
Government of Nepal
Ministry of Energy, Water Resources and Irrigation
Alternative Energy Promotion Centre (AEPC)

BIDDING DOCUMENT

For

**Procurement of 150kWp Solar Mini-grid
System for Thabang Rural Municipality
Ward No-1&2, Thabang, Rolpa District**

Single-Stage: Two-Envelope Bidding Procedure

Issued on: 25 July, 2019

Invitation for Bids No.: AEPC/ADB/SASEC/NCB/SWMG/09

NCB No.: SWMG/09

Employer: Alternative Energy Promotion Centre (AEPC)

Country: Nepal

Government of Nepal
Ministry of Energy, Water Resources and Irrigation
Alternative Energy Promotion Centre (AEPC)
South Asia Sub-regional Economic Cooperation (SASEC)
Power System Expansion Project
Procurement of 150kWp Solar Mini-grid System for Thabang Rural
Municipality Ward No-1&2, Thabang, Rolpa District

Invitation for Bids

Date	25 July, 2019
Grant No and Title	ADB Grant No. 0398-NEP (EF)
Contract No.	AEPC/ADB/SASEC/NCB/SWMG/09
Deadline for Submission of Bids	25 August, 2019, 12:00 hours NST

1. The Government of Nepal has received financing from the Asian Development Bank (ADB) toward the cost of South Asia Sub-regional Economic Cooperation (SASEC), Power System Expansion Project, Off-grid Component, and it intends to apply part of the proceeds of this financing to payments under the contract named above.
2. Alternative Energy Promotion Centre (AEPC) invites sealed Bids from eligible Bidders for the Procurement of 150kWp Solar Mini-grid System for Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District having the following main criteria: minimum average annual turnover of NRs 164 Million within the last three (3) years, successfully completed as main supplier of at least one contract, solar PV system or solar/wind hybrid system valued at NRs 41 Million within the last five (5) years.
3. National competitive bidding will be conducted in accordance with ADB's single stage two envelope bidding procedure and is open to all bidders from eligible countries as described in the Bidding Document.
4. To obtain further information and inspect the Bidding Documents, bidder should contact:

Alternative Energy Promotion Centre (AEPC)
Ministry of Energy, Water Resources and Irrigation
Khumaltar Height, Lalitpur Sub-Metropolitan City, Nepal
Dr. Narayan Prasad Adhikari
Project Manager, AEPC/SASEC
P.O. Box: 14364
Tel: +977-1-5539390, 5539391
Fax: +977-1-5542397, 5539392

5. To purchase the Bidding Documents in English, eligible bidders should
 - Write to the address requesting the Bidding Documents for Procurement of 150kWp Solar Mini-grid System for Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District
 - Pay a non refundable fee of NRs 5,000 by cash.
6. Pre-bid meeting will be held on 9 August, 2019 at 2:00 PM in the AEPC Meeting Hall, Khumaltar, Lalitpur.
7. Bidders are requested to specify the total price of the Bid in the Letter of Bid or the Bid Price in the Price Schedule. Failure to specify the total price of the Bid in the Letter of Bid or the Bid Price in the Price Schedule may be ground for declaring the Bid nonresponsive.
8. Deliver your bid
 - To the address above
 - On or before the deadline: 25 August, 2019, 12:00 Hours.
 - Together with a Bid Security as described in the Bidding Document.

Bids will be opened immediately after the deadline for bid submission in the presence of bidders' representatives who choose to attend.

In case the day of final Bid submission falls on a public holiday, the final Bid submission date shall be the following working day.

9. The AEPC will not be responsible for any costs or expenses incurred by Bidders in connection with the preparation or delivery of bids.

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Section 1 - Instructions to Bidders

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A. General

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| 1. Scope of Bid | <p>1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Purchaser, as indicated in the BDS, issues this Bidding Document for the supply of Goods and Related Services incidental thereto as specified in Section 6 (Schedule of Supply). The name, identification, and number of lots of the international competitive bidding (ICB) are provided in the BDS.</p> <p>1.2 Throughout this Bidding Document,</p> <ul style="list-style-type: none"> (a) the term “in writing” means communicated in written form and delivered against receipt; (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and (c) “day” means calendar day. |
| 2. Source of Funds | <p>2.1 The Borrower or Recipient (hereinafter called “Borrower”) indicated in the BDS has applied for or received financing (hereinafter called “funds”) from the Asian Development Bank (hereinafter called “ADB”) toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.</p> <p>2.2 Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called the Financing Agreement), and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.</p> |
| 3. Fraud and Corruption | <p>3.1 ADB’s Anticorruption Policy requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB</p> <ul style="list-style-type: none"> (a) defines, for the purposes of this provision, the terms set forth below as follows: <ul style="list-style-type: none"> (i) “corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; (ii) “fraudulent practice” means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; (iii) “coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; |

- (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
 - (v) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to provide information, documents, or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding ADB's contractual rights of audit or access to information; and
 - (vi) "integrity violation" is any act which violates ADB's Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.
- (b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
 - (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation;
 - (d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate¹ in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and
 - (e) will have the right to require that a provision be included in bidding documents and in contracts financed by ADB, requiring Bidders, suppliers and contractors to permit ADB or its representative to inspect their accounts and records and other documents relating to the bid submission and contract

¹ Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

performance and to have them audited by auditors appointed by ADB.

- 3.2 Furthermore, Bidders shall be aware of the provision stated in Subclause 3.2 and Subclause 35.1 (c) of the General Conditions of Contract.

4. Eligible Bidders

- 4.1 A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5-or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a joint venture. In the case of a joint venture,
- (a) all parties to the Joint Venture shall be jointly and severally liable; and
 - (b) the Joint Venture shall nominate a representative who shall have the authority to conduct all businesses for and on behalf of any and all the parties of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.
- 4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract, including related services.
- 4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if any of, including but not limited to, the following apply:
- (a) they have controlling shareholders in common; or
 - (b) they receive or have received any direct or indirect subsidy from any of them; or
 - (c) they have the same legal representative for purposes of this Bid; or
 - (d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the Bid of another Bidder, or influence the decisions of the Purchaser regarding this bidding process; or
 - (e) a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a joint venture, except for alternative offers permitted under ITB 13. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3 (a)–(d) above, this does not limit the participation of a Bidder as a subcontractor in another bid or of a firm as a

subcontractor in more than one Bid; or

- (f) a Bidder or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the goods and services that are the subject of the Bid; or
- (g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Purchaser or Borrower as Project Manager for the contract.

- 4.4 A firm shall not be eligible to participate in any procurement activities under an ADB-financed, -administered, or -supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporary suspended or debarred firm will be rejected.
- 4.5 Government-owned enterprises in the Purchaser's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not a dependent agency of the Purchaser.
- 4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.
- 4.7 Firms shall be excluded if by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.

5. Eligible Goods and Related Services

- 5.1 All Goods and Related Services to be supplied under the Contract and financed by ADB, shall have their country of origin in eligible source countries as defined in ITB 4.2, and all expenditures under the Contract will be limited to such Goods and Related Services.
- 5.2 For purposes of this clause, the term "goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "related services" includes services such as insurance, transportation, installation, commissioning, training, and initial maintenance.
- 5.3 The term "country of origin" means the country where the goods have been mined, grown, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components.
- 5.4 The nationality of the firm that produces, assembles, distributes, or sells the goods shall not determine their origin.

B. Contents of Bidding Document

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| <p>6. Sections of the Bidding Document</p> | <p>6.1</p> | <p>The Bidding Document consists of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITB 8.</p> <p>PART I Bidding Procedures</p> <ul style="list-style-type: none"> • Section 1 Instructions to Bidders (ITB) • Section 2 Bid Data Sheet (BDS) • Section 3 Evaluation and Qualification Criteria (EQC) • Section 4 Bidding Forms (BDF) • Section 5 Eligible Countries (ELC) <p>PART II Supply Requirements</p> <ul style="list-style-type: none"> • Section 6 Schedule of Supply (SS) <p>PART III Conditions of Contract and Contract Forms</p> <ul style="list-style-type: none"> • Section 7 General Conditions of Contract (GCC) • Section 8 Special Conditions of Contract (SCC) • Section 9 Contract Forms (COF) |
| | <p>6.2</p> | <p>The IFB issued by the Purchaser is not part of the Bidding Document.</p> |
| | <p>6.3</p> | <p>The Purchaser is not responsible for the completeness of the Bidding Document and its addenda, if they were not obtained directly from the source stated by the Purchaser in the IFB.</p> |
| | <p>6.4</p> | <p>The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document, may result in the rejection of the Bid.</p> |
| <p>7. Clarification of Bidding Document</p> | <p>7.1</p> | <p>A prospective Bidder requiring any clarification on the Bidding Document shall contact the Purchaser in writing at the Purchaser's address indicated in the BDS. The Purchaser will respond in writing to any request for clarification, provided that such request is received no later than 21 days prior to the deadline for submission of Bids. The Purchaser shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Purchaser deem it necessary to amend the Bidding Document as a result of a clarification, it shall do so following the procedure under ITB 8 and ITB 24.2.</p> |
| <p>8. Amendment of Bidding Document</p> | <p>8.1</p> | <p>At any time prior to the deadline for submission of the Bids, the Purchaser may amend the Bidding Document by issuing addenda.</p> |
| | <p>8.2</p> | <p>Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document directly from the Purchaser in accordance with ITB 6.3.</p> |

- 8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Purchaser may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB 24.2

C. Preparation of Bids

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| 9. Cost of Bidding | 9.1 | The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Purchaser shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process. |
| 10. Language of Bid | 10.1 | The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Purchaser, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern. |
| 11. Documents Comprising the Bid | 11.1 | The Bid shall comprise two envelopes submitted simultaneously, one containing the Technical Bid and the other the Price Bid, both envelopes enclosed together in an outer single envelope. |
| | 11.2 | <p>The Technical Bid submitted by the Bidder shall comprise the following:</p> <ul style="list-style-type: none"> (a) Technical Bid Submission Sheet; (b) Bid Security or Bid-Securing Declaration, in accordance with ITB 21; (c) alternative Technical Bid, if permissible, in accordance with ITB 13; (d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 22; (e) documentary evidence in accordance with ITB 16, establishing the Bidder's eligibility to bid; (f) documentary evidence in accordance with ITB 17, that the Goods and Related Services to be supplied by the Bidder are of eligible origin; (g) documentary evidence in accordance with ITB 18 and ITB 32, that the Goods and Related Services conform to the Bidding Document; (h) documentary evidence in accordance with ITB 19, establishing the Bidder's qualifications to perform the contract if its Bid is accepted; and (i) any other document required in the BDS. |

- 11.3 The Price Bid submitted by the Bidder shall comprise the following:
- (a) Price Bid Submission Sheet and the applicable Price Schedules, in accordance with ITB 12, ITB 14, and ITB 15;
 - (b) alternative Price Bid corresponding to the alternative Technical Bid, if permissible, in accordance with ITB 13; and
 - (c) any other document required in the BDS.
- 12. Bid Submission Sheets and Price Schedules**
- 12.1 The Bidder shall submit the Technical Bid Submission Sheet and the Price Bid Submission Sheet using the form furnished in Section 4 (Bidding Forms). These forms must be completed without any alterations to their format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
- 12.2 The Bidder shall submit, as part of the Price Bid, the Price Schedules for Goods and Related Services, according to their origin as appropriate, using the forms furnished in Section 4 (Bidding Forms) and as required in the BDS.
- 13. Alternative Bids**
- 13.1 Unless otherwise indicated in the BDS, alternative Bids shall not be considered.
- 14. Bid Prices and Discounts**
- 14.1 The prices and discounts quoted by the Bidder in the Price Bid Submission Sheet and in the Price Schedules shall conform to the requirements specified below.
- 14.2 All items in the Schedule of Supply must be listed and priced separately in the Price Schedules. If a Price Schedule shows items listed but not priced, their prices shall be assumed to be included in the prices of other items. Items not listed in the Price Schedule shall be assumed not to be included in the Bid, and provided that the Bid is substantially responsive, the corresponding adjustment shall be applied in accordance with ITB 33.3.
- 14.3 The price to be quoted in the Price Bid Submission Sheet shall be the total price of the Bid excluding any discounts offered. Absence of the total bid price in the Price Bid Submission Sheet may result in the rejection of the Bid.
- 14.4 The Bidder shall quote discounts and the methodology for their application in the Price Bid Submission Sheet.
- 14.5 The terms EXW, CIF, CIP, and other similar terms shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce, at the date of the Invitation for Bids or as specified in the BDS.
- 14.6 Prices proposed in the Price Schedule Forms for Goods and Related Services, shall be disaggregated, when appropriate, as indicated in this sub-clause. This disaggregation shall be solely for the purpose of facilitating the comparison of Bids by the Purchaser. This shall not in any way limit the Purchaser's right to contract on any of the terms offered

- (a) for Goods offered from within the Purchaser's country:
 - (i) the price of the goods quoted EXW (ex works, ex factory, ex warehouse, ex showroom, or off-the-shelf, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of goods quoted ex works or ex factory, or on the previously imported goods of foreign origin quoted ex warehouse, ex showroom, or off-the-shelf;
 - (ii) sales tax and all other taxes applicable in the Purchaser's country and payable on the Goods if the Contract is awarded to the Bidder; and
 - (iii) the total price for the item.
- (b) for Goods offered from outside the Purchaser's country:
 - (i) the price of the goods quoted CIF (named port of destination), or CIP (border point), or CIP (named place of destination), in the Purchaser's country, as specified in the BDS;
 - (ii) the price of the goods quoted FOB port of shipment (or FCA, as the case may be), if specified in the BDS; and
 - (iii) the total price for the item.
- (c) for Related Services whenever such are specified in the Schedule of Supply:
 - (i) the local currency cost component of each item comprising the Related Services; and
 - (ii) the foreign currency cost component of each item comprising the Related Services, inclusive of all customs duties, sales and other similar taxes applicable in the Purchaser's country, payable on the Related Services, if the Contract is awarded to the Bidder.

14.7 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account, unless otherwise specified in the BDS. A Bid submitted with an adjustable price quotation shall be treated as nonresponsive and shall be rejected, pursuant to ITB 32. However, if in accordance with the BDS, prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, but a Bid submitted with no indexes identified in the Tables of Adjustment Data, price adjustment shall be treated as zero for the purpose of price adjustment during the performance of the contract.

14.8 If so indicated in ITB 1.1, Bids are being invited for individual contracts (lots) or for any combination of contracts (packages). Unless otherwise indicated in the BDS, prices quoted shall correspond to 100% of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Bidders wishing to offer any price discount for the award of more than one Contract shall specify in their Price Bids the price discount applicable to each package, or alternatively, to individual Contracts within the package. Price discounts shall be submitted in accordance with ITB 14.4,

provided the Price Bids for all lots are submitted and opened at the same time.

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| 15. Currencies of Bid | 15.1 | <p>Bid prices shall be quoted in the following currencies:</p> <ul style="list-style-type: none"> (a) Bidders may express their bid price in any fully convertible currency. If a Bidder wishes to be paid in a combination of amounts in different currencies, it may quote its price accordingly but shall use no more than three currencies in addition to the currency of the Purchaser's country. (b) If some of the expenditures for the Related Services are to be incurred in the borrowing country, such expenditures should be expressed in the Bid and will be payable in the Purchaser's currency. |
| 16. Documents Establishing the Eligibility of the Bidder | 16.1 | <p>To establish their eligibility in accordance with ITB 4, Bidders shall</p> <ul style="list-style-type: none"> (a) complete the eligibility declarations in the Bid Submission Sheet, included in Section 4 (Bidding Forms); and (b) if the Bidder is an existing or intended Joint Venture in accordance with ITB 4.1, submit a copy of the Joint Venture Agreement, or a letter of intent to enter into such an Agreement. The respective document shall be signed by all legally authorized signatories of all the parties to the existing or intended Joint Venture, as appropriate. |
| 17. Documents Establishing the Eligibility of Goods and Related Services | 17.1 | <p>To establish the eligibility of the Goods and Related Services, in accordance with ITB 5, Bidders shall complete the country of origin declarations in the Price Schedule Forms included in Section 4 (Bidding Forms).</p> |
| 18. Documents Establishing the Conformity of the Goods and Related Services to the Bidding Document | 18.1 | <p>To establish the conformity of the Goods and Related Services to the Bidding Document, the Bidder shall furnish as part of its Technical Bid documentary evidence that the Goods and Related Services conform to the requirements specified in Section 6 (Schedule of Supply).</p> |
| | 18.2 | <p>The documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed item-by-item description of the essential technical and performance characteristics of the Goods and Related Services, demonstrating substantial responsiveness of the Goods and Related Services to those requirements, and if applicable, a statement of deviations and exceptions to the provisions of Section 6 (Schedule of Supply).</p> |
| | 18.3 | <p>Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by the Purchaser in Section 6 (Schedule of Supply), are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers,</p> |

provided that it demonstrates, to the Purchaser's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in Section 6 (Schedule of Supply).

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| 19. Documents Establishing the Qualifications of the Bidder | <p>19.1 To establish its qualifications to perform the Contract, the Bidder shall submit as part of its Technical Proposal the evidence indicated for each qualification criteria specified in Section 3 (Evaluation and Qualification Criteria).</p> <p>19.2 If so required in the BDS, a Bidder that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization using the form included in Section 4 (Bidding Forms) to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in the Purchaser's country.</p> <p>19.3 If so required in the BDS, a Bidder that does not conduct business within the Purchaser's country shall submit evidence that it will be represented by an agent in the country equipped and able to carry out the Supplier's maintenance, repair, and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications.</p> |
| 20. Period of Validity of Bids | <p>20.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Purchaser. A Bid valid for a shorter period shall be rejected by the Purchaser as nonresponsive.</p> <p>20.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Purchaser may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a Bid Security is requested in accordance with ITB 21, it shall also be extended 28 days beyond the deadline of the extended bid validity period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its Bid.</p> |
| 21. Bid Security/ Bid-Securing Declaration | <p>21.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS.</p> <p>21.2 If a Bid-Securing Declaration is required pursuant to ITB 21.1, it shall use the form included in Section 4 (Bidding Forms). The Purchaser will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if a Bid-Securing Declaration is executed.</p> <p>21.3 If a bid security is specified pursuant to ITB 21.1, the bid security shall be, at the Bidder's option, in any of the following forms:</p> <ul style="list-style-type: none"> (a) an unconditional bank guarantee, (b) an irrevocable letter of credit, or |

- (c) a cashier's or certified check,

all from a reputable source from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section 4 (Bidding Forms), or another form acceptable to the Purchaser. The form must include the complete name of the Bidder. The bid security shall be valid for 28 days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 20.2.

- 21.4 Unless otherwise specified in the BDS, any bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 21.1, shall be rejected by the Purchaser as nonresponsive.
- 21.5 If a bid security is specified pursuant to ITB 21.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the performance security pursuant to ITB 46.
- 21.6 If a bid security is specified pursuant to ITB 21.1, the bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract Agreement and furnished the required performance security.
- 21.7 The bid security may be forfeited or the Bid-Securing Declaration executed,
- (a) if a Bidder withdraws its bid during the period of bid validity as specified by the Bidder on the Technical Bid Submission Sheet, except as provided in ITB 20.2; or
 - (b) if the successful Bidder fails to
 - (i) sign the Contract Agreement in accordance with ITB 45;
 - (ii) furnish a performance security in accordance with ITB 46; or
 - (iii) accept the arithmetical corrections of its bid in accordance with ITB 36.
- 21.8 The bid security or the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security or the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.

22. Format and Signing of Bid

- 22.1 The Bidder shall prepare one original set of the Technical Bid and one original set of the Price Bid as described in ITB 11 and clearly mark each "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID". In addition, the Bidder shall submit copies of the Technical Bid and the Price Bid, in the number specified in the BDS and clearly mark them "COPY NO... - TECHNICAL BID" and "COPY NO.... - PRICE BID". In the event of any discrepancy between the original and the copies, the original shall prevail.

- 22.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for unamended printed literature, shall be signed or initialled by the person signing the Bid. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Purchaser shall request the Bidder to submit an acceptable authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the prescribed period of receiving such a request shall cause the rejection of the Bid.
- 22.3 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialled by the person signing the bid.

D. Submission and Opening of Bids

23. Sealing and Marking of Bids

- 23.1 Bidders may submit their bids by mail or by hand. When so specified in the BDS, Bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows:
- (a) Bidders submitting Bids by mail or by hand shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and each copy of the Price Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL - TECHNICAL BID", "ORIGINAL - PRICE BID" and "COPY NO... - TECHNICAL BID" and "COPY NO.... - PRICE BID", as appropriate. These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB 23.2 to ITB 23.6.
 - (b) Bidders submitting Bids electronically shall follow the electronic bid submission procedures specified in the BDS.
- 23.2 The inner and outer envelopes shall
- (a) bear the name and address of the Bidder;
 - (b) be addressed to the Purchaser in accordance with ITB 24.1; and
 - (c) bear the specific identification of this bidding process indicated in the BDS.
- 23.3 The outer envelopes and the inner envelopes containing the Technical Bids shall bear a warning not to open before the time and date for the opening of Technical Bids, in accordance with ITB 27.1.

- 23.4 The inner envelopes containing the Price Bids shall bear a warning not to open until advised by the Purchaser in accordance with ITB 27.2.
- 23.5 If all envelopes are not sealed and marked as required, the Purchaser will assume no responsibility for the misplacement or premature opening of the Bid.
- 23.6 Alternative Bids, if permissible in accordance with ITB 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB 22 and ITB 23, with the inner envelopes marked in addition "ALTERNATIVE NO...." as appropriate
- 24. Deadline for Submission of Bids**
- 24.1 Bids must be received by the Purchaser at the address and no later than the date and time indicated in the BDS.
- 24.2 The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
- 25. Late Bids**
- 25.1 The Purchaser shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 24. Any Bid received by the Purchaser after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.
- 26. Withdrawal, Substitution, and Modification of Bids**
- 26.1 A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 22.2 (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be
- (a) prepared and submitted in accordance with ITB 22 and ITB 23 (except that withdrawal notices do not require copies), and in addition, the respective inner and outer envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
 - (b) received by the Purchaser prior to the deadline prescribed for submission of bids, in accordance with ITB 24.
- 26.2 Bids requested to be withdrawn in accordance with ITB 26.1 shall be returned unopened to the Bidders.
- 26.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Technical Bid Submission Sheet or any extension thereof.

27. Bid Opening

- 27.1 The Purchaser shall open the Technical Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidder's designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 23.1, shall be as specified in the BDS.
- 27.2 The Price Bids will remain unopened and will be held in custody of the Purchaser until the time of opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Purchaser. If the Technical Bid and the Price Bid are submitted together in one envelope, the Purchaser may reject the Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.
- 27.3 First, envelopes marked "WITHDRAWAL" shall be opened, read out, and recorded, and the envelope containing the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out and recorded at bid opening.
- 27.4 Next, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 27.2. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.
- 27.5 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original as well as Modification, will remain unopened in accordance with ITB 27.2.
- 27.6 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded
- (a) the name of the Bidder;
 - (b) whether there is a modification or substitution;
 - (c) the presence of a bid security or a Bid-Securing Declaration, if required; and
 - (d) any other details as the Purchaser may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Technical Bid

Submission Sheet are to be initialed by at least three representatives of the Purchaser attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB 25.1.

- 27.7 The Purchaser shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, modification, or alternative offer; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.
- 27.8 At the end of the evaluation of the Technical Bids, the Purchaser will invite bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Purchaser. Bidders shall be given reasonable notice of the opening of Price Bids.
- 27.9 The Purchaser will notify Bidders in writing who have been rejected on the grounds of being substantially nonresponsive to the requirements of the Bidding Document and return their Price Bids unopened.
- 27.10 The Purchaser shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders' representatives who choose to attend at the address, on the date, and time specified by the Purchaser. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.
- 27.11 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded
- (a) the name of the Bidder;
 - (b) whether there is a modification or substitution;
 - (c) the Bid Prices, including any discounts and alternative offers; and
 - (d) any other details as the Purchaser may consider appropriate.
- Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Price Bid Submission Sheet and Price Schedules are to be initialed by at least three representatives of the Purchaser attending bid the opening. No Bid shall be rejected at the opening of Price Bids.
- 27.12 The Purchaser shall prepare a record of the opening of Price Bids that shall include, as a minimum: the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The

Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted bids on time, and posted online when electronic bidding is permitted.

E. Evaluation and Comparison of Bids

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| 28. Confidentiality | <p>28.1 Information relating to the examination, evaluation, comparison, and qualification of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on the Contract award is communicated to all Bidders.</p> <p>28.2 Any attempt by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and postqualification of the Bids or Contract award decisions may result in the rejection of its Bid.</p> <p>28.3 Notwithstanding ITB 28.2, from the time of opening the Technical Bids to the time of Contract award, if any Bidder wishes to contact the Purchaser on any matter related to the bidding process, it should do so in writing.</p> |
| 29. Clarification of Bids | <p>29.1 To assist in the examination, evaluation, comparison and post-qualification of the Bids, the Purchaser may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder with regard to its Bid and that is not in response to a request by the Purchaser shall not be considered. The Purchaser's request for clarification and the response shall be in writing. No change in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Purchaser in the evaluation of the Price Bids, in accordance with ITB 36.</p> <p>29.2 If a Bidder does not provide clarifications on its Bid by the date and time set in the Purchaser's request for clarification, its bid may be rejected.</p> |
| 30. Deviations, Reservations, and Omissions | <p>30.1 During the evaluation of Bids, the following definitions apply:</p> <ul style="list-style-type: none"> (a) "Deviation" is a departure from the requirements specified in the Bidding Document; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document. |
| 31. Examination of Technical Bids | <p>31.1 The Purchaser shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.4 have been provided, and to determine the completeness of each document submitted.</p> |

- 31.2 The Purchaser shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the offer shall be rejected:
- (a) Technical Bid Submission Sheet in accordance with ITB 12.1;
 - (b) written confirmation of authorization to commit the Bidder;
 - (c) bid security or Bid-Securing Declaration, if applicable; and
 - (d) Manufacturer's Authorization, if applicable.
- 32. Responsiveness of Technical Bid**
- 32.1 The Purchaser's determination of a Technical Bid's responsiveness is to be based on the contents of the Technical Bid itself, as defined in ITB 11.
- 32.2 A substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,
- (a) If accepted, would
 - (i) affect in any substantial way the scope, quality, or performance of the Goods and Related Services specified in Section 6 (Schedule of Supply); or
 - (ii) limits in any substantial way, inconsistent with the Bidding Document, the Purchaser's rights or the Bidder's obligations under the Contract; or
 - (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Technical Bids.
- 32.3 The Purchaser shall examine the technical aspects of the Bid in particular, to confirm that all requirements of Section 6 (Schedule of Supply) have been met without any material deviation, reservation, or omission.
- 32.4 If a Technical Bid is not substantially responsive to the Bidding Document, it shall be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.
- 33. Nonmaterial Nonconformities**
- 33.1 Provided that a Technical Bid is substantially responsive, the Purchaser may waive nonconformities in the Bid that does not constitute a material deviation, reservation, or omission.
- 33.2 Provided that a Technical Bid is substantially responsive, the Purchaser may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

- 33.3 Provided that a Technical Bid is substantially responsive, the Purchaser shall rectify quantifiable nonmaterial nonconformities or omissions. To this effect, the Bid Price shall be adjusted during evaluation of Price Bids, for comparison purposes only, to reflect the price of the missing or non-conforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).
- 34. Qualification of the Bidder**
- 34.1 The Purchaser shall determine to its satisfaction during the evaluation of Technical Bids whether Bidders meets the qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).
- 34.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 19.
- 34.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. A negative determination shall result into the disqualification of the Bid, in which event the Purchaser shall return the unopened Price Bid to the Bidder.
- 35. Examination of Price Bids**
- 35.1 Following the opening of Price Bids, the Purchaser shall examine the Price Bids to confirm that all documents and financial documentation requested in ITB 11.5 have been provided, and to determine the completeness of each document submitted.
- 35.2 The Purchaser shall confirm that the following documents and information have been provided in the Price Bid. If any of these documents or information is missing, the offer shall be rejected:
- (a) Price Bid Submission Sheet in accordance with ITB 12.1; and
 - (b) Price Schedules, in accordance with ITB 12, ITB 14, and ITB 15.
- 36. Correction of Arithmetical Errors**
- 36.1 During the evaluation of Price Bids, the Purchaser shall correct arithmetical errors on the following basis:
- (a) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.
 - (b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.
 - (c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
- 36.2 If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its bid

security may be forfeited, or its Bid-Securing Declaration executed.

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| 37. Conversion to Single Currency | 37.1 | For evaluation and comparison of Price Bids, the Purchaser shall convert all bid prices expressed in the amounts in various currencies into a single currency, using the selling exchange rates established by the source and on the date specified in the BDS. |
| 38. Margin of Preference | 38.1 | Unless otherwise specified in the BDS, a margin of preference shall not apply. |
| 39. Evaluation of Price Bids | 39.1 | The Purchaser shall use the criteria and methodologies indicated in this clause. No other criteria or methodology shall be permitted. |
| | 39.2 | <p>To evaluate a Price Bid, the Purchaser shall consider the following:</p> <ul style="list-style-type: none"> (a) the bid price as quoted in accordance with ITB 14; (b) price adjustment for correction of arithmetic errors in accordance with ITB 36.1; (c) price adjustment due to discounts offered in accordance with ITB 14.4; (d) price adjustment due to application of the evaluation criteria specified in Section 3 (Evaluation and Qualification Criteria). These criteria may include factors related to the characteristics, performance, and terms and conditions of purchase of the Goods and Related Services which shall be expressed to the extent practicable in monetary terms to facilitate comparison of bids unless otherwise specified in Section 3; and (e) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 37. |
| | 39.3 | <p>The Purchaser's evaluation of a bid will exclude and not take into account,</p> <ul style="list-style-type: none"> (a) in the case of Goods offered from within the Purchaser's country, all sales tax and all other taxes, applicable in the Purchaser's country and payable on the Goods if the Contract is awarded to the Bidder; (b) in the case of Goods offered from outside the Purchaser's country, all customs duties, sales tax, and other taxes, applicable in the Purchaser's country and payable on the Goods if the Contract is awarded to the Bidder; and (c) any allowance for price adjustment during the period of performance of the Contract, if provided in the Bid. |
| | 39.4 | If the Bidding Document allows Bidders to quote separate prices for different lots (contracts), and the award to a single Bidder of multiple lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Price Bid Submission Sheet, is as specified in Section 3 (Evaluation and Qualification Criteria). |

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| 40. Comparison of Bids | 40.1 | The Purchaser shall compare all substantially responsive Bids to determine the lowest evaluated bid, in accordance with ITB 39. |
| 41. Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids | 41.1 | The Purchaser reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to Contract award, without thereby incurring any liability to the Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders. |

F. Award of Contract

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| 42. Award Criteria | 42.1 | The Purchaser shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder has remained qualified to perform the Contract satisfactorily. |
| | 42.2 | A Bid shall be rejected if the qualification criteria as specified in Section 3 (Evaluation and Qualification Criteria) are no longer met by the Bidder whose offer has been determined to be the lowest evaluated Bid. In this event the Purchaser shall proceed to the next lowest evaluated Bid to make a similar reassessment of that Bidder's capabilities to perform satisfactorily. |
| 43. Purchaser's Right to Vary Quantities at Time of Award | 43.1 | At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified in Section 6 (Schedule of Supply), provided this does not exceed the percentages indicated in the BDS, and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Document. |
| 44. Notification of Award | 44.1 | Prior to the expiration of the period of bid validity, the Purchaser shall notify the successful Bidder, in writing, that its Bid has been accepted. |
| | 44.2 | At the same time, the Purchaser shall also notify all other Bidders of the results of the bidding. The Purchaser will publish in an English language newspaper or well-known freely accessible website the results identifying the Bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of Bidders whose Bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful Bidders may request in writing to the Purchaser for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Purchaser shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award, requests a debriefing. |
| | 44.3 | Until a formal Contract is prepared and executed, the notification of award shall constitute a binding Contract. |

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| 45. Signing of Contract | 45.1 | Promptly after notification, the Purchaser shall send to the successful Bidder the Agreement. |
| | 45.2 | Within 28 days of receipt of the Agreement, the successful Bidder shall sign, date, and return it to the Purchaser. |
| 46. Performance Security | 46.1 | Within 28 days of the receipt of notification of award from the Purchaser, the successful Bidder shall furnish the Performance Security in accordance with the GCC, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Purchaser. |
| | 46.2 | Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event, the Purchaser may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Purchaser to be qualified to perform the Contract satisfactorily. |

Section 2 - Bid Data Sheet

A. General	
ITB 1.1	The number of the Invitation for Bids is: AEPC/ADB/SASEC/NCB/SWMG/09
ITB 1.1	The Purchaser is: Alternative Energy Promotion Centre (AEPC)
ITB 1.1	<p>The name of the national competitive bidding (NCB) is: Supply, Delivery, Installation, Testing and Commissioning of 150kWp Solar Mini-grid Subproject at Thabang Rural Municipality Ward no-1&2, Thabang, Rolpa District</p> <p>The identification number of the NCB is: AEPC/ADB/SASEC/NCB/SWMG/09</p> <p>The number and identification of lots comprising this NCB is: None</p>
ITB 2.1	The Borrower is: <u>Nepal</u>
ITB 2.1	The name of the Project is: SASEC Power System Expansion Project
B. Contents of Bidding Document	
ITB 7.1	<p>For clarification purposes only, the Purchaser's address is:</p> <p>Attention: Dr. Narayan Prasad Adhikari</p> <p>Street Address: Khumaltar Height</p> <p>Floor/Room number: Second Floor, AEPC Building</p> <p>City: Lalitpur</p> <p>Country: Nepal</p> <p>Telephone: +9771-5539390, 5539391</p> <p>Facsimile number: +9771-5542397, 5539392</p> <p>Electronic mail address: narayan.adhikari@aepec.gov.np</p>
C. Preparation of Bids	
ITB 10.1	The language of the Bid is: English
ITB 11.2 (i)	<p>The Bidder shall submit with its Technical Bid the following additional documents:</p> <p>(i) The bidder or bidder's manufacturer's experience: At least 3 years of manufacture of similar type of PV Module, Solar Batteries, Solar Charge Controllers, Solar Inverters. In addition, should have continuous production.</p> <p>(ii) Completion certificates issued by employer for similar projects.</p>
ITB 11.3 (c)	The Bidder shall submit with its Price Bid the following additional documents: <u>None</u>
ITB 12.2	The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive.
ITB 13.1	Alternative Bids shall not be permitted
ITB 14.3	<p>Replace the second sentence with the following:</p> <p>Failure to specify the total price of the Bid in the Price Bid Submission Sheet or the Bid Price in the Price Schedule may be ground for declaring the bid nonresponsive</p>
ITB 14.5	The Incoterms edition is: Incoterms 2010

ITB 14.6 (b) (i)	For Goods offered from outside the Purchaser's country, the Bidder shall quote prices using the following Incoterms: Not Applicable
ITB 14.6 (b) (ii)	In addition to the above, the Bidder shall quote prices for Goods offered from outside the Purchaser's country using the following Incoterms: Not applicable
ITB 14.7	The prices shall be fixed
ITB 14.8	Prices quoted for each lot shall correspond at least to _____ % of the items specified for each lot. Not applicable Prices quoted for each item of a lot shall correspond at least to _____ % of the quantities specified for this item of a lot. Not applicable
ITB 19.2	The Bidder is required to submit the Manufacturer's Authorization using the form included in Section: 4 (Bidding Forms) to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in the Purchaser's country.
ITB 20.1	The bid validity period shall be 90 days.
ITB 21.1	The Bidder shall furnish a Bid Security in the amount of NRs 1,640,000
ITB 21.2	The ineligibility period will be: Not Applicable
ITB 21.4	Subject to the succeeding sentences, any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Purchaser as nonresponsive. If a Bidder submits a bid security that (i) deviates in form, amount, and/or period of validity, or (ii) does not provide sufficient identification of the Bidder (including, without limitation, failure to indicate the name of the Joint Venture or, where the Joint Venture has not yet been constituted, the names of all future Joint Venture Partners), the Purchaser shall request the Bidder to submit a compliant bid security within 7 days of receiving such a request. Failure to provide a compliant bid security within the prescribed period of receiving such a request shall cause the rejection of the Bid.
ITB 22.1	In addition to the original Bid, the number of copy is: One
ITB 22.2	The written confirmation of Authorization to sign on behalf of the Bidder shall consist of: "An organizational document, board resolution or its equivalent, or power of attorney specifying the representative's authority to sign the Bid on behalf of, and to legally bind, the Bidder. If the Bidder is an intended or an existing joint venture, the power of attorney should be signed by all partners and specify the authority of the named representative of the joint venture to sign on behalf of, and legally bind, the intended or existing joint venture. If the joint venture has not yet been formed, also include evidence from all proposed joint venture partners of their intent to enter into a joint venture in the event of a contract award in accordance with ITB 16.1 (b)".
ITB 22.2	The Bidder shall submit an acceptable authorization within 7 days.
D. Submission and Opening of Bids	
ITB 23.1	Bidders shall not have the option of submitting their bids electronically.
ITB 23.1 (b)	If Bidders shall have the option of submitting their bids electronically, the electronic bidding submission procedures shall be: Not applicable

ITB 23.2 (c)	The identification of this bidding process is: AEPC/ADB/SASEC/NCB/SWMG/09
ITB 24.1	For bid submission purposes only, the Purchaser's address is : Attention: Dr. Narayan Prasad Adhikari Street Address: AEPC, Khumaltar Height Floor/Room number: Ground Floor, Reception Section City: Lalitpur, Country: Nepal
ITB 24.1	The Deadline for Bid Submission is: Date: 25 August, 2019 Time: 12:00 Noon, Local Time
ITB 27.1	The Technical Bid opening shall take place at: Street Address: AEPC, Khumaltar Height Floor/Room number: AEPC Meeting Hall City : Lalitpur, Country: Nepal Date: 25 August, 2019 Time: Immediately After Deadline for Bid Submission
ITB 27.1	Electronic bid opening procedure shall be as follows: Not applicable
ITB 27.6	The Technical Bid Submission Sheet shall be initialed by THREE representatives of the Purchaser attending Technical Bid opening.
ITB 27.11	The Price Bid Submission Sheet and Price Schedules shall be initialed by THREE representatives of the Purchaser attending Price Bid opening.
E. Evaluation and Comparison of Bids	
ITB 37.1	The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: No conversion is necessary as all bids must be submitted in "Nepalese Rupees" The source of the selling exchange rate shall be: Not applicable The date for the selling exchange rate shall be: Not applicable
ITB 38.1	A margin of preference shall not apply.
F. Award of Contract	
ITB 43.1	The maximum percentage by which quantities may be increased is: 15% The maximum percentage by which quantities may be decreased is: 15%

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1. Technical Evaluation

1.1 Technical Criteria

The Bids submitted by the Bidders should comply with the technical requirements in Section-6 (Schedule of Supply). However, a minor deficiency in technical compliance may not be cause for rejection of the Bid.

The cost of all quantifiable deviations or deficiencies from the technical requirements as specified in Section 6 (Schedule of Supply) shall be evaluated. The Purchaser will make its own assessment of the cost of these deviations or deficiencies for the purpose of ensuring fair comparison of Bids.

2. Qualification Criteria

Bidders shall meet the qualification criteria set by the Purchaser on a pass-fail basis. Unless specifically indicated otherwise, it is the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries, or affiliates that must satisfy these criteria.

2.1 Eligibility and Pending Litigation

2.1.1 Eligibility

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

2.1.1.1 Nationality

Nationality in accordance with ITB Subclause 4.2.	must meet requirement	must meet requirement	must meet requirement	not applicable	Technical Bid Submission Sheet; Forms ELI – 1 and ELI - 2
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2.1.1.2 Conflict of Interest

No conflicts of interest in accordance with ITB Subclause 4.3.	must meet requirement	must meet requirement	must meet requirement	not applicable	Technical Bid Submission Sheet
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2.1.1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITB Subclause 4.4.	must meet requirement	must meet requirement	must meet requirement	not applicable	Technical Bid Submission Sheet
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2.1.1.4 Government-Owned Enterprise

Bidder required to meet conditions of ITB Subclause 4.5.	must meet requirement	must meet requirement	must meet requirement	not applicable	Technical Bid Submission Sheet; Forms ELI – 1 and ELI - 2
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2.1.1.5 United Nations Eligibility

Not having been excluded by an act of compliance with a United Nations Security Council resolution in accordance with ITB Subclause 4.7.	must meet requirement	must meet requirement	must meet requirement	not applicable	Technical Bid Submission Sheet
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2.1.2 Pending Litigation

Pending litigation and arbitration criterion shall not apply.

2.2 Experience and Technical Capacity

2.2.1 Contractual Experience

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Successful completion as main supplier/contractor within the last five (5) years, of at least one contracts valued at NRs 41 Million ¹ with nature, and complexity similar to the scope of supply described in Section 4 (Bidding Forms EXP-1, Contractual Experience).	must meet requirement	must meet requirement	Participation in at least one contract that has been successfully completed within the last Five (5) year and that is similar to the proposed contract exceeds NRs 20.5 Million.	not applicable	Form EXP - 1

2.2.2 Technical Experience

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
The Bidder shall demonstrate that the goods offered have (i) been in production for at least three (3) years, and (ii) been sold a minimum of three (3) units of similar type and specification over the last three (3) years; (iii) been in operation for a minimum of two (2) years.	must meet requirement	must meet requirement	not applicable	not applicable	Form EXP - 2

¹ Only the Net Amount shall be calculated after deducting the amount for VAT and such amount shall be adjusted to present value by applying wholesale price index of Nepal Rastra Bank. Same is applicable for JV.

2.2.3 Production Capacity

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
The Bidder or manufacturer shall demonstrate ^a that it can supply the type, size, and quantity of the goods as required by Purchaser in accordance with the Delivery and Completion Schedule in Section 6 (Schedule of Supply).	must meet requirement	must meet requirement	not applicable	not applicable	Form EXP - 3

- Note -

^a Bidder or Manufacturer shall provide evidence of production output.

2.3 Financial Situation

2.3.1 Historical Financial Performance

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Submission of audited financial statements or, if not required by the law of the Bidder's country, other financial statements acceptable to the Purchaser, for the last three (3) years to demonstrate the current soundness of the Bidder's financial position. As a minimum, the Bidder's net worth for the last year calculated as the difference between total assets and total liabilities should be positive.	must meet requirement	not applicable	must meet requirement	not applicable	Form FIN - 1

2.3.2 Size of Operation (Average Annual Turnover)

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Minimum average annual turnover of NRs 164 Million ² calculated as total payments received by the Bidder for contracts completed or under execution over the last three (3) years.	must meet requirement	must meet requirement	must meet Minimum 25% of the requirement	must meet Minimum 40% of the requirement	Form FIN - 2

² Only the Net Amount shall be calculated after deducting the amount for VAT and such amount shall be adjusted to present value by applying wholesale price index of Nepal Rastra Bank. Same is applicable for JV.

3. Economic Evaluation

The economic criteria will be evaluated bid price in accordance with Section 1, Sub-clause 33 and Section 3, Sub-clause 1.2.1.1.

3.1 Adjustment for Scope

3.1.1 Local Handling and Inland Transportation

Costs for inland transportation, insurance, and other incidental costs for delivery of the goods from the EXW premises, or port of entry, or border point to Project Site as defined in Section 6 (Schedule of Supply), shall be quoted in the Price Schedule for Related Services to Be Offered from Outside and Within the Purchaser's Country provided In Section 4 (Bidding Forms). These costs will be taken into account during bid evaluation. If a Bidder fails to include such costs in its Bid, then these costs will be estimated by the Purchaser on the basis of published tariffs by the rail or road transport agencies, insurance companies, or other appropriate sources, and added to EXW or CIF or CIP price.

3.1.2 Minor Omissions or Missing Items

Pursuant to ITB 33.3, the cost of all quantifiable nonmaterial nonconformities or omissions from the contractual and commercial conditions shall be evaluated. The Purchaser will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of Bids.

3.2 Adjustment for Deviations from the Terms of Payment

Deviations from the Terms of Payment as specified in SCC 16.1 are not permitted.

3.3 Adjustment for Deviations in the Delivery and Completion Schedule

Bidders are required to base their prices on the Delivery and Completion Schedule specified in Section 6 (Schedule of Supply).

Deviations from the Delivery and Completion Schedule specified in Section 6 (Schedule of Supply) are not permitted.

Section 4 - Bidding Forms

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Technical Bid Submission Sheet

-- Note --

The Bidder must accomplish the Technical Bid Submission Sheet on its letterhead clearly showing the bidder's complete name and address.

Date: _____
National Competitive Bidding (NCB) No.: _____
Invitation for Bid (IFB) No.: _____

To: -----

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including the Addenda issued in accordance with Instructions to Bidders (ITB) Clause 8.
- (b) We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule specified in Section 6 (Schedule of Supply), the following Goods and Related Services: AEPC/ADB/SASEC/NCB/SWMG/09, Procurement of 150kWp solar mini-grid system for Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District.
- (c) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of **90 days** from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (d) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries in accordance with ITB 4.2.
- (e) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3.
- (f) We are not participating, as a Bidder in more than one Bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers in accordance with the Bidding Document.
- (g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ADB, under the Purchaser's country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council.

- (h) [We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5].¹
- (i) We agree to permit ADB or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

¹ Use one of the two options as appropriate.

Price Bid Submission Sheet

-- Note --

The Bidder must accomplish the Price Bid Submission Sheet on its letterhead clearly showing the bidder's complete name and address.

Date: _____

National Competitive Bidding (NCB) No.: _____

Invitation for Bid (IFB) No.: _____

To: -----

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including the Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule specified in Section 6 (Schedule of Supply), the following Goods and Related Services: AEPC/ADB/SASEC/NCB/SWMG/09, Procurement of 150kWp solar mini-grid system for Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District.
- (c) The total price of our Bid, excluding any discounts offered in item (d) below, is

[Amount of local currency in words], [amount in figures]

The total bid price from the price schedules should be entered by the Bidder inside this box. Absence of the total bid price in the Price Bid Submission Sheet may result in the rejection of the bid.

- (d) The discounts offered and the methodology for their application are as follows:

Discounts: If our Bid is accepted, the following discounts shall apply: *[specify in detail each discount offered and the specific item of the Schedule of Supply to which it applies]*

Methodology of Application of the Discounts: The discounts shall be applied using the following method: *[specify in detail the method that shall be used to apply the discounts]*

- (e) Our bid shall be valid for a period of **90 days** from the date fixed for the submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (f) If our Bid is accepted, we commit to obtain a Performance Security in the amount of **10%** percent of the Contract Price for the due performance of the Contract.

- (g) The following commissions, gratuities, or fees have been paid or are to be paid with respect to the bidding process or execution of the Contract:¹

Name of Recipient	Address	Reason	Amount
_____	_____	_____	_____
_____	_____	_____	_____

- (h) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
- (i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (j) We agree to permit ADB or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

¹ If none has been paid or is to be paid, indicate "None."

Supply, Delivery, Installation, Testing and Commissioning of Solar Mini-grid System for Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District, including all accessories as per Schedule-A, Schedule-B & Technical Specifications

SCHEDULE-A: PRICE SCHEDULE FOR GOODS TO BE OFFERED FROM WITHIN THE PURCHASERS COUNTRY

Name of Bidder		IFB Number		Page of			
Item No.	Item Description	Country of Origin	Quantity	Unit	Unit Price NRs, EXW	Unit Price NRs, EXW (In Words)	Total Price NRs, EXW
	A- Power Generation Components:						
1	Solar Photovoltaic Array of Total Minimum Capacity 150kWp (Size of individual PV module should be ≥250Wp, Mono or Poly Crystalline Silicon)		1	Set			
2	Three Phase Grid Tie PV Inverter with MPPT controller, total minimum capacity 150kW (Individual inverter capacity: Minimum 30kW), including AC and DC surge protector		1	Set			
3	VRLA Gel Tubular Battery of Total Minimum Capacity 950kWh (Individual battery capacity: Minimum 2,000Ah@C10, 2Volt) with rack, cables and accessories, OR LiFePO4 of total minimum 800kWh capacity		1	Set			
4	Off-grid Battery Inverter, Total Minimum Capacity 90kW stackable as Master and Slave for 3-Phase Supply (Individual Inverter Capacity: Minimum 6kW)		1	Set			
5	Control System with Accessories including necessary breakers and fuses		1	Set			
6	Solar PV Module support structure, hot dipped galvanized metal frame complete set			LS			
7	Balance of System materials (DC and AC copper cables, Connectors, surge protector, Nails, Powerhouse lights-6 etc)			LS			

Item No.	Item Description	Country of Origin	Quantity	Unit	Unit Price NRs, EXW	Unit Price NRs, EXW (In Words)	Total Price NRs, EXW
8	PV Combiner Boxes with Fuses, Isolators, Surge Protective Relays, MCB, MCCB & accessories		1	Set			
9	DC Distribution Board or Panel with breakers, DC surge protection device & accessories		1	Set			
10	AC Distribution Board with Circuit Breakers, AC Surge Protectors, Energy Meter & Accessories		1	Set			
11	Lightning and Earthing System for Power Plant (maintenance free/chemical LPI standard or better technology, lightening rods, surge protectors etc)		1	Set			
12	Remote System Monitoring Unit & Accessories including communication router		1	Set			
13	Fire Extinguisher		2	Set			
14	Wall Fans for Control/Battery Room		4	Set			
15	Exhaust Fans for Control/Battery Room		4	Set			
16	PVC Water Tank 500 Liter for Powerhouse Use		1	Set			
17	Office Equipments (Table, Chair, Shelf, Laptop Computer, Printer)		1	Set			
	B- Power Transmission & Distribution Components						
18	XLPE Insulated Copper Armored AC Cable, 4 Core 70mm ² (Power House to First Pole or Transformer)		30	Met er			
19	Earthing System Complete Set for Power Distribution System		20	Nos			
20	MS Pole Tubular 11 meter for 3-phase power transmission complete set as per the attached BOQ		12	Nos			
21	Power Distribution 3-Phase, MS Pole Tubular 9 meter		55	Nos			
22	Power Distribution 1-Phase, MS Pole Tubular 8 meter		90	Nos			
23	ACSR Conductor, Rabbit for 11KV Line		1.8	Km			
24	Aluminum Conductor Insulated ABC Cable 4 core		0.88	Km			

Item No.	Item Description	Country of Origin	Quantity	Unit	Unit Price NRs, EXW	Unit Price NRs, EXW (In Words)	Total Price NRs, EXW
	50 Sq. mm twisted for 3-Phase, max. resistance 0.641Ω/km@20 ⁰						
25	Aluminum Conductor Insulated ABC Cable 2 core 50 Sq. mm twisted for 1-Phase, max. resistance 0.641Ω/km@20 ⁰		2.8	Km			
26	Aluminum Conductor Insulated ABC Cable 4 core 95 Sq. mm twisted for 3-Phase, max. resistance 0.32Ω/km@20 ⁰		1.6	Km			
27	Aluminum Conductor Insulated ABC Cable 2 core 95 Sq. mm twisted for 1-Phase, max. resistance 0.32Ω/km@20 ⁰		1.3	Km			
28	Anchor and Suspension Clamp for both 9m and 8m MS-Poles for binding of ABC cable into pole		150	Nos			
29	Cable Connector suitable for interconnection of service cable and Insulated ABC cable		350	Nos			
30	Shackle Insulators and D-Iron (Medium size)		40	Set			
31	Service wire, concentric 6 sq.mm.		13	Km			
32	100 kVA Transformer with all complete set as per Technical Specification Section.6		2	Set			
33	Lightening Arrestor, 9 kV, 10 KA		3	Set			
34	Lightning Arrestor, 0.5 kV, 1.5 kA		25	Nos			
35	Stay Set with accessories- hot dipped galvanized (stay plate of area 600mm*600mm and thickness 6mm, thimble, stay wire stranded, turn buckle and stay rod of dia 19mm, length1.8m etc all complete)		2	Set			
36	Stay Set with accessories- hot dipped galvanized (stay plate of area 300mm*300mm and thickness 6mm, thimble, stay wire stranded, turn buckle and stay rod of dia 16mm, length1.8m etc all complete). Galvanized stay wire should be stranded by 7 wires of sizes 8 SWG.		50	Set			

Item No.	Item Description	Country of Origin	Quantity	Unit	Unit Price NRs, EXW	Unit Price NRs, EXW (In Words)	Total Price NRs, EXW
37	Tool Box (Insulating Gloves, Crimping Tool, 3-phase Digital Clamp meter etc.)		1	Set			
38	Aluminum Foldable Pole Ladder of Extended Length Minimum 7 meter		1	No			
39	Pre-paid Energy Meter 5Amp, 230VAC 50Hz, Class 1		320	Nos			
40	Pre-paid Energy Meter 16Amp, 230VAC 50Hz, Class 1		5	Nos			
41	Pre-paid Energy Meter 32Amp, 230VAC 50Hz, Class 1		1	Nos			
42	Pre-paid Energy Meter 25Amp, 400VAC 50Hz, Class 1		4	Nos			
42	MCB 6Amp DP 230V for Households		320	Nos			
43	MCB Holders Boxes for Households		320	Nos			
44	MCB 16Amp DP 230V for PEU		5	Nos			
45	MCB 32Amp DP 230V for RM Office		1	Nos			
46	MCCB 25Amp TP for 400V PEU Loads		4	Nos			
47	MCCB 63Amp TPN with pole mounted distribution box of IP65		1	Nos			
48	MCCB 125Amp TPN with pole mounted distribution box of IP65		1	Nos			
49	MCB 63Amp, DP with pole mounted distribution box of IP65		2	Nos			
50	LED Lamp 5 Watt, AC 230V		960	Nos			
51	LED Lamp 3 Watt, AC 230V		960	Nos			
52	LED Street Light 230V 20Watt AC with photo sensors and mounting arms		30	Nos			
53	Outdoor boxes for Street Lights switches, surge protection devices etc		5	Nos			
		Total Amount of Goods (NRs)					

SCHEDULE – B: PRICE SCHEDULE FOR SERVICES TO BE OFFERED

Name of Bidder _____ IFB Number _____ Page ____ of ____

Item No.	Item Description	Quantity	Unit	Unit Rate NRs (in Figure)	Unit Price (in Words)	Total Price (NRs)
1	Transmission Pole Installation and Commissioning	12	Nos			
2	Distribution Pole Installation and Commissioning	145	No			
3	Transformer Pole Erection, Cabling and Charging	2	Set			
4	Conductor stringing with LA fitting (11 KV Three Phase) and line charging	0.60	Km			
5	Conductor stringing with LA fitting (Three Phase)	3.0	Km			
6	Conductor stringing with LA fitting (Single Phase)	4.0	Km			
7	Civil works for 150kWp solar PV array foundations including material and workmanship		LS			
8	Fence for PV array & Powerhouse (Chain Link Mess Size of 2"*2" with Iron Angle Post of 50mm*50mm*5mm size at interval of 2m c/c of height 1.5m from ground level with concrete base of 0.2m*0.2m cover & 0.5m depth)	250	Meter			
9	Installation, Commissioning and Testing of 150kWp Solar Mini-grid System		LS			
10	Construction of Powerhouse including Toilet/Washroom with RCC Roof Cover as per the technical specifications (Size: 16.5 meter * 7	116	m2			

Item No.	Item Description	Quantity	Unit	Unit Rate NRs (in Figure)	Unit Price (in Words)	Total Price (NRs)
	meter * 3 meter)					
11	Transportation of all goods from Supplier's warehouse to subproject site		LS			
12	Operation, Maintenance and Management of whole system for 3 Years		PS			1,200,000
13	Site Development and Retaining Wall		PS			850,000
14	Environmental Mitigation and Enhancement		PS			150,000
		Total Amount of Services (NRs)				

PS: Provisional Sum, LS: Lump-sum

Summary of the Schedules, Goods and Services

Name of Bidder _____ IFB Number _____ Page ____ of ____

Schedule No.	Title	Total Price in NRs in Figure	Total Price in NRs in Words
A	Price Schedule for the Solar Mini-grid System Goods to be offered		
B	Price Schedule for the Solar Mini-grid System Services to be offered		
C	Total (A+B)		
D	Physical Contingency (Provisional Sum)	1,600,000	
E	Value Added Tax (Provisional Sum)	10,500,000	
F	Grand Total in NRs (C+D+E)		

NOTE: The VAT amount specified above is provisional. As per Government Rules VAT is exempted in certain BOQ Items. AEPC will assist suppliers in exempting VAT. VAT will be paid for VAT applicable items only.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Bid Security Bank Guarantee

*[insert bank's name, and address of issuing branch or office]*¹

Beneficiary: *[insert name and address of the purchaser]*

Date: *[insert date (as day, month, and year)]*

Bid Security No.: *[insert number]*

We have been informed that *[insert name of the bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated *[insert date (as day, month, and year)]* (hereinafter called "the Bid") for the execution of *[insert name of contract]* under Invitation for Bids No. *[insert IFB number]* ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we *[insert name of bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert amount in words][insert amount in figures]* upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Technical Bid Submission Sheet and Price Bid Submission Sheet; or
- (b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or
- (c) having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity, (i) fails or refuses to execute the Contract Agreement; or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder's bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.²

. *Authorized signature(s) and bank's seal (where appropriate)*

-- Note --

In case of a joint venture, the bid security must be in the name of all partners to the joint venture that submits the bid.

¹ All italicized text is for use in preparing this form and shall be deleted from the final document.

² Or 758 as applicable.

Manufacturer's Authorization

Date: *[insert date (as day, month, and year) of bid submission]*

NCB No.: *[insert number of bidding process]*

To: *[insert complete name of the purchaser]*

WHEREAS

We *[insert complete name of the manufacturer]*, who are official manufacturers of *[insert type of goods manufactured]*, having factories at *[insert full address of manufacturer's factories]*, do hereby authorize *[insert complete name of the bidder]* to submit a bid the purpose of which is to provide the following goods, manufactured by us *[insert name and/or brief description of the goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 28 of the General Conditions, with respect to the goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the manufacturer]*

Title: *[insert title]*

Duly authorized to sign this Authorization on behalf of *[insert complete name of the manufacturer]*

Dated on _____ day of _____, _____ *[insert date of signing]*

-- Note --

*All italicized text is for use in preparing this form and shall be deleted from the final document.
The bidder shall require the manufacturer to fill out this form in accordance with the instructions indicated. This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the manufacturer. The bidder shall include it in its bid, if so indicated in the Bid Data Sheet (BDS).*

Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria), the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Form ELI - 1: Bidder's Information Sheet

Bidder's Information	
Bidder's legal name	
In case of a Joint Venture, legal name of each partner	
Bidder's country of constitution	
Bidder's year of constitution	
Bidder's legal address in country of constitution	
Bidder's authorized representative (name, address, telephone number(s), fax number(s) and e-mail address)	
Attached are copies of the following documents: <ul style="list-style-type: none"> <input type="checkbox"/> 1. In case of a single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2 <input type="checkbox"/> 2. Authorization to represent the firm or Joint Venture named above, in accordance with ITB 22.2 <input type="checkbox"/> 3. In case of a Joint Venture, a letter of intent to form a Joint Venture or Joint Venture agreement, in accordance with ITB 4.1 <input type="checkbox"/> 4. In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5 	

Form ELI - 2: Joint Venture Information Sheet

Each member of the Joint Venture must fill out this form separately.

Joint Venture Information	
Bidder's legal name	
Joint Venture Partner's legal name	
Joint Venture Partner's country of constitution	
Joint Venture Partner's year of constitution	
Joint Venture Partner's legal address in country of constitution	
Joint Venture Partner's authorized representative information (name, address, telephone number(s), fax number(s) and e-mail address)	
Attached are copies of the following documents: <ul style="list-style-type: none"> <input type="checkbox"/> 1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2 <input type="checkbox"/> 2. Authorization to represent the firm named above, in accordance with ITB 22.2 <input type="checkbox"/> 3. In the case of a government-owned enterprise, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5 	

Form EXP - 1: Contractual Experience

Fill out one (1) form per contract.

Contractual Experience		
Contract No of	Contract Identification	
Award Date		Completion Date
Role in Contract	<input type="checkbox"/> Manufacturer <input type="checkbox"/> Supplier <input type="checkbox"/> Subcontractor	
Total Contract Amount		
If partner in a joint venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Purchaser's name Address Telephone/Fax Number E-mail		
Description of the Similarity in Accordance with Criterion 2.2.1 of Section 3 (Evaluation and Qualification Criteria)		
At least one contract of Solar PV System or Solar/Wind Hybrid system successfully completed as main supplier/contractor within the last Five (5) years of 75 kW.		

- Note -

This form shall only be included if Criterion 2.2.1 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form EXP - 2: Technical Experience

Fill out one (1) form per contract.

Technical Experience	
Name of Product	
Manufacturer:	Address and Nationality:
Requirements in Accordance with Criterion 2.2.2 of Section 3 (Evaluation and Qualification Criteria)	
(i) Product has been in production for at least three (3) years.	
(ii) Product (or equipment) has been sold a minimum of three (3) units of similar type and specification over the last three (3) years.	
(iii) Product has been in operation for a minimum of two (2) years.	

- Note -

This form shall only be included if Criterion 2.2.2 of Section 3 (Evaluation and Qualification Criteria) is applicable. Add pages as necessary. The Purchaser reserves the right to verify authenticity of Bidder submissions.

Form EXP - 3: Production Capacity

Fill out one (1) form per product and manufacturer.

Production Capacity	
Name of Product	
Manufacturer:	Address and Nationality:
Requirements in Accordance with Criterion 2.2.3 of Section 3 (Evaluation and Qualification Criteria)	
Production facility 1 (include location): The Bidder or Manufacturer should have supplied at least one Solar PV System or Solar/Wind hybrid system of minimum 150 kW capacities in last 5 years.	
Production facility 2 (include location):	
Production facility 3 (include location):	

- Note -

This form shall only be included if Criterion 2.2.3 of Section 3 (Evaluation and Qualification Criteria) is applicable. The Purchaser reserves the right to verify authenticity of Bidder submissions.

Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name below:

Joint Venture Partner: _____

Financial Data for Previous Three (3) Years [NRs Equivalent]		
Year 1:	Year 2:	Year 3:

Information from Balance Sheet

Total Assets (TA)			
Total Liabilities (TL)			
Net Worth = TA-TL			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital = CA - CL			

Most Recent Working Capital		To be obtained for most recent year and carried forward to FIN - 3 Line 1; in case of joint ventures, to the corresponding Joint Venture Partner's FIN - 3.
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Information from Income Statement

Total Revenues			
Profits Before Taxes			
Profits After Taxes			

- ☐ Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last three (3) years, as indicated above, complying with the following conditions:
- Unless otherwise required by Section 3 of the Bidding Documents, all such documents reflect the financial situation of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries, or affiliates.
 - Historical financial statements must be audited by a certified accountant.
 - Historical financial statements must be complete, including all notes to the financial statements.
 - Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

- Note -

This form shall only be included if Criterion 2.3.1 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form FIN - 2: Size of Operation (Average Annual Turnover)

Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each member of a Joint Venture in terms of the amounts billed to clients for each year for work in progress or completed, converted to US dollars at the rate of exchange at the end of the period reported.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name below:

Joint Venture Partner: _____

Annual Turnover Data for the Last Three (3) Years			
Year	Amount Currency	Exchange Rate	Equivalent (Nepalese Rupees)
Average Annual Turnover			

- Note -

This form shall only be included if Criterion 2.3.2 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Section 5 - Eligible Countries

“No nationality restrictions apply, other than any restrictions arising from ITB 4.7”

Section 6 - Schedule of Supply

Contents

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1. List of Goods and Related Services

Supply, Delivery, Installation, Testing and Commissioning of Solar Mini-grid System at Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District including all accessories as per Schedule-A, Schedule-B & Technical Specifications

Schedule-A

Item No.	Item Description	Quantity	Unit of Measurement
	A- Power Generation Components:		
1	Solar Photovoltaic Array of Total Minimum Capacity 150kWp (Size of individual PV module should be $\geq 250\text{Wp}$, Mono or Poly Crystalline Silicon)	1	Set
2	Three Phase Grid Tie PV Inverter with MPPT controller, total minimum capacity 150kW (Individual inverter capacity: Minimum 30kW), including AC and DC surge protector	1	Set
3	VRLA Gel Tubular Battery of Total Minimum Capacity 950kWh (Individual battery capacity: Minimum 2000Ah@C10, 2Volt) with rack, cables and accessories, OR LiFePO4 of total minimum 800kWh capacity	1	Set
4	Off-grid Battery Inverter, Total Minimum Capacity 90kW stackable as Master and Slave for 3-Phase Supply (Individual Inverter Capacity: Minimum 6kW)	1	Set
5	Control System with Accessories including necessary breakers and fuses	1	Set
6	Solar PV Module support structure, hot dipped galvanized metal frame complete set		LS
7	Balance of System materials (DC and AC copper cables, Connectors, surge protector, Nails, Powerhouse lights-6 etc)		LS
8	PV Combiner Boxes with Fuses, Isolators, Surge Protective Relays, MCB, MCCB & accessories	1	Set
9	DC Distribution Board or Panel with breakers, DC surge protection device & accessories	1	Set
10	AC Distribution Board with Circuit Breakers, AC Surge Protectors, Energy Meter & Accessories	1	Set
11	Lightning and Earthing System for Power Plant (maintenance free/chemical LPI standard or better technology, lightening rods, surge protectors etc)	1	Set
12	Remote System Monitoring Unit & Accessories including communication router		LS
13	Fire Extinguisher	2	Set
14	Wall Fans for Control/Battery Room	4	Set
15	Exhaust Fans for Control/Battery Room	4	Set
16	PVC Water Tank 500Liter for Powerhouse Use	1	Set
17	Office Equipments (Table, Chair, Shelf, Laptop Computer, Printer)	1	Set
	B- Power Transmission & Distribution Components		
18	XLPE Insulated Copper Armored AC Cable, 4 Core 70mm^2 (Power House to First Pole or Transformer)	30	Meter
19	Earthing System Complete Set for Power Distribution System	20	Nos
20	MS Pole Tubular 11 meter for 3-phase power transmission complete set as per the attached BOQ	12	Nos
21	Power Distribution 3-Phase, MS Pole Tubular 9 meter	55	Nos
22	Power Distribution 1-Phase, MS Pole Tubular 8 meter	90	Nos

Item No.	Item Description	Quantity	Unit of Measurement
23	ACSR Conductor, Rabbit for 11KV Line	1.8	Km
24	Aluminum Conductor Insulated ABC Cable 4 core 50 Sq. mm twisted for 3-Phase, max. resistance 0.641Ω/km@20 ⁰	0.88	Km
25	Aluminum Conductor Insulated ABC Cable 2 core 50 Sq. mm twisted for 1-Phase, max. resistance 0.641Ω/km@20 ⁰	2.8	Km
26	Aluminum Conductor Insulated ABC Cable 4 core 95 Sq. mm twisted for 3-Phase, max. resistance 0.32Ω/km@20 ⁰	1.6	Km
27	Aluminum Conductor Insulated ABC Cable 2 core 95 Sq. mm twisted for 1-Phase, max. resistance 0.32Ω/km@20 ⁰	1.3	Km
28	Anchor and Suspension Clamp for both 9m and 8m MS-Poles for binding of ABC cable into pole	150	Nos
29	Cable Connector suitable for interconnection of service cable and Insulated ABC cable	350	Nos
30	Shackle Insulators and D-Iron (Medium size)	40	Set
31	Service wire, concentric 6 sq.mm.	13	Km
32	100 kVA Transformer with all complete set as per Technical Specification Section.6	2	Set
33	Lightening Arrestor, 9 kV, 10 KA	3	Set
34	Lightning Arrestor, 0.5 kV, 1.5 kA	25	Nos
35	Stay Set with accessories- hot dipped galvanized (stay plate of area 600mm*600mm and thickness 6mm, thimble, stay wire stranded, turn buckle and stay rod of dia 19mm, length1.8m etc all complete)	2	Set
36	Stay Set with accessories- hot dipped galvanized (stay plate of area 300mm*300mm and thickness 6mm, thimble, stay wire stranded, turn buckle and stay rod of dia 16mm, length1.8m etc all complete). Galvanized stay wire should be stranded by 7 wires of sizes 8 SWG.	50	Set
37	Tool Box (Insulating Gloves, Crimping Tool, 3-phase Digital Clamp meter etc.)	1	Set
38	Aluminum Foldable Pole Ladder of Extended Length Minimum 7 meter	1	No
39	Pre-paid Energy Meter 5Amp, 230VAC 50Hz, Class 1	320	Nos
40	Pre-paid Energy Meter 16Amp, 230VAC 50Hz, Class 1	5	Nos
41	Pre-paid Energy Meter 32Amp, 230VAC 50Hz, Class 1	1	Nos
42	Pre-paid Energy Meter 25Amp, 400VAC 50Hz, Class 1	4	Nos
42	MCB 6Amp DP 230V for Households	320	Nos
43	MCB Holders Boxes for Households	320	Nos
44	MCB 16Amp DP 230V for PEU	5	Nos
45	MCB 32Amp DP 230V for RM Office	1	Nos
46	MCCB 25Amp TP for 400V PEU Loads	4	Nos
47	MCCB 63Amp TPN with pole mounted distribution box of IP65	1	Nos
48	MCCB 125Amp TPN with pole mounted distribution box of IP65	1	Nos
49	MCB 63Amp, DP with pole mounted distribution box of IP65	2	Nos
50	LED Lamp 5 Watt, AC 230V	960	Nos
51	LED Lamp 3 Watt, AC 230V	960	Nos
52	LED Street Light 230V 20Watt AC with photo sensors and mounting arms	30	Nos
53	Outdoor boxes for Street Lights switches, surge protection devices etc	5	Nos

Schedule-B

Item No.	Item Description	Quantity	Unit of Measurement
1	Transmission Pole Installation and Commissioning	12	Nos
2	Distribution Pole Installation and Commissioning	145	Nos
3	Transformer Pole Erection, Cabling and Charging	2	Set
4	Conductor stringing with LA fitting (11 KV Three Phase) and line charging	0.60	Km
5	Conductor stringing with LA fitting (Three Phase)	3.0	Km
6	Conductor stringing with LA fitting (Single Phase)	4.0	Km
7	Civil works for 150kWp solar PV array foundations including material and workmanship		LS
8	Fence for PV array & Powerhouse (Chain Link Mess Size of 2"*2" with Iron Angle Post of 50mm*50mm*5mm size at interval of 2m c/c of height 1.5m from ground level with concrete base of 0.2m*0.2m cover & 0.5m depth)	250	Meter
9	Installation, Commissioning and Testing of 150kWp Solar Mini-grid System		LS
10	Construction of Powerhouse including Toilet/Washroom with RCC Roof Cover as per the technical specifications (Size: 16.5 meter * 7 meter * 3 meter)	116	m2
11	Transportation of all goods from Supplier's warehouse to subproject site		LS
12	Operation, Maintenance and Management of whole system for 3 Years		PS
13	Site Development and Retaining Wall		PS
14	Environmental Mitigation and Enhancement		PS

PS: Provisional Sum

LS: Lump-sum

No: Numbers

Km: Kilometers

2. Delivery and Completion Schedule

The delivery period shall start as of _____.

Item No.	Description of Goods or Related Services	Delivery Schedule (Duration)	Location	Required Arrival Date of Goods or Completion Date for Related Services
1	Delivery of all goods as per List of Goods and Related Services	150 days after signing of contract Agreement	Thabang Rural Municipality Ward-1&2, Thabang, Rolpa District	Supply, Delivery, Installation, Testing and Commissioning should be completed within 240 days from contract effective date.
2	Installation of solar PV modules	30 days after delivery of equipment at site	Thabang Rural Municipality Ward-1&2, Thabang, Rolpa District	
3	Construction of Powerhouse and Control room	120 days after signing of contract Agreement	Thabang Rural Municipality Ward-1&2, Thabang, Rolpa District	
4	Installation of battery bank, controllers, inverters, electronics, cables etc.	60 days after completion of Item No.1 works	Thabang Rural Municipality Ward-1&2, Thabang, Rolpa District	
5	Erection of 3-phase and 1-phase transmission and distribution line	150 days after signing of contract Agreement	Thabang Rural Municipality Ward-1&2, Thabang, Rolpa District	
6	System output testing and commissioning	30 days after completion of Item No.4 and 5	Thabang Rural Municipality Ward-1&2, Thabang, Rolpa District	

3. Technical Specifications

150KWP SOLAR MINI-GRID SYSTEMS FOR THABANG RURAL MUNICIPALITY WARD No-1 and 2, THABANG, ROLPA DISTRICT

Introduction and Project Background

The subproject site is located at Thabang Rural Municipality Ward No-1&2, Thabang village, Rolpa District, having geographical coordinates 28.495757° N and 82.713215°E, at an elevation of 2,036 meters. The detail feasibility study of the subproject was conducted in 2018 by AEPC. The technical due diligence and community consultant was conducted in May-2019 by AEPC/SASEC PIU. The solar mini-grid system design revision, transmission and distribution network design revision for the base year demand of 2019 is carried out by AEPC-SASEC PIU. Total numbers of households to be served are 320. In addition to basic household electricity demand there is significant energy demand for the public demand, small businesses and industries within Thabang Bazaar. The projected productive energy use demands will be well above 20% of the total forecasted energy demand of base year. The public service demand is foreseen for schools, hospital & health post, police office, Rural Municipality offices and solar street lights. As per the base year energy demand of 2019, the estimated average daily energy demand is 396kWh without considering system losses and 489kWh with considering losses.

The electricity produced by solar photovoltaic system will be transmitted by 11KV line from powerhouse to the entry point of Thabang Bazaar which is 500meter distance. Two units of distribution transformers, one at power plant (100 kVA, 0.4 kV/11 kV) and another towards entry point of Thabang village (100 kVA, 11 kV/0.4 kV) shall be integrated in the power distribution network. Another 230Vac distribution line from powerhouse will supply electricity to Gobang village. The power distribution to various settlements will be done through low voltage three phase 400Vac and single phase 230Vac line as required by the household and enterprise demands. As there exist bare conductors those were used earlier for Micro-hydro power distribution, therefore, insulated Arial Bundle Conductor (ABC) shall be used for the new solar mini-grid power distribution purpose. The local mini-grid power will be supplied through the 3-phase photovoltaic inverters and battery inverters in the form of pure sine wave output through power conditioning device (s). The 3-phase loads will be feeding through 400Vac, 50Hz whereas single phase village loads will be feeding through 230Vac, 50Hz local distribution network. One of the advantages of choosing AC mini-grid system is that, it can also be

integrated into a national grid system at any time in future, simply by connecting to the utility lines through the standard grid-tie inverters proposed in this system. This can be an important advantage of Thabang Solar Mini-grid Subproject where rural utility grid might be expanded in future either in isolated mode or in grid-connected mode.

Project Site Map



Fig: Location of Thabang Solar Mini-grid Subproject Rolpa District

The purpose of the Technical Specifications (TS) is to define the technical characteristics of the goods and related services that are required to be procured for the installation. The TS, as a part of the schedule of requirements (SR), constitute a contract document and are, therefore, a part of the contract. The bidder must furnish documentary evidence in the form of literature (catalogue), certified dimensional drawings, and detailed description of goods with essential technical information. All data, drawings, catalogues and other technical documents shall be bound separately from the Bid documents.

The Bidder shall furnish a clause-by-clause commentary on specification, specifying compliance and deviations, if any. The bidders are required to mention their characteristics of proposed goods with related service stating Complied or Non-Complied or Partially Complied. In the case of non-Complied or Partially Complied comment provided by Bidder, the bidder has to propose its alternative specification so to satisfy the purchaser's requirements. It is mandatory to submit document from manufacturer showing the proposed parameter and highlight the parameter in the technical specification.

3.1 SOLAR POWER GENERATION COMPONENTS

The bidder shall clearly response the technical specifications and standards asked for the equipments and mini-grid system components in their technical proposal. The bidder shall provide the data sheet, product catalogue and technical specifications of all the indicated equipments of power generation and distribution system including performance curve, power and energy curve, test certificates, warranty assurance certificate, international standard that the proposed goods comply with.

3.1.1 Solar Photovoltaic(PV) Module

General Description

The solar PV module shall comply with the standard set forth under Nepal Photovoltaic Quality Assurance (NEPQA) 2015 rev1 or the latest revision if so. The solar PV modules shall typically be tested for durability and reliability according to standards developed by the International Electro-technical Commission IEC61215 2nd Edition or latest edition of IEC61215-1:2016, IEC61215-2:2016 for crystalline silicon terrestrial PV modules include, amongst others, tests for thermal cycling, humidity and freezing, mechanical stress and twist hail resistance and performance under fixed test conditions. The proposed **minimum size of solar PV array is**

150kWp. The solar PV modules shall meet minimum following technical specification and standard.

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	The manufacturer shall have: ISO 9001, ISO 14001 Certificates and must be Tier-1 Module Manufacturer		
2	Manufacturer/Brand/Model:		
3	Peak Power of Individual Module under STC: ≥ 250 Watt-peak		
4	Array Capacity: At least 150kWp		
5	PV Module Efficiency: $\geq 16\%$		
6	Cell type: Mono or Poly Crystalline		
7	No. of Cells per Module: 60 or 72 or 120 or 144 (full or half-cut cell)		
8	Module Power Warranty: A letter provided by principal PV module manufacturer in their letter head stating the warranty period for their PV module. The warranty period for the PV module must be at least 10 years of 90% rated power output and 20 years min 80% rated power output at STC. Minimum 5 years warranty against manufacturing defects.		
9	Local certification required: RETS Certificate (PIT Certificate must be submitted with Bid and RST Certificate must be submitted before installation/commissioning)		
10	International Certification: IEC 61215:2005 2 nd edition or latest edition of IEC61215-1:2016, IEC61215-2:2016, IEC62804 for PID and IEC 61730. The test certificates must be provided.		
11	Bidder must submit the technical datasheet of Solar PV Module		

3.1.2 Solar Deep Cycle Battery

General Description

The deep cycle maintenance free batteries are required to be designed for the off-grid renewable energy application where regular charge and discharge cycle is foreseen unlike the standby operation. The total required battery bank size shall be at least **950kWh** VRLA Tubular Gel or at least **800kWh** LiFePO4. The battery bank shall be designed for 48VDC systems.

The General Technical Specifications of the batteries should meet the following parameters.

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	The manufacturer shall have: ISO 9001, ISO 14001, OHSAS 18001 Certificates		
2	Warranty of minimum 5 years from battery manufacturer in their letter head signed and stamped		
3	Manufacturer/Brand/Model:		
4	Battery Type: VRLA Gel Tubular with rack and properly sized cables accessories. Or LiFePO4 with complete battery management system and protection system, rack and cables		
5	Individual Battery Capacity of VRLA: 2 Volts, minimum size 2,000Ah@C10 at 25°C		
6	Battery bank nominal voltage: shall match the inverter and charge controller requirement		
7	Cycle usage: Minimum 1,500 cycles @80% Depth of Discharge		
8	No. of batteries in parallel: Maximum up to 3 strings per inverter		
9	Average Self Discharge: ≤3% per month at 25°C		
10	RETS Certification or Bidders Quality certificate validation by AEPC or Third party assigned by AEPC		
11	International Certification:		

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
	IEC 61427 & IEC 60896-21&22. Test certificates from IEC accredited independent laboratory must be provided. Battery should be certified by Certification Body (CB) Testing Laboratory or National Certification Body enlisted in IECEE, IECRE Website etc.		
12	Bidder must submit the technical datasheet of Battery		

3.1.3 Solar Charge Controller

General Description

The solar charge controller or regulator shall be Photovoltaic maximum power point tracking (MPPT) algorithm. The size of MPPT controllers shall be designed and selected in such a way that it is sufficient to regulate minimum 150kWp solar PV power. The charge controller can be separate unit or inbuilt in the solar PV inverters. The charger in the microprocessor shall be controlling to get maximum power from the PV to charge battery bank with LCD display and front panel for easy and accurate setting.

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	The manufacturer shall have: ISO 9001, ISO 14001 Certificates		
2	Warranty: Manufacturing warranty of minimum 5 years from charge controller manufacturer in their letter head signed and with company stamp		
3	Manufacturer/Brand/Model:		
4	Charging current and PV Power handling: At least 150kWp PV power regulation		
5	Charger Peak Efficiency: > 95%		
6	Type: Advanced microprocessor control type Maximum Power Point		

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
	Tracking (MPPT) solar charge controller		
7	Charging stage: Three stage charging to provide quick and safe charging for battery		
8	Protection Function: Over charge, over discharge, lightning, reverse PV polarity protection, PV transient voltage surge, over temperature		
9	RETS Certification or Bidders Quality certificate validation by AEPC or third party assigned by AEPC		
10	Charge Controller Standards: International Certification: IEC or UL standard. Either test certificate or test report of UL or from IEC accredited independent laboratory must be provided.		
11	Bidder must submit the technical datasheet of Solar Charge Controller		

3.1.4 Three Phase Solar PV Inverter

General Description

Solar PV Inverter shall be capable of providing AC power directly to the loads as well as charging the connected batteries. It should be capable to import and export power from the grid when utility line is available. It should be capable to support in grid interactive mode and able to interface with off-grid inverter. The inverter shall be capable of providing energy directly to the load bypassing the batteries and excess energy to charge the batteries.

The inverter shall meet minimum of the following standard and technical specifications.

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	The manufacturer shall have: ISO 9001, ISO 14001 Certificates		
2	Warranty: Manufacturing warranty of minimum 5 years from inverter		

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
	manufacturer in their letter head signed and stamped		
3	Manufacturer/Brand/Model:		
4	Inverter type: Three Phase Grid Tie		
5	Rated Power: Total Cumulative Capacity of at least 150kW @25°C (Individual inverter capacity shall be minimum 30kW)		
6	AC output Voltage: Three Phase 400±10% Vac (L-L), Single Phase 230 ±10% Vac (L-N)		
7	Output Frequency: 50 Hz ± 2.5%		
8	Output Wave form: Pure Sine Wave		
9	Peak efficiency: minimum 97%		
10	Inverter efficiency: The efficiency when operating loads at power levels within 40% to 90% of the rated load must be greater than 90%. The bidder must submit efficiency curve of the inverter		
11	Total Harmonic Distortion (THD) < 5%		
12	Power Factor: 0.8 Lag to 0.95 Lead		
13	Protection class: IP65 or above		
14	Protection: DC side disconnect, grid monitoring, DC reverse polarity, AC Disconnect		
15	Communication Interface: Modbus or RS232 or RS485 pack embedded, should communicate with other equipment and monitoring system		
16	RETS Certification or Bidders Quality certificate validation by AEPC or third party assigned by AEPC		
17	International Certifications: IEC61727, IEC62116, IEC62109 &		

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
	IEC61683 Test certificates and test reports from IEC accredited independent laboratory must be provided. Inverter should be certified by Certification Body Testing Laboratory or National Certification Body enlisted in IECEE Website.		
18	Bidder must submit technical datasheet of PV Inverter		

3.1.5 Off-grid Inverter or Battery Inverter

General Description

The off-grid inverters or battery inverters shall be capable of charging batteries as well as supply backup power to the load when mains supply (PV or Grid) to load is not available or not sufficient. The off-grid inverter shall meet minimum of the following standard and technical specifications.

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	The manufacturer shall have: ISO 9001, ISO 14001 Certificates		
2	Warranty: Manufacturing warranty of minimum 5 years from inverter manufacturer in their letter head signed and stamp		
3	Manufacturer/Brand/Model:		
4	Inverter type: Off Grid Inverter, Either 1-phase or 3-phase combine output, AC interactive		
5	Inverter arrangement: Stackable (Master-slave); One master in each cluster		
6	Rated Power: Total Cumulative Capacity of at least 90kW @25°C.		

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
	(Individual Inverter Capacity shall be minimum 6kW)		
7	Battery rated voltage: 48Vdc		
8	Surge Rating: The surge factor shall be at least 150% for 3sec		
9	Output Wave form: Pure Sine Wave		
10	Peak efficiency: minimum 93%		
11	Inverter efficiency: The efficiency when operating loads at power levels within 40% to 90% of the rated load must be greater than 85%. The bidder must submit the efficiency curve of the inverter		
12	Total Harmonic Distortion (THD) < 5%		
13	Power Factor: 0.8 lagging to 0.95 leading		
14	Protection class: IP54 or above		
15	Battery Equalization: Automatic		
16	Protection: AC short circuit, AC overload, battery deep discharge		
17	Features: capable to support in battery backup and able to interface with grid tie inverter. The inverter shall be capable of charging the batteries and use the stored energy to supply to the connected load		
18	Communication Interface: Modbus /multi-cluster pack embedded, Should communicate with other equipment and monitoring system		
19	RETS Certification or Bidders Quality certificate validation by AEPC or third party assigned by AEPC		
20	International Certifications:		

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
	IEC 61683 or IEC62109, IEC60335. Test certificates and test reports from IEC accredited independent laboratory must be provided. Inverter should be certified by Certification Body Testing Laboratory or National Certification Body enlisted in IECEE Website.		
21	The bidder must submit the technical datasheet of Battery Inverter		

3.1.6 Control System

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	Manufacturer/Brand/Model:		
2	Box/Center Point: Terminals for connection of grid tie inverters, off-grid inverters and loads		
3	No of phase:1-phase or 3-phase		
4	External grid connected AC combiner box: For connection of grid tie inverters		
5	Degree of protection: IP54		
6	Certification: CE		
7	The bidder must submit the technical datasheet of Control System		
8	Warranty: 5 years		

3.1.7 Battery Fuse

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	Manufacturer/Brand/Model:		
2	Battery fuse box: For battery protection		
3	Compatibility: Battery and Inverter		
4	Type/rating: as per system design and requirement		
5	The bidder must submit the technical datasheet of battery fuse		
6	Warranty: 3 years		

3.1.8 System Monitoring Unit

The system monitoring unit shall be designed and used for remote power monitoring, energy production data and battery state of charge monitoring real time monitoring, and other system parameter monitoring purpose of the mini-grid system. The data shall be logged to a remote server and also shown in real-time monitor display via internet that only authorized person can access any time at any place via the selected web server. The system monitoring unit shall meet at least following technical parameters and standards.

- RS485 or Modbus communication port for receiving data from inverter, charge controller, PV monitoring unit or power meter etc
- RS232 or LAN port or Modbus for local monitoring or network monitoring
- Internet connection via GSM modem, CDMA, GPRS, 3G, ADSL, VSAT
- Automatic store data into SD card when communication is failed
- The bidder must submit the technical datasheet of Monitoring System

3.1.9 Support Structure for PV Modules

The support structure for 150kWp solar PV array is proposed to be ground mount fixed type as specified in the drawing. All the module structure shall be installed in such a way that it utilize optimum land surface and there must not be shadow on the solar array during day time. The PV frame should be able to resist at least 20 years of outdoor exposure without suffering significant damage or corrosion. The supporting structure must allow easy cleaning of the PV modules.

The PV array mounting structure sketches are presented in the drawing section for the reference. The structure shall meet minimum of following technical standards and specifications.

- Tilt angle and orientation: 27- 30 degree and south facing
- The solar PV module structure must be made of MS hot dip galvanized suitable sections of rectangular tubes, angles and channels. The minimum size to be followed are; Vertical leg (Main leg): 40mmx80mmx2mm Rectangular tube Rafter or Purlins: 40mmx80mmx2mm Rectangular tube Column bracing or supporting bracing: 40mmx40mmx5mm angle Base plate: 200mmx200mmx6mm
- The minimum thickness of galvanization must be at least 85 microns.
- Support structure design and foundation or fixation mounting arrangements should withstand wind speed up to 170 km/hr.
- Clearance: Minimum necessary clearance between ground level and bottom edge of the PV modules/arrays must be at least 80cm
- The foundation of PV structure shall be minimum 0.8m deep with 0.3m(L) x 0.3m(B) size with 0.3m thick stone soling with sand filling and 0.3m(L) x 0.3m(B) x 0.8m(H) pillar in 1:2:4 PCC with 0.35m pillar above ground.

3.1.10 Cables and Accessories:

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	All the outdoor cables must be UV protected. All DC and indoor AC cable must be copper		
2	Allowable voltage drop from PV Array to Inverter: <3%		
3	Allowable voltage drop from battery bank to inverter to battery bank: < 1%		
4	Protection and safety: PV array to PV charge controller or inverter, Cabling trench with high grade insulation protection		
5	Outdoor cables from PV to Powerhouse should be armored		
6	String junction boxes or string combiner boxes or main combiner boxes or grid connected AC combiner box: IP65		

3.1.11 Generation System Earthing and Protections:

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document
1	The metal casing of solar system components shall be grounded properly using adequate number of earthing kits.		
2	The solar PV system shall be provided with lightning and over voltage protection.		
3	The solar PV system shall be provided with Lightning Arrestor (LA) and surge protection. Separate Earthing for LA and surge arrestor should be provided. The earthing plate/rod/strip should be copper.		
4	The resulting earthing resistance must be less than 4 Ohm		
5	DC and AC circuit breakers must be included as needed.		

3.1.12 Others:

S.N.	Specifications Required	Specifications Offered with Compliance	Reference Document (Specify Document)
1	Appropriate labeling to the solar powered sockets, solar PV Power components and its wirings.		
2	Single Line Diagram (SLD) must be provided in Technical Bid.		
3	Safety breakers and surge protectors: Internationally Recognized certifications		

3.1.13 Powerhouse, Control Room and Toilet:

The powerhouse shall be single story type and will be constructed next to the solar power plant. The house will serve as powerhouse/control-battery room, operator's office room and Toilet/Washroom for the mini-grid subproject. The powerhouse details are presented in the drawing section of the bid document. The minimum size of the proposed house will be 16.5m x 7m = 115.5 m². It will have the partition for office room and battery/control room as indicated in the drawing. During the construction phase, supplier/contractor shall receive final approval of

powerhouse drawing and its design from the employer. The powerhouse must be weather resistant to local climatic conditions at the project site.

The specification of the power house will be as follows:

- Construction of Powerhouse in Brick Masonry (minimum wall thickness: 230mm) of minimum size 16.5m (length)* 7m (breadth)* 3.0m (internal height)
- Cement sand ratio 1:6 for wall, Cement sand ratio 1:4 for plaster
- Floor: PCC (1:2:4) flooring of 75mm thickness with punning 1:3 cement mortar
- RCC Pillar: 15 numbers of RCC Pillar of size 300mm*300mm with 8 numbers of 16mm Diameter TMT bar and concrete ratio 1:1.5:3
- Roofing: RCC roof (1:1.5:3) with slab thickness of 125mm, beam size of 300mm (W) * 355mm (D) as per given drawing
- Foundation: Typical isolate footing of 1300mm wide and 1300mm depth, and wall foundation of 1050mm wide and 1300mm depth.
- The Toilet shall be constructed inside Powerhouse as shown in the Powerhouse drawing. The inner dimension of the proposed toilet/washroom will be 2.95m length, 1.25m breadth. The Toilet/washroom will be fitted with W/C pan, wash basin, shower complete with all pipes fittings and accessories. Water tank (HDP) 500 Liter for water supply to the toilet/washroom shall be located on the roof of the Powerhouse. A circular Soak pit (1.2 meter diameter) shall be constructed at least 5 meters distance from the Powerhouse as shown in the drawing.
- Main wooden door double panel with frame (1500 mm * 2300 mm) of SAL WOOD (One)
- Operator and Washroom wooden door single panel with frame (1000mm * 2300mm) of SAL WOOD (Two)
- Window (glaze 5mm thick): 5 numbers of wooden window with frame (1500mm * 1500mm") and two Ventilations (500mm*750mm) of SAL WOOD
- All Door and Windows Frame shall be of size 75mm * 100mm
- 20mm thick plaster at 1:4 cement sand ratio in inside and outside of the powerhouse
- Two layer of Wall Putty shall be applied in all Wall and Ceiling inside the Powerhouse
- Minimum **TWO** numbers of 5 Kg size ABC Stored Pressure Type **Fire Extinguishers** must be set up inside Powerhouse.
- Painting:
 - All wood works shall be painted with one coat wood primer and two coats of enamel paint.

- External face of powerhouse wall shall be painted with one coat of cement primer and two coats of Pink color
- Internal plastered surface shall be painted with one coat of cement primer and two coats of white distemper

3.1.14 Fencing

The power plant and powerhouse after installation shall be secured by fencing around it. An entrance door and lock shall be included. The fence must include:

- The chain link mesh size must be at least 2" x 2" of 10 guage
- The metal post must be at least 1.5 m high from ground level with MS angle iron of minimum size 50mm*50mm*5mm, with the maximum spacing of 2 m center to center
- The iron angle post must be at least 0.5m below ground level in M15 concrete (1:2:4) with 0.2m*0.2m cover
- Fencing must include a MS iron lockable gate of 1.5m width and 2.5m height
- All MS angle iron must be coated with a single coat of primer and 2 coat of Enamel Paint.
- There should be a free space of 2 m between the front of PV array and the fencing
- There should be a free space of 1.5 m between the side of PV array and the fencing
- There should be a free space of 1 m on the back of PV array and the fencing

3.1.15 Solar Mini-grid System Electrical Protection

Protection system shall be provided to isolate faulty section as quickly as possible, to limit damage and to maintain healthy systems in stable operating condition. The distributed mini-grid system will feature a high degree of selectivity and discrimination between faulty and healthy circuits. In general the protection system shall be provided for

- Solar PV modules and PV controller
- Battery Bank
- PV and Battery Inverter and power conditioning devices
- Entire section of the transmission and distribution network (by installing MCCBs in various sections as per BoQ)

All the components of solar PV system, both AC and DC must be grounded to a low impedance ground. Grounding conductors and bus bar should be tested and determine the "grounding system" resistance, this should be 4 ohm or less.

3.1.16 MCB - Double Pole (DP)

The DP circuit-breakers are intended for the protection against over-currents (overload and/or short-circuit) of electrical installations of the energy end users. MCB shall be IEC 60898 compliance or equivalent with degree of protection equal or higher than IP20. Each unit shall accompany with an external fuse-holder and fuses rating 6Amp, 16Amp and 32Amp at 230Vac.

3.1.17 MCCB - Triple Pole (TP)

The TP circuit-breakers are intended for the protection against over-currents (overload and/or short-circuit) of electrical installations of the energy end users. MCCB shall be IEC 60898 compliance or equivalent with degree of protection equal or higher than IP20. Each unit shall accompany with an external fuse-holder and fuses rating 25Amp, 63Amp, and 140Amp at 400Vac.

3.1.18 Pre Payment Energy Meters

The Pre-paid Energy meter measures energy consumption of each households or end use institutions that will be served by the subproject. Unlike hydro power, power from solar mini-grid system is limited and therefore it is necessary to control the use of electricity by the consumers or use efficiently by demand side management techniques. Pre-payment energy meters are good tool for power metering, load control and customer information management. Pre-paid smart energy meters are similar to the conventional energy meters used at consumer end, the difference is that the users would need to buy a top up (in the form of code or a card) and input it to the meter to use electricity as long as the cash balance remains. Minimum of following function and features are required:

- The energy meters shall be single phase or three phase electronic pre-paid smart meters of 5Amp, 16Amp, 25Amp, 32Amp accuracy class 1, as specified in the BoQ section.
- One card for one user having well protected from forgery. Once the electric consumption available is out, it should be auto cut-off.
- Should protect from power theft and record the information as well as expansible RS485
- Auto cut-off for overload (must have inbuilt WATT limiting facility)
- Should have Low voltage disconnect and high voltage disconnect facility
- The IC card power selling control system should have sound functions of power selling and power using supervision.

3.1.19 Solar Street Lights

The Streetlights shall have 3 years of replacement warranty and the LED lights shall meet minimum of the following technical specifications:

- Metallic body with heat sink LED light, nominal working voltage of 230VAC
- Luminous efficacy ≥ 100 Lumens/Watt
- LED color rendering index (CRI) ≥ 60
- LED fixture protection grade: IP65 or better.
- Lifespan of the LED shall be at least 30,000 hours
- View angle of individual LEDs $\geq 100^\circ$
- The streetlight shall include mounting clamp, connector/switch arrangement for outdoor condition with the galvanized light arm
- Proposed 25 lamps and accessories will be installed by the contractor on the electricity distribution poles being erected for power distribution
- LED lamp power consumption: 20 Watt
- Control Mechanism: Photo-censor and Activation Switch On/Off
- Operational for 6 hours full power and another 6 hours at 50% output by achieving energy efficiency

3.1.20 Computer and Printer

- Laptop Computer: Intel core i5 processor, 4GB ram, 500GB HDD, 15.6" display, DVD RW Drive
- 3 in 1 laser printer
- Pre-paid energy meter token printer

3.1.21 LED Lamps for Households

The LED lights shall meet minimum of the following technical specifications:

- Nominal working voltage of 230VAC
- Luminous efficacy of individual LED ≥ 100 Lumens/Watt
- Luminous yield of the lamp ≥ 80 Lumens/Watt
- Lamp driver circuit efficiency must be at least 80%
- LED color rendering index (CRI) ≥ 60
- LED fixture protection grade: IP65 or better.
- Lifespan of the LED shall be at least 30,000 hours
- View angle of individual LEDs $\geq 100^\circ$

- LED lamp power consumption: 3 Watt and 5 Watt (as indicated in the BoQ)
- 3 years of replacement warranty

3.1.22 Human and Equipment Safety:

Following safety affairs are proposed in the solar Hybrid power plant.

- A suitable Fire Protection system shall be incorporated inside the powerhouse (as specified in the Powerhouse Section) where the battery bank, power conditioning devices, cabling and communication systems will be setup.
- Safety Signage: High visibility warning signs such as electrical shock, acid burn, explosion etc shall be placed at the recommended sections.
- Maintenance and safety equipments shall be used while handling electrical work at the site such as eye glass, electrical safety gloves, acid spill kit etc.

3.1.23 Operation, Maintenance Manual and Training Program

The bidder shall provide system operation, technical instruction and maintenance manual, in English and Nepali language upon completion of the solar mini-grid subproject. Moreover, detail of system wiring and connection diagrams shall be provided along with the manual. The supplier/contractor shall also provide operation and maintenance training as per the manual, to at least 5 persons selected by the users committee.

3.2 400/230 VOLT TRANSMISSION AND DISTRIBUTION SYSTEM

3.2.1 Background Information

The evacuation of power from 150kWp solar mini-grid system in Thabang Village of Thabang Rural Municipality ward number-1 is proposed via 11KV, 400VAC, 230VAC line to serve various loads within the service area. The power generated from the proposed 150kWp solar photovoltaic array will be connected to the power conditioning unit(s), to convert battery stored DC power into the 3-phase 400VAC, 50Hz system before sending to the local mini-grid transmission and distribution network. However, for the day time energy demand the PV power will also supply direct loads to optimize size of battery bank.

The local 3-phase and 1-phase low tension line will distribute electricity to the proposed 320 households, small industries and enterprise demands within various clusters of Thabang. The total span of transmission and distribution system (one way) is 5.92 kilometer. The distribution

system shall be overhead from powerhouse up to the consumer ends in the various clusters of proposed site. The table below summarizes major components of transmission and distribution system design.

Description	Length/Quantity/Numbers
Length of Transmission & Distribution Lines	5.92 Km
Three Phase (4 wires)	2.62 Km
Single Phase (2 wires)	3.30 Km
ABC Cable 4 core 95 Sq. mm	1.6 Km
ABC Cable 4 core 50 Sq. mm	0.88 Km
ABC Cable 2 core 95 Sq. mm	1.3 Km
ABC Cable 2 core 50 Sq. mm	2.8 Km
ACSR Rabbit Conductor	1.8Km Km
Service Cable 6 square mm	13 Km
Distribution Component Size and Number	
MS tubular pole (11 m length)	12 number
MS tubular pole (9 m length)	55 number
MS tubular pole (8 m length)	90 number
Cable Connector for ABC cable	350 number
Anchor and Suspension Clamp for ABC cable	150 number
Shackle Insulator and D-Iron (Medium Size)	40 number
Stay sets with accessories (hot dipped galvanized)	52 number
Lightning Arrester, 0.5kV, 1.5kA	25 number
Lightning Arrester, 9kV, 10kA	3 number

The local power transmission and distribution system of Thabang village is proposed to be constructed in such as way that it should be Nepal Electricity Authority (NEA) grid compatible by complying its quality and standard. The objective of up scaling the off-grid mini-grid system distribution quality is that, in case of the national grid power will be extended to the village in future, the power generated by the solar mini-grid electricity system could be integrated into the national grid network at local level and existing local power distribution network can be used. The detail technical specifications and standards of the transmission and distribution system components and accessories are also indicated in this section. The single line diagram for the proposed power distribution network is demonstrated in the drawing section of the bid document.

Transmission and Distribution Components

1. Transmission lines shall be suspended overhead on poles. Overhead lines are more common as they are less expensive and easier to install. Overhead lines are also easy to repair and maintain. As per the design and BoQ both ASCR bare conductors and ABC conductors will be used in the transmission and distribution network.
2. A stay set should be provided at the first pole, at all poles set at an angle and at line ends. For safety and protection from storms, every fifth pole is generally stayed on both sides even if the poles are in a straight line.
3. The design of transmission and distribution lines should be such that voltage drops at any distribution line end is limited to 10% of nominal value.
4. Service connections should be 230 VAC for single phase loads and 400VAC for three phase
5. Bare wire 11,000 Volt circuits shall be supported on shackle insulator with D-iron. Generally, shackle insulator with D-iron shall be placed on the same side of the pole throughout the length of the line.
6. **Neutral Conductor:** Neutral conductor may be the same size as the phase conductor or be sized smaller than the phase conductors. The neutral conductor size shall be specified by the work plan. All neutral conductors shall be within the ABC bundle conductor.
7. **Phase Conductor:** Phase conductors shall be bare ACSR conductor for 11KV and ABC conductor for low tension line as specified by the work plan.
8. For easy maintenance and faultfinding, the distribution system should be divided into different area separated by switches and fuses. MCCBs will also be placed in various sections to isolate the particular sections in case of fault.
9. The transmission line and associated equipment at both ends shall be protected with the over current protection, ground over current protection, lightning protection etc.
10. The clearances of overhead conductors with ground, trees and other structures should maintained in accordance with the values presented in tables below

Table: Minimum Ground Clearances

Voltage Level	Across Road (m)	Along Road (m)	Other places (m)
above 230/400 V and below 11 kV	5.8	5.5	4.6

Table: Minimum Clearances between live wires and structures or trees

Voltage Level	Minimum Clearance (m)
---------------	-----------------------

230/400 to 11 kV	1.25
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Note: Maximum deflection of wire due to wind pressure should be considered while fixing the minimum clearances.

11. The minimum sag for cables up to 11 kV can be calculated as follow:

$$d = (L/172.8)^2$$

Where, d= sag in m

L= length of span in m

Table: Sag for spans of overhead cables

Span (m)	20	30	40	50	60	80
Minimum sag (mm)	13	30	54	84	121	210

The value of sag should be included when determining the ground clearance of a transmission line.

3.2.2 Transformers

Technical Specification of 100 kVA Step up / Step Down Transformers

The following specifications cover the requirements of Oil Immersed, natural cooled three phase distribution transformers suitable for outdoor installation on 11 kV, 50 Hz system

Service Condition:

The transformer shall be designed and constructed for outdoor installation and operation under the following conditions

Ambient Temperature	5°C to 45°C
Relative Humidity	Up to 100 %

Tank:

Each Transformer shall be provided with a case of rigid construction, which shall be oil tight and gas- tight. The tank shall be capable of withstanding , without leakage or permanent distortion, a pressure 25% greater than the maximum operating pressure. The tank cover shall be bolted. Each transformer shall be provided with earthing terminal with camp type connector. The radiator shall be of pressed steel or corrugated type design

Core:

Core shall be constructed of amorphous metal or CRGO silicon steel.(Amorphous metal is highly efficient material and processes good magnetic properties, low inherent magnetic resistance losses. Due to its ability to be constructed into very thin sheets “Eddy current “losses are significantly reduced.)

Winding:

The design, construction and treatment of winding shall give proper consideration to all service factors. The completed assembly of core and coils shall be dried in a vacuum sufficient to ensure elimination of air and moisture within the insulation structure. After the drying process, the assembly shall be immediately impregnated with dry oil. The windings of the transformer shall be fabricated of copper materials.

Oil Preservation System:

The 100 kVA , 11/0.4 kV transformer shall be permanently sealed and completely oil filled type.

Short Circuit Capacity:

The transformer shall be designed and constructed to withstand without injury the mechanical and thermal stress produced by short circuit current limited by the impedance of the transformer only.

Insulating Oil:

The insulating oil shall be refined mineral oil. The contractor shall furnish necessary quantity of oil for the transformer.

Bushing:

The bushing shall be made of homogeneous and well ventilated porcelain. The color of the insulator shall be brown and the surface shall have polished glaze. The high voltage bushings shall have bolted terminal lugs suitable for terminating 30- 100 mm² standard ACSR conductor. The low voltage bushing shall have bolted terminal lugs suitable for terminating aluminum conductor compatible to the kVA rating of the transformer. The low voltage neutral bushings shall include a bolted terminal lug for terminating together an earth wire and an aluminum conductor of neutral circuit of the LV system.

Temperature Rise:

Average winding temperature rise above maximum ambient temperature (45°C) carrying maximum continuous rated kVA shall not exceed 55°C. The temperature rise of the insulating oil shall not exceed 50°C when measured near the top of the main tank.

Accessories:

The following accessories shall be provided with each transformer

- Upper oil filter valve
- Lower oil filter and drain valve
- Oil sampling device
- Liquid level gauge
- Lifting lug
- Name Plate
- Tang grounding terminal connector suitable for grounding cable # 6 SWG solid or stranded copper.

The transformer shall be provided with three units of surge arrestors and one unit of four pole secondary circuit breaker. The surge arrestor shall be distribution class as the specification.

The secondary circuit breaker shall be moulded case circuit breaker (MCCB) type with resisting provision and overload indication signal light. The circuit breaker shall respond to both oil temperature and secondary circuit and shall be of thermal and magnetic trip type. The rating of the breaker shall be suitable for the associated transformer. The signal light shall be lit when the load reaches approximately 80% of rated secondary current of the transformer. The signal light shall be installed on the transformer tank in such a way that it shall be clearly seen.

Tests:

The following test shall be made on the transformers

- Temperature rise tests
- Impulse voltage tests
- Air pressure tests
- Short Circuit Tests

Routine Tests

The following tests shall be performed on each unit of transformer before delivery

- Applied voltage test
- Induced voltage tests
- No load loss and excitation current test
- Impedance voltage and load loss test
- Resistance measurement
- Ratio test
- Polarity and phase relation test
- Leakage test
- Insulation resistance tests

Rating and Feature for Distribution Transformer

Type	11/0.4kV , Three Phase	
Rated Power	As specified (100kVA)	
Rated Voltage	Primary 11kV	Secondary 400/230V
Max System Voltage	Primary 12kV	Secondary 440 V
Rated Frequency	50Hz	
Cooling System	ONAN	
Vector Group	Ynd11: Step-up Dyn11: Step-down	

Rated Voltage	Impedance	<4.5%	
Withstand Voltage 50Hz,60 Sec.		Primary 28 kV	Secondary 3 kV
Insulation Temperature			Class A
Maximum Allowable noise level at 3 meter hemispherical radius		<44 db	
Applicable Standard		IEC or equivalent standard	
Approximate Weight		690 Kg	
Oil Requirements		(120-150 Liter) as per different company tank size	

3.2.3 Specification of pin insulator

Pin type insulators are provided for 11 KV poles along straight runs. Disc or strain insulators are provided for dead ends, double pole structures and transformer substations.

Highest System voltage	12Kv
Rated Voltage	11Kv
Creepage Distance (min)	265 mm
Wet power Frequency Withstand Voltage	35kV
Impulse Withstand Voltage	75kV
Puncture Power Frequency Voltage	105kV
Visible Discharge Voltage	9kv
Cantilever Strength	5KN
G.I. Pin Head	Small Thimble type

3.2.4 Specification of String or Disc Insulator

Highest System voltage	12Kv
Rated Voltage	11Kv
Creepage Distance (min)	280mm
Porcelain Diameter(min)	255mm
Spacing	145mm
Wet power Frequency Withstand Voltage	35kV
Impulse Withstand Voltage	75kV
Puncture Power Frequency Voltage (min)	1.3 x Actual dry flashover
Visible Discharge Voltage	9kv

Mechanical Strength	45KN
Ball and Socket size	16mm B

Circuit breakers

All LV overhead lines are proposed to be distributed through appropriately sized MCB or MCCB as shown in the single line diagrams. Their ampere ratings are shown in the drawing. All MCB and MCCBs are proposed to be minimum 10KA SC rated.

Isolators

HT side of each of the substation are to be equipped with gang operated no off-load isolators rated at 12.8KV. The frame of each isolator switch shall be provided with a separate earthing terminal for each phase for connection to an earthing conductor. Earthing switches shall be provided at various locations to facilitate maintenance. The earthing switch shall be capable of withstanding short circuit current for short duration as applicable to the corresponding isolator. Earthing switches shall be suitable for manual operation.

Transmission Line Protection

The transmission line and associated equipment at both ends shall be protected with the following protection schemes:

- Over current protection
- Ground over current protection
- Lightning protection by Lightning arrester

3.2.5 ACSR Conductor

1. **Scope:** This Specification covers the fabrication and supply of aluminum conductors steel reinforced (ACSR) commonly used on overhead power line construction.
2. The aluminum conductors steel reinforced (ACSR) shall be a concentrically strand right-hand lay conductor.
3. ACSR conductors are available in various sizes and designations. The Dog, Rabbit and Weasel type conductors in the quantities specified in the price schedule shall be supplied:

Table: Sizes and designations of ACSR conductors used in mini-grid schemes

ACSR Code number	Type of ACSR	Resistance Ohm/km	Current rating max Amps	Equivalent Cu area mm2	Impedance Ohm/km	Sp. Weight (kg/km)	ACSR Code number
1	Squirrel	1.374	76	13	0.3013	80	1

2	Gopher	1.098	85	16	0.294	106	2
3	Weasel	0.9116	95	20	0.288	128	3
4	Rabbit	0.5449	135	30	0.2723	214	4
5	Otter	0.3434	185	50	0.257		5
6	Dog	0.2745	205	65	0.25	394	6

4. The ASCR conductor shall be fabricated in accordance with BS: 215 (Part 2) - 1970, or latest revision thereof, or any other national or international standards that ensures a substantially equal quality to the standard mentioned above, will also be acceptable.
5. The ACSR conductors must be manufactured by a company approved to quality standard ISO 9001 or ISO 9002. The ISO certification number, the name of the authorized approving authority with the contact address and telephone and fax numbers shall also be stated. The Bidder shall enclose a verified copy of the ISO certificate with the bid.
6. The packaging of goods shall be in accordance with B.S. 1559:1949 Reels and wooden drums for bare wire, stranded conductors and trolley wire. All conductors shall be furnished on non-returnable treated seasoned wooden reels. All timber shall be treated to provide protection against rot and insects. Protective external lagging of sufficient thickness shall be provided and fitted closely on the reels. Binder consisting of steel straps shall be provided over the external laggings. The reel shall be new and sufficiently sturdy in construction to withstand ocean shipping, road transport, several loading and unloading, storage in tropics, hauling and field erection of conductor without distortion or disintegration.
7. Each reel of the conductors furnished shall contain only one (1) length of conductor.
8. All reels shall be legibly marked in paint with the following information: a) Size of conductor b) Type of conductor c) Length in meters d) Net weight of conductor e) Direction of rolling
9. The standard length of the completed conductor in each reel is shown in the table below:

Conductor size, mm ²	30	50	100
Normal length of the conductor, m	3,000	2,000	1,000

10. The manufactured conductor shall be tested in full compliance with the governing standard (including the following tests) and a certified test report shall be produced for all tests conducted. Aluminum Wire (Tensile Test, Wrapping Test, Resistivity Test), Steel Wire (Tensile Test).

11. The operating voltage and span determine the minimum spacing of the conductors. Generally conductor spacing on the poles should be at least 300 mm in case of up to 400 V, 400 mm in case of 1000 V and 600 mm in case of 11 kV lines. For aluminum conductors in horizontal or triangular alignment, spacing is given by the formula:

$$\text{Spacing} = \sqrt{d + (V/150)}$$

Where, Spacing is in meters, V= voltage in kV, d = sag in meters

In general, 70% should be added as a safety factor on the value calculated above.

3.2.6 Steel Tubular Pole

1. **Scope:** This Specification covers the design, fabrication, testing and supply of tubular steel poles commonly used in overhead power lines.
2. **General:** The Steel pole shall be fabricated in several length and strength, as specified in Table contained herein.
3. The steel poles shall be of swaged design and shall consist of three (3) separate lengths of steel tubing swaged at two (2) joints to fabricate the poles.
4. Transmission poles carrying 11,000 VAC circuit shall be 11 meter, 400VAC circuits shall be 9 meters, and 230VAC circuit shall be 8 meters.
5. The steel tubing used in pole fabrication shall be of steel of any approved process possessing a minimum tensile strength of 42 Kg/sq. mm and a chemical composition of not more than 0.06% sulphur and not more than 0.06% phosphorous.
6. Tabular poles shall be made of welded tubes, swaged and joined together. The upper edge of each joint shall be chamfered at an angle of about 45 degrees.
7. The whole section of the MS poles shall be galvanized with minimum coating of weight not less than 460-gm/-sq. m internally and externally. The base plate shall also be galvanized for both 11 meter and 8 meter poles.
8. Each pole shall be provided with the through hole of 1/1 mm diameter at a height of 300 mm above planting depth of Earthling.
9. Each pole shall be provided with a steel top plate 3-mm minimum thickness welded to the end of the section. The top plate shall not project beyond the perimeter of the top section. Each pole shall also be provided with a welded base plate welded to the bottom of the pole.
10. Recommended specifications of transmission and distribution steel pole are:

IS Designation	410 SP-52	410 SP-29	410 SP-13
Overall Length	11 m	9 m	8 m

Planting depth	1.8 m	1.5 m	1.5 m
Section Length, m			
Top section (h1)	2.7 m	2.0 m	1.75 m
Middle section (h2)	2.7 m	2.0 m	1.75 m
Bottom section (h3)	5.6 m	5.0 m	4.50 m
Outside Diameter, mm			
Outside diameter, Top (h1)	114.3 mm	88.9 mm	88.9 mm
Outside diameter, Middle (h2)	139.7 mm	114.3 mm	114.3 mm
Outside diameter, Bottom (h3)	165.1 mm	139.7 mm	139.7 mm
Thickness, mm			
Thickness, Top (h1)	3.65 mm	3.25 mm	3.25 mm
Thickness, Middle (h2)	4.5 mm	4.5 mm	3.65 mm
Thickness, Bottom (h3)	4.5 mm	4.85 mm	4.5 mm
Approximate weight	175 Kg	125 Kg	101 Kg
Application of load from top of pole, m	0.6	0.3	0.3

A. Tolerance

- a) The pole shall be as nearly circular as possible, and their outside diameter shall not vary from the specified value by more than 4.1%.
- b) The finished pole shall not be out of straightness by more than 1/600 of its length

B. Tests

The following test shall be performed for the pole furnished. All testing shall be fully documented and certified test reports shall be provided to AEPC.

- a) Tensile test and chemical analysis for sulphur and phosphorous
 - Deflection test
 - Permanent set test
 - Drop test

3.2.7 Stay Set

1. **Scope:** This Specification covers the fabrication and supply of adjustable threaded, galvanized steel stay sets for use in overhead line construction.

2. The stay material set shall consist of mild steel, galvanized stay rod, stay tightened (turn buckle) or adjustable head, eyebolt for steel tubular pole or two-way clamp and twisted double-eye for steel tubular pole, thimbles complete with stay plate.
3. The stay rod and stay tightened shall be made of mild steel of minimum tensile strength of 4200 kg/sq.cm.
4. The stay plate shall be square type mild steel plate, and the plate shall have a matching hole at the center to fit the end of the stay rod.
5. The thimbles shall be made of 1.219mm (18 SWG) GI sheet, and shall be suitable for terminating steel stay wire with a preformed grip.
6. The stay rod is either thimble-eye type or twin-eye type. The thimble-eye or twin-eye of the stay rod shall be made by drop-forged processing. The thread form at the threaded end of the rod, and that of the accompanying nut, shall be optional with the supplier. However, it shall be the responsibility of the Supplier to supply the stay rod with a thread form that shall sustain the rated loads without creep or stripping over the full life of the rod material at specified diameter.
7. The eyebolt shall be oval-eye type. The eyebolt shall be made by drop-forged processing. The eyebolt shall be supplied with suitable nut and washer.
8. After galvanizing, the nut and rod threading shall be such that the nut may be run the full length of the thread without the use of tools.
9. All ferrous parts of the stay set shall be galvanized after fabrication in accordance with IS: 2629-1985 or the latest version thereof or any other national or international standards that ensures at least equal or better quality to the standard mentioned above, will also be acceptable.
10. The Bidder shall furnish with the Bid a complete description of the stay sets proposed to be supplied including, but not limited to, steel classification of base metal, detailed drawings showing shape, dimensions, and threading certified type test results the identity of the proposed manufacturer, and manufacturers catalogue number, plus catalogue cuts. The technical data furnished shall be bound separately from the Bid Document.

11. Ratings and features:

Length of stay rod	1.8 m
Diameter of stay rod	16 mm
Ultimate tensile strength of stay rod and tightner (min.)	4200 kg/sq. mm
Minimum breaking load	6,433 Kg
Length of threaded portion	300 mm

Thimble shape	Suitable for preformed for 7/12 SWG stay wire
Thimble section Min	18 SWG
Eyebolt length, mm./1	300
Galvanization	IS:2629-1985
Stay plate section	300 mm * 300 mm * 6 mm

3.2.8 Stranded Stay Wire

1. **Scope:** This Specification covers the fabrication and supply of galvanized stranded steel wire for use in overhead power line as stay wire ropes for line supports (poles).
2. The steel strand shall be fabricated in accordance with B.S. 183 1972/ (1983) or any revision thereof or other equivalent national or international standard provided that the resulting steel stock is of equal quality and strength. The minimum tensile strength of the steel shall be 4200 kg/cm². The wires shall be 45-ton quality fully galvanized by hot dip process to British Standard or equivalent.
3. The steel wire stand shall have a left-hand lay. The steel wires shall have no joint throughout the whole length. Strands shall be uniform and shall have no defects such as cracks, dust encapsulation or crevices.
4. **Packing:** The steel wire strand shall be furnished in reels holding approximately 300m (1000ft). Each reel shall have a weather-resistant tag securely attached showing the length, nominal diameter, number of individual wires, grade of the strand, and the class of zinc coating.
5. The stranded stay wire shall be galvanized after fabrication in accordance with IS: 2629-1985 or any revision thereof or any other national or international standards that ensure at least equal or better quality to the standard mentioned above will also be acceptable.
6. Ratings and Features:

Steel Wire Size (No. of wire/SWG)	7/12
Grade	700
Steel quality	45 ton
Diameter of Wires, mm.	2.64
Minimum Weight, kg/km	300
Applicable Standard	B.S. 183 1972/(1983)
Galvanization (Zinc coating on steel)	IS: 2629-1985 or BS: 443(1982)

3.2.9 Porcelain Insulators

1. **Scope:** This Specification covers the fabrication and supply of porcelain insulators, as herein specified, for use on overhead power line construction.
2. All porcelain insulators shall be fabricated and tested in accordance with the Standards referenced or other national or international standards, for each type of insulator.
3. Porcelain shall be sound, free from defects, thoroughly vitrified and smoothly glazed. Unless otherwise specified, the glaze shall be brown in color. The glaze shall cover all exposed parts of the insulators.
4. The design of insulators shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to deterioration. The porcelain shall not engage directly with hard metal.
5. The cement used in construction of insulators shall not give rise to chemical reaction with metal fittings and its thickness shall be as uniform as possible.
6. The insulators should be manufactured in automatic temperature-controlled kilns to obtain uniform baking and better electrical and mechanical properties.
7. The manufacturer of the Insulators must have been accredited with ISO 9001 (including design in the scope of registration) quality certification.
8. **Shackle Insulator:** The shackle insulator shall be manufactured and tested in accordance with IS: 1445-1977 or the latest version thereof or any other national or international standards that ensures at least equal or better quality to the standard mentioned above, will also be acceptable.
9. Shackle insulators of appropriate voltage should be used in overall lines with voltages up to 1000 V. Stay insulators shall be provided on all stays sets along overhead lines of more than 1000 V. Insulator dimensions and appropriate conductors are listed in the table below.

S.N.	Size	Dimensions	Weight	Corresponding Conductor
1	Small	55 mm * 55 mm	200 gm	Squirrel, Service Wire
2	Medium	75 mm * 90 mm	600 gm	Gopher, Weasel and Rabbit
3	Large	100 mm * 100 mm	1400 gm	Dog

10. Insulator shall be legibly and indelibly marked to show the name or trademark of manufacturer and year of manufacture. Markings on porcelain shall be printed and shall be applied before firing.
11. The insulators shall comply with the following tests as per IS: 731-1971

- a. Visual examination
 - b. Verification of dimensions
 - c. Visible discharge test
 - d. Impulse voltage withstand test
 - e. Wet power frequency voltage withstand test
 - f. Temperature cycle test
 - g. Mechanical failing load test
 - h. 24-hour mechanical strength test for strain insulators
 - i. Puncture test
 - j. Porosity test and
 - k. Galvanizing test
 - l. In addition routine test such as visual examination, mechanical routine test, electrical routine test.
12. The Bidder shall provide certified type test results of all types of porcelain insulators as required by governing standards and the documentary evidence to show that it has automatic temperature controlled kilns. Failure of bidder to provide the said documents shall lead to rejection of its bid.
13. The Bidder shall provide with the Bid two (2) clear copies of the governing standards for fabrication and testing of porcelain insulators and two (2) clear copies of all other relevant standards referenced therein.
14. The Bidder shall furnish two (2) sets of dimensional drawings of all types of porcelain insulators.
15. The Bidder shall provide complete description, catalogue (in original) dimensional drawings of all types of insulators.
16. All data, drawings, catalogues and other technical documents shall be bound separately from the Bid documents.

3.2.10 Shackle Insulator Fitting

1. **Scope:** This Specification covers the fabrication and supply of D-Iron type shackle insulator fittings, and shackle strap required for shackle insulators for use in overhead low voltage line construction.
2. The shackle fittings shall be free of burrs, splinters, splits, sharp points and edges which may damage conductors or show evidence of poor workmanship. All ferrous fittings and parts other than stainless steel shall be galvanized as per IS: 2629-1985 or equivalent

national or international standard. The minimum coating thickness shall be not less than 85 micron.

3. D-Iron type shackle fittings shall consist of the following main components: Mild Steel D-Iron, No. Mild Steel Bolt and Nut, No Spring Washer.
4. The shackle fittings shall comply with the tests as per IS: 7935 or equivalent national or international standard.

3.2.11 Ground Conductor

1. **Scope:** The specification covers the fabrication and supply of galvanized stranded steel grounding conductor for use in the neutral grounding and body grounding of electrical equipments.
2. The conductor shall be 7-wire stranded conductor and shall be galvanized.
3. The manufacturer of ground Conductor must have been accredited with ISO 9001:2000 with design and manufacturing quality certification.
4. The stranded stay wire shall be galvanized after fabrication in accordance with IS: 2629-1985 or any revision thereof or any other national or international standards that ensure at least equal or better quality to the standard mentioned above will also be acceptable.
5. The grounding conductor shall undergo type and routine tests in accordance with the relevant governing standard
6. Minimum requirements of the grounding conductor are as follows:
 - Number of strand: 7-No. 12 SWG
 - Diameter of single strand: 2.67 mm
 - Weight: 299 kg/km
 - Short time fusing current: 12 kA for 1 sec
 - Resistivity: 15 Micro-Ohm-cm

3.2.12 Ground Rods and Clamps

1. **Scope:** This Specification covers the fabrication and supply of galvanized steel ground rods and clamps for use in overhead power line construction.
2. The ground rod shall be made of high carbon, open-hearth steel so as to achieve maximum strength. It shall be hot dip galvanized.
3. The ground rod shall be 19mm in diameter and 4,000mm in overall length.

4. The driven end of the ground rod shall have a truncated cone point. The cone point shall be approximately 13mm long, measured along the axis of the ground rod. The driving head of the ground rod shall have an approximate 3 mm, 45 degrees chamfer.
5. The manufacturing process shall assure that ground rod does not bend when driven into hard soils.
6. The ground rod clamp shall be heavy duty forged steel clamp provided with a hex head cup point set screw of high strength steel with machine-cut threads. It shall be so manufactured that it gives low resistance connection. The ground rod clamp shall be galvanized.
7. The clamp shall suitably accommodate and clamp a 19 mm. ground rod and a stranded grounding conductor of 7/12 SWG size.
8. The galvanization of ground rod and clamp shall be in accordance with IS: 2629-1985 or any revision thereof or other equivalent national or international standard provided that ensure at least equal or better quality to the standard mentioned above will also be acceptable.
9. Ground rods and clamps shall undergo type and routine tests in accordance with the relevant governing standard.

3.2.13 Pole Clamps

1. **Scope:** This Specification covers the fabrication and supply of galvanized steel pole clamps with nuts, bolts and washers for use on overhead power line construction.
2. The pole clamp shall be fabricated out of hot-rolled steel flat.
3. The steel flat for pole clamp shall be fabricated and tested in accordance with Indian Standards IS: 226-1975, and IS-1731-1971 or any revision thereof or other equivalent national or international standard provided that ensure at least equal or better quality to the standard mentioned above will also be acceptable. The minimum tensile strength of the steel shall be 4200 kg/cm².
4. The fittings shall be free of burrs, splinters, splits, sharp points and edges, which may damage conductors or show evidence of poor workmanship.
5. The surface of the steel shall be flat after drilling or (punching) and free of dimpling or imperfections. The hole edges shall be broken by reaming. The holes shall be full dimension after galvanizing and no minus tolerance of specified hole size will be accepted.

6. Along with fully threaded galvanized bolts of size 16 mm (dia.) × 60mm (length), contractor shall provide nuts and washers as required in each pole clamp.
7. The pole clamps shall have a minimum tensile strength of 3182 kg at the bolt-hole and bolt slot.
8. The pole clamps and nut, bolts and washers shall be galvanized after fabrication in accordance with IS: 2629-1985 or any revision thereof or other equivalent national or international standard provided that ensure at least equal or better quality to the standard mentioned above will also be acceptable.
9. Apart from the tests indicated herein in the referenced standards, the pole clamps shall undergo visual inspection and verification of dimensions.

3.2.14 Lightning Arrestor Set

1. **Scope:** The specification covers the manufacture testing and supply of distribution type polymer-housed surge arresters commonly installed on overhead lines.
2. The surge arresters shall be suitable for use on a three phase, Y-connected, ungrounded (solid grounding) distribution circuit at an altitude up to 2,000 meters, and ambient temperature ranging from -5°C to 45°C.
3. Lightning arrestors should be provided for all current-carrying conductors at the start and end of transmission and distribution lines. Moreover, in lightning prone areas, lightning arrestors should be provided at least in every 500 m along distribution lines.
4. Earthing should be provided at each lightning arrestor along the electrical lines and should be carried out using a minimum 600mm×600mm×3mm ground plate of copper or GI piping/strips with adequate depth, fill material and maintenance provisions (soaking, tightening connections, earth-resistance measurement) in order to achieve the least-resistance earth path for fault current and lightning strikes.
5. The surge arrester housing shall be of polymer type, manufactured using industry recognized polymeric material having superior insulation properties necessary for outdoor installations. The housing shall display in an indelible manner arrester type voltage rating and year of manufacture.
6. The surge arrestor shall be of gapless metal oxide type
7. The surge arrestor shall have line terminals and ground lead terminals accommodating copper or aluminum conductor sizes from 13.3 mm sq, (6 SWG) through 53.49mm sq. Each arrester shall be provided with nut and wire clamp as the line terminal and ground terminal accessory hardware.

8. The surge arresters must be manufactured by a company approved to quality standard ISO 9001.
9. The surge arresters shall be manufactured and tested in accordance with IEC 99-4 (latest revision).

3.2.15 Construction Work Standard

3.2.15.1 General

1. These specifications together with the construction standards shall govern the performance of the works and shall be the basis for inspection and acceptance of the works by the purchaser.
2. These specifications and the construction standards shall be considered as mutually inclusive, and the conditions stated in each shall supplement the other as appropriate.
3. All these specifications shall be followed at all times by the Contractor unless specifically accepted in writing by the Purchaser, or unless some aspects of the work covered by these specifications are not required by the scope of work.

3.2.15.2 Route of Circuits

1. The line routes shown on line route drawings are provisional and subject to finalization by the Contractor. To the greatest extent practicable, all overhead circuits should be located along streets or traveled ways ordained by the Village Development Committee or required authority as public property, except as required for service drops and circuits to individual consumers.
2. To the great extent practicable, all facilities should be located on public property, and in no case shall private property be occupied unless specifically authorized by the Purchaser and the users' community.

3.2.15.3 Surveys and Staking

1. All structures should be located at the outer limits of public property along streets or travelled ways. Structures should also be located along streets at property lines of adjacent private property. Structures and stays running parallel or perpendicular to the line route shall not block portions of streets, travelled ways, drives, passages, or gates.
2. All structures shall be so located as to reduce, to the greatest extent practicable, obstacles to pedestrian and vehicular traffic.
3. Where underground facilities are indicated by surface conditions, or where such facilities can be located, structures and stays shall be so located as to avoid conflict with such facilities during construction.

4. All structure and stay lead locations shall be staked. At points of intersection (PI) of tangent line sections, steel rebar stakes shall be used to locate the PI. A minimum of two side sightings will be made at each PI to permit re-location of PI in the event of stake removal. All structure locations in tangent line sections shall be staked.
5. All distances between structures, and other necessary measurements of length, shall be measured to accuracy of 0.1 meter and all angles shall be determined by transit to an accuracy of 0.1 decimal degree. All elevations shall be measured to an accuracy of 0.1 meter by means acceptable to AEPC.
6. All measuring and staking activity shall be accomplished by personnel with experience in survey procedures; and standard survey equipment acceptable to AEPC, shall be used to perform the survey work. Field survey notes covering all survey work shall be produced and maintained and shall be returned to AEPC at the time of submission of final PCS report. The format of proposed survey notes shall be submitted to the AEPC for approval.
7. Survey work shall include centerline and structure location and staking; determination of overhead and side clearings of other structures, wires, and obstacles; area surveys and plotting; and centerline profiles of terrain; as directed by AEPC.

3.2.15.4 Material Storage

1. The Contractor shall be responsible for storage of all materials and equipment delivered by him for the work; and security of materials. The Contractor shall manage all labor, equipment, and vehicles to load and transport said materials and equipment to the subproject site.
2. Subproject Site
 - (a) Extended storage of materials along the routes of lines will not be permitted.
 - (b) Conductor reels may be spotted at the subproject site for a short period prior to installation provided that crating and reel lagging are intact to protect the items. Poles may be spotted at structure locations for short periods prior to setting.
 - (c) All poles, and conductor placed at the subproject site shall be located so that the items are not subject to damage and do not impede pedestrian or vehicular traffic.
 - (d) Any damage caused by imprudent placement of equipment and materials by the Contractor at the worksites shall be corrected by the Contractor, in a manner acceptable to AEPC, at the Contractor's cost.
3. Contractor's Storage Facility

The Contractor shall be financially responsible for the secure and proper storage of materials, prior to installation of the materials and equipment, to prevent loss or damage to any materials.

3.2.15.5 Excavation

All excavations made for the installation, or demolition, of facilities shall be accomplished in a timely manner according to the scheduled installation. Required excavations shall be opened, material installed, and backfill placed, as specified, in a continuing operation to the greatest extent practicable. Any excavation left open during discontinuous construction, which is accessible to the public or along public thoroughfare, shall be covered or barricaded, and marked by suitable visual means, to prevent a public hazard.

Excavations shall be properly located and sized for the intended use. Pole and stay plate anchor excavations shall be correctly sized to retain undisturbed soil to the greatest extent consistent with the means of excavation. Pole holes shall be made by power-driven auger or by manual methods; power-driven shovel equipment shall not be used. Pole holes shall be excavated to the specified depth with no tolerance shallow and tolerance of ten (10) centimeters deep. The bottom of pole holes shall be undisturbed soil, gravel or rock. Stay plate holes shall be excavated by manual methods to specified depth with no disturbed soil in the direction of the anchor rod.

All excavations shall be backfilled with excavated material, or as specified for the installation. Backfill shall be free of foreign materials and shall be well tamped with excess backfill graded over the excavated area to prevent depressions resulting from eventual natural compaction. The Supplier/Contractor if so directed by AEPC shall remove large amounts of excess backfill from the site. If so directed by AEPC, the Contractor shall provide suitable backfill materials for excavations where existing removed materials is insufficient, or inappropriate, to provide suitable grading of the excavated area.

3.2.15.6 MS Tubular Pole Setting

Poles shall be set in accordance with the appropriate Sections of the Construction Standards.

Each pole shall be assigned a unique construction number at the time of structure staking for preliminary identification and preparation of Structure Data Sheet (SDS).

Pole holes shall be dug large enough in diameter to admit a tamping bar all around the periphery of the pole and shall have a uniform dimension as per the type of pole used at the top and bottom. Poles shall be planted in the ground to the depth specified in Pole drawings.

Drawings before planting a pole, the bottom of the hole made for planting the pole, shall be cleaned of free soil and firmly tamped, to prevent the hole from settling.

The stability of a pole, particularly a pole without stay, is greatly influenced by the size of the pole hole, the nature of the soil and the care exercised in back filling and tamping. Two active hand tampers and one slow shovel shall result in good compaction.

Poles shall be set to stand perpendicular except at terminals, angles and other points of excessive strain where they shall be given a rake not to exceed 10 centimeters against the direction of strain. Poles located at the sides of banks or other locations, where washouts may occur, shall be protected by suitable cribbing, or shall be referred to the Engineer for recommended action.

After the pole is in position and the hole is back filled and tamped, soil shall be piled and packed firmly around the pole. The Pole shall be surrounded by PCC 1:2:4 concrete work minimum thickness 10 cm, 30cm above ground and up to plantation depth below the ground. Pole setting shall be inspected prior to acceptance and any back fills that have sunk shall be refilled.

Where it is necessary to set poles at locations where the soil has very low bearing value, or in swampy conditions, a pole may be fitted with a bog shoe in accordance with construction drawings the engineer may specify that type of construction.

Poles located in shallow riverbeds shall be protected by gabions as designated by the Site Engineer or Engineer. Gabions should be approximately 2 meters x 1 meter x 1 meter. Four such gabions are required for each pole. Set pole and pour 860 mm diameter foundation as per construction standard construction drawing. Level areas around pole and set gabions in pattern shown in construction drawing.

It is important to lace adjacent gabions together along the perimeter of all contact surfaces.

Fill gabions with hard, durable, clean stone, 100 mm to 200 mm in size in three layers.

Install two connecting wires at each layer. Lace gabion lids securely making certain all edges are closed. Fill void between pole and gabion with hard, durable, clean rock 200 mm minimum size.

3.2.15.7 Stays

1. Stay leads specified in construction documents are defined as the horizontal distance from the centerline of the pole at ground line to the point where the anchor rod should enter the ground assuming the ground to be level. The Engineer, upon request, may designate the actual location of stay anchor rods on slope of hills. The stay stake indicates the point where the anchor rod enters the ground. The anchor hole shall be dug accordingly.

The attachment of one stay shall not overlap that of another stay when two or more stays are carried to a pole or anchor. Each shall be entirely independent of the other. This does not prevent the use of multiple eye rods for nuts designed for such use.

All stays to be installed on a pole line shall be placed and drawn reasonably taut before the conductors are tensioned. After the conductors are tensioned and sagged to their final position, the stays shall be carefully inspected to see that each is carrying its share of the load on the pole as intended. If multiple stays are not carrying equal strain, the slack stay shall be pulled up until it is sharing load as intended.

Stay anchors must be installed full depth and set to pull against undisturbed soil to develop full tension. An anchor not properly installed will move and allow movement of the top of the pole, thus slacking the conductors. Stay anchors installed in soft or unstable earth shall be placed at specified depth and back filled with 5 cm. maximum size crushed stone placed to a depth of 1 meter from the bottom of the pole.

2. Installation of Stays: Where stays are installed on a line angle structure, line of stay shall bisect the outside line angle. The span of stay extending between poles shall not be greater than 60 meter. Anchor and anchor rods shall be set so that the axis of the rod and line of stay shall be straight. The portion of the anchor rod above the ground shall not be bent at an angle to connect a stay wire. If this occurs, anchor and anchor rod shall be reset. The anchor rod shall not be exposed for more than 15 centimeters above the ground after the anchor is set.

If gravel back fill is required to set anchor in soft or unstable soil, as per construction drawing the Contractor will have to carry out the gravel back fill as directed by Engineer.

If a stay is installed on a pole where low voltage conductor is dead ended or double dead ended and extends past stay, a piece of plastic hose slit along the length shall be placed over the stay wire extending from the upper stay attachment to 200 mm below lowest low voltage conductor. After installation, the hose shall be wrapped with plastic tape and the hose shall be secured to the upper stay bolt with tie wire.

3. Stay Insulators: Stay insulators shall be installed on all stays in accordance with the construction drawings.

3.2.15.8 Conductor

Aluminum Conductor Steel Reinforced (ACSR) conductor shall be used for 11KV, whereas Aerial Bundle Conductor (ABC) cables shall be used for 400VAC and 230AC overhead lines.

1. Sagging: Conductors shall be sagged in accordance with the sag chart specified by these specifications. The importance of careful sagging of conductors cannot be over emphasized.

Conductors have definite characteristic that control their behavior resulting from changes of temperature, wind speed and additional load due to ice or wet snow.

Conductors must not be sagged too tightly (less than specified sag) as unspecified extra tensions may result in failure of conductor structure. Conductors sagged too loosely (more than specified sag) may contact adjacent conductors hardware or any structure.

2. Sag Charts: Unless otherwise noted, all sag charts are calculated on the basis of 35 kg/m² wind pressure. Sag is always measured vertically, without wind, when conductors are being installed or re-sagged. Unless otherwise specified by the Site Engineer or Engineer for a specific condition, initial or stringing sag shall be applied to the installation of all new unstressed conductors. The initial sag is always less than the final sag. The most practical method of obtaining the correct sag is by sighting between two adjacent structures. Choose the structure, which is reasonably the same elevation. Sags for the various temperatures shall be furnished by the Engineer in a table form for spans not covered by the sag chart.

In order to ascertain the sag for a given stringing temperature, select the point corresponding to the proper temperature on the scale on the left-hand side of the sag chart. Lay a straight edge so that it passes through this point and the point of the center scale representing the length of span to be sagged. The straight edge will then indicate the proper stringing sag on the right-hand scale. Interpolate if the temperature of span is not exactly the same as designated on the chart. The low voltage neutral conductor shall be sagged with the same sag as the low voltage phase conductor. If the low voltage conductor, as a group, has less design sag than the high voltage phase conductor installed above it, the low voltage conductor, as a group, shall be installed to the same sag as the high voltage conductors installed above. The sag of pre stressed conductors such as installed with a tensioning machine shall be specified by the Engineer for the job.

3. Stringing: All cable grip used for the installation of conductors shall be of the type designed to prevent injury to the conductor. Attach targets to each structure at a distance below each point of the support of conductor equal to the required sag. Sight from one target to the other. The line of sight between targets may be horizontal or inclined. Draw the conductor up to the proper sag, which will be reached when its lowest point will be in line with the target. Where terrain and / or length of span is such that the targets would fall below the ground line, the difference in elevation between the lower conductor attachment and the lowest point of sag, sag below lowest support will be furnished by the engineer in the tabular form.

The dynamometers and similar apparatus shall be used for tensioning of conductor to obtain appropriate sagging of conductors. Dynamometer shall be used only when the sight method is not feasible. Dynamometer shall be checked for accuracy before using.

For stringing of ACSR conductors of all sizes, stringing rollers or roller shall be used to support the conductor as it is pulled out and sagged. Stringing rollers shall be used regardless of size of aluminum conductors, bare or covered.

Stringing rollers shall be suspended at each insulator support position so that the conductor shall roll smoothly over the roller-protecting conductor from any physical damage.

Stringing sheaves shall have a diameter at least 20 times the conductor diameter and so finished as to prevent damage of any kind to the conductor as it is pulled through the sheaves.

Conductor drum shall be located at a sufficient distance from the first structure to avoid excessive bending of the conductor over the sheaves and excessive downward loading on the cross-arms.

Attention shall be paid to the fact that all sag charts contained herein for ACSR conductors are calculated on the basis of non pre-stressed conductor. For this reason, at no time during the stringing or sagging operation, shall conductors of this type be pulled to sag, which are less than those shown by the charts.

Special care shall be taken at all times to prevent the conductor from becoming kinked, twisted or abraded in any manner. Where it is necessary to drag conductors on the ground, the conductors shall be protected by covering all stones or other objects, which might damage the conductor with boughs or trees or suitable pieces of lumber. These requirements are especially important when ACSR conductor is being handled on river crossing spans. Floats with rollers shall be used to prevent the conductor from dragging along the river bottom.

In stringing conductors across highways, the conductors shall be fully protected from passing vehicles by use of temporary guard structures.

4. Damaged Conductor: Damaged conductors shall be repaired by using a repair sleeve provided that no more than 2 strands of the outer aluminum layer are damaged and further provided that none of the sleeve core strands are damaged. For a conductor damaged in excess of the above conditions, the damaged section of the conductor shall be cut out and a tension splice installed.

When cutting out damaged section of conductor, no more than 1 tension splice shall be permitted in a span and no splice is made within 8 meters of an insulator attachment.

5. Sag Error: Sag error shall not exceed ± 40 mm from the sag defined by the sag chart.
6. Conductor Attachment: Conductors shall be secured to pin insulators with pre-formed conductor ties or with tie wire. Insulator ties, except at jumper supports in structures, shall be made with pre-formed ties when available. Conductors shall be connected to dead end assemblies with tension set.
7. Line Splices for Tensioning and Looping: Cleaned and polished contact surfaces are necessary to make conductor splices so that it shall remain free from trouble. Great care shall be taken to completely clean the strands of aluminum conductor. The splicing sleeve must be centered over the conductor ends before compressing to make a splice of required strength. Appropriate sleeve shall be used for splicing ACSR conductors prior to installation. The outer strands of aluminum shall be carefully cleaned with a wire brush to remove all foreign matter till the aluminum shines brightly. The cleaning applies to both new and old conductors. The manufacturer pre-filled with inhibitor compound supplies splicing sleeves for aluminum conductor.

Splices in line conductors shall be so located that the end of the splicing sleeve is at least 30 cm from the end of a suspension or dead end clamp. Non-tension loops, such as between dead ends, shall be spliced with a connector when the conductors are of same metal and size.

8. Connectors: Cleaned and polished contact surfaces are necessary to make electrical connections that will be free from trouble. Tap connectors are supplied by manufacturers pre-filled with inhibitor compound. Excess inhibitor compound shall not to be removed but it shall be wiped over the connector as a moisture seal. Connectors shall not be covered or taped. Compression connectors shall be located in such a manner that there shall be at least 30 cm of conductor between the end of the connector and the end of a dead end. Connectors shall be installed on non-tensioned portion of the conductor such as loops in preference to the conductor in the span. Connectors installed on conductor shall be located in a span adjacent to the crossing rather than the crossing span when practicable. Aluminum compression connectors, pre-filled with inhibitor compound, shall be compressed on the cleaned area of aluminum conductor. Where necessary, inhibitor compound shall be applied to the cleaned conductor and connector before assembly.

3.2.15.9 Safety

1. The Contractor shall take all measures required to safeguard the public, public and private property from any hazard to life, limb, or property, which may arise during the performance of the construction of the works. Such measures shall include, but not be limited to

barricades, signs, newspaper announcements, traffic control by police, or other advisory and control methods deemed appropriate.

2. The Contractor shall provide his work force with all tools and equipment in sufficient numbers and quality to perform all aspects of the works in a safe manner. The Contractor shall provide protective headgear for all members of his workforce, and shall provide protective clothing as required for specific tasks. The Contractor shall instruct their work Force in proper and safe construction techniques and shall continuously monitor compliance with safety instructions throughout the period of the Contract.
3. The Contractor shall provide, and require use of, protective grounding equipment when:
 - a) Work is being performed on lines adjacent, either in extension of, or parallel to, energized circuits.
 - b) Work is being performed on isolated circuits after conductors have been installed.
4. The Contractor shall maintain all tools and equipment in good working order. All mechanized equipment shall have adequate safety mechanisms and guards in place and be fully operational. Operators of such equipment shall be skilled and fully trained in the operation of such equipment.
5. The Contractor shall provide and maintain emergency medical supplies to cover with accidents or snakebites for his work force on a readily available basis. The Contractor shall also instruct all supervisory personnel in the action to be taken in the event of serious injury, and the sources and locations of professional medical assistance, which shall be employed in such cases.
6. The Contractor shall apply all accidental insurance policies to his work force for an accident occurring during the working period of the construction.
7. The Contractor shall furnish the electrical test equipment and personnel to perform electrical tests of equipment and circuits, as specified by, and under the supervision of AEPC.
8. All tests specified shall be conducted during suitable atmospheric conditions under the supervision and witness of AEPC. All test results shall be documented and signed by both parties.

3.2.15.10 Service Wire

1. Service wire should be double insulated: they should be PVC cable (concentric or multi-core) and additional voltage drops should not exceed 2%. Underground service connections should be either armored cable or PVC cable in protective circuit.
2. Service wire should be of the same material as the line conductor (aluminum) to avoid the galvanic corrosion.

3. For the household point, if the spans exceeding 20m, in consideration of the mechanical strength required, service wire of minimum 4-6 mm² (depending on the span) should be used for all lighting loads regardless of the actual power supply. However, if the distance (span) between a pole and a house is very short (i. e. less than 20 m), then a twin flat cable of 2.5 mm² can also be used.
4. A breaker fuse unit (main unit) should be installed in each house.
5. The breaker of the main switch should be rated to protect against exceeding the maximum current ratings of the service connection.
6. To avoid overloading of plant, a load-limiting device (ECC, MCB or PTC) will be installed in each household.
7. Service wires should be clamped to poles to avoid creating tension in connections.

3.2.15.11 Cleanup

- 1) The Contractor shall ensure that all worksites shall be free of all manner of debris resulting from the construction activity.
- 2) All crating, conductor reels, packaging materials, conductor scraps, and other miscellaneous items are removed from the workplace. All holes resulting from removal of facilities shall be filled. If trees or brush have been cut or trimmed, all cuttings shall be removed. The worksites shall be left in clean natural conditions.
- 3) Site cleanup shall be an integral part of the Provisional Acceptance process, and no line section shall be provisionally accepted unless all cleanup work has been accomplished.

3.2.15.12 Technical Documentation

All technical documentation as specified herein shall be prepared by the Contractor. The Contractor shall employ skilled drafting personnel to produce all documentation specified. All technical documentation prepared by the Contractor shall be subject to the approval of AEPC prior to acceptance of such documentation. All technical documentation shall be prepared in the English language.

3.3 **Technical Data Sheets** (To be completed by the Bidder)

3.3.1 ABC Conductor

Description

Queries

1. Manufacturer

2. Copies of fabrication standards attached?

Yes/No

If Standards are other than BS / IEC, conductor specifications

Diameter

Yes/No

Strand size

Yes/No

Direction of lay

Yes/No

Lay ratio

Yes/No

Materials

Yes/No

3. Technical data:

Code Name	Nominal Area (mm ²)	Breaking Strength (KN)	Mass (Kg/Km)	Resistance at 20°C (Ohm/Km)
3-Phase, 4 Core 95mm ²				
3-Phase, 4 Core 50mm ²				
1-Phase, 2 Core 95mm ²				
1-Phase, 2 Core 50mm ²				

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.2 ACSR Conductor

Description

Queries

1. Manufacturer

2. Copies of fabrication standards attached?

Yes/No

4. If standards are other than BS: 215 / IEC: 209 (Part II)

Then conductor specifications are same as

BS: 215 / IEC: 209 requirements in respect of the following?

Diameter

Yes/No

Strand size

Yes/No

Direction of lay

Yes/No

Lay ratio

Yes/No

Materials

Yes/No

5. Technical data:

Code Name	Nominal Area (m ²)	Stranding (Al/Steel)	Breaking Strength (KN)	Mass (Kg/Km)	Resistance at 20°C (Ohm/Km)
Rabbit					
Weasel					
Squirrel					

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.3 Steel Tubular Pole

Description

Queries

Overall Length

11m

9m

8m

1. Section of Pole

<u>Top</u>	<u>11m</u>	<u>9m</u>	<u>8m</u>
Length			
Outer side diameter			
Thickness			
<u>MIDDLE</u>			
Length			
Outer side diameter			
Thickness			
<u>BOTTOM</u>			
Length			
Outer side diameter			
Thickness			

2. Application of load from top

3. Approximate weight

4. Crippling Load

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.4 Shackle Insulators

Description	Queries
1. Manufacturer	
2. Catalog number	
3. Standard	
4. Copies of standards attached	Yes/No
5. If not IS standard, are standards used equivalent?	Yes/No
6. Copies of alternate standard attached?	Yes/No
7. Ratings:	
Highest system voltage	kV
Rated voltage	kV
Power frequency withstand voltage, 1 minute	
Dry	kV
Wet	kV
Power frequency puncture withstand	
Voltage	kV
Leakage distance (min)	mm
Mechanical strength	kN
IS designation	

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.5 Shackle Insulator Fittings

Description	Queries
1. Manufacturer	
2. Catalog number	
3. Drawing furnished?	Yes/No
4. Steel classification	
5. Reference galvanizing specifications	

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.6 Surge Arrestor/Lightening Arrestor

Description	Queries
1. Manufacturer	
2. Catalog numbers	
3. Copies of standard attached?	Yes/No
4. Certification	
5. Copies of certified type tests attached?	Yes/No
6. Surge arrestor type	
7. Pressure relief provided	Yes/No
8. Ground lead disconnect provided	Yes/No
9. Ratings:	
System Voltage	kV
Maximum system voltage	kV
Voltage rating (Ur), Vrms	kV
System frequency	Hz
Nominal discharge current	kA
Creepage distance	mm
Minimum power frequency withstands:	
Wet	kV
Dry	kV
Pressure relief class	

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.7 Grounding Conductor

Description	Queries
1. Manufacturer	
2. Governing Standard for manufacturing and testing	
3. Governing Standard for galvanization	
4. Standards attached?	Yes/No
5. Diameter	mm
6. Cross Section	Sq. mm
7. Short time fusing, 30 cycles	Amps
8. Weight (Approx)	Kg/Km
9. Resistance at 20 degree C (Approx)	Ohm/Km

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.8 Stay Rod

Description	Queries
1. Manufacturer	
2. Catalogue Numbers	
3. Steel Classification	
4. Load rating	Kg
5. Type tests-tensile load data attached?	Yes/No
6. Type test-bend test data attached?	Yes/No
7. Drawing attached?	Yes/No

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.9 Stranded Stay Wire

Description	Queries
1. Manufacturer	
2. Strand diameter (overall)	mm
3. No of Stands	
4. Minimum Breaking load	Kg
5. Nominal diameter of coated	
6. Left hand lay	Yes/No
7. Fabrication Specification	
B.S.183 1972 (1983)	mm
8. If not, what standard?	Yes/No
9. Standard copies (2) attached	Yes/No
10. If not B.S. 183 is strand offered equivalent in all respect?	Yes/No
11. Class of Zinc coating?	

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.3.10 Distribution Panel Board

Description	Queries
1. Manufacturer	
2. Fabrication drawings copies attached?	Yes/No
3. Attached description of all materials used?	Yes/No
4. Furnished description of cable entrance fittings?	Yes/No

Signature: _____

As representative for: _____

Address: _____

Date: _____

3.4 System Warranty and Guarantee

- 1) The complete solar mini-grid system must be warranted against any manufacturing/design/installation defects for a minimum period of Three (3) years.
- 2) Solar system components used in power plant must be warranted as indicated in the above Section 3.1 of technical specification.
- 3) The Warrantee/Guarantee Card to be supplied with the power plant must contain the details of the system supplied. The manufacturers can provide additional information about the system.
- 4) During the Warrantee/Guarantee period, Employer will have all the rights to cross check the performance of the solar power plant. Employer may carry out the frequent inspections of the system installed and randomly pick up its components to get them tested at any test center. If during such tests any part is not found as per the specified technical parameters, Employer will take the necessary action. The decision of Employer in this regard will be final and binding to the Bidder.

3.5 System Testing and Commissioning Requirement

Shop Test

The bidder must submit the test report of the equipment from the accredited laboratory.

Site test

As per standard norms, following tests shall be carried out at the field.

- Full load test shall be conducted at site for a minimum duration of five hours with a maximum allowable downtime of 5% (for any and all reasons cumulatively) of the total test duration.
- Transmission and distribution system voltage drops testing: voltage drop at any line end shall not exceed 10% of nominal value.
- The power and energy output of solar PV array will be measured with the help of Electrical Power Analyzer for a whole day. Alternatively, same test and observation can be made along the power conditioning devices/inverters integrated in the solar mini-grid system. The output energy at full sunny day shall be at least 90% of nominal value designed at 5 hours average sunshine.
- Each finished component or item installed at site shall be inspected against applicable requirements as indicated in the technical specifications.

3.6 System Operation and Maintenance

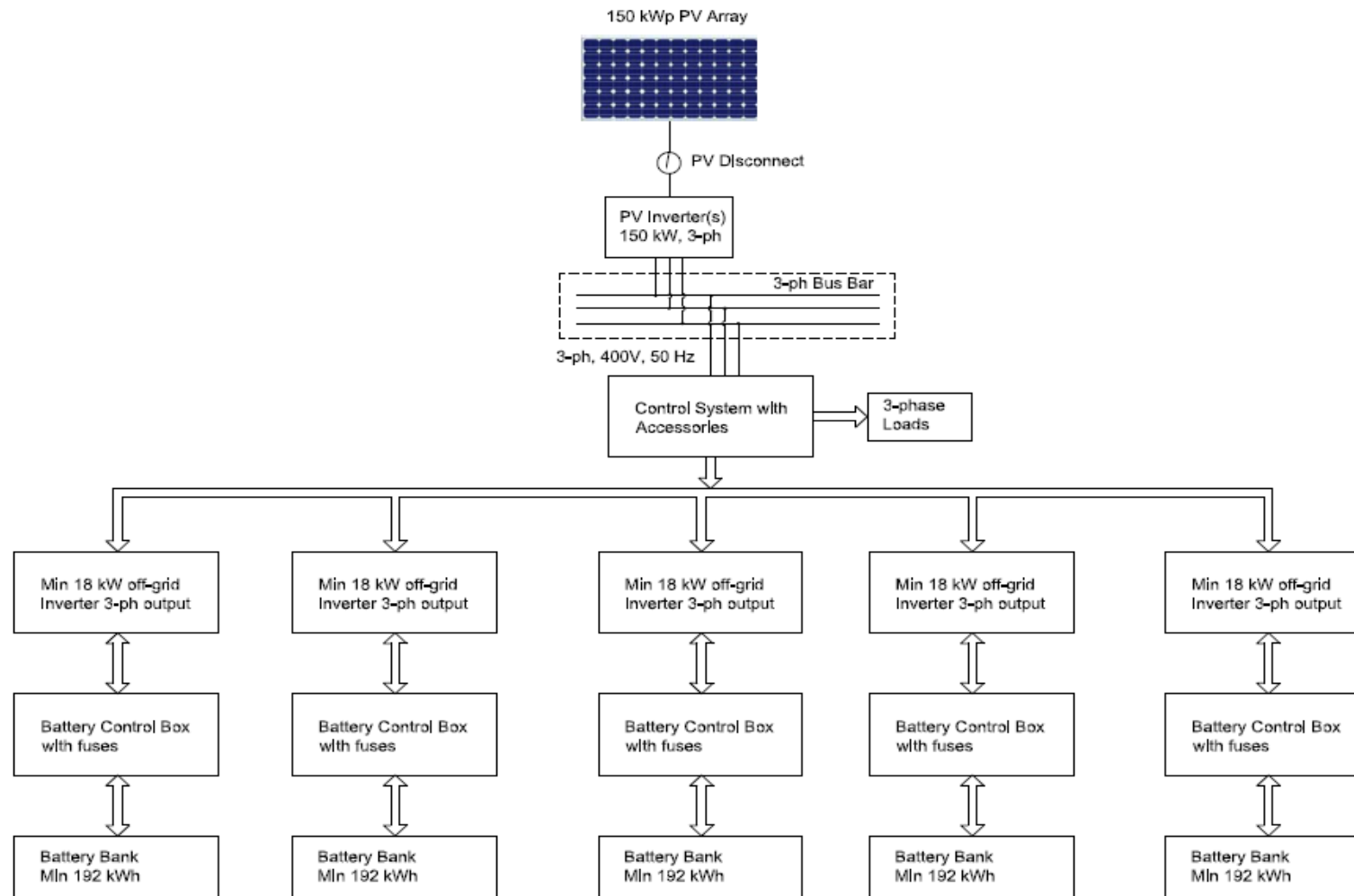
Operation and Maintenance of solar mini-grid system is essential for the reliable and sustainable power supply to the proposed Thabang village. For the first three (3) year the Supplier/Contractor shall be fully responsible for any kind of operation and maintenance jobs required to the solar mini-grid system. The supplier/contractor will depute TWO full time operators (One Senior Technician and One Assistant), tools and consumables, for operation of solar mini-grid system for three (3) years from the date of commissioning. The Senior Technician shall have minimum academic qualification of Intermediate/10+2 and shall be paid monthly remuneration of minimum NRs 15,000. The Assistant shall have minimum qualification of SLC/SEE and shall be paid monthly remuneration of minimum NRs 10,000.

A quarterly site visit must be done by the contractor's engineer to make sure the preventative maintenance and assure that all the system components are fully functional. The quarterly site visit report shall be submitted to AEPC and Thabang Solar Mini-grid Users Committee or Rural Municipality Office within a week of each visit.

4. Drawings

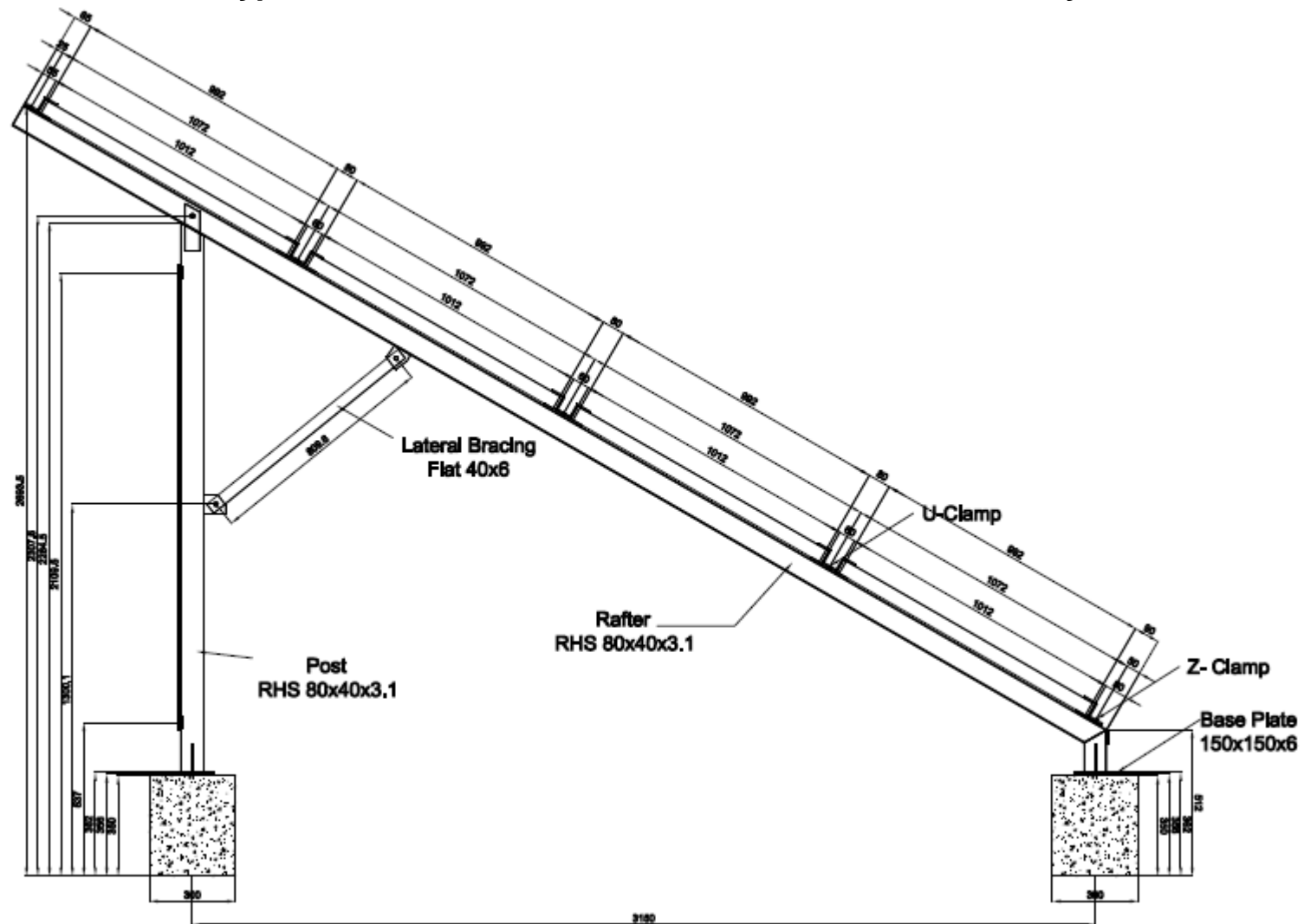
The purpose of drawings is to specify locations, dimensions, size, materials to be used, and other characteristics of the Goods and Related Services. The bidder shall prepare all the required drawings and include them in the technical proposal document and will be part of the system design and technical bid. Employer may request the Supplier/Contractor to provide additional relevant drawings for approval during Contract execution.

Typical Line Diagram of Solar Mini-grid System Power Generation

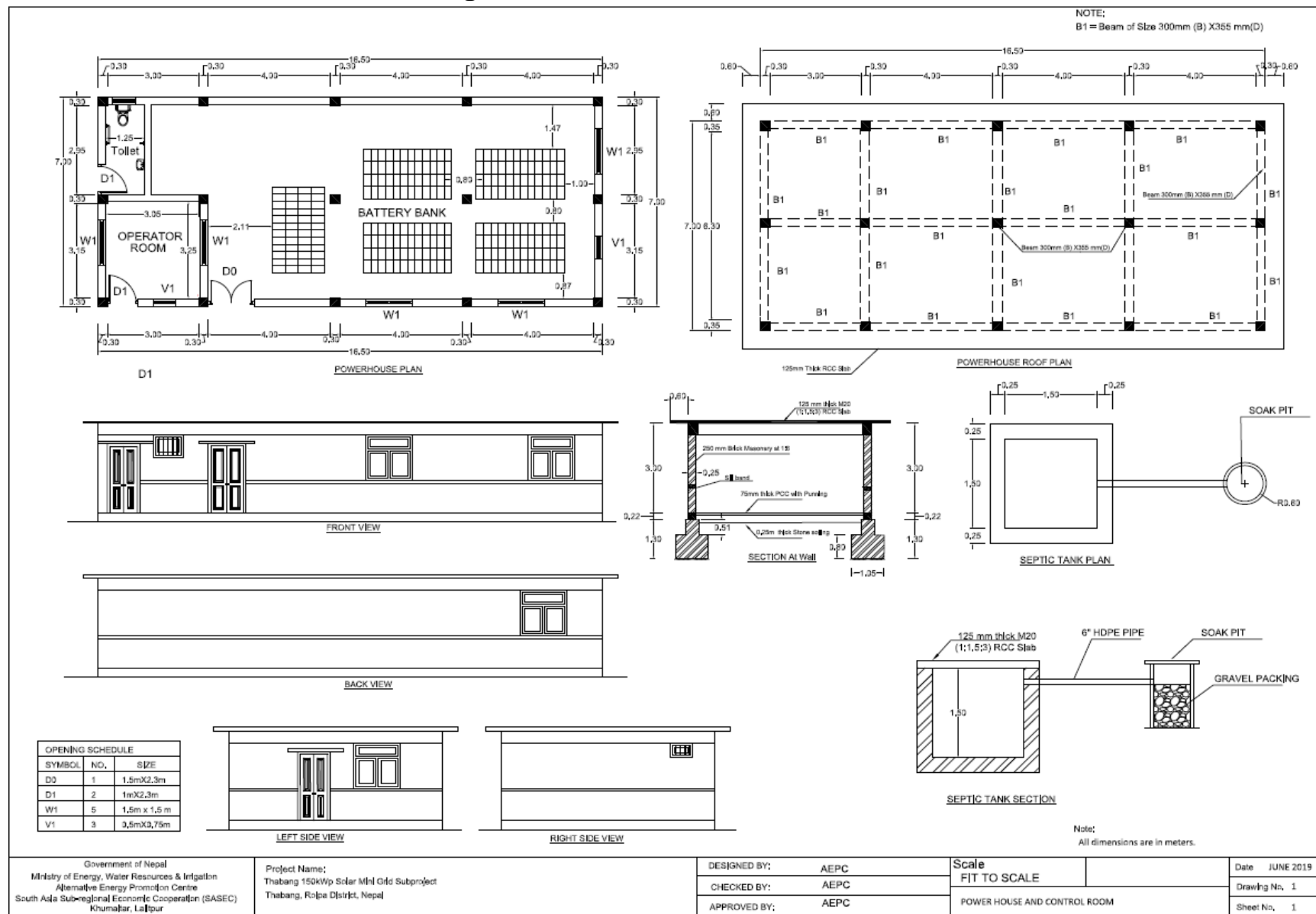


NOTE: THE BIDDERS ARE REQUIRED TO SUBMIT POWER GENERATION SYSTEM BLOCK DIAGRAM BASED ON THEIR PROPOSED SOLAR PANELS, BATTERIES, INVERTERS, CHARGE CONTROLLERS AND PROTECTION DEVICES

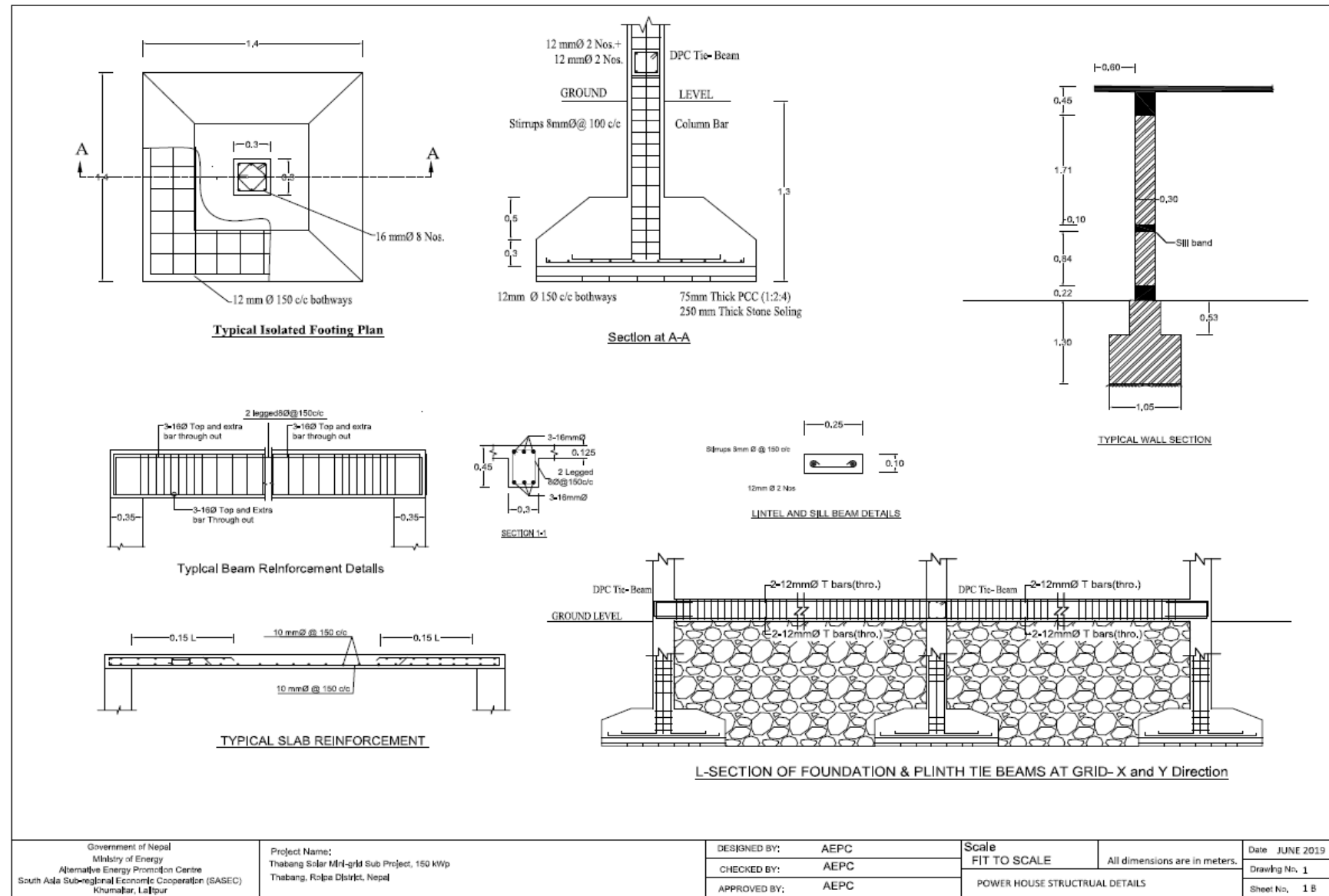
Typical Section View of Ground Mounted Solar PV Array

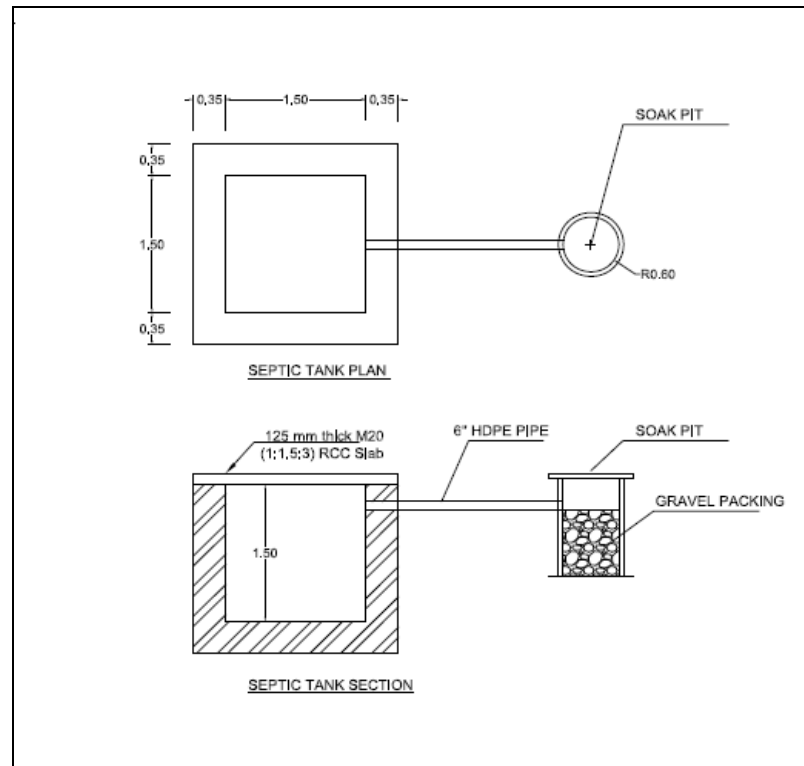


Detail Drawing of Powerhouse, Control Room and Toilet:

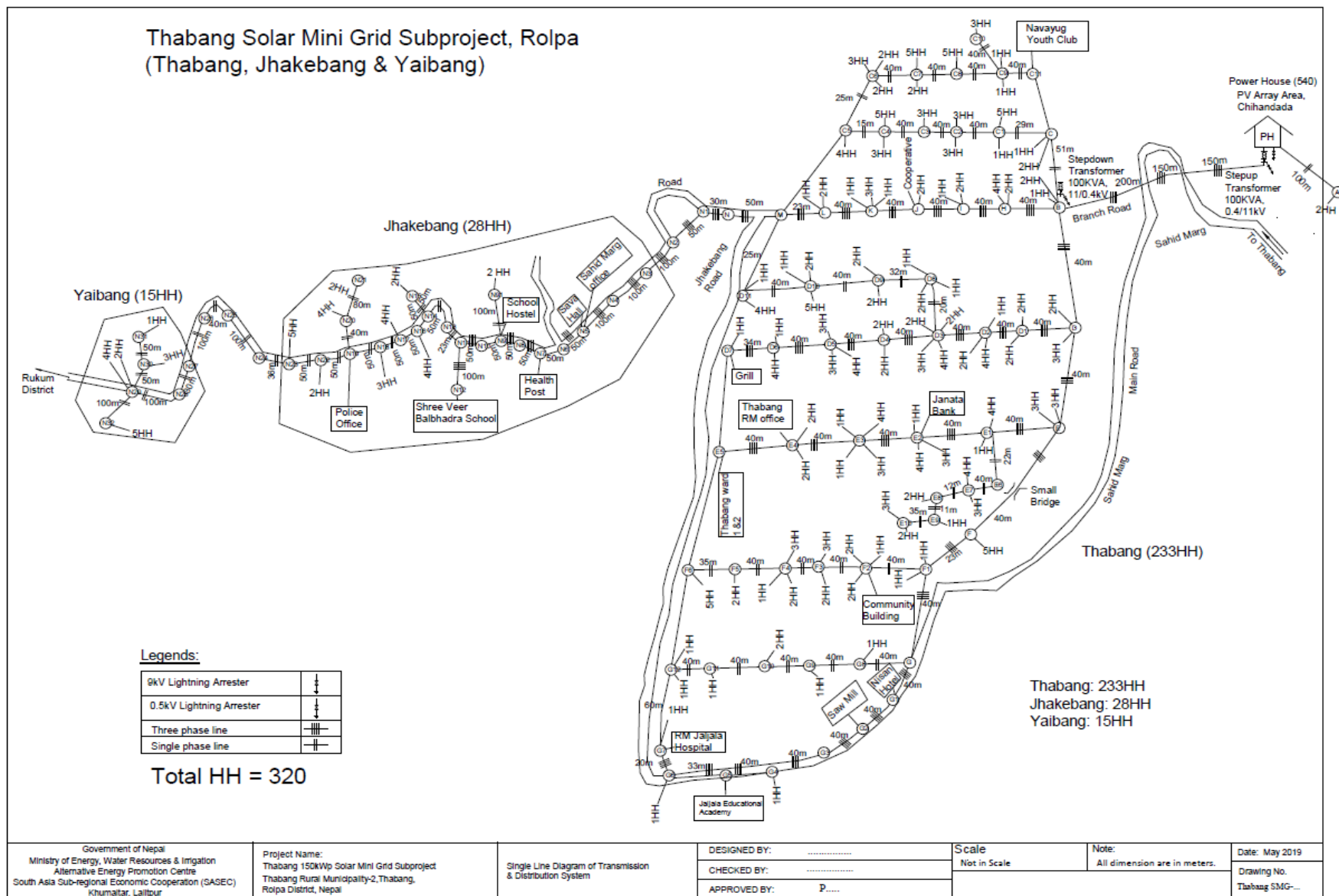


Powerhouse Foundation Structure Design Drawing:

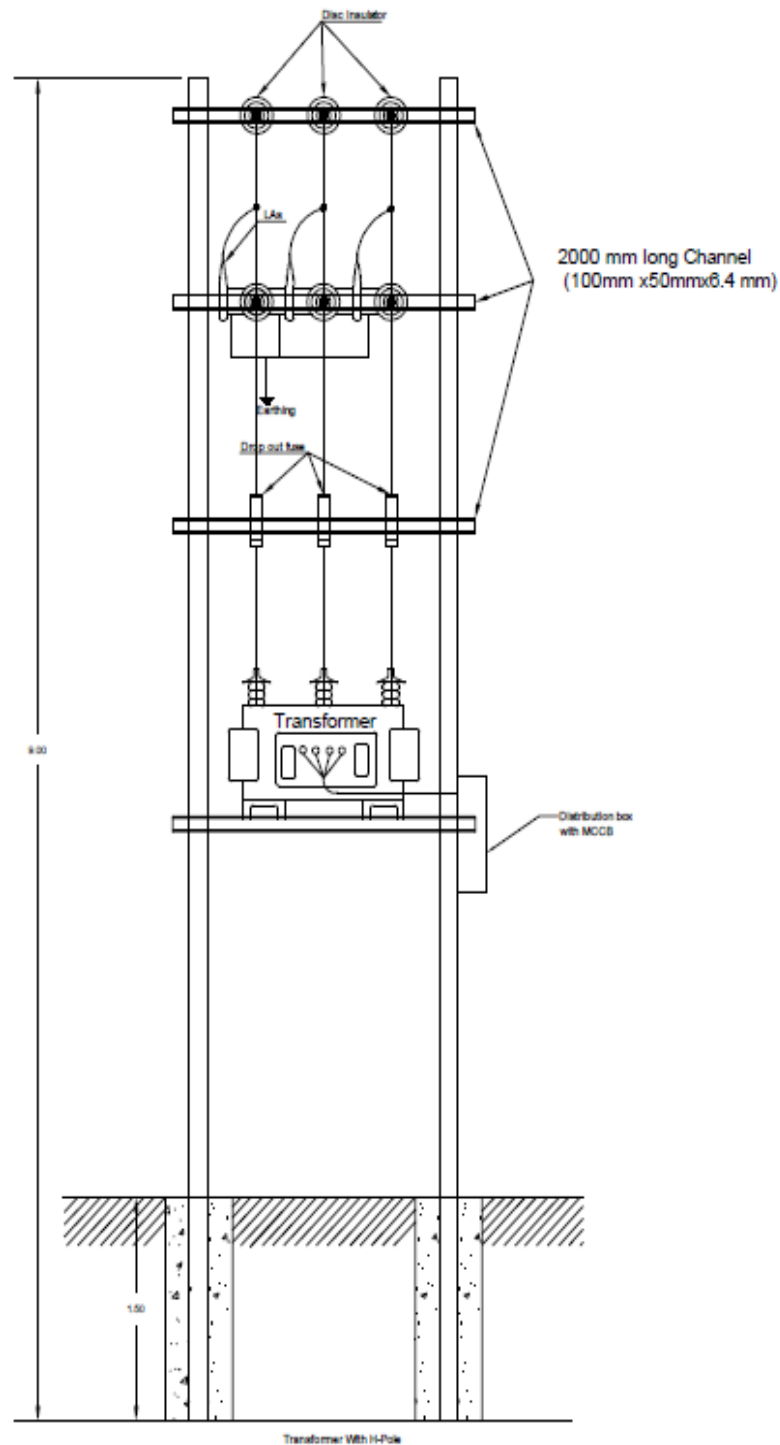


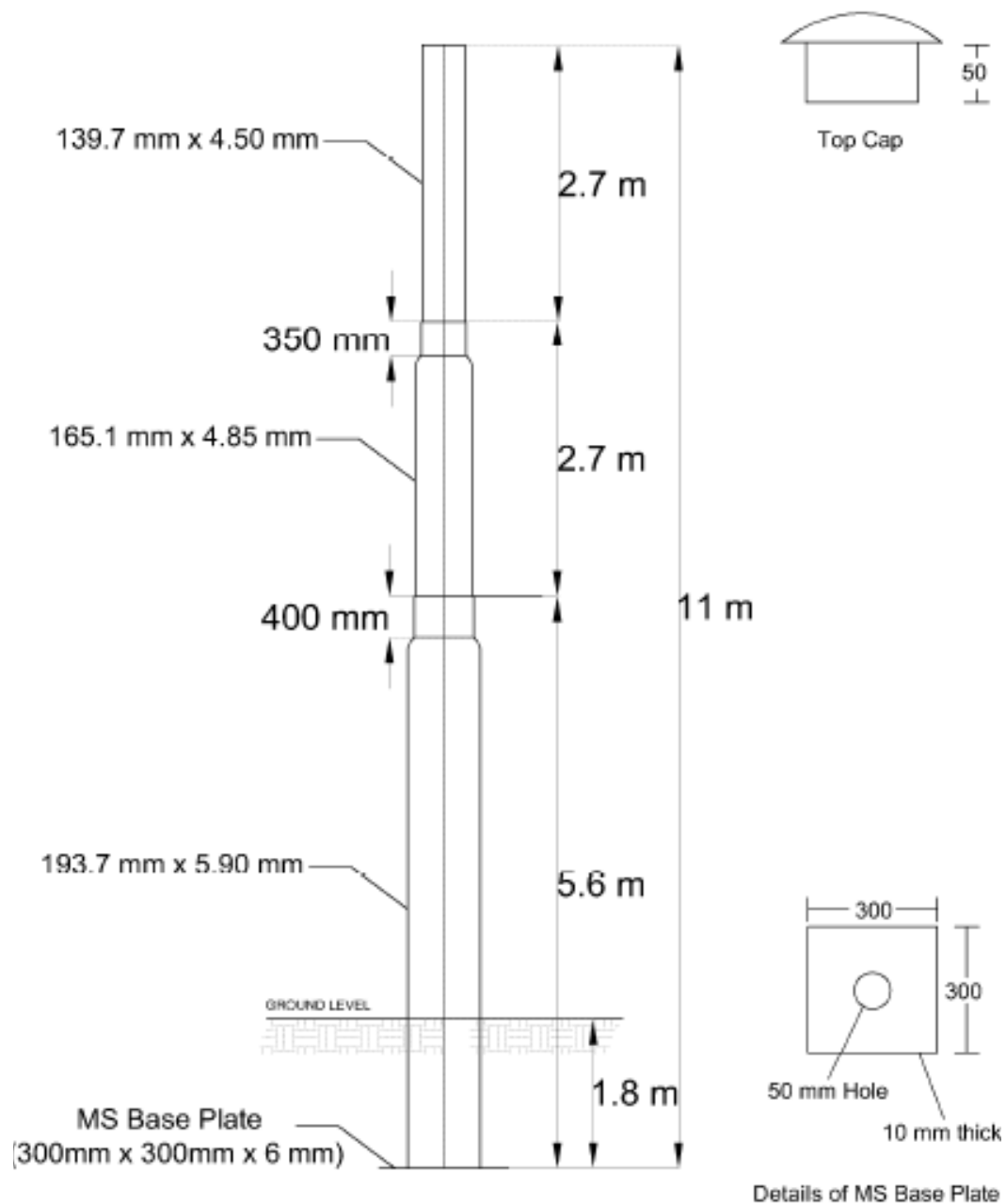
Detail Drawing of Septic Tank and Soakpit for Toilet to be constructed next to Powerhouse:

Power Transmission and Distribution System Single Line Diagram of Thabang SMG:

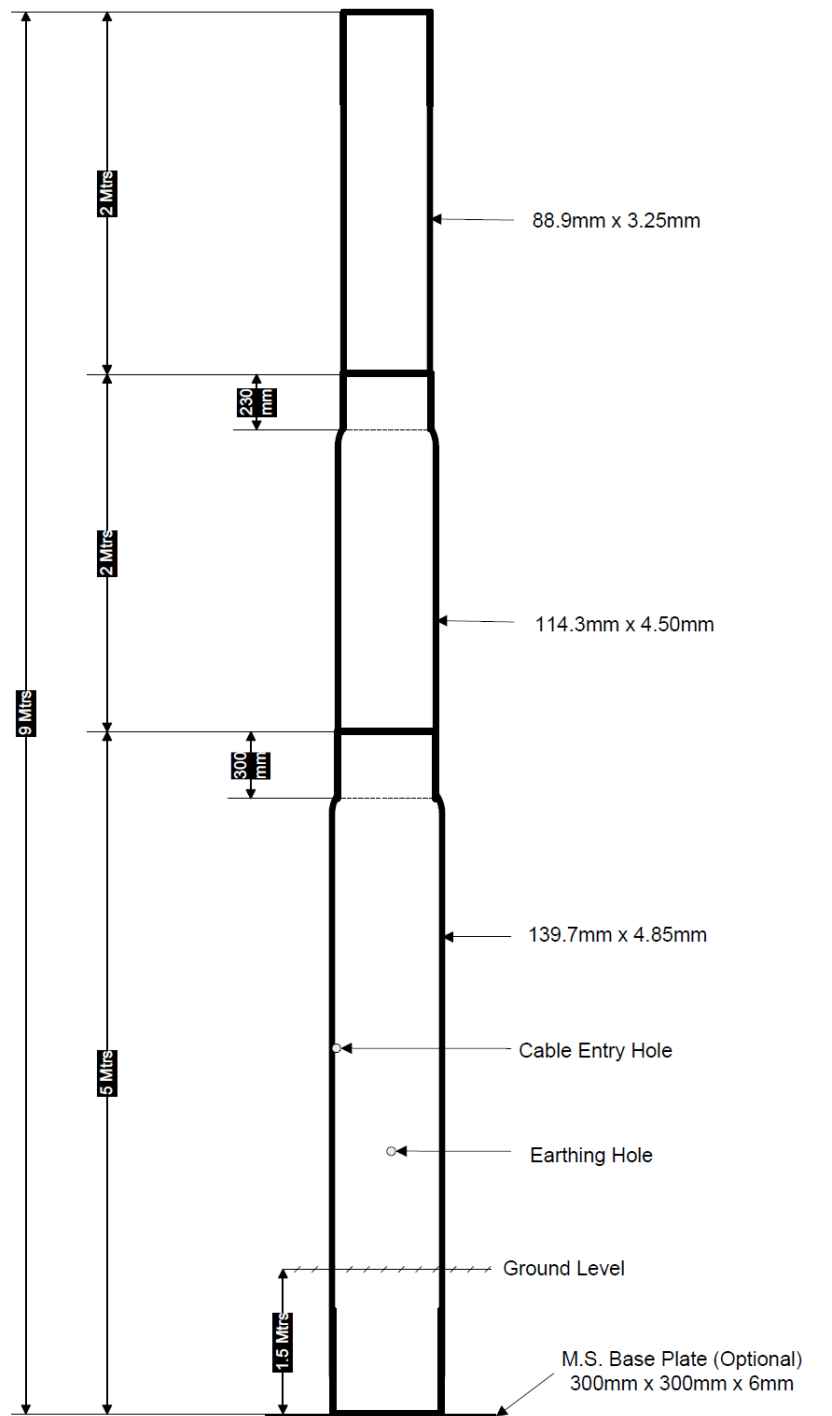


Transmission and Distribution H-pole with Distribution Transformer



Steel Tubular Pole (11 Meter):

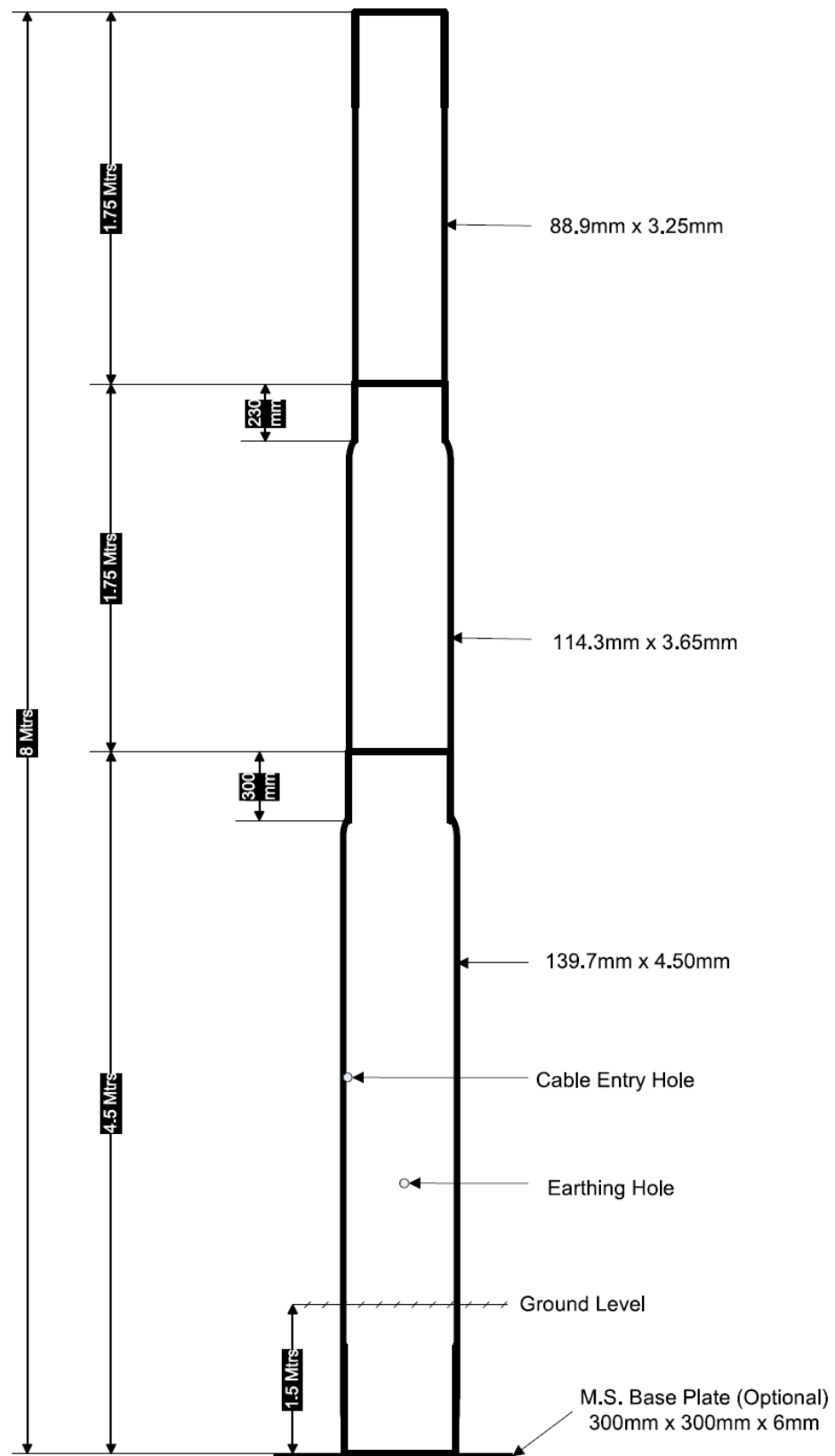
9 Meter Steel Tubular Pole:



FURTHER SPECIFICATIONS

Load Applied from Top at a Distance of : 30 cm
 Approx. Weight of Pole (without M.S. Base Plate): 125 Kgs.
 Breaking Load: 390 Kgs.
 Crippling Load: 277 Kgs.
 Load for Permanent Set Not Exceeding 13 mm: 190 Kgs.
 Load for Temporary Deflection of 157.5 mm: 83 Kgs.

© THE NATIONAL TUBING COMPANY
 DRAWING No. NTC/410 SP 29
 NOT TO SCALE

8 Meter Steel Tubular Pole:

Section 7 - General Conditions of Contract

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1. Definitions

1.1 The following words and expressions shall have the meanings hereby assigned to them:

- (a) "Contract" means the Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendixes, and all documents incorporated by reference therein.
- (b) "Contract Documents" means the documents listed in the Agreement, including any amendments thereto.
- (c) "Contract Price" means the price payable to the Supplier as specified in the Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.
- (d) "Day" means calendar day.
- (e) "Delivery" means the transfer of the Goods from the Supplier to the Purchaser in accordance with the terms and conditions set forth in the Contract.
- (f) "Completion" means the fulfillment of the Related Services by the Supplier in accordance with the terms and conditions set forth in the Contract.
- (g) "Eligible Countries" means the countries and territories eligible as listed in Section 5.
- (h) "GCC" means the General Conditions of Contract.
- (i) "Goods" means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Purchaser under the Contract.
- (j) "Purchaser's Country" is the country specified in the Special Conditions of Contract (SCC).
- (k) "Purchaser" means the entity purchasing the Goods and Related Services, as specified in the SCC.
- (l) "Related Services" means the services incidental to the supply of the goods, such as insurance, installation, training and initial maintenance and other similar obligations of the Supplier under the Contract.
- (m) "SCC" means the Special Conditions of Contract.
- (n) "Subcontractor" means any natural person, private or government entity, or a combination of the above, including its legal successors or permitted assigns, to whom any part of the Goods to be supplied or execution of any part of the Related Services is subcontracted by the Supplier.
- (o) "Supplier" means the natural person, private or government entity, or a combination of the above, whose bid to perform the

Contract has been accepted by the Purchaser and is named as such in the Agreement, and includes the legal successors or permitted assigns of the Supplier.

(p) "ADB" is the Asian Development Bank.

(q) "The Site," where applicable, means the place named in the SCC.

2. Contract Documents

2.1 Subject to the order of precedence set forth in the Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory.

3. Fraud and Corruption

3.1 ADB's Anticorruption Policy requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB

(a) defines, for the purposes of this provision, the terms set forth below as follows:

- (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
- (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
- (v) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to provide information, documents, or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding ADB's contractual rights of audit or access to information; and
- (vi) "integrity violation" is any act which violates ADB's Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy,

including failure to adhere to the highest ethical standard.

- (b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
- (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation; and
- (d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate¹ in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations.

- 3.2 The Supplier shall permit ADB to inspect the Supplier's accounts and records relating to the performance of the Supplier and to have them audited by auditors appointed by ADB, if so required by ADB.

4. Interpretation

- 4.1 If the context so requires it, singular means plural and vice versa.

4.2 Incoterms

- (a) The meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.
- (b) EXW, CIF, CIP, and other similar terms, shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce at the date of the Invitation for Bids or as specified in the SCC.

4.3 Entire Agreement

The Contract constitutes the entire agreement between the Purchaser and the Supplier and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

¹ Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

4.4 Amendment

No amendment or other variation of the Contract shall be valid unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party thereto.

4.5 Nonwaiver

- (a) Subject to GCC Subclause 4.5(b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.
- (b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

4.6 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

5. Language

- 5.1 The Contract as well as all correspondence and documents relating to the Contract exchanged by the Supplier and the Purchaser, shall be written in the language specified in the SCC. Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the SCC, in which case, for purposes of interpretation of the Contract, this translation shall govern.
- 5.2 The Supplier shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

6. Joint Venture

- 6.1 If the Supplier is a Joint Venture all of the parties shall be jointly and severally liable to the Purchaser for the fulfillment of the provisions of the Contract and shall designate one party to act as a leader with authority to bind the Joint Venture. The composition or the constitution of the Joint Venture shall not be altered without the prior consent of the Purchaser.

7. Eligibility

- 7.1 The Supplier and its Subcontractors shall have the nationality of an eligible country. A Supplier or Subcontractor shall be deemed to have the nationality of a country if it is a citizen or constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country.

- 7.2 All Goods and Related Services to be supplied under the Contract and financed by ADB shall have their origin in Eligible Countries. For the purpose of this clause, "country of origin" means the country where the goods have been grown, mined, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components.
- 8. Notices**
- 8.1 Any Notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the SCC. The term "in writing" means communicated in written form with proof of receipt.
- 8.2 A Notice shall be effective when delivered or on the Notice's effective date, whichever is later.
- 9. Governing Law**
- 9.1 The Contract shall be governed by and interpreted in accordance with the laws of the Purchaser's country, unless otherwise specified in the SCC.
- 10. Settlement of Disputes**
- 10.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.
- 10.2 If the parties fail to resolve such a dispute or difference by mutual consultation within 28 days from the commencement of such consultation, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the SCC.
- 11. Scope of Supply**
- 11.1 Subject to the SCC, the Goods and Related Services to be supplied shall be as specified in Section 6 (Schedule of Supply).
- 11.2 Unless otherwise stipulated in the Contract, the Scope of Supply shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Delivery and Completion of the Goods and Related Services as if such items were expressly mentioned in the Contract.
- 12. Delivery**
- 12.1 Subject to GCC Subclause 33.1, the Delivery of the Goods and Completion of the Related Services shall be in accordance with the Delivery and Completion Schedule specified in the Section 6 (Schedule of Supply). The details of shipping and other documents to be furnished by the Supplier are specified in the SCC.
- 13. Supplier's Responsibilities**
- 13.1 The Supplier shall supply all the Goods and Related Services included in the Scope of Supply in accordance with GCC Clause 11, and the Delivery and Completion Schedule, as per GCC Clause 12.
- 14. Purchaser's Responsibilities**
- 14.1 Whenever the supply of Goods and Related Services requires that the Supplier obtain permits, approvals, and import and other licenses from local public authorities, the Purchaser shall, if so required by the Supplier, make its best effort to assist the Supplier in complying with such requirements in a timely and expeditious manner.

- 14.2 The Purchaser shall pay all costs involved in the performance of its responsibilities, in accordance with GCC Subclause 14.1.
- 15. Contract Price**
- 15.1 The Contract Price shall be as specified in the Agreement subject to any additions and adjustments thereto, or deductions therefrom, as may be made pursuant to the Contract.
- 15.2 Prices charged by the Supplier for the Goods delivered and the Related Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in the SCC.
- 16. Terms of Payment**
- 16.1 The Contract Price shall be paid as specified in the SCC.
- 16.2 The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by invoices describing, as appropriate, the Goods delivered and Related Services performed, and by the documents submitted pursuant to GCC Clause 12 and upon fulfillment of all the obligations stipulated in the Contract.
- 16.3 Payments shall be made promptly by the Purchaser, no later than 60 days after submission of an invoice or request for payment by the Supplier, and the Purchaser has accepted it.
- 16.4 The currency or currencies in which payments shall be made to the Supplier under this Contract shall be specified in the SCC.
- 17. Taxes and Duties**
- 17.1 For goods supplied from outside the Purchaser's country, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's country.
- 17.2 For goods supplied from within the Purchaser's country, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Purchaser.
- 17.3 If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in the Purchaser's Country, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.
- 18. Performance Security**
- 18.1 The Supplier shall, within 28 days of the notification of Contract award, provide a Performance Security for the due performance of the Contract in the amounts and currencies specified in the SCC.
- 18.2 The proceeds of the Performance Security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.
- 18.3 The Performance Security shall be denominated in the currencies of the Contract, or in a freely convertible currency acceptable to the Purchaser, and shall be in one of the forms stipulated by the Purchaser in the SCC, or in another form acceptable to the Purchaser.

- 18.4 The Performance Security shall be discharged by the Purchaser and returned to the Supplier not later than 28 days following the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in the SCC.
- 19. Copyright**
- 19.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Purchaser by the Supplier herein shall remain vested in the Supplier, or, if they are furnished to the Purchaser directly or through the Supplier by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.
- 20. Confidential Information**
- 20.1 The Purchaser and the Supplier shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Subcontractor such documents, data, and other information it receives from the Purchaser to the extent required for the Subcontractor to perform its work under the Contract, in which event the Supplier shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Supplier under GCC Clause 20.
- 20.2 The Purchaser shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the Contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Purchaser for any purpose other than the design, procurement, or other work and services required for the performance of the Contract.
- 20.3 The obligation of a party under GCC Subclauses 20.1 and 20.2 above, however, shall not apply to information that
- (a) the Purchaser or Supplier needs to share with ADB or other institutions participating in the financing of the Contract;
 - (b) now or hereafter enters the public domain through no fault of that party;
 - (c) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or
 - (d) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.
- 20.4 The above provisions of GCC Clause 20 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

- 20.5 The provisions of GCC Clause 20 shall survive completion or termination, for whatever reason, of the Contract.
- 21. Subcontracting**
- 21.1 The Supplier shall notify the Purchaser in writing of all subcontracts awarded under the Contract if not already specified in the Bid. Subcontracting shall in no event relieve the Supplier from any of its obligations, duties, responsibilities, or liability under the Contract.
- 21.2 Subcontracts shall comply with the provisions of GCC Clauses 3 and 7.
- 22. Specifications and Standards**
- 22.1 Technical Specifications and Drawings
- (a) The Supplier shall ensure that the Goods and Related Services comply with the technical specifications and other provisions of the Contract.
 - (b) The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designed by or on behalf of the Purchaser, by giving a notice of such disclaimer to the Purchaser.
 - (c) The Goods and Related Services supplied under this Contract shall conform to the standards mentioned in Section 6 (Schedule of Supply) and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the country of origin of the Goods.
- 22.2 Wherever references are made in the Contract to codes and standards in accordance with which it shall be executed, the edition or the revised version of such codes and standards shall be those specified in the Section 6 (Schedule of Supply). During Contract execution, any changes in any such codes and standards shall be applied only after approval by the Purchaser and shall be treated in accordance with GCC Clause 33.
- 23. Packing and Documents**
- 23.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination of the Goods and the absence of heavy handling facilities at all points in transit.
- 23.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in the SCC, and in any other instructions ordered by the Purchaser.

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| 24. Insurance | 24.1 Unless otherwise specified in the SCC, the Goods supplied under the Contract shall be fully insured, in a freely convertible currency from an eligible country, against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in accordance with the applicable Incoterms or in the manner specified in the SCC. |
| 25. Transportation | 25.1 Unless otherwise specified in the SCC, obligations for transportation of the Goods shall be in accordance with the Incoterms specified in Section 6 (Schedule of Supply). |
| 26. Inspections and Tests | <p>26.1 The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services as are specified in Section 6 (Schedule of Supply).</p> <p>26.2 The inspections and tests may be conducted on the premises of the Supplier or its Subcontractor, at point of delivery, and/or at the final destination of the Goods, or in another place in the Purchaser's country as specified in the SCC. Subject to GCC Subclause 26.3, if conducted on the premises of the Supplier or its Subcontractor, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser.</p> <p>26.3 The Purchaser or its designated representative shall be entitled to attend the tests and/or inspections referred to in GCC Subclause 26.2, provided that the Purchaser bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.</p> <p>26.4 Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.</p> <p>26.5 The Purchaser may require the Supplier to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the Goods comply with the technical specifications, codes, and standards under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.</p> <p>26.6 The Supplier shall provide the Purchaser with a report of the results of any such test and/or inspection.</p> <p>26.7 The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser, and shall repeat</p> |

the test and/or inspection, at no cost to the Purchaser, upon giving a notice pursuant to GCC Subclause 26.4.

- 26.8 The Supplier agrees that neither the execution of a test and/or inspection of the Goods or any part thereof, nor the attendance by the Purchaser or its representative, nor the issue of any report pursuant to GCC Subclause 26.6, shall release the Supplier from any warranties or other obligations under the Contract.

27. Liquidated Damages

- 27.1 Except as provided under GCC Clause 32, if the Supplier fails to deliver any or all of the Goods or perform the Related Services within the period specified in the Contract, the Purchaser may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in the SCC of the Contract Price for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in the SCC. Once the maximum is reached, the Purchaser may terminate the Contract pursuant to GCC Clause 35.

28. Warranty

- 28.1 The Supplier warrants that all the Goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.
- 28.2 Subject to GCC Subclause 22.1, the Supplier further warrants that the Goods shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.
- 28.3 Unless otherwise specified in the SCC, the warranty shall remain valid for 12 months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the SCC, or for 18 months after the date of shipment or loading in the country of origin, whichever period concludes earlier.
- 28.4 The Purchaser shall give Notice to the Supplier, stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Purchaser shall afford all reasonable opportunity for the Supplier to inspect such defects.
- 28.5 Upon receipt of such Notice, the Supplier shall, within the period specified in the SCC, expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Purchaser.
- 28.6 If having been notified, the Supplier fails to remedy the defect within the period specified in the SCC, the Purchaser may proceed to take within a reasonable period such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

29. Patent Indemnity

29.1 The Supplier shall, subject to the Purchaser's compliance with GCC Subclause 29.2, indemnify and hold harmless the Purchaser and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Purchaser may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract by reason of

- (a) the installation of the Goods by the Supplier or the use of the Goods in the country where the Site is located; and
- (b) the sale in any country of the products produced by the Goods.

Such indemnity shall not cover any use of the Goods or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, neither any infringement resulting from the use of the Goods or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Supplier, pursuant to the Contract.

29.2 If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Subclause 29.1, the Purchaser shall promptly give the Supplier a notice thereof, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

29.3 If the Supplier fails to notify the Purchaser within 28 days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf.

29.4 The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim, and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

29.5 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Supplier may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Purchaser.

- 30. Limitation of Liability**
- 30.1 Except in cases of gross negligence or willful misconduct,
- (a) neither party shall be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and
 - (b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort, or otherwise, shall not exceed the amount specified in the SCC, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Supplier to indemnify the Purchaser with respect to patent infringement.
- 31. Change in Laws and Regulations**
- 31.1 Unless otherwise specified in the Contract, if after the date of the Invitation for Bids, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in the place of the Purchaser's country where the Site is located (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Delivery Date and/or the Contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Supplier has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with GCC Clause 15.
- 32. Force Majeure**
- 32.1 The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.
- 32.2 For purposes of this clause, "Force Majeure" means an event or situation beyond the control of the Supplier that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.
- 32.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
- 33. Change Orders and Contract Amendments**
- 33.1 The Purchaser may at any time order the Supplier through Notice in accordance GCC Clause 8, to make changes within the general scope of the Contract in any one or more of the following:

- (a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
- (b) the method of shipment or packing;
- (c) the place of delivery; and
- (d) the Related Services to be provided by the Supplier.

33.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery and Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this Clause must be asserted within 28 days from the date of the Supplier's receipt of the Purchaser's change order.

33.3 Prices to be charged by the Supplier for any Related Services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

34. Extensions of Time

34.1 If at any time during performance of the Contract, the Supplier or its Subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to GCC Clause 12, the Supplier shall promptly notify the Purchaser in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

34.2 Except in case of Force Majeure, as provided under GCC Clause 32, a delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 27, unless an extension of time is agreed upon, pursuant to GCC Subclause 34.1.

35. Termination

35.1 Termination for Default

- (a) The Purchaser, without prejudice to any other remedy for breach of Contract, by Notice of default sent to the Supplier, may terminate the Contract in whole or in part,
 - (i) if the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 34; or
 - (ii) if the Supplier fails to perform any other obligation under the Contract.

- (iii) if the Supplier, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in GCC Clause 3, in competing for or in executing the Contract.
- (b) In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 35.1(a), the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

35.2 Termination for Insolvency

The Purchaser may at any time terminate the Contract by giving Notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Purchaser.

35.3 Termination for Convenience

- (a) The Purchaser, by Notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The Notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.
- (b) The Goods that are complete and ready for shipment within 28 days after the Supplier's receipt of the Notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect
 - (i) to have any portion completed and delivered at the Contract terms and prices; and/or
 - (ii) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier.

36. Assignment

- 36.1 Neither the Purchaser nor the Supplier shall assign, in whole or in part, their obligations under this Contract, except with prior written consent of the other party.

Section 8 - Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

GCC 1.1(j)	The Purchaser's country is: <u>Nepal</u>
GCC 1.1(k)	The Purchaser is: <u>Alternative Energy Promotion Centre (AEPCC)</u>
GCC 1.1 (q)	The Site is: <u>Thabang Rural Municipality Ward No-1 and 2, Thabang Village, Rolpa District</u>
GCC 4.2 (b)	The version of Incoterms shall be: <u>Incoterms 2010</u>
GCC 5.1	The language shall be: <u>English</u> Language for translation of supporting documents and printed literature is: <u>English</u>
GCC 8.1	For <u>notices</u> , the Purchaser's address shall be: Attention: <u>Dr. Narayan Prasad Adhikari, Project Manager, AEPCC/SASEC</u> Street address: <u>Khumaltar Height, Lalitpur, Nepal</u> Floor/ Room number: <u>2nd Floor</u> City: <u>Lalitpur</u> Country: <u>Nepal</u> Telephone: <u>+977-01-5539390, 5539391</u> Fax: <u>+9771-5542397, 5539392</u> E-mail address: narayan.adhikari@aepp.gov.np
GCC 9.1	The governing law shall be: <u>Laws of Nepal</u>
GCC 10.2	The formal mechanism for the resolution of disputes shall be: <u>Nepal Council of Arbitration Rules</u> Place of arbitration: <u>NEPCA Head office, Lalitpur City</u>
GCC 11.1	The Scope of Supply shall be defined in detail in Section-6 Schedule of Supply. At the time of awarding the Contract, the Purchaser shall specify any change in the Scope of Supply with respect to Section-6 Schedule of Supply included in the Bidding Document. Such changes may be due, for instance, if the quantities of Goods and Related Services are increased or decreased at the time of award.

GCC 12.1	<p>Details of shipping and documents to be furnished by the Supplier shall be:</p> <p>For Goods from within the Purchaser's country as per Incoterm EXW:</p> <p>Upon delivery of the Goods to the transporter, the Supplier shall notify the Purchaser and send the following documents to the Purchaser:</p> <ul style="list-style-type: none"> (a) Two copies of the Supplier's invoice showing the description of the Goods, quantity, unit price, and total amount; (b) Delivery note, railway receipt, or truck receipt; (c) Manufacturer's or Supplier's warranty certificate; (d) Inspection certificate issued by the nominated inspection agency, and the Supplier's factory inspection report; and (e) Certificate of origin. <p>The Purchaser, shall receive the above documents before the arrival of the Goods and, if not received, the Supplier will be responsible for any consequent expenses</p>
GCC 15.2	The price adjustment shall be: <u>Not Applicable</u>
GCC 16.1	<p>Payment of the Contract Price shall be made in the following manner: _____</p> <p>(i) Delivery of Goods:</p> <p><u>(a) Advance Payment:</u> Twenty (20) percent of the Contract Price of the Goods and Services within twenty-eight (28) days of signing of the Contract. Payment shall be made, provided the Supplier presents a request for payment accompanied by an Advance Payment Security in the form of a bank guarantee (Reputable Bank) for an amount equal to the amount of the payment, and that shall be valid until the Goods and Services are delivered. The security shall be in the form as specified in Section-9, Contract Forms.</p> <p><u>(b) On Delivery:</u> The Purchaser shall pay the Supplier sixty (60) percent of the Contract Price of the Goods delivered.</p> <p><u>(c) After Installation and Commissioning:</u> Fifteen (15) percent of the Contract Price of Goods received and 75% of Services shall be paid within twenty-eighty (28) days of receipt of the Goods upon submission of a claim supported by the acceptance certificate issued by the Purchaser.</p> <p><u>(d) Retention Money:</u> Five (5) percent of the Contract Price of Goods and Services received shall be paid within twenty-eighty (28) days of completion of warranty period.</p> <p>(ii) Operation and Maintenance</p> <p>The Supplier shall submit invoice for the operation and maintenance after completion of one year O&M period, and same procedure shall apply for the subsequent years.</p>
GCC 16.4	The currencies for payments shall be: <u>Nepalese Rupees</u>

GCC 18.1	The Supplier shall provide a Performance Security of 10 percent of the Contract Price in Nepalese Rupees.
GCC 18.3	<p>The forms of acceptable Performance Security are:</p> <p>The types of acceptable Performance Securities are: A bank guarantee issued by a reputable bank located in the Purchaser's country or abroad, acceptable to Purchaser's in the format included in Section 9, Contract Forms, or a cashier's or certified check, or cash.</p>
GCC 18.4	<p>Discharge of the Performance Security shall take place:</p> <p>Pursuant to GCC Sub-Clause 18.4, after delivery and acceptance of the Goods, the performance security shall be reduced to 5% of the Contract to cover the Supplier's warranty obligations in accordance with GCC Clause 28.3.</p>
GCC 23.2	<p>The packing, marking, and documentation within and outside the packages shall be:</p> <p>Thabang Solar Mini-grid Subproject, Thabang Rural Municipality Ward No-1&2, Thabang Village, Rolpa District AEPC/ADB/SASEC/NCB/SWMG/09 Alternative Energy Promotion Centre (AEPC), Khumaltar, Lalitpur, Nepal</p>
GCC 24.1	<p>The insurance coverage shall be in accordance with</p> <p>"Pursuant to GCC, Sub-Clause 24.1, the Supplier must insure the Goods in an amount equal to 110 percent of the EXW price of the Goods from "Warehouse" to "Warehouse" on "All Risks" basis, including War Risks and Strikes."</p>
GCC 25.1	Obligations for transportation of the Goods shall be in accordance with: Incoterms 2010
GCC 26.2	<p>Tests and Inspections specified in Section 6 (Schedule of Supply), shall be carried out at the following times or milestones, and places : _____</p> <p>Goods: <u>Solar PV Modules, Solar MPPT Controllers, Inverters and Batteries.</u></p> <p>Type of Test: As mentioned in technical specifications</p> <p>Time or Milestone: As mentioned in technical specifications</p> <p>Place: As mentioned in technical specifications</p>
GCC 27.1	The applicable rate for liquidated damages for delay shall be: 0.5 % per week or part thereof contract amount.
GCC 27.1	The maximum amount of liquidated damages shall be: 10% of the Contract price.

GCC 28.3	The period of validity of the Warranty shall be: <u>Three (3) Years</u> The place of final destination shall be: <u>Thabang Rural Municipality Ward No-1&2, Thabang, Rolpa District</u>
GCC 28.5	The Supplier shall correct any defects covered by the Warranty within <u>30 days</u> of being notified by the Purchaser of the occurrence of such defects.
GCC 30.1 (b)	The amount of aggregate liability shall be: 100% of the Contract price.

Section 9 - Contract Forms

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Notification of Award

---- on letterhead of the purchaser ----

Letter of Acceptance

..... date.

To: name and address of the supplier

Subject: Notification of Award Contract No.

This is to notify you that your Bid dated date for execution of the name of the contract and identification number, as given in the Bid Data Sheet for the Accepted Contract Amount of the equivalent of amount in words and figures and name of currency, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose the Performance Security Form included in Section 9 (Contract Forms) of the Bidding Document.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made on the *[insert date]* day of *[insert month]*, *[insert year]*, between *[insert complete name of the Purchaser]* of *[insert complete address of the purchaser]* (hereinafter "the Purchaser"), of the one part, and *[insert complete name of the supplier]* of *[insert complete address of the supplier]* (hereinafter "the Supplier"), of the other part:

WHEREAS the Purchaser invited Bids for certain Goods and Related Services, viz., *[insert brief description of the goods and related services]* and has accepted a Bid by the Supplier for the supply of those Goods and Related Services in the sum of *[insert currency or currencies and amount of contract price in words and figures]* (hereinafter "the Contract Price").

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 Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
 - (a) the Letter of Acceptance;
 - (b) the Price Bid Submission Sheet and the Price Schedules submitted by the Supplier;
 - (c) the Technical Bid Submission Sheet submitted by the Supplier;
 - (d) the Special Conditions of Contract;
 - (e) the List of Eligible Countries that was specified in Section 5 of the Bidding Document;
 - (f) the General Conditions of Contract;
 - (g) the Schedule of Supply; and
 - (h) any other documents shall be added here.¹

This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

3. In consideration of the payments to be made by the Purchaser to the Supplier as indicated in this Agreement, the Supplier hereby covenants with the Purchaser to provide the Goods and Related Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and Related Services and the remedying of defects therein, 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.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of *[indicated name of country]* on the day, month and year indicated above.

Signed by *[insert authorized signature for the purchaser]* (for the Purchaser)

Signed by *[insert authorized signature for the supplier]* (for the Supplier)

¹ Tables of Adjustment Data may be added if the contract provides for price adjustment (see GCC 15).

Performance Security

*Bank's name, and address of issuing branch or office*¹

Beneficiary: *insert name and address of the purchaser*

Date: *insert date (as day, month, and year)*

Performance Guarantee No.:

We have been informed that *name of the supplier*. (hereinafter called "the Supplier") has entered into Contract No. *reference number of the contract*. dated with you, for the execution of *name of contract and brief description of goods and related services*. (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Supplier, we *name of the bank*. hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *name of the currency and amount in words*². (*amount in figures*.) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Supplier is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the day of ,³ and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.⁴

.....
Signature(s) and seal of bank (where appropriate)

-- Note to Bidder --

If the institution issuing the performance security is located outside the country of the purchaser, it shall have a correspondent financial institution located in the country of the purchaser to make it enforceable.

- ¹ All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.
- ² The guarantor shall insert an amount representing the percentage of the contract price specified in the contract and denominated either in the currency (ies) of the contract or a freely convertible currency acceptable to the purchaser.
- ³ Insert the date 28 days after the expected completion date. The purchaser should note that in the event of an extension of the time for completion of the contract, the purchaser would need to request an extension of this guarantee from the guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the purchaser might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Purchaser's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."
- ⁴ Or the same or similar to this clause specified in the Uniform Rules for Demand Guarantees, ICC Publication No. 758 where applicable.

Advance Payment Security

[insert complete name and number of contract]

To: [insert complete name of the purchaser]

In accordance with the payment provision included in the Contract, in relation to advance payments, [insert complete name of the supplier] (hereinafter called "the Supplier") shall deposit with the Purchaser a security consisting of [indicate type of security], to guarantee its proper and faithful performance of the obligations imposed by said Clause of the Contract, in the amount of [insert currency and amount of guarantee in words and figures].

We, the undersigned [insert complete name of the guarantor], legally domiciled in [insert full address of the guarantor] (hereinafter "the Guarantor"), as instructed by the Supplier, agree unconditionally and irrevocably to guarantee as primary obligor and not as surety merely, the payment to the Purchaser on its first demand without whatsoever right of objection on our part and without its first claim to the Supplier, in the amount not exceeding [insert currency and amount of guarantee in words and figures].

This security shall remain valid and in full effect from the date of the advance payment being received by the Supplier under the Contract until [insert date (as day, month, and year)].

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458 [or ICC Publication No. 758 as applicable].

Name: [insert complete name of person signing the Security]

In the capacity of [insert legal capacity of person signing the Security]

Signed: [insert signature of person whose name and capacity are shown above]

Duly authorized to sign the security for and on behalf of [insert seal (where appropriate) and complete name of the guarantor]

Date: [insert date of signing]

-- Note to Bidder --

If the institution issuing the advance payment security is located outside the country of the purchaser, it shall have a correspondent financial institution located in the country of the purchaser to make it enforceable.