- PV module specifications and mounting structures details/specifications.
- Grid-Tie Inverter specifications & details
- Transformer specifications & details
- AC and DC cable details & Specifications.
- Plant protection schemes and detailed specifications.
- System integration and power evacuation plans with the existing power system
- All relevant design drawings and system diagrams

2. Structural Design Standards

- The drawings shall include detailed structure designs, and materials selected shall conform to IS 2062 / IS 4759. Designs shall be based on Soil test done at site and designed by Accredited Structural Consultant meeting all geographical requirements and wind loads etc for the entire plant.

3. Technical Particulars and Documentation

- Guaranteed Technical Particulars (GTPs) for all items, including:
 - Make, model number, and specifications in accordance with relevant standards
 - Complete technical drawings
 - Detailed test reports and certificates
 - List of O&M spares for major components
 - Detailed Bill of Materials (BoM)
 - Priced Bill of Quantities (BoQ) covering all materials, equipment, and works for the entire project

4. Submission for Approval

- The Contractor shall submit all relevant design briefs, diagrams, and drawings to the Agreement Authority for approval.
- Specifications of all major items (e.g., PV modules, Grid-Tie Inverters, Transformers) shall be submitted for separate approval.
- Approvals for the plant layout shall be issued by the Agreement Authority within 15 days of submission of all drawings from the date of LoA issuance.
- Any modifications suggested by the Agreement Authority shall be incorporated and revised documents shall be resubmitted within seven working days from the date of notification.

5. Required Design Documents

The following design documents shall be submitted by the Contractor (but not limited to):

1. String sizing and array design
2. String layout
3. Array layout
4. DC protection scheme
5. Inverter sizing

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6. AC protection scheme
7. DC cable size calculations
8. DC cable specifications
9. DC cable schedule including voltage drop and power loss calculations
10. String monitoring unit specifications
11. DC earthing and earth pit calculations
12. HT transformer and isolation transformer switchgear details
13. Lightning protection design and specifications
14. Technical specifications of all AC components
15. Comprehensive AC and DC cable schedules
16. PVSyst Simulation Report with proposed PV modules and grid-tie inverter details

6. Required Drawings for Approval

The following drawings shall be submitted and approved under this contract:

- a) Shadow analysis
 - b) General arrangement drawings and dimensioned layout plans
 - c) Schematic drawings showing SPV panels, Grid-Tie Inverter, Junction Boxes, AC/DC Distribution Boards, meters, etc.
 - d) Layout of the solar PV array and single-line diagram with specifications of all components
 - e) Mounting structure design documentation
 - f) Mounting structure drawings
 - g) Structural drawings including foundation details
 - h) Civil drawings of the control room building
 - i) Cable layout showing routing for power and communication cables
 - j) Utility drawings indicating water lines, fire protection lines, etc.
 - k) Itemized Bill of Materials for the complete SPV plant, including all components and accessories
 - l) Cable sizing and specifications for:
 - Array interconnections
 - Arrays to junction boxes
 - Junction boxes to inverters
- Any other drawings as is required and prescribed under statues, regulations, Act etc or recommended by Daya Engineering Wing.

7. Execution Based on Approved Design

- All drawings, structure designs, and selected materials shall be submitted for **approval before commencement** of any on-site execution work.
- The work shall strictly follow the **approved designs only**.

8. Statutory Approvals

- The Contractor shall:
 - Submit necessary drawings and documents to statutory authorities (e.g., Electrical Inspectorate, KSEB, etc.)

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- Obtain all required approvals before commencing erection works
- Engage only **licensed/accredited contractors** as per the requirements of the statutory authorities
- All associated costs for obtaining statutory approvals shall be **borne by the Contractor** and deemed to be included in the quoted price.
- Such subcontracting agencies must receive **prior approval from Daya General Hospital**, and all responsibilities for their work shall remain **with the Contractor**.
- Approvals include (But not limited to) KSEB, PWD/Irrigation/Panchayat/KWA/Forest authorities, / Electrical Inspectorate etc as required

Quality Assurance

The Contractor shall establish a Quality Assurance System (QAS) for the work in accordance with the requirements of this bid and the tender document. The system shall be subject to approval by the Engineer-in-Charge.

Quality Assurance Requirements:

1. The Contractor shall ensure strict compliance with the approved, proven, and established Quality Assurance procedures during all stages of the project—starting from sizing, selection of make, storage (at site), erection, testing, and commissioning.
2. All materials supplied for the project shall be tested as per the technical specifications outlined in the tender. All acceptance and routine tests on equipment shall be carried out in the presence of the Agreement Authority or authorised personnel.
3. The Agreement Authority may, at its sole discretion, undertake quality inspections during manufacturing stages.
4. All works shall be executed with the highest level of quality and workmanship and in conformity with applicable quality and safety norms.
5. Any material or work found to be defective or non-compliant with the specifications shall be rejected and must be replaced at the Contractor's cost.
6. The Contractor shall submit a detailed Quality Assurance Plan (QAP) for approval. Testing and inspections shall comply with relevant BIS/IEC/Manufacturer's standards before dispatch to the site and after erection and commissioning.
7. The Contractor shall submit a list of on-site tests to be conducted to demonstrate the operational performance of the plant.

General Technical / Quality Provisions

The Bidder shall use **SPV modules of adequate capacity**, grid-tie inverters, and associated components to ensure generation of electrical power in line with the **design energy estimates**.

Design and Performance Criteria:

1. The design shall include liberal de-rating factors for the solar array, and account for inverter efficiency and other associated system losses. The inverter output shall be monitored and validated.

2. Only proven equipment and systems with a high availability track record under similar operating conditions shall be used.
3. Equipment selection and plant layout must ensure ease of maintenance and accessibility.
4. The Contractor must strictly follow approved and validated Quality Assurance norms and procedures throughout the project lifecycle.
5. System synchronisation shall be properly monitored to ensure stable power export to the grid. The generated low-voltage output shall be stepped up to the applicable grid voltage at the interconnection point.
6. DC injection into the grid must be avoided. A suitable isolation transformer equivalent to the plant capacity shall be used. Either:
 - o A grid-tie inverter with a built-in isolation transformer, or
 - o A separate isolation transformer
 shall be adopted, subject to approval during the design review by the Agreement Authority.
7. If a separate isolation transformer is used, a test report as per IEC 61558-2-4 and IEC 61558-2-6 shall be submitted.
8. Harmonic levels must comply with CEA Grid Connectivity Technical Standards. The Total Harmonic Distortion (THD) for individual voltage components shall be within limits prescribed by IEEE 519-2014.
9. The solar power plant must be designed to operate in parallel with the grid, which is considered an infinite source. The plant shall include protective relays, LVRT/HVRT capability, and circuit breakers to protect its equipment from faults or disturbances from the grid.
10. The plant must be equipped with protection systems to allow physical and electrical isolation from the grid during faults or any critical operating condition.
11. The Bidder shall provide weatherproof and ventilated housing for grid-tie inverters, in accordance with the approved layout and drawings.
12. The inverter shall include internal fault protection and be protected against lightning and surges. MOV-type surge arresters shall be provided on both AC and DC terminals for overvoltage protection due to lightning-induced surges.
13. The inverter shall include alarm contacts for:
 - Hardware faults
 - Internal/external auxiliary supply failures
 Alarm outputs shall be provided via voltage-free (potential-free) contacts for integration with external monitoring systems.

Technical Specifications – Solar PV Modules

1. Technical Standards

Sl. No.	Specification	Other Details / Standards	Remarks
1	IEC 61215 / IS 14286:2010	Crystalline silicon terrestrial photovoltaic modules – Design qualification and type approval	—
2	IEC 61730 – Part I:	Photovoltaic module safety qualification –	—

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	2007	Requirements for construction	
3	IEC 61730 – Part II: 2007	Photovoltaic module safety qualification – Requirements for testing	—
4	IEC 61701	Salt mist corrosion testing of the module	—
5	IEC 61853	Photovoltaic (PV) module performance testing and energy rating	—

Any other Applicable standards if not covered in above list for entire Systems, equipment's, components of Project.

General Requirements

- The Solar PV modules shall be of appropriate specification/rating and shall be certified under ISO 9001:2008 and ISO 14001, or equivalent BIS standard.
- Modules must have valid test certificates issued by MNRE-accredited national or international test laboratories.
- Modules shall be made of polycrystalline or monocrystalline silicon solar cells, connected in series/parallel.
- Modules shall be Potential Induced Degradation (PID) free and must be accompanied by a valid certificate confirming the same.
- Module efficiency shall be declared at Standard Test Conditions (STC):
 - 1000 W/m² irradiance
 - 25°C cell temperature
 - AM 1.5 spectrum
- Modules shall have RFID tags embedded within the laminate, durable enough to withstand harsh environmental conditions.
- During Factory Acceptance Test (FAT), inspection of modules will include verification of RFID data using RFID reader and submission of I-V curves of all modules in hard copy.
- Preference shall be given to the bidder offering modules with the highest wattage, provided all other parameters are equal.

2. Contractor to Specify (Module Data Sheet Format)

Sl. No.	Description	Details / Requirements	Remarks
1	PV Module Type	[To be filled by bidder]	
2	Make	[To be filled by bidder]	
3	Efficiency	[To be filled by bidder]	In %
4	Fill Factor	[To be filled by bidder]	In %

5	Degradation Warranty	[To be filled by bidder]	≥ [Specify] years for 90% Generation Capacity @ nominal PF
6	Module Frame	[To be filled by bidder]	Material type (e.g., anodized aluminum)
7	Termination Box	[To be filled by bidder]	IP rating if applicable
8	RFID Tag for Each Module	[To be filled by bidder]	RFID must be embedded inside laminate and withstand harsh environmental conditions
9	Power Output Rating	[To be filled by bidder]	I-V Curve at STC to be submitted in hard copy during FAT

3. Authorized Testing Centers

- The PV modules must be tested and certified by an IEC-accredited test center.
- Additionally, a PV module qualification test certificate as per IEC standards, issued by:
 - ETDC Bangalore, or
 - MNRE – Solar Energy Centre, must be submitted.

4. RFID Information Requirements

The following information must be encoded in the **RFID tag** of each module:

1. Name of PV module manufacturer
2. Name of solar cell manufacturer
3. Month and year of manufacture (for both module and solar cells)
4. Country of origin (for both module and solar cells)
5. I–V curve of the module
6. Wattage, Im, Vm, and Fill Factor
7. Unique serial number and model number of the module
8. Date and year of obtaining IEC PV module qualification certification
9. Name of the test lab issuing the IEC certificate
10. Traceability data as per ISO 9000
11. Name of Client: Daya General Hospital

The successful bidder shall arrange an RFID reader to verify the embedded data for each module delivered to the site. This verification shall be performed in the presence of the Engineer-in-Charge and is mandatory for site acceptance testing.

5. Warranty Requirements

The Contractor shall clearly specify and submit the OEM-provided warranty documents and also provide an undertaking for compliance. The following warranty types shall be specified in detail, without ambiguity:

- Replacement Warranty
- Manufacturer’s Warranty

- Linear Performance Warranty
- Degradation Warranty
- Generation Guarantee

All warranties shall cover performance parameters, material defects, and power degradation in line with international norms and the tender requirements.

Module Mounting Structure

Applicable Standards

- **Structural Steel Material:** IS 2062 (latest amendment)
- **Galvanization Standard:** IS 4759 (latest amendment)

General Description

Photovoltaic (PV) arrays must be mounted on a stable and durable structure capable of supporting the modules and withstanding environmental conditions including wind, rain, and temperature extremes. The mounting arrangement shall be fixed-tilt, designed for the specific site location, and capable of withstanding wind speeds up to **150 km/h**.

Specifications

Parameter	Requirement
Wind Withstanding Capacity	150 km/h
Structure Material	Hot-Dip Galvanized Steel
Galvanization Thickness	85–90 microns
Bolts, Nuts, Fasteners, Clamps	Stainless Steel (SS 304)
Ground Mounting	Durable structural foundation as per relevant IS codes and soil conditions
Minimum Ground Clearance (PV Panel)	500 mm (may be increased based on site conditions)
Panel Orientation and Tilt	Fixed tilt facing true South, 9°–13° depending on site location
Panel Cleaning & Maintenance Accessibility	Full access from top and bottom; clearance between rows to avoid shading
Array Spacing	Sufficient to avoid shading from adjacent rows
Seismic Consideration	Must be included in foundation design
Corrosion Protection	All joints, welds, and fasteners must be adequately treated to prevent corrosion
Structural Design Life	Minimum 25 years
Inverter Area Access	Vehicle-accessible pathway to all array tables (design to be approved)
Grid Isolation Switch	Manual lockable disconnection switch to be provided for utility maintenance

Mechanical Specifications

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1. Array layout and tilt shall be optimized for maximum annual energy yield.
2. Structural design must incorporate a **minimum factor of safety of 1.5**.
3. PV modules shall be mounted using SS fasteners and clamps; no additional holes shall be made on module frames.
4. Fasteners shall use only existing manufacturer-provided mounting holes.
5. Provisions shall be made for protecting inverter foundations from vegetation and waterlogging.
6. Inverter mounting should allow convenient maintenance and access.
7. All structures and components must be **free from corrosion** at installation.
8. Any modifications required by inspecting authorities must be implemented at no additional cost.
9. Provision for **manual isolation** from the grid must be included, with locking facility for utility safety.

String Combiner Box / Array Junction Box (AJB)

Specifications:

1. **Enclosure:** FRP/ABS Plastic, IP65, vermin-proof, dustproof, weatherproof
2. **Internal Arrangement:**
 - Copper bus bars of suitable size
 - Reverse blocking diodes (max. 1000V DC)
 - Surge Protection Device (SPD), Type 2 as per IEC 60364-5-53
 - Cable entry glands with proper identification and ferrules
3. **Functionality:**
 - Combines strings into sub-arrays
 - Disconnection provision for each group
 - Test points for fault isolation
4. **Mounting:** Outdoor, corrosion-resistant
5. **Conformance:** IEC 60529

String Monitoring Unit (SMU)

Specifications:

- Monitors current/power of each string; communicates with SCADA
- IP65 enclosure, UV-resistant, fire-retardant (UL 746C), halogen-free
- Impact resistance: IK07 (IEC 62262 or equivalent)
- Surge Protection: Properly rated SPD included
- Data: Real-time string voltage and SPD status via SCADA
- Communication: RS-485 or equivalent up to SCADA
- Max. 2 strings per SMU input channel
- Control PCB: Rugged, proven design

Grid-Tie Inverter

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Applicable Standards

Sl. No.	Standard	Description
1	IEC/IS 61683	Photovoltaic systems – Efficiency measurement
2	IEC 60068	Environmental testing
3	IEC 62116	Anti-islanding protection
4	IEC 61727	Utility grid interface
5	IEC 62109-1 & 2	Power converter safety
6	IEC 60255	Protection relays and measuring equipment

Certificates must be from NABL/IEC/MNRE-approved test centers.

Recommended Specifications

- 3-phase Grid-Tie Inverter from a reputed manufacturer
- MPPT-based, PWM/IGBT technology
- **Inverter Efficiency:** $\geq 97\%$ at 75% load (as per IEC 61683)
- **Voltage Ripple:** $< 3\%$
- **Cooling:** Forced convection based on internal temperature
- **Enclosure Rating:** IP65 (IEC 62208)
- **Operating Temp.:** 5°C to 50°C
- **Humidity:** $\leq 95\%$ non-condensing
- **Earthing:** AC bypass and DC input earthing
- **Synchronization:** Automatic with KSEBL grid
- **DC Injection Limit:** $\leq 1\%$ of inverter rated current (as per IEC 61727)
- **Protection Features:**
 1. Overload protection (150% for 10s)
 2. LVRT & HVRT support
 3. Over/under grid voltage & frequency protection
 4. Reverse polarity, short circuit (AC/DC), over-voltage
 5. Ground fault detection and anti-islanding
 6. Earth leakage protection
 7. Lightning & surge protection (MOV type, AC/DC sides)

Monitoring and Display

- LED/LCD with keypad interface for:
 - Per-phase voltage, current, power (kW/kVA)
 - Grid voltage/frequency
 - PV voltage and current
 - On/off/grid connection status
 - Ambient and heat sink temperature
 - Cumulative energy output
 - System event logs and setpoints

Switchgear and Protections

- Electrically operated draw-out (EDO) circuit breaker with microprocessor-based protection on AC output
- Manual and automatic disconnects on AC & DC sides
- Internal self-diagnostics on startup

Installation & Mounting

- Inverter must be mounted on corrosion-resistant support at an accessible height
- Provisions must be made to prevent water stagnation and weed growth near base

Power Quality Requirements

Parameter	Requirement
DC Injection to Grid	< 1% of rated current (IEC 61727)
Harmonic Distortion – Voltage	As per IEEE 519-2014
Harmonic Distortion – Current	As per IEEE 519-2014
Output Frequency	50 Hz ± 0.5 Hz
Isolation Transformer	Required; tested as per IEC 61558-1 & 61558-2-4

SCADA (Data Acquisition System)

An integrated SCADA system shall be provided, capable of communicating with all Grid-Tie Inverters (GTIs) and acquiring data on:

- Individual inverter performance (instantaneous and cumulative energy output)
- Grouped plant performance for the full MW_p capacity

The SCADA system shall:

- Provide data visibility at KSEBL's Load Dispatch Centre, Kalamassery and the Data Monitoring Centre at Daya General Hospital, Thrissur
- Be compliant with IEC 61724-1:2017 and IEC 61829:2015

Parameters to be Monitored and Recorded

1. Ambient air temperature near array field
2. Module back-surface temperature
3. Wind speed at array plane level
4. Solar radiation incident on array plane
5. Inverter DC input and AC output
6. Power at DC and AC sides
7. Energy exported to the grid (kWh)
8. Grid/system frequency
9. HT-side voltage

10. Instantaneous MW and MVAR
11. Switchgear status
12. Sub-array/string current and voltage
13. Power at 11 kV terminal
14. Other parameters as per KSEBL/prudent engineering practice

System Requirements

- Communication: RS232/RS485, Modbus, modem/Wi-Fi compatible
- Software: GUI-based real-time monitoring with control capability
- Compliance: CE marked; compliant with EN61000-6-4, EN61000-6-2, EN50178, VDEW, and IEC safety directives

Transformers and Grid Interfacing

- Power evacuation system shall use transformers suitable for 11 kV grid connection
- Transformers must:
 - Be of reputed make, IS 2026 compliant
 - Include all protection and monitoring devices
 - Be of “K-Factor” type with redundancy
 - Have test certificates from NABL/IEC accredited labs
- Grid interfacing equipment (e.g., LA, CTs, PTs, relays, RMUs) must comply with CERC grid codes and IS/IEC standards

Protective Relays

- All protection relays (OC, EF, UV, OV) must be numerical, of reputed make
- Protection scheme must be submitted and approved by Agreement Authority

AC Distribution Board (ACDB)

- Located between GTI and 11 kV transformer
- IP54-rated panel with SCADA compatibility
- Equipped with MCCB/ACB, protections, annunciation, meters
- Bus bars: Electrolytic grade copper, adequately sized
- All terminations supported by fire-retardant and track-resistant insulators

DC Distribution Board (DCDB)

- Collects DC output from array yard and transmits to inverter
- Panel equipped with:
 - DC circuit breakers
 - Surge arresters (as per IS)
 - Relays, annunciation, control/protection devices
- Fabricated to IP65 protection level with copper bus bars

Cables

- DC cables: XLPO insulated, UV stabilized, single-core copper ($\geq 4 \text{ mm}^2$)
- AC cables: XLPE/PVC, single/multi-core copper ($\geq 4 \text{ mm}^2$); UV-stabilized sheath for outdoor use
- All cables to comply with IEC 60227 / IS 694 and IEC 60502 / IS 1554
- Cable color coding as per standard:
 - DC (+): Red (or black with red line)
 - DC (-): Black
 - AC 3 ϕ : Red, Yellow, Blue; Neutral: Black
 - Earth: Green

Installation Guidelines

- Max DC voltage drop: 2%
- Max AC voltage drop: 2%
- Cable routing through UV-resistant conduits ($\geq 1.5 \text{ mm}$ thick)
- Marked with aluminum tags every 8 m
- Route markers: RCC slabs 300x200x500 mm with "LT CABLE" and feeder details

Lightning Protection System

Standards & Design

- As per IS 2309 & IEC 62305-3
- Design via rolling sphere method (40 m radius)
- Separate lightning protection for inverter rooms

Materials

- Lightning arrestors with redundancy
- Earthing via 3 m long copper-bonded rods (99.9% pure, 250-micron coating)
- Earth interconnection: GI strip (30x3 mm, 70-micron zinc coated)
- Inspection chambers: Polypropylene/Polyethylene with 50 kN load rating

Surge Protection

- SPDs on both DC and AC sides, Type 2 as per IEC 61643
- Proper earth connection of SPD to dedicated earth pit

Grid Islanding and Protection

- Grid-Tie Inverter must shut down automatically during grid failure
- Islanding protection, as well as under/over-voltage protection, is mandatory
- Manual isolation switch to be provided near utility metering point for safety

Earthing System

1. The earthing system shall connect all non-current-carrying metal receptacles, electrical boxes, appliance frames, chassis, and PV module mounting structures in one continuous run. Earthing GI strips shall be interconnected by proper welding and not bolted.
2. Each array structure and PV modules shall be grounded in accordance with applicable safety regulations. All components such as modules, inverters, and junction boxes shall be earthed as per the manufacturer's recommendations. Materials used for earthing shall be copper or hot-dip galvanized iron. Joints in GI strips shall be protected against corrosion using bituminous compound as directed by the Engineer-in-Charge. Earth electrodes shall be copper-clad iron or stainless-steel rods with chemical treatment for reducing resistance. Earthing shall be designed to dissipate fault current for 3 seconds.
3. The complete earthing system shall be electrically connected to provide independent return paths to earth from all equipment.
4. The equipment grounding wire shall be connected to the earth strip using appropriate fixing arrangements. Each strip shall extend at least 500 mm from the equipment.
5. The earthing system shall conform to IS 3043 (1987 edition).
6. A masonry enclosure of not less than 400mm x 400mm (depth) with a handle on the cover shall be provided for each earth pit for future maintenance.
7. A minimum of four interconnected earth pits shall be provided per location. Adequate spacing between pits shall be as per standards. Separate body earthing shall be provided for inverters, panels, mounting structures, kiosks, etc.
8. The earthing system must be interconnected using a minimum 25mm x 6mm GI strip for equipotential bonding.
9. All metal enclosures shall be thoroughly grounded per Indian Electricity Act. Each three-phase equipment shall have two separate earth connections. An earthing bus shall be provided in the control facility.
10. Earth pits shall include test points for verification. All non-current carrying metallic parts shall have at least two distinct earth paths to efficient earth electrodes. The installation shall conform to the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010.

DC Battery Charger

- Adequate-capacity DC battery bank shall be provided for emergency supply to control/protection systems and emergency lighting.
- A suitable battery charger shall be provided with automatic changeover, relay circuits, fuses, annunciation, and a DC power supply distribution panel.
- All equipment shall conform to relevant IS/IEC standards.

Civil Works

- DGHTL will provide land boundary details. Contractor shall conduct digital surveys using approved surveyors for contouring and leveling.
- Site preparation includes land development, clearing, leveling, and road creation.
- 8-meter-high perimeter fencing shall be installed.

Land Development

- Contractor shall conduct soil testing and contour surveys for module structures and control rooms.
- Site preparation shall include clearing vegetation, tree cutting, leveling, etc.

Buildings

- Includes construction of all necessary structures: drains, water tanks, cable ducts, control rooms, substations, office buildings, etc.
- All civil works must be pre-approved.

Illumination System

- LED lighting shall be provided in inverter rooms and for yard lighting.

Panel Surface Cleaning

- Provide well/tube well, pipeline network along the array rows with manual taps and hoses.
- Install CPVC network with sprinklers or nozzles at intervals for module cleaning.
- Alternately any advanced Panel Cleaning system that enhances efficiency of generation and Plant life can also be suggested.

Energy Meter

- As per KSERC 2014 regulations, install solar meter and import/export net meter.
- All meters must be tested, sealed by TMR divisions.
- Accuracy class of solar and net meter: 0.2S or better.
- Meters must comply with IEC 60687 / IEC 62052-11 / IEC 62053-22 / IS 14697.
- Parameters to be displayed: voltage, current, power factor, import/export kWh, MD (import/export), date, time, etc.
- Install per CEA (Installation and Operation of Meters) Regulations, 2006.

Safety Regulations

- Supply and maintain adequate firefighting equipment.
- One 10 kg CO₂ fire extinguisher per 15kW installation is mandatory.
- Extinguishers shall conform to IS:2171-7, IS:10658 and be suitable for electrical fires and flammable materials.
- Contractor is responsible for periodic renewal during the maintenance period.

Plant Drawings, Data, and Documents

Contractor shall submit the following:

- a. General description of equipment offered including key features, technical specs, material details.
- b. Technical catalogues and publications.
- c. Layout of complete plant with subsystems.
- d. Single line diagram.
- e. General arrangement and foundation details.

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Signature

Seal

- f. Technical particulars.
- g. Earthing layout and calculations.
- h. Lightning protection design.
- i. CSS drawings.
- j. Module installation guidelines.
- k. Auxiliary consumption calculations.
- l. Type test certificates for major equipment.

Erection, Testing & Commissioning

1. Submit statutory drawings and documents before starting erection.
2. Any changes suggested by inspecting authorities shall be implemented at no cost.
3. Execute unloading, installation, testing, commissioning as per manufacturer's instructions.
4. Provide all erection consumables, tools, instruments, etc.
5. Mark all equipment with identification and warning boards.
6. Handle equipment per relevant codes and manufacturer's guidance.
7. Temporary electrical connection for construction must be arranged and later removed.

Project Completion Report and Drawings

1. Submit test reports, calibration certificates, and 3 sets of O&M manuals upon commissioning.
2. Provide four "As Built" drawings (1 reproducible, 1 CAD soft copy).
3. Provide an information booklet with:
 - o System features, specifications, accessory details.
 - o Cable and panel layout.
 - o GA, SLD, schematic diagrams.
 - o All test reports, SOPs, maintenance manuals.
4. Laminated wiring diagrams must be placed inside relevant panels.
5. SOP must be approved by the Engineer-in-Charge and include manufacturer recommendations and preventive maintenance guidelines.

OPERATION & MAINTENANCE OF THE PLANT

The contractor shall be responsible for the comprehensive Operation and Maintenance (O&M) of the Solar Power Plant(s) installed at the specified location(s) for a period of five (5) years from the date of commissioning.

The O&M team shall operate the solar plant in accordance with an Operations and Maintenance Agreement (the "O&M Agreement"), which shall provide for, at a minimum, the following services:

A. Routine and Non-Routine Maintenance

1. Operating the solar plant.
2. Providing all materials and services necessary for solar plant maintenance.
3. Performing all duties necessary for safe and efficient operation and maintenance.
4. Complying with all applicable regulatory obligations.

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Signature

SOLAR POWER PLANT TENDER DOCUMENT – DAYA GENERAL HOSPITAL LIMITED

Seal

B. Training

- Contractor shall impart **basic training** to the employer's personnel, with the concurrence of the Engineer-in-Charge.
- Additional training shall be conducted at designated KSEBL training centers with participation from OEM trainers.
- The contractor shall provide comprehensive O&M manuals in English.

C. O&M Execution Standards

The contractor shall perform the work and supply all required spare parts in a prudent and efficient manner and in accordance with:

- (a) Manufacturers' and system designers' specifications.
- (b) The Annual Operating Plan.
- (c) All applicable Indian laws (environmental, pollution, safety, employment, etc.).
- (d) Prudent Utility Practices.

The operator shall make every reasonable and practical effort to:

- Maximize plant capacity utilization.
- Minimize plant downtime.
- Optimize the useful life of all equipment.

Scope of Contractor's Responsibilities

- a) Monitoring, controlling, troubleshooting, and maintaining records and registers.
- b) Supply and replacement of all spares, consumables, components (including panels, Grid Tie Inverters, indoor panels, circuit breakers, cables, etc.) for five years.
- c) Preventive and corrective maintenance including testing, calibration, and overhauling.
- d) Rectification of faults within 48 hours upon intimation from KSEBL, failing which penalties may apply.
- e) General monthly upkeep: cleaning of equipment, PV stations, transformer yard, and array area.
- f) Monthly reports on energy generation and operating conditions by the 2nd of each month to the Engineer-in-Charge, and a consolidated report to the Chief Engineer (RE & Energy Savings) by the 5th.
- g) Ensuring site security.
- h) Replacement of damaged modules during the 5-year period.
- i) Replacement of Grid Tie Inverter(s), batteries (if used), and any other equipment as required.
- j) Comprehensive insurance covering all risks (fire, natural calamities, theft, etc.).
- k) Maintenance and replacement of lightning arresters.
- l) Continuous performance monitoring and system maintenance for maximum energy output.
- m) Achieving and sustaining the Performance Ratio (PR) as per Clause 2.2.3 of Volume I.
- n) Annual calibration of energy meters by TMR Divisions; prompt rectification or replacement of defective meters.
- o) Periodic calibration of all measuring instruments as per OEM recommendations.

2.1 Operation and Monitoring

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Signature

Seal

- Deployment of necessary manpower for real-time monitoring.
- Operation to follow OEM instructions and safety protocols.
- Annual performance evaluation in the presence of KSEBL officials.

Monthly Operator Tasks

1. Cleaning of PV modules.
2. Logging voltage, current, power factor, energy output.
3. Recording of failures, interruptions, tripping incidents, and their durations.
4. Monthly documentation of energy output and downtime.

2.2 Maintenance

- Preventive maintenance every three (3) months, including:
 - Checking of all electrical connections.
 - Module cleaning.
 - Structural and inverter checks.
 - Ensuring generation data availability.
- Stock of essential consumables and spares to be maintained.
- Resistance of earthing system to be measured monthly; corrective action required if resistance exceeds 3 ohms.
- Periodic checks of modules, inverters, junction boxes, etc.
- Cleaning and inspection of all joints, boxes, insulators, etc. every three months.

Additional Maintenance Requirements:

- Modules must be cleaned at least twice per month.
- Maintain detailed maintenance logs.
- Written approval is required for any maintenance during non-office hours or holidays.
- Display emergency contact details of O&M personnel at each site.
- Immediate accident reporting in case of any incidents.

Compliance & Safety

- Compliance with all relevant Central and State Acts, including:
 - Payment of Wages Act, Minimum Wages Act, Workmen's Compensation Act, Industrial Dispute Act, Contract Labour Act, etc.
- Provision of statutory amenities to all workmen.
- Full safety measures for all personnel.
- Contractor to bear the cost of any damage due to negligence or operator error.

Deductions:

- Non-performance of O&M responsibilities will result in pro-rata deduction from O&M bills.

Tools and Tackles

- All tools, measuring instruments, spares, and testing equipment to be arranged by the contractor.
- Vegetation control, debris removal, and water clogging prevention are part of regular duties.

Performance Ratio (PR) Testing

- Plant must run for minimum 2 weeks without major failure prior to PR test.
- Submit two (2) copies of O&M manual (hard and soft) before PR testing.
- Pyranometers or METEONORM data shall be used as instructed by KSEBL.
- PR Test to comply with IEC 61724.

PR Formula:

- Performance Ratio (Rp) = Y_f / Y_r
 - Y_f = Plant AC Output (kWh) / Plant Capacity (kWp)
 - Y_r = Solar Irradiance (kWh/m²) / 1 kW/m²

Target:

- Minimum PR: 75%–80%, measured at HT panel (inverter room).
- If not achieved:
 - First attempt: 7 consecutive days.
 - Second attempt: next 7 days.
 - Final attempt: third 7-day period.
 - Failing all: Contractor shall upgrade system (modules/components) at own cost to meet PR.
- Energisation and commissioning will occur only after:
 - PR Test successful,
 - Energisation Approval from Electrical Inspectorate.

Design, Installation, Testing and Commissioning of Solar Captive Power Plant of Capacity 1500KWp with Suitable Hybrid Model technologies at Kalladikkode, Palakkad for Daaya General Hospital, Thrissur

Tender No:
PRICE BID

Sl NO	Description	Unit	Rate	Total Amount
A	<u>EPC Construction , DLP, AMC and Hand Over Model</u>			
1	<p><u>1500 KWp Solar Captive Power Plant</u> covering Site investigation, survey, design, engineering, planning, and procurement.</p> <p>Manufacturer’s quality assurance and shop testing (including type testing where applicable).</p> <p>Transportation, handling, storage, and erection of Structures, Panels, Inverters, Transformers, DC/AC Cables, Equipment’s and associated electrical systems equipment as per specification in the bid .</p> <p>All associated civil and structural works.</p> <p>Electrical works including cabling, instrumentation, piping, installation, testing, and commissioning, Control rooms/substations etc. as per specification and details in Bid</p> <p>Integration with SCADA system to ensure real-time monitoring with visibility at:</p> <p>Load Dispatch Centre, Kalamassery & Renewable Energy Data Centre, Vidyuthi Bhavanam, Thiruvananthapuram</p> <p>Cost of transformers, HT metering, and interfacing.</p> <p>Providing compatible hardware/software for plant-</p>	Per KWp		

	<p>level and string-level monitoring.</p> <p>Arranging all required permits, consents, clearances (including Electrical Inspectorate), PWD, and KSEBL approvals.</p> <p>Training of personnel and insurance coverage during all phases.</p>			
2	<p><u>Construction and commissioning the Power Evacuation System</u> form Plant output to Substation as approved by KSEB and in requirements of Electrical Inspectorate/KSEB//CEA standards and meeting all local body requirements like road cutting etc</p>			
3	<p><u>Hybrid Technology Battery Energy Storage System</u> if required for meeting Daya Requirements and possible as per regulations and subject to technical/Commercial Viability – Size & Capacity, Discharge Rating etc as quoted</p>			
B	<p>Above Systems under <u>Annuity Model of 60 Monthly</u> Instalments from Date of Commissioning</p>			
C	<p>Above Systems with Plant Ownership by DAYA and Payments in Equated Monthly Instalments for 25 Years as per service levels agreed and units adjusted in Daya Bills – Include all costs of Installation, Operation, AMC, Replacements etc for successful delivery of power for 25 Years</p>	Rs/Unit		