

DR. VITHALRAO VIKHE PATIL FOUNDATION

Vilad Ghat, Ahilyanagar – 414111, Maharashtra

**DESIGN, ENGINEERING, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND
COMPREHENSIVE MAINTENANCE OF**

100 kW / 300 kWh BATTERY ENERGY STORAGE SYSTEM (BESS)

**Integrated with Existing Captive Solar Generation Plant
Engineering College Campus**

VOLUME I TENDER AND CONTRACT CONDITIONS

Tender Document

Tender No.	DVVPF/ENGG/BESS/2026-27/01
Issue Status	Tender – version 1.1
Issue Date	July 2026
Employer	Dr. Vithalrao Vikhe Patil Foundation, Ahilyanagar
Project Site	Engineering College Campus, Vilad Ghat, Ahilyanagar

IMPORTANT DESIGN-BASIS NOTICE: The Employer has provided monthly import, export, solar generation and utility TOD-band data for March 2025 to February 2026. Transformer rating, short-circuit level, solar plant nameplate capacity, inverter details, existing SLD, relay settings, CT/PT ratios and exact BESS location were not available at tender drafting stage. Bidders shall conduct a mandatory site survey and validate all interface data. The successful bidder remains fully responsible for detailed engineering, system studies, statutory approvals and safe integration.

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1. Notice Inviting Tender

Dr. Vithalrao Vikhe Patil Foundation, Ahilyanagar invites sealed/electronic two-envelope bids from eligible Original Equipment Manufacturers (OEMs) or OEM-authorized BESS system integrators for design, engineering, manufacture, supply, transportation, insurance, unloading, storage, installation, testing, statutory approvals, commissioning, performance demonstration and five-year comprehensive operation and maintenance of a grid-connected 100 kW / 300 kWh Battery Energy Storage System at the Engineering College Campus.

The BESS shall be AC-coupled to the existing campus electrical system and integrated with the existing captive solar generation plant through a local Energy Management System. The system shall primarily maximize solar self-consumption, reduce grid import during designated periods, manage demand and provide controlled active/reactive power support without causing unintended export, islanding, protection conflict or adverse power-quality impact.

Tender Particular	Requirement
Tender No.	DVVPF/ENGG/BESS/2026-27/01
Tender system	Two-envelope: Technical & Commercial Bid and Price Bid
Bid validity	120 days from price-bid opening
Completion period	24 weeks from Letter of Award, including statutory clearances
Defect liability / comprehensive warranty	Minimum 5 years from successful commissioning
Battery performance warranty	8 years or 6,000 equivalent full cycles, whichever occurs earlier
Bid submission deadline	30th JULY 2026
Pre-bid meeting and site visit	10 th & 11 th August 2026
Employer contact	Purchase Department, DVVPF, Vilad Ghat, Ahilyanagar

2. Tender Information Sheet

Item	Tender Requirement
Employer	Dr. Vithalrao Vikhe Patil Foundation, Vilad Ghat, Ahilyanagar – 414111
Facility	Engineering College Campus
Scope type	Turnkey EPC with five-year CMC and ten-year battery performance warranty
Rated AC power	100 kW continuous charge and 100 kW continuous discharge at PCC
Contracted energy	Minimum 300 kWh net usable AC energy at PCC at beginning of life; bidder shall size installed DC capacity accordingly
Battery chemistry	Lithium Iron Phosphate (LiFePO ₄) only
Configuration	Outdoor, modular, AC-coupled, grid-connected
Connection voltage	415 V, 3-phase, 4-wire, 50 Hz; final interface to be verified
Primary applications	Solar surplus charging, TOD energy shifting, peak-demand limiting, export limiting, PF/reactive power control, scheduled dispatch
Optional application	Critical-load backup/islanding/black-start, separately priced and subject to Employer approval
Future expansion	Provision for minimum 500 kWh aggregate energy and additional PCS modules without replacement of EMS architecture
Evaluation	Technically qualified L1 based on total evaluated base-scope cost including five-year CMC
Language	English
Currency	Indian Rupees
Applicable law and jurisdiction	Laws of India; courts at Ahilyanagar, Maharashtra

3. Instructions to Bidders

3.1 Scope of Bid

The bidder shall quote for a complete, safe, operable and maintainable BESS. Any item necessary for guaranteed performance, statutory compliance or safe operation shall be deemed included even if not expressly listed in the BOQ.

3.2 Mandatory Site Survey

The bidder shall inspect the proposed location, electrical rooms, existing solar interconnection, PCC, cable routes, earthing network, fire access and available communication infrastructure. A signed Site Survey Certificate shall be included in the technical bid.

3.3 Bidder Responsibility

The bidder shall independently verify all dimensions, ratings, protection requirements, electrical clearances and utility conditions. Reliance on preliminary Employer data shall not relieve the bidder of design responsibility.

3.4 Clarifications

Questions shall be submitted in writing before the deadline specified in the tender schedule. Verbal statements shall not modify the tender.

3.5 Deviations

All technical and commercial deviations shall be listed only in the prescribed deviation schedules. Silence shall constitute unconditional compliance.

3.6 Alternative Offers

Alternative technical proposals may be submitted only in addition to a fully compliant base bid and shall not replace the base bid.

3.7 Confidentiality and Site Data

Campus drawings, load data and network information shall be treated as confidential and used solely for bid preparation and execution.

3.8 Subcontracting

Core battery system, PCS, BMS and EMS engineering shall not be subcontracted without disclosure and Employer approval. The prime contractor remains fully responsible.

3.9 Make in India and Local Support

The bidder shall disclose country of origin, local value addition and service infrastructure in India. Mandatory spares and trained service support shall be available in Maharashtra.

3.10 Bid Preparation Costs

All costs of bid preparation, site survey, demonstrations and pre-award discussions shall be borne by the bidder.

4. Bid Qualification and Eligibility Criteria

Criterion	Minimum Requirement	Documentary Evidence
Legal status	Company/LLP incorporated in India or Indian subsidiary/authorized integrator of OEM	Certificate of incorporation, PAN, GST
OEM authorization	Integrator shall hold project-specific authorization from battery and PCS OEMs	Manufacturer authorization forms
Experience	At least three commissioned BESS projects in last five years; at least one project ≥ 100 kW and ≥ 200 kWh; cumulative commissioned energy ≥ 1 MWh	POs, completion and performance certificates
Financial capacity	Average annual turnover $\geq$ INR 10 crore during preceding three audited financial years and positive net worth in latest year	Audited statements and CA certificate
Service support	Qualified service team and response capability within Maharashtra	Service organization statement and escalation matrix
Quality systems	ISO 9001; ISO 14001 and ISO 45001 preferred/required for lead EPC contractor	Valid certificates
Safety certification	Proposed battery cell/module/rack and complete system shall have specified IEC and fire-propagation	Type-test certificates and test reports

Criterion	Minimum Requirement	Documentary Evidence
	evidence	
Blacklisting	Not debarred/blacklisted by any Government department, PSU, statutory body or major institutional client	Notarized declaration
Litigation	Material litigation shall be disclosed	Litigation statement
Solvency	Bank solvency of minimum INR 1.5 crore	Certificate from scheduled bank

5. Bid Submission and Opening

- Envelope/Part A shall contain EMD, tender fee, eligibility documents, technical proposal, guaranteed technical particulars, schedules, drawings, project programme, O&M plan and unpriced BOQ.
- Envelope/Part B shall contain only the priced BOQ and price schedules in the prescribed format, without conditions or technical deviations.
- Prices shall be firm for the contract period and inclusive of design, engineering, packing, freight, transit insurance, unloading, erection, testing, commissioning, documentation, training, consumables, tools and all statutory obligations except GST, which shall be shown separately.
- The Employer may seek written clarifications; however, no bidder shall be permitted to materially alter the offered system after bid opening.
- Only bids achieving the minimum technical score and meeting all mandatory requirements shall proceed to price-bid opening.

6. Technical and Commercial Evaluation

Evaluation will be undertaken in four stages: preliminary responsiveness, eligibility verification, detailed technical scoring and commercial evaluation. Mandatory safety, capacity and certification requirements are pass/fail. A bidder must score at least 70 out of 100 in technical evaluation and must meet every pass/fail item.

Technical Evaluation Area	Maximum Marks
Compliance with battery, PCS, BMS, EMS and system-performance requirements	30
Relevant BESS experience and demonstrated operating references	20
Safety engineering, fire propagation evidence and hazard-mitigation approach	15
Integration methodology, studies, protection and EMS control philosophy	15
Warranty, degradation guarantee, O&M and local service capability	10
Project execution methodology, QA/QC and schedule	5
Cybersecurity, data ownership and open-protocol integration	5
Total	100

Commercial ranking shall be based on the total evaluated price of the base scope, mandatory spares, five-year comprehensive maintenance and taxes/duties as defined in the Price Schedule. Optional islanding/backup and Years 6–10 AMC prices shall be evaluated for reasonableness but excluded from L1 unless expressly stated in the bid notice.

7. General Conditions of Contract

7.1 Contract Documents

The Letter of Award, accepted bid, tender volumes, clarifications, approved drawings and subsequent amendments shall form the contract. In case of conflict, the order of precedence shall be: Letter of Award; Special Conditions; Employer's Requirements; General Conditions; accepted schedules; bidder proposal.

7.2 Performance Security

The successful bidder shall submit a performance bank guarantee equal to 10% of the contract value within 14 days of award, valid through completion plus 90 days. A separate warranty PBG equal to 5% shall remain valid through the five-year comprehensive warranty or may be reduced annually subject to satisfactory performance.

7.3 Programme

A baseline programme with engineering, approvals, manufacture, FAT, shipment, civil works, erection, testing and commissioning milestones shall be submitted within 14 days.

7.4 Design Review

Employer review does not relieve the contractor of responsibility. No manufacture or site work shall commence for affected equipment before approved-for-construction documents are released.

7.5 Inspection

The Employer or its consultant may inspect manufacturing and witness tests. Waiver of inspection does not waive contract requirements.

7.6 Variations

Changes shall be implemented only through written variation order. The contractor shall promptly identify cost, schedule and technical impact.

7.7 Delay and Liquidated Damages

LD shall be 0.5% of contract value per completed week of delay, capped at 10%, without prejudice to other remedies.

7.8 Suspension and Termination

The Employer may suspend unsafe or non-compliant work. Material default, insolvency, abandonment, repeated safety violations or failure to remedy defects may lead to termination.

7.9 Insurance

Contractor shall maintain transit, erection-all-risk, third-party liability, workmen compensation and other legally required insurance until handover.

7.10 Indemnity

Contractor shall indemnify the Employer against bodily injury, property damage, IP infringement and statutory non-compliance attributable to the contractor.

7.11 Force Majeure

Force majeure shall be limited to events beyond reasonable control and shall require prompt notice, mitigation and substantiation.

7.12 Dispute Resolution

Disputes shall first be referred to senior management. Unresolved disputes shall be referred to arbitration under the Arbitration and Conciliation Act, 1996. Seat and venue: Ahilyanagar, Maharashtra.

8. Special Conditions of Contract

- The system shall be installed without compromising continuity of campus electrical supply; shutdowns shall be pre-approved and normally scheduled during low-occupancy hours.
- The base configuration shall be grid-connected and shall not energize an islanded campus bus unless the optional islanding scheme is ordered and all interlocks/protection are approved.
- The contractor shall obtain/coordinate approvals from the Electrical Inspector, fire authority and MS&EDCL/other utility as applicable to the final scheme.
- The BESS shall be designed to comply with the CEA Safety Regulations, 2023 and applicable amendments. The 2026 BESS-specific amendment, notified on 30 March 2026 and effective 1 April 2027, shall be proactively incorporated where commissioning or operation may extend beyond its effective date.
- No mandatory cloud subscription shall be required for normal operation. All primary controls shall operate locally during internet failure.
- All operating data, alarms, reports and historian records shall be owned by the Employer and exportable in open formats.
- Battery augmentation required to meet the guaranteed end-of-warranty capacity shall be included in the contract price.

9. Payment, Securities and Taxes

Milestone	Payment
Advance against equivalent unconditional advance bank guarantee, after contract execution and approved project plan	10%

Milestone	Payment
Approved detailed engineering and successful FAT / readiness for dispatch	10%
Delivery of major equipment at site, verified and insured	55%
Completion of installation, pre-commissioning and statutory readiness	15%
Successful performance acceptance test and 30-day reliability operation	10%
Total	100%

GST shall be paid at actual statutory rate against valid tax invoice. Retention may be replaced by approved bank guarantee. Payments are subject to submission of required certificates, test reports, insurance, as-built documentation and statutory compliance.

10. Warranty, Performance Guarantees and O&M

Guarantee	Minimum Requirement
Rated AC power	100 kW continuous charge and discharge at the PCC under specified ambient conditions
Net usable AC energy at COD	≥ 300 kWh measured at PCC after auxiliary consumption
Round-trip efficiency	$\geq 88\%$ AC-to-AC including auxiliaries at defined test conditions
Annual technical availability	$\geq 98\%$, excluding approved planned maintenance and force majeure
Battery capacity retention	$\geq 80\%$ of contracted usable AC energy at end of year 10 or 6,000 EFC, including augmentation
PCS efficiency	$\geq 97.5\%$ peak and $\geq 96.5\%$ weighted
Power factor range	0.90 lagging to 0.90 leading within converter capability
Harmonic distortion	THDi $\leq 3\%$ at rated output; PCC compliance with applicable CEA/IEC requirements
Response time	Active-power set-point response ≤ 200 ms; emergency trip as per protection design
Warranty response	Remote acknowledgement ≤ 2 hours; site attendance ≤ 24 hours for critical fault, ≤ 48 hours for non-critical fault

11. Contract Forms and Annexures

- Form A – Letter of Bid
- Form B – Bidder Information
- Form C – Site Survey Certificate
- Form D – Manufacturer Authorization
- Form E – Bid Security Format
- Form F – Performance Bank Guarantee
- Form G – Power of Attorney
- Form H – Not-Blacklisted Declaration
- Form I – Deviation Schedule
- Form J – Work Experience Schedule
- Form K – Financial Capacity Schedule
- Form L – Guaranteed Technical Particulars Declaration
- Form M – Integrity and Confidentiality Undertaking
- Form N – Contract Agreement

12. Source and Regulatory Reference Register

Reference	Official Source
Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023	https://cea.nic.in/regulations/central-electricity-authority-measures-relating-to-safety-and-electric-supply-regulations-2023/
CEA (Measures relating to Safety and Electric Supply) Amendment Regulations, 2026 (BESS-specific provisions; effective 1 April 2027)	https://cea.nic.in/wp-content/uploads/regulations_cpt/2026/04/_____2026.pdf
CEA Advisory on co-locating Energy Storage Systems with Solar Power Projects, 18 February 2025	https://cea.nic.in/wp-content/uploads/notification/2025/02/Advisory_on_colocating_Energy_Storage_System_with_Solar_Power_Projects_to_enhance_grid_stability_and_cost_efficiency.pdf
Ministry of Power – Guidelines for Procurement and Utilization of BESS, 10 March 2022	https://powermin.gov.in/hi/node/6154
CEA Technical Standards for Connectivity to the Grid Regulations and amendments	https://cea.nic.in/regulations-category/connectivity-to-the-grid/
MSEDCL Renewable Energy / Net Metering portal and applicable	https://www.mahadiscom.in/en/consumer/re-rooftop-net-metering/

Reference	Official Source
procedures	
IEC 62619:2022 – Industrial lithium battery safety	https://webstore.iec.ch/en/publication/64073
IEC 62933-5-1:2024 and IEC 62933-5-2:2025 – Grid-integrated EES safety	https://webstore.iec.ch/en/publication/72239 ; https://webstore.iec.ch/en/publication/68297
IEC 62477-1:2022 – Power electronic converter safety	https://webstore.iec.ch/en/publication/28936
UL 9540A:2025 test method information	https://www.ul.com/services/ul-9540a-test-method
NFPA 855:2026 – Stationary energy storage systems (good engineering practice where applicable)	https://www.nfpa.org/product/nfpa-855-standard/p0855code/nfpa-855-standard-for-the-installation-of-stationary-energy-storage-systems-2026/85526

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100 kW / 300 kWh BATTERY ENERGY STORAGE SYSTEM (BESS)

**Integrated with Existing Captive Solar Generation Plant
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VOLUME II EMPLOYER'S REQUIREMENTS AND TECHNICAL SPECIFICATIONS

Tender Document

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1. Project Background and Objectives

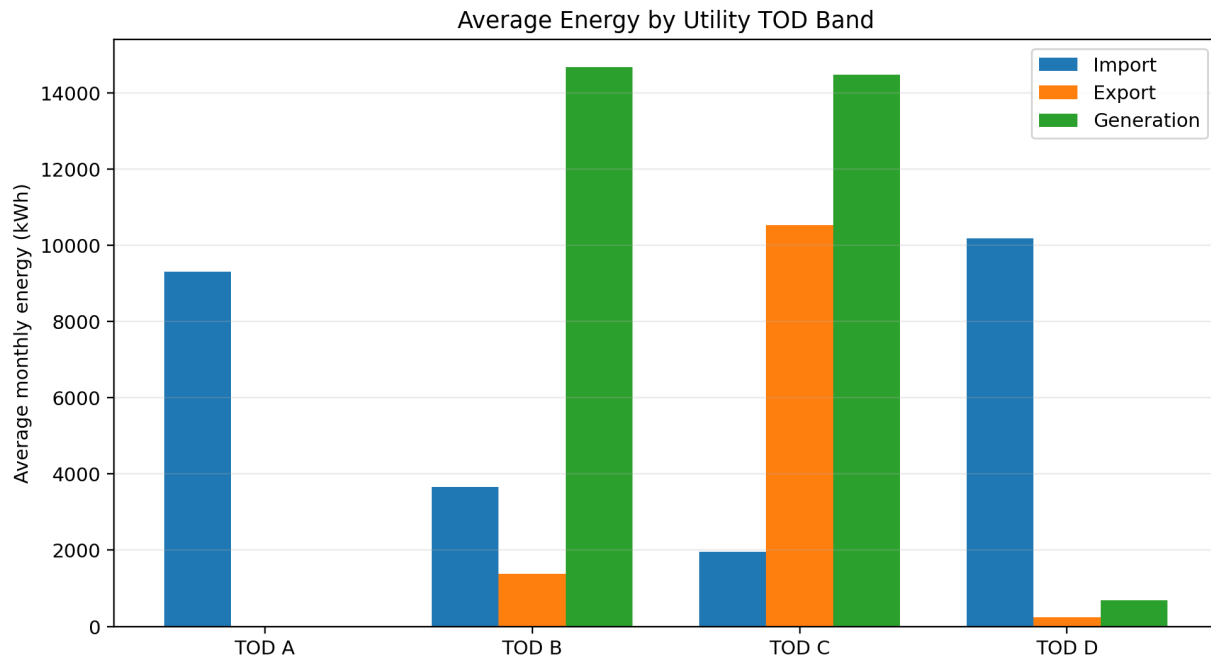
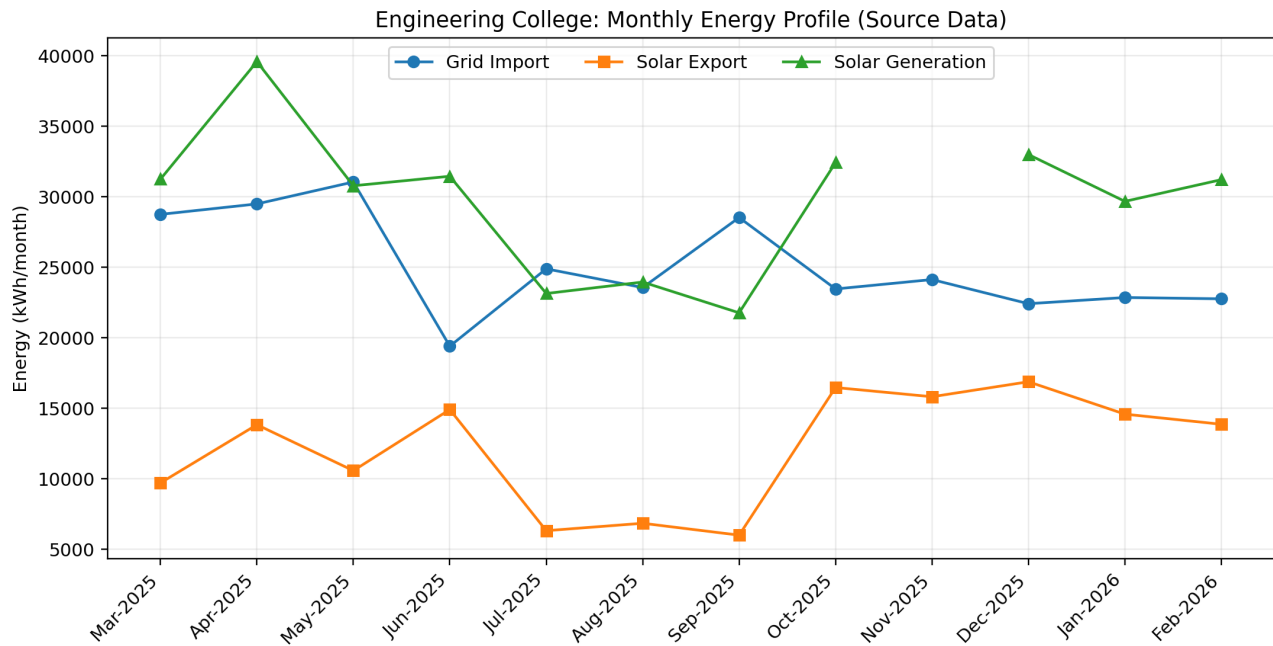
Dr. Vithalrao Vikhe Patil Foundation operates an Engineering College campus at Vilad Ghat, Ahilyanagar with captive solar generation and a grid-connected electrical distribution system. The monthly energy dataset supplied by the Employer shows recurring daytime export while substantial energy is imported during other utility TOD periods. The proposed BESS is intended to increase behind-the-meter use of solar energy and provide a controllable energy-management asset.

- Absorb available solar surplus without disturbing the existing solar plant, net meter or protection scheme.
- Discharge during Employer-defined TOD windows and/or to maintain a configurable grid-demand limit.
- Provide dynamic export limiting, active power scheduling and power-factor/reactive-power control at the PCC.
- Operate safely under grid disturbances and trip without unintentional islanding in the base scope.
- Provide local data acquisition, alarms, historian and secure remote support.
- Allow modular expansion to at least 500 kWh aggregate storage.

2. Site and Existing Energy Data

The available dataset covers March 2025 to February 2026. Total grid import was 301,324 kWh and total export was 145,878 kWh. Solar generation was reported for eleven months at 328,246 kWh; the annualized generation based on the reported monthly average is approximately 358,087 kWh. Average monthly export was 12,156 kWh, equivalent to approximately 399 kWh/day. One month of generation data was not available and shall be validated during detailed engineering.

Parameter	Value / Observation
Data period	March 2025 to February 2026
Annual grid import	301,324 kWh
Annual solar export	145,878 kWh
Average monthly import	25,110 kWh
Average monthly export	12,156.5 kWh
Reported solar generation	328,246 kWh over 11 months
Annualized solar generation	Approx. 358,087 kWh
Average daily export	Approx. 399 kWh/day
Dominant export band	Utility TOD Band C, average approx. 10,535 kWh/month
Design implication	A 300 kWh system can absorb a substantial portion of average daily export subject to intra-day profile and SOC availability



2.1 Data Validation by Successful Bidder

- Install portable Class 0.5S or better meters/data loggers at the campus PCC and solar inverter for not less than 30 consecutive days before final EMS set-point design.
- Record 1-minute active power, reactive power, voltage, current, frequency, PF, THD and import/export direction; retain 15-minute demand records for utility-demand analysis.
- Verify transformer rating and impedance, fault level, busbar rating, breaker interrupting capacity, CT/PT ratios, earthing resistance, protection relay model/settings and existing solar anti-islanding scheme.
- Confirm solar plant AC/DC capacity, inverter makes/ratings, ACDB topology, grid connection agreement and net-metering arrangement.

3. Design Basis and Functional Philosophy

Design Parameter	Minimum Requirement
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Design Parameter	Minimum Requirement
System rating	100 kW charge / 100 kW discharge, continuous at PCC
Energy duration	3 hours at rated discharge; ≥ 300 kWh net usable AC energy at COD
Battery chemistry	LiFePO ₄
Connection	AC-coupled, 415 V, 3-phase, 4-wire, 50 Hz; TN-S arrangement preferred
Service	Behind-the-meter, grid-connected
Design ambient	0°C to 50°C; full rated output at least to 45°C and no unsafe operation at 50°C
Altitude	Below 1,000 m above mean sea level unless site survey establishes otherwise
Enclosure	Outdoor weatherproof modular cabinet/container, minimum IP55 for outdoor electrical compartments
Design life	Minimum 15 years for non-battery equipment
Battery guarantee	10 years / 6,000 EFC with $\geq 80\%$ end-of-warranty usable capacity including augmentation
Availability	$\geq 98\%$ annual technical availability
Expansion	EMS, switchgear and communication architecture expandable to ≥ 500 kWh
Noise	≤ 75 dBA at 1 m, or stricter local requirement
Seismic/wind	Designed for applicable Ahilyanagar site parameters under latest Indian codes

3.1 Operating Modes

Solar Surplus Capture

Charge command shall be based on PCC export and battery SOC, with ramp limits to prevent oscillation with solar inverter MPPT and campus loads.

TOD Energy Shifting

Charge/discharge schedules shall be configurable by season, day type and utility TOD band. The EMS shall enforce reserve SOC and cycle limits.

Demand Limiting / Peak Shaving

The EMS shall maintain grid demand below a configurable kW/kVA threshold using fast meter feedback and predictive control.

Export Limiting

The EMS shall maintain a selectable export set-point, including zero-export, while respecting battery limits and avoiding unstable hunting.

Power Factor / VAR Control

The PCS shall support PF and reactive power commands within its kVA capability and coordinate with existing capacitor banks/APFC panels.

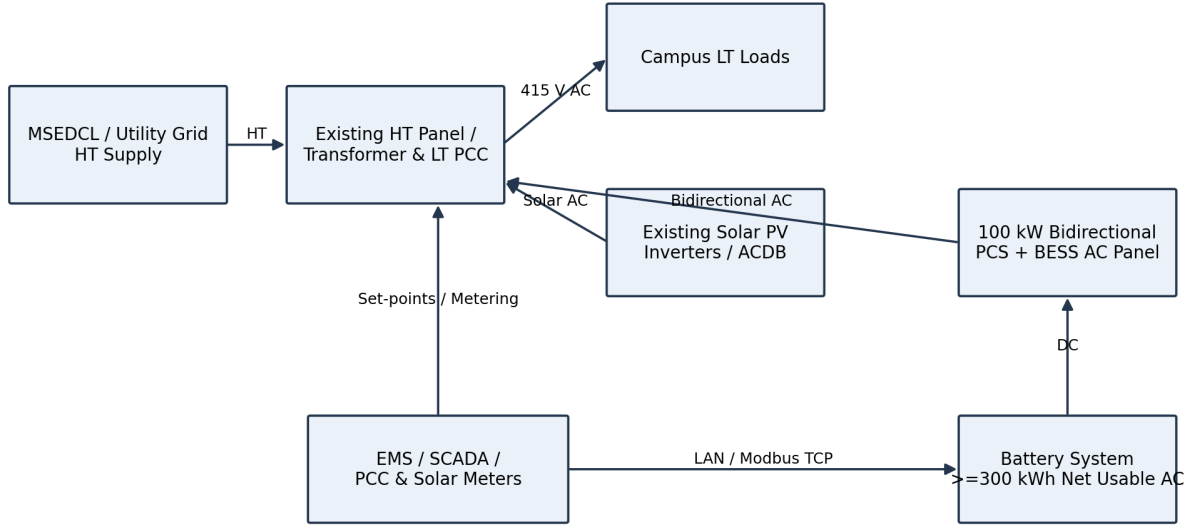
Emergency Stop and Safe Shutdown

Local and remote E-stop shall stop charging/discharging, open designated contactors/breakers and place the battery in a safe state.

Optional Islanded Backup

Only if ordered: include dedicated critical-load bus, static/automatic transfer, grid-forming controls, neutral/earthing design, black start and protection studies. The base bid shall be non-islanding.

Conceptual AC-Coupled BESS Integration at Engineering College PCC



Final connection point, breaker ratings, CT/PT ratios, protection settings and islanding philosophy shall be verified during detailed engineering.

4. Battery System Requirements

Item	Requirement
Cell chemistry	Lithium Iron Phosphate (LiFePO ₄), prismatic or pouch cells with proven stationary-BESS service
Cell manufacturer	Tier-1/established manufacturer with traceability, quality controls and minimum five years mass-production experience
Cell certification	IEC 62619:2022; IEC 62620 performance; UN 38.3 for transport; applicable BIS registration where mandated
System safety	IEC 62933-5-1:2024 and IEC 62933-5-2:2025 or latest applicable editions
Fire propagation evidence	UL 9540A:2025 or equivalent representative cell/module/unit-level thermal runaway propagation test report
Installed capacity	Bidder-selected DC nominal capacity sufficient to guarantee >=300 kWh net usable AC at PCC at COD after auxiliary consumption
SOC operating window	Bidder-defined, normally not wider than 5%–95%, with user-configurable reserve
Depth of discharge	Minimum 90% usable operating window where required to meet guarantee
Cycle life	>=6,000 equivalent full cycles at warranted operating conditions
Cell balancing	Automatic passive or active balancing at cell/module level
Isolation monitoring	Continuous DC insulation monitoring with alarm and trip thresholds
Contactors and pre-charge	Redundant/monitored main contactors, pre-charge circuit, DC fuses and service disconnects
Rack protection	Rack/string current protection, temperature sensing and accessible isolation
Traceability	Cell, module and rack serial numbers mapped in digital asset register
Augmentation	Space, bus capacity, controls and software to accept future augmentation; guaranteed augmentation included for year-10 capacity target

4.1 Battery Degradation and Capacity Guarantee

The bidder shall submit a warranted degradation curve stating available net usable AC energy for each year under the stated duty cycle, ambient conditions and equivalent full-cycle limits. Calendar and cycle degradation shall both be included. Capacity testing shall be carried out annually or when degradation is suspected. Any augmentation required to meet the guaranteed curve shall be supplied, installed and commissioned at no additional cost.

5. Power Conversion System (PCS)

PCS Parameter	Minimum Specification
Topology	Four-quadrant, bidirectional, PWM converter suitable for stationary BESS
Rated active power	100 kW continuous charge and discharge
Rated apparent power	Not less than 110 kVA, or sufficient to deliver specified PF/VAR performance at active power set-point
AC voltage	415 V +/-10%, 3-phase, 4-wire, 50 Hz
DC voltage window	Matched to offered battery system with adequate margins
Peak efficiency	>=97.5%
Weighted efficiency	>=96.5%
Power factor	Continuously adjustable from 0.90 lag to 0.90 lead within kVA rating
THDi	<=3% at rated output; no individual harmonic shall exceed applicable limits
DC injection	Within CEA/grid-interconnection limits
Control modes	P/Q, PF, Volt-VAR, frequency-watt, ramp-rate, charge/discharge power, grid-following
Grid-forming	Optional, separately priced unless inherently available
Response	Power set-point response <=200 ms; ramp rate configurable
Overload	Minimum 110% for 10 minutes and 120% for 1 minute, or bidder standard not inferior
Protection	Over/under voltage, over/under frequency, overcurrent, short circuit, earth fault, DC over/under voltage, reverse polarity, overtemperature, anti-islanding, loss of communication safe state
Cooling	Forced air or liquid cooling with monitored fan/pump redundancy
Enclosure	Minimum IP54 indoors and IP55 outdoors; corrosion-resistant
Safety	IEC 62477-1:2022/COR1:2024, IEC 62109 where applicable
EMC	IEC 61000-6-2 and IEC 61000-6-4 or applicable product standard
Communication	Modbus TCP minimum; IEC 61850 preferred; hardwired trip/enable interface
Serviceability	Front/side access, modular power blocks, replaceable fans and filters

5.1 PCS Detailed Working and Interface

During charging, the PCS operates as an active rectifier, drawing controlled sinusoidal current from the AC bus and regulating the DC link/battery current according to BMS limits. During discharge, it operates as a synchronized inverter, converting battery DC energy to AC and following active/reactive power commands. A local controller shall continuously reconcile EMS commands with grid conditions, thermal limits, battery charge/discharge limits and protection status. In the base non-islanding mode, loss of grid shall cause anti-islanding trip and opening of the BESS breaker/contactors.

6. Battery Management System (BMS)

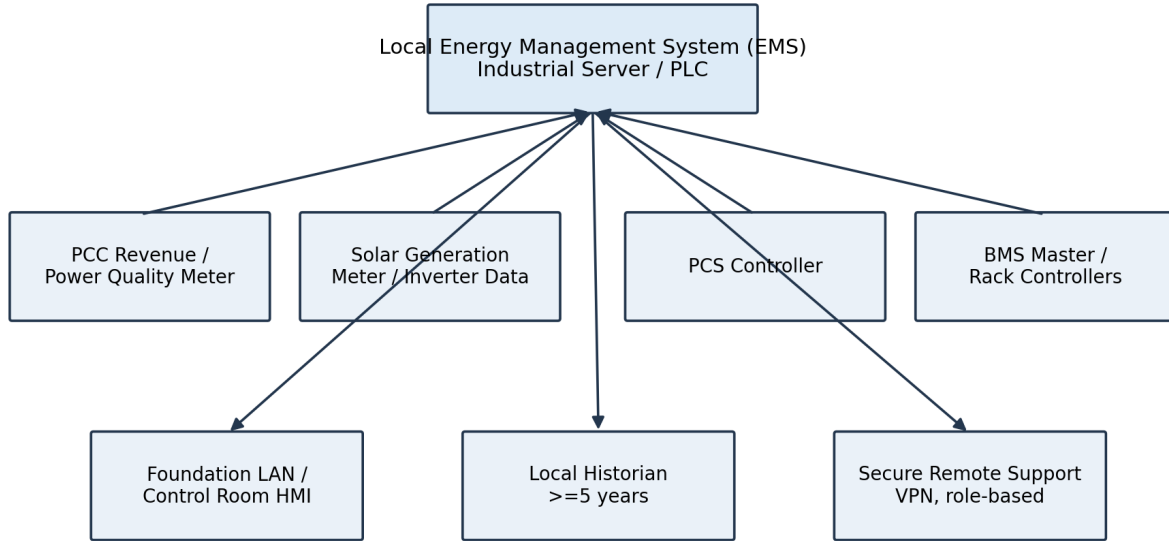
- Hierarchical cell/module/rack/master architecture with no single-point failure capable of causing uncontrolled operation.
- Continuous measurement of individual cell voltage, module/rack voltage, current and temperatures at representative locations.
- SOC, SOH, state-of-energy and available charge/discharge power calculations with documented accuracy.

- Configurable warning, derating and trip thresholds; thermal runaway precursor detection and event recording.
- Automatic cell balancing, insulation monitoring, contactor control and safe sequencing.
- CAN/Modbus communication with PCS and EMS; watchdog and fail-safe behavior on communication loss.
- Minimum 10,000 timestamped events retained locally and exportable.
- Password-controlled service functions and firmware integrity controls.

7. Energy Management System (EMS) and SCADA

EMS Function	Requirement
Architecture	Local industrial controller/server; autonomous operation without cloud dependency
Data acquisition	PCC meter, solar meter/inverter data, PCS, BMS, auxiliary panel, fire/HVAC systems
Control cycle	Fast enough for stable export limiting and demand control; bidder to state scan and command rates
Scheduling	Daily/weekly/seasonal calendars, holiday profiles and utility TOD mapping
Optimization	Rule-based and predictive dispatch using load, solar and SOC forecasts where available
Set-point priorities	Safety/BMS limits > protection > reserve SOC > export/demand control > economic schedule
HMI	Local web HMI with single-line mimic, KPIs, trends, alarms, reports and manual authorized controls
Historian	Minimum 5 years local storage at 1-minute resolution for key tags; event and alarm retention for 10 years
Reports	Daily/monthly energy balance, cycles, availability, efficiency, alarms, peak demand, solar capture and savings indicators
User management	Role-based access, audit trail, password policy and account lockout
Open data	CSV/XLSX/JSON export and REST/OPC-UA/Modbus interface where offered
Time synchronization	NTP; GPS optional
Remote support	Secure VPN initiated/approved by Employer; no direct uncontrolled internet exposure
Integration	Capable of future integration with campus BMS/SCADA and additional BESS modules

Conceptual EMS / SCADA Communication Architecture



8. Solar and Grid Integration

- The BESS shall be connected on the consumer side of the utility meter at a technically suitable PCC confirmed through studies and site survey.
- The system shall not alter the approved solar inverter settings, anti-islanding scheme, net-metering arrangement or utility meter without written approval.
- Charging from solar shall be implemented through PCC-based net power control; direct DC coupling is not included unless offered as an approved alternative.
- The EMS shall prevent battery discharge from being counted as unintended renewable export where prohibited by applicable utility agreement.
- The bidder shall prepare an import/export logic matrix for all combinations of solar availability, campus load, battery SOC, utility status and communication failure.
- The bidder shall coordinate with MSEDCL and the Electrical Inspector where the final interconnection or protection changes require approval.

9. Protection, Metering and Power Quality

System / Function	Minimum Requirement
BESS AC breaker	Motorized ACB/MCCB with adequate making/breaking capacity, shunt trip, aux contacts and lockable isolation
Protection relay	Numerical relay or integrated certified PCS protection covering 27/59, 81U/O, 50/51, 50N/51N, 32 where required, ROCOF/vector shift if approved
Anti-islanding	Compliant with CEA connectivity requirements and coordinated with existing solar protection
Synchronism	Automatic voltage/frequency/phase supervision before connection
PCC meter	Class 0.5S multifunction power-quality meter with bidirectional energy and 15-minute demand
BESS meter	Separate Class 0.5S bidirectional meter at BESS incomer
Solar meter interface	Existing meter interface or new Class 0.5S meter
Surge protection	Type 1+2 at outdoor incomer where exposure requires; Type 2 at equipment panels
Harmonics	PCC voltage/current distortion shall remain within CEA/IEEE 519 or stricter utility

System / Function	Minimum Requirement
	limits
Flicker and voltage change	No objectionable flicker or rapid voltage variation during charge/discharge transitions
Earthing	Separate equipment and clean/control earth bonding to common earth grid; design per IS 3043 and CEA rules
Emergency trip	Hardwired E-stop chain, fire-system trip and remote control-room trip

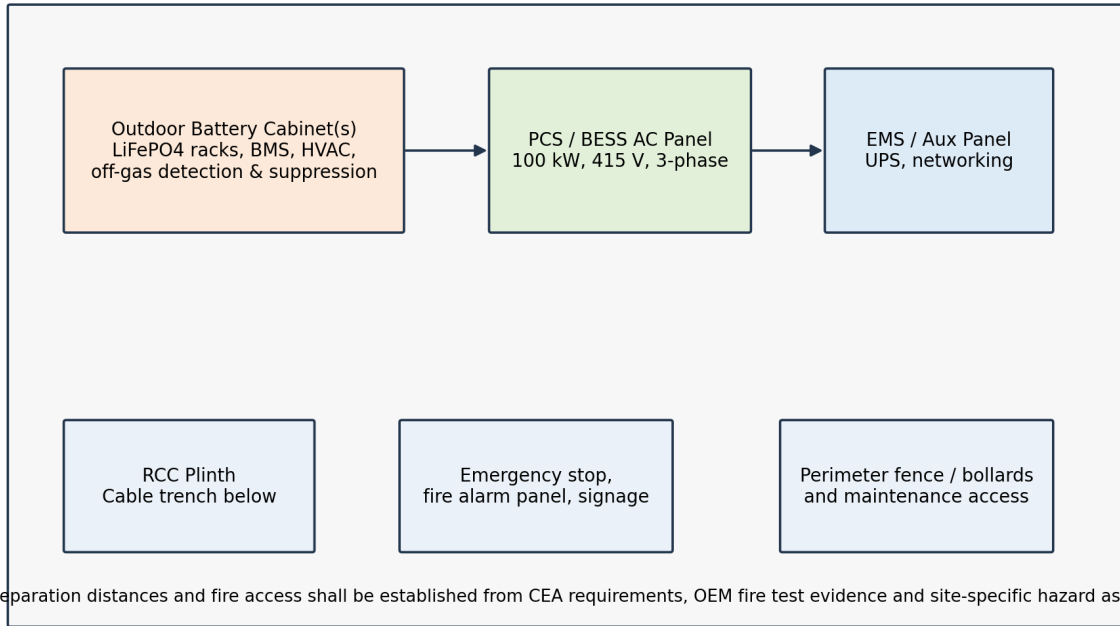
10. Electrical Balance of Plant

- BESS AC panel, auxiliary panel, control panel, isolation devices, protection relays, meters, SPDs, indication and annunciation.
- XLPE armoured copper/aluminium power cables sized for ampacity, voltage drop, short-circuit withstand and derating; minimum 25% spare capacity in trays/ducts.
- FRLS/LSZH control and communication cables; fibre optic where electromagnetic separation or distance warrants.
- Cable glands, lugs, ferrules, tags, markers, trays, trenches and fire stopping.
- Dedicated auxiliary supply distribution with UPS for controls, BMS, EMS, fire alarm and networking; minimum 30-minute control backup.
- Earthing electrodes/grid augmentation, equipment bonding and lightning/surge protection as determined by study.
- All panels to comply with IS/IEC 61439 and have verified short-circuit withstand, internal segregation and temperature rise.

11. Civil, Structural and Enclosure Requirements

- RCC plinth/foundation designed for equipment loads, wind, seismic actions and local soil conditions; finished level above surrounding grade and highest likely water accumulation.
- Cable trenches/ducts with drainage, removable covers and fire sealing at entries.
- Outdoor enclosure with corrosion-resistant coating suitable for dusty campus environment and minimum 15-year structural life.
- Non-combustible internal surfaces and fire-resisting penetrations.
- Vehicle-impact protection using bollards where required, perimeter fencing and controlled access.
- Maintenance clearances, emergency egress, lighting, signage and access for fire services.
- Final separation distances from occupied buildings and between BESS units based on CEA requirements, OEM fire-test evidence and site-specific fire risk assessment.

Conceptual Outdoor BESS General Arrangement (Not to Scale)



12. HVAC, Ventilation and Environmental Control

- Maintain cell and equipment temperatures within OEM limits under maximum ambient and rated cycling.
- Provide N+1 cooling for critical battery cabinet/container functions or demonstrate equivalent fault tolerance.
- Prevent condensation and maintain humidity within OEM limits; include anti-condensation heaters where required.
- Temperature sensors shall be monitored by BMS/EMS with staged alarm, derating and shutdown.
- Ventilation shall limit accumulation of flammable/toxic gases. On gas-detection or ventilation failure, the system shall enter a safe state and isolate ignition sources as designed.
- Filters shall be accessible and included in preventive-maintenance schedule.

13. Fire Detection, Suppression and Emergency Systems

The fire-safety design shall be based on a documented hazard analysis and representative thermal-runaway test evidence. A generic extinguisher-only approach is not acceptable.

Requirement	Minimum Provision
Early detection	Off-gas detection appropriate to cell chemistry plus smoke and heat detection
Alarm integration	Local audiovisual alarm, fire panel, EMS alarm and hardwired shutdown interlock
Automatic suppression	OEM-engineered automatic system validated for the offered cabinet/container and supported by test evidence
Propagation mitigation	Module/rack barriers, spacing, ventilation and suppression measures demonstrated to limit propagation
Emergency isolation	Automatic and manual shutdown with readily accessible E-stop stations
Explosion/deflagration control	Vent panels or other engineered measures where risk assessment identifies flammable gas accumulation
Fire water / external cooling	Provision/connection/access as required by risk assessment and local fire authority
Portable extinguishers	Appropriate ABC/clean-agent units for ancillary electrical fires; not relied upon as primary lithium-battery control
Fire response plan	Site-specific emergency response plan, signage, SDS, isolation points and training
Third-party audit	Independent fire-safety audit before energization and at intervals required by CEA/authority

14. Communication and Cybersecurity

- Industrial Ethernet switches, managed VLAN capability and fibre uplink where required.
- IEC 62443-aligned security architecture: role-based access, least privilege, secure configuration, signed firmware where supported, audit logs and backup/restore.
- No hard-coded shared passwords. Default credentials shall be changed before handover.
- Remote connectivity shall use Employer-approved VPN with multi-factor authentication where available and session logging.
- Critical controls shall not depend on public cloud or internet access.
- Bidder shall provide a five-year vulnerability and firmware-support commitment and disclose end-of-support dates.
- All data shall remain accessible locally and belong to the Employer.

15. Performance Guarantees

Performance Test	Acceptance Criterion
Rated power test	100 kW charge and 100 kW discharge sustained for 30 minutes each without derating or alarm
Usable energy test	≥ 300 kWh net AC discharge at PCC over full warranted SOC window
Round-trip efficiency	$\geq 88\%$ AC-AC including auxiliary energy for one complete charge/discharge cycle
SOC accuracy	Within ± 3 percentage points after calibration cycle
Export-limit test	Maintain set-point within ± 5 kW after stabilization under representative load/solar changes
Demand-limit test	Maintain grid demand within configured limit plus agreed deadband
PF/VAR test	Demonstrate commanded PF/VAR points within PCS capability
Anti-islanding	Trip and isolate within applicable limits
Availability run	30 consecutive days with $\geq 98\%$ availability and no unresolved critical alarm
Noise	Within specified limit at 1 m
Fire/HVAC interlocks	Successful functional test of all alarms, trips and fail-safe sequences

16. Detailed Engineering and Studies

- Site survey and interface data report
- Load-flow and voltage-drop study
- Short-circuit study and equipment duty verification
- Protection coordination and relay-setting study
- Harmonic and power-quality assessment
- Earthing and lightning-protection study
- Cable sizing and route design
- Battery sizing and degradation/augmentation model
- Thermal/HVAC calculation
- Fire hazard analysis and emergency response plan
- Structural/foundation design
- Control narrative, cause-and-effect matrix and cybersecurity design
- Utility and statutory approval drawings/documentation

17. Standards and Codes

Category	Applicable Standard / Regulation
CEA Safety	CEA (Measures relating to Safety and Electric Supply) Regulations, 2023 and applicable amendments, including 2026 BESS provisions from effective date

Category	Applicable Standard / Regulation
Grid connectivity	CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 and amendments/re-enactment
BESS safety	IEC 62933-5-1:2024; IEC 62933-5-2:2025; IEC 62933-5-4:2026 where applicable
Battery safety/performance	IEC 62619:2022; IEC 62620; UN 38.3
PCS safety	IEC 62477-1:2022/COR1:2024; IEC 62109 where applicable
LV assemblies	IS/IEC 61439-1 and 61439-2
Electrical installations	IS 732; National Electrical Code of India; National Building Code
Earthing	IS 3043
Cables	Applicable IS 7098/IS 1554/IEC standards for selected voltage and construction
EMC	IEC 61000-6-2, IEC 61000-6-4 and applicable harmonic/flicker standards
Fire test	UL 9540A:2025 or equivalent accepted full-scale/representative propagation test
Fire installation practice	NFPA 855:2026 as supplementary good engineering practice where not inconsistent with Indian law/AHJ
Cybersecurity	IEC 62443 series; applicable CEA cybersecurity requirements
Utility	MSEDCL/MERC procedures and interconnection conditions applicable to the existing renewable energy system

DR. VITHALRAO VIKHE PATIL FOUNDATION

Vilad Ghat, Ahilyanagar – 414111, Maharashtra

**DESIGN, ENGINEERING, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND
COMPREHENSIVE MAINTENANCE OF**

100 kW / 300 kWh BATTERY ENERGY STORAGE SYSTEM (BESS)

**Integrated with Existing Captive Solar Generation Plant
Engineering College Campus**

VOLUME III ENGINEERING DRAWINGS, QA, TESTING AND O&M

Tender Document

Tender No.	DVVPF/ENGG/BESS/2026-27/01
Issue Status	Tender – Version 1.1
Issue Date	July 2026
Employer	Dr. Vithalrao Vikhe Patil Foundation, Ahilyanagar
Project Site	Engineering College Campus, Vilad Ghat, Ahilyanagar

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5. Inspection and Test Plan
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8. Site Acceptance and Performance Testing
9. Commissioning and Reliability Run
10. O&M and Training Requirements
11. HSE and Permit-to-Work Requirements
12. Documentation and Handover
13. Recommended Spares and Special Tools

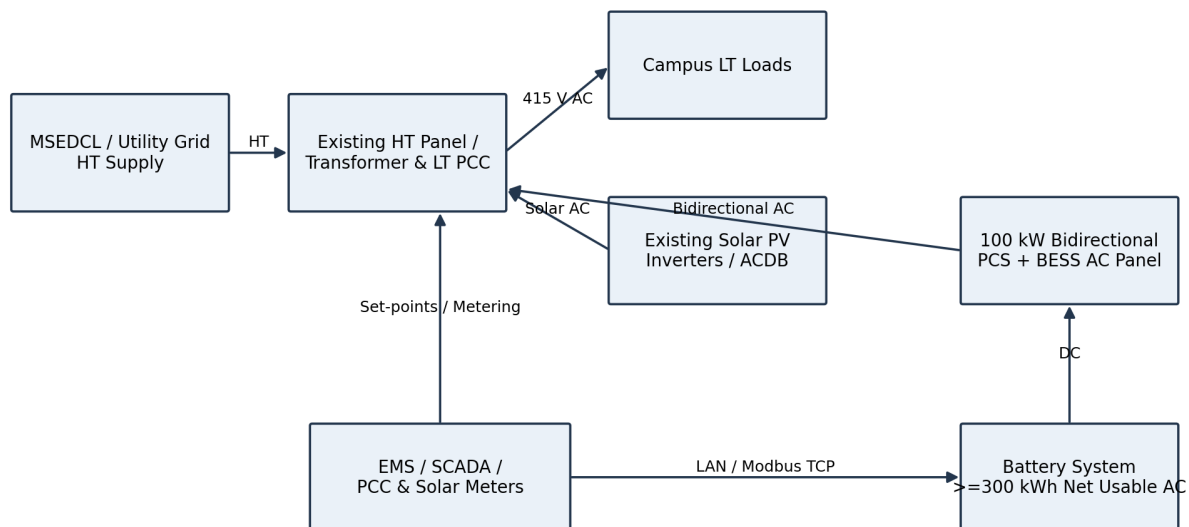
1. Drawing Register

Drawing No.	Title	Status
D-01	Monthly Energy Profile – Employer Source Data	Tender information
D-02	Average Energy by Utility TOD Band	Tender information
D-03	Conceptual AC-Coupled BESS Single-Line Diagram	Tender concept; bidder to develop
D-04	Conceptual EMS / SCADA Communication Architecture	Tender concept; bidder to develop
D-05	Conceptual Outdoor BESS General Arrangement	Tender concept; bidder to develop
V-01	Final single-line diagram and protection scheme	Vendor deliverable
V-02	Battery cabinet/container GA and sections	Vendor deliverable
V-03	PCS and AC-panel GA	Vendor deliverable
V-04	Foundation, trench and cable-routing plan	Vendor deliverable
V-05	Earthing and lightning-protection layout	Vendor deliverable
V-06	Fire detection/suppression layout and cause-effect	Vendor deliverable
V-07	EMS architecture, network and I/O schedule	Vendor deliverable
V-08	As-built drawings	Vendor deliverable

2. Conceptual Drawings

D-03 Conceptual Single-Line Diagram

Conceptual AC-Coupled BESS Integration at Engineering College PCC

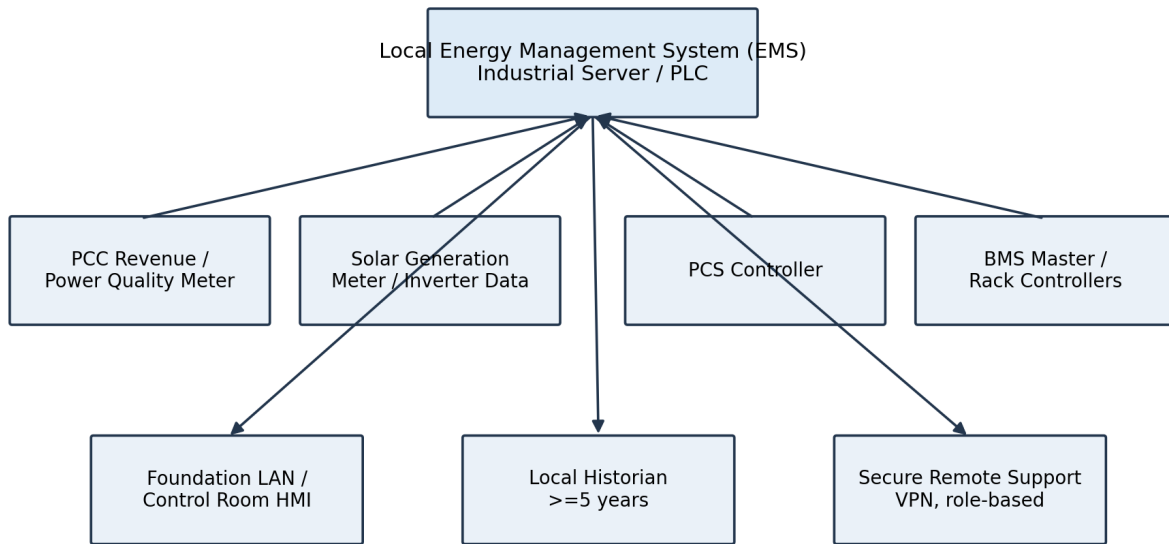


Final connection point, breaker ratings, CT/PT ratios, protection settings and islanding philosophy shall be verified during detailed engineering.

Tender-stage concept only. The successful bidder shall verify all interface data and submit coordinated approved-for-construction drawings with calculations and protection studies.

D-04 EMS / SCADA Architecture

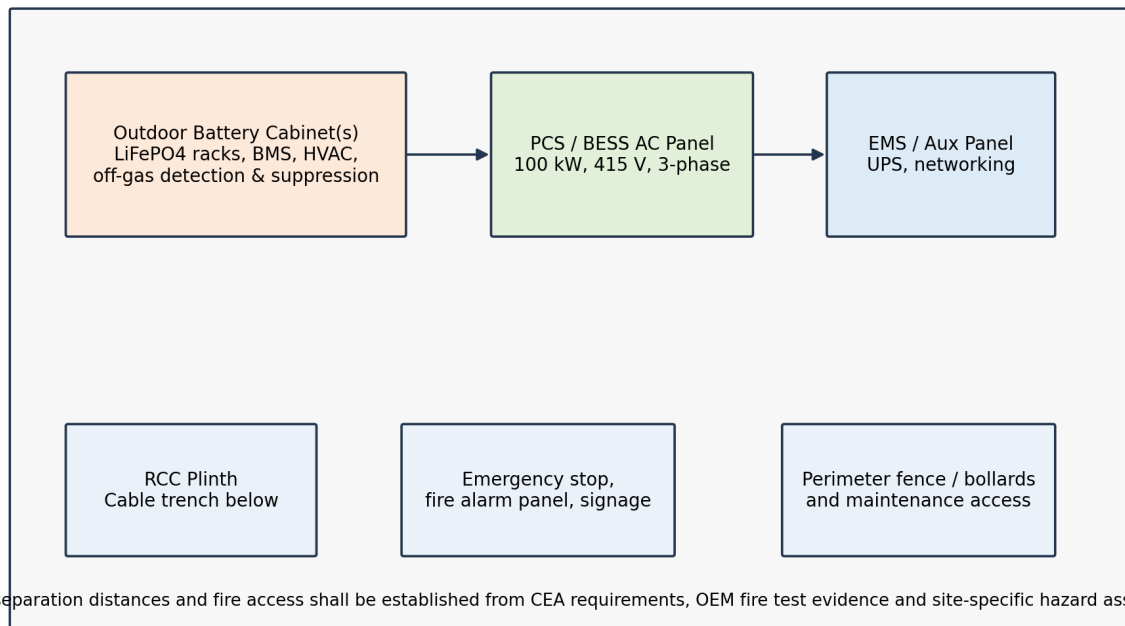
Conceptual EMS / SCADA Communication Architecture



Tender-stage concept only. The successful bidder shall verify all interface data and submit coordinated approved-for-construction drawings with calculations and protection studies.

D-05 Conceptual General Arrangement

Conceptual Outdoor BESS General Arrangement (Not to Scale)



Actual separation distances and fire access shall be established from CEA requirements, OEM fire test evidence and site-specific hazard assessment.

Tender-stage concept only. The successful bidder shall verify all interface data and submit coordinated approved-for-construction drawings with calculations and protection studies.

3. Vendor Data Requirement Schedule

No.	Document / Data	Submission
1	Project execution plan and organization chart	14 days after LOA
2	Site survey and validated interface data report	21 days
3	Design basis report and battery sizing/degradation model	28 days
4	SLD, protection philosophy and load-flow/short-circuit studies	35 days
5	GA drawings, foundation loads and civil details	35 days
6	Battery cell/module/rack datasheets and certificates	With bid / 21 days
7	PCS datasheet, efficiency curve and type tests	With bid / 21 days
8	BMS/EMS architecture, I/O list, protocol map and control narrative	35 days
9	Fire hazard analysis, test evidence and suppression design	42 days
10	Cable schedule, earthing layout and calculations	42 days
11	QAP/ITP and FAT procedures	6 weeks before FAT
12	FAT report and release note	Before dispatch
13	Installation method statement and HSE plan	Before site mobilization
14	SAT/performance test procedures	4 weeks before testing
15	As-built drawings, O&M manuals and software backups	Before provisional acceptance
16	Training materials and maintenance schedule	Before training
17	Warranty certificates and spares inventory	Before handover

4. Quality Assurance Plan

- The contractor shall maintain an ISO 9001-compliant project quality plan covering design, procurement, manufacturing, software, installation and commissioning.
- All critical bought-out items shall have approved vendors, traceable certificates and incoming inspection records.
- Battery cells shall be production-lot matched and accompanied by capacity, internal resistance and traceability data.
- Welding, crimping, torqueing, insulation, firmware loading and parameter setting shall follow controlled procedures.
- Non-conformities shall be logged, dispositioned and closed before dispatch/energization.
- Employer hold/witness points shall not be bypassed without written waiver.
- Final quality dossier shall include certificates, calibration records, test reports, inspection releases and red-line/as-built drawings.

5. Inspection and Test Plan

Equipment / Activity	Inspection / Test	Point
Battery cells/modules	Certificate review; visual/traceability; sample capacity/IR; insulation	W/R
Battery racks/cabinets	Dimensions, wiring, torque, insulation, BMS checks, thermal sensors	W
PCS	Routine tests, protection, efficiency, harmonic, communication, full-load run	H/W
BESS AC panel	IS/IEC 61439 routine verification, dielectric, wiring, breaker operation	W
EMS/SCADA	I/O simulation, logic, alarms, historian, user roles, cyber hardening	W
Fire/HVAC system	Sensor calibration, alarm/suppression logic, ventilation and shutdown	H/W
Integrated FAT	Charge/discharge simulation, interlocks, cause-effect, communications	H
Civil works	Rebar/formwork inspection, concrete tests, dimensions and levels	W
Cables/earthing	IR, continuity, phase identification, earth resistance	W

Equipment / Activity	Inspection / Test	Point
SAT/PAT	Functional, power, energy, efficiency, export/demand and reliability tests	H

Legend: H = Hold point; W = Witness point; R = Review of records. Detailed ITP shall identify applicable standards, acceptance criteria, responsible party and records.

6. Factory Acceptance Testing

6. Document and configuration audit against approved BOM and drawings.
7. Visual, dimensional, nameplate and workmanship inspection.
8. Battery rack insulation, polarity, continuity, contactor, fuse and BMS channel verification.
9. PCS no-load and full-load operation in charge and discharge directions.
10. PCS efficiency and harmonic measurement at 25%, 50%, 75% and 100% load where facility permits.
11. Protection relay injection or functional simulation for all trip/alarm functions.
12. EMS I/O and communication simulation, schedule logic, demand/export control and fail-safe tests.
13. Fire, HVAC, gas detection, door switch, E-stop and emergency shutdown cause-effect tests.
14. Minimum 8-hour integrated heat run at representative load or equivalent validated OEM test.
15. Cybersecurity configuration review, user access test, backup/restore and time synchronization.
16. FAT punch-list closure before release for dispatch.

7. Site Installation and Pre-commissioning

- Approved method statements, lifting plan, electrical safety plan and permit-to-work shall be in place before mobilization.
- Equipment shall be inspected for transit damage and stored under OEM-prescribed conditions.
- Civil foundations shall be checked for dimensions, level, strength and anchor layout before equipment placement.
- All electrical terminations shall be torque-marked and recorded. Cable test certificates shall be included.
- Earthing continuity and resistance shall be verified before energization.
- Protection settings shall be loaded only from approved setting sheets and independently checked.
- Battery energization shall follow OEM sequence with barricading, arc-flash PPE and authorized personnel.
- Pre-commissioning checklists shall be signed by contractor and Employer representative.

8. Site Acceptance and Performance Testing

Test	Acceptance
Document review	Approved drawings, certificates, settings, test reports and punch-list status complete
Visual/mechanical	Installation, clearances, labels, access, torque marks, ventilation and fire systems satisfactory
Insulation/continuity	AC/DC insulation, earthing and protective conductor continuity within limits
Communication	All devices online, correct addressing, time sync, data quality and alarm mapping
Protection	Trip tests including grid loss, OV/UV, OF/UF, overcurrent, earth fault and E-stop
Rated charge	100 kW charge for minimum 30 minutes without abnormal alarm
Rated discharge	100 kW discharge for minimum 30 minutes without abnormal alarm
Usable energy	≥ 300 kWh net AC at PCC from full usable SOC to minimum SOC
Round-trip efficiency	$\geq 88\%$ AC-AC including auxiliaries
Export control	Set-point tracking within agreed deadband under load/solar changes
Demand control	Maintain demand threshold during simulated/actual load change
PF/VAR	Demonstrate at least unity, 0.95 lag and 0.95 lead where kVA allows
Emergency functions	All fire/HVAC/E-stop alarms and trips operate as cause-effect matrix
Data/reporting	Historian, trends, daily report and export functions verified

9. Commissioning and Reliability Run

After successful SAT and performance acceptance, the system shall operate for 30 consecutive days under automatic control. The reliability run shall demonstrate at least 98% availability, correct dispatch, stable export/demand control, accurate reporting and no unresolved critical alarms. Interrupted periods caused by contractor defects shall restart or extend the run as directed by the Employer.

10. O&M and Training Requirements

Activity	Minimum Requirement
Comprehensive maintenance	Five years from provisional acceptance, including labour, travel, consumables, software support and defective parts
Preventive maintenance	At least quarterly in year 1 and semi-annually thereafter, or more frequent if OEM requires
Remote monitoring	Daily health monitoring with alarm escalation during warranty/CMC
Response	2-hour remote acknowledgement; 24-hour critical site attendance; 48-hour non-critical attendance
Annual tests	Capacity/energy test, protection trip checks, fire/HVAC checks, earthing and thermal inspection
Battery augmentation	Included to maintain guaranteed capacity curve
Training	Minimum three days onsite for operators and two days for maintenance personnel
Training content	Safety, operating modes, EMS, alarms, isolation, emergency response, routine inspection and reporting
Competency	Training records and certificates for nominated Foundation staff
O&M reports	Monthly availability, alarms, cycles, capacity, efficiency, maintenance and recommendations

11. HSE and Permit-to-Work Requirements

- Project-specific HSE plan, risk assessments and job safety analyses.
- Authorized electrical persons, lock-out/tag-out, test-before-touch and permit-to-work.
- Arc-flash and DC battery PPE, insulated tools, rescue hook and first-aid arrangements.
- No lone work on energized or battery-connected equipment.
- Lifting equipment certification and controlled exclusion zones.
- Hot-work permit and fire watch where applicable.
- Spill control, waste segregation and end-of-life battery take-back plan.
- Emergency contact list, evacuation route, fire service liaison and drills before handover.

12. Documentation and Handover

- Approved and as-built SLDs, GAs, schematics, wiring diagrams, cable schedules and layouts.
- Design calculations and studies.
- Type-test, routine-test, FAT, SAT and performance-test reports.
- Protection settings, passwords under sealed control, software licences and backups.
- O&M manuals, maintenance schedules, troubleshooting guides and safety data sheets.
- Asset register with serial numbers, firmware versions and warranty dates.
- Spare-parts inventory and special tools.
- Statutory approvals, inspection certificates and fire-safety audit report.
- Training records and attendance.
- Editable native files plus searchable PDF copies.

13. Recommended Spares and Special Tools

Item	Minimum Quantity / Requirement
PCS cooling fan/pump set	One complete set or 10%, whichever higher
BMS slave/controller	One of each type
Communication gateway/switch	One of each critical type
Temperature/door/smoke/off-gas sensors	Two of each type or 10%
AC/DC fuses	10% of each rating, minimum two
Contactors/auxiliary relays	One of each critical type
Filters	Two years requirement
Panel indication lamps/MCBs/SPDs	5% or minimum two
Special tools	Insulated torque tools, diagnostic cables, software dongles/licences and OEM test adapters
PPE and rescue equipment	As required for safe routine operation and emergency isolation

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Vilad Ghat, Ahilyanagar – 414111, Maharashtra

**DESIGN, ENGINEERING, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND
COMPREHENSIVE MAINTENANCE OF**

100 kW / 300 kWh BATTERY ENERGY STORAGE SYSTEM (BESS)

**Integrated with Existing Captive Solar Generation Plant
Engineering College Campus**

VOLUME IV SCHEDULES, FORMS AND BID RETURNABLES

Tender Document

Tender No.	DVVPF/ENGG/BESS/2026-27/01
Issue Status	Tender – Version 1.1
Issue Date	July 2026
Employer	Dr. Vithalrao Vikhe Patil Foundation, Ahilyanagar
Project Site	Engineering College Campus, Vilad Ghat, Ahilyanagar

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3. Project Experience Schedule
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6. Commercial Deviation Schedule
7. Proposed Makes and Sub-vendors
8. Project Programme
9. Price Schedule Instructions
10. Bank Guarantee Formats
11. Manufacturer Authorization
12. Site Survey Certificate
13. Performance Guarantee Declaration
14. Contract Agreement Form

1. Bid Submission Checklist

No.	Returnable	Included
1.	Signed tender volumes	Yes/No
2.	Company registration, PAN, GST	Yes/No
3.	OEM authorizations	Yes/No
4.	Audited financial statements	Yes/No
5.	Experience certificates	Yes/No
6.	Site survey certificate	Yes/No
7.	Technical proposal and methodology	Yes/No
8.	Guaranteed technical particulars	Yes/No
9.	Battery/PCS/BESS safety certificates	Yes/No
10.	Preliminary SLD and GA	Yes/No
11.	Degradation and augmentation model	Yes/No
12.	Fire safety test evidence and hazard approach	Yes/No
13.	EMS control narrative and cybersecurity statement	Yes/No
14.	Unpriced BOQ	Yes/No
15.	Deviation schedules	Yes/No
16.	Price bid in prescribed workbook	Yes/No

2. Bidder Information Form

Field	Bidder Response
Legal name	
Registered address	
Contact person / designation	
Email / phone	
Company registration number	
PAN / GSTIN	
Year of incorporation	
OEM or system integrator	
Battery OEM	
PCS OEM	
EMS supplier	
Local service address in Maharashtra	
Authorized signatory	

3. Project Experience Schedule

Client	Location	BESS Rating kW/kWh	Application	Commissioning Date	OEMs	Contact / Certificate

4. Guaranteed Technical Particulars

Parameter	Tender Requirement	Bidder Offer
System rated charge power	100 kW	
System rated discharge power	100 kW	
Net usable AC energy at COD	>=300 kWh	
Installed DC nominal energy	Bidder to state	
Battery chemistry	LiFePO4	
Cell manufacturer/model	State	
Cell nominal capacity and voltage	State	
Number of cells/modules/racks	State	
Warranted SOC window	State	
Cycle life	>=6,000 EFC	
Year-10 capacity retention	>=80% including augmentation	
PCS make/model	State	
PCS rated kVA	>=110 kVA or adequate	
PCS peak efficiency	>=97.5%	
AC voltage/frequency	415 V / 50 Hz	
PF range	0.90 lag to 0.90 lead	
THDi at rated output	<=3%	
Round-trip efficiency	>=88% AC-AC incl. auxiliaries	
Annual availability	>=98%	
EMS make/platform	State	
Protocols	Modbus TCP mandatory; others state	
Outdoor IP rating	>=IP55	
Design ambient	0 to 50°C	
Noise at 1 m	<=75 dBA	

Parameter	Tender Requirement	Bidder Offer
Fire detection	Off-gas + smoke + heat	
Suppression system	State and support with test evidence	
UL 9540A/equivalent test	Report number and edition	
IEC 62619 certificate	Report/certificate number	
IEC 62933 compliance	State	
Warranty	5-year comprehensive; 8-year performance	

5. Technical Deviation Schedule

Clause Reference	Tender Requirement	Offered Deviation	Reason	Cost / Performance Impact

6. Commercial Deviation Schedule

Clause Reference	Tender Condition	Deviation	Reason / Qualification

7. Proposed Makes and Sub-vendors

Equipment	Proposed Make / Model	Country of Origin	OEM Authorization Attached	Alternative Make
Battery cells				

Equipment	Proposed Make / Model	Country of Origin	OEM Authorization Attached	Alternative Make
Battery modules/racks				
PCS				
BMS				
EMS/SCADA				
AC panel/switchgear				
Protection relay/meter				
Fire detection/suppression				
HVAC				
Cables				
Networking				

8. Project Programme

Milestone	Weeks from LOA	Bidder Commitment
Kick-off and site survey	0–2	
Validated design basis	2–4	
Detailed engineering / approvals	3–8	
Manufacture and procurement	5–14	
Civil works	6–12	
FAT	14–16	
Delivery	16–18	
Installation	18–21	
SAT / performance testing	21–23	
Provisional acceptance	By week 24	

9. Price Schedule Instructions

- Price schedules shall be completed only in the issued Excel workbook; no rows shall be deleted.
- The total price shall include all items necessary for a complete system, whether or not separately quantified.
- GST shall be shown separately. All other duties, freight, insurance, labour, tools and incidental costs shall be included.
- Mandatory spares and five-year CMC shall be included in evaluated price.
- Optional islanding/critical-load backup and Years 6–10 AMC shall be separately priced.
- Any unpriced item shall be deemed included elsewhere at zero additional cost.

10. Bank Guarantee Formats

The bid security, performance security, advance bank guarantee and warranty bank guarantee shall be issued by a scheduled commercial bank in India, payable at Ahilyanagar/Pune, unconditional and irrevocable, in a format acceptable to the Employer. The guarantee shall permit extension on written demand and shall not require proof of contractor default beyond the Employer's written invocation.

11. Manufacturer Authorization

We, [OEM name], being the manufacturer of [equipment], authorize [bidder] to submit a bid, negotiate and execute the contract for the subject project. We confirm full technical support, supply of genuine equipment/spares, software support and warranty obligations for the offered system for the full contract period.

12. Site Survey Certificate

We certify that our authorized representatives inspected the Engineering College Campus, reviewed the available electrical and solar interfaces, cable routes, access, environmental conditions and proposed BESS area, and have incorporated all foreseeable site requirements in our bid. We understand that final ratings and interfaces must be validated during detailed engineering.

13. Performance Guarantee Declaration

We guarantee the offered BESS to meet the rated power, usable energy, round-trip efficiency, availability, harmonic, control, safety and capacity-retention requirements specified in the tender. We accept the performance test procedures and the obligation to rectify, replace or augment equipment at our cost if guarantees are not achieved.

14. Contract Agreement Form

This Agreement is made between Dr. Vithalrao Vikhe Patil Foundation (“Employer”) and [Contractor] for execution of the 100 kW / 300 kWh BESS project in accordance with the Letter of Award, tender documents, accepted bid, clarifications, approved drawings and schedules. The contractor shall complete the works for the Contract Price and within the Time for Completion, subject to the conditions of contract.