TENDER BIDDING DOCUMENT
FOR
INSTALLATION OF 1.5MWp GRID CONNECTED SOLAR PHOTOVOLTAIC(SPV) POWER PLANT AT ZORAM MEDICAL COLLEGE AND HOSPITAL, FALKAWN

Power & Electricity Department, Government of Mizoram

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RFB Notice/ NIT No.	
Contract Title for the Procurement	Installation of 1.5 MWp Grid Connected Solar Photovoltaic (SPV) Power Plant at Zoram Medical College & Hospital, Falkawn
Mode of Procurement/Bidding	Single Stage Two-Envelope Bidding Process with e-Procurement/ e-Tendering
Date of Release of RFB Notice/ NIT	No P-37126/1/26-E-in-C(PM)/5 Dt 22.06.2026
Date & Time of Pre-Bid Meeting	16.07.2026 13:00 Hrs
Last date of Bid Submission	23.07.2026 13.00 Hrs
Date of Opening of Technical Part (First Envelope) of the bid	23.07.2026 14:00 Hrs
Opening of Financial Part (Second Envelope) of the Bid	To be notified later. Financial Part of bids from only those bidders shall be opened who, upon evaluation of Technical Part of the bids, are found eligible and qualified, and whose bids are found responsive to bidding documents.
Location of Submission/ Opening of Bids, as applicable	Engineer-In-Chief Office, P&E Dept. Kawlphetha, MINECCO, Aizawl, Mizoram Pin: 796001
Estimated Project Cost	Total Project Cost: ₹13,08,67,680.(Rupees Thirteen Crore eight lakh sixty seven thousand six hundred eighty Only)
Tender processing Fees	Rs. 2500 should be paid in shape of Demand Draft in favour of "Engineer-In-Chief, Power & Electricity Dept. payable at Aizawl, Mizoram.
EMD/ Bid Security	The amount of the Bid Security shall be ₹23,08,677/- (Rupees Twenty-three lakh eight thousand six hundred seventy seven only)This is as per CPWD guideline, clause no. 5.1.2, Subclause 2 mentioned below: (1) For works estimated to cost up to Rs Ten Crores or as notified from time to time: 2% (Two percent) of the estimated cost. (2) For works estimated to cost more than Rs. Ten Crores or as notified from time to time : Rs.Twenty Lakhs plus 1% (one percent) of the estimated cost put to tender in excess of Rs. Ten Crores).
Performance Security	The Performance Security amount is 10% of Accepted Contract Price.
Bid Validity period	The bid validity period will be 180 days from date of Opening of Technical Part of the Bid.
Time for Completion	9 Months from the Effective Date of the Contract
Address for Correspondence	Office of The Engineer in Chief, Power & Electricity Department, KAWLPHETHA, MINECCO, Khatla, Mizoram, Pin-796001 Email: eincpower@gmail.com Contact no: 7832871956.

SECTION – I

INSTRUCTIONS TO TENDERERS

1.0 General

These Instructions to Tenderers shall be read in conjunction with the Notice Inviting Tender, Scope of Work, Technical Specifications, Bill of Quantities, General Conditions of Contract, Special Conditions of Contract and all other sections of the Tender Document.

The tender is invited for the work of design, engineering, supply, installation, testing and commissioning of the 1.5MWp Grid Connected Solar Photovoltaic (SPV) Power Plant at Zoram Medical College & Hospital, Falkawn, Mizoram on Engineering Procurement Contruction(EPC) / Turnkey basis.

The bidder shall be deemed to have examined all the tender documents and to have fully satisfied himself regarding the nature and extent of the work, the general and local conditions, access to the site, rooftop conditions, availability of labour, materials, transport, statutory obligations and all other matters affecting the execution of the work. No claim whatsoever shall be entertained on account of failure to examine the tender documents or to inspect the site and acquaint himself with all relevant conditions.

2.0 Mode of Tendering

The tender shall be invited and processed under a two-bid system, namely Part-I consisting of the Technical / Qualification Bid and Part-II consisting of the Financial Bid.

Part-I shall contain all documents relating to eligibility criteria, technical qualification, experience, financial capability, statutory registrations, technical compliance, GTPs(Guaranteed Technical Particulars), datasheets, OEM authorizations and all other documents required under the tender. Part-II shall contain only the duly filled financial bid, price schedule or BOQ(Bill of Quantity).

The Financial Bid of only those bidders who are found technically and commercially responsive in Part-I shall be opened.

3.0 Qualifying Requirements

The qualification of a bidder shall be based on meeting the minimum criteria specified below.

Sl. No.	Criteria	Requirement
1	Experience	The bidder shall have successfully completed, during the last five years ending on the last date of bid submission, similar Solar Photovoltaic (SPV) works. The bidder shall have executed one work of minimum 500 kWp, or two works each of minimum 300 kWp, or cumulative installed capacity of 1000 kWp or more. Similar work shall mean design, supply, installation, testing and commissioning of grid-connected solar PV systems, whether rooftop, ground-mounted or hybrid, including works executed under PM Surya Ghar, net metering, captive solar, institutional

		solar or equivalent schemes.
2	Financial Capability	The bidder shall have achieved an average annual financial turnover of not less than Rs 393 Lakh (30% of the estimated cost) during the last three consecutive financial years, supported by audited financial statements and certificate from Chartered Accountant.
3	Profitability	The bidder shall not have incurred losses in more than two years during the last available consecutive audited financial years.
4	Banker's Certificate / Net Worth	The bidder shall submit either a Banker's Certificate of not less than Rs 524 Lakh (40% of the Estimated Cost) or a Net Worth Certificate of minimum Rs 131 Lakh (10% of the estimated Cost), certified by a Chartered Accountant with UDIN.
5	Statutory Registration	The bidder shall possess and submit valid PAN, valid GST Registration and valid Electrical Contractor License authorizing execution of relevant LT / HT electrical and solar installation works.
6	Joint Venture / Consortium	Joint Venture / Consortium shall be permitted up to two partners. Both partners shall be jointly and severally liable, and the JV Agreement shall be signed by both the partner firms and shall clearly indicate the scope and responsibilities of each partner.
7	Operation & Maintenance Capability	The bidder shall undertake Operation and Maintenance of the plant for a period of five years as required under the project. The bidder shall have prior experience in O&M of solar plants or submit an undertaking to deploy trained manpower for the same.

P&E Department reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

4.0 Documents to be Submitted with Technical Bid

The bidder shall upload or submit the following documents along with Part-I of the bid:

1. Work Orders, Experience Certificates and Completion Certificates for similar solar works.
2. Certificate of Financial Turnover for the last 3 years from Chartered Accountant and audited financial statements.
3. Profitability Certificate.
4. Banker's Certificate or Net Worth Certificate.
5. Valid Electrical Contractor License authorizing execution of relevant LT / HT electrical and solar installation works, GST Registration Certificate and PAN.
6. Proof of Earnest Money Deposit.
7. Joint Venture Agreement and Power of Attorney signed by all participating firms, wherever applicable.
8. List of key manpower with qualifications and designations.

9. Integrity Declaration.
10. Site Visit Certificate duly signed by concerned EE/SDO.
11. OEM Authorizations for major equipment, wherever applicable.
12. Technical compliance statement and preliminary GTP or datasheets for major solar equipment.
13. Any other document required under the tender.

Note: Incomplete submission of the above documents will be liable for rejection. Duly filled forms as per prescribed forms 1-7 in Section VII shall be submitted along with supporting documents.

5.0 Earnest Money Deposit

The bidder shall furnish Earnest Money Deposit of ₹23,08,677/- (Rupees Twenty three lakh eight thousand six hundred seventy seven only) in the form of Demand Draft/Fixed Deposit Receipt, Banker's Cheque, Bank Guarantee, Insurance Surety Bond pledged in favour of the Engineer-in-Chief, Power & Electricity Department, Government of Mizoram. Relaxation or exemption, if any, shall be allowed only in accordance with applicable Government rules and upon submission of valid documentary proof. Any bid not accompanied by valid EMD, unless exempted under applicable rules, shall be liable for rejection.

6.0 Bid Validity

The bid shall remain valid for a period of 180 (One hundred Eighty) days from the date of opening of the Technical Bid. Any bid with a shorter validity period shall be liable for rejection.

7.0 Site Visit and Local Conditions

The bidder is mandated to visit and inspect the site conditions before submission of bid. The bidder shall be deemed to have fully acquainted himself with local conditions, access roads, rooftop conditions, structural constraints, shutdown requirements, storage and transportation arrangements, climatic conditions and labour and logistics availability.

8.0 Technical Submission Requirements

The bidder shall submit, along with the Technical Bid, the technical compliance statement, filled preliminary GTP, product datasheets or catalogues, manufacturer's authorization wherever required, and type test references or test certificates for all major items.

Major items shall include, but not be limited to, Solar PV Modules, 300kVA Grid Connected Inverters, 100kVA Hybrid Inverters / Power Conditioning Units, 3 sets of 300kWh LFP Battery Bank with BMS (total 900kWh battery capacity), Hot Dip Galvanized Module Mounting Structures, ACDB, DCDB, AJB, MJB, cables, earthing system, lightning protection system, CT-operated bidirectional / net metering system and associated control and protection equipment.

Submission of filled technical compliance and preliminary GTP for major equipment shall be mandatory. The successful bidder shall submit final detailed GTPs, drawings, datasheets, QA plans and supporting documents after award and before manufacture or supply for approval by the Department.

9.0 Standards and Certifications

All materials and equipment offered shall conform to relevant applicable standards such as IS, IEC, MNRE guidelines, CEA Regulations, BIS standards and utility / net-metering requirements, as applicable.

The bidder shall submit valid manufacturer's technical documents, quality certifications, test certificates and compliance documents relevant to the offered items.

Solar PV modules shall be sourced from models and manufacturers enlisted in the latest applicable ALMM list of MNRE, wherever ALMM applicability is mandatory under Government of India / MNRE orders at the time of supply. BIS registration and other mandatory certifications applicable on the date of supply shall also be complied with.

10.0 Pre-Bid Meeting

A pre-bid meeting may be held on the date, time and venue indicated in the tender portal. The purpose of the meeting shall be to clarify issues and answer questions raised by prospective bidders. Non-attendance at the pre-bid meeting shall not be a ground for disqualification.

11.0 General Bid Instructions

1. Only one bid shall be submitted by each bidder, either individually or as part of one Joint Venture or Consortium.
2. A single work order or contract shall be issued for the entire project.
3. An incomplete and/or ambiguous and/or conditional bid and/or bid submitted late shall be liable to be ignored/ summarily rejected.
4. The Contractor shall be responsible for obtaining all statutory and safety clearances required for execution of the work.
5. The Contractor shall coordinate with the concerned dept., field officers and other concerned authorities for shutdowns, net metering, grid interconnection and execution planning.
6. The materials used shall be of approved quality and from reputed manufacturers.
7. The Department reserves the right to accept or reject any or all bids without assigning any reason, subject to applicable rules.

12.0 Variation / Addition / Omission

The Contractor shall not make any modification in the works, materials or equipment except with prior written approval of the Employer or Engineer-in-Charge. The Employer shall have the right to alter, amend, omit or otherwise vary the scope of work for successful implementation and commissioning of the project.

SECTION II - SCOPE OF WORK

1. Introduction

The work shall be executed on Engineering, Procurement and Construction (EPC) basis and shall include complete design, engineering, manufacture, procurement, supply, transportation, unloading, storage, handling, insurance, installation, erection, testing, commissioning, trial operation, performance demonstration and successful handing over of the project in all respects. The Contractor shall provide all materials, equipment, accessories, fittings, civil works, electrical works, tools, tackles, consumables and services necessary for the complete and satisfactory execution of the project.

2.1 Name of Work

Installation of 1.5 MWp Grid Connected Solar Photovoltaic (SPV) Power Plant at Zoram Medical College & Hospital, Falkawn, including associated electrical works, distribution strengthening works, commissioning and five-year operation and maintenance.

2.2 General Scope

The Contractor shall execute the works in accordance with the tender conditions, approved drawings, approved Guaranteed Technical Particulars (GTP), applicable Indian Standards, IEC standards, CEA regulations, utility requirements and directions of the Engineer-in-Charge.

The works shall include all activities required for a complete and functional plant, whether or not every minor item is specifically mentioned in this section, provided such items are necessary for safe, reliable and efficient operation of the project.

The scope shall also include all statutory clearances, coordination with the concerned utility and institutional authorities, preparation of drawings and documents, submission of test certificates, and completion of all formalities required for energisation, net metering, commissioning and handover.

2.2.1 Site Details

The project site is located within the campus of Zoram Medical College & Hospital (ZMC&H), Falkawn, in Tlangnuam Block, Aizawl District, Mizoram. The geographical coordinates of the project site are 23.6241240030°N and 92.72833530°E. The site receives solar radiation of about 5.005 kWh/m²/day with average ambient temperature in the range of 19°C to 33°C. Existing government buildings within the campus have been identified for rooftop installation of the solar PV modules. The total available rooftop area considered is 8,644 square metres, which is considered sufficient for installation of 1,500 kWp of solar modules. The modules are proposed to be installed over existing tin roofs after fastening the mounting structures to the building structures, with suitable layout planning to avoid inter-row shadow effects.

2.2.2 Building-wise Proposed Installation Details

Sl. No.	Name of Building	Roof Area (SqM)	Proposed Capacity (kWp)	No. of Modules	Type of SPV Plant
1	OPD Building	1200	180	327	Grid Connected
2	Medical Supdt. Office	700	90	164	Grid Connected
3	Hospital Block A1	1690	300	546	Grid Connected

Sl. No.	Name of Building	Roof Area (SqM)	Proposed Capacity (kWp)	No. of Modules	Type of SPV Plant
4	Hospital Block A2	1456	300	546	Hybrid
5	Hospital Block B	1456	280	509	Grid Connected
6	Academic Building	1818	300	545	Grid Connected
7	MRU Building	324	50	91	Grid Connected
	Total	8644	1500	2728	

The detailed array layout, stringing arrangement, inverter interfacing, battery-backed configuration for the identified hybrid building, cable routing, net metering interface and all related engineering details shall be finalised by the Contractor during detailed design, subject to approval of the Engineer-in-Charge and without reducing the sanctioned scope or performance requirements.

2.3 Detailed Scope of Work

2.3.1 Design, engineering and project planning

Survey of the project site; detailed engineering; array layout; sizing of solar PV system, inverter system, battery-backed hybrid system, cables, protections and earthing; preparation and submission of detailed drawings, single line diagram, layout drawings, structural drawings, battery system drawings, equipment data sheets, method statements, bar chart, quality assurance plan and other documents required for approval.

2.3.2 Solar PV modules

Design support, procurement, supply, transportation, unloading, storage, handling, installation, mounting, interconnection, testing and commissioning of a total 1.5 MWp monocrystalline solar photovoltaic modules of minimum 550 Wp single-module capacity, complete with junction boxes, interconnections, mounting accessories, name plates and all standard accessories required for complete installation and operation.

2.3.3 Grid-connected solar inverters

Procurement, supply, installation, erection, interconnection, testing and commissioning of 4Nos. of 300 kVA grid-connected solar inverters, 600 V DC input and 3-phase 415 V AC output, complete with all standard protections, communication features, accessories, interface equipment, inverter foundations/supports where required, terminations and commissioning services.

2.3.4 Hybrid inverter / Power Conditioning Unit

Procurement, supply, installation, erection, interconnection, testing and commissioning of 3 Nos. of 100 kVA hybrid grid-connected inverter / Power Conditioning Unit with MPPT-based input and 3-phase 415 V AC output, complete with required controls, protections, interfacing arrangements for battery-backed operation and all associated accessories necessary for complete functioning.

2.3.5 Battery energy storage system

Procurement, supply, installation, erection, interconnection, testing and commissioning of 3 sets of Lithium Ferro Phosphate (LFP) battery banks of 300kwh each with at least 8000 charge/discharge cycles to provide back up power supply to Operation Theatre(New), Operation Theatre(Old) and Intensive Care Unit for 7.5 hours, including battery management system (BMS), racks, interconnections, enclosures, safety devices, controls, ventilation requirements and all associated accessories for complete operation of the battery-backed system.

2.3.6 Module mounting structures and structural works

Design, fabrication, supply, erection, installation, alignment, anchoring, tightening and testing of hot dip galvanized module mounting structures, supports, fasteners, clamps, foundation bolts, pedestals and all structural accessories required for secure installation of the PV modules under local site and wind conditions. Providing Housing for Inverter and Battery bank and staff duty room shall also be under the scope of the contractor.

The Contractor shall verify the structural adequacy of each roof / building before installation and shall submit structural stability calculations / certificate from a qualified structural engineer for approval. No installation shall be carried out in a manner that damages the existing roof sheets, waterproofing, trusses, purlins, structural members or building services. Any damage caused during installation shall be rectified by the Contractor at his own cost.

2.3.7 Cables, junction boxes and balance of system

Supply and laying of all DC and AC power cables, control cables, communication cables and associated accessories. This shall include Array Junction Boxes (AJB), Main Junction Boxes (MJB), AC Distribution Boards (ACDB), DC Distribution Boards (DCDB), isolators, connectors, cable glands, lugs, ferrules, raceways, conduits, cable trays, clamps, supports and all other balance of system items required for complete interconnection of the plant.

2.3.8 Earthing, lightning protection and protective equipment

Design, supply, installation, testing and commissioning of complete earthing system, lightning protection system, surge protection devices and all protective equipment required for safe operation of the solar plant, inverter system, battery-backed system and associated electrical installations.

2.3.9 Metering and interface arrangement

Supply, installation, testing and commissioning of CT-operated bidirectional meter(s) with CTs of suitable rating, metering panels, wiring and all accessories necessary for energy accounting and integration with the net metering / utility interface system, as applicable.

2.3.10 Integration, installation, erection and commissioning

Mechanical erection, electrical installation, terminations, interconnections, pre-commissioning checks, testing, trial operation, synchronization, performance demonstration and commissioning of the entire solar power plant including battery-backed sub-system and all associated equipment.

2.3.11 Construction of LT distribution line

Construction of approximately 1 km LT ABC line for power distribution, including galvanized steel tubular poles, stay sets, LT ABC accessories, aerial bunched cable, distribution boxes, pole foundations, erection, stringing, jungle clearance if required, testing and commissioning, complete and applicable departmental standards.

2.3.12 Augmentation of distribution transformers

Supply, installation, testing and commissioning of 3 Nos. 500 kVA, 11/0.415 kV, outdoor type, oil immersed, naturally cooled, copper wound distribution transformers of vector group Dyn11 with tap

changer, conforming to applicable IS standards, including all mounting arrangements and safety clearances as per requirement.

2.3.13 Associated switchgear and HT cable for transformer augmentation

Supply and installation of 3-phase HRC main switch of required rating for the transformer augmentation works and laying of 3-core, 11 kV XLPE aluminium cable of the size, complete with termination kits, glands, lugs, trenching or protective arrangements, testing and commissioning.

2.3.14 Civil, structural and miscellaneous works

All foundations, pedestals, minor civil works, equipment supports, cable trenches, cable route protections, grouting, repair of disturbed surfaces, painting, identification tags, danger boards, anti-climbing devices, fencing modifications if required, housekeeping and all miscellaneous works necessary for complete project execution and satisfactory handover.

2.3.15 Monitoring, control and reporting arrangements

Provision of a suitable monitoring and control arrangement as part of the balance of system for recording plant generation, inverter status, basic electrical parameters, alarms and operating data, together with the required communication hardware, software and accessories for effective operation and reporting. No separate payment shall be made for such balance of system facilities unless specifically provided in the price schedule.

2.3.16 Documentation, training and handover

Submission of approved drawings, manufacturer test certificates, warranty certificates, inspection reports, as-built drawings, operation manuals, maintenance manuals, spare parts list, test results and all completion documents. The Contractor shall impart training to departmental personnel for operation, routine maintenance and safety procedures prior to final handover.

2.3.17 Operation and maintenance

Comprehensive operation and maintenance of the commissioned project for a consecutive period of **five years**, including preventive maintenance, breakdown maintenance, replacement of defective components during warranty, cleaning of solar panel, routine checks, safety compliance, performance monitoring, record keeping and submission of periodic reports.

2.3.18 SCADA system, weather monitoring system, LT & HT Power Interfacing Panels, Plant Monitoring Desk, AC & DC Distribution boards. Data acquisition system with remote monitoring facilities. Provision for specific data transfer to the State Load Dispatch Centre (SLDC) may be provided as per the site/ DISCOM'S requirement.

2.4 Activities Deemed Included in the Scope

Any item, component, fitting, hardware, software, protection device, fastener, support, termination material, consumable or accessory not specifically mentioned but required for completeness, safety, performance, reliability, testing, commissioning or statutory compliance of the works shall be deemed to be included in the Contractor's scope and quoted price.

All loading, unloading, watch and ward, storage, insurance, protection of materials, protection of completed works and disposal of debris during execution shall be the responsibility of the Contractor.

All liaison and coordination necessary for execution inside the Zoram Medical College & Hospital campus and for interconnection with the existing electrical system shall form part of the scope.

2.5 Summary of Major Components

A	**Installation of 1.5 MWp solar power plant**
1	Supply and installation of total 1.5 MWp monocrystalline solar photovoltaic modules of minimum 550 Wp single-module capacity
2	Supply and installation of 4 Nos. of 300 kVA grid-connected solar inverters
3	Supply and installation of 3 Nos. of 100 kVA hybrid inverter / PCU
4	Supply and installation of Battery Energy Storage System consisting of 3 Nos. of LFP battery bank of 300kwh each with BMS
5	Supply and erection of module mounting structures
6	Supply of cables, AJB, MJB, ACDB, DCDB and related BoS
7	Earthing, lightning arresters and protective equipment
8	CT-operated bidirectional metering and integration
9	Integration, installation and commissioning
10	Five-year operation and maintenance
B	**Installation of DT and its associated Lines**
1	Construction of 1 km LT ABC line
2	Installation of 3 Nos. 500 kVA distribution transformers
3	Associated HRC main switch and 11 kV XLPE cable
4	SCADA System

Note: The detailed design, configuration, layout and interfacing arrangement shall be finalised by the Contractor and approved by the Engineer-in-Charge without reducing the sanctioned scope or performance requirements.

SECTION – III
GENERAL CONDITIONS OF CONTRACT

1 DEFINITION OF TERMS

In the Contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them.

EPC shall mean Engineering Procurement Construction

DPR shall mean Detail Project Report

The 'Contract' means the Documents duly signed by both the Parties, forming formal Agreement executed between Power & Electricity Department, Govt. of Mizoram, Aizawl and the Tenderer.

'Contract Price' shall mean the total sum of financial involvement named in or calculated in accordance with the provisions of the Contract Price.

'General Conditions' shall mean these General Conditions of Contract.

'Month' shall mean a Calendar Month.

'Owner' means the Power & Electricity Department, Govt. of Mizoram, Aizawl.

'Project' refers to that mentioned under the headings of the Tender Specifications.

'Purchaser' shall mean the Engineer-in-Chief, Power & Electricity Department, Govt. of Mizoram, Aizawl.

'Purchaser's Representatives' shall mean any Person or Consulting Firm appointed and remunerated by the Purchaser to Supervise, Inspect, Test and Examine Workmanship on the Survey, Supply and erection works.

'The Contractor' shall mean the Tenderer whose Bid has been accepted by the Purchaser and shall include the Tenderer's Executors, Administrators, Successors and permitted assigns approved by Engineer-in-Chief, Power & Electricity Department, Mizoram, Aizawl.

'The Engineer/Engineer in charge' shall mean the Engineer appointed by the Purchaser/Owner for the purpose of this Contract.

'Specification' shall mean the specification annexed to or issued with the General Conditions and shall include the Schedules and Drawings attached thereto as well as samples and patterns, if any.

'Ton' or 'Tonne' used in these specifications shall mean Metric Ton, unless otherwise specified.

'Plant' is any integral part of the works, which has mechanical, electrical, electronic or chemical or biological functions.

'Contract Documents' shall mean the following documents which shall be deemed to form an integral part of this Contract.

i) Contract Agreement, Instructions to Tenderers and all conditions of contract.

ii) Contractor's proposal including the letters or clarifications there to between the Contractor and the Purchaser prior to award of Contract and

iii) Equipment Specifications and Drawings. In the event of any conflict between the above mentioned documents, the Contract Agreement shall prevail.

'Works' means the materials and equipment to be supplied and the work to be executed as defined and set out in the specifications and includes all extra Work, Additions, Deletions, Substitutions and Variations ordered by the Engineer in accordance with the provisions of the Contract.

'Site' means the land on, under, in or through which the works are to be executed or carried out or such lands as may be agreed between the Owner and the Tenderer as being reasonable and necessary for the carrying out of the work.

'Labourer' shall mean all categories of labour engaged by the Contractor, his Sub- Contractor and his piece workers for work in connection with the execution of the work covered by the specifications. All these labourers will be deemed to be employed primarily by the Contractor.

'Fiscal Year' shall mean a year beginning on 1st April and ending on 31st March in the succeeding year.

'Security Deposit' shall mean all deposits whether in Government Securities, Fixed Deposit Receipts or Bank Guarantees from Nationalized Banks of India, amounts deducted from interim payments or in any other form as specified by the Purchaser pledged to the Owner for due performance of the Contract and shall be adjusted in case of compensations or penalties and which may stand for future either in part or whole as the situation demands.

Letter of Intent means the letter from the Engineer-in-Chief conveying his intention to accept the Bid subject to reservations as may have been stated therein.

Letter of Award/Instruction to Commence means the letter from the Engineer-in-Chief notifying the formal acceptance of the Bid subject to the terms and conditions finally arrived at after conduction/negotiation (if any).

'Manufacturer' used herein refers to the party proposing to design, fabricate and manufacture as specified complete or in part.

'Authorised Representative' of the Owner shall mean any Authorized Officer of the Owner from the level of Junior Engineer and above.

2 Manner of Execution:

The project shall be executed on EPC / turnkey basis with single-point responsibility.

3 Price:

The Contract shall be on **single lump-sum EPC / turnkey basis** for complete design, detailed engineering, supply, transportation, insurance, unloading, storage, handling, erection, installation, integration, testing, commissioning, performance demonstration, documentation, training and handing over of the entire works covered under the Contract.

The quoted **Contract Price** shall be deemed to include the cost of all materials, equipment, labour cess(1% of Contract Price as applicable), accessories, fittings, consumables, minor hardware, tools, tackles, labour, transport, freight, transit insurance, loading, unloading, storage, preservation, watch and ward, taxes, duties, levies, erection inputs, testing equipment, commissioning activities, integration works, documentation, as-built drawings, training and all incidental and auxiliary works necessary for complete and successful execution of the project in accordance with the Contract.

The Contract Price shall remain **firm and binding** during the currency of the Contract, except to the extent specifically provided elsewhere in the Contract for statutory variation, approved change in scope, or other expressly admissible adjustment.

Any price break-up, schedule-wise break-up, BOQ-wise break-up, or milestone-wise allocation furnished by the Contractor shall be for the purposes of bid analysis, reasonableness check, progress assessment and payment administration only, and shall not alter the nature of the Contract as a **lump-sum EPC Contract.**

4 Terms of Payment:

The terms of payment under the Contract shall be on **milestone basis** against achievement of defined stages of progress under the EPC / turnkey Contract. No item-wise payment shall be made on the basis of individual BOQ items, supply quantities, erection quantities or actual measurement of isolated items, except where expressly provided elsewhere in the Contract.

Payment shall be released by the Owner subject to availability of funds, certification by the Engineer-in-Charge, submission of valid invoices and supporting documents, and fulfillment of all contractual conditions applicable to the relevant milestone.

The milestone payment schedule shall be as follows:

Mobilization Advance

Ten percent (10%) of the total Contract Price may be paid as Mobilization Advance against submission of an unconditional Bank Guarantee of equivalent amount from a scheduled bank, valid for such period as may be required by the Owner, within fifteen (15) days from signing of the Contract Agreement, subject to availability of funds and approval of the Engineer-in-Charge.

The Mobilization Advance shall be treated strictly as an advance payment and shall not constitute a separate milestone payment. The Mobilization Advance shall be recovered progressively from subsequent running bills on pro-rata basis, or in such manner as may be decided by the Engineer-in-Charge, until fully adjusted. The Bank Guarantee against Mobilization Advance shall be released only after full recovery of the advance. It shall be interest bearing at the rate prescribed by Government/ Department or as specified in the LOA and interest shall be recovered along with advance.

(i) Milestone–1: Survey, Detailed Engineering and Approval of Drawings / GTP

Ten percent (10%) of the total Contract Price shall be payable upon completion of site survey, verification of existing site conditions, detailed engineering, submission and approval of layout drawings, single line diagrams, design calculations, structural arrangement, equipment data sheets and Guaranteed Technical Particulars, as applicable under the Contract, and certification thereof by the Engineer-in-Charge.

(ii) Milestone–2: Supply and Delivery of Major Materials and Equipment at Site

Forty percent (40%) of the total Contract Price shall be payable upon supply and delivery of major materials, equipment and systems at site in good condition, including but not limited to Solar PV modules, inverters, battery bank, battery management system, module mounting structures, transformers, AC/DC cables, AC/DC distribution boards, protection equipment, metering equipment, earthing materials, lightning protection system, LT ABC line materials and other associated items required under the Contract.

Payment under this milestone shall be subject to verification of quantities, receipt records, manufacturer test certificates, inspection clearances wherever applicable, safe storage at site and certification by the Engineer-in-Charge.

(iii) Milestone–3: Erection, Installation, Integration and Completion of Major Physical Works

Twenty-five percent (25%) of the total Contract Price shall be payable upon completion of major physical works, including installation of Solar PV modules, module mounting structures, inverters, battery system,

transformers, AC/DC panels, cables, terminations, LT ABC line, earthing system, lightning protection system, metering arrangement, protection system, net-metering/grid interconnection arrangement and all associated field activities required under the Contract, duly certified by the Engineer-in-Charge.

(iv) Milestone–4: Testing, Commissioning and Successful Grid Synchronization

Ten percent (10%) of the total Contract Price shall be payable after completion of testing, pre-commissioning checks, insulation resistance tests, earth resistance tests, inverter functional tests, battery system tests, protection tests, metering tests, safety checks, grid synchronization/net-metering checks, successful commissioning of the complete system and certification thereof by the Engineer-in-Charge.

(v) Milestone–5: Final Acceptance and Handing Over

Five percent (5%) of the total Contract Price shall be payable after successful operation during the prescribed observation period, rectification of defects, submission of all completion documents including as-built drawings, operation and maintenance manuals, test reports, warranty certificates, equipment manuals, statutory approval documents and handing over of the works to the Owner, and issuance of Final Acceptance / Completion Certificate by the Engineer-in-Charge.

(vi) Milestone–6: Operation and Maintenance for Five Years

Ten percent (10%) of the total Contract Price shall be reserved towards Operation and Maintenance of the complete Solar PV power plant and associated systems for a period of five (5) years from the date of successful commissioning / final acceptance, as specified in the Contract.

The O&M amount shall be payable in five equal annual installments of two percent (2%) of the total Contract Price each, after satisfactory completion of each year of O&M service and certification by the Engineer-in-Charge.

The scope of O&M shall include regular inspection, preventive maintenance, breakdown maintenance, cleaning of Solar PV modules, monitoring of inverter and battery performance, checking of cables, terminations, earthing system, protection system, metering arrangement, LT ABC line and associated electrical installations, attending defects, replacement of defective minor parts and consumables, maintaining generation and maintenance records, and submission of periodic O&M reports to the Owner.

Payment for O&M shall be subject to satisfactory performance of the plant, compliance with the prescribed O&M obligations, rectification of defects, submission of maintenance records and certification by the Engineer-in-Charge.

General Conditions Relating to Payment

All payments shall be subject to deductions, recoveries, adjustment of Mobilization Advance, statutory deductions, taxes, duties, levies, liquidated damages, if any, and other recoveries as applicable under the Contract.

Approval of any invoice, milestone certificate, drawing, GTP, document, inspection report, O&M report or stage payment shall not relieve the Contractor of any responsibility or liability under the Contract. The Contractor shall remain fully responsible for the complete and satisfactory design, supply, installation,

testing, commissioning, performance, operation and maintenance of the entire EPC works during the Contract period.

The above milestone payment schedule is only a mechanism for progressive payment and shall not convert the EPC contract into an item-rate or re-measurement contract. The Contractor shall be responsible for completing the entire scope of work on a lump-sum EPC basis, whether or not any minor item, accessory, fitting, support, connector, cable, consumable, civil foundation, statutory compliance or incidental work is specifically mentioned in the BOQ, price schedule or any other part of the Contract.

5 Mode of Payment:

Payments shall be made subject to availability of fund by the Owner at the receipt of the Tenderer's invoice, complete in all respects and supported by the requisite documents and fulfillment of stipulated conditions, if any. All the payment shall be released to the Contractor directly.

All invoices under the Contract shall be raised by the Tenderer on "the Owner" and all payments shall be made to the Contractor by the Owner.

6 Target Date of Completion:

The work up to commissioning shall be completed within 9 (nine) months from the date of signing of the Contract Agreement. The five year O&M period shall commence from the date of successful commissioning and final acceptance.

7 Extension of Time:

If the supply of equipment or execution of the works is delayed due to reasons beyond the control of the Contractor, the Contractor shall, without delay and in any case within thirty (30) days of occurrence of the event causing delay, give notice in writing to the Purchaser with full particulars and supporting documents in support of his claim for extension of time.

The Purchaser, on receipt of such notice and after examination of the circumstances, may grant such reasonable extension of the Contract Completion Date as may be justified. In case of Force Majeure or any such circumstances accepted by the Purchaser as beyond the control of the Contractor, extension of time may be granted without levy of Liquidated Damages. In all other cases, extension of time, if granted, may be with Liquidated Damages, as decided by the Purchaser.

8 Defect Liability Period:

"Defect Liability Period" means 12 calendar months after successful commissioning and formal taking over of the Project by the Owner. The Defect Liability Period shall be distinct from equipment warranties and the five-year comprehensive Operation and Maintenance obligation. Where a longer warranty is specified for any equipment, such longer warranty shall prevail for that equipment.

The Contract shall not be considered completed until a Defects Liability Certificate shall have been signed by the Engineer-in-Charge and delivered to the Contractor stating the date on which the Contractor shall have completed his obligations to execute and complete the Works and remedy any defects there in to the Engineer's satisfaction. The Defects Liability Certificate shall be given by the Engineer within 28 days after the expiration of the Defects Liability Period, or, if different defects liability periods shall become applicable to different sections or parts of the Permanent Works, the expiration of the latest such period, or as soon thereafter as any works instructed, pursuant to relevant clauses of this Chapter have been completed to the satisfaction of the Engineer-in-Charge.

Notwithstanding the issue of the Defects Liability Certificate, the Contractor and the Owner shall remain liable for the fulfillment of any obligation incurred under the provisions of the Contract prior to the issue of the Defects Liability Certificate which remains unperformed at the time such Defect Liability Certificate is issued and for the purposes of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force between the parties.

If it appears to the Engineer or his Representative at any time during construction or reconstructions or prior to the expiry of the Defects Liability Period, as specified or 12 (twelve) calendar months from the certified date of final completion of entire work covered under the Contract, that any work has been executed with unsound, imperfect, or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the work are unsound or of a quality inferior to that contracted for, or otherwise not in accordance with the Contract or that any defect, shrinkage or other faults in the work arising out of defective or improper materials or workmanship, the Contractor shall upon receipt of a notice in writing on that behalf from the Engineer, forthwith rectify or remove or reconstruct the works so specified in whole or in part as the case may be and/or remove that material/articles so specified and provide other proper and suitable materials at his own expense.

9 Completion of the work:

The work shall be completed to the entire satisfaction of the Engineer and in accordance with the time stipulated in the Contract. The works shall be deemed complete only after completion of all supply, erection, installation, testing, commissioning, successful operation and performance demonstration, submission of all drawings, manuals, test reports, as-built documents and clearance of the site in all respects.

As soon as the work under the Contract is substantially completed as a whole, the Contractor shall give notice of such substantial completion to the Engineer together with an undertaking to complete any outstanding work during the Defect Liability Period. The Engineer shall, within 30 days of receipt of such notice, inspect the works and, if satisfied that the works have been substantially completed in accordance with the Contract, issue to the Contractor a Certificate of Completion indicating the date of completion. If defects or incomplete items are noticed, the Engineer shall issue a written notice requiring rectification / replacement / completion within such time as may be specified, and upon compliance and further notice by the Contractor, the Engineer shall inspect and issue the Completion Certificate accordingly.

No Certificate of Completion shall be issued and no work shall be considered completed unless the Contractor has removed from the site and / or premises all temporary arrangements, surplus materials, debris, tools, plants and belongings brought by him for execution of the work and has cleared the site in all respects to the satisfaction of the Engineer. If the Contractor fails to do so, the Engineer may, at the

risk and cost of the Contractor, carry out such clearance and recovery shall be made from dues payable to the Contractor.

10 Taking over:

i) The work shall be taken over from the Contractor by the Owner after successfully commissioned and after fulfillment of all contract obligations.

(ii) The issuance of a Taking over Certificate shall in no way relieve the Contractor of his responsibility for the satisfactory operation of the equipment in terms of the specifications.

11 Insurance of Equipment:

The materials and equipment shall be fully insured by the Contractor against damage, lost, pilferage etc. in transit. Insurance Document should be sent along with evidence of dispatch. The insurance shall cover the entire project duration till defect liability period.

12 Replacement:

If the materials/equipment or any portion thereof is damaged or lost before taking over of the work by the Owner, the replacement of such materials/equipment shall be rectified by the Contractor within a specified time to avoid unnecessary delay in the commissioning of the materials and equipment. The replacement of materials/equipment damaged shall be made free of cost by the Contractor.

13 Rejection:

In the event that any portion of the works carried out by the Contractor is found below standard or otherwise not in conformity with the requirements of the Contract Specifications, the Purchaser shall request the Contractor in writing to rectify the same. The Contractor on receipt of such notification shall rectify the work free of cost to the Purchaser. If the Contractor fails to do so, the Purchaser may:

a) at its option replace or rectify such defective work and recover the extra cost so involved from the Tenderer plus 15% of the defective work

b) terminate the Contract.

14 Inspection & Testing During Manufacture:

i) The Purchaser's representative shall be entitled at all reasonable times during manufacture to inspect, examine and test on the Contractor's premises the material, manpower and workmanship of all equipment to be supplied under this Contract by the Contractor and if part of the said equipment is being manufactured on other premise, the Contractor shall obtain for the Purchaser's representative permission to, inspect, examine, and test as if the equipment were being manufactured on the Contractor 's premises. Such inspection, examination and testing shall not release the Contractor from his obligations under this Contract.

ii) The Contractor shall give the Purchaser's Representative thirty (30) days notice in writing of the date and the place at which the materials and equipment will be ready for testing. All the materials shall be tested and inspected by the purchaser's representative after completion of manufacturing at the manufacturer's site if not waived.

iii) Inspection and Testing will be at the cost of Contractor including providing assistance for labour, materials, electricity, fuel and instrument as may be required or as may be reasonably demanded by the Purchaser's Representative to carry out such tests efficiently. Transportation, Food and Lodging of the Purchaser's Representative will also be borne by the Contractor.

iv) When the equipment has passed the specified tests, the Purchaser's Representative shall furnish a Certificate to his effect in writing to the Contractor. The Contractor shall provide reasonable copies of the Test Certificates to the Purchaser.

15 Guarantee:

The Contractor shall provide warranty / guarantee for all materials and equipment supplied under the Contract in accordance with the Technical Specifications, manufacturer warranty and approved GTPs. Solar PV modules, inverters, battery system, distribution transformers and other major equipment shall carry the specific warranty periods stipulated in the Technical Specifications. During the guarantee / warranty period, the Contractor shall remedy, at his own expense, all defects in design, materials, workmanship or performance that may develop under normal use upon written notice from the Purchaser. The provisions of this clause, including transportation, dismantling, reinstallation, testing and all associated costs, shall be complied with within the period specified by the Purchaser. This guarantee period shall cover Defect Liability Period

16 Force Majeure:

The term 'Force Majeure' shall herein mean Riots (other than among the Contractor's Employees), Civil Commotion (to the extent not Insurable), War (whether declared or not), Invasion, Act of Foreign Enemies, Hostilities, Civil War, Rebellion, Revolution, Insurrection, Military or Usurped Power, Damage from Aircraft, Nuclear Fission, such as Earthquake (above 7 Magnitude on Richter Scale), Lightning, Unprecedented Floods, Fires not caused by Contractor 's negligence and other such causes over which the Contractor has no control and are accepted as such by the Purchaser, whose decision shall be final and binding.

In the event of either party being rendered unable by Force Majeure to perform any obligation required to be performed by them under this Contract, the relative obligation of the Party effected by such Force majeure shall be treated as suspended for the period during which such Force Majeure cause lasts, provided the Party alleging that it has been rendered unable as aforesaid, thereby shall notify within 10 days of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of such cause. The Purchaser shall verify the facts and grant such extension or as the case may be as fact justify.

17 Payment due from the Contractor:

All cost and damages for which the Contractor is liable to the Purchaser including a recovery of advance will be deducted by the Purchaser from any amount due to the Contractor under the Contract.

If for any unavoidable reasons, payment is delayed, the Contractor shall neither charge any interest for the delay in payment nor the Contractor shall stop the contract work on account of this.

18 Performance Bond or Bank Guarantee for Security:

At the time of signing the Contract, the Contractor shall provide the Purchaser with Security Deposit / Performance Bank Guarantee for an amount of 10% (ten percent) of the total accepted Contract Price in the form of Demand Draft/Fixed Deposit Receipt, Banker's Cheque, Bank Guarantee, Insurance Surety Bond pledged in favour of the Engineer-in-Chief, Power & Electricity Department, Government of Mizoram. The Performance Security shall remain valid up to completion of the Defect Liability Period and sixty (60) days thereafter, or for such longer period as may be required under applicable Government instructions.

For securing the five-year O&M obligation after completion of DLP, the Contractor shall submit a separate O&M Performance Security of 10%(Ten percent) of O&M total amount(10 percent of the Total Contract Price) or such amount as specified by the Employer before release of the Final Acceptance payment. The Security / Bank Guarantee shall be released only after satisfactory completion of the applicable obligations and on written request by the Contractor. Form of Bank Guarantee is attached.

19 Delay in Completion:

If the Contractor fails to complete the work within the time specified in the Contract Agreement or within the extended time granted without Liquidated Damages, the Purchaser shall recover from the Contractor, as Liquidated Damages, a sum equal to one half of one percent (0.5%) of the Total Contract Price for each week or part thereof of delay from the expiry of the scheduled date of completion. The total Liquidated Damages shall not exceed 10% (ten percent) of the Total Contract Price. Recovery of Liquidated Damages shall not relieve the Contractor from his obligation to complete the works nor from any other liability under the Contract.

20. Contractor's Default & Liability:

The Purchaser may, upon written notice of default to the Contractor, terminate the Contract in whole or in part in any of the following circumstances:

(a) if, in the judgment of the Purchaser, the Contractor fails to complete the work within the time specified in the Contract Agreement or within the period for which extension has been granted by the Purchaser; or

(b) if, in the judgment of the Purchaser, the Contractor fails to comply with any of the other provisions of the Contract.

In the event the Purchaser terminates the Contract in whole or in part under this clause, the Purchaser reserves the right to procure, upon such terms and in such manner as he may deem appropriate, materials and equipment similar to those so terminated, and the Contractor shall be liable to the Purchaser for any additional cost and for delay damages until such reasonable time as may be required for completion / procurement of the same.

If the Contract is terminated under this clause, the Purchaser may require the Contractor to transfer title and deliver to the Purchaser:

(i) any completed materials and equipment; and

(ii) such partially completed materials and equipment, drawings, information and contract rights as the Contractor has specifically produced or acquired for performance of the Contract. The Purchaser shall pay the Contract Price for completed materials and equipment delivered to and accepted by the Purchaser and for manufacturing material delivered and accepted.

If the Purchaser does not terminate the Contract as provided herein, the Contractor shall continue performance of the Contract and shall remain liable to the Purchaser for liquidated damages for delay as set out in Clause 19 until the equipment and works are accepted.

21 Termination of the Contract:

If the Contractor finds it impracticable to continue operations or if, owing to Force Majeure or any cause beyond the control of the parties, the Purchaser finds it impossible to continue operations, prompt notification in writing shall be given by the affected party to the other.

If the delay or difficulties so caused cannot reasonably be expected to cease or become avoidable, or if operations cannot be resumed within six (6) months, either party shall have the right to terminate the Contract upon ten (10) days' written notice to the other. In the event of such termination, payment to the Contractor shall be made as follows:

(a) the Contractor shall be paid for all materials and equipment approved by the Purchaser's Representative and for any other legitimate expenses due to him;

(b) if the Purchaser terminates the Contract owing to Force Majeure or due to any cause beyond his control, the Contractor shall additionally be paid for work done during the said six months' period including financial commitments properly made for performance of the Contract and not reasonably defrayed by payments under item (a); and

(c) the Purchaser shall release all bonds and guarantees at its disposal except in cases where the amount already paid to the Contractor exceeds the final amount due, in which case the Contractor shall refund the excess within sixty (60) days, failing which recovery may be made from the bonds or guarantees furnished.

On termination of the Contract for any cause, the Contractor shall arrange orderly suspension and termination of operations with due regard to the interests of the Purchaser in safeguarding, storing and preserving equipment produced for performance of the Contract and in facilitating salvage and resale thereof.

If the qualifying documents submitted by the Contractor are found to be fake or forged, the Contract may be terminated forthwith at any time during execution, without prejudice to other actions permissible under law and the applicable tender rules.

22 Powers of the Engineer upon Termination:

i) To take possession of the site of Work under the Contract as well as the Land/Premises allotted to the Tenderer for his preliminary, enabling and Works and

ii) To take possession of any Materials, Constructional Plant, Equipment, Implements, Stores, Structures etc. thereon.

The Engineer shall also have powers to carry out the incomplete Work by any means or through any other Agency or by himself at the risk and cost of the Contractor. In such a case, the value of the Work done through such agencies shall be credited to the Contractor at his Contract prices and the Contractor shall pay the excess amount, if any incurred in completing the Work as aforesaid as stipulated herein.

On termination of the Contract in full or in part, the Engineer may direct that a part or whole of such Sub-Station, Equipment and Materials, Structures be removed from the site of the Work as well as from the land/premises allotted to the Contractor for his preliminary, enabling and ancillary Works, within a stipulated period. If the Contractor fails to do so within the period specified in a written notice, the Engineer may cause the same to be sold, and the net proceeds of sale shall be adjusted against amounts due under the Contract.

If the expenses incurred or to be incurred by the Department for carrying out and completing the incomplete work are in excess of the value of the work credited or to be credited to the Contractor, the difference shall be paid by the Contractor to the Department. If the Contractor fails to pay such amount within thirty (30) days of receipt of notice in writing, the Engineer shall be empowered to recover such amount from any sums due to the Contractor under this or any other Contract, from the Security Deposit or otherwise.

The Engineer shall also have the right to sell any or all unused materials, construction plant, equipment, implements and temporary buildings / structures of the Contractor and apply the proceeds thereof towards satisfaction of sums due from the Contractor under the Contract. Subject to the Contract and applicable law, decisions of the Engineer under this clause shall be binding on the Contractor.

23 Bankruptcy

If the Contractor becomes bankrupt or has a receiving order made against him, or compounds with his creditors, or, being a corporation, commences to be wound up otherwise than for purposes of amalgamation or reconstruction, or carries on business under a receiver for the benefit of creditors, the Purchaser shall be at liberty:

(a) to terminate the Contract forthwith by notice in writing to the Contractor or to the liquidator or receiver or to any person in whom the Contract may become vested and to act in the manner provided in Clause 21 as though the said notice had been issued thereunder; or

(b) to give such liquidator, receiver or other person the option of carrying out the Contract subject to his providing a guarantee for due and faithful performance of the Contract up to an amount to be determined by the Purchaser.

24. Contingent Fees

The Contractor warrants that he has not employed any person to solicit or secure the Contract upon any agreement for a commission, percentage, brokerage or contingent fee. Breach of this warranty shall give the Purchaser the right to cancel the Contract or to take such other measure as the Purchaser may deem fit. This warranty shall not apply to commissions payable by the Contractor to established commercial or selling agents for the purpose of securing business.

25. Non-Assignment

The Contractor shall not assign or transfer the Contract or any part thereof without the prior written approval of the Purchaser.

26. Certificate Not to Affect Rights of the Purchaser or the Contractor

Issue of any certificate by the Purchaser or grant of any extension of time by the Purchaser shall not prejudice the rights of the Purchaser under the Contract, nor shall the same relieve the Contractor of his obligations for due performance of the Contract.

27. Settlement of Disputes

Except as otherwise specifically provided in the Contract, all disputes concerning questions of fact arising under the Contract shall initially be referred to the Purchaser for decision. The parties shall first attempt to settle amicably all disputes or differences arising out of or in connection with the Contract. If amicable settlement cannot be reached within a reasonable time, the disputes shall be referred to arbitration in accordance with Clause 28.

28. Arbitration

If at any time any question, dispute or difference whatsoever arises between the Contractor and the Purchaser upon, in relation to or in connection with this Contract, either party may give to the other notice in writing of the existence of such question, dispute or difference, and the same shall be referred to arbitration in accordance with the Arbitration and Conciliation Act, 1996 and statutory modifications thereof.

Unless otherwise agreed by the parties, the dispute shall be referred to a sole arbitrator appointed in accordance with applicable law. The seat and place of arbitration shall be Aizawl, Mizoram, and the proceedings shall be conducted in English. The award of the arbitrator shall be final and binding on the parties.

The cost of and incidental to the arbitration and award shall be at the discretion of the arbitrator.

The work under this Contract shall, if reasonably possible, continue during arbitration proceedings, and no payments due from or payable by the Purchaser shall be withheld on account of such proceedings except to the extent which may be in dispute.

29. Jurisdiction

No legal proceedings shall be taken to enforce any claim and no suit arising out of any conflict shall be instituted except in a court of competent jurisdiction located within Mizoram.

30. Language and Measure

All documents pertaining to the Contract including Specifications, Schedules, Notices, Correspondence, Operating and Maintenance Instructions, Drawings and any other writings shall be in English language. The Metric System of measurement shall be used exclusively in this Contract.

31. Correspondence

i) Any notice to the Contractor under the terms of the Contract shall be served by registered mail, speed post, courier, electronic mail where accepted, or by hand at the Contractor's principal place of business or registered office.

ii) Any notice to the Purchaser shall be served at the Purchaser's principal office in the same manner.

32. Consignee and Paying Authority

The consignee and paying authority for the Contract shall be as specified in the Contract Agreement, Letter of Award, Special Conditions of Contract or relevant schedule / annexure. Unless otherwise specified, the paying authority shall be the Engineer-in-Chief, Power & Electricity Department, against duly passed bills received from the concerned Executive Engineer, and the consignee shall be the concerned field office / sub-divisional officer as applicable to the work.

33. Legal Addresses of the Parties

The legal addresses of the parties to the Contract shall be as stated in the Contract Agreement. Unless otherwise amended in writing, the Purchaser shall be the Engineer-in-Chief, Power & Electricity Department, Government of Mizoram, Aizawl, and the Contractor shall be the address stated in the bid and Contract Agreement.

34. Additional Project-Specific Provisions

(i) Change in Law / Tax Variation: Any change in taxes, duties or statutory provisions after the last date of bid submission and having direct impact on the Contract shall be adjusted accordingly in terms of law and documentary evidence.

(ii) Safety and Statutory Compliance: The Contractor shall be solely responsible for safety of personnel, equipment and works and shall comply with all statutory safety regulations, labour laws, electricity rules, environmental requirements and instructions of the Engineer-in-Charge. Any accident, damage or claim arising out of execution of the work shall be to the Contractor's account, except to the extent attributable to the Employer.

(iii) Drawings, GTPs and Approvals: The Contractor shall submit GTPs, drawings, data sheets, manuals and other documents for approval within the timelines specified in the Contract. Manufacture, supply or execution affecting approved design shall not proceed without required approvals, except at the Contractor's own risk where specifically permitted.

(iv) Final Acceptance: Final acceptance of the works shall be only after successful commissioning, integration, performance verification, submission of all completion documents and as-built drawings, rectification of defects and formal handing over to the Department.

SECTION-IV
SPECIAL CONDITIONS OF CONTRACT

Note: These Special Conditions of Contract shall apply only to the extent of project-specific requirements and shall supplement the General Conditions of Contract. In case of conflict, the provision specifically dealing with this project shall prevail.

1 Purpose and applicability

These Special Conditions of Contract are intended only to cover project-specific requirements arising for the work of installation of 1.5 MWp Grid Connected Solar Photovoltaic Power Plant at Zoram Medical College & Hospital, Falkawn. Matters already adequately covered under the Instructions to Tenderers, General Conditions of Contract and standard contractual provisions shall not be read as repeated herein.

2 Nature of contract

The contract shall be on Engineering, Procurement and Construction (EPC) basis. Accordingly, the Contractor shall be responsible for complete design support, detailed engineering, procurement, manufacture, supply, transportation, unloading, storage, handling, insurance, installation, erection, testing, commissioning, trial operation, successful grid synchronisation, performance demonstration, handover and five-year operation and maintenance of the plant and associated works.

3 Completeness of scope

The Contractor shall provide all equipment, accessories, fittings, hardware, software, civil works, electrical works, consumables, tools, tackles, spares and services required for complete and satisfactory operation of the plant, whether or not each minor item is expressly mentioned in the tender documents, provided the same is necessary for safe, reliable and efficient performance of the system.

4 Equipment to be supplied and installed

The Contractor shall supply, install, test and commission the equipment including solar PV modules, grid-connected solar inverters, hybrid inverter / power conditioning unit, battery bank with battery management system, module mounting structures, associated DC and AC distribution equipment, cables, earthing and lightning protection system, bidirectional CT metering arrangement, LT ABC line, distribution transformers, HRC main switch, 11 kV cable and all other associated Balance of System components required for complete integration of the project.

5 Drawings, design documents and GTP

Before procurement or manufacture of any major equipment, the Contractor shall submit for approval the relevant drawings, data sheets, layout, single line diagram, protection scheme, battery system details, cable schedule, earthing layout, structural details and Guaranteed Technical Particulars for all major equipment. Procurement or installation of major equipment before approval of such documents shall be at the Contractor’s risk. Detailed engineering including GTP, drawings and calculations shall be submitted within specified time. Delay shall directly affect project schedule and shall be Contractor’s responsibility.

6 Site survey and layout responsibility

The Contractor shall verify the site conditions, available roof or installation area, equipment locations, cable routes, transformer placement, interconnection arrangements, clearances, structural feasibility and all other site requirements before finalising the design. Any adjustment required for proper execution at site, without changing the essential sanctioned scope, shall be carried out by the Contractor as part of the EPC obligation.

7 Coordination with existing system and utility interface

The Contractor shall carry out the work in coordination with the existing electrical installation and with the concerned utility and institutional authorities. The scope shall include all interfacing works, terminations, synchronisation arrangements, metering integration, testing formalities and assistance required for energisation and commissioning of the complete plant.

8 Standards, compatibility and approvals

All materials and equipment shall conform to the applicable Indian Standards, IEC standards, CEA regulations, safety requirements and utility requirements. All supplied items shall be mutually compatible and suitable for continuous operation under the site conditions prevailing in Mizoram. Approval of drawings, GTP or documents by the Engineer-in-Charge shall not absolve the Contractor from responsibility for adequacy, correctness, safety and performance of the plant.

9 Installation, testing and commissioning responsibility

All major equipment shall be installed by the Contractor with proper foundations, supports, interconnections, protection arrangements, identification, danger notices, safety devices and accessories. The Contractor shall carry out all pre-commissioning checks, routine tests, site tests, functional tests, protection checks, charging, trial run and commissioning tests necessary to demonstrate readiness and proper functioning of the complete system.

10 Performance demonstration

The plant shall not be deemed complete merely on erection of equipment. Completion shall include successful commissioning, stable operation of the integrated system, demonstration of functional performance of the solar generation system, inverter system, battery-backed system, protection system and evacuation arrangement, and rectification of all defects noticed during testing and trial operation.

For commissioning and acceptance, the Contractor shall demonstrate, at minimum, completion of the approved installed capacity, successful inverter operation and grid synchronization, functional net / bidirectional metering, satisfactory battery backup operation for the designated OT / ICU critical loads, satisfactory insulation resistance and earth resistance tests, operation of protections and shutdown functions, communication / monitoring data visibility, trial operation for the period specified by the Engineer-in-Charge and rectification of all defects observed during testing and trial operation.

11 Operation and maintenance during defect liability / O&M period

The Contractor shall undertake operation and maintenance of the complete plant for a period of five years from the date of successful commissioning or handing over, as specified in the tender documents. During this period, the Contractor shall maintain the solar plant, inverter system, battery system, transformers, lines, metering, protections, monitoring arrangements and all associated equipment in healthy operating condition, and shall attend breakdowns and defects promptly.

12 Training, manuals and handover documents

Before final handover, the Contractor shall provide operation and maintenance manuals, approved drawings, test reports, equipment warranties, catalogues, data sheets, as-built drawings, spare parts recommendations and such other documents as may be required by the Engineer-in-Charge. The Contractor shall also impart training to the Department's designated personnel for operation, routine checks and first-level maintenance of the installed system.

13 No separate payment for incidental items

No separate payment shall be made for minor accessories, supports, clamps, lugs, glands, ferrules, communication accessories, fixing materials, fasteners, consumables, software accessories, protection auxiliaries or other incidental items required for complete installation, unless specifically provided otherwise in the financial bid format. The cost of all such items shall be deemed included in the accepted contract price.

14 Completion Criteria (Project Specific)

The project shall be considered complete only after successful integration and operation of all systems together, and not merely individual equipment commissioning.

15 Data and Document Compatibility

All data, settings, configurations and documentation shall be compatible with existing departmental systems and formats.

16 Type Test Report

The bidder shall furnish valid type test reports / certification documents for the offered major equipment along with the bid, wherever applicable. For solar PV modules, inverters and battery systems, valid IEC / BIS / MNRE / ALMM / internationally recognized certification or test reports from accredited laboratories shall be acceptable. For distribution transformers, cables, switchgear and other electrical equipment, type test reports shall be from CPRI / ERDA / NABL-accredited or other nationally / internationally recognized laboratories, as applicable.

In case the exact type test report for the offered rating / model is not available at bidding stage, type test reports of similar or higher rating equipment may be submitted for review, provided the Employer is satisfied regarding design equivalence.

However, the Employer reserves the right to ask the successful bidder to conduct required type / routine / acceptance tests on the offered equipment after award at no extra cost where compliance is not adequately established, and supply shall be subject to successful completion / acceptance of such tests.

SECTION V
TECHNICAL SPECIFICATIONS

1. General

The technical requirements under this section shall cover design, engineering, manufacture, factory testing, supply, transportation, unloading, storage, erection, installation, testing, commissioning, trial operation and satisfactory performance of all major equipment necessary for the complete execution of the project.

All equipment shall be new, unused, of proven design and suitable for continuous operation under the climatic, electrical and environmental conditions prevailing at Falkawn, Mizoram. The contractor shall ensure compatibility among all supplied equipment and shall be solely responsible for proper integration of the entire system.

Wherever a standard is not specifically stated, the latest revision of the applicable Indian Standard, IEC standard or equivalent internationally accepted standard shall apply. In case of conflict, the more stringent requirement shall prevail.

2. Solar photovoltaic modules

2.1 Scope

The contractor shall design, supply, test, deliver, install, handle, store, commission and make operational the solar photovoltaic modules required for the project, complete in all respects, along with all accessories, interconnections, fittings, mounting interface requirements, labels, junction box connectors, module leads and all other items necessary for satisfactory operation of the plant.

The solar modules shall be suitable for long-term outdoor service under the climatic conditions of the project site, including high humidity, rainfall, heat, ultraviolet exposure, and other environmental stresses normally associated with tropical conditions.

2.2 Applicable Standards

The offered solar modules shall conform to the latest editions of applicable IEC, IS, MNRE and other relevant international or national standards. Compliance shall include, but shall not be limited to, the following standards or their latest equivalents:

- IEC 61215 for design qualification and type approval of terrestrial photovoltaic modules.
- IEC 61730 for photovoltaic module safety qualification.
- IEC 62804 for resistance to Potential Induced Degradation (PID), wherever applicable.
- IEC 61701 for salt mist corrosion resistance, where required by site conditions or tender provisions.
- IEC 62716 for ammonia corrosion resistance, where applicable.
- IEC 60068 series for environmental and mechanical endurance tests.

• Any applicable BIS certification requirement, ALMM requirement, MNRE guidelines, and utility or statutory requirements in force at the time of supply.

2.3 Type and Construction

The solar modules shall be new, unused, crystalline silicon photovoltaic modules suitable for grid-connected solar power plants. The module technology shall be high-efficiency mono crystalline type, preferably Mono PERC, TOPCon, HJT or other approved equivalent technology of proven field performance.

The modules shall be manufactured using high-reliability solar cells and shall preferably be of half-cut cell construction to reduce internal losses and improve electrical performance under partial shading conditions.

The modules may be of glass-backsheet or glass-glass construction as proposed by the contractor and approved by the employer; however, the offered construction shall be suitable for the project design life and site conditions.

2.4 Rating and Electrical Performance

The rated peak power of each solar module under Standard Test Conditions (STC) shall be clearly declared by the bidder. The module wattage shall be selected to optimize the plant design and shall meet the approved DC capacity requirements of the project.

The module efficiency at STC shall be clearly stated and shall be as high as practicable for the offered technology. Higher module efficiency shall be preferred in order to reduce land use, module support structure quantity and cable lengths for the same plant capacity.

The power output tolerance shall be positive or tightly controlled. Modules with negative tolerance shall not be accepted unless expressly permitted in the tender conditions.

The bidder shall furnish complete electrical characteristics of the offered module, including maximum power (Pmax), open circuit voltage (Voc), short circuit current (Isc), voltage at maximum power (Vmp), current at maximum power (Imp), module efficiency and maximum series fuse rating.

2.5 System Voltage and String Design Compatibility

The module shall be suitable for use in 1000 V DC or 1500 V DC photovoltaic systems, as per the approved plant design. The maximum system voltage rating of the module shall be clearly specified by the bidder.

The voltage and current characteristics of the module shall be fully compatible with the proposed inverter configuration, MPPT window, cable sizing, combiner arrangements, protection coordination and overall DC system design.

2.6 Temperature Performance

The temperature coefficients of power, voltage and current shall be declared by the bidder. The temperature coefficient of maximum power shall be low in magnitude so as to minimize energy loss at elevated operating temperatures.

The module shall maintain stable performance under high operating temperatures commonly experienced under field conditions. The Nominal Operating Cell Temperature (NOCT) or equivalent operating temperature parameter shall also be furnished.

2.7 Mechanical Characteristics

The bidder shall provide full details of the module dimensions, weight, cell configuration, glass thickness, frame dimensions, frame material and junction box arrangement.

The module frame shall be made of corrosion-resistant material, generally anodized aluminium alloy or approved equivalent, with adequate mechanical strength to withstand transportation, handling, installation loads and long-term outdoor exposure.

The module shall be capable of withstanding design mechanical loads on the front and rear faces in accordance with the applicable standards. The guaranteed mechanical load ratings for wind, suction and other relevant service loads shall be clearly indicated.

2.8 Junction Box, Connectors and Cables

Each module shall be provided with a suitably rated, weatherproof and UV-resistant junction box, preferably with minimum protection degree of IP68 or equivalent.

The junction box shall contain the required number of bypass diodes for protection against hot-spot formation and partial shading effects.

Module output cables shall be of adequate cross-section, UV-resistant, outdoor grade and suitable for the operating voltage and temperature. The connectors shall be touch-safe, locking type, field-proven and compatible with the associated DC cabling system.

2.9 Degradation and Long-Term Output Warranty

The bidder shall clearly state the first-year degradation and the annual degradation rate thereafter. The module shall have a well-defined long-term performance warranty supported by the manufacturer.

The guaranteed minimum output after the applicable warranty period, typically 25 years or 30 years depending on module type, shall be clearly stated. Preference shall be given to modules with lower degradation and stronger long-term performance guarantees.

2.10 Reliability Requirements

The offered modules shall be resistant to Potential Induced Degradation (PID), Light Induced Degradation (LID), and Light and Elevated Temperature Induced Degradation (LeTID), as applicable to the offered cell technology.

The modules shall be capable of safe and reliable operation in hot, humid and rainy climates and shall demonstrate satisfactory resistance to moisture ingress, corrosion, mechanical fatigue, UV exposure and thermal cycling.

2.11 Identification and Traceability

Each module shall bear a durable, legible and non-removable label showing at least the manufacturer name, model number, serial number, year of manufacture, electrical ratings, maximum system voltage, safety class and relevant certification markings.

The serial numbering and barcode or QR identification system, if provided, shall support traceability for warranty management, quality control and plant asset management.

2.12 Factory Testing and Certification

The bidder shall submit valid type test certificates, design qualification certificates and safety compliance documents for the offered module model or equivalent family of models from accredited laboratories.

Routine factory quality assurance records, flash test data and inspection records shall be made available as required under the contract. The employer or its representative may inspect the manufacturing and testing process before dispatch, if so provided in the tender.

2.13 Warranty

The solar modules shall be covered by a product warranty against defects in material, workmanship, design and manufacturing quality for the period specified in the contract. The product warranty period shall be clearly stated by the bidder.

In addition, the modules shall be covered by a performance warranty guaranteeing the minimum output level over the specified warranty duration. Any module found defective or under-performing beyond the permissible warranty limits shall be repaired or replaced by the contractor at no extra cost to the employer.

2.14 Approved Manufacturer and Provenness

The offered module shall be a standard, commercially proven product manufactured by an established solar module manufacturer with adequate production capacity, quality assurance systems and service support.

The bidder shall furnish documentary evidence regarding manufacturer experience, production capability, certifications, previous project references and after-sales support arrangement.

2.15 Documentation

The bidder shall furnish detailed data sheets, catalogue information, guaranteed technical particulars, test certificates, warranty declarations, installation instructions, handling and storage instructions, and operation and maintenance guidance relevant to the offered module.

All documents shall clearly correspond to the exact module make and model proposed in the bid.

3. Hybrid inverter / power conditioning unit - 100 kVA

3.1 Scope

The work shall include design support, manufacture, testing, supply, packing, forwarding, transportation, unloading, storage, installation, testing, commissioning and integration of 100 kVA hybrid grid connected inverter / power conditioning unit complete with all accessories, controls, communication interfaces, protection devices, software, wiring terminations and all ancillary items required for efficient, reliable and safe operation of the solar photovoltaic system with battery back-up.

3.2 Basis of Design

The equipment shall be a 100 kVA hybrid grid connected inverter / power conditioning unit with 240 V MPPT based DC input and 3-phase 415 V AC output. The inverter is intended for the 100 kWp SPV plants with battery back-up proposed for operation theatres and ICU, and the quantity under the project is 3 Nos. The offered equipment shall fully conform to this project basis.

3.3 Type of Equipment

The inverter / power conditioning unit shall be a static, solid-state, microprocessor controlled, hybrid grid interactive power conversion system designed specifically for solar photovoltaic applications with battery integration. It shall be capable of converting DC power from the SPV array and battery bank into synchronized 3-phase AC power and shall manage power flow between solar array, battery storage, connected load and utility grid as per system control philosophy.

3.4 Duty and Application

The unit shall be suitable for continuous duty for hospital critical loads and shall be specifically suitable for backup support to Operation Theatre (New), Operation Theatre (Old) and Intensive Care Unit installations. The inverter shall be designed for safe and stable operation in grid-connected mode, battery-assisted mode and emergency backup mode as applicable.

3.5 Applicable Standards

The equipment shall conform to the latest editions of applicable IEC, IS, CEA and MNRE requirements, including but not limited to IEC 62109-1 and IEC 62109-2 for safety, IEC 61683 for efficiency measurement, IEC 61727 for utility interface, IEC 62116 for anti-islanding protection, IEC 61000 series for electromagnetic compatibility, IEC 60529 for enclosure protection, IEC 60068 for environmental testing, and all applicable Indian standards and utility interconnection requirements. In case of any conflict, the more stringent requirement shall prevail.

3.6 Rated Capacity

The rated apparent power of each inverter / power conditioning unit shall be 100 kVA. The equipment shall be capable of delivering rated output continuously at the declared site conditions without exceeding the permissible temperature rise limits of internal components.

3.7 DC Input Characteristics

The inverter shall be suitable for photovoltaic DC input with 240 V MPPT based input. The bidder shall clearly state the nominal DC voltage, MPPT operating voltage range, maximum DC voltage, maximum DC current, number of MPPT channels, and the permissible array sizing range. The unit shall be designed so that the photovoltaic array configuration adopted under the project remains within all voltage and current limits under all operating conditions including low temperature open-circuit condition.

3.8 Battery Interface

The inverter / power conditioning unit shall be suitable for seamless integration with the battery bank provided under the project. The battery interface shall support charging, discharging, protection coordination and control functions as required for hybrid operation. The bidder shall furnish details of battery voltage window, charging method, battery protection logic, communication interface with battery management system and control philosophy for charging from solar and grid, if applicable.

3.9 AC Output Characteristics

The inverter shall provide 3-phase, 415 V, 50 Hz AC output synchronized with the utility grid. The output waveform shall be sinusoidal and suitable for operation with sensitive hospital loads. The inverter shall maintain stable output characteristics within permissible limits under varying solar generation, battery state and load conditions.

3.10 Operating Modes

The inverter / power conditioning unit shall be capable of operating in grid-connected solar mode, battery charging mode, battery discharge / backup mode and automatic transition mode during grid interruption. The transition philosophy shall ensure continuity of supply to designated critical loads with minimum disturbance. The bidder shall furnish a detailed functional description of operating modes and priority logic.

3.11 Efficiency

The inverter shall be of high efficiency design. Maximum conversion efficiency shall preferably not be less than 97.5%, and weighted / European efficiency shall be clearly declared by the bidder. Efficiency curves at different loading conditions shall be furnished.

3.12 MPPT Performance

The inverter shall incorporate fast and accurate maximum power point tracking to maximize solar energy harvest. MPPT control shall be effective under varying irradiance and temperature conditions. The bidder shall state the MPPT efficiency and the number of MPPT trackers provided.

3.13 Power Quality

The inverter shall deliver output power of acceptable quality. Total harmonic distortion of output current at rated condition shall generally not exceed 3%. DC injection into the AC network shall be within permissible standard limits. The equipment shall be capable of operating at near unity power factor under normal conditions and shall provide adjustable power factor or reactive power control if required by the utility or system designer.

3.14 Synchronization and Anti-Islanding

The inverter shall automatically synchronize with the grid when grid voltage and frequency are within permissible limits. It shall incorporate inbuilt anti-islanding protection conforming to IEC 62116 or equivalent standard and shall automatically disconnect from the grid on failure or abnormality of supply. Reconnection shall take place only after restoration of normal grid conditions and expiry of the preset reconnection delay.

3.15 Protection Features

The inverter / power conditioning unit shall be provided with all necessary protections, including but not limited to DC over-voltage protection, DC over-current protection, reverse polarity protection, AC over-voltage protection, AC under-voltage protection, over-frequency protection, under-frequency protection, overload protection, short-circuit protection, over-temperature protection, insulation monitoring, ground fault protection, anti-islanding protection, DC surge protection, AC surge protection and battery related protections. All alarm and trip conditions shall be annunciated locally and made available for remote monitoring.

3.16 Enclosure and Degree of Protection

The inverter enclosure shall be of rugged industrial construction suitable for the installation environment approved under the project. For outdoor installation, the enclosure protection shall be minimum IP65 or better. For indoor electrical room installation, the enclosure shall still be dust-proof, vermin-proof and suitable for humid tropical conditions. The enclosure shall be corrosion-resistant and adequately ventilated or cooled.

3.17 Cooling Arrangement

The inverter shall have a reliable cooling arrangement such as intelligent forced air cooling or any other proven cooling system suitable for continuous duty. The cooling system shall be designed for local ambient conditions and shall not impair performance or reliability.

3.18 Monitoring, Display and Communication

The inverter shall be provided with local display and communication facilities for monitoring, diagnostics and system integration. It shall provide, at minimum, indication or communication of DC voltage, DC current, AC voltage, AC current, frequency, active power, reactive power, energy generated, battery status, inverter status, trip indications, alarm logs and event history. Communication interfaces such as RS-485, Ethernet, Modbus RTU, Modbus TCP/IP or equivalent shall be provided as required for integration with the plant monitoring and control system.

3.19 SCADA / Remote Monitoring Integration

The bidder shall include all hardware and software required for seamless integration of the inverter with the plant SCADA or remote monitoring system. Protocol mapping, signal list, ports, converters, communication cables and interface modules required for complete integration shall form part of the scope.

3.20 Environmental Suitability

The inverter shall be suitable for operation under the site environmental conditions of Mizoram, including high humidity, tropical climate, heavy rainfall and continuous duty conditions. The bidder shall state clearly any derating due to ambient temperature, altitude or enclosure arrangement.

3.21 Mechanical Construction

The inverter shall be robustly built with adequately rated power electronic devices, bus bars, internal cabling, terminals and protective devices. Internal wiring shall be neatly ferruled and identified. Construction shall permit safe inspection and maintenance. Hardware and exposed metallic parts shall be corrosion resistant.

3.22 Acoustic Noise

The inverter shall have acceptable acoustic noise during normal operation. The bidder shall state the guaranteed noise level in dB(A) at rated operating condition.

3.23 Tests and Inspection

The inverter shall be routine tested at the manufacturer's works and shall be backed by valid type test reports from accredited laboratories for the offered model or equivalent family. Routine tests shall include visual inspection, functional tests, electrical safety checks, protection tests, synchronization checks and communication checks. Type tests shall cover safety, anti-islanding, efficiency, EMC and environmental suitability, as applicable. Acceptance inspection and witness testing may be carried out by the Employer or its representative.

3.24 Documentation

The contractor shall submit detailed data sheets, guaranteed technical particulars, general arrangement drawings, wiring diagrams, interface drawings, protection details, test certificates, catalogues, operation and maintenance manuals, troubleshooting manuals, communication details and warranty documents for review and approval before supply.

3.25 Warranty and Service Support

The inverter / power conditioning unit shall be warranted for not less than 5 years from the date of successful commissioning, unless a longer warranty is specified elsewhere in the contract. During the warranty period, all defects due to design, material, workmanship or performance deficiency shall be rectified or the defective unit replaced without extra cost to the Employer. The bidder shall indicate after-sales service support arrangement, availability of spare parts and response time.

3.26 Guaranteed Technical Particulars

The bidder shall furnish complete Guaranteed Technical Particulars for the offered inverter / power conditioning unit, including make and model, type, rated kVA, rated kW, nominal DC input voltage, MPPT voltage range, maximum DC voltage, maximum DC current, battery voltage range, charging parameters, AC output voltage, frequency, efficiency, THD, power factor range, degree of protection, cooling type, operating temperature range, communication protocol, dimensions, weight, standards complied with and warranty.

GUARANTEED TECHNICAL PARTICULARS (To be furnished by the bidder)

Sl. No.	Particulars	Bidder's Offer
1	Equipment	100 kVA Hybrid Grid Connected Inverter / Power Conditioning Unit
2	Project basis as per DPR	240 V MPPT based DC input, 3-phase 415 V AC output
3	Rated apparent power	100 kVA
4	Rated active power	To be stated by bidder
5	Nominal DC voltage	To be stated by bidder
6	MPPT voltage range	To be stated by bidder
7	Maximum DC voltage	To be stated by bidder
8	Maximum DC current	To be stated by bidder
9	Number of MPPT channels	To be stated by bidder
10	Battery voltage range / interface details	To be stated by bidder
11	AC output voltage	415 V, 3-phase
12	Frequency	50 Hz
13	Maximum efficiency	To be stated by bidder
14	Weighted / European efficiency	To be stated by bidder
15	Output current THD at rated condition	To be stated by bidder
16	Power factor range	To be stated by bidder
17	Degree of protection	To be stated by bidder
18	Cooling system	To be stated by bidder
19	Operating temperature range	To be stated by bidder
20	Communication protocol / ports	To be stated by bidder
21	Dimensions and weight	To be stated by bidder
22	Applicable standards complied with	To be stated by bidder
23	Warranty	Minimum 5 years or as specified in contract

4. Grid-connected solar inverters - 300 kVA

The inverter offered under this contract shall be suitable for the project requirement namely 300 kVA grid-connected solar inverter, 600 V DC input and 3-phase 415 V AC output, complete with all accessories, protections, control interfaces, communication hardware, and ancillary items required for safe and reliable operation of the solar PV plant.

4.1 Scope

The scope of work shall include design support, manufacture, testing, supply, packing, forwarding, transportation, unloading, storage at site, installation, testing, commissioning, trial operation and integration of 300 kVA grid-connected solar inverters complete with all fittings, accessories, communication devices, protection functions, software, licenses, termination hardware, interconnection accessories and all other items required for complete and satisfactory operation.

4.2 Project Basis

The offered inverter shall be rated 300 kVA, shall be suitable for solar photovoltaic duty, shall accept 600 V DC input as the project design basis, and shall provide 3-phase, 415 V, 50 Hz AC output synchronized with the utility grid.

4.3 Applicable Standards

The inverter and all associated equipment shall conform to the latest editions of applicable IEC, IS, CEA, MNRE and utility interconnection standards, including but not limited to IEC 62109-1, IEC 62109-2, IEC 61683, IEC 61727, IEC 62116, IEC 61000 series, IEC 60529 and IEC 60068. Wherever Indian standards or utility requirements are more stringent, those requirements shall prevail.

4.4 Type and Construction

The inverter shall be a static, solid-state, microprocessor-based, grid-interactive solar inverter specifically designed for photovoltaic applications. It shall be of robust industrial construction, suitable for continuous duty, and shall be complete with control and protection logic, switching devices, power electronic assemblies, filters, heat dissipation arrangement, operator interface, event and fault recording functions, and communication ports for monitoring and SCADA integration.

4.5 Rating and Output Characteristics

Each inverter shall have a rated apparent power output of 300 kVA and shall be suitable for continuous operation at rated load under site conditions without exceeding permissible temperature rise limits. The inverter shall provide 3-phase, 415 V AC output at 50 Hz and shall be suitable for parallel operation with the grid and with other inverters in the plant, wherever applicable.

4.6 DC Input Characteristics

The inverter shall be suitable for 600 V DC input. The bidder shall clearly indicate the nominal DC input voltage, maximum DC input voltage, MPPT operating voltage range, full power operating voltage range, maximum DC current, short-circuit withstand capability at the input, and the number of DC input groups or channels. The design shall ensure that the inverter remains fully compatible with the approved PV string configuration under all operating conditions including low-temperature open circuit voltage and high-temperature operating voltage.

4.7 MPPT and Conversion Performance

The inverter shall be provided with advanced maximum power point tracking functions to maximize energy harvest under varying irradiance and temperature conditions. The MPPT algorithm shall be fast, stable and accurate, and shall minimize mismatch losses. The maximum efficiency of the inverter shall preferably not be less than 98%, and the bidder shall furnish weighted or European efficiency together with efficiency curves at different loading levels.

4.8 Grid Synchronization and Power Quality

The inverter shall automatically synchronize with the utility grid and shall export power only when the grid parameters are within permissible limits. The output waveform shall be sinusoidal. Total harmonic distortion of output current shall generally not exceed 3% at rated conditions. DC injection into the grid shall remain within permissible limits. The inverter shall normally operate at near unity power factor and shall be capable of adjustable power factor or reactive power control if required by the utility or plant control philosophy.

4.9 Protection Functions

The inverter shall be provided with comprehensive inbuilt protection including, but not limited to, DC over-voltage protection, DC over-current protection, reverse polarity protection, AC over-voltage protection, AC under-voltage protection, over-frequency protection, under-frequency protection, overload protection, short-circuit protection, over-temperature protection, insulation monitoring, ground fault protection, anti-islanding protection, surge protection on DC side and surge protection on AC side. All protection operations shall result in appropriate alarm, indication and trip logic as applicable.

4.10 Anti-Islanding and Automatic Reconnection

The inverter shall incorporate anti-islanding protection conforming to applicable standards. In the event of grid failure or abnormal grid conditions, the inverter shall automatically disconnect from the grid and shall reconnect only after the restoration of normal grid conditions and completion of a safe reconnection delay. The settings shall be compatible with utility interconnection requirements.

4.11 Enclosure and Degree of Protection

The inverter enclosure shall be suitable for the approved installation environment and shall be adequately protected against dust, moisture, vermin, accidental contact and corrosion. For outdoor installation, the enclosure protection shall be minimum IP65. For indoor installation, the enclosure protection shall be as per approved manufacturer's design but shall remain suitable for industrial service conditions. The enclosure shall permit safe access for operation and maintenance.

4.12 Cooling Arrangement

The inverter shall have a reliable and efficient cooling arrangement such as intelligent forced air cooling, heat sink based cooling, liquid cooling or other proven industrial arrangement as per manufacturer's standard design. The cooling system shall be suitable for continuous operation under the ambient conditions prevailing at site, and any derating due to temperature or altitude shall be clearly declared by the bidder.

4.13 Monitoring, Display and Data Logging

Each inverter shall be provided with local display and operator interface for monitoring operating parameters, status conditions, alarms and fault history. The inverter shall display or communicate, at minimum, DC voltage, DC current, AC voltage, AC current, active power, reactive power, frequency, cumulative energy, daily energy, operating status, warning conditions, trips and event logs. The inverter shall support data logging and retrieval for operation and maintenance purposes.

4.14 Communication and SCADA Integration

The inverter shall be fully compatible with the plant monitoring system and SCADA. It shall support communication through RS-485, Ethernet, Modbus RTU, Modbus TCP/IP or equivalent approved protocol as required by the project. The contractor shall include all communication cards, protocol mapping, converters, interface modules, software configuration, signal database and accessories necessary for seamless integration with the plant monitoring and control system.

4.15 Safety Requirements

The inverter shall include all features required for safe operation and maintenance, including suitable isolating arrangement, emergency shutdown provision, touch-safe terminals, warning labels, internal segregation of power and control circuits, and interlocks wherever necessary. The inverter shall be safe for operation by plant personnel and shall comply with applicable electrical safety standards.

4.16 Mechanical Construction and Workmanship

The inverter shall be of rigid and durable construction. All internal components shall be adequately rated and mounted. Busbars, power devices, terminals, cable glands, internal wiring and support members shall be suitable for the intended duty. Wiring shall be neatly laid, properly ferruled and identified. All exposed hardware shall be corrosion resistant, and the overall workmanship shall be of high industrial standard.

4.17 Tests and Inspection

Each inverter shall be routine tested at manufacturer's works and shall be supplied with routine test certificates. Valid type test reports or certificates from accredited laboratories shall be furnished for the offered model or equivalent family covering safety, anti-islanding, efficiency, EMC and environmental suitability. The employer or its representative shall have the right to witness tests or inspect the manufacturing and testing arrangements if required under the contract.

4.18 Documentation

The contractor shall furnish complete technical documentation for approval and record, including data sheets, guaranteed technical particulars, general arrangement drawings, wiring/interface drawings, protection details, communication architecture, type test reports, routine test certificates, O&M manuals, troubleshooting manuals, spare parts list, warranty details and commissioning procedures.

4.19 Warranty and Service Support

The inverter shall be covered by manufacturer's warranty for not less than five years from the date of successful commissioning, unless a higher period is specified elsewhere in the contract. During the warranty period, the contractor shall arrange repair, replacement, firmware support and defect rectification at no extra cost to the employer. The bidder shall indicate the after-sales service arrangement, availability of spares, nearest service support location and expected response time.

4.20 Guaranteed Technical Particulars

The bidder shall furnish complete Guaranteed Technical Particulars for the offered inverter and the offered inverter shall, at minimum, comply with the requirements set out in the following schedule.

Guaranteed Technical Particulars Schedule

Sl. No.	Parameter	Requirement / Minimum Value	Bidder to Confirm
1	Type of inverter	Grid-connected solar inverter for PV	

Sl. No.	Parameter	Requirement / Minimum Value	Bidder to Confirm
		application	
2	Rated inverter capacity	300 kVA	
3	DC input basis	Suitable for 600 V DC input	
4	AC output	3-phase, 415 V, 50 Hz	
5	Grid operation	Automatic synchronization with utility grid	
6	Maximum DC voltage	To be stated by bidder	
7	MPPT operating voltage range	To be stated by bidder; shall match PV array design	
8	Maximum DC current	To be stated by bidder	
9	Maximum efficiency	Preferably not less than 98%	
10	Weighted / European efficiency	To be stated by bidder	
11	Output current THD	Generally not more than 3%	
12	Power factor	Near unity, adjustable if required	
13	Anti-islanding protection	Required	
14	DC reverse polarity protection	Required	
15	Surge protection	Required on DC and AC sides	
16	Ground fault / insulation monitoring	Required	
17	Over-voltage / under-voltage / frequency protection	Required	
18	Enclosure protection	Minimum IP65 for outdoor installation	
19	Cooling arrangement	To be stated by bidder	
20	Communication protocol	RS-485 / Ethernet / Modbus RTU / Modbus TCP-IP as required	
21	Display and data logging	Required	
22	SCADA compatibility	Required	
23	Operating temperature range	To be stated by bidder	
24	Applicable standards	IEC 62109, IEC 61683, IEC 61727, IEC 62116, IEC 61000, IEC 60529, IEC 60068 or equivalent applicable standards	
25	Warranty	Minimum 5 years from successful commissioning	
26	Quantity basis as per DPR	4 Nos.	

Note: The contractor shall furnish detailed manufacturer data sheets and complete confirmed technical particulars with the bid. Any offered parameter inferior to the above minimum requirement shall render the offer liable for rejection.

5. Lithium ferro phosphate battery bank with BMS

5.1 Scope

The contractor shall design, manufacture, test, supply, transport, unload, install, integrate, test and commission the Lithium Ferro Phosphate (LFP) battery bank complete with Battery Management System (BMS), battery racks/cabinets, inter-cell connectors, DC cabling, protection devices, monitoring system, communication interfaces, earthing, labels, accessories and all other items required for safe and reliable operation of the battery energy storage system.

The battery bank shall be suitable for integration with the solar PV system and inverter/PCS arrangement of the project and shall be capable of providing the required backup support to the identified critical loads.

5.2 Project Requirement

The battery system shall be Lithium Ferro Phosphate type with usable storage capacity of 300 kWh per system. The project requirement shall be 3 sets of 300 kWh battery banks of at least 8000 charge/discharge cyles, i.e. total usable battery capacity of 900 kWh. The battery system shall be suitable for solar PV backed critical load application and shall be designed for safe indoor or outdoor installation, as per approved layout, with all protections and interlocks necessary for hospital service continuity.

5.3 Applicable Standards

The battery bank, battery modules, racks, BMS, cables and associated equipment shall conform to the latest editions of applicable IEC, IS, UL and other internationally accepted standards, including but not limited to IEC 62619, IEC 63056, IEC 62477, IEC 61000 series, IEC 60529, IEC 60730 where applicable, IS/IEC safety standards, and all relevant CEA, MNRE and local utility requirements.

In case of any conflict between standards, the more stringent requirement shall prevail.

5.4 Battery Chemistry and Construction

The battery shall be of Lithium Ferro Phosphate (LFP/LiFePO4) chemistry. The cells shall be new, unused, of proven design and from a reputed manufacturer.

The battery bank shall be modular in construction and shall consist of battery cells assembled into modules and modules assembled into racks/cabinets. The system shall be designed to permit safe maintenance, monitoring and replacement of modules, where necessary.

5.5 Capacity and Configuration

The rated battery energy capacity shall back up ICU,OT(New) and OT(Old) for 7.5 Hours. The bidder shall clearly state the nominal energy capacity, usable energy capacity, nominal DC voltage, operating voltage range, charge-discharge rates, recommended depth of discharge and minimum state of charge limits.

The battery bank shall be designed to meet the required backup duration indicated in the DPR and shall be matched with the inverter/PCS and critical load requirement. The bidder shall submit detailed sizing calculations in support of the offered configuration.

5.6 Battery Management System (BMS)

The battery bank shall be provided with an intelligent BMS for continuous monitoring, protection and control of each battery string and module.

The BMS shall continuously monitor cell voltage, module voltage, string voltage, charge-discharge current, cell temperature, module temperature, state of charge, state of health, alarms and fault conditions.

The BMS shall provide at least the following protection and control functions: over-voltage protection, under-voltage protection, over-current protection, short-circuit protection, over-temperature protection, under-temperature protection, cell balancing, charge and discharge control, insulation or grounding fault indication where applicable, event logging and communication to supervisory system.

The BMS shall support communication through Modbus RTU, Modbus TCP/IP, RS-485, Ethernet or equivalent protocols required for integration with the plant monitoring and SCADA system.

5.7 Performance Requirements

The battery bank shall be designed for high cycle life and long service life under the specified operating conditions. The bidder shall furnish guaranteed values for cycle life, calendar life, round-trip efficiency, permissible depth of discharge and capacity retention at the end of warranty period.

Unless otherwise approved, the battery system shall be suitable for daily cycling operation and shall maintain stable performance without abnormal degradation.

The round-trip efficiency of the battery system shall be high and shall be clearly declared by the bidder.

5.8 Electrical Requirements

The bidder shall state the nominal DC voltage and operating voltage range of the battery bank. The design shall be compatible with the associated inverter/PCS.

The battery system shall be designed for safe charging and discharging at the required C-rate. The maximum continuous charge current, maximum continuous discharge current, peak discharge current and short-time overload capability shall be clearly stated by the bidder.

All battery terminals, busbars, links and DC cables shall be adequately rated for the full charge-discharge duty and short-circuit withstand level.

5.9 Enclosure, Rack and Cabinet

The battery modules shall be housed in robust, corrosion-resistant racks or cabinets designed for the intended installation condition. The battery enclosure shall provide adequate ventilation or thermal management and shall prevent accidental contact with live parts.

For outdoor application, the battery cabinet/container shall have suitable weather-proof construction with adequate ingress protection. For indoor application, the battery system shall be suitable for safe operation within the battery room conditions approved for the project.

The rack or cabinet design shall withstand transportation loads, seismic loads where applicable, and normal operational stresses.

5.10 Thermal Management

The battery bank shall be provided with adequate thermal design to maintain cell temperature within the manufacturer's permissible range under all operating conditions. Where active thermal management is required, the bidder shall provide complete cooling/heating arrangement with controls and alarms.

The battery system shall be designed so that temperature variation between cells/modules remains within acceptable limits for reliable battery life and safe operation.

5.11 Safety Requirements

The battery bank shall be designed with all necessary safety features to prevent thermal runaway, internal short-circuit propagation, fire escalation and unsafe operating conditions.

The battery system shall include automatic isolation or shutdown logic under critical fault conditions. Suitable fuses, DC breakers/contactors, disconnectors, emergency isolation arrangement and interlocks shall be provided as required.

The contractor shall provide all required safety labels, warning signs, emergency operating instructions and lockout-tagout provisions.

5.12 Fire Protection and Emergency Measures

The battery system shall incorporate provisions for early fault detection and alarm generation. The bidder shall specify the recommended fire detection, fire suppression and ventilation requirements for the offered battery technology and enclosure arrangement.

Where required by design or safety code, suitable fire barriers, smoke detection, temperature detection, gas detection and suppression interface shall be provided.

The contractor shall furnish a detailed battery safety philosophy, emergency response procedure and shutdown logic for approval.

5.13 Environmental Conditions

The battery system shall be suitable for operation under the climatic conditions prevailing at site, including high humidity, elevated ambient temperature and heavy rainfall conditions typical of Mizoram.

The bidder shall clearly state the permissible ambient temperature range, relative humidity range, altitude limit and any derating applicable to the offered battery system.

5.14 Monitoring, Indication and Communication

The battery bank shall have local and remote monitoring facilities. The system shall provide display or HMI for key battery parameters, alarms and status indications.

All required hardware and software for integration of battery parameters into the solar plant SCADA/monitoring system shall be included in the contractor's scope.

The system shall provide alarm and event history with time stamping and suitable data retention capability.

5.15 Protections

The battery system shall include, as a minimum, protection against over-charge, over-discharge, over-current, short-circuit, reverse polarity, over-temperature and abnormal voltage unbalance.

Protection coordination between the battery bank, BMS, inverter/PCS and associated DC protection system shall be ensured by the contractor.

5.16 Installation Requirements

The contractor shall provide complete installation, internal wiring, interconnection, labeling, earthing and testing of the battery bank. Proper clearance for operation and maintenance shall be maintained around racks/cabinets.

The contractor shall submit installation drawings, battery layout, single line diagram, wiring diagrams, cable schedule and earthing scheme for approval prior to installation.

5.17 Tests

The battery bank and associated BMS shall be routine tested at manufacturer's works and type tested in accordance with applicable standards.

The contractor shall furnish valid type test certificates/reports from accredited laboratories for the offered battery technology or equivalent model family, covering safety, performance and environmental suitability.

Routine tests, factory acceptance tests and pre-dispatch inspection records shall be submitted to the employer. Site acceptance testing shall include verification of installation, BMS operation, communication, charge-discharge performance, alarms and protection functions.

5.18 Guaranteed Technical Particulars

The bidder shall furnish complete Guaranteed Technical Particulars for the offered battery bank, including battery chemistry, nominal capacity, usable capacity, nominal voltage, operating voltage range, depth of discharge, cycle life, round-trip efficiency, charge-discharge rate, cabinet/rack details, ingress protection, communication interfaces, standards, protection features and warranty.

5.19 Warranty

The battery bank, BMS and all associated components shall be covered by comprehensive warranty for the period specified in the bid document. During the warranty period, any defect in design, materials, workmanship, battery performance or BMS operation shall be rectified or replaced by the contractor at no extra cost to the employer.

The bidder shall clearly indicate the guaranteed capacity retention at the end of the warranty period.

5.20 Documentation

The contractor shall submit technical data sheets, GTP, drawings, installation manual, operation and maintenance manual, safety manual, BMS architecture, communication protocol details, recommended spare parts list, test certificates and warranty documents.

6. Module mounting structures

6.1 Scope

The contractor shall design, supply, fabricate, galvanize and install hot dip galvanized module mounting structures complete with rails, fasteners, clamps, supports, anchorages and all accessories required for safe rooftop installation of the PV modules.

6.2 Design requirements

The structure shall be designed to suit the actual rooftop geometry, available area and shadow-free layout approved during detailed engineering. The design shall consider dead load, live load, wind load, corrosion conditions, seismic considerations where applicable and the integrity of the existing roof.

The arrangement shall ensure proper module orientation, tilt, maintenance access, cable routing and drainage without causing damage to the existing roof structure.

6.3 Material and galvanization

Structural steel members shall be hot dip galvanized after fabrication. Galvanization thickness shall be adequate for long service life in outdoor conditions. Fasteners shall be of corrosion resistant material.

7. Cables, combiner boxes and control panels

7.1 Scope

This section covers DC cables, AC cables, battery cables where applicable, array junction boxes, main junction boxes, AC distribution boards, DC distribution boards, isolators, terminations, lugs, glands, ferrules, cable trays, conduits and all associated accessories included under the DPR item for cables and controlling units.

7.2 Cable requirements

DC cables shall be UV-resistant, flame-retardant, weatherproof and suitable for photovoltaic applications. AC and power cables shall be sized for the actual current carrying duty with acceptable voltage drop, short circuit withstand and installation conditions.

All cables shall be laid, dressed, tagged and terminated in a neat and workmanlike manner. Cable sizing shall be based on approved detailed engineering calculations.

7.3 AJB, MJB, ACDB and DCDB

The boxes / panels shall be fabricated from suitable material with adequate ingress protection for the respective installation environment. They shall house the required switchgear, protection devices, busbars, terminals, surge protection devices and metering / indication as required.

Each unit shall be suitably rated for voltage, current, fault level and environmental duty. Internal wiring shall be ferruled and all outgoing and incoming feeders shall be properly identified.

7.4 Standards

Cables and associated distribution / control equipment shall conform to the latest applicable IS / IEC standards relevant to their type, voltage class and application.

8. Earthing, lightning protection and electrical safety

8.1 Scope

The contractor shall provide a complete earthing and lightning protection system for PV modules, mounting structures, inverters, battery systems, control panels, transformers, distribution boxes and all other exposed conductive parts, complete in all respects.

8.2 Earthing requirements

The earthing system shall be designed in accordance with IS 3043 and good engineering practice. Separate or combined earthing arrangement, as appropriate, shall be provided for equipment body earthing, lightning protection and system neutral earthing.

Earth pits, conductors, earth strips, test links and interconnections shall be designed for safety, corrosion resistance and long-term reliability.

8.3 Lightning protection and surge protection

Suitable lightning arresters and surge protection devices shall be provided to protect the plant against transient over-voltages on both DC and AC sides. The protection scheme shall be coordinated with the earthing arrangement.

9. CT-operated bidirectional metering system

9.1 Scope

The contractor shall provide 7 sets of CT-operated bidirectional meter with CT of required rating, complete with wiring, meter boxes, accessories, sealing arrangements and integration with the relevant transformer / feeder points.

9.2 Functional requirements

The meter shall be capable of measuring import and export energy accurately and shall be suitable for net metering / bi-directional metering application. Meter class accuracy, communication and installation arrangement shall be as per utility requirements.

Current transformers and associated circuits shall be appropriately rated and installed in accordance with approved metering scheme.

10. LT ABC line - 1 km

10.1 Scope

The contractor shall provide the complete 1 km LT ABC line system comprising galvanized steel tubular poles, stay sets, ABC accessories for tension and suspension points, LT aerial bunched cable of 3 x 120 sq.mm, distribution boxes and all incidental materials and erection works necessary for a complete and safe installation.

10.2 Poles and supporting structures

Galvanized steel tubular poles of the specified type shall be erected in concrete foundations at the approved locations and with the specified planting depth. Pole alignment, verticality, painting where required and site restoration shall be included in the scope.

Stay sets shall be complete with stay rod, plate, GI stay wire, guy insulator, stay bow, foundation and all accessories needed for a stable line.

10.3 Aerial bunched cable and accessories

The LT ABC shall be 3 x 120 sq.mm or as specifically indicated in the sanctioned estimate. The cable, insulation, messenger arrangement, clamps, piercing connectors and accessories shall be suitable for outdoor overhead LT distribution service.

Stringing, sagging, clipping, clearances and termination shall conform to the applicable standards, utility practice and statutory safety requirements.

10.4 Distribution boxes

LT ABC three-phase distribution boxes shall be provided complete with suitable enclosure, busbars, connectors, protection and mounting arrangement for outdoor service.

11. 500 kVA outdoor distribution transformers

11.1 Scope

- The contractor shall design, manufacture, test, supply, transport, unload, store, erect, test and commission 500 kVA outdoor distribution transformers complete with insulating oil, all accessories, fittings, terminal connectors, earthing terminals, mounting hardware, danger plates, rating plates and all other items necessary for safe and satisfactory operation.
- The transformer shall be supplied as a complete unit suitable for integration with the solar PV project distribution system and shall be matched to the approved electrical design and protection scheme.

11.2 Service Conditions

- The transformer shall be suitable for outdoor operation in tropical and humid climatic conditions, including heavy rainfall, high atmospheric humidity, temperature variations and normal dust levels likely to be encountered at site in Mizoram.
- The transformer and all accessories shall be adequately designed for continuous service, frequent load variations and voltage fluctuations normally encountered in distribution systems.

11.3 Applicable Standards

- The transformer and its accessories shall conform to the latest editions, amendments and revisions of applicable Indian Standards and IEC standards, including but not limited to IS 1180 (Part 1) for outdoor type oil-immersed distribution transformers, IS 2026 / IEC 60076 series, IS 335 for insulating oil, IS 2099 for bushings and other relevant standards governing materials, fittings and tests.
- The offered transformer shall specifically comply with BIS Energy Efficiency Level-2 loss requirements for the applicable rating and voltage class under IS 1180 (Part 1), as amended up to the due date of bid submission. Compliance with a lower loss level shall not be accepted.
- Wherever a requirement is not specifically covered in this specification, the relevant provisions of the above standards and good engineering practice shall apply. In case of conflict, the more stringent requirement shall govern.

11.4 Type and Rating

- The transformer shall be outdoor type, oil immersed, naturally cooled, three phase, 50 Hz, copper wound distribution transformer of 500 kVA rating.
- The transformer shall be suitable for plinth mounting or other approved support arrangement and shall comply with applicable statutory safety clearances and CEA safety requirements.

11.5 Voltage Ratio and Vector Group

- The rated voltage ratio shall be 11/0.415 kV unless otherwise required by the finally approved drawings.
- The vector group shall be Dyn11.
- The low voltage side shall be suitable for 3-phase, 4-wire operation with neutral brought out for solid earthing.

11.6 Cooling, Insulation and Oil

- The transformer shall be of ONAN cooling type unless the manufacturer uses an equivalent designation for naturally cooled distribution transformers.
- The transformer shall be supplied with new, unused and tested insulating oil conforming to the relevant Indian Standard. The oil shall be free from moisture, sludge and other contaminants and shall possess adequate dielectric strength and oxidation stability.

11.7 Winding and Core

- The transformer shall be copper wound, and the winding design shall be suitable to withstand thermal and mechanical stresses during normal operation and under short-circuit conditions.
- The core shall be manufactured from high-grade CRGO silicon steel or superior approved material with low hysteresis and eddy current losses. The design shall minimize no-load loss, vibration and audible noise.

11.8 Tap Changer

- The transformer shall be provided with an off-circuit tap changer on the high voltage side.
- Unless otherwise approved, the tap range shall be +5 percent to -5 percent in steps of 2.5 percent, or the manufacturer's standard arrangement meeting the applicable standard requirement.
- Tap positions shall be clearly marked and the tap switch shall be robust, reliable and suitable for maintenance operation.

11.9 Losses and BIS Level-2 Compliance

- The transformer shall meet BIS Energy Efficiency Level-2 loss limits for 500 kVA, 11/0.433-0.415 kV class distribution transformers under the latest applicable version of IS 1180 (Part 1).
- The bidder shall clearly furnish guaranteed no-load loss, load loss at 75°C, total loss and no-load current in the Guaranteed Technical Particulars. These guaranteed values shall not exceed the permissible loss figures corresponding to BIS Energy Efficiency Level-2.
- Bids offering transformers merely conforming to older conventional IS limits, unspecified loss class, or a lower efficiency level shall be treated as non-responsive unless the tender expressly permits otherwise.

11.10 Impedance and Efficiency

- The percentage impedance at rated current shall be as per applicable standards and approved design requirements. The bidder shall state the guaranteed impedance value.
- The bidder shall furnish efficiency values at 50 percent, 75 percent and 100 percent load, calculated on the basis of guaranteed losses.

11.11 Tank, Construction and Painting

- The transformer tank shall be of robust welded steel construction, leak-proof and designed to withstand transport stresses, oil filling operations and normal service pressures.
- The external surfaces shall be properly prepared, primed and painted with a durable anti-corrosive paint system suitable for long-term outdoor service in humid climatic conditions.

11.12 Bushings, Terminals and Earthing

- Suitable outdoor bushings shall be provided on HV and LV sides, conforming to the relevant standards and rated for the specified voltage and current.
- Terminals and connectors shall be adequate for the intended cable or conductor sizes and shall permit safe, reliable and convenient site connections.
- The transformer shall be provided with at least two separate earthing terminals. The LV neutral shall be brought out for earthing.

11.13 Accessories

- The transformer shall be supplied complete with all standard accessories as applicable, including conservator or sealed tank arrangement as per design, silica gel breather where applicable, oil level indicator, drain valve, sampling valve, air release device, lifting lugs, jacking pads where applicable, rating plate, diagram plate, danger plate, tap position indicator and all other accessories necessary for proper operation and maintenance.
- Any accessory specifically required by the governing standard for the offered rating and construction shall be deemed included whether or not individually listed in the BOQ.

11.14 Temperature Rise, Noise and Short-Circuit Withstand

- The limits of oil and winding temperature rise shall comply with the applicable standards at rated load.
- The transformer shall have low noise and vibration levels and shall be mechanically robust enough to withstand the thermal and dynamic stresses caused by short-circuit conditions as per applicable standards.

11.15 Tests

- Each transformer shall be subjected to routine tests at the manufacturer's works in accordance with IS 1180 / IS 2026 / IEC 60076, including winding resistance, voltage ratio, polarity/vector group, no-load loss and current, load loss and impedance voltage, insulation resistance, induced over-voltage withstand, separate source voltage withstand and oil tests, as applicable.
- Valid type test reports from NABL-accredited or other nationally/internationally accredited laboratories shall be furnished for the offered rating or a design duly established as equivalent, covering temperature rise test, lightning impulse withstand test where applicable, short-circuit withstand test where applicable and any other mandatory type tests under the governing standards.

• The employer or its representative shall have the right to witness routine and acceptance tests at the manufacturer's works.

11.16 Guaranteed Technical Particulars

• The bidder shall furnish complete Guaranteed Technical Particulars covering rating, voltage ratio, vector group, cooling type, tap range, winding material, core material, no-load loss, load loss, total loss, no-load current, impedance, insulation level, oil quantity, total weight, temperature rise limits and BIS Energy Efficiency Level-2 compliance declaration.

• The GTP shall specifically mention the applicable IS 1180 Part 1 edition/amendment and confirm that the guaranteed losses comply with BIS Energy Efficiency Level-2.

11.17 Warranty

• The transformer shall be guaranteed for satisfactory performance for not less than 60 months from the date of supply or 12 months from commissioning, whichever is later, unless a longer period is specified elsewhere in the contract.

• Any defect arising during the warranty period due to defective design, material, workmanship or performance deficiency shall be rectified or replaced by the contractor at no extra cost to the employer.

11.18 Documentation

• The contractor shall submit for approval the data sheet, GTP, GA drawings, foundation/loading details, name plate details, test certificates, oil test reports and O&M manuals before dispatch and during handover, as applicable.

Minimum Guaranteed Technical Particulars to be Furnished by Bidder

Sl. No.	Parameter	Bidder to Furnish
1	Rated Capacity	500 kVA
2	Voltage Ratio	11/0.415 kV
3	Type	Outdoor, oil immersed
4	Cooling	ONAN
5	Vector Group	Dyn11
6	Winding Material	Copper
7	Tap Range	State exact range
8	No-load Loss	Guaranteed value
9	Load Loss	Guaranteed value
10	Impedance	Guaranteed value
11	Applicable Standard	IS 1180 Part 1 / IS 2026 / IEC 60076
12	BIS Energy Efficiency	Confirm Level-2 compliance or above
13	Type Test Reports	Yes / No, details

12. 630 A HRC main switch with 400 A HRC fuse

12.1 Scope

The contractor shall provide and install 3-phase HRC main switch, 630 A, conforming to IEC 60947 (Part 3) or latest equivalent standard, complete with 400 A HRC fuse and all accessories necessary for safe operation.

12.2 Requirements

The switch shall be suitable for the system voltage, fault level and outdoor / indoor location where installed. The enclosure, contacts, fuse links, operating handle and terminations shall be robust and suitable for continuous duty.

13. 11 kV XLPE aluminium cable

13.1 Scope

The contractor shall supply and lay 3 core, 11 kV, 240 sq.mm XLPE insulated aluminium cable conforming to IS 7098 Part 2 or latest revision, complete with glands, lugs, terminations, identification tags, route markers and associated accessories.

13.2 Requirements

The cable shall be suitable for the installation conditions and shall have adequate current carrying capacity, insulation level and short circuit withstand. Laying, jointing and termination shall be carried out using approved methods by qualified personnel.

14. Testing, documentation and guaranteed technical particulars

14.1 Testing

All major equipment shall be subjected to routine tests at works in accordance with the applicable standards. Site tests and commissioning checks shall be carried out after installation. The engineer-in-charge shall have the right to witness tests where considered necessary.

14.2 Documentation

The contractor shall submit technical data sheets, catalogues, drawings, layout details, single line diagram, protection philosophy, test certificates, operation and maintenance manuals, warranty documents and as-built drawings.

14.3 Guaranteed technical particulars

The bidder shall submit preliminary guaranteed technical particulars for all major equipment along with the bid. The successful bidder shall submit detailed and final GTP, drawings and technical data for approval before manufacture or supply. Approval of documents shall not relieve the contractor of contractual responsibility for performance and compliance.

15. Minimum GTP schedule to be furnished by the successful bidder

Sl. No.	Equipment	Principal particulars
1	SPV module	Make, model, cell technology, wattage,

Sl. No.	Equipment	Principal particulars
		Voc, Isc, Vmp, Imp, efficiency, dimensions, weight, certification and warranty
2	300 kVA solar inverter	Make, model, DC input range, MPPT range, nominal AC output, efficiency, THD, IP rating, protections and communication
3	100 kVA hybrid inverter / PCU	Make, model, charging logic, battery voltage range, AC output, efficiency, transfer characteristics and protections
4	LFP battery bank with BMS	Make, chemistry, usable energy, nominal voltage, cycle life, DoD, BMS functions, enclosure / rack details and safety protections
5	MMS	Material grade, galvanization thickness, structural arrangement, fixing details, design loading and drawing references
6	AJB / MJB / ACDB / DCDB	Voltage class, current rating, SPD type, protection scheme, enclosure IP rating and termination details
7	Distribution transformer	Make, rating, voltage ratio, vector group, impedance, no-load loss, load loss, oil quantity and routine / type test particulars
8	CT-operated bidirectional meter	Accuracy class, CT ratio, communication, meter standard and sealing arrangement

SECTION VI

REFERENCE BOQ AND EPC PRICE SCHEDULE

The quantities indicated in Part A are provisional and indicative only and are included for scope definition, engineering verification, bid completeness and milestone assessment under the EPC contract. The Reference BOQ shall not be treated as a re-measurement schedule, and no claim for item-wise payment or minor quantity variation shall be entertained except as otherwise expressly provided in the Contract.

Part A - Reference BOQ / Scope Quantity Schedule

A.1 Building-wise / Package-wise Summary of Major Quantities

Sl. No	**Building / Package**	**Approx. Roof Area (Sqm)**	**SPV Capacity (kWp)**	**PV Modules 550Wp (No.)**	**Type of SPV Plant**	**300kVA Grid Inverter (No.)**	**100kVA Hybrid Inverter (No.)**	Battery Bank (No.)
1	OPD Building	1200	180	327	Grid Connected			
2	Medical Supdt. Office	700	90	164	Grid Connected			
3	Hospital Block A1	1690	300	546	Grid Connected	1		
4	Hospital Block A2	1456	300	546	Hybrid		3	3
5	Hospital Block B	1456	280	509	Grid Connected	1		
6	Academic Building	1818	300	545	Grid Connected	1		
7	MRU Building	324	50	91	Grid Connected			
8	Common / balance system including remaining grid inverter, meters, AC/DC panels, cables, protection, integration and O&M	-	-	-	Common	1	-	-
	Total Quantity	**8644**	**1500**	**2728**		**4**	**3**	**3**

The following additional scope packages shall also form part of the same lump sum EPC contract price.

Sl. No	**Package / Work Component**	**Unit**	**Quantity**
1	Construction of LT ABC line for power distribution within/around	Km	1

Sl. No	Package / Work Component	Unit	Quantity
	ZMC&H campus, complete with poles, stays, ABC, accessories and distribution boxes.		
2	Augmentation of existing distribution system by installation of 500kVA, 11/0.415kV Distribution Transformers with allied switchgear and 11kV XLPE cable.	No.	3
3	Operation and Maintenance of the complete SPV Power Plant after commissioning.	Years	5

A.2 Reference Item Schedule

SL No	Item Description	Unit	Qty
A	**Installation of 1.5MWp Grid Connected / Hybrid Solar Photovoltaic Power Plant**		
1	Supply, installation, testing and commissioning of Monocrystalline Solar Photovoltaic (SPV) modules with minimum capacity of 550Wp per module, including module interconnection, connectors, clamps, fasteners and all accessories required for complete functional installation.	Wp	15,00,000
	Total number of 550Wp SPV modules corresponding to the indicated 1.5MWp plant capacity.	No.	2,728
2	Supply, installation, testing and commissioning of 300kVA grid connected solar inverter, 600V DC input and 3-phase 415V AC output, including communication, protection, mounting and all associated accessories.	No.	4
3	Supply, installation, testing and commissioning of 100kVA hybrid grid connected inverter / Power Conditioning Unit with MPPT based operation and 3-phase 415V AC output, including all hybrid control and protection accessories.	No.	3
4	Supply, installation, testing and commissioning of Lithium Ferro Phosphate (LFP) battery bank for providing power supply back up for Operation Theatre(New), Operation Theatre(Old) and Intensive Care Unit for 7.5 hours including Battery Management System (BMS), battery racks/cabinets, DC protection and all required accessories.	LOT	3
5	Supply and installation of hot dipped galvanized module mounting structures for rooftop SPV installation including clamps, anchoring arrangements, fasteners and all associated structural accessories suitable for the site conditions.	LS	1
6	Supply, laying, termination and commissioning of cables and controlling units such as Array Junction Box (AJB), Main Junction Box (MJB), ACDB, DCDB and other AC/DC protection and control panels.	Set	7
7	Earthing, lightning arresters, surge protection and other protective equipment for modules, inverters, battery system, AC/DC panels and allied electrical systems.	Set	7
8	Supply, installation, testing and commissioning of CT operated	Set	7

SL No	Item Description	Unit	Qty
	bidirectional / net meters with CTs of required ratings, including wiring, testing and integration with the respective feeders/transformers.		
9	Complete integration, installation and commissioning of the 1.5MWp SPV plant including grid synchronization, testing, trial run, safety checks, documentation and handing over.	LS	1
10	Operation and Maintenance of the complete SPV plant for five consecutive years after commissioning, including module cleaning, preventive maintenance, breakdown attendance, reporting and performance monitoring.	Year	5
B	**Construction of 1 Km LT ABC Line for Power Distribution**		
1	Providing and erection of galvanized steel tubular pole (SP-33) with cement concrete foundation, excavation, backfilling, muffling, pole painting and carriage of materials at site as directed by the Engineer-in-Charge.	Pole	40
2	Providing and erection of galvanized stay set for LT overhead lines complete with 16mm stay rod, stay plate, G.I. stay wire, LT guy insulator, stay bow and cement concrete foundation including excavation and refilling.	Set	40
3	Providing and fitting of LT ABC accessories for stringing at tension points, complete with all fittings and hardware required for the LT ABC line.	Each	20
4	Providing and fitting of LT ABC accessories for stringing at suspension points, complete with all fittings and hardware required for the LT ABC line.	Each	20
5	Providing and stringing, clipping and piercing of LT line per single conductor per metre using Aerial Bunched Cable (3 x 120 sq.mm) including jungle clearance and all accessories.	Mtr	1,000
6	Providing and fitting of LT ABC three phase distribution box with accessories, complete as directed by the Engineer-in-Charge.	No.	40
C	**Installation of 3 Nos. 500kVA Distribution Transformers for Augmentation of Existing DTs**		
1	Providing and installation of outdoor type, oil immersed, naturally cooled, 3-phase, 50Hz, copper wound Distribution Transformer, vector group Dyn-11, with tap changer, capacity 500kVA, 11/0.415kV, complete with fittings and safety clearances as specified in applicable regulations.	Each	3
2	Providing and installation of 3-phase HRC Main Switch, 630A, with 400A HRC Fuse, complete with enclosure, mounting, wiring and accessories.	Each	3
3	Providing and laying of 3 core, 11kV XLPE aluminium cable, 240 sq.mm, including laying, termination, glands, lugs, testing and all accessories required for commissioning.	Mtr	20

Part B - EPC Bid Price Schedule

The bidder shall quote a single lump sum EPC price for complete design, engineering, supply, erection, testing and commissioning of the works covered under the tender, including operation and maintenance obligations as specified in the tender document.

Lump Sum EPC Contract Price

Sl. No.	Description	Amount (INR)
1	Total lump sum EPC price for design, engineering, supply, installation, erection, testing and commissioning of Installation of 1.5MWp Grid Connected Solar Photovoltaic (SPV) Power Plant at Zoram Medical College & Hospital, Falkawn including construction of 1 Km LT ABC line, installation of 3 Nos. 500kVA Distribution Transformers for augmentation of existing DTs and Five years O&M of the SPV plant.	

Note: The price quoted above shall be the lump sum EPC contract price inclusive of all taxes, duties, levies, labour, materials, transportation, insurance, loading, unloading, erection, installation, testing, commissioning, documentation, statutory compliances, five years O&M of the SPV plant and all incidental costs necessary for successful completion of the works in accordance with the tender documents.

The bidder shall indicate the notional annual O&M value for each of the five years in the detailed price break-up, wherever such break-up is required by the Employer. Such break-up shall be for payment of administration and O&M monitoring only and shall not alter the lump-sum EPC nature of the Contract. The O&M obligation shall be secured through extended Performance Security / O&M Performance Security as provided in the Contract.

SECTION VII

PRESCRIBED FORMS AND SCHEDULES

PRESCRIBED FORMS TO BE SUBMITTED ALONG WITH SUPPORTING DOCUMENTS

FORM 1 - SIMILAR WORK EXPERIENCE

Sl. No.	Particulars	Details / Bidder Response
1	Name of work	
2	Client / Employer	
3	Work order number and date	
4	Solar PV capacity executed	
5	Nature of work: design / supply / installation / testing / commissioning / O&M	
6	Date of completion / commissioning	

FORM 2 – FINANCIAL TURNOVER

Sl. No.	Particulars	Details / Bidder Response
1	Financial Year 1 turnover	
2	Financial Year 2 turnover	
3	Financial Year 3 turnover	
4	Average annual turnover	
6	CA name, membership number and UDIN	

FORM 3 – PROFITABILITY STATEMENT

Year	Profit After Tax (₹ Lakh)	Positive/Negative

FORM 4 - NET WORTH / BANKER CERTIFICATE SUMMARY

Sl. No.	Particulars	Details / Bidder Response
1	Net worth as certified by CA	
2	Banker certificate amount	
3	Name of bank / CA	
4	Certificate date and reference number	
5	UDIN, if CA certificate	

FORM 5 – KEY MANPOWER

Sl No	Name	Qualification	Experience (Years)	Designation

FORM 6

SITE VISIT CERTIFICATE

Name of Work: _____
Tender No.: _____
Name of Bidder: _____
Name of Bidder's Representative: _____
Date of Site Visit: _____
Site / Route Visited: _____

This is to certify that the above-named bidder / bidder's representative has visited and inspected the site / route of the work before submission of bid.

The bidder / bidder's representative has acquainted himself with the site conditions, rooftop conditions, building access, structural constraints, shadow conditions, cable routes, inverter/battery/transformer locations, shutdown requirements, storage and transportation arrangements, climatic conditions and labour/logistics availability.

This certificate is issued for the purpose of tender submission.

Place: _____
Date: _____

Seal and Signature of concerned EE/SDO: _____

FORM 7
INTEGRITY DECLARATION

(Declaration to be made by the Bidder/Contractor)

I, _____ (Bidder's name) hereby declared that:

1) I_____(name of the firm) has not been blacklisted or debarred in the past by the Central/State Government or organization from taking part in Government tenders in India.
2) No employees of the firm have direct relationship/relative(s) with officials dealing with the file connected with the tender being invited. (*In case, if any employees of the firm have direct relationship/relative(s) with the officials, the same shall be disclosed by the bidder along with this declaration in Form A)
3) No employees of the Firm were involved in any illegal activities.
4) I have read, understood and comply with procurement rules, regulations and procedures.
5) I will provide accurate, complete and truthful information in my bid.
6) I will not engage in any collusive or anti-competitive behavior.
7) I will not offer or give any bribes, gifts or other improper benefits to influence the procurement process.
8) 1 will maintain the confidentiality of all procurement information.
9) I will not contact or influence any procurement officials or decision-makers improperly.

I understand that any breach of this declaration may result in disqualification may result in disqualification from the procurement process, and I may be subject to further action,

"Relatives for the purpose of this declaration includes father including step-father, mother, including step mother, son including step-son, daughter-in-law, daughter, son-in-law, brother including step-brother, sister including step-sister"

Name & Signature of Bidder with seal

FORM 8

FORM OF EARNEST MONEY(For Bank Guarantee)

WHEREAS, contractor …….. (Name of contractor) (Hereinafter called "the Contractor") has submitted his tender dated …….. (date) for the construction of……..(name of work) (Hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we (name of bank) having our registered office at……..(hereafter called "the Bank" are bound unto the Engineer-in-Chief, Power & Electricity Dept., Govt. of Mizoram (hereinafter called "the engineer-in-charge") in the sum of Rs…… (Rs. In words……..) for which payment well and truly to be made to the said Engineer-in- Charge the Bank binds itself, his successors and assigns by these presents.

SEALED with the common Seal of the said Bank this …….. Day of …….. 20…….

THE CONDITIONS of this obligation are :

(1) If after tender opening the contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;

(2) If the contractor having been notified of the acceptance of his tender by the Engineer-in-Charge:

   a) Fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required; Or

   b) Fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and instructions to contractor, Or

   c) Fails or refuses to start the work, in accordance with the provisions of the contract and Instructions to contractor, Or

   d) Fails or refuses to submit fresh Bank Guarantee of an equal amount of this Bank Guarantee, against Security Deposit after award of contract.

We undertake to pay to the Engineer-in-Charge up to the above upon receipt of his first written demand, without the Engineer-in-Charge having to substantiates his

demand, provided that in his demand the Engineer-in-Charge will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date ____ after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the Engineer-in-Charge, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

Date ……. SIGNATURE OF THE BANK

WITNESS ……. SEAL

(SIGNATURE, NAME AND ADDRESS)

FORM 9

Form of Performance Security (Guarantee)
Bank Guarantee Bond

1. In consideration of the Governor of Mizoram (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between _____ and _____ (hereinafter called "the said Contractor(s)") for the work_____ (hereinafter called "the said agreement") having agreed to production of irrevocable Bank Guarantee for Rs_____ (Rupees_____only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

   We, _____(hereinafter referred to as "the Bank") hereby undertake to

   (*indicate the name of the Bank*)

   pay to the Government an amount not exceeding Rs_____ (Rupees_____ _____only) on demand by the Government.

2. We, _____(hereinafter referred to as "the Bank") do hereby undertake to

   (*indicate the name of the Bank*)

   pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regard the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding

   Rs_____(Rupees_____ _____only).

3. We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)

in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We, _____further agree that the guarantee herein contained shall

(*indicate the name of the Bank*)

remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. We, _____ further agree with the Government that the Government shall

(*indicate the name of the Bank*)

have the fullest liberty without our consent and without affecting in any manner out obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or postpone for any time or from time to time any of the powers exercisable by the Government against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

7. We, _____lastly undertake not to revoke this guarantee except with
(indicate the name of the bank)
the previous consent of the Government in writing.

8. This guarantee shall be valid up to unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted in Rs_____(Rupees_____ _____only) and unless a claim in writing is lodged with us within six months of the date of expiry of the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the_____ day of_____

for_____ (*indicate the name of the bank*)

FORM 10

BANK GUARANTEE
(for Equipment/Mobilization Advance)

To,

The Engineer-in-Chief, P&ED (Employer)

_____

Aizawl: Mizoram.

Subject: - (*Please state the name of the work*).

Sir,

In accordance with the provision of the Conditions of Contract, in respect of Equipment/Mobilization Advance of the Contract Agreement for the above named work, (hereinafter called "the Contract" shall deposit with (*Name of Employer*)_____
a bank guarantee in an amount of (*Amount of Guarantee*) _____
(in
words)_____
We, the (Bank) _____ as instructed by the Contractor, agree unconditionally and irrevocably to guarantee, as primary obligator and not as surety merely, the payment to (Name of Employer)_____
on his first demand, without any right of objection on our part and without his first claim to the Contractor, in the amount not exceeding (Amount of Guarantee) Rs_____ (In words _____)
in the event that the contractual obligations expressed in the said Clause of the above mentioned contract have not been fulfilled by the Contractor giving the right of claim to the Employer for recovery of the whole part of the Mobilization Advance Loan from the Contractor under the Contract or the Contractor's employment has been terminated in accordance to the said Conditions of Contract.

We further agree that no change or addition to or other modification of the terms of the Contract of works to be performed there under or of any of the Contract Documents which may be made between (*name of Employe*r) _____
_____ and the

Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.
This guarantee shall remain valid and in full effect from the date of the advance loan payment to the Contractor under the Contract until.

a) (*Name of Employer*) _____ receives full repayment of the same amount including interests thereon, if any, from the Contractor.

b) _____ (Insert date to cover time period for completion plus 12 months defects liability period).

Yours truly

SIGNATURE AND SEAL

_____

_

(Name and Designation)

Name of Bank/Financial Institution

Address:

Date:

WITNESS 1.

2.

FORM 11

Standard Form of Agreement

(Notes on Standard Form of Agreement)

The Agreement should incorporate any corrections or modifications to the Bid resulting from corrections of errors (Instructions to Bidders, Clause 26).

Agreement

This agreement made the _____day of _____ 20_____ between _____ [name and address of Employer] (hereinafter called "the Employer") of the one part, and _____ [name and address of Contractor] (hereinafter called "the Contractor") of the other part).

Whereas the Employer is desirous that the Contractor execute _____

[name and identified number of Contract] (hereinafter called "the Works") and the Employer has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein at a cost of Rupees…….

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the Contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the works and the remedying the defects wherein the Contract price or such other sum as may become payable under the

provisions of the Contract at the times and in the manner prescribed by the Contract.

4. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz:
   i) Letter of Acceptance;
   ii) Notice to proceed with the works;
   iii) Contractor's Bid;
   iv) Contract Data;
   v) Special Conditions of Contract and General Conditions of Contract;
   vi) Specifications;
   vii) Bill of Quantities; and
   viii) Any other document listed in the Contract Data as forming part of the contract.

In witness whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

The Common Seal of

_____

was hereunto affixed in the presence of
Signed, Sealed and Delivered by the said

_____

_____

In the presence of:

Binding Signature of Employer

_____

Binding Signature of Contractor

_____