



## Invitation for Bids

<b>Date:</b>	<b>8 August 2024</b>
<b>Loan No. and Title:</b>	Loan 3867-IND: Scaling Up Demand-Side Energy Efficiency Sector Project
<b>Contract Nos. and Title:</b>	<b>EESL/06/2023-24/ICB/ADB/Solar/232402035</b> “Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW (Lot -1: 30 MW, Lot-2: 20 MW and Lot 3: 20 MW) at various locations in Maharashtra”  Separate bespoke Operation and Maintenance contract for the 3 lots; each of 30 /20 /20 MW capacity respectively
<b>Deadline for Submission of Bids:</b>	20 September 2024 (Friday) 11:00 Hrs IST

1. The Government of India has received financing from the Asian Development Bank (ADB) towards the cost of **Scaling up Demand – Side Energy Efficiency Sector Project**. Part of this financing will be used for payments under the contract named above. Bidding is open to Bidders from eligible source countries of ADB.
2. The Energy Efficiency Services Limited (EESL) (the “Employer”) invites sealed bids from eligible Bidders for “Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW (Lot -1: 30 MW, Lot-2: 20 MW and Lot 3: 20 MW) at various locations in Maharashtra” (the “Facilities”) and Separate bespoke Operation and Maintenance contract for the 3 lots; each of 30/ 20 /20 MW capacity respectively.

The detailed scope of work for the above lots is defined in their respective bidding document.

Note: The procurement is grouped in 3 lots being bid out as Package 1- Lot 1, Package 1- Lot 2 and Package 1-Lot 3. The Employer will evaluate and compare Bids on the basis of a contract, or a combination of contracts, or as a total of contracts to arrive at the least cost combination for the Employer by taking into account discounts offered by Bidders in case of award of multiple contracts.

3. **International 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. The complete Bidding Documents including tender drawings, if any, shall be available for inspection and downloading at EESL’s e-procurement portal <https://www.tenderwizard.com/EESL> (hereinafter referred to as the ‘e-Portal’) from 11:00 hours IST on **8 August 2024** till 11:00 hours IST on **20 September 2024**.

5. The Key Qualifying requirements are given below:

**Experience and Technical Capacity:**

a. **Contracts of Similar Size and Nature**

Participation as an EPC contractor, Joint Venture partner, or Subcontractor in at least one EPC contract that has been satisfactorily completed within the last seven (07) years (from the originally scheduled date of Bid Opening (as per RfP document)) and that is similar to the proposed contract, where the value of the Bidder's participation exceeds or equal to INR 136 Crores or USD 17 Million for Lot 1, INR 91 Crores or USD 11 Million for Lot 2 and INR 91 Crores or USD 11 Million for Lot 3.

OR

Participation as an EPC contractor, Joint Venture partner, or Subcontractor in at least two EPC contracts that has been satisfactorily completed within the last seven (07) years (from the originally scheduled date of Bid Opening (as per RfP document)) and that is similar to the proposed contract, where the value of the Bidder's participation exceeds or equal to INR 85 Crores or USD 11 Million for Lot 1, INR 57 Crores or USD 7 Million for Lot 2 and INR 57 Crores or USD 7 Million for Lot 3.

OR

Participation as an EPC contractor, Joint Venture partner, or Subcontractor in at least three EPC contracts that has been satisfactorily completed within the last seven (07) years (from the originally scheduled date of Bid Opening (as per RfP document)) and that is similar to the proposed contract, where the value of the Bidder's participation exceeds or equal to INR 68 Crores or USD 9 Million for Lot 1, INR 45 Crores or USD 6 Million for Lot 2 and INR 45 Crores or USD 6 Million for Lot 3.

b. **Experience in Key Activities**

The bidder(s) shall be:

1. Manufacturer of Solar Module OR
2. Manufacturer of Grid Tie Solar Inverter OR
3. Developer of Solar PV based power plants OR
4. System Integrator of Solar PV based power plants

**Financial Criteria:**

- (i). As a minimum, the Bidder's net worth for the last financial year calculated as the difference between total assets and total liabilities should be positive
- (ii). The Average Annual Turnover defined as the total payments received by the Bidder for contracts completed or under execution over the last three (3) years should be as indicated in the Table below for each of the three lots

Lot No	Average Annual Turnover (In INR)*	Average Annual Turnover (In USD)*
1	254 Crore	32 Million
2	169 Crore	21 Million
3	169 Crore	21 Million

- (iii). The Bidder must demonstrate that its financial resources less its financial obligations for its current contract commitments meet or exceed the total requirement for the Subject Contract of USD 5.96 million or INR 47.0 Crore for lot 1, USD 3.94 million or INR 31.0 Crore for lot 2 and USD 3.94 million or INR 31.0 Crore for lot 3.

The Bidders are requested to refer to the bid documents to understand the detailed qualification criteria

6. The Interested bidders have to necessarily enroll themselves on the e-Portal <https://www.tenderwizard.com/EESL> to participate in the bidding under this invitation for bids. It shall be the sole responsibility of the interested bidders to get themselves registered at the e-portal for which they are required to contact M/s. Antares Systems Limited (Application Service Provider (ASP) appointed by EESL) at the following to complete the registration formalities (refer Attachment-A to Section-2 of the bidding document for more details):  
EESL Global Support Telephones and e-mail id  
Contact Details: +91-80-45811365, +91-80-45982100, +91-9560095958  
Email: mohitkumar@etenderwizard.com

The registration on the e-Portal is free of cost.

Digital Signature Certificates (DSCs): To carry out e-Procurement using e-Procurement portals, all bidders will be required to obtain valid DSC of requisite Class issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) [refer <http://www.cca.gov.in>]. Bidders are solely responsible for purchase of valid Digital Signature Certificate from authorized Certification Authorities and safe keeping of the certificates. The e-mail address specified in the Digital Signature Certificate shall match with the e-mail address specified in the user profile created during supplier registration. Bidders shall take due care to safe keep the e-Procurement system and DSC token passwords. The Employer shall not be responsible for inability of bidder to participate in a tender due to loss of password by bidder or inability of the bidder to retrieve password. The Employer shall not be responsible for failures or breakdowns of systems, other than those, strictly within the control of the Employer and its e-Procurement service provider. Bidders shall take due care to ensure purchase of the right Digital Signature Certificate required for tender submission in the e-Procurement portal, availability of internet connectivity and requisite client software.

6.1 Enrollment on e-Procurement portal: As stated above, Bidders have to be registered in the e-Procurement portal to be able to participate in tenders published on the site. Registration of each organization is to be done by one of its senior duly authorised official who will be the main person coordinating for the e-tendering activities. For further details, please visit the website <https://www.tenderwizard.com/EESL> and follow further instructions as per Attachment-A to Section-2 of the Bidding document.

Please note that even after acceptance of your registration by the Service Provider, Bidders need time to complete the mandatory activities related to their organization and prospective bidders are advised to plan accordingly.

6.2 Bidders may obtain further information regarding this IFB from the office of Head (Contracts), EESL at the address given at para 12 below from 1500 hours to 1700 hours (IST) on all working days before the deadline of submission of bids as per para 4.0 above.

7. The original documents in hard copy as per details below shall be received up to 11:00 Hrs. IST on **20 September 2024** at the address given at Para 12 below: .
- (a) Original Bid Security.
  - (b) Original Joint Venture Agreement
  - (c) Notarized Power of Attorney authorising the signatory to submit the bid
  - (d) Affidavit regarding correctness of information in the Bid

Soft Copy parts of bids can be uploaded up to 11:00 Hrs. IST on **20 September 2024**. Bids must be accompanied by a Bid Security in the amount as stated in the Bidding Document (Bid Data Sheet).

The Technical Bid (First Envelope) shall be opened online on **20 September 2024** at 11:30 Hrs. IST. The schedule for opening of Price part (Second Envelope) shall be intimated separately, as per the bidding documents.

The Employer shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, the Employer

shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to the tender.

8. Alternative Bids shall not be permitted.
9. A Pre-Bid conference will be held both physically and virtually at 15:30 Hrs on **12 August 2024**. A Link for attending the meeting will be uploaded in tender portal <https://www.tenderwizard.com/EESL> well in advance.
10. EESL will not be responsible for any costs or expenses incurred by Bidders in connection with the preparation or submission of Bids.
11. In the comparison of Bids, ADB's Domestic Preference Scheme will be applied in accordance with the provisions stipulated in the Bidding Documents.
12. All correspondence with regard to the above shall be made to the following address:

**(By Post/In Person)**

**DGM (Contracts)**

Energy Efficiency Services Ltd.,  
4<sup>th</sup> Floor, Core 5,  
SCOPE Complex, Lodhi Road,  
City: New Delhi  
Pin Code: 110003, INDIA

Telephone: + 91 11 45801260; Extn:319, 316 and 315

Kind Attention: Sh. Prabodh Kumar Singh, DGM

E-mail address: [prabodh.singh@eesl.co.in](mailto:prabodh.singh@eesl.co.in)/[mainak.roy@eesl.co.in](mailto:mainak.roy@eesl.co.in)

For more information on EESL, please visit the site at <http://www.eeslindia.org>

# Section 1: Instructions to Bidders

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## A. General

- 1. Scope of Bid**
- 1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of plant and services as specified in Section 6 (Employer's Requirements). The name, identification, and number of lot/s (contract/s) of the open competitive bidding (OCB) are provided in the BDS.
- 1.2 Throughout this Bidding Document,
- (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**
- 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.
- 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 "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.
- 3. Fraud and Corruption**
- 3.1 ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders, Suppliers, and Contractors, agents, subcontractors, subconsultants, service providers, subsuppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). 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) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;
  - (vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and
  - (vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, 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 or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers 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, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;
  - (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, including declaring ineligible, either indefinitely or for a stated period of time, to participate<sup>1</sup> 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 the Bidding Documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, to permit ADB or its representative to inspect the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

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<sup>1</sup> 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).



- 3.2 All Bidders, consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:
- (a) being available to be interviewed and replying fully and truthfully to all questions asked;
  - (b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;
  - (c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;
  - (d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);
  - (e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and
  - (f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.
- 3.3 All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contract with its sub-consultants, subcontractors, and other third parties engaged or involved in ADB-related activities, such sub-consultants, subcontractors, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.
- 3.4 The Employer hereby puts the Bidder on notice that the Bidder or any Joint Venture partner of the Bidder (if any) may not be able to receive any payments under the Contract if the Bidder or any of its Joint Venture partners, as appropriate, is, or is owned (in whole or in part) by a person or entity subject to applicable sanctions.
- 3.5 Furthermore, Bidders shall be aware of the provision stated in GCC 9.6 and GCC 42.2.1 (c).
- 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 partners shall be jointly and severally liable, and
  - (b) the Joint Venture shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the partners 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 partners 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 Employer 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, Joint Venture partner, associates, parent company or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the plant 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 Employer or Borrower as Project Manager for the Contract; or
  - (h) a Bidder would be providing goods, works, or nonconsulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm.
  - (i) A Bidder that has a financial or familial relationship with staff of the Employer including project implementing/executing agency, or of a recipient of a part of the loan who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unless the conflict stemming from such relationship has been resolved in a

manner acceptable to ADB throughout the procurement process and execution of the contract.

- 4.4 A firm will 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 and such bid may be in breach of debarment conditions, thereby subject to further ADB's investigation.
- 4.5 Government-owned enterprises in the Borrower'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 dependent agencies of the Employer.
- 4.6 A Bidder shall not be under suspension from bidding by the Employer as the result of the execution of a Bid-Securing Declaration.
- 4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.
- 4.8 Bidders 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 from, or payments to, a particular country, person, or entity in respect of goods or services originating in that country. Where the Borrower's country prohibits payments to a particular person or entity or for particular goods or services by such an act of compliance, that firm shall be excluded.
- 5. Eligible Plant and Services**
- 5.1 The plant and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 and all expenditures under the Contract will be limited to such plant and services.
- 5.2 For purposes of ITB 5.1 above, "origin" means the place where the plant, or component parts thereof are mined, grown, produced, or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

## **B. Contents of Bidding Document**

- 6. Sections of Bidding Document**
- 6.1 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.

### **PART I Bidding Procedures**

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)

**PART II Requirements**

Section 6 - Employer's Requirements (ERQ)

**PART III Conditions of Contract and Contract Forms**

Section 7 - General Conditions of Contract (GCC)

Section 8 - Special Conditions of Contract (SCC)

Section 9 - Contract Forms (COF)

- 6.2 The IFB issued by the Employer is not part of the Bidding Document.
- 6.3 The Employer 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 Employer in the IFB.
- 6.4 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.
- 7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting**
- 7.1 A prospective Bidder requiring any clarification on the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the BDS, or raise inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond 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 Employer's response shall be in writing with copies 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 Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 24.2.
- 7.2 The Bidder is advised to visit and examine the site where the plant is to be installed and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a contract for the provision of plant and services. The costs of visiting the site shall be at the Bidder's own expense.
- 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents, will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the pre-bid meeting.
- 7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB

6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.

7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

- 8. Amendment of Bidding Document**
- 8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.
- 8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.
- 8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to ITB 24.2

## C. Preparation of Bids

- 9. Cost of Bidding** 9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer 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 Employer, 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 into 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 The Technical Bid submitted by the Bidder shall comprise the following:
- (a) Letter of Technical Bid;
  - (b) Bid Security or Bid-Securing Declaration, in accordance with ITB 21;
  - (c) alternative Bids, if permissible, in accordance with ITB 13;
  - (d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 22.2;
  - (e) documentary evidence in accordance with ITB 14.1, that the plant and services offered by the Bidder in its Bid or in any alternative Bid, if permitted, are eligible;
  - (f) documentary evidence in accordance with ITB 15, the Bidder's eligibility and qualifications to perform the contract if its Bid is accepted;

- (g) Technical Proposal in accordance with ITB 17.
- (h) documentary evidence in accordance with ITB 16, that the plant and services offered by the Bidder conform to the Bidding Document;
- (i) in the case of a bid submitted by a Joint Venture, the Bid shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement;
- (j) list of subcontractors, in accordance with ITB 17.2; and
- (k) any other document required in the BDS.

11.3 The Price Bid submitted by the Bidder shall comprise the following:

- (a) Letter of Price Bid;
- (b) completed schedules as required, including Price Schedules, in accordance with ITB 12 and ITB 18;
- (c) alternative price Bids, if permissible, in accordance with ITB 13; and
- (d) any other document required in the BDS.

**12. Letter of Bid and Schedules**

12.1 The Letters of Technical Bid and Price Bid, and the Schedules, and all documents listed under ITB 11, shall be prepared using the relevant forms furnished in Section 4 (Bidding Forms). The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested and as required in the BDS.

**13. Alternative Bids**

13.1 The BDS indicates whether alternative Bids are allowed. If they are allowed, the BDS will also indicate whether they are permitted in accordance with ITB 13.3, or invited in accordance with ITB 13.2 and/or ITB 13.4.

13.2 When alternatives to the Time Schedule are explicitly invited, a statement to that effect will be included in the BDS, and the method of evaluating different time schedules will be described in Section 3 (Evaluation and Qualification Criteria).

13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the Employer's requirements as described in the Bidding Document must also provide: (i) a price at which they are prepared to offer a plant meeting the Employer's requirements; and (ii) all information necessary for a complete evaluation of the alternatives by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed installation methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

13.4 When Bidders are invited in the BDS to submit alternative technical solutions for specified parts of the facilities, such parts shall be described in Section 6 (Employer's Requirements). Technical alternatives for the specific parts of the facilities that comply with the performance and technical criteria specified for the plant and services shall be considered by the Employer on their own merits, pursuant to ITB 32.

- 14. Documents Establishing the Eligibility of Plant and Services**
- 14.1 To establish the eligibility of the plant and services in accordance with ITB 5, Bidders shall complete the Country of Origin Declaration Form included in Section 4 (Bidding Forms).
- 15. Documents Establishing the Eligibility and Qualifications of the Bidder**
- 15.1 To establish its eligibility and 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 in Section 4 (Bidding Forms).
- 15.2 Domestic Bidders, individually or in Joint Ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility as described in ITB 38.
- 16. Documents Establishing Conformity of the Plant and Services**
- 16.1 The documentary evidence of the conformity of the plant and services to the Bidding Document may be in the form of literature, drawings and data, and shall furnish:
- (a) a detailed description of the essential technical and performance characteristics of the plant and services, including the functional guarantees of the proposed plant and services, in response to the Specification;
  - (b) a list giving full particulars, including available sources, of all spare parts and special tools necessary for the proper and continuing functioning of the plant for the period named in the BDS, following completion of plant and services in accordance with provisions of the contract; and
  - (c) a commentary on the Employer's Specifications and adequate evidence demonstrating the substantial responsiveness of the plant and services to those specifications. Bidders shall note that standards for workmanship, materials and equipment designated by the Employer in the Bidding Document are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalog numbers in its Bid, provided that it demonstrates to the Employer's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Specifications.
- 17. Technical Proposal, Subcontractors**
- 17.1 The Bidder shall furnish a Technical Proposal, including a statement of work methods, equipment, personnel, schedule, environmental, health and safety (EHS) management plan commensurate with the proposed scope of works, EHS Code of Conduct, and any other information as stipulated in Section 4 (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.
- 17.2 For major items of plant and services as listed by the Employer in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria), which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including Manufacturers, for each of those items. In addition, the Bidder shall include in its Bid information establishing compliance with the requirements specified by the Employer for these items. Bidders are free to list more than one Subcontractor against each item of the plant and services. Quoted rates and prices will be deemed

to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

- 17.3 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB 4, and that any plant, or services to be provided by the Subcontractor comply with the requirements of ITB 5 and ITB 15.1

**18. Bid Prices and Discounts**

- 18.1 Unless otherwise specified in the BDS and/or Section 6 (Employer's Requirements), bidders shall quote for the entire plant and services on a "single responsibility" basis such that the total Bid price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the Bidding Document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation, and completion of the plant. This includes all requirements under the Contractor's responsibilities for testing, pre-commissioning and commissioning of the plant and, where so required by the Bidding Document, the acquisition of all permits, approvals, and licenses, etc.; the operation, maintenance, and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.

- 18.2 Bidders are required to quote the price for the commercial, contractual, and technical obligations outlined in the Bidding Document. The prices for all items in the Price Schedules shall be expressed in positive values. If the prices are expressed in negative values, the bid will be rejected.

- 18.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section 4 (Bidding Forms). Where no different Price Schedules are included in the Bidding Document, Bidders shall present their prices in the following manner: Separate numbered Schedules included in Section 4 (Bidding Forms) shall be used for each of the following elements. The total amount from each Schedule (Nos. 1 to 4) shall be summarized in a Grand Summary (Schedule No. 5) giving the total bid price(s) to be entered in the Letter of Price Bid. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.

Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad

Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer's Country

Schedule No. 3: Design Services

Schedule No. 4: Installation and Other Services

Schedule No. 5: Grand Summary (Schedule Nos. 1 to 4)

Schedule No. 6: Recommended Spare Parts

Bidders shall note that the plant and mandatory spare parts included in Schedule Nos. 1 and 2 above exclude materials used for civil, building, and other construction works. All such materials shall be included and priced under Schedule No. 4, Installation and Other Services.



- 18.4 In the Schedules, Bidders shall give the required details and a breakdown of their prices as follows:
- (a) Plant to be Supplied from Abroad (Schedule No. 1):
    - (i) the price of the plant shall be quoted carriage and insurance paid (CIP)-named place of destination basis specified in the BDS;
    - (ii) all customs duties and other taxes paid or payable in the Employer's country on the plant if the contract is awarded to the Bidder; and
    - (iii) the total price for the plant.
  - (b) Plant Supplied from Within the Employer's Country (Schedule No. 2):
    - (i) the price of the plant shall be quoted on an EXW Incoterm basis (ex works, ex factory, ex warehouse, ex showroom, 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 plant quoted ex works or ex factory, or on the previously imported plant of foreign origin quoted ex warehouse, ex showroom;
    - (ii) sales tax and other taxes payable in the Employer's country on the plant if the contract is awarded to the Bidder, and
    - (iii) the total price for the plant.
  - (c) Design Services. (Schedule No. 3). Rates or prices shall include all taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of Bids.
  - (d) Installation and Other Services (Schedule No. 4) shall be quoted separately and shall include rates or prices for local transportation, insurance, and other services incidental to delivery of the plant, all labor, contractor's equipment, temporary works, materials, consumables, and all matters and things of whatsoever nature, including operations and maintenance services, the provision of operations and maintenance manuals, training, etc., where identified in the Bidding Document, as necessary for the proper execution of the installation and other services, including all taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of bids.
  - (e) Recommended spare parts (Schedule No. 6) shall be quoted separately as specified in either subparagraph (a) or (b) above in accordance with the origin of the spare parts.
- 18.5 The current edition of Incoterms, published by the International Chamber of Commerce shall govern.
- 18.6 The prices shall be either fixed or adjustable as specified in the BDS.
- (a) In the case of Fixed Price, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation will be treated as nonresponsive and rejected.
  - (b) In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport, and

contractor's equipment in accordance with the procedures specified in the corresponding appendix to the Contract Agreement. A Bid submitted with a fixed price quotation will be treated as nonresponsive and be rejected. The Bidder shall furnish the indexes (e.g. for labor and materials), their weightings and source in the Tables of Adjustment Data included in Section 4 (Bidding Forms). The Employer may require the Bidder to justify its proposed indexes and weightings. Any bid that omits indexes and weightings shall be subject to clarification with the Bidder.

18.7 If so indicated in BDS 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer any price reduction (discount) for the award of more than one contract shall specify in their Letter of Price Bid the price reductions applicable to each package, or alternatively, to individual contracts within the package, and the manner in which the price reductions will apply.

**19. Currencies of Bid and Payment**

19.1 The currency(ies) of the bid shall be, as specified in the BDS.

19.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements.

**20. Period of Validity of Bids**

20.1 Bids shall remain valid for the bid validity period specified in the BDS. The bid validity period starts from the date fixed for the bid submission deadline date prescribed by the Employer in accordance with ITB 24.1. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.

20.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer 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.

**21. Bid Security/ Bid Securing Declaration**

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.

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 Employer 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.

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:

- (a) an unconditional bank guarantee (hard copy of the bank guarantee or in the form of SWIFT message MT760), or
- (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 using either the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Employer. 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 Employer as nonresponsive.
- 21.5 If a bid security is specified pursuant to ITB 21.1, the bid security of substantially nonresponsive Technical Bids shall be returned before opening the Price Bids. The bid security of unsuccessful Bidders at Price Bid evaluation shall be returned promptly 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 successful Bidders shall be returned promptly once the successful Bidder has signed the Contract and furnished the required performance security.
- 21.7 The bid security may be forfeited or the Bid-Securing Declaration executed, if
- (a) notwithstanding ITB 26.3, a Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, except as provided in ITB 20.2 or
  - (b) the successful Bidder fails to:
    - (i) sign the Contract 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 If the bid security is required as per ITB 21.1, the bid security 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 shall be in the name of any or all of the Joint Venture partners. If the Bid-Securing Declaration is required as per ITB 21.1, 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-Securing Declaration shall be in the names of all future partners as named in the letter of intent referred to 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 comprising the Bid as described in ITB 11 and clearly mark it "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID". Alternative bids, if permitted in accordance with ITB 13, shall be clearly marked "ALTERNATIVE". In addition, the Bidder shall submit copies of the Bid, in the number specified in the BDS and clearly mark each of them "COPY." 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. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Employer 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 period stated in the Employer's request shall cause the rejection of the Bid. If either the Letter of Technical Bid or Letter of Price Bid or the Bid-Securing Declaration (if applicable) is not signed, the Bid shall be rejected.

- 22.3 A Bid submitted by a Joint Venture shall be signed so as to be legally binding on all partners.
- 22.4 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

## D. Submission and Opening of Bids

- 23. **Submission, Sealing, and Marking of Bids**
  - 23.1 Bidders shall submit their Bids as specified in the BDS. Procedures for submission, sealing and marking are as follows:
    - (a) Bidders submitting Bids by mail or by hand shall enclose the original and each copy of the Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL," "ALTERNATIVE," and "COPY." 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 Employer in accordance with ITB 24.1, and
    - (c) bear the specific identification of this bidding process indicated in the BDS 1.1.
  - 23.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB 27.1.
  - 23.4 The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB 27.7.
  - 23.5 Alternative Bids, if permissible in accordance with ITB 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB 20 and ITB 21, with the inner envelopes marked in addition "ALTERNATIVE NO...." as appropriate.

- 23.6 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.
- 24. Deadline for Submission of Bids**
- 24.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.
- 24.2 The Employer 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 Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
- 25. Late Bids**
- 25.1 The Employer shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 24. Any Bid received by the Employer 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 for withdrawal notices, which 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 for withdrawal notices, which do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
  - (b) received by the Employer 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 Letter of Technical Bid or any extension thereof.
- 27. Bid Opening**
- 27.1 The Employer 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. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening. If the Technical Bid and the Price Bid are submitted together in one envelope, the Employer may reject the entire Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.
- 27.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with 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 at bid opening.

- 27.3 Second, 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 27.1. 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.
- 27.4 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 27.1.
- 27.5 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 Employer 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 Letter of Technical Bid are to be initialed by at least three representatives of the Employer 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.
- 27.6 The Employer 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, or modification; and alternative Bids; 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 who submitted Bids on time, and posted online when electronic bidding is permitted.
- 27.7 At the end of the evaluation of the Technical Bids, the Employer 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 Employer. Bidders shall be given reasonable notice of the opening of Price Bids.
- 27.8 The Employer will notify in writing Bidders who have been rejected for submitting nonresponsive Technical Bids and return their Price Bids unopened together with their bid securities, before opening the Price Bids of the substantially responsive Bidders.

- 27.9 The Employer 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 Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.
- 27.10 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 Employer 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 Letter of Price Bid and Price Schedules are to be initialed by at least three representatives of the Employer attending bid the opening. No Bid shall be rejected at the opening of Price Bids.

- 27.11 The Employer 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**

- 28. Confidentiality**
- 28.1 Information relating to the evaluation of Bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until publication of Contract award.
- 28.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
- 28.3 Notwithstanding ITB 28.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it should do so in writing.
- 29. Clarification of Bids**
- 29.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 36.

- 29.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.
- 30. Deviations, Reservations, and Omissions**
- 30.1 During the evaluation of Bids, the following definitions apply:
- (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**
- 31.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted. If any of these documents or information is missing, the Bid may be rejected.
- 31.2 The Employer 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) Letter of Technical Bid;
  - (b) written confirmation of authorization to commit the Bidder;
  - (c) Bid Security or Bid-Securing Declaration, if applicable; and
  - (d) Technical Proposal in accordance with ITB 17.
- 32. Responsiveness of Technical Bid**
- 32.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB11.
- 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 plant and services specified in the Contract; or
    - (ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or
  - (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.
- 32.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 17, Technical Proposal, in particular to confirm that all requirements of Section 6 (Employer's Requirements) have been met without any material deviation, reservation, or omission.
- 32.4 If a Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be



made responsive by correction of the material deviation, reservation, or omission.

**33. Nonmaterial Nonconformities**

- 33.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.
- 33.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
- 33.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or nonconforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).

**34. Detailed Evaluation of Technical Bids**

- 34.1 The Employer will carry out a detailed technical evaluation of the Bids not previously rejected as being substantially nonresponsive, to determine whether the technical aspects are in compliance with the Bidding Document. The Bid that does not meet minimum acceptable standards of completeness, consistency, and detail, and the specified minimum and/or maximum requirements for specified functional guarantees, will be treated as nonresponsive and hence rejected. To reach such a determination, the Employer will examine and compare the technical aspects of the bids on the basis of the information supplied by the Bidders, taking into account the following:
- (a) overall completeness and compliance with the Employer's Requirements; deviations from the Employer's Requirements; conformity of the plant and services offered with specified performance criteria; suitability of the plant and services offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the Bid. The Bid that does not meet minimum and/or maximum acceptable standards of completeness, consistency, and detail will be rejected for nonresponsiveness;
  - (b) type, quantity, and long-term availability of mandatory and recommended spare parts and maintenance services; and
  - (c) other relevant factors, if any, listed in Section 3 (Evaluation and Qualification Criteria).
- 34.2 Where alternative technical solutions have been allowed in accordance with ITB 13, and offered by the Bidder, the Employer will make a similar evaluation of the alternatives. Where alternatives have not been allowed but have been offered, they shall be ignored.

- 35. Eligibility and Qualification of the Bidder**
- 35.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether a Bidder meets the eligibility and qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).
- 35.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 15. Unless permitted in the BDS, the determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates.
- 35.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. The Employer reserves the right to reject the bid of any bidder found to be in circumstances described in GCC 42.2.1(a). A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.
- 35.4 The capabilities of the manufacturers and subcontractors proposed in its Bid for the major items of plant and services to be used by a Bidder will also be evaluated for acceptability in accordance with Section 3 (Evaluation and Qualification Criteria). Their participation should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to propose, without changing its bid price, an acceptable substitute manufacturer or subcontractor meeting the minimum technical specifications stated in Section 6 (Employer's Requirements). If a Bidder does not provide an acceptable substitute manufacturer or subcontractor by the date and time set in the Employer's request for substitution of manufacturer or subcontractor, its Bid may be rejected.
- 35.5 Prior to signing the Contract, the corresponding Appendix to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.
- 36. Correction of Arithmetical Errors**
- 36.1 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:
- (a) where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the amounts given under the column for the price breakdown shall prevail and the Total Price will be corrected accordingly;
  - (b) where there are errors between the total of the amounts of Schedule Nos. 1 to 4 and the amount given in Schedule No. 5 (Grand Summary), the total of the amounts of Schedule Nos. 1 to 4 shall prevail and the Schedule No. 5 (Grand Summary) will be corrected accordingly;
  - (c) if there is a discrepancy between the grand total price given in Schedule No. 5 (Grand Summary) and the bid amount in item (c) of the Letter of Price Bid, the grand total price given in Schedule No. 5 (Grand Summary) will prevail and the bid amount in item (c) of the Letter of Price Bid will be corrected; and
  - (d) 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 arithmetical error, in which case the amount in figures shall prevail subject to (a), (b), and (c) 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.
- 37. Conversion to Single Currency** 37.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS.
- 38. Domestic Preference** 38.1 Unless otherwise specified in the BDS, domestic preference shall not apply.
- 39. Evaluation and Comparison of Price Bids** 39.1 The Employer shall use the criteria and methodologies listed in this clause. No other evaluation criteria or methodologies shall be permitted.
- 39.2 I. To evaluate a Price Bid, the Employer shall consider the following:
- (a) the bid price, excluding provisional sums and the provision, if any, for contingencies in the Price Schedules;
  - (b) price adjustment for correction of arithmetical errors in accordance with ITB 36.1;
  - (c) price adjustment due to discounts offered in accordance with ITB 18.7;
  - (d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 33.3;
  - (e) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 37;
  - (f) assessment whether the bid is abnormally low in accordance with ITB 40; and
  - (g) the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).
- II. The Employer's evaluation of a Bid will exclude and not take into account,
- (a) in the case of Plant and Mandatory Spare Parts (Schedule No. 1) supplied from abroad, all taxes and duties, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder; and
  - (b) in the case of Plant and Mandatory Spare Parts (Schedule No. 2) supplied from within the Employer's country, sales and other taxes, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder.
- 39.3 If price adjustment is allowed in accordance with ITB 18.6, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
- 39.4 If this 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 Letter of Price Bid, is specified in Section 3 (Evaluation and Qualification Criteria).

- 39.5 If the Bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Price Schedules, to demonstrate the internal consistency of those prices with the methods and time schedule proposed. After evaluation of the price analyses, taking into consideration the terms of payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.
- 39.6 The Employer shall compare all substantially responsive Bids to determine the lowest evaluated Bid, in accordance with ITB 39.2.

#### **40. Abnormally Low Bids**

- 40.1 An abnormally low bid is one where the bid price, in combination with other elements of the bid, appears to be so low that it raises concerns as to the capability of the Bidder to perform the contract for the offered bid price.
- 40.2 When the offered bid price appears to be abnormally low, the Employer shall undertake a three-step review process as follows:
- (a) identify abnormally low costs and unit rates by comparing them with the engineer's estimates, other substantially responsive bids, or recently awarded similar contracts;
  - (b) clarify and analyze the bidder's resource inputs and pricing, including overheads, contingencies and profit margins; and
  - (c) decide whether to accept or reject the bid.
- 40.3 With regard to ITB 40.2 (b) above, the Employer will seek a written explanation from the bidder of the reasons for the offered bid price, including a detailed analysis of costs and unit prices, by reference to the scope, proposed methodology, schedule, and allocation of risks and responsibilities. This may also include information regarding the economy of the manufacturing process; the services to be provided, or the construction method to be used; the technical solutions to be adopted; and any exceptionally favorable conditions available to the bidder for the works, equipment or services proposed.
- 40.4 After examining the explanation given and the detailed price analyses presented by the bidder, the Employer may:
- (a) accept the bid, if the evidence provided satisfactorily accounts for the low bid price and costs, in which case the bid is not considered abnormally low;
  - (b) accept the bid, but require that the amount of the performance security be increased at the expense of the bidder to a level sufficient to protect the Employer against financial loss. The amount of the performance security shall generally be not more than 20% of the contract price; or
  - (c) reject the bid if the evidence provided does not satisfactorily account for the low bid price, and make a similar determination for the next ranked bid, if required.

#### **41. Employer's Right to Accept Any Bid, and to**

- 41.1 The Employer 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 Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

## Reject Any or All Bids

- 42. Notice of Intention for Award of Contract**      42.1 If Standstill provisions apply as specified in the BDS, the standstill period shall be defined in the BDS to specify the duration subsequent to notification of intention for award of contract (before making the actual contract award) within which any unsuccessful bidder can challenge the proposed award.

## F. Award of Contract

- 43. Award Criteria**      43.1 The Employer shall award the Contract to the Bidder whose offer has been determined successful in line with ITB 34 to ITB 40 above to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be eligible and qualified to perform the Contract satisfactorily.
- 44. Notification of Award**      44.1 Prior to the expiration of the period of bid validity and upon expiry of the standstill period specified in ITB 42.1, or upon satisfactory resolution of a complaint filed within standstill period, if applicable, the Employer shall transmit the Notification of Award through issuance of Letter of Acceptance using the form included in Section 9 (Contract Forms) to the successful Bidder, in writing, that its Bid has been accepted. At the same time, the Employer shall also notify all other Bidders of the results of the bidding.
- 44.2 Unless standstill period applies, upon notification of award through issuance of Letter of Acceptance, unsuccessful Bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond in writing and/or in a debriefing meeting 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 through issuance of Letter of Acceptance shall constitute a binding Contract.
- 44.4 Within 2 weeks of the award of contract or expiry of the standstill period, where such period applies, or, if a complaint has been filed within the standstill period, upon receipt of ADB's confirmation of satisfactory resolution of the complaint, the borrower shall publish in an English language newspaper or widely known and freely accessible website the results identifying the bid and lot or package numbers, as applicable and the following information:
- (a) name of each Bidder who submitted a bid;
  - (b) bid prices as read out at bid opening;
  - (c) name and evaluated prices of each bid that was evaluated;
  - (d) name of Bidders whose Bids were rejected and the reasons for their rejection; and
  - (e) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.

- 45. Signing of Contract**
- 45.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.
- 45.2 Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
- 46. Performance Security**
- 46.1 Within 28 days of the receipt of notification of award through issuance of Letter of Acceptance from the Employer, the successful Bidder shall furnish the performance security in accordance with the conditions of contract, subject to ITB 39.5 and ITB 40.4, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Employer. If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.
- 46.2 Failure of the successful Bidder to submit the abovementioned performance security or sign the Contract 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 Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.
- 47. Bidding-Related Complaints**
- 47.1 The procedures for dealing with Bidding-Related Complaints arising out of this bidding process are specified in the BDS.

### Section 2: Bid Data Sheet

This section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section 1 (Instructions to Bidders).

#### A. General

<p><b>ITB 1.1</b></p>	<p>The number of the Invitation for Bids (IFB) is: <b>EESL/06/2023-24/ICB/ADB/Solar/232402035</b></p> <p>The Employer is: <b>Energy Efficiency Services Limited</b></p> <p>The name of the open competitive bidding (OCB) is: <b>Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra.</b></p> <p>The identification number of the OCB is: <b>EESL/06/2023-24/ICB/ADB/Solar/232402035</b></p> <p>The number and identification of lots (contracts) comprising this OCB is:</p> <table border="1"> <thead> <tr> <th>Lot</th> <th>Site/Location</th> <th>Size in MW</th> </tr> </thead> <tbody> <tr> <td>Lot 1</td> <td>At Specified Location (<i>refer Annexure-1 of Section-6</i>) within the State of Maharashtra</td> <td>30 MW</td> </tr> <tr> <td>Lot 2</td> <td>At Specified Location (<i>refer Annexure-1 of Section-6</i>) within the State of Maharashtra</td> <td>20 MW</td> </tr> <tr> <td>Lot 3</td> <td>At Specified Location (<i>refer Annexure-1 of Section-6</i>) within the State of Maharashtra</td> <td>20 MW</td> </tr> </tbody> </table> <p>The above scope of work is indicative and the detailed scope of work is given in the Section-6 of the Bidding documents.</p>	Lot	Site/Location	Size in MW	Lot 1	At Specified Location ( <i>refer Annexure-1 of Section-6</i> ) within the State of Maharashtra	30 MW	Lot 2	At Specified Location ( <i>refer Annexure-1 of Section-6</i> ) within the State of Maharashtra	20 MW	Lot 3	At Specified Location ( <i>refer Annexure-1 of Section-6</i> ) within the State of Maharashtra	20 MW
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Lot 3	At Specified Location ( <i>refer Annexure-1 of Section-6</i> ) within the State of Maharashtra	20 MW											
<p><b>ITB 2.1</b></p>	<p>The Borrower is: Government of India</p> <p>The name of the Project is: <b>Scaling Up Demand-Side Energy Efficiency Sector Project</b></p> <p>Loan No. : 3867 - IND</p>												

<p><b>ITB 4.1(b)</b></p>	<p><b>To be replaced by the following:</b></p> <p>Bids submitted by a Joint Venture (JV) of two or more partners shall comply with the following requirements:</p> <ul style="list-style-type: none"> <li>(i) The bid, and, in case of successful bid, the specified Form of Agreement shall be signed as to be legally binding on all partners.</li> <li>(ii) One of the partners shall be nominated as Leader, and this authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatories of all the partners (Section 4. Bidding Forms).</li> <li>(iii) The Leader shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture, and the entire execution of the Contract shall be done with the Leader and payment under the Contract shall be received by the Leader on behalf of the Joint Venture, as per power conferred to him in the Power of Attorney. The payment under the contract can also be received by other Partner (s) based on authorization of Leader.</li> <li>(iv) All partners of the Joint Venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a statement to this effect shall be included in the authorization mentioned under (ii) above as well as in the Letter of Bid (Bid Form) and in the Contract Form (in case of a successful bid).</li> <li>(v) Agreement (Section 4. Bidding Forms) entered into by the Joint Venture partners shall be submitted with the bid.</li> <li>(vi) The joint venture agreement should indicate precisely the responsibility of all members of JV in respect of Planning, Design, Engineering, Supply, Storage, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance. All members of JV should have active participation in execution during the currency of the Contract. This should not be varied/ modified subsequently without prior approval of the Employer.</li> <li>(vii) The Bid Security/Performance Security (<i>to be submitted by successful Bidder</i>) shall be in the name of the Joint Venture and not in the name of the Leader or any other Partner(s) of the Joint Venture</li> </ul>
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## B. Contents of Bidding Documents

<b>ITB 6.2</b>	<p><b>Replace with the following:</b></p> <p>The Invitation for Bids issued by the Employer is not part of the Bidding Document.</p> <p>The Bidding Documents are available on e-Procurement portal <a href="https://www.tenderwizard.com/EESL">https://www.tenderwizard.com/EESL</a> (also referred as e-Tendering portal). Bidders shall submit their response to this Invitation for Bids electronically through the e-Procurement portal only. The submission of bids through any other mode is not permitted. Bids, if any, submitted through any other mode shall not be accepted by the Employer.</p> <p>a) Bidders are required to register themselves in the e-Procurement portal for participation in the bidding against the Invitation for Bids published. Prospective bidders must visit the website and complete the registration process in time. There is no registration fee for tenders floated by EESL.</p> <p>A Bid Document fee (Bid fee) of <b>INR 25,000/- or USD 302</b> is required to be paid by Demand Draft in favour of Energy Efficiency Services Limited payable at New Delhi as per the process of payment of fee submission specified in ITB clause 22.1.</p> <p>In addition to above, Bid Document fee may also be submitted online through RTGS. The detail of RTGS is as mentioned below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Account Name</th> <th style="text-align: center;">Account No.</th> <th style="text-align: center;">Bank Name</th> <th style="text-align: center;">Branch Name</th> <th style="text-align: center;">RTGS DETAIL</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">ENERGY EFFICIENCY SERVICES LIMITED</td> <td style="text-align: center;">216400210001 2319</td> <td style="text-align: center;">Punjab National Bank</td> <td style="text-align: center;">LARGE CORPO RATE BRIN DELHI</td> <td>IFSC CODE: PUNB0216400 MICR Code: 110751001 BRANCH: DELHI NEW, L.C.B. ADDRESS: TOLSTOY HOUSE, TOLSTOY MARG, NEW DELHI, DELHI- 110001</td> </tr> </tbody> </table> <p><b>Note: Bidders submitting Bid Fee through RTGS shall upload the scan copy of receipt of transfer of amount in Envelope-1 as mentioned at ITB 11.1. Participation of bidder shall be subject to confirmation of amount transferred through RTGS. The details mentioned in</b></p>	Account Name	Account No.	Bank Name	Branch Name	RTGS DETAIL	ENERGY EFFICIENCY SERVICES LIMITED	216400210001 2319	Punjab National Bank	LARGE CORPO RATE BRIN DELHI	IFSC CODE: PUNB0216400 MICR Code: 110751001 BRANCH: DELHI NEW, L.C.B. ADDRESS: TOLSTOY HOUSE, TOLSTOY MARG, NEW DELHI, DELHI- 110001
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	<p><b>document uploaded as proof of transfer of amount shall only be considered for verification purpose.</b></p> <p>Bidder's failure to submit the Bidding Document fee alongwith the Bid or subsequently pursuant to ITB Clause 29, shall lead to rejection of the Bid.</p> <p>b) Bidders are informed to get acquainted with the bid submission process in e-Procurement portal by contacting Employer at the address specified below:</p> <p>Attention: Sh. Prabodh Kumar Singh, DGM (Contracts)  Street Address: Core 5, SCOPE Complex, Lodhi Road,  Floor/Room number: Fourth Floor  City: New Delhi  Pin code: 110003,  Country: India  Telephone: + 91 11 45801260; Extn:321 and 359  E-mail address: <a href="mailto:prabodh.singh@eesl.co.in">prabodh.singh@eesl.co.in</a>/<a href="mailto:mainak.roy@eesl.co.in">mainak.roy@eesl.co.in</a></p>
<p><b>ITB 7.1</b></p>	<p>For <b><u>clarification purposes</u></b> only, the Employer's address is:</p> <p>Attention: Sh. Prabodh Kumar Singh, DGM (Contracts)  Street Address: Core 5, SCOPE Complex, Lodhi Road,  Floor/Room number: Fourth Floor  City: New Delhi  Pin code: 110003,  Country: India  Telephone: + 91 11 45801260; Extn:321 and 359  E-mail address: <a href="mailto:prabodh.singh@eesl.co.in">prabodh.singh@eesl.co.in</a>/<a href="mailto:mainak.roy@eesl.co.in">mainak.roy@eesl.co.in</a></p> <p>Bidders are advised to send the queries prior to the date of pre-bid meeting.</p> <p>The Employer shall publish its response to the queries in the e-Procurement portal where the tender is published online.</p>
<p><b>ITB 7.4</b></p>	<p>A Pre-Bid meeting will take place. Date, time and place are as follows:</p> <p>Date: <b>12 Aug 2024</b></p> <p>Time: 1500 hrs (Indian Standard Time (IST))</p> <p>Place:</p>

	<p>Street Address: Core 5, SCOPE Complex, Lodhi Road,  Floor/Room number: Fourth Floor  City: New Delhi  Pin code: 110003,  Country: India</p> <p>A site visit conducted by the Employer will not be organized.</p> <p>Note: The pre-bid meeting shall be conducted online, for which requisite link is provided below. However, those Bidders who wish to attend physically, may do so by reaching the aforementioned address at stipulated date and time.</p> <p>Link for online pre-bid meeting:  <a href="https://teams.microsoft.com/dl/launcher/launcher.html?url=%2F_%23%2F1%2Fmeetup-join%2F19%3Ameeting_YTIzOGY1OWEtZTRjNS00OTU2LWEwMTMtYzg1ODE3ZDc1M2Zk%40thread.v2%2F0%3Fcontext%3D%257b%2522Tid%2522%253a%25224a993be3-3ce0-49c4-96e9-23324992b1dd%2522%252c%2522Oid%2522%253a%2522f8552825-a885-4cd3-8928-3de07203f6b3%2522%257d%26anon%3Dtrue&amp;type=meetup-join&amp;deeplinkId=8db1a8ec-58d4-4161-9212-bd4eb11cd64e&amp;directDl=true&amp;msLaunch=true&amp;enableMobilePage=true&amp;suppressPrompt=true">https://teams.microsoft.com/dl/launcher/launcher.html?url=%2F_%23%2F1%2Fmeetup-join%2F19%3Ameeting_YTIzOGY1OWEtZTRjNS00OTU2LWEwMTMtYzg1ODE3ZDc1M2Zk%40thread.v2%2F0%3Fcontext%3D%257b%2522Tid%2522%253a%25224a993be3-3ce0-49c4-96e9-23324992b1dd%2522%252c%2522Oid%2522%253a%2522f8552825-a885-4cd3-8928-3de07203f6b3%2522%257d%26anon%3Dtrue&amp;type=meetup-join&amp;deeplinkId=8db1a8ec-58d4-4161-9212-bd4eb11cd64e&amp;directDl=true&amp;msLaunch=true&amp;enableMobilePage=true&amp;suppressPrompt=true</a></p>
<b>ITB 7.5</b>	<p><b>Replace with the following:</b></p> <p>The Bidder is requested to submit any questions in writing, to reach the Employer not later than 3 days before the pre-bid meeting.</p>
<b>ITB 7.6</b>	<p><b>Replace with the following:</b></p> <p>Minutes of the pre-bid meeting, if applicable, including the text of the questions raised without identifying the source, and the responses given, together with any responses prepared after the meeting, will be posted on the e-Procurement portal only. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum through the e-Procurement/e-Tendering portal pursuant to ITB 8 and not through the minutes of the pre-bid meeting.</p>
<b>ITB 8.1</b>	<p><b>Replace with the following:</b></p> <p>At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda through the e-Procurement portal in accordance with ITB 7.6.</p>

<b>ITB 8.2</b>	<p><b>Replace with the following:</b></p> <p>Any addendum /addenda issued shall be part of the Bidding Document and shall be published in the same e-Procurement portal on which the tender was published online. The onus is on the bidder to visit the e-Procurement portal to learn about the addendum and to submit its response as per the addendum published.</p>
<b>ITB 8.3</b>	<p><b>Replace with the following:</b></p> <p>To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 24.2 by issuing a notification in the e-Procurement portal.</p>

### C. Preparation of Bids

<b>ITB 10.1</b>	The language of the Bid is: English
<b>ITB 11.1</b>	<p><b>Replace sub clause 11.1 with the following:</b></p> <p>The Bid shall comprise of two envelopes: Envelope-1 (First Envelope i.e. Techno Commercial Bid) and Envelope-2 (Second Envelope, i.e., Price Bid), submitted simultaneously as per the details mentioned below.</p> <p>A) <u>The following shall be submitted as part of Envelope-1 (First Envelope i.e. Techno Commercial Bid):</u></p> <p>The Hard Copy and Soft Copy parts of Envelope-1 (First Envelope i.e. Techno Commercial Bid) of the bid shall comprise the following:</p> <p><b>I. Hard Copy Part</b></p> <p>As Hard copy part of <b>Envelope -1 (First Envelope i.e. Techno Commercial Bid)</b>, the bid shall comprise of following documents to be submitted in sealed envelope:</p> <ul style="list-style-type: none"> <li>(i) Demand Draft (DD) or scan copy of receipt of transfer of amount through RTGS, towards Bidding Document fee of the amount in accordance with clause 6.2(a) of ITB, in separate envelope.</li> <li>(ii) Bid Security (in Original) in accordance with clause 21 of ITB, Section-2 in separate envelope (the format is attached at Section-4: Bidding Forms).</li> </ul>

	<p>(iii) Original Joint Venture Agreement</p> <p>(iv) Notarized Power of Attorney authoring the signatory of the Bidder to submit the BID</p> <p>(v) Affidavit regarding correctness of information in the Bid</p> <p>(vi) Any other document further specified in the BDS.</p> <p><b>Bidder shall note that any document/s, required to be submitted as part of Envelope-2 (Second Envelope, i.e. Price Bid), shall not be submitted in Hard Copy Part of Envelope-1.</b></p> <p><b>II. Soft Copy Part</b></p> <p>Soft copy part of <b>Envelope -1 (First Envelope i.e. Techno Commercial Bid)</b>, the bid shall comprise following documents to be uploaded on the e-Procurement portal as per provisions therein.</p> <p>(i) First Envelope Bid Form (Letter of Technical Bid) as per format given in Section-4: Bidding Forms.</p> <p>(ii) Declaration of the Lots, for which bid is submitted, as per Attachment -1 of Section-4: Bidding Forms</p> <p>(iii) A power of attorney duly authorized by a notary public, indicating that the person(s) signing the bid has/have the authority to sign the bid and thus the bid is binding upon the bidder during the full period of its validity in accordance with ITB clause 20.1. The said power of attorney to be submitted as Attachment-3 of Bidding Forms, Bidders to use their own format.</p> <p>(iv) Deviation statement as per Attachment -4 of Section-4: Bidding Forms. Confirmation regarding no deviations to the provisions of the Bidding Documents</p> <p style="padding-left: 40px;">NOTE: Bids containing material deviations from or reservation to the terms and conditions and specifications mentioned in the RfP Documents will be treated as non-responsive and will not be considered further.</p> <p>(v) The documentary evidence establishing in accordance with ITB Clause 4, Part-I of the Bidding Documents that the Goods and Services offered by the bidder in its bid are eligible facilities and conform to the Bidding Documents, is to be furnished as Attachment- 5, Section-4: Bidding Forms</p> <p>(vi) Letter of undertaking (as per Attachment-6, Section-4: Bidding Forms) to be executed by the Holding Company Supported by Board Resolution and submitted by the Bidder along with the Bid,</p>
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	<p>in case financial support is being extended by the Holding Company to the Bidder for meeting the stipulated Financial Qualifying Criteria (as applicable)</p> <p>(vii) Details regarding Qualifying Requirement /Eligibility criteria as per formats at Section-4: Bidding Forms.</p> <p>(viii) Delivery and Completion Schedule as per format at Section-4: Bidding Forms</p> <p>(ix) Certificate from Bidder's Banker(s) (as per prescribed formats in Attachment-9, Section-4: Bidding Forms) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders' Bankers</p> <p>(x) In case of Bid from Joint Venture, The Joint Venture Agreement &amp; Power of Attorney of Joint Venture Agreement as per the attached format at Section-4: Bidding Forms.</p> <p><b>Note: For Joint Venture:</b> Apart from the above mentioned documents, JV partner shall submit the following documents</p> <ol style="list-style-type: none"> <li>1. Experience certificate of the individual partners of the Joint Venture issued by the employer / client to the extent of experience claimed by him.</li> <li>2. Copy of registered agreement on JV.</li> <li>3. Notarized Power of Attorney authoring the signatory of the Bidder to submit the BID.</li> </ol> <p>(xi) Documentary evidence regarding bidder's qualifications to perform the contract as required under Qualification Criteria, Section-3 of the Bidding Documents.</p> <p>(xii) Attestation Letter using the form included in Section 4 (Bidding Forms) to demonstrate that works, goods and services, and related materials and products to be used for the Project do not involve production or activities involving forced labor and/or child labor.</p> <p>(xiii) Duly Notarized Copy of Manufacturer's Authorization for all the major items/ equipment specified in Section 6, Employers Requirements.</p> <p>(xiv) Requisite documents regarding registration of the bidder to fulfill the eligibility of the bidder as per clause no. ITB 4 of the Bid Document.</p>
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	<p>(xv) Guaranteed Technical Particulars for all the major equipment specified in Section 6, Employers Requirements.</p> <p>(xvi) Technical Proposal in accordance with ITB 17.</p> <p>(xvii) Any other document as mentioned in the Bidding Documents inter-alia including that required under Section-3 of the Bidding Documents.</p> <p>Note: The format for all the aforementioned Attachments, as applicable, are part of Section-4: Bidding Forms.</p> <p><i>Bidder to note that no document revealing the prices shall be submitted in Envelope-1 along with the techno-commercial bid. Revealing of prices at this juncture in any mode shall lead to outright rejection of the bid. Prices are to be filled in Envelope-2 as per the provision(s) made available by EESL in the prescribed format uploaded on e-Procurement portal.</i></p> <p>B) <u>The following shall be submitted as part of Envelope-2 (Second Envelope, i.e., Price Bid):</u></p> <p>The following to be uploaded in soft copy on e-Procurement portal only:</p> <p>(i) Second Envelope Bid Form (Letter of Price Bid) as per format given in Section-4: Bidding Forms.</p> <p>(ii) The prices are to be filled in prescribed format in soft copy (in excel format) available on e-Procurement portal only. Bidders are requested not to submit the price bid in hard copy at EESL as the same shall not be considered. Price Bid Format as attached at Section-4 of the Bidding document is only for illustration/reference purpose, however, terms and conditions mentioned there in is part of this Bidding Document.</p> <p><b>Note: Bidders who will not submit original Bid Security in Hard Copy part and First Envelope Bid Form in Soft Copy part of Envelope-1 &amp; Second Envelope Bid Form in Envelope-2 shall be considered non-responsive and shall not be considered for further evaluation.</b></p>
<p><b>ITB 11.2</b></p>	<p><b>Replace with the following:</b></p> <p>The contents of Envelope -1 (First Envelope i.e. Techno Commercial Bid) is defined at ITB 11.1.</p>

<b>ITB 11.3</b>	<p><b>Replace with the following:</b></p> <p>The contents of Envelope -2 (Second Envelope i.e. Price Bid) is defined at ITB 11.1.</p>
<b>ITB 12.1</b>	<p>Bidders have to submit the bids on e-Procurement portal <a href="http://www.tenderwizard.com/EESL">www.tenderwizard.com/EESL</a> along with the relevant documents. For this purpose, the bidders shall fill-up the forms that are available for online filling on the portal. The forms shall be downloaded by the bidders and filled up. The filled-up pages shall then be scanned and uploaded on the e-procurement portal along with the scanned copies of the supporting documents as per ITB 11.</p> <p>The bidder shall have to fill the unit prices against all items in the respective column of the BOQ in Excel format uploaded on the e-Procurement portal <a href="http://www.tenderwizard.com/EESL">www.tenderwizard.com/EESL</a>.</p>
<b>ITB 13.1</b>	Alternative bids are not permitted.
<b>ITB 13.2</b>	<b>Alternatives to the Time Schedule shall not be permitted</b>
<b>ITB 13.4</b>	Alternative technical solutions shall be permitted for the following parts of the plant and services: <b>Not applicable</b>
<b>ITB 18.1</b>	Bidders shall quote for the entire plant and services on a single responsibility basis.
<b>ITB 18.3</b>	<p><b>Replace the existing clause by the following:</b></p> <p>Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules as available online on the e-Procurement portal.</p> <p>The Price Schedules will comprise the schedules listed below:</p> <p>Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad</p> <p>Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer's Country</p> <p>Schedule No. 3: Design Services</p> <p>Schedule No. 4: Installation and Other Services</p> <p>Schedule No. 4a: Operation and Maintenance</p>



	<p>Schedule No. 5: Grand Summary (Schedule Nos. 1 to 4 and their sub schedules)</p> <p>Bidders shall note that the plant and mandatory spare parts included in Schedule Nos. 1 and 2 above exclude materials used for civil, building, and other construction works. All such materials shall be included and priced under Schedule No. 4, Installation and Other Services.</p>
<p><b>ITB 18.4(a)</b></p>	<p><b>Replace the existing clause by the following:</b></p> <p>In the Price schedules, Bidder shall give the required details and a break-down of their price considering and taking into account the Input Tax Credit (ITC) as may be available under the Goods and Services Tax (GST), in the schedules as follows:</p> <p>a) Plant to be supplied from abroad (<b>Schedule-1</b>) by a foreign Bidder shall be quoted CIP named place of destination basis [<b>Destination: As per respective Lots</b>].</p> <p>For the purpose of contract administration, the bidder is required to provide break-down of CIP named place of destination basis prices as :</p> <p>(i) CIP Entry Border Point/ CIF Indian Port of Entry basis Price. The breakup up of CIF Price into FOB price, Freight and Insurance charges shall also be quoted in this <b>Schedule-1</b> and</p> <p>(ii) Charges upto Destination for Local/Inland transportation, In-Transit insurance, loading and unloading of the Goods supplied from Abroad shall be quoted separately in <b>Schedule-4</b> as composite supply of services, with local/inland transportation being the Principal Supply.</p> <p>Further, charges for Custom clearance &amp; port handling for CIP/CIF supply of Plant from abroad shall also be quoted in <b>Schedule 1</b>. The Price quoted in respect of Custom clearance &amp; port handling services shall be excluding GST, if any, payable.</p> <p>The Employer shall be responsible and be liable for payment of Customs duty (i.e. Basic Customs duty, Cess, GST etc.) on CIP Entry Border Point/ CIF Indian Port of Entry component of the Goods to be supplied from abroad.</p> <p>However, the Employer, as an importer, shall furnish promptly necessary clarifications and documents as may be required to be furnished by the importer for the purpose of customs clearance.</p>

<p><b>ITB 18.4(b)</b></p>	<p><b>Replace the existing clause by the following:</b></p> <p>b) Plant to be supplied from within the Employer's country, (<b>Schedule 2</b>) shall be quoted on an EXW (ex-factory, ex-works, ex-warehouse or off-the-self, as applicable) basis and shall be inclusive of all cost as well as duties and taxes (viz., customs duties &amp; levies, duties, GST etc.) paid or payable on components, raw materials and any other items used for their consumption incorporated or to be incorporated in the facilities.</p> <p>Bidders offering (i) imported Equipments/items as 'Off the Shelf' or dispatched directly from the Indian Port of disembarkation and/or (ii) bought-out finished Equipments/items as 'Off the Self' items or dispatched directly from the Bidder's works, the price of such Equipments/items shall be inclusive of all cost as well as any duties paid/payable in relation to import of such Equipments/items (viz., customs duties, GST &amp; levies etc.) considering and taking into account the ITC as may be available under the applicable laws including GST.</p> <p>The price quoted in respect of all items in the above schedule shall be excluding GST applicable on transaction between the Employer and the Contractor. The Employer shall be responsible and be liable for payment of such applicable GST on transaction between the Employer and the Contractor.</p>
<p><b>ITB 18.4 (e)</b></p>	<p><b>Replace the existing clause by the following:</b></p> <p>Operation and Maintenance (O&amp;M) Charges (Schedule No. - 4a) shall be quoted separately and shall include rates or prices for providing all O&amp;M services as per the provision of Bidding Documents.</p>
<p><b>ITB 18.4 (f), (g), (h)</b></p>	<p><b>Additional Clause:</b></p> <p>(f) The Input Tax Credit (ITC) available, if any, under the GST scheme as per the relevant Government policies wherever applicable shall be taken into account by the Bidder while quoting bid price.</p> <p>(g) The Bidder shall include insurance charges in its bid prices as per insurance requirement mentioned in Section - 7: General Conditions of Contract (GCC) of the Bidding Documents.</p> <p>(h) Employer shall, deduct taxes at source as per the applicable laws/ rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor.</p>

<b>ITB 18.6</b>	The prices quoted by the Bidder shall be fixed.												
<b>ITB 19.1</b>	<p>The currencies of the Bid shall be as follows:</p> <p>(a) The prices shall be quoted either in the currency of the Bidder's home country, or in any fully convertible currency/(ies).</p> <p>(b) A Bidder expecting to incur a portion of its expenditures in the performance of the Contract in more than one currency, and wishing to be paid accordingly, shall so indicate in the Schedule of Prices and the Letter of Price Bid.</p> <p>(c) If some of the contract expenditures related to Design, Installation and Other Services are to be incurred in the Employer's country, such expenditures shall be quoted in either foreign and/or local currency, depending upon the currency in which the costs are to be incurred.</p> <p>(d) Bidders may be required by the Employer to clarify their local and foreign currency requirements, and to substantiate that the amounts included in the Price Schedules are reasonable and responsive to ITB 18.1 in which case a detailed breakdown of its foreign currency requirements shall be provided by the Bidder</p> <p>(e) During the performance of the contract, the foreign currency portions of the outstanding balance of the Contract Price may be adjusted by agreement between the Employer and the Contractor to reflect any changes in foreign currency requirements for the contract. Any such adjustment shall be effected by comparing the amounts quoted in the bid with the amounts already used in the Facilities and the Contractor's future needs for imported items.</p>												
<b>ITB 20.1</b>	The bid validity period shall be 180 days.												
<b>ITB 21.1</b>	<p>Bidder shall note that Bid Securing Declaration is not applicable for the subject tender.</p> <p>The Bidder shall furnish a bid security in the amount of:</p> <table border="1"> <thead> <tr> <th>Lot</th> <th>INR</th> <th>USD</th> </tr> </thead> <tbody> <tr> <td>Lot-1</td> <td>34,050,000</td> <td>425,000</td> </tr> <tr> <td>Lot-2</td> <td>22,700,000</td> <td>288,000</td> </tr> <tr> <td>Lot-3</td> <td>22,700,000</td> <td>288,000</td> </tr> </tbody> </table>	Lot	INR	USD	Lot-1	34,050,000	425,000	Lot-2	22,700,000	288,000	Lot-3	22,700,000	288,000
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Lot-1	34,050,000	425,000											
Lot-2	22,700,000	288,000											
Lot-3	22,700,000	288,000											

	<p>in the form of Bank Guarantee from Nationalized Bank/Scheduled Bank in India in favour of Energy Efficiency Services Limited, payable at New Delhi.</p> <p>The Bid security in the form of Bank Guarantee shall be valid for a period of <b>208 days</b> from the last day of bid submission. A Bidder submitting Bank Guarantee from outside India, should ensure that the Guaranteeing Bank should have a representative office in India.</p>
<b>ITB 21.2</b>	The ineligibility period is not applicable as Bid Securing Declaration is not applicable for the subject tender.
<b>ITB 21.3</b>	<p>Replace ITB 21.3 with the following:-</p> <p>The bid security shall be, at the Bidder's option, in any of the following forms:</p> <ol style="list-style-type: none"> <li>a. An unconditional bank guarantee in the name of "Energy Efficiency Services Limited", New Delhi ; or</li> <li>b. Fixed deposit receipt pledged in favour of Energy Efficiency Services Limited, New Delhi;</li> <li>c. An irrevocable Letter of Credit in favor of "Energy Efficiency Services Ltd." New Delhi</li> </ol> <p>The above instruments shall be obtained from a reputable source from an eligible country.</p> <p>In the case of a bank guarantee, the bid security shall be submitted using the Bid Security Form included in Section 4 (Bidding Forms). The form must include the complete name of the Bidder. The bid security shall be valid for twenty eight days (28) beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 20.2.</p>
<b>ITB 21.4</b>	<p>Any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Employer as nonresponsive.</p> <p>However, 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 Employer shall request the Bidder to submit a compliant bid security within 7 working days of receiving such a request. Failure to provide a compliant</p>

	bid security within the prescribed period of receiving such a request shall cause the rejection of the Bid.
<b>ITB 22.1</b>	<p><b>Replace the existing clause by the following:</b></p> <p>The Bidder shall prepare the documents comprising the bid as described in ITB 11 and upload them in the e-Procurement portal in the manner as specified hereunder.</p> <p>In addition, the Bidder shall produce originals of the Tender fee and Bid Security, in the manner specified in the BDS. In the event of any discrepancy between the original and the uploaded documents, the original shall prevail.</p> <p><b>I) <u>First Envelope:</u></b></p> <ol style="list-style-type: none"> <li>1) The soft copy part of the First Envelope consisting of the documents listed in ITB Clause 11 shall be uploaded through the e-Procurement portal only. Submission of Soft Copy of any documents by any other means shall not be accepted by the Employer in any circumstances.</li> <li>2) The Hard Copy part of the First Envelope consisting of the documents listed in ITB Clause 11, which includes the following: <ol style="list-style-type: none"> <li>(a) Demand Draft (DD) or scan copy of receipt of transfer of amount through RTGS, towards Bidding Document fee of the amount in accordance with clause 6.2(a) of ITB, in separate envelope.</li> <li>(b) Bid Security (in Original) in accordance with clause 21 of ITB, Section-2 in separate envelope (the format is attached as Attachment-2, Section-4: Bidding Forms).</li> <li>(c) Original Joint Venture Agreement</li> <li>(d) Notarized Power of Attorney authoring the signatory of the Bidder to submit the BID</li> <li>(e) Affidavit regarding correctness of information in the Bid</li> <li>(f) Any other document further specified in the BDS.</li> </ol> </li> </ol> <p><b>II) <u>Second Envelope:</u></b></p> <p>The following to be uploaded in soft copy on e-Procurement portal only:</p> <ol style="list-style-type: none"> <li>(i) Second Envelope Bid Form (Letter of Price Bid) as per format given in Section-4: Bidding Forms.</li> </ol>

	<p>(ii) The prices are to be filled in prescribed format in soft copy (in excel format) available on e-Procurement portal only. Bidders are requested not to submit the price bid in hard copy at EESL as the same shall not be considered. Price Bid Format as attached at Section-4 of the Bidding document is only for illustration/reference purpose, however, terms and conditions mentioned there in is part of this Bidding Document.</p>
<b>ITB 22.2</b>	<p>The written confirmation of authorization to sign on behalf of the Bidder shall consist of:</p> <p>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 .</p> <p>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 11.</p> <p>The written confirmation of authorization to sign on behalf of the Tender shall be uploaded on the e-procurement portal.</p>
<b>ITB 22.2</b>	<p>The Bidder shall submit an acceptable authorization <b>within 7 working days in line with clause ITB 29.2</b> .</p>

#### D. Submission and Opening of Bids

<p><b>ITB 23</b> (sub-clause 23.1, 23.2, 23.3, 23.4, 23.5, 23.6)</p>	<p><b>Replace the existing clause by the following:</b></p> <p>23.1 The Bidder shall submit the bids, through the e-Procurement portal in the manner and including the contents as specified under Cl. ITB 11. Any document submitted through any other means will not be considered as part of the Bid, except for the "Hard Copy" part specified at Cl. ITB 11.1.</p> <p>23.2 All the documents to be submitted in Hard Copy part of Envelope-1, as described at ITB 11.1 which interalia includes Bid Security, DD/RTGS towards Bidding Document Fee, Original Joint Venture Agreement, Notarized Power of Attorney authoring the signatory of the Bidder to submit the bid, Affidavit regarding correctness of</p>
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	<p>information in the Bid, etc. shall be submitted in separate superscribed envelopes as part of Hard copy part of First Envelope.</p> <p>All the envelopes of Hard copy part of Envelope-1 shall also indicate the name and address of the Bidder so that the bid can be returned in case it is declared "late."</p> <p>23.3 The Hard Copy part shall be addressed to the Employer at the address given below, and bear the contract name indicated in the BDS, the Invitation for Bids title and number indicated in the BDS, and the statement "Do Not Open Before [date]," to be completed with the time and date specified in the BDS, pursuant to ITB Sub-Clause 27.1.</p> <p>Address for submission of Hard copy of Documents;</p> <p>Address in Person or by Post:  Sh. Prabodh Kumar Singh, DGM (Contracts)  Energy Efficiency Services Ltd.,  4th Floor, Core 5,  SCOPE Complex, Lodhi Road,  City: New Delhi  Pin code: 110003, INDIA  Telephone: + 91 11 45801260; Extn:321 and 359  E-mail address: prabodh.singh@eesl.co.in/mainak.roy@eesl.co.in</p> <p>(a) Bid Title:</p> <p><b>Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra</b></p> <p><b>EESL/06/2023-24/ICB/ADB/Solar/232402035</b></p> <p>FIRST ENVELOPE</p> <p>(b)Do not open before 1130 hours (Indian Standard Time) on 20 Sept. 2024.</p> <p>Note: Other important instructions to Bidders related to e-tendering portal are enclosed as Attachment-A to this Section-2</p>
ITB 24.1	<p><b>Replace the existing clause by the following:</b></p> <p>Bids must be submitted on the e-Procurement portal not later than the date and time specified hereunder:</p> <p>For <b><u>Hard copy part of the bid submission</u></b>, the Employer's address is  Attention: Sh. Prabodh Kumar Singh, DGM (Contracts)  Energy Efficiency Services Ltd.,</p>

	<p>4th Floor, Core 5, SCOPE Complex, Lodhi Road, City: New Delhi Pin code: 110003, INDIA Telephone: + 91 11 45801260; Extn:321 and 359 E-mail address: prabodh.singh@eesl.co.in/mainak.roy@eesl.co.in</p> <p><b>The deadline for <u>Soft copy part of the bid submission</u> is</b> Date: 20 Sept. 2024 Time: <b>1100 hrs. [e-Procurement portal server Time, which is based on Indian Standard Time (IST)].</b></p> <p><b>The deadline for <u>Hard copy part of the bid submission</u> is</b> <b>Date:</b> 20 Sept. 2024 <b>Time: 10:30 hrs. [Indian Standard Time (IST)].</b></p> <p>The Bidder shall submit its bid before expiry of the date and time for bid submission as specified in the e-Procurement portal. The system will automatically lock the tender as per the server clock. The Time followed in the portal is ordinarily as per Indian Standard Time (IST) which is GMT+5:30 hours.</p> <p>Bid opening date specified in the e-Procurement portal shall be taken as the final date. Employer reserves the right to open bids on or after the announced bid opening date and time specified in the e-Procurement portal <a href="https://www.tenderwizard.com/EESL">https://www.tenderwizard.com/EESL</a></p> <p>Bid submission and bid opening timelines will be defined as per line e-Procurement portal server clock only</p>
ITB 24.3	<p>Add the new sub-clause:</p> <p>The Employer will not be held responsible for delay or difficulty faced by the Bidder during online bid submission on account of issues beyond the Employer's control</p>
ITB 25.1	<p><b>Replace the existing clause by the following:</b></p> <p>The e-Procurement portal would not allow any late submission of bids through the portal after due date &amp; time as specified in ITB clause 24. After electronic online proposal submission, the system generates a unique identification number which is time stamped. This shall be treated as acknowledgement of the bid submission.</p>



	<p>In case Hard copy part of the bid is received by the Employer after the deadline for submission of the same prescribed by the Employer pursuant to ITB Clause 24, but the bidder has uploaded the soft copy part of the bid within the respective stipulated deadline, the bid will be considered as late bid. In such a case, the soft copy part of the first envelope bid uploaded on the portal shall be opened in line with provisions of Bidding Documents. Such bids will be rejected during preliminary examination.</p>
<p><b>ITB 26.4</b></p>	<p><b>Addition of New Clause:</b></p> <p>In case of soft copy part of the Bid:</p> <p>26.4 A Bidder may withdraw, substitute, or modify its bid on the e-Procurement portal, in accordance with the process defined under relevant clause, not later than the date and time specified in the Bidding document.</p> <p>26.4.1 The Bidder's modifications, if any, shall be done in the following manner:</p> <p>(i) Modified Electronic form of the bid as per the provision of portal therein.</p> <p>(ii) Soft copy of the entire bid, if any, modification is there.</p> <p>Employer will not have access to bids withdrawn on e-portal.</p>
<p><b>ITB 27. and its sub-clauses</b></p>	<p><b>Replace the existing clauses by the following:</b></p> <p><b>Bid Opening First Envelope (Techno-commercial bid):</b></p> <p>27.1 The Employer shall conduct the bid opening in public, in the presence of Bidders` designated representatives (up to 2 persons) who choose to attend at the address, date and time below. Bidders can also view the bid opening by logging on to the e-Procurement portal. Bid opening date specified in the e-Procurement portal/site shall be taken as the due date. The Employer reserves the right to open bids received in response to a tender on or after the bid opening date and time specified in the e-Procurement portal: <a href="https://www.tenderwizard.com/EESL">https://www.tenderwizard.com/EESL</a></p> <p><b>The bid opening shall take place at:</b></p> <p>Energy Efficiency Services Ltd., 4th Floor, Core 5, SCOPE Complex, Lodhi Road, City: New Delhi Pin code: 110003, INDIA</p>

	<p>Telephone: + 91 11 45801260; Extn:321 and 359  E-mail address: prabodh.singh@eesl.co.in;  mainak.roy@eesl.co.in</p> <p>Kind Attention: Sh. Prabodh Kumar Singh, DGM (Contracts)</p> <p>Date: 20 Sept 2024</p> <p>*Time: 1130hrs. (Indian Standard Time (IST))</p> <p>Bid opening timelines will be defined as per the e-Procurement portal's server clock only</p> <p>The technical bids recorded and opened at the time of opening shall be considered for evaluation.</p> <p>The Price Bids will remain unopened in the e-Procurement portal and will remain encrypted, until the specified time of its opening.</p> <p>27.2 The withdrawn bid will not be available in the system. Only the last modified bid shall be available in the system which shall be opened along with other bids. Only bids that are opened at bid opening shall be considered further. If the Price Bid is found to be submitted in Envelope-I, the Employer shall reject the Bid</p> <p>27.3 All other Bids, the bidders' names and any such other details as the Employer may consider appropriate, will be available through the portal as per Electronic form filled in by the bidder, and will become viewable at the time of opening of bids. The Employer shall neither discuss the merits of any bid nor reject any bid (except for late bids, in accordance with ITB 25.1).</p> <p>However, opening of bid, whether or not accompanied with the Bidding Document Fee and/or Bid Security, shall not be construed to imply its acceptability which shall be examined in detail pursuant to the provisions contained in this Section-2.</p> <p>27.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and the presence or absence of a bid security and Bidding Document Fee. The Bidders' representatives who are present in the office of the Employer to witness the bid opening shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents of the record.</p> <p>27.5 Bids not opened at bid opening shall not be considered further for evaluation, irrespective of the circumstances and shall be returned to the Bidder unopened/send to archive unopened.</p> <p>The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially non-</p>
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	<p>responsive to the requirements of the Bidding Document and their Price Bids will remain encrypted in the e-Procurement portal</p> <p><b>Bid Opening Second Envelope (Price bid):</b></p> <p>27.6 The Second Envelope i.e., Price Part of only those Bidders shall be opened who are determined as having submitted substantially responsive bids and are ascertained to be qualified to satisfactorily perform the Contract, pursuant to ITB Clause 32, 34 and 35. Such Bidders shall be intimated about the date and time for opening of Price Part i.e., Second Envelope of the Bids by the Employer. A negative determination of the bids pursuant to ITB Clause 34 and 35, shall be notified by the Employer through the portal to such Bidders and the Second Envelope submitted by them shall be sent to archive unopened and Bid Security shall be returned.</p> <p>27.7 The Employer will open Second Envelope i.e., Price Part at the specified time and date in the presence of bidders’ designated representatives who choose to attend, at the time, date, and location stipulated in the intimation for opening of Second Envelope. The bidders’ representatives who are present shall sign a register evidencing their attendance. Bidders who have submitted their bid and found qualified as mentioned at para 27.6 above may view on line tender opening on the portal from their end.</p> <p>27.8 The bidders’ names, the Bid Prices, including any alternative Bid Price or any discounts, and any such other details as per Electronic form/Template filled in by the bidder on the portal will become viewable at the time of opening of bids. The prices and details as filled by the bidder and opened during the bid opening and recorded in the Bid Opening Statement would not be construed to determine the relative ranking amongst the Bidders, or the successful Bidder, and would not confer any right or claim whatsoever on any Bidder. The successful Bidder (also referred to as the L1 Bidder) shall be determined as per the provisions of this Section -2 and considered for award of contract as provided in ITB Clause 43.</p>
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**E. Evaluation and Comparison of Bids**

<b>ITB 29.1</b>	<p><b>Add the following at the end of Clause ITB 29.1</b></p> <p>Tender documents uploaded on the e-Procurement portal shall be considered as legally valid document. The Employer reserves the right to verify original copies of scanned documents uploaded by bidders.</p>
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	Employer may seek additional documentary evidence or clarifications from bidders on their technical proposals
<b>ITB 29.2</b>	<p><b>Supplement with the following:</b></p> <p>In case of erroneous/ non submission of documents related to/identified in ITB Sub-Clause 11.1 (A)- I -(i), (iii), (iv), (v) and <b>ITB Sub-Clause 11.1 (A)-II-(ii), (iii), (v), (vi), (vii), (viii), (ix), (x), (xi),(xii), (xiii), (xiv), (xv), (xvi), (xvii)</b> and the complete annual reports together with Audited statement of accounts, required to be submitted by the Bidder as per the provisions of the Bidding Documents, the Employer may give the Bidder not more than 7 working days' notice to rectify/furnish such documents, failing which the bid shall be liable for rejection.</p>
<b>ITB 31.1</b>	<p><b>Replace with the following:</b></p> <p>The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.1 have been provided, and to determine the completeness of each document submitted. If any of these documents or information is missing or not submitted ( even after seeking clarification wherever required as per ITB 29.2), the Bid may be rejected.</p> <p>In case of non-submission of bid in the portal (Part of the bid in electronic form i.e. soft copy part) within the stipulated deadline, then even if the bidder has submitted the specific documents in hard copy in original within the stipulated deadline pursuant to ITB24.1, its bid shall be considered as incomplete bid, which shall be summarily rejected.</p> <p>Similarly, in case of non-submission of Hard copy part of the bid, but the bidder has uploaded the soft copy part of the bid, the bid will be considered as incomplete bid. In such a case, the soft copy part of the first envelope bid uploaded on the portal shall be opened. Such bids will be rejected during preliminary examination.</p> <p>However, the employer can seek only those documents through clarifications on bids which are permitted as per clause ITB 29.2 of BDS.</p>
<b>ITB 31.2</b>	<b>The said clause stands Deleted.</b>
<b>ITB 32.2.1</b>	<p><b>Add a new sub clause 32.2.1 as under:</b></p> <p>Bids containing Deviations/Reservations/Omissions from critical/important provisions relating to Bid Security (ITB 34), GCC Clauses: 5 (Law and Language), 45 (Disputes and Arbitration), 12 (Terms</p>

	of Payment), 13.3 (Performance Security), 14 (Taxes and Duties), 26.2 (Completion Time Guarantee), 27 (Defect Liability), 28 (Functional Guarantees), 29 (Patent Indemnity), 30 (Limitation of Liability) will be considered as non-responsive.
<b>ITB 32.2.2</b>	<p><b>Add new sub Clause 32.2.2 as under:</b></p> <p>Regarding deviations, omission or reservations introduced in the bid, which will be reviewed to conduct a determination of substantial responsiveness of the Bidder's bid as stated in ITB Clause 32.2, the order of precedence of these documents to address contradictions, if any, in the contents of the bid, shall be as follows:</p> <ol style="list-style-type: none"> <li>I. Letters of Technical and Price Bid (First Envelope and Second Envelope Bid Forms).</li> <li>II. Attachment-4 (Deviation Statement)</li> <li>III. Price Schedules</li> <li>IV. Technical Data Sheet</li> <li>V. Any other part of the bid</li> </ol> <p>Contents of the document at Sr. No. I above will have overriding precedence over other documents (Sr. No. II to V above). Similarly, contents of document at Sr. No. II above will have overriding precedence over other documents (Sr. No. III to V above), and so on. However, any major inconsistency amongst the above documents of the bid will be interpreted against the bidder.</p>
<b>ITB 35.2</b>	<p><b>Supplementing with the following:</b></p> <p>Bidder may use credentials of parent/holding company for meeting all the financial requirement. The bidder must demonstrate that the parent company or holding company is liable for it with legal effect (e.g. by providing a guarantee or a "hard" letter of comfort) duly supported by board resolution of holding company.</p>
<b>ITB 35.6</b>	<p><b>Add new sub Clause 35.6 as under:</b></p> <p>35.6 The Employer shall determine to its satisfaction whether the Bidder that is selected as having substantially responsive bid is eligible and meets the qualifying criteria specified in Section 3, Evaluation and Qualification Criteria.</p> <p>It will be based upon an examination and verification of the documentary evidence of the Bidder's qualifications submitted by the Bidder in Section 3, Evaluation and Qualification Criteria to the bid, as well as such other information as the Employer deems</p>

	<p>necessary and appropriate. Further, the Employer will also take into account the Bidder's financial, technical capabilities including production capabilities, in particular contract work in hand inter-alia including future commitments and past performance of the bidder.</p> <p>35.6.1 The Employer, if needed, may assess the capacity and capability of the bidder, to ascertain that the bidder can successfully execute the scope of work covered under the package within stipulated completion period. This assessment may inter-alia include (i) manufacturing capacity, details of work executed, works in hand, anticipated in future &amp; the balance capacity available for the present scope of work; (ii) details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (iii) details of quality systems in place; (iv) past experience and performance; (v) customer feedback; (vi) Banker's feedback etc.</p> <p>35.6.1.1 During the bid evaluation, no physical contact with the bidder shall take place in respect of the subject tender/packages for the purpose of assessment of capacity &amp; capability, by visiting the Bidder's works/premises etc. The Employer may, however, obtain feedback from clients of the bidder by visiting the clients and/or can visit the bidder's bankers for banker's feedback and/or can seek clarification from the bidder as per ITB 29.0.</p> <p>35.6.2 Notwithstanding the declaration by the bidder in the Bid, the Manufacturing Capacity shall be subject to assessment, if any, by the Employer.</p> <p>35.6.3 For new bidders, assessment shall be done using similar parameters as mentioned at BDS clauses ITB 35.6.1 above.</p>
<p><b>ITB 36.1</b></p>	<p><b>Add the following Sub Clauses 36.1 (e) and 36.1 (f) :</b></p> <p>36.1 (e) If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected. However, in case of items quoted without indicating any quantity, the total price quoted against such items shall prevail.</p> <p>36.1 (f) If the discount(s)/rebate(s) offered by the Bidder is a percentage discount and the price component(s) on which the said discount is not indicated in the bid, the same shall be considered on the total bid price [i.e. proportionately on each price component], in the event of award. However, if lump-sum discount is offered,</p>

	<p>the foreign currency portion of the same shall be considered in full on the CIP/CIF price component and the Indian Rupee portion shall be considered in full on the Ex-works price component (by proportionately reducing CIP/CIF/Ex-works price of individual items), in case of award.</p>
<b>ITB 37.1</b>	<p>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: Indian Rupees.</p> <p>Source of exchange rate: Reference rates as published by Financial Benchmarks India Pvt. Ltd. (FBIL).</p> <p>Date of Exchange Rate:</p> <p>To facilitate evaluation &amp; comparison, the Employer will convert all the bid prices, expressed in the various currencies, to Indian Rupees at the exchange rate on the date of bid opening (First Envelope).</p>
<b>ITB 38.1</b>	<p>A Domestic Preference shall apply. The application methodology will be as specified in Section 3 (Evaluation and Qualification Criteria).</p>
<b>ITB 39.4</b>	<p><b>Supplementing with the following:</b></p> <p>Bidder may quote for multiple Lots.</p>
<b>ITB 42.1</b>	<p>Standstill provisions shall not apply.</p>

**F. Award of Contract**

<b>ITB 43.1</b>	<p><b>Supplementing with the following:</b></p> <p>The Award shall be placed Lot wise and Contract of each Lot shall be independent of the other.</p>
<b>ITB 43.2</b>	<p><b>Add new sub-Clause 43.2, 43.2.1, 43.2.2, 43.2.3 &amp; 43.2.4 as follows:</b></p> <p>43.2 The mode of contracting with the successful bidder will be as per stipulation outlined in the conditions of contract and briefly indicated below:</p> <p>43.2.1 In the case of successful Indian Bidder, the single award shall be made for complete Scope of Work inter-alia including Ex-Works supply of all equipments and materials, providing all services viz., inland transportation for delivery at site, In-transit insurance, unloading, handling at site, storage, design services, Installation, Commissioning, Operation and Maintenance of Plant and any other work specified in the Contract Documents.</p> <p>43.3.2 In the case of successful foreign Bidder, the single award shall be made for complete Scope of Work inter-alia including CIP Entry Border Point/CIF Indian Port of Entry supply of all the Plant and Goods to be supplied from Abroad; providing all services viz. port handling and custom clearance of imported goods under CIF Contract and loading, inland transportation for delivery at site, In-transit insurance, unloading, handling at site, storage, design services, Installation, Commissioning, Operation and Maintenance of Plant and any other work specified in the Contract documents.</p> <p>43.3.3 It is Employer's understanding that as per extant provisions, Indian Income Tax is not payable on sale of goods, if the Contract is on Principal-to-Principal basis and the title of goods passes to the Employer outside India. The Bidders are, however, advised to check the position from their own sources.</p> <p>43.3.4 Compliance of applicable laws of the land in India inter-alia including Taxation laws, FEMA and RBI guidelines etc shall be a necessary condition for release of payments to the successful Foreign Bidder/Contractor.</p>
<b>ITB 47.1</b>	<p>The procedures for Bidding-Related Complaints are referenced in the Procurement Regulations for ADB Borrowers (Appendix 7). The Bidder should submit its complaint following these procedures, in writing, to:</p> <p>For kind attention: Sh. Vishal Kapoor</p>



	<p>Title/position: Chief Executive Officer  Employer: Energy Efficiency Services Ltd  E-mail address: ceo@eesl.co.in</p>
<b>ITB 48</b>	<p>Add the following clauses :</p> <p>48.1 Bidders shall upload their bid documents in formats, which can be opened and read by open standard interfaces.</p> <p>48.2 Bidders shall not lock electronic files uploaded in their proposal with passwords of their choice. The Employer reserves the right to reject password locked files outright and not consider contents within such locked files for bid evaluation.</p> <p>48.3 In case the bidder who wishes to ascertain the grounds on which its bid was made non-responsive, may do so by submitting his appeal to the Employer. Such a case shall be addressed as per Procurement Guidelines of ADB.</p> <p>48.4 The Employer reserves the right to extend bid submission timeline or recall the tender if e-Tendering server is inaccessible or inoperative for a prolonged period of time within the last 24 hours of the bid submission due date. The Employer shall consult the e-Tendering service provider and seek its opinion and decide to extend the bid submission timeline in accordance with the technical explanation provided by the e-Tendering service provider.</p> <p>48.5 The Employer reserves the right to verify original copies of scanned documents uploaded by bidders.</p> <p>48.6 The Bidder shall take due care to ensure that the documents uploaded by them in the e-Procurement portal are virus free. If the documents uploaded by the Bidder could not be opened, due to virus during tender opening, the bid is liable to be rejected.</p> <p>Only those bids marked as submitted, as acknowledged by a bid submission reference, at the bid submission time will be considered for evaluation.</p>

**Attachment-A to Section-2**

**Important Instruction for participation in the e-Bidding:**

Interested bidders have to register themselves on the portal [www.tenderwizard.com/EESL](http://www.tenderwizard.com/EESL) through M/s. **Antares Systems Limited** (Application Service Provider (ASP) appointed by EESL) to participate in the bidding under this invitation for bids. It shall be the sole responsibility of the interested bidders to get themselves registered at the aforesaid portal for which they are required to contact M/s. Antares Systems Limited at following contact details to complete the registration formalities:

*Bidders are requested to visit "e-Tendering" section at EESL website, [www.eeslindia.org](http://www.eeslindia.org) for instructions and registration on E-tendering portal.*

**Steps for Registration on EESL's E-Procurement Portal**

- (i) Open portal by entering URL [www.tenderwizard.com/EESL](http://www.tenderwizard.com/EESL).
- (ii) Download and read Registration Manual from EESL's e-tendering portal [www.tenderwizard.com/EESL](http://www.tenderwizard.com/EESL)
- (iii) Click on 'REGISTER' link for new registration.
- (iv) Fill all mandatory fields and click on 'CREATE PROFILE' button.
- (v) On the next page, upload registration related documents and proceed further.
- (vi) User ID and system-generated password will be displayed. Login and mandatorily change the system-generated password.
- (vii) Login with your new password and Register your class-III Signing and Encryption Digital Signature Certificate (DSC).
- (viii) Also read the instructions given under Registration Manual available at home page of EESL website [www.tenderwizard.com/EESL](http://www.tenderwizard.com/EESL).

**Note:** Online registration shall be done on e-tendering website, i.e., [www.tenderwizard.com/EESL](http://www.tenderwizard.com/EESL) & in general, activation of registration may take 24 hours. It is sole responsibility of the bidder to register in advance.

*There is no fee for Registration on EESL E-procurement Portal.*

**A. Digital Signature Certificate:**

It is mandatory for all the bidders to have class-III Digital Signature Certificate (DSC) with signing and Encryption certificate (in the name of person who will sign the BID) from any of the licensed Certifying Agency (Bidders can see the list of licensed CAs from the link [www.cca.gov.in](http://www.cca.gov.in)) to participate in e-tendering of EESL.

**B. EESL Global Support Telephones and e-mail id**

Contact Details: +91-80-45811365, +91-80-45982100, +91-9560095958  
[mohitkumar@etenderwizard.com](mailto:mohitkumar@etenderwizard.com), [krishna.a@etenderwizard.com](mailto:krishna.a@etenderwizard.com)

For proper uploading of the bids on the portal namely [www.tenderwizard.com/EESL](http://www.tenderwizard.com/EESL) (*hereinafter referred to as the 'portal'*), it shall be the sole responsibility of the bidders to apprise themselves adequately regarding all the relevant procedures and provisions as detailed at the portal as well as by contacting from **M/s. Antares Systems Limited** directly, as and when required, for which contact details are mentioned above. The Employer in no case shall be responsible for any issues related to timely or properly uploading/submission of the bid in accordance with the relevant provisions of Section 1 - ITB of the Bidding Documents.

# Section 3: Evaluation and Qualification Criteria

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# 1. Evaluation

## 1.1 Technical Evaluation

In addition to the criteria listed in ITB 34.1 (a)–(b), other relevant factors are as follows:  
Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to successfully implement the contract considering its proposed site organization, method statement, mobilization, and construction schedule (to be described by the Bidder in sufficient detail to demonstrate the adequacy of its work methods, scheduling, and material sourcing) including the extent to which they are presented in a consistent manner and comply with requirements stipulated in Section 6 (Employer's Requirements) without material deviation, reservation, or omission.

Noncompliance with equipment and personnel requirements described in Section 6 (Employer's Requirements) shall not normally be a ground for bid rejection and such noncompliance will be subject to clarification during bid evaluation and rectification prior to contract award.

## 1.2 Alternative Technical Solutions

Technical alternatives are not permitted.

## 1.3 Economic Evaluation

In addition to the criteria listed in ITB 39.2 I (a)–(f), other relevant factors are as follows:  
Not applicable

### 1.3.1 Quantifiable Deviations and Omissions

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

### 1.3.2 Time Schedule

Time to complete the plant and services from the effective date specified in Article 3 of the Contract Agreement for determining the time for completion of Installation and commissioning activities is: 240 days from the date of handover of each site/Notice to Proceed (NTP). No credit will be given for earlier completion.

EESL shall ensure that all the sites are handed over within 9 months from the date of issuance of LoA and post site handover, the Contractor shall be responsible for complete design, engineering, supply, erection and commissioning of each site within 240 days from date of NTP/handover.

The Contractor shall also be responsible for 12 years comprehensive O&M on site wise basis from the date of commissioning of each project site.

### 1.3.3 Operation and Maintenance (O&M) Costs

The O&M cost factors for calculating the life cycle cost are as follows:

- (a) Number of years for life cycle: 12-year comprehensive maintenance services are to be provided
- (b) Operating costs: Bidder to suitably consider O&M cost for comprehensive maintenance services for each of the site
- (c) Maintenance costs, including the cost of spare parts for the initial period of operation,

### 1.3.4 Functional Guarantees of the Facilities

The minimum requirements stated in the Specification for functional guarantees required in the Specification are:

Functional Guarantee	Minimum
Guaranteed energy generation on year wise basis from the plant at each of the locations in the Lot	Eg. For 1 <sup>st</sup> year; 1664 Units per kWac Refer Section- 6 for details

**If the functional Guarantee particulars as specified at Section-6 are not met by any bidder, their corresponding bid shall be rejected. In this regard, Form FUNC of Section-4 (Bidding forms) must be submitted by the bidder along with their bids.**

### 1.3.5 Work, Services, Facilities, etc., to Be Provided by the Employer

The Employer shall not be responsible for the provision of any works, services, or facilities in connection with the Contractor's performance of its obligations under this Agreement. The Contractor shall be solely responsible for procuring and maintaining all such resources at its own cost and expense.

### 1.3.6 Specific Additional Criteria

The following additional criteria will be used in the evaluation:

#### 1.3.6.1 Environmental, Health and Safety Management Plan (EHSMP)

Any bid not accompanied with the confirmation that 'Bidder shall comply with the EESL EHSMP mentioned at Annexure-4 of Section- 6 (Final site wise EHSMP shall be shared with successful bidder)' may be rejected by the Employer as nonresponsive.

### 1.3.7 Domestic Preference

Domestic preference will be granted to eligible domestically produced Plant and Equipment in accordance with the following provisions:

- (a) The preference margin shall not be applied to the whole facility but only to the eligible domestically produced Plant and Equipment within the contract.
- (b) Plant and Mandatory Spare Parts supplied from abroad shall be quoted CIP (Section 4 [Bidding Forms], Schedule No. 1). Plant and Mandatory Spare Parts supplied from within the Employer's country shall be quoted EXW (ex works, ex factory, ex warehouse, ex showroom, or off-the-shelf, as applicable) free of sales and similar taxes (Section 4 [Bidding Forms], Schedule No. 2).
- (c) All other cost components for services and works such as costs for design, local handling, transportation, storage, installation, and commissioning shall be quoted separately. See Section 4 (Bidding Forms), ~~Schedule No. 3 - Design Services~~ and Schedule No. 4 - Installation and Other Services.
- (d) In the comparison of Bids, only the CIP price component of each Bid for the Plant and Equipment offered from outside the Employer's country shall be increased by **15%**.
- (e) No domestic preference shall be applied to any of the services or works included in the contract.
- (f) Bidders shall not be permitted or required to modify the mix of local and foreign Plant and Equipment after bid opening.

### 1.4 Multiple Contracts

If works are grouped in multiple contracts and pursuant to ITB 39.4, the Employer will evaluate and compare Bids on the basis of a contract, or a combination of contracts, or as a total of contracts to arrive at the least cost combination for the Employer by taking into account discounts offered by Bidders in case of award of multiple contracts.

In addition to above, if a Bidder as defined in ITB 4.1 submits several successful (lowest evaluated substantially responsive) bids, the evaluation will also include an assessment of the Bidder's capacity to meet the following aggregated requirements as presented in the bid:

- Average annual turnover,
- Financial resources,

## 2. Qualification

### 2.1 Eligibility

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

#### 2.1.1 Nationality

Nationality in accordance with ITB 4.2.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1; ELI - 2 with attachments
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#### 2.1.2 Conflict of Interest

No conflicts of interest in accordance with ITB 4.3.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid
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#### 2.1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITB 4.4.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid
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#### 2.1.4 Government-Owned Enterprise

Bidder required to meet conditions of ITB 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Forms ELI - 1; ELI - 2 with attachments
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#### 2.1.5 United Nations Eligibility

Not having been excluded by an act of compliance with a United Nations Security Council resolution in accordance with ITB 4.8.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid
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## 2.2 Historical Contract Nonperformance

### 2.2.1 History of Nonperforming Contracts

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Nonperformance of a contract <sup>a</sup> did not occur as a result of contractor default since 1 January 2021.	Must meet requirement	Must meet requirement	Must meet requirement <sup>b</sup>	Not applicable	Form CON-1

<sup>a</sup> Nonperformance, as decided by the Employer, shall include all contracts where (a) nonperformance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Nonperformance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Nonperformance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

<sup>b</sup> This requirement also applies to contracts executed by the Bidder as Joint Venture partner.

### 2.2.2 Suspension Based on Execution of Bid-Securing Declaration

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Not under suspension based on execution of a Bid Securing Declaration pursuant to ITB 4.6.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

### 2.2.3 Pending Litigation and Arbitration

Pending litigation and arbitration criterion shall apply.

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

<p>All pending litigation, arbitration or other material events impacting the net worth and/or liquidity of the bidder, if any, shall be treated as resolved against the Bidder and so shall in total not represent more than 50% percent of the Bidder’s net worth calculated as the difference between total assets and total liabilities.</p>	<p>Must meet requirement</p>	<p>Not applicable</p>	<p>Must meet requirement</p>	<p>Not applicable</p>	<p>Form CON – 1</p>
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**2.2.4 Declaration: Environmental, and Health and Safety Past Performance**

Criteria	Compliance Requirements			Submission Requirements	
Requirement	Single Entity	All Partners Combined	Each Partner	One Partner	
<p>Declare any contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, health and safety contractual obligations in the past five years.</p>	<p>Must make the declaration. If the bidder proposes Specialist Sub-contractor/s to meet EQC 2.4.2, those Specialist Sub-contractor/s must also make the declaration</p>	<p>Not applicable</p>	<p>Each partner must make the declaration. If the bidder proposes Specialist Sub-contractor/s to meet EQC 2.4.2, those Specialist Sub-contractor/s must also make the declaration.</p>	<p>Not applicable</p>	<p>Form CON-2</p>

## 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 any other financial statements as applicable/ required by law of the Bidder's country, acceptable to the Purchaser, for the last three (03) financial years (from the originally scheduled date of Bid Opening (as per RfP document) 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 with attachments

#### **For Indian Bidders:**

The Bidder shall also furnish documentary evidence/ declaration regarding financial restructuring of the company, if any. If the opening of the bids or the ascertainment of qualification is carried out after 30<sup>th</sup> September, the bidder shall be required to submit the complete annual reports together with Audited statement of accounts of the company for the immediately preceding Financial Year except in cases where the Board of the Company/ Registrar of Companies has granted extension of time for finalization of accounts, for which the bidder has to submit requisite documentary evidence. In case of Bidder's failure to submit the same along with the Bid or subsequently pursuant to Clarification, the Bid shall be rejected.

**NOTE:** In case of Proprietor/ Partnership firm, where auditing of Balance Sheet is not required, the date of ITR (if extended) to be considered. Proof of extension from the Income Tax Department to be submitted by the bidder.

**For Foreign bidders:**

The bidder shall furnish documentary evidence/ declaration that the balance sheets submitted by them are of immediate last three years as per the law of the country. In case of the date of extension, if any, allowed by the Govt. orders etc. as per the provisions of law, the bidder shall be required to submit the complete annual reports together with Audited statement of accounts of the company for the immediately preceding Financial Year except in cases where the Board of the Company/ Registrar of Companies/ Statutory Body has granted extension of time for finalization of accounts, for which the bidder has to submit requisite documentary evidence. In case of Bidder's failure to submit the same along with the Bid or subsequently pursuant to Clarification, the Bid shall be rejected.

**2.3.2 Average Annual Turnover**

Criteria Requirement	Compliance Requirements			Documents Submission Requirements	
	Single Entity	Joint Venture			
		All Partners Combined	Each Partner	One Partner	
Minimum average annual turnover (MAAT) of the bidder for last three (03) financial years (from the originally scheduled date of Bid Opening (as per RfP document)) should be: <b><u>For Lot 1- 30 MW approx.</u></b> INR 254 Crores or USD 32 Million or equivalent^ <b><u>For Lot 2 - 20 MW approx.</u></b> INR 169 Crores or USD 21 Million or equivalent^ <b><u>For Lot 3- 20 MW approx.</u></b> INR 169 Crores or USD 21 Million or equivalent^	Must meet requirement	Must meet requirement	Must meet 25% of the requirement	Must meet 40% of the requirement	Form FIN - 2

**Note:**

1. Turnover means revenue from operations, which is Annual total income as incorporated in the profit and loss account excluding non-recurring income, i.e. sale of fixed assets. The annual turnover of any Bidder will include realization out of sales of Goods and Services but excludes any tax levied (Direct or Indirect) by any enactment of the Government of India.
2. For Bidders to qualify for more than one Lot, their financial position shall not be less than the sum of the requirement for the Lots they propose to qualify for.
3. In case any Bidder doesn't meet cumulative requirement as specified under criteria at 2.3.2 for the quoted Lots, the Price Bids shall be opened in the descending order of the MAAT value (as per 2.3.2 above) of the Lot (s). In case of Lot-2 & 3, Lots will be opened in numerical order i.e. first Lot 2 then Lot 3. However, Price Bid of Bidder for only those Lot (s) shall be opened for which he is considered to meet the combined and individual requirement of the Lot (s) as per the qualification criteria.

4. ^The equivalent amount in INR for another currency, shall be based on the exchange rate at the end of the period reported in audited financial statements, as per rates published by Financial Benchmarking India Pvt. Ltd. (FBIL).

### 2.3.3 Financial Resources

Bidders are required to submit their current contract commitments and latest information on financial resources supported by latest audited accounts or audited financial statements, or if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, and the Bidders' financial capacity, will be reassessed on this basis.

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
<p>For Single Entities:</p> <p>The Bidder must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its current contract commitments defined in FIN - 4, meet or exceed the total requirement for the Subject Contract of <b>INR 47 Crores or USD 5.96 Million or equivalent^ for Lot 1, INR 31 Crores or USD 3.94 Million or equivalent^ for Lot 2 and INR 31 Crores or USD 3.94 Million or equivalent^ for Lot 3.</b></p>	Must meet requirement	Not applicable	Not applicable	Not applicable	Form FIN – 3 and Form FIN - 4
<p>For Joint Ventures:</p> <p>(1) One partner must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its own current contract commitments defined in FIN - 4, meet or exceed its required share of 40% from the total requirement for the Subject Contract. AND</p>	Not applicable	Not applicable	Not applicable	Must meet requirement	Form FIN – 3 and Form FIN - 4
<p>(2) Each partner must demonstrate that its financial resources defined in FIN - 3, less its financial obligations for its own current contract commitments defined in FIN - 4, meet or exceed its required share of 25% from the total requirement for the Subject Contract. AND</p>	Not applicable	Not applicable	Must meet requirement	Not applicable	Form FIN – 3 and Form FIN - 4

(3) The Joint Venture must demonstrate that the combined financial resources of all partners defined in FIN - 3, less all the partners' total financial obligations for the current contract commitments defined in FIN - 4, meet or exceed the total requirement for the Subject Contract of <b>INR 47 Crores or USD 5.96 Million or equivalent^</b> for Lot 1, <b>INR 31 Crores or USD 3.94 Million or equivalent^</b> for Lot 2 and <b>INR 31 Crores or USD 3.94 Million or equivalent^</b> for Lot 3.	Not applicable	Must meet requirement	Not applicable	Not applicable	Form FIN – 3 and Form FIN - 4
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**Note:**

- 1) For Bidders to qualify for more than one Lot, their financial position shall not be less than the sum of the requirement for the Lots they propose to qualify for.
- 2) In case any Bidder doesn't meet cumulative requirement as specified under criteria at 2.3.2 for the quoted Lots, the Price Bids shall be opened in the descending order of the MAAT value (as per 2.3.2 above) of the Lot (s). In case of Lot-2 & 3, Lots will be opened in numerical order i.e. first Lot 2 then Lot 3. However, Price Bid of Bidder for only those Lot (s) shall be opened for which he is considered to meet the combined and individual requirement of the Lot (s) as per the qualification criteria.

**^The equivalent amount in INR for another currency, shall be based on the exchange rate at the end of the period reported in audited financial statements, as per rates published by Financial Benchmarking India Pvt. Ltd. (FBIL).**

- 3) **For Financial Position Criteria at sl. no. 2.3.1, 2.3.2 and 2.3.3 above:**
  - i) In case a bidder does not satisfy the financial criteria, as stipulated on its own, the Holding Company would be required to meet the stipulated respective criteria, provided that the Net Worth of such Holding Company as on the last day of preceding financial year is at least equal to or more than the paid-up share capital of the Holding Company. In such an event, the bidder would be required to furnish along with its bid, a letter of undertaking from the Holding Company, supported by a Board resolution, as per the format enclosed at **Attachment-6 of Section-4**, pledging unconditional & irrevocable financial support for the execution of the contract by the bidder in case of award.
  - ii) In view of above, either Holding company's or bidder's standalone financial statement will only be considered for evaluation purpose. In any case, consolidated financial statement will not be considered for evaluation.

## 2.4 Bidder's Experience

### 2.4.1 Contracts of Similar Size and Nature

Criteria	Compliance Requirements			Documents	
	Single Entity	Joint Venture		Submission Requirements	
All Partners Combined		Each Partner	One Partner		
<p>Participation as an EPC contractor, Joint Venture partner, or Subcontractor in at least one EPC contract that has been satisfactorily completed within the last seven (07) years (from the originally scheduled date of Bid Opening (as per RfP document)) and that is *similar to the proposed contract, where the value of the Bidder's participation exceeds or equal to <b>INR 136 Crores or USD 17 Million or equivalent*</b> for Lot 1, <b>INR 91 Crores or USD 11 Million or equivalent*</b> for Lot 2 and <b>INR 91 Crores or USD 11 Million or equivalent*</b> for Lot 3.</p> <p>Or</p> <p>Participation as a contractor, Joint Venture partner, or Subcontractor, in at least two EPC contracts that have been satisfactorily completed within the last seven (07) years (from the originally scheduled date of Bid Opening (as per RfP document)) and that are *similar to the proposed contract, where the value of the Bidder's participation exceeds or equal to <b>INR 85 Crores or USD 11 Million or equivalent*</b> for Lot 1, <b>INR 57 Crores or USD 7 Million or equivalent*</b> for Lot 2 and <b>INR 57 Crores or USD 7 Million or equivalent*</b> for Lot 3.</p> <p>Or</p> <p>Participation as a contractor, Joint Venture partner, or Subcontractor, in at least three</p>	Must meet requirement	Not applicable	Not applicable	Lead Partner must meet requirement	Form EXP – 1 <sup>d</sup>



<p>EPC contracts that have been satisfactorily completed within the last seven (07) years (from the originally scheduled date of Bid Opening (as per RfP document)) and that are *similar to the proposed contract, where the value of the Bidder's participation exceeds or equal to <b>INR 68 Crores or USD 9 Million or equivalent*</b> for Lot 1, <b>INR 45 Crores or USD 6 Million or equivalent*</b> for Lot 2 and <b>INR 45 Crores or USD 6 Million or equivalent*</b> for Lot 3.</p> <p>* "Similar" shall mean- Supply, erection, testing and commissioning of grid connected ground mounted solar PV based power plants.</p>					
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- <sup>a</sup> For contracts under which the Bidder participated as a Joint Venture partner or Subcontractor, only the Bidder's share, by value, shall be considered to meet this requirement.
- <sup>b</sup> For contracts implemented by a Joint Venture contractor, if the Bidder comprises the same Joint Venture, the 'Single Entity' requirements will apply.
- <sup>c</sup> Each partner to demonstrate one satisfactorily completed contract of similar nature where such partner's value of participation exceeds 25% of the subject contract value.
- <sup>d</sup> In addition to the submission requirement Form EXP - 1, the bidder shall provide the following supporting documents:
  - (a) Scan of the Taking-Over Certificate, Contract Completion Certificate or Performance Certificate (without any adverse remarks) in sufficient detail to verify the contract name, value and completion time. If the documents are other than in English, an accurate translation of these documents in English shall also be provided. Apart from above, any other document/confirmation issued by client/employer/end-user who has awarded the contract, which substantiates the successful and satisfactory execution and completion of the contract.

**\* During evaluation, the equivalent amount in INR for another currency, shall be based on the exchange rate at the end of the period reported in audited financial statements of the financial year in which the bidder has completed the work, as per rates published by Financial Benchmarking India Pvt. Ltd. (FBIL)**

Note:

- a. In case bidder is a holding company, the above experience criteria referred to in clause 2.4.1 above shall be of that holding company only (i.e. excluding its subsidiary/ group companies). In case bidder is a subsidiary of a holding company, the above experience criteria referred to in clause 2.4.1 above shall be of that subsidiary company only (i.e. excluding its holding company).
- b. In case Bidder participates in multiple Lots and meets the highest experience requirement, then he will be considered to meet the lesser experience requirement of other Lots also.

### 2.4.2 Experience in Key Activities

2.4.2(a) Must be complied with by the Bidder. In case of a Joint Venture Bidder, all the partners must meet the requirement in the key activity.

Table A

Criteria	Compliance Requirements		Documents
	Requirement	Single Entity	Joint Venture
The bidder(s) shall be:	Must meet requirement	Each partner must meet requirement	Form EXP – 2 <sup>a</sup>
1 Manufacturer of Solar Module OR			
2 Manufacturer of Grid Tie Solar Inverter OR			
3 .. Developer of Solar PV based power plants OR			
4. System Integrator of Solar PV based power plants			

<sup>a</sup> Submission requirements: Form EXP - 2 shall be supported by documents such as Signed Contract Agreement, Taking-Over Certificate or Contract Completion Certificate indicating the contract name, value, completion date (or percentage of substantial completion), activities performed by Joint Venture partners, and other relevant details sufficient to demonstrate compliance with the requirements.

### 2.4.3 Specific Experience in Managing Environmental, Health and Safety Aspect

Criteria	Compliance Requirements		Documents
	Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors
For the contracts in 2.4.1 and 2.4.2 above and/or any other contracts as EPC contractor, Joint Venture partner, or Subcontractor between 1st January 2021 and Bid submission deadline, experience in managing EHS risks and impacts as per EESL/ADB EHS compliances.	Must meet requirements	One member must meet requirements	Form EXP – 3

## 2.5 Organizational Environmental, Health and Safety System

### 2.5.1 Environmental, Health and Safety Certification

Criteria	Compliance Requirements		Documents
Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
1. Availability of a valid ISO certification or internationally recognized equivalent (equivalency to be demonstrated by the Bidder), and applicable to the worksite.	Must meet requirements	One member must meet requirements	Form EXP – 4

### 2.5.2 Environmental, Health and Safety Documentation

Criteria	Compliance Requirements		Documents
Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
Availability of in-house policies and procedures for ESHS management.	Must meet requirements	One member must meet requirements	Form EXP – 5

### 2.5.3 Environmental, Health and Safety Dedicated Personnel

Criteria	Compliance Requirements		Documents
Requirement	Single Entity or Its Specialist Subcontractors	Joint Venture or Its Specialist Subcontractors	Submission Requirements
Availability of in-house personnel dedicated to EHS issues: -	Must meet requirements	One member must meet requirements	Form EXP – 6

## 2.6 Subcontractors

Subcontractors or Manufacturers for the following major items of plant and services must meet the following minimum qualification criteria, herein listed for a Subcontractor for that item. Failure to comply with this requirement will result in rejection of the Subcontractor but not the Bidder.

Item No.	Description of Item	Minimum Criteria to be met	Documents Submission Requirements
1	PV Modules	<ul style="list-style-type: none"> <li>• Manufacturer having history of at least 3 years (from the originally scheduled date of Bid Opening (as per RfP document)) production</li> <li>• Having valid ISO 9001 and ISO 14001 certifications</li> <li>• At least 175 MWp have been sold or installed and have been operating satisfactorily for atleast 3 years (from the originally scheduled date of Bid Opening (as per RfP document)) Recycling program of the PV modules sold</li> </ul>	<p>Form EXP-7 Duly signed and stamped statement for the manufacturer</p>
2	PV Inverter	<ul style="list-style-type: none"> <li>• Manufacturing history of at least 3 years (from the originally scheduled date of Bid Opening (as per RfP document))</li> <li>• 140 MW have been sold or installed and have been operating satisfactorily for at least 3 years (from the originally scheduled date of Bid Opening (as per RfP document))  Minimum manufacturing capacity is at least 140 MW yearly for the last 3 years (from the originally scheduled date of Bid Opening (as per RfP document))</li> </ul>	<p><i>Duly signed and stamped statement from the supplier or manufacturer or the certifier</i></p>

<p>3</p>	<p>33KV Transformer</p>	<ul style="list-style-type: none"> <li>• Manufacturer having history of at least 3 years (from the originally scheduled date of Bid Opening (as per RfP document)production</li> <li>• Should have supplied similar equipment earlier during the last three (03) years (from the originally scheduled date of Bid Opening (as per RfP document)</li> <li>• The equipment so supplied should have been in successful operation at least in three Solar PV plants</li> </ul>	<p><i>Duly signed and stamped statement from the supplier or manufacturer or the certifier</i></p>
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In the case of a Bidder who offers to supply and install major items of plant under the contract, which the Bidder did not manufacture or otherwise produce, the Bidder shall provide the Manufacturer’s authorization, using the form provided in Section 4 (Bidding Forms), showing that the Bidder has been

duly authorized by the Manufacturer or producer of the related plant and equipment or component to supply and install that item in the Employer's country. Failure to submit the Manufacturer's authorization at the first instance is considered a minor, nonmaterial omission and shall be subject to clarification. However, failure of the Bidder to submit the omitted authorization shall lead to rejection of the Subcontractor or Manufacturer of the item under evaluation in accordance with ITB 35.4.

The aforesaid criteria for sub-contractor shall be evaluated during execution of Contract with the awarded bidder while finalizing the sub-contractors. Bidders are required to ensure that their proposed sub-contractors for aforementioned items/equipment must meet the specified requirements.

## Section 4: Bidding Forms

This section contains the forms to be completed by the Bidder and submitted as part of its Bid.

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# Letter of Technical Bid

*The Bidder must accomplish the Letter of Technical Bid on its letterhead clearly showing the Bidder's complete name and address. All notes to be deleted in final submission*

Date: .....

OCB No.: .....

Invitation for Bid No.: .....

To:

General Manager (Contracts)  
Energy Efficiency Services Limited.  
(A JV of PSUs of Ministry of Power, Govt. of India)  
Core-5, 4th Floor, SCOPE Complex,  
Lodhi Road, New Delhi-110003

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.
- (c) We offer to design, manufacture, test, deliver, install, pre-commission, commission, operate and maintain in conformity with the Bidding Document the following Plant and Services:  
**Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra, India, on turnkey basis, Lot No. .... (1/2/3 Choose as applicable).**
- (d) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of **180** days starts from the date fixed for the bid submission deadline in accordance with ITB 24.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (e) Our firm, including any Subcontractors or Manufacturers for any part of the Contract, have or will have nationalities from eligible countries, in accordance with ITB 4.2.
- (f) We, our directors, key officers, key personnel, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers for any part of the Contract, do not have any conflict of interest in accordance with ITB 4.3.  
If there is any conflict of interest, please state details:
  - (i) Parties involved in the conflict of interest: \_\_\_\_\_
  - (ii) Details about the conflict of interest: \_\_\_\_\_
- (g) We are not participating, as a Bidder, either individually or as partner in a Joint Venture, in more than one bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers submitted in accordance with ITB 13.

- (h) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Asian Development Bank or a debarment imposed by the Asian Development Bank in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the Asian Development Bank and other development banks.<sup>1</sup>
- (i) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers for any part of the contract, are not under ongoing investigation and/or sanctions proceedings by the Asian Development Bank or any multilateral development bank.  
If under ongoing investigation and/or sanction proceedings by the Asian Development Bank or any multilateral development bank, please state details:
- (i) Name of the multilateral development bank: \_\_\_\_\_
- (ii) Reason for the ongoing investigation / allegations: \_\_\_\_\_
- (j) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers for any part of the Contract, are not temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency.

If so temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency, please state details (as applicable to each Joint Venture partner, their respective direct or indirect shareholders, directors, key officers, key personnel, associate, parent company, affiliate, subsidiaries, Subcontractors, consultants, sub consultants, manufacturers, service providers and/or Suppliers):

- (i) Name of Institution: \_\_\_\_\_
- (ii) Period of the temporary suspension, debarment, ineligibility, or national or international sanction [*start and end date*]: \_\_\_\_\_
- (ii) Reason for the temporary suspension, debarment, ineligibility, or national or international sanction: \_\_\_\_\_

<sup>1</sup> These institutions include African Development Bank, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB), and the World Bank Group. According to paragraph 9 of the Agreement, other international financial institutions may join upon the consent of all Participating Institutions and signature of a Letter of Adherence by the international financial institution substantially in the form provided (Annex B to the Agreement). Upon adherence, such international financial institution shall become a Participating Institution for purposes of the Agreement. Bidders are advised to check [www.adb.org/integrity](http://www.adb.org/integrity) for updates

(k) Our firm, Joint Venture partners, associates, parent company affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers Suppliers, key officers directors and key personnel have never been charged or convicted with any criminal offense (including felonies but excluding misdemeanors) or infractions and/or violations of ordinance; nor charged or found liable in any civil or administrative proceedings in the last 10 years; or undergoing investigation for such, or subject to any criminal, civil or administrative orders, monitorship or enforcement actions.

If so charged, convicted/found liable, under ongoing investigation, or subject to orders, monitorship or enforcement actions, please state details:

- (i) Nature of the offense/violation, proceedings, investigation, and/or monitorship or enforcement actions: \_\_\_\_\_
- (ii) Court, area of jurisdiction and/or the enforcement agency: \_\_\_\_\_
- (iii) Resolution [i.e., *dismissed, settled, or convicted; duration of penalty*]: \_\_\_\_\_
- (iv) Other relevant details [*please specify*]: \_\_\_\_\_

(l) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers, can make and receive electronic fund transfer payments through the international banking system or otherwise discharge the Employer’s obligation upon initiation of wire transfer.

If unable to make or receive funds through the international banking system or otherwise discharge the Employer’s obligation upon initiation of wire transfer, please state the details:

- (i) Nature of the restriction: \_\_\_\_\_
- (ii) Jurisdiction of the restriction: \_\_\_\_\_
- (iii) Other relevant details: \_\_\_\_\_

(m) Our firm, Joint Venture partners, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers, key officers, directors and key personnel are not from a country which is prohibited to export goods or services to, or receive any payments from the Employer’s country and/or are not prohibited to receive payments for particular goods or services by the Employer’s country 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.

(n) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract.<sup>1</sup>

Name of Recipient Amount	Address	Reason
.....	.....	.....
.....	.....	.....

(o) We understand that it is our obligation to notify the Employer of any changes in connection with the matters described in paragraphs (f), (h), (i), (j), (k), (l), (m) and (n) of this Letter of Technical Bid.

- (p) [We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5].<sup>2</sup>
- (q) We have not been suspended nor declared ineligible by the Employer based on execution of a Bid-Securing Declaration in accordance with ITB 4.6.
- (r) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our sites, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.
- (s) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.
- (t) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.
- (u) If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 6 (Employer’s Requirements) and our technical proposal, or as otherwise agreed with the Employer.
- (v) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded, and may result in remedial actions, in accordance with ADB’s Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name

.....

In the capacity of

.....

Signed

.....

Duly authorized to sign the Bid for and on behalf of

.....

Date

.....

- <sup>1</sup> If none has been paid or is to be paid, indicate "None".  
<sup>2</sup> Use one of the two options as appropriate.

## Country of Origin Declaration Form

Name of Bidder \_\_\_\_\_ IFB Number \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

Item	Description	Country of origin

## Letter of Price Bid

**- Note-**

*The Bidder must accomplish the Letter of Price Bid on its letterhead clearly showing the Bidder's complete name and address*

Date: .....

OCB No.: .....

Invitation for Bid No.: .....

To:

General Manager (Contracts)  
Energy Efficiency Services Limited.  
(A JV of PSUs of Ministry of Power, Govt. of India)  
Core-5, 4th Floor, SCOPE Complex,  
Lodhi Road, New Delhi-110003

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.
- (b) We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.
- (c) We offer to design, manufacture, test, deliver, install, pre-commission, commission, operate and maintain in conformity with the Bidding Document the following Plant and Services: **Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra, India, on turnkey basis, Lot No. .... (1/2/3 Choose as applicable)**
- (d) The total price of our Bid, excluding any discounts offered in item (d) below is the sum of 
*[amount of foreign currency in words], [amount in figures], and [amount of local currency in words], [amount in figures] The total bid price from the Grand Summary (Schedule No. 5) should be entered by the Bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.*
- (e) The discounts offered and the methodology for their application are as follows: *[insert discounts and methodology for their application if any]*
- (f) Our Bid shall be valid for a period of 180 days starts from the date fixed for the submission deadline in accordance with ITB 24.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

- (g) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document.
- (h) We understand that this bid, together with your written acceptance thereof included in your notification of award through the issuance of Letter of Acceptance, 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) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, sub consultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our sites, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.
- (k) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.
- (l) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after the completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.
- (m) We confirm and stand by our commitments and other declarations made in connection with the submission of our Letter of Technical Bid.
- (n) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded; and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name

.....

In the capacity of

.....

Signed

.....

Duly authorized to sign the Bid for and on behalf of



.....  
Date  
.....

## Attestation Letter

Date: .....  
OCB No.: .....

To:

General Manager (Contracts)  
Energy Efficiency Services Limited.  
(A JV of PSUs of Ministry of Power, Govt. of India)  
Core-5, 4th Floor, SCOPE Complex,  
Lodhi Road, New Delhi-110003

We, the undersigned, acknowledge that ADB will not finance activities listed on the prohibited investment activities list, under Appendix 5 of its Safeguard Policy Statement (2009), which includes, among others, production or activities involving forced labor<sup>1</sup> or child labor<sup>2</sup>.

After duly considering the above policy and commitment of ADB, we have conducted due diligence on the works, goods and services, and related materials and products to be used in the Project, and following such due diligence:

- (a) we attest and represent that (i) to the best of our knowledge, we are not using (and we have not used, and we will not use) works, goods and services, and related materials and products in the Project, where the production and supply of such products used forced labor or child labor; (ii) we adhere to labor legislation of the Employer's country and require our subcontractors and suppliers for the Project to adhere to the same in the production and supply of works, goods and services, and related materials and products proposed to be used in the Project; and (iii) to the best of our knowledge, the works, goods and services, and related materials and products to be procured and/or supplied by us for the Project do not involve production or activities involving the use of forced labor or child labor;
- (b) we attest and represent that our subcontractors, manufacturers and suppliers have confirmed to us separately that to their knowledge, after due enquiry and diligence, the offered works, goods and services, and related materials and products do not involve production or activities involving the use of forced labor or child labor;**
- (c) we further confirm that should you or ADB require an audit of our records related to the procurement of works, goods and services, and related materials and products used in the Project, we shall promptly make available to you, ADB or your respective designated representatives all relevant documents and records to assist with the audit, and grant access, to the extent practicable, to the sites, facilities, plants, and equipment to an independent auditor retained by you or ADB;
- (d) we confirm that if the contract is awarded to us, (i) we shall monitor the works, goods and services, and related materials and products provided by us on an ongoing basis, (ii) require our subcontractors, suppliers or manufacturers to immediately notify to us any incidents of forced labor or child labor, and if new risks or incidents of forced labor or child labor are identified, (iii) we commit to promptly inform you, if we receive information that the representation in (a) is false and of any new risks or incidents of forced labor or child labor in the production or activities for the offered works, goods and services, and related materials and products used in the Project, and to take appropriate steps to remedy them;

(e) we agree that a breach and misrepresentation of (a), (b), (c), or (d) above is a sufficient ground for bid rejection and may give the Employer/Purchaser the right to terminate the contract with us, if our bid is accepted and the contract is awarded to us.

Sincerely,

Authorized Signature [In full and initials]: \_\_\_\_\_

Name and Title of Signatory: \_\_\_\_\_

Address: \_\_\_\_\_

<sup>1</sup> Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.

<sup>2</sup> Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" ([www.ilo.org](http://www.ilo.org)).

# Price Schedules

## PREAMBLE

### General

1. The Price Schedules are divided into separate Schedules as follows:
  - a. Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad
  - b. Schedule No. 2: Plant and Mandatory Spare Parts Supplied from within the Employer's Country
  - c. Schedule No. 3: Design Services
  - d. Schedule No. 4: Installation and Other Services
  - e. Schedule No. 4a: Operation and Maintenance
  - f. Schedule No. 5: Grand Summary (Schedule Nos. 1 to 4 and their sub schedules )
  - g. Schedule No. 6: Recommended Spare Parts (Not applicable)
2. The Schedules do not generally give a full description of the plant to be supplied and the services to be performed under each item. Bidders shall be deemed to have read the Employer's Requirements and other sections of the Bidding Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.
3. If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITB 7 prior to submitting their bid.

### Pricing

4. The prices are to be filled in prescribed format in soft copy (in excel format) available on e-portal only. Bidders are requested not to submit the price bid in hard copy at EESL as the same shall not be considered. Price Bid Format as attached at Section-4 of the Bidding document is only for illustration/reference purpose, however, terms and conditions mentioned there in is part of this Bidding Document.
5. As specified in the Bid Data Sheet and Special Conditions of Contract, prices shall be fixed and firm for the duration of the Contract.
6. Bid prices shall be quoted in the manner indicated and, in the currencies, specified in the Instructions to Bidders in the Bidding Document.
7. For each item, Bidders shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules.
8. Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section 6 (Employer's Requirements) or elsewhere in the Bidding Document.
9. Payments will be made to the Contractor in the currency or currencies indicated under each respective item.

10. When requested by the Employer for the purposes of making payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.
11. The bid price is inclusive of all Environmental, Health and Safety management and compliance cost.

**Note:**

- (a) Drawings provided in the BID are only indicative in nature and should not be considered as final. The successful bidder shall have to submit completed drawings generated by them after detailed engineering as per site requirement to the Employer for necessary approval and consequently undertake construction based on those approved drawings.

### Schedules of Rates and Prices

LOT 1

**Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad**

Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>		Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7 = 4 x 6	8	
A1	Supply of Solar Power Generating System (Inclusive of solar PV module, Balance of System (BoS) including grid tie inverters, MMS, transformers, AJB, cables, connectors, spares etc. required for successful installation and commissioning		30 MW					
<b>TOTAL Column 7 to be carried forward to Schedule No. 5: Grand Summary</b>								

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.

**Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country**

**LOT 1**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total EXW Price <sup>a</sup>	Sales and other Taxes
			Local Currency	EXW Price <sup>b</sup>		
1	2	3	4	5	6 = 3 x 5	7
A1	Supply of Solar Power Generating System (Inclusive of solar PV module, Balance of System (BoS) including grid tie inverters, MMS, transformers, AJB, cables, connectors, spares etc. required for successful installation and commissioning	30 MW				

<b>TOTAL Column 6 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> *Specify currency in accordance with ITB 19.1 of the BDS.*

<sup>b</sup> *Column 5 EXW Price shall include all customs duties and sales and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of the item or the customs duties and sales and other taxes already paid on previously imported items.*



**Schedule No. 3: Design Services  
LOT 1**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Design Services	1 LS				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

**Schedule No. 4 - Installation and Other Services  
LOT 1**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Inland transportation including loading, unloading and transfer to site, insurance and other cost incidental to delivery	30 MW				
B	Custom duty, cess, custom clearance, port charges and other duties except GST	30 MW				
C	Erection, Installation & Commissioning of SPGS projects	30 MW				
D	STI, STD and HIV/AIDS alleviation program <sup>b</sup>	LS				
E	COVID 19 prevention program	LS				
F	Formal Training Program	LS				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

<sup>b</sup> As described in SCC 22.2.7.

**Schedule No. 4a – Operation and Maintenance  
LOT 1**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Comprehensive Operation and Maintenance on quarterly basis for 12 years	48 quarters				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

**Schedule No. 5: Grand Summary  
LOT 1**

Schedule No.	Title	Total Price <sup>a</sup>	
		Foreign	Local
<b>1</b>	<b>Plant and Mandatory Spare Parts Supplied from Abroad <sup>b</sup></b>		
<b>2</b>	<b>Plant and Mandatory Spare Parts Supplied from Within the Employer's Country <sup>b</sup></b>		
<b>3</b>	<b>Design Services</b>		
<b>4</b>	<b>Installation and Other Services</b>		
<b>4a</b>	<b>Operation and Maintenance</b>		
<b>Grand Total to be carried forward to Letter of Price Bid</b>			

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- <sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.
- <sup>b</sup> Taxes and/or duties from Schedules 1 and 2 may be added to the contract price in accordance with GCC 14 (Taxes and Duties) but excluded from bid evaluation in accordance with ITB 39.2.

**Schedule No. 6: Recommended Spare Parts (NOT APPLICABLE)  
LOT 1**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
<b>TOTAL</b>						

## Schedules of Rates and Prices

### LOT 2

#### Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad

Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency
1	2	3	4	5	6	7 = 4 x 6	8
A1	Supply of Solar Power Generating System (Inclusive of solar PV module, Balance of System (BoS) including grid tie inverters, MMS, transformers, AJB, cables, connectors, spares etc. required for successful installation and commissioning		20 MW				
<b>TOTAL Column 7 to be carried forward to Schedule No. 5: Grand Summary</b>							

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.

**Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country**

**LOT 2**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total EXW Price <sup>a</sup>	Sales and other Taxes
			Local Currency	EXW Price <sup>b</sup>		
1	2	3	4	5	6 = 3 x 5	7
A1	Supply of Solar Power Generating System (Inclusive of solar PV module, Balance of System (BoS) including grid tie inverters, MMS, transformers, AJB, cables, connectors, spares etc. required for successful installation and commissioning	20 MW				

<b>TOTAL Column 6 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> *Specify currency in accordance with ITB 19.1 of the BDS.*

<sup>b</sup> *Column 5 EXW Price shall include all customs duties and sales and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of the item or the customs duties and sales and other taxes already paid on previously imported items.*



**Schedule No. 3: Design Services  
LOT 2**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Design Services	1 LS				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

**Schedule No. 4 - Installation and Other Services  
LOT 2**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Inland transportation including loading, unloading and transfer to site, insurance and other cost incidental to delivery	20 MW				
B	Custom duty, cess, custom clearance, port charges and other duties except GST	20 MW				
C	Erection, Installation & Commissioning of SPGS projects	20 MW				
D	STI, STD and HIV/AIDS alleviation program <sup>b</sup>	LS				
E	COVID 19 prevention program	LS				
F	Formal Training Program	LS				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

<sup>b</sup> As described in SCC 22.2.7.

**Schedule No. 4a – Operation and Maintenance  
LOT 2**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Comprehensive Operation and Maintenance on quarterly basis for 12 years	48 quarters				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

**Schedule No. 5: Grand Summary  
LOT 2**

Schedule No.	Title	Total Price <sup>a</sup>	
		Foreign	Local
<b>1</b>	<b>Plant and Mandatory Spare Parts Supplied from Abroad <sup>b</sup></b>		
<b>2</b>	<b>Plant and Mandatory Spare Parts Supplied from Within the Employer's Country <sup>b</sup></b>		
<b>3</b>	<b>Design Services</b>		
<b>4</b>	<b>Installation and Other Services</b>		
<b>4a</b>	<b>Operation and Maintenance</b>		
<b>Grand Total to be carried forward to Letter of Price Bid</b>			

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- <sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.
- <sup>b</sup> Taxes and/or duties from Schedules 1 and 2 may be added to the contract price in accordance with GCC 14 (Taxes and Duties) but excluded from bid evaluation in accordance with ITB 39.2.

**Schedule No. 6: Recommended Spare Parts (NOT APPLICABLE)  
LOT 2**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
<b>TOTAL</b>						

### Schedules of Rates and Prices

#### LOT 3

#### Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad

Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency
1	2	3	4	5	6	7 = 4 x 6	8
A1	Supply of Solar Power Generating System (Inclusive of solar PV module, Balance of System (BoS) including grid tie inverters, MMS, transformers, AJB, cables, connectors, spares etc. required for successful installation and commissioning		20 MW				
<b>TOTAL Column 7 to be carried forward to Schedule No. 5: Grand Summary</b>							

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.

**Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country**

**LOT 3**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total EXW Price <sup>a</sup>	Sales and other Taxes
			Local Currency	EXW Price <sup>b</sup>		
1	2	3	4	5	6 = 3 x 5	7
A1	Supply of Solar Power Generating System (Inclusive of solar PV module, Balance of System (BoS) including grid tie inverters, MMS, transformers, AJB, cables, connectors, spares etc. required for successful installation and commissioning	20 MW				

<b>TOTAL Column 6 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> *Specify currency in accordance with ITB 19.1 of the BDS.*

<sup>b</sup> *Column 5 EXW Price shall include all customs duties and sales and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of the item or the customs duties and sales and other taxes already paid on previously imported items.*



**Schedule No. 3: Design Services  
LOT 3**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Design Services	1 LS				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

**Schedule No. 4 - Installation and Other Services  
LOT 3**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Inland transportation including loading, unloading and transfer to site, insurance and other cost incidental to delivery	20 MW				
B	Custom duty, cess, custom clearance, port charges and other duties except GST	20 MW				
C	Erection, Installation & Commissioning of SPGS projects	20 MW				
D	STI, STD and HIV/AIDS alleviation program <sup>b</sup>	LS				
E	COVID 19 prevention program	LS				
F	Formal Training Program	LS				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

<sup>b</sup> As described in SCC 22.2.7.

**Schedule No. 4a – Operation and Maintenance  
LOT 3**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
A	Comprehensive Operation and Maintenance on quarterly basis for 12 years	48 quarters				
<b>TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary</b>						

**Schedule No. 5: Grand Summary  
LOT 3**

Schedule No.	Title	Total Price <sup>a</sup>	
		Foreign	Local
<b>1</b>	<b>Plant and Mandatory Spare Parts Supplied from Abroad <sup>b</sup></b>		
<b>2</b>	<b>Plant and Mandatory Spare Parts Supplied from Within the Employer's Country <sup>b</sup></b>		
<b>3</b>	<b>Design Services</b>		
<b>4</b>	<b>Installation and Other Services</b>		
<b>4a</b>	<b>Operation and Maintenance</b>		
<b>Grand Total to be carried forward to Letter of Price Bid</b>			

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- <sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS. Create additional columns for foreign currencies if so required.
- <sup>b</sup> Taxes and/or duties from Schedules 1 and 2 may be added to the contract price in accordance with GCC 14 (Taxes and Duties) but excluded from bid evaluation in accordance with ITB 39.2.

**Schedule No. 6: Recommended Spare Parts (NOT APPLICABLE)  
LOT 3**

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
<b>TOTAL</b>						

### Bid Security – Bank Guarantee

*(To be furnished from Nationalized Bank of India)*

*[Bank's name, and address of issuing branch or office]<sup>1</sup>*

**Beneficiary:** ..... *[Name and address of the Employer]* .....

**Date:** .....

**Bid Security No.:** .....

We have been informed that *[name of the Bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated *[insert date]* (hereinafter called "the Bid") for the execution of **“Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra, India”, on turnkey basis, Lot No. .... (1/2/3 Choose as applicable)** under Invitation for Bids No. **EESL/06/2023-24/ICB/ADB/Solar/232402035** (“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 *[name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[amount in words]* *[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 Letters of Technical and Price Bid; 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 Employer 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.
- (d) does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid

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.<sup>2</sup>

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

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1 All italicized text is for use in preparing this form and shall be deleted from the final document.  
2 Or 758 as applicable.

## Technical Proposal

**All Sections of the Technical Proposal below must be provided in detail.**

This technical Information is used to evaluate technically how applicable, adequate and acceptable your Site, Methodology, Scheduling Construction, Mobilization, Plans, Personnel and Equipment are to the Client.

1. **Site Organization**
2. **Method Statement**
3. **Mobilization Schedule**
4. **Construction Schedule**
5. **Plant**
6. **Personnel**
7. **Equipment**
8. **Proposed Subcontractors for Major Items of Plant and Services**
9. **Manufacturer's Authorization**
10. **Time Schedule**
11. **Functional Guarantee of the Proposed Facilities**
12. **COVID-19 Specific Site Health and Safety Management Plan**



## Site Organization

The Bidder's submission on site organization shall provide, but not limited to:

- (a) An Organization Chart of the Bidder showing, as a minimum, the reporting lines of the key personnel participating in the project as well as the main communication lines (home office as well as site office personnel, including international and national personnel).
- (b) A Construction Site Management Plan clearly addressing: (i) how the site will be managed from day to day, and throughout the duration of the contract; (ii) indicating the proposed locations of the Bidder's temporary facilities; and (iii) a description of any site requirements, with an accompanying explanation of the way in which such works and requirements will be coordinated across all parties present on the Site.
- (c) Outlines of the organization for the execution of the following activities:
  - Quality Management
  - Health and Safety
  - Construction Environmental Management

## Method Statement

### General

- Staging plan
- Logistics and storage Safety plan
- Materials quality control process
- Location and management of utilities (telecommunications, power, water, waste, etc.)
- Testing and commissioning plan

### Civil and Structural works

- Demolition
- Control of dust and hazardous materials
- Waste disposal
- Concrete, sand and aggregate – source and quality control
- Steel – source and quality control
- Construction methods

### Gensets & auxiliaries

- Source, procurement and shipping
- Installation
- Testing and commissioning

### Control system

- Design & control philosophy
- Installation
- Testing and commissioning

### Switchboards

- Source, procurement and shipping
- Quality control
- Installation
- Testing and commissioning

The Bidder will include in the method statement any constraints and restrictions that may apply in completing the proposed activities and shall outline the strategies to manage them. In particular, the method statements shall address, but not limited to:

- (1) Site investigation and survey of the Site and preparation of the land, including ground clearing, drainage, transportation of materials, etc.
- (2) Transportation and delivery of key items of plant to the Site.
- (3) Design, installation and commissioning of the Facilities, including the PV panels, inverters, transformer, SCADA / control systems, cabling and ancillary services.
- (4) Interconnection of the Plant to the grid operator and required cooperation from the grid operator during interconnection, commissioning and testing.
- (5) Compliance with requirements of the Due Diligence Report, Resettlement Plan, Environmental Management Plan and Gender Action Plan, if relevant.

## Mobilization Schedule

### **Mobilization Resources, Materials, Plant and Equipment**

The Bidder must show realistic, adequately detailed mobilization of staff, resources, equipment and materials to site, identify all significant activities, take due account of rainy season, environmental constraints, (5 pages maximum)

The Bidder shall provide at least resource histograms clearly defining staffing levels by discipline and a resource mobilization plan for the full construction period, taking due account of rainy season, broken down into construction, installation, commissioning and operations and maintenance activities. Designated Resources shall be shown separately.

### Construction Schedule

*Bidders shall describe the methods they will use to carry out the Contract Works on time and to the standards specified and must also submit a program for the Works. Bidders must also describe the means and methods by which the desired results will be achieved in a practicable and efficient manner with the aim to meet the standards specified in the Contract and in Section 6 of the Bid Documents. (5 pages maximum).*

The Bidder shall prepare a detailed construction schedule for the Plant and Installation Services. The schedule shall employ critical path methodology in a project software and shall include the following activities, but not limited to:

- (a) Mobilization
- (b) Survey & data collection
- (c) Detail design
- (d) Approvals
- (e) Manufacturing
- (f) Factory Acceptance Tests
- (g) Transport / delivery
- (h) Outage times during interconnection, commissioning and testing.
- (i) Civil works
- (j) Installation & erection
- (k) Commissioning tests
- (l) Performance and guarantee Tests.
- (m) Hand over
- (n) O&M for **12** years after commissioning of the plant

The construction schedule will demonstrate how the Contractor will achieve the Time for Completion of the complete Facilities and for each part of the Facilities for which a separate Time for Completion has been specified (refer EQC 1.3.2 (Time Schedule) of Section 3).

**Plant**

### Form PER – 1: Proposed Personnel

Bidders should provide the details of proposed personnel and their experience record in the relevant Information Forms below for each of the candidate. ***All titles of positions will be as listed in Section 6 (Employer’s Requirements) and are considered a minimum requirement for each lot. The same persons shall not be submitted for the two lots***

<b>1.</b>	<b>Title of position: Project Manager</b>
	<b>Name:</b>
<b>2.</b>	<b>Title of position: Civil Engineer</b>
	<b>Name:</b>
<b>3.</b>	<b>Title of position: Electrical Engineer</b>
	<b>Name:</b>
<b>4.</b>	<b>Title of position: On-site Supervisor (Civil)</b>
	<b>Name:</b>
<b>5.</b>	<b>Title of position: On-site Supervisor (Electrical)</b>
	<b>Name:</b>
<b>6.</b>	<b>Title of position: Environmental and Social Safeguards Specialist &amp; Health &amp; Safety Officer<sup>1</sup></b>
	<b>Name:</b>

<sup>1</sup>One CV or two CVs for each category may be provided

**Form PER-2: Resume of Proposed Personnel**

The Bidder shall provide all the information requested below. Use one form for each position.  
3 pages max

<b>Nominated Position</b>		
<b>Personnel information</b>	<b>Name</b>	<b>Date of Birth</b>
	<b>Professional qualifications [include institution and date of qualification, show documentary evidence]</b>	
<b>Present Employment</b>	<b>Name of employer</b>	
	<b>Address of employer</b>	
	<b>Telephone</b>	<b>Contact (Manager / personnel officer)</b>
	<b>Fax</b>	<b>E-mail</b>
	<b>Job title</b>	<b>Years with present employer</b>

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project. Provide detailed information that relates to this position

From	To	Company/Project /	Position / Relevant Technical and Management Experience	Responsibilities

### Form EQU: Equipment

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment requirements **indicated in Section 6 (Employer's Requirements)**, using the Forms below. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder

<b>Item of Equipment</b>		
<b>Equipment information</b>	<b>Name of manufacturer</b>	<b>Model and power rating</b>
	<b>Capacity</b>	<b>Year of manufacture</b>
<b>Current Status</b>	<b>Current Location</b>	
	<b>Details of current commitments</b>	
<b>Source</b>	<b>Indicate source of equipment</b>	
	<input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Bidder.

<b>Owner</b>	<b>Name of owner</b>	
	<b>Address of owner</b>	
	<b>Telephone</b>	<b>Contact name and title</b>
	<b>Fax</b>	<b>Telex</b>
<b>Agreements</b>	<b>Details of rental/lease/manufacture agreements specific to the project</b>	



**Proposed Subcontractors and/or Manufacturers for Major Items of Plant and Services**

The following Subcontractors and/or Manufacturers are proposed for carrying out the item of the facilities indicated based on **Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria)**. Bidders are free to propose more than one for each item.

<b>Major items of plant &amp; services</b>	<b>Proposed subcontractor / manufacturers</b>	<b>Nationality</b>

## Manufacturer's Authorization

Date: *[insert date (as day, month and year) of bid submission]*  
OCB No.: *[insert number of bidding process]*

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

### WHEREAS

We *[insert complete name of the manufacturer or manufacturer's authorized agent]*, who are official manufacturers or agent authorized by the Manufacturer 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 27 of the General Conditions of Contract, 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-**

***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 BDS.***

### Form FUNC: Functional Guarantee of the Proposed Facilities

The Bidder shall copy on the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Employer in EQC 1.3.4 of Section 3, Evaluation and Qualification Criteria, and on the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.

<b>Functional Guarantee</b> <i>[as required by the Employer in Section 3]</i>	<b>Functional Guarantee Value Offered by the Bidder</b>
Guaranteed energy generation on year wise basis from each of the plant	Eg. For 1 <sup>st</sup> year; 1664 Units per kWac Refer Section- 6 for details

Bidder's Seal and Signature  
/ Authorized Representative

**HS-C19: COVID 19 Health and Safety Plan**

The Plan should be fit for purpose for the particular construction works of this contract and be aligned with any relevant government regulations and guidelines on COVID-19 prevention and controls, as well as workplace safety requirements, or in the absence thereof, to international good practice guidelines such as the World Health Organization's publication entitled "Considerations for public health and social measures in the workplace in the context of COVID-19" (available here: <https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19>), and to ADB SDCC's advisory entitled "Protecting the Safety and Well-Being of Workers and Communities from COVID-19" (available here: <https://www.adb.org/publications/safety-well-being-workers-communities-covid-19>)

In accordance with ITB 16.1 the Bidder shall submit a draft Health and Safety Plan for the works in accordance with local laws and Section 6 (Employer's Requirements). This plan shall outline a credible site specific COVID-19 risk management strategy and shall be sufficiently detailed to identify clear stages in risk profile and suppression strategies. The Health and Safety Plan shall be a "living" document to be updated at appropriate stages during the contract but shall be sufficiently detailed and robust to facilitate cost appraisals of changes to risk mitigation strategies.

Bidder's Seal and Signature  
/ Authorized Representative

## 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 following information requested in the corresponding Information Sheets.

You must provide the **supporting Documentary Evidence** in support of all claims made in this section up to the satisfaction of the employer

### Form ELI - 1: Bidder's Information Sheet

<b>Bidder's Information</b>	
<b>Bidder's legal name</b>	
<b>In case of a Joint Venture, legal name of each partner</b>	
<b>Bidder's country of constitution</b>	
<b>Bidder's years of constitution</b>	
<b>Bidder's legal address in country of constitution</b>	
<b>Bidder's authorized representative (name, address, telephone number(s), fax number(s), email address)</b>	
<p><b>Attached are copies of the following documents:</b></p> <ol style="list-style-type: none"> <li>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</li> <li>2. Authorization to represent the firm or Joint Venture named above, in accordance with ITB 22.2</li> <li>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</li> <li>4. In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5</li> </ol>	

Bidder's Seal and Signature  
/ Authorized Representative

### Form ELI - 2: Joint Venture Information Sheet

1. **Each member of the Joint Venture must fill out this form separately.**
2. **Each Subcontractor must fill out this form.** All Sub-contractors for key activities must complete the information in this form as per Section III, Evaluation and Qualification Criteria, Sub-Factor 2.5. Each Specialist Contractor must be nominated with complete information provided in this form for consideration during the evaluation process

Joint Venture / Subcontractor Information	
<b>Bidder's legal name</b>	
<b>Joint Venture Partner's or Subcontractor's legal name</b>	
<b>Joint Venture Partner's or Subcontractor's country of constitution</b>	
<b>Joint Venture Partner's or Subcontractor's years of constitution</b>	
<b>Joint Venture Partner's or Subcontractor's legal address in country of constitution</b>	
<b>Joint Venture Partner's or Subcontractor's authorized representative information (name, address, telephone number(s), fax number(s), email address)</b>	
<b>Attached are copies of the following documents:</b> <ol style="list-style-type: none"> <li>1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2</li> <li>2. Authorization to represent the firm named above, in accordance with ITB 22.2</li> <li>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</li> </ol>	

Subcontractors are those listed in Technical Proposal – Proposed Subcontractors and/or Manufacturers for Major Items of Plant and Services.

Bidder's Seal and Signature  
/ Authorized Representative



### Form CON-1: Historical Contract Nonperformance

Each Bidder must fill out this form in accordance with Criteria 2.2.1 and 2.2.3 of Section 3 (Evaluation and Qualification Criteria) to describe any history of nonperforming contracts and pending litigation or arbitration formally commenced against it.

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

**Joint Venture Partner:** \_\_\_\_\_

**Table 1: History of Nonperforming Contracts**

**Choose one of the following:**

- No nonperforming contracts.
- Below is a description of nonperforming contracts involving the Bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Description	Amount of Non performed Portion of Contract (\$ equivalent)	Total Contract Amount (\$ equivalent)
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for nonperformance: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>	<i>[insert amount]</i>

**Table 2: Pending Litigation and Arbitration**

**Choose one of the following:**

- No pending litigation, arbitration or any other material events impacting the net worth and/or liquidity of the bidder.
- Below is a description of all pending litigation, arbitration involving the Bidder or any other material events impacting the net worth and/or liquidity of the bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Matter in Dispute	Value of Pending Claim (\$ Equivalent)	Value of Pending Claim as a Percentage of Net Worth

<p><i>[insert year]</i></p>	<p>Contract Identification, as applicable: <i>[indicate complete contract name/ number, and any other identification]</i>                  Name of Employer, parties involved in the material events impacting the net worth and/or liquidity of the bidder: <i>[insert full name]</i>                  Address of Employer, parties involved in the material events impacting the net worth and/or liquidity of the bidder: <i>[insert street/city/country]</i>                  Matter of Dispute: <i>[indicate full description of dispute]</i>                  Party who initiated the dispute: <i>[indicate "Employer" or "Contractor"]</i>                  Status: <i>[indicate status of dispute]</i></p>	<p><i>[insert amount]</i></p>	<p><i>[insert amount]</i></p>

Bidder's Seal and Signature  
 / Authorized Representative

**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:

**Joint Venture Partner:** \_\_\_\_\_

Financial Data for Previous 5 Years [\$ Equivalent]					
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
<b>Information from Balance Sheet</b>					
<b>Total Assets (TA)</b>					
<b>Total Liabilities (TL)</b>					
<b>Net Worth = TA-TL</b>					
<b>Current Assets (CA)</b>					
<b>Current Liabilities (CL)</b>					
<b>Working Capital = CA-CL</b>					
<b>Most Recent Working Capital</b>		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.			
<b>Information from Income Statement</b>					
<b>Total Revenues</b>					
<b>Profits Before Taxes</b>					
<b>Profits After Taxes</b>					
		<p>Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last <b>5</b> years, as indicated above, complying with the following conditions.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Historical financial statements must be audited by a certified accountant.</li> <li>• Historical financial statements must be complete, including all notes to the financial statements.</li> <li>• Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).</li> </ul>			

Bidder's Seal and Signature  
/ Authorized Representative

Seal and Signature  
Registered Chartered Account

***N.B: Converted to US dollars at the rate of exchange at the end of the period reported.***

**Form FIN - 2: 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:

**Joint Venture Partner:** \_\_\_\_\_

Annual Turnover Data for the Last 5 years			
Year	Amount of Currency	Exchange Rate	\$ Equivalent
1			
2			
3			
4			
5			
<b>Average Annual Turnover</b>			

Bidder's Seal and Signature  
/ Authorized Representative

Seal and Signature  
Registered Chartered Account

### Form FIN-3: Availability of Financial Resources

Bidders must demonstrate sufficient financial resources, usually comprising of Working Capital supplemented by credit line statements or overdraft facilities and others to meet the Bidder's financial requirements for

- (a) its current contract commitments, and
- (b) the subject contract.

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

**Joint Venture Partner:** \_\_\_\_\_

<b>Financial Resources</b>		
<b>Sl. No</b>	<b>Source of Financing</b>	<b>Amount (\$ Equivalent)</b>
1	Working Capital (To be taken from FIN-1)	
2	Credit Line <sup>a</sup>	
3	Other Financial Resources <sup>b</sup>	
<b>Total Available Financial Resources</b>		

<sup>a</sup> To be substantiated by a letter from the bank issuing the line of credit.

<sup>b</sup> Documentary evidence must be provided in support of any assets named and that would require liquidation

**N.B: Converted to US dollars at the rate of exchange at the end of the period reported.**

### Form FIN- 4: Financial Requirements for Current Contract Commitments

Bidders (or each Joint Venture partner) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

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

**Joint Venture Partner:** \_\_\_\_\_

Current Contract Commitments						
Sl. NO	Name of Contract	Employer's Contact (Address, Tel, Fax)	Contract Completion Date	Outstanding Contract Value (X) <sup>a</sup>	Remaining Contract Period in months (Y) <sup>b</sup>	Monthly Financial Resources Requirement (X / Y)
1						
2						
3						
4						
<b>Total Monthly Financial Requirement for Current Contract Commitments</b>						<b>\$</b> .....

<sup>a</sup> *Remaining outstanding contract values to be calculated from 28 days prior to the bid submission deadline (\$ equivalent based on the foreign exchange rate as of the same date).*

<sup>b</sup> *Remaining contract period to be calculated from 28 days prior to bid submission deadline.*

### Form FIN - 5: Self-Assessment Tool for Bidder's Compliance to Financial Resources

This form requires the same information submitted in Forms FIN - 3 and FIN - 4. All conditions of "Available Financial Resources Net of Current Contract Commitments (CCC)  $\geq$  Requirement for the Subject Contract" must be satisfied to qualify.

#### Form FIN - 5A: For Single Entities

For Single Entities: (A)	Total Available Financial Resources from FIN - 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN - 4 (C)	Available Financial Resources Net of CCC $D = (B - C)$	Requirement for the Subject Contract (E)	Results: Yes or No [ <i>D must be greater than or equal to E</i> ] (F)
(Name of Bidder)					

#### Form FIN - 5B: For Joint Ventures

For Joint Ventures: (A)	Total Available Financial Resources from FIN - 3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN - 4 (C)	Available Financial Resources Net of CCC $D = (B - C)$	Requirement for the Subject Contract (E)	Results: Yes or No [ <i>D must be greater than or equal to E</i> ] (F)
One Partner					
_____				.....	
(Name of Partner)					
Each Partner					
_____				.....	
(Name of Partner 1)					
_____				.....	
(Name of Partner 2)					
_____				.....	
(Name of					



Partner 3)					
All partner combined	Σ D = Sum of available financial resources net of current contract commitments for all partners		Σ D = _____		

**-Note-**

*Form FIN – 5 is made available for use by the bidder as a self-assessment tool, and by the Employer as an evaluation work sheet, to determine compliance with the financial resources requirement as stated in 2.3.3. Failure to submit Form FIN - 5 by the Bidder shall not lead to bid rejection.*

**Form EXP – 1: Contracts of Similar Size and Nature**

Fill out one (1) form per contract.

The exchange rate to be used to calculate the value of the contract for conversion to a specific currency shall be the selling rate of the Borrower’s national bank on the date of the contract.

Contract of Similar Size and Nature		
Contract No . . . . . of . . . . .	Contract Identification	
Award Date	Completion Date	
Role of Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	\$	
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percentage of Total	Amount
Employer’s name, Address Telephone number Fax number E-mail		
<b>Description of the Similarity in Accordance with Criterion 2.4.1 of Section 3 (Evaluation and Qualification Criteria)</b>		

### Form EXP - 2: Experience in Key Activities

Fill out one (1) form per contract.

Each Bidder must fill out this form.

If complied by Specialist Subcontractor, **each Specialist Subcontractor** must fill out this form and provide the Specialist Subcontractor's name:

**Specialist Subcontractor:** \_\_\_\_\_

Contract with similar key activities		
Contract No . . . . . of . . . . .	Contract Identification	
Award Date	Completion Date	
Role of Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	\$	
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percentage of Total	Amount
Employer's name, Address Telephone number Fax number E-mail		
Description of the Key Activities in Accordance with Criterion 2.4.2 of Section 3 (Evaluation and Qualification Criteria)		

**Form EXP - 3: Subcontractors**

Fill out one (1) form per contract

Contract for the Major Items		
Contract No . . . . . of . . . . .	Contract Identification	
Award Date	Completion Date	
Role of Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	\$	
If partner in a Joint Venture or Subcontractor, specify participation of total contract amount	Percentage of Total	Amount
Employer's name, Address Telephone number  Fax number E-mail		
<b>Description of the Major Items in Accordance with Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria)</b>		

### Form EXP – 4: Specific Experience in Managing Environmental, Health and Safety Aspects

Fill out one form per contract.

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:

Joint Venture Partner: \_\_\_\_\_

1. Key Requirement no 1 in accordance with Criterion 2.4.3 of Section 3:

\_\_\_\_\_

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Partner In JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Subcontractor <input type="checkbox"/>
Total Contract Amount			US\$	
Details of relevant experience				

2. Key Requirement no 2 in accordance with Criterion 2.4.3 of Section 3:

3. Key Requirement no 3 in accordance with Criterion 2.4.3 of Section 3:

\_\_\_\_\_

**Form EXP – 5: Environmental, Health and Safety Certification****Please provide the following information:**

Availability of the following valid ISO certification or internationally-recognized equivalent (equivalency to be demonstrated by the Bidder), and applicable to the worksite:

- Quality management certificate ISO 9001
- Environmental management certificate ISO 14001
- Health and Safety management certificate ISO 45001

**Form EXP – 6: Environmental, Health and Safety Documentation****Please provide the following information:**

Availability of in-house policies and procedures acceptable to the Employer for EHS management:

1. Existence of an Ethics Charter.
2. Existence of a system for monitoring compliance with EHS commitments for the Bidder's Subcontractors and all its partners.
3. Existence of official company procedures for the management of the following relevant points:
  - *EHS resources and facilities and EHS monitoring system;*
  - *Project Areas management information (base camps, quarries, burrow pits, storage areas);*
  - *Health and Safety on worksites policy and related guidance;*
  - *Local recruitment and EHS trainings of local staff/subcontractors/local partners;*
  - *Community stakeholder engagement practice;*
  - *Traffic management practice;*
  - *Hazardous products management practice;*
  - *Waste management practice;*
  - *Protection of water resources;*
  - *Biodiversity protection practices;*
  - *Site rehabilitation and revegetation practice;*
  - *Local cultural heritage protection practice;*
  - *Erosion and sedimentation practices;*
  - *Control of infectious and communicable diseases (HIV/AIDS, malaria, COVID-19 etc.)*

**Form EXP – 7: Environmental, Health and Safety Dedicated Personnel**

Please provide CV [Form PER-2] of the in-house personnel of the main contractor/ Joint Venture partners for the EHS positions specified in Section 6 (Employers Requirements):

***-Environmental Specialist***

***-Health and Safety Specialist***

***- Community Consultation Officer***



**(Declaration of the Lots for which bid is submitted)****To,**

General Manager (Contracts)  
 Energy Efficiency Services Limited.  
 (A JV of PSUs of Ministry of Power, Govt. of India)  
 Core-5, 4<sup>th</sup> Floor, SCOPE Complex,  
 Lodhi Road, New Delhi-110003

**Subject Tender: Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra under Scaling Up Demand-Side Energy Efficiency Sector Project**  
**IFB/OCB No.: EESL/06/2023-24/ICB/ADB/Solar/232402035**

1.0 I/we (on behalf of M/s.....) hereby admit that I/we, have quoted for the following Lots in the above-referred Tender.

Table-1

Lot No.	Participated/Submitted Bid (Yes/No)
LOT-1	
LOT-2	
LOT-3	

2.0 We understood that our Bid shall be evaluated as per the provisions of the Bidding Documents for only those Lots against which we have indicated as 'Yes'. **Further, our Bid shall not be evaluated for those Lots against which we have indicated 'No' or has left blank or has written something else.**

Signature of bidder

With stamp &amp; Address

Note: Bidder has to mandatorily submit the declaration as above. The bid shall be evaluated on the basis of this declaration. Providing false information may lead to technically non-responsiveness of the bid.

**Power of Attorney**  
*(Bidder to use its own format)*

**DEVIATION STATEMENT**

To:  
 General Manager (Contracts)  
 Energy Efficiency Services Limited.  
 (A JV of PSUs of Ministry of Power, Govt. of India)  
 Core-5, 4th Floor, SCOPE Complex,  
 Lodhi Road, New Delhi-110003

**Subject Tender:** Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra under Scaling Up Demand-Side Energy Efficiency Sector Project  
 IFB/OCB No.: EESL/06/2023-24/ICB/ADB/Solar/232402035

Dear Sir,

The following are the deviations and variations from and exceptions to the terms, conditions and specification of the bidding documents for IFB No. EESL/06/2023-24/ICB/ADB/Solar/232402035. These deviations and variations are exhaustive. We are furnishing below the cost of withdrawal for the deviations and variations stated in this Attachment. We shall withdraw the deviations proposed by us in this Attachment at the cost of withdrawal indicated herein, failing which our bid may be rejected and bid security may be forfeited. We confirm that except for these deviations and variations, the entire work shall be performed as per your specifications and conditions of bidding documents. Further, we agree that additional conditions, variations, deviations if any, found in the proposal documents other than those stated in this Attachment, save those pertaining to any rebates offered, shall not be given effect to:

Sl. No.	Section/ Part/ Chapter	Clause No.	Page No.	Statement of Deviations/Variations	Cost of Withdrawal
A.	COMMERCIAL DEVIATIONS :				
B.	TECHNICAL DEVIATIONS :				

Date : (Signature).....  
 Place : (Printed Name).....  
  
 (Designation).....  
 (Common Seal).....  
 Name & Address of the Bidder:.....

Note: Continuations sheets of like size and format may be used as per Bidder's requirement.

### Eligibility Certificate

To:  
 General Manager (Contracts)  
 Energy Efficiency Services Limited.  
 (A JV of PSUs of Ministry of Power, Govt. of India)  
 Core-5, 4th Floor, SCOPE Complex,  
 Lodhi Road, New Delhi-110003

**Subject Tender:** Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra under Scaling Up Demand-Side Energy Efficiency Sector Project  
**IFB/OCB No.:** EESL/06/2023-24/ICB/ADB/Solar/232402035

Dear Sir,

We hereby certify that Plant to be supplied are produced in eligible source country.

We hereby certify that our company is incorporated and registered in eligible source country.

Sl. No.	Plant produced in (Name of the Country)	Company incorporated and registered in (Name of the Company)
1.		
2.		

Date : (Signature).....

Place : (Printed Name).....

(Designation).....

(Common Seal).....

Name & Address of the Bidder:.....

PROFORMA OF LETTER OF UNDERTAKING

(TO BE FURNISHED ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

[To be executed by the Holding Company Supported by Board Resolution and submitted by the Bidder along with the Bid, in case financial support is being extended by the Holding Company to the Bidder for meeting the stipulated Financial Qualifying]

To,  
General Manager (Contracts)  
Energy Efficiency Services Limited.  
(A JV of PSUs of Ministry of Power, Govt. of India)  
Core-5, 4th Floor, SCOPE Complex,  
Lodhi Road, New Delhi-110003

**Subject Tender:** Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra under Scaling Up Demand-Side Energy Efficiency Sector Project  
IFB/OCB No.: EESL/06/2023-24/ICB/ADB/Solar/232402035

---

Dear Sir,

1.0 We, M/s..... (Name of the Holding Company) declare that we are the holding company of M/s..... (Name of the Bidder) and have controlling interest therein.

M/s..... (Name of the Bidder) proposes to submit the bid for the package ..... (Name of the package) for ..... (Name of the Project) under bid reference no..... dated ..... and have sought financial strength and support from us for meeting the stipulated Financial Qualifying Requirement as per Clause Section 3 and its subsequent amendment.

2.0 We hereby undertake that we hereby pledge our unconditional & irrevocable financial support for the execution of the said package to M/s..... (Name of the Bidder), for the execution of the

Contract, in case they are awarded the Contract for the said package at the end of the bidding process. We further agree that this undertaking shall be without prejudice to the various liabilities that M/s..... (Name of Bidder) would be required to undertake in terms of the Contract including the Performance Security as well as other obligations of M/s.....(Name of the Bidder).

3.0 This undertaking is irrevocable and unconditional, and shall remain in force till the successful execution and performance of the entire contract and/or till it is discharged by EESL.

4.0 We are herewith enclosing a copy of the Board Resolution in support of this undertaking.

**Witness:**

**Yours faithfully,**

(1) .....

(Signature of Authorized Signatory)  
on behalf of the Holding Company

(2) .....

Name & Designation

.....

Name of the Holding Company

.....

(Seal of Holding Company)

**FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY  
OF CREDIT/FACILITIES**

**BANK CERTIFICATE**

This is to certify that M/s. \_\_\_\_\_ (Full Name & Address) \_\_\_\_\_ who have submitted their bid to EESL against their tender specification Vide IFB/OCB No. EESL/06/2023-24/ICB/ADB/Solar/232402035 & date \_\_\_\_\_ is our customer for the past \_\_\_\_\_ years.

Their financial transactions with our Bank have been satisfactory. They enjoy the following fund based and non fund based limits including for guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

<b>Sl. No.</b>	<b>TYPE OF FACILITY</b>	<b>SANCTIONED LIMIT AS ON DATE</b>	<b>UTILISATION AS DATE _____</b>	<b>ON</b>
1.				
2.				
3.				

This letter is issued at the request of M/s. \_\_\_\_\_.

Signature \_\_\_\_\_  
 Name of Bank \_\_\_\_\_  
 Name of Authorised \_\_\_\_\_  
 Signatory  
 Designation \_\_\_\_\_  
 Phone No. \_\_\_\_\_  
 Address \_\_\_\_\_

SEAL OF THE BANK

**FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS  
(On Non-Judicial Stamp Paper of Appropriate Value if required)**

THIS JOINT DEED OF UNDERTAKING executed on this..... day of..... Two Thousand and..... by ..... a company incorporated under the laws of .....and having its Registered Office at ..... (hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s.....a company incorporated under the laws of.....and having its Registered Office at..... (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns ) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award}] against the NIT/ICB No.....for .....(**insert name of the Tender**)..... of Energy Efficiency Services Limited, a Company incorporated under the Companies Act of 1956 having its registered office at NFL Building, 5th & 6th Floor, Core – III, SCOPE Complex, Lodhi Road, New Delhi – 110003 (hereinafter called the "Purchaser").

WHEREAS the Party No.1 and Party No.2 have entered into an Agreement dated .....

AND WHEREAS the Purchaser invited bids as per the above mentioned Specification for the design, manufacture, Supply of Equipment Materials stipulated in the bidding documents under subject **Tender i.e.**.....

AND WHEREAS Clause 19, Section-ITB and BDS (documents establishing the Qualification of Bidder) & Qualification Criteria in Section-3 forming part of the bidding documents, inter-alia stipulates that an Undertaking of two qualified manufacturers as partners, meeting the requirements of Qualification Criteria in Section-3, as applicable may bid, provided, the Joint Venture fulfills all other requirements under Clause 4 of ITB and Qualification Criteria in Section-3 and in such a case, the Bid Submission Sheets shall be signed by all the partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that this Undertaking shall be attached to the bid and the Contract performance guarantee will be as per the format enclosed with the bidding document without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Purchaser vide proposal No.....dated..... by Party No.1 based on this Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Clause 19, Section-ITB and BDS (documents establishing the Qualification of Bidder) & Qualification Criteria in Section-3, has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the Purchaser to the Joint Venture Partners, we, the Parties do hereby undertake that M/s..... the Party No.1, shall act as Leader and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Purchaser for the successful performance of the Contract and shall be fully responsible for the design, manufacture, Supply, and successful performance of the equipment in accordance with the Contract:



2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.
3. Further, if the Purchaser suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Purchaser, on its demand without any demur. It shall not be necessary or obligatory for the Purchaser to proceed against Leader to these presents before proceeding against or dealing with the other Party(s), the Purchaser can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Purchaser.
4. The financial liability of the Parties of this Deed of Undertaking to the Purchaser, with respect to any of the claims rising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.
5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties are given as in the bid. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.
6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract. and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.
7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.
8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Purchaser in the currency/currencies of the Contract. In case of award on us, the delineation of scope of work shall be as per the following:

SI. No.	Scope of Work to be executed by	
	Party No.-1	Party No.-2

9. It is further agreed that this Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Purchaser discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorised representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of .....  
has been affixed in my/ our  
presence pursuant to Board of  
Director's Resolution dated .....

For Leader (Party No.-1)  
For and on behalf of M/s .....

Name .....

(Signature of the authorized representative)

Designation .....

Signature .....

**WITNESS :**

I. ....

II. ....

Common Seal of .....  
has been affixed in my/ our  
presence pursuant to Board of  
Director's Resolution dated .....

For Party No.-2  
For and on behalf of M/s.....

Name .....

(Signature of the authorized  
representative)

Designation .....

Signature .....

**WITNESS :**

I. ....

II. ....

Common Seal of .....  
has been affixed in my/ our

For Party No.-3  
For and on behalf of M/s .....

presence pursuant to Board of  
Director's Resolution dated .....

Name .....

Designation ..... (Signature of the authorized representative)

Signature .....

**WITNESS :**

I. ....

II. ....

**FORM OF POWER OF ATTORNEY FOR JOINT VENTURE**  
(On Non-Judicial Stamp Paper of Appropriate Value if required)

KNOW ALL MEN BY THESE PRESENTS THAT WE, the Partners whose details are given hereunder..... have formed a Joint Venture under the laws of ..... and having our Registered Office/Head Office at ..... (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s. .... being the Partner incharge do hereby constitute, nominate and appoint M/s. .... a Company incorporated under the laws of ..... and having its Registered/Head Office at ..... as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Leader" or "Authorised Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Specification No.....; Package ....., the bids for which have been invited by Energy Efficiency Services Limited, a Company incorporated under the Companies Act of 1956 having its registered office at NFL Building, 5th & 6th Floor, Core – III, SCOPE Complex, Lodhi Road, New Delhi – 110003, INDIA (hereinafter called the "Purchaser") to undertake the following acts:

- i) To submit proposal and participate in the aforesaid Bid Specification of the Purchaser on behalf of the "Joint Venture".
- ii) To negotiate with the Purchaser the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Purchaser for and on behalf of the "Joint Venture".
- iii) To do any other act or submit any document related to the above.
- iv) To receive, accept and execute the Contract for and on behalf of the "Joint Venture".
- v) To receive payment on behalf of the "Joint Venture".
- vi) To authorize any other partners of the Joint Venture, if necessary, to receive payments under the contract.

It is clearly understood that the Partner Incharge shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Warranty Period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney /Authorised Representative quotes in the bid, negotiates and signs the Contract with the Purchaser and/or proposes to act on behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this ..... day of ..... under the Common Seal(s) of their Companies.

for and on behalf of  
the Partners of Joint Venture

.....  
.....  
.....

The Common Seal of the above Partners of the Joint Venture :

The Common Seal has been affixed there unto in the presence of :

**WITNESS**

1. Signature.....  
Name .....  
Designation .....  
Occupation .....
2. Signature.....  
Name .....  
Designation .....  
Occupation .....

## **Section 5: Eligible Countries**

**No nationality restrictions apply, other than any restrictions arising from ITB 4.8.**

# Section 6: Employer's Requirements

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# 1. Scope of Supply of Plant and Services

## Abbreviations and Definitions

Following abbreviations and terms used in the document will carry the meaning and interpretations as described below:

“B.I.S.” means specifications of Bureau of Indian Standards (BIS)

“CEA” shall mean Central Electricity Authority.

“CLIENT” shall mean Maharashtra State Power Generation Company Limited

“COD” shall mean the “Commercial Operations Date” of the Solar Power Generating System

“DC CAPACITY” shall mean the total solar PV array capacity of the solar PV modules installed in a project.

“DISCOM” means Power Distribution Company of the state (MSEDCL, in this case), responsible for distribution of Electrical power in the region and associated activities.

“IEC” means International Electro-technical Commission.

“ILAC” International Laboratory Accreditation Cooperation.

“Interconnection point” means point of interface of solar power plant facility with distribution system at which the Solar Energy is delivered to the PROCURER’s System and such interface point is 11 kV or 33 kV side of the pooling substation / sub-station

“kWh” means Kilo-Watt-hour.

“LVRT” means Low-voltage ride through.

“HVRT” means High-voltage ride through.

“MWp” means Mega-Watt Peak.

“MPPT or Maximum Power Point Tracking” shall mean algorithm that is used for extracting maximum available power from PV module under certain conditions.

“MSEDCL” means Maharashtra State Electricity Distribution Company Limited.

“MSPGCL” means Maharashtra State Power Generation Company Limited.

“NTP” means Notice to Proceed.

“OEM” Original Equipment Manufacturer.



“O&M” means Comprehensive Operation and Maintenance of the Facilities.

“PPA” shall mean “Power Purchase Agreement” for sale of energy generated from the project

“PPE” means Personal Protective Equipment.

“RM” means length in running meters.

“Solar Inverter” shall mean inverters that convert electricity generated from solar PV panels from DC to AC.

“System Integrator” shall mean the agency who had carried out the Design, Engineering, Supply, Installation, Testing & Commissioning and O&M of Grid connected solar PV based Power Plants.

## **PROJECT NAME:**

**Design, Engineering, Supply, Construction, Erection, Testing, Commissioning, Operation and Comprehensive Maintenance Service Contract (CMC) of 12 years for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra.**

- a) Project Scope and Technology Selection

### **a.1. Introduction**

EESL has entered into PPAs with MAHAGENCO for supply of solar power. The facilities under the PPA are proposed to be set up at multiple sites owned by the two utilities in Maharashtra. Under this programme, EESL will establish solar PV based Decentralised Solar Power Generating Systems (SPGS) with capacities approx. 2 MW to 10 MW (AC) on the open, unused lands in the locations of MAHAGENCO.

### **a.2 Proposed System**

#### **Site Description**

- a) The requisite land for implementation of proposed solar PV power plants in the state of Maharashtra will be provided by EESL to the contractor(s) for land development, implementation of plant including power evacuation arrangement on site wise basis.
- b) The lands are owned by MAHAGENCO.

**NOTE: The details of the tentative locations wherein the Decentralised Solar Power Generating System are proposed to be established are given in 'Annexure-1' to this 'Section-6'. EESL reserves the right, to change the sites /districts, quantity and capacity of power plants as mentioned in Annexure -1 without any cost implication.**

### **a.3 Project Scope**

The scope of this Bid Document covers:

The Scope of Work under this package, includes site surveys, design & engineering, procurement & supply of equipment and materials, testing at manufacturers works, inspection, packing and forwarding, supply, receipt, unloading and storage at site, associated civil works, services, permits, licenses, installation and incidentals, insurance at all the stages, erection, testing and commissioning of Grid Interactive Decentralised Solar Power Generating System (s) (Decentralised Solar Power Generating System ) of capacity ranging from 2 MW to 10 MW AC and performance demonstration with associated equipment and materials along with associated transmission system up to 11 kV or 33 kV **on turnkey basis** in the state of Maharashtra, India and 12 (Twelve) years comprehensive operation and maintenance of the plant thereafter.

**a) The equipment and materials for approx. 70 MWac (3 lots) Grid Interactive Decentralised Solar Power Generating System (s) with associated system (typical) shall include but not be limited to the receipt, unloading, storage, erection, testing and commissioning of all supplied material for the following:**

- i. Solar PV modules, Module mounting structures, fasteners, array foundation and module interconnection.
- ii. Array Junction boxes, distribution boxes and fuse boxes: MCBs, Surge Arrestors with string monitoring capabilities and with proper lugs, glands, ferrules, terminations and mounting structures.
- iii. DC and AC cables of appropriate sizes with adequate safety and insulation.
- iv. Power Conditioning Units (PCU)/Inverter (String or Central grid-tie) with SCADA compatibility, common AC power evacuation panel with bus bars and circuit breakers LT & HT Power Interfacing Panels, Plant Monitoring Desk, AC & DC Distribution boards.
- v. Step up transformers (Inverter Duty with suitable intermediate voltage but not less than 11 kV or 33 kV) in relevance with state grid code and inverter manufacturer requirements.
- vi. Suitable protection system.
- vii. LT Power and Control Cables including end terminations and other required accessories for both AC & DC power.
- viii. Internal 415V interconnection & indoor feeder panels to cater auxiliary needs of Plant.
- ix. 11 kV or 22 kV indoor/ outdoor panels having incoming and outgoing feeders with VCBs, CTs, PTs, Bus bars, cables terminals kits and Main Bus. Each bay shall consist of VCB, CT, Isolators with earth switch, Las and PT's etc.
- x. Data acquisition system with remote monitoring facilities. Provision for specific data transfer to the State Load Dispatch Centre (SLDC) may be provided as per the MAHAGENCO/ MSEDCL/MERC requirement. Data shall also be provided to EESL's server (details will be shared with successful bidder(s) only).
- xi. Weather Monitoring shall include but not limited to the following:
  - Pyranometers- For horizontal and tilted plane
  - Ultrasonic Anemometer (for wind speed and direction)
  - Temperature Sensor- Ambient and Module surface
  - Power source to all the sensors
  - Data logger
- xii. Lightning arrestors for entire plant area.
- xiii. PVC pipes, cable conduits, cable trays and accessories/trenches.
- xiv. Earthing of the entire plant as per relevant standards.
- xv. Control room for Solar Power Generating Systems (SPGS).
- xvi. One Energy meter (ABT) with modem facility to communicate with any remote server. The meter shall be as per specification of MSEDCL or same class as installed commercial meters, to be connected with HT Panel which would collect daily Generation data and grid outage data. This energy meter will be in addition to the Energy Meter (ABT) (Main and Check) to be installed at substation end for billing purpose.
- xvii. Testing, maintenance and monitoring of equipment(s). Spares & consumables, as required, for 12 years O&M period.
- xviii. Necessary CCTV cameras at suitable locations in the plant area in order to capture any trespassing, theft & pilferage etc.

- xix. Fire detection & protection system in the plant area. Adequate number & types of fire extinguishers. All safety gadgets during Construction and O&M period including but not limited to, anti-static rubber mats of appropriate grade, PPE, rubber gloves and shoes etc.
- xx. Design of approx. 2 MW – 10 MW AC Grid Interactive Decentralised Solar Power Generating System (s) and its associated civil, structural, electrical & mechanical auxiliary systems includes preparation of single line diagrams and installation drawings, manuals, electrical layouts, erection key diagrams, electrical and physical clearance diagrams, design calculations for Earth- mat, Bus Bar & Spacers indoor and outdoor lighting/ illumination etc. design memorandum, GTP and GA drawings for the major equipment & facilities, design basis & calculation sheets, and other relevant drawings and documents required for engineering of all facilities within the fencing to be provided under this contract, are covered under contractor's scope of work. The contractor has to provide the project design document with all the necessary technical details including simulation reports.
- xxi. Estimation and determination of the plant generation on daily basis in form of look ahead scheduling of power output.
- xxii. Any other equipment / material, not mentioned but essentially required to complete the Decentralised Solar Power Generating System in all respects.
- xxiii. Contractor has to carry out the site survey of the open land allocated to the contractor and install the solar PV power plant of suitable capacity based on the shadow free area. However the contractor has to install a minimum of approx. 2000 kW of SPGS in any of the allocated lands. However, a variation of (+/-20%) of the capacity may be allowed to be installed at any project site depending on the open/vacant / shadow free area available at the designated location(s) and approval from MAHAGENCO/MSEDCL.
- xxiv. Requisite testing facilities at site, safety requirements and provision for other things that may require for successful operation and maintenance of plant and equipment.
- xxv. In case, the contractor wishes to use higher quantity of solar PV modules on the DC side of any power plant, the contractor has to provide the complete design document justifying the necessary AC/DC ratio. It is upto the bidder to decide on AC/DC ratio based on minimum generation guarantee and site-specific losses. Bidder is required to ensure the site wise energy generation guarantee as mentioned in this bid document.
- xxvi. Submission of weekly/monthly work progress report by the contractor.
- xxvii. In case of absence of the standards for any of the equipment, the contractor may comply to the latest CEA/CERC/State Grid code.
- xxviii. Construction of the semi grouting type approach road to the site and semi grouting type Periphery Road along with Drainage system. Construction of barbed wire fencing (minimum 6 feet in height) to the land plot & Bore wells at the site.
- xxix. Arrangement of topographical, Geological, soil test & water test report.
- xxx. Contractor will construct & erect complete evacuation line along with 2 ABT meters (main and check) from the switchyard of solar power project to the nearest MSEDCL substation. Energy meter (ABT) will be located at MSEDCL Substation. The Right of Way (RoW) issues if any, shall be in the scope of Contractor. EESL/MAHAGENCO will support the bidder in early resolution of RoW issues.
- xxxi. Construction of bays and installation of all necessary associated equipment and protection and metering system at interconnection point at MSEDCL substation.
- xxxii. Construction of office cum control room or alternate 10X40 feet prefabricated portable cabin with washroom.
- xxxiii. Construction of security cabin at strategic location inside the plant.
- xxxiv. Bidder will carry the O&M of the evacuation line and associated equipment, viz. Breakers, Isolators, Bays, CT, PT, ABT meter, Protection & metering etc. for atleast 12 years.

- xxxv. Arrangement of Water and Electricity during construction and O&M period.
- xxxvi. Borewells need to be fitted with a flow meter to measure the amount of extraction of groundwater.
- xxxvii. Install rainwater harvesting measures to recharge ground water
- xxxviii. Provision of storm water drains across the site to carry wash water to the natural drain
- xxxix. Arrangement of Security of the plants during construction and O&M period.

**b) During the O&M period, the contractor shall,**

- i. Keep the measured daily generation, import, auxiliary, fault log data at regular intervals and provide the same to EESL in electronic form compatible in excel format. The right to use the data shall remain with EESL. Generation data shall be provided in the form of continuous day around generation curve. The plant outage data (due to solar plant or DISCOM grid) as certified by DISCOM shall be maintained and submitted to EESL on monthly basis.
- ii. Maintain materials, spares, tools & tackles, logistics and accessories, which are necessary or usual for satisfactory and trouble-free operation and maintenance of the Solar Power Generating System(s).

**c) The items of civil design and construction work shall include all works required for solar power generating system and should be performed specifically with respect to following but not limited to:**

- i. Conducting soil testing of the allocated plot area.
- ii. Conduction of contour survey and mapping of the whole plot area.
- iii. Construction of foundation for mounting structures for SPV panels, considering life of Plant & existing soil/ natural conditions.
- iv. Construction of foundation for transformers, switchgears, buildings (if any), equipment etc.
- v. Necessary arrangement for module cleaning shall be made available in SPV array yard.
- vi. Suitable Communication System.
- vii. Perimeter lighting: Fabrication, supply & erection along with required GI Poles, junction boxes, support, brackets, accessories & LED lights as required.
- viii. Supply of ferrules, lugs, glands, terminal blocks, galvanized sheet steel junction boxes with powder coating paint for internal fixtures, cable fixing clamps, nuts and bolts etc. of appropriate sizes as required in the Plant.
- ix. Power Cables laying underground / over ground with proper cable tray arrangements
- x. Entire GI cable tray with proper support and accessories inside equipment room and control room and other locations as required.

d) The contractor shall carry out the site surveys and submit the report to EESL for the allotted locations per the time lines and formats discussed in process flow table attached under Annexure-3 to this 'section-6'. The report shall contain the details of the solar power generating system, proposed capacity of the Decentralised Solar Power Generating System etc. Please refer site survey report format under Annexure-3 to this 'section-6'.

e) The contractor shall arrange for Land Development and Power Evacuation as per the requirement on his own cost. The land development and power evacuation shall be as per specifications of MSEDCL.

- f) All approvals as necessary for setting up of a Solar Power Plant including (but not limited to) CEIG/CEA/MSEDCL/MERC, connectivity, power evacuation etc. as per the latest regulations / guidelines for which DISCOM will facilitate the bidder.
- g) The Contractor shall arrange deployment of qualified and suitable manpower and required necessary tools, logistics, spares & consumables during construction, commissioning and O&M.
- h) Complete responsibility of total Operation & Maintenance of Solar Power Generating Systems including all the infrastructure developed as a part of EPC Contract for 12 years from commissioning of the Plant, including deployment of necessary staff after the commissioning till final acceptance shall be with the Contractor. Any cost(s) associated with the project for successful commissioning and O&M during the project period shall be borne by the contractor.
- i) All approvals, equipment, item and works which are not specifically mentioned in this document but are required for successful completion of work including construction, commissioning, O&M of Solar PV Power Plant (s) in every respect and for safe and efficient construction & erection, operation and guaranteed performance are included in the scope of the Contractor.
- j) Submission of following documents, drawings, data design, and engineering information (not limited to) to EESL or its authorized representative for review and approval in hard copy and soft copy from time to time as per project schedule.
  - 1. Contour map of the complete land area.
  - 2. General arrangement, array layout diagrams and assembly drawings of all major equipment.
  - 3. Design basis criteria along with relevant standards (list of standards and respective clause description only).
  - 4. Design calculations and sheets with expected power loss at each stage and backup sheets, if any. Lightning arrestor with area coverage also to be provided.
  - 5. Detailed technical specifications of all the equipment.
  - 6. Schematic diagram for entire electrical system including single line diagrams (SLD)
  - 7. GTP & G.A. drawings for all types of structures/ components, 11 kV or 33 kV switchgears & other interfacing panels.
  - 8. Relay setting charts.
  - 9. Quality assurance plans for manufacturing (MQP), Standard Operating Procedures (SOP) and field activities (FQP).
  - 10. Detailed site EHS plan, fire safety & evacuation plan and disaster management plan.
  - 11. Detailed risk assessment and mitigation plan.
  - 12. Test reports (for type, acceptance, and routine tests).
  - 13. O&M Instruction's manuals and its drawings.
  - 14. As-built drawings / documents and deviation list from good for construction (GFC).
  - 15. O&M plans, schedules and operational manuals for all equipment etc.
  - 16. Daily progress update.

17. Weekly site work progress report with catch-up plan(s), as necessary to monitor actual timelines of the project during construction period along with the real time snap shots during the time of construction.

18. Monthly O&M reports after commissioning of the project.

- k) Estimation of plant generation based on solar radiation and other climatic conditions prevailing at site (Bidder shall be responsible for ensuring the guaranteed energy generation as per this document)
- l) All drawings shall be fully corrected to agree with the actual "as built" site conditions and submitted to EESL after commissioning of the project for record purpose. All as-built drawings must include the Good for Construction deviation list.
- m) The Contractor shall provide a detailed training plan for all operation, maintenance procedures, which shall after approval by EESL/MSEDCL/MAHAGENCO form the basis of the training program. The contractor shall also provide training to EESL/MSEDCL/MAHAGENCO's nominated staff.
- n) The Contractor shall employ and coordinate the training of contractors' personnel who will be qualified and experienced to operate and monitor the facility and to coordinate operations of the facility with the grid system.
- o) Establishing a system to maintain an inventory of spare parts, tools, equipment, consumables and other supplies required for the facility's hassle free operation.
- p) Adequate and seamless insurance coverage during construction period and O&M period to cater all risks related to construction and O&M of Plant to indemnify the EESL/MSEDCL/MAHAGENCO.
- q) Maintain at the facility accurate and up-to-date operating logs, records and monthly reports regarding the generation, Operation & Maintenance of facility. Contractor shall also submit monthly energy bills (export, import etc.) to EESL/DISCOM/MAHAGENCO before 3rd of every month.
- r) Perform or contract for and oversee the performance of periodic overhauls or maintenance required for the facility in accordance with the recommendations of the original equipment manufacturer (OEM).
- s) Procurement for spares parts, overhaul parts, tools, equipment, consumables, etc. required to operate and maintain the project in accordance with the prudent utility practices and having regarded to warranty recommendations during entire O&M period.
- t) The contractor shall transfer (if any) and handover all the plants/SPGS assets in good working condition on completion of the 12-year period to EESL. EESL shall, six months prior to the 12<sup>th</sup> year, determine the procedures and responsibilities for transferring the assets in good working condition. If the transfer is delayed, the Bidder shall operate the assets for a maximum of six months after the completion of the 12-year O&M period, under mutually agreed terms.

- u) Maintain and keep all administrative offices, roads, tool room, stores room, equipment, clean, green and in workable condition.

All the type test reports along with Material Dispatch Clearance Certificate (MDCC) and Material Safety Data Sheet (MSDS) for all applicable products & equipment and cables are to be submitted by the Contractor prior to the dispatch of the same. The contractor has to provide the type test report for all the equipment used under this contract. If the equipment is not type tested, the Contractor has to ensure conduction of such test and supply the type test Report to the EESL without any additional cost.

#### **a.4 Required Documentation**

Complete documentation shall be provided for the design, manufacturing/assembling, testing, installation, commissioning, start-up, operation, maintenance, repair and disposal of the Decentralised Solar Power Generating System components.

The bidder shall provide the following minimum documentation:

1. Project design document containing detailed engineering calculations, losses, drawings, simulation reports, performance guarantee etc.
2. Technical data sheets
3. Test reports and commissioning protocols
4. Installation, operation and maintenance manual

However, EESL at its own discretion may also ask for any other documentation related to Scope of Work mentioned hereunder, as and when required for any purpose.

#### **a.5 Operation & Maintenance (O&M):**

The contractor shall be entrusted to carry out the total O&M activities of the Solar Power Generating System(s) including Land Development and Power Evacuation network to be built by the contractor upto the interconnection point/metering point at MSEDCL substation as per the scope of work for the 12 (Twelve) years with immediate effect from the date of commissioning.

- a) The Turnkey contractor shall be responsible for all the required activities for the successful construction, running, guaranteed energy generation & maintenance of the Solar Power Generating Systems covering (not limited to):
  - i. Deputation of qualified and experienced engineers Supervisors & Technicians (on permanent basis at each of the site).
  - ii. Successful running of Solar Power Plant and ensuring guaranteed energy generation.
  - iii. Co-ordination with MSEDCL/MAHAGENCO/MERC/other statutory organizations as per the requirement on behalf of EESL for Joint Metering Report (JMR), furnishing generations schedules as per requirement, revising schedules as necessary and complying with grid requirements updated time to time.
  - iv. Monitoring, controlling, troubleshooting maintaining of logs & records, registers.
  - v. Supply of all spares, consumables and fixing / application as required.



- vi. Supply & use of spares, consumables, tools, logistics and skilled manpower throughout the maintenance period as per recommendations of the equipment manufacturers and requirement of the Plant & other associated infrastructure developed under the scope of EPC works.
  - vii. Conducting periodical checking, testing, overhauling, preventive and corrective action.
  - viii. Up keeping of all equipment, building, roads, Solar PV modules, inverters etc.
  - ix. Arranging & updating any licenses/permits required for successful operation of plant (s).
  - x. Submission of periodical reports to EESL on the energy generation & operating conditions of the power plant.
  - xi. Furnishing DISCOM certified generation data monthly to EESL by 3<sup>rd</sup> of every month.
  - xii. Contractor shall be responsible for making all the payments towards renewal of all the permits / clearances etc. (if required) to the Government bodies /MSEDCL/MERC/MEDA/STU for smooth operation of the project.
  - xiii. Periodic cleaning of solar modules as per the recommendations of OEM & existing site conditions.
  - xiv. Repair & replacement of components of SPGS including all other associated infrastructure developed as a part of EPC Works which has gone faulty or worn-out components including those which has become inefficient.
- b) Continuous monitoring the performance of the Solar Power Generating Systems and regular maintenance of the whole system including Modules, PCU's, transformers, outdoor/indoor panels/ kiosks and other infrastructure developed as a part of EPC works in order to extract & maintain maximum energy output from the SPGS & serviceability from the associated infrastructure.
- i. Preventive and corrective maintenance of the complete Solar Power Plant and associated infrastructure developed as a Part of EPC work, including supply of spares, consumables, repair & replacement of wear and tear, overhauling, replacement of damaged modules, invertors, PCU's and insurance covering all risks (Fire & allied perils, earth quake, terrorists, burglary, power output warranty of solar PV modules and others) as required, for a period of 12 (Twelve) years from the date of start of O&M/commissioning of the project.
  - ii. The period of Operation and Maintenance will be deemed to commence from the date of commissioning. EESL may extend the O&M period beyond the project duration at mutually agreed terms and conditions.
  - iii. All the equipment required for Testing, Commissioning and O&M for the healthy operation of the SPGS must be calibrated, time to time, from the NABL accredited labs and the certificate of calibration must be provided prior to its deployment.
- c) Operation and Performance Monitoring
- i. Operation part consists of deputing necessary manpower required to operate the Solar Power Generating System (s) at the full capacity. Standard Operation procedures (SOPs) such as preparation to starting, running, routine operations with safety precautions, monitoring etc., shall be carried out as per the manufacturer's instructions & best engineering practices to have trouble free & optimum operation of the complete system with maximum possible energy generation.
  - ii. Daily work of the operation and maintenance in the Decentralised Solar Power Generating System (s) involves periodic cleaning of Modules, logging the voltage, current, power factor, power and energy output of the Plant at different levels along with fault/breakdown log. The operator shall also note down time/failures, interruption in supply and tripping of different relays, reason for such tripping,

duration of such interruption etc. The operator shall record monthly energy output, down time (due to solar power plant and grid), fault logs & their Root Cause Analysis reports etc.

d) Maintenance

- i. The contractor shall carry out the periodical plant maintenance as given in the manufacturer's service manual and perform operations to achieve committed generation.
- ii. Regular periodic checks of the modules, PCU's and other switchgears shall be carried out as a part of routine corrective & preventive maintenance. In order to meet the maintenance requirements stock of consumables are to be maintained as well as various spare as recommended by the manufacturer.
- iii. Maintenance of other major equipment involved in Solar Photovoltaic Power Generating System are transformers, underground/ overhead cables, indoor/ outdoor VCB/ SF6 kiosk, associated switchgears, other fixtures & components metering panel, fire protection system & other infrastructure developed as a part of scope of Work during development of Plant. Particular care shall be taken for outdoor equipment to prevent corrosion. Earth resistivity of plant as well as individual earth pit is to be measured and recorded every month. If the earth resistance is high, suitable action is to be taken to bring down the same to required level.
- iv. A maintenance record is to be submitted to operation/engineer-in-charge to record the regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance reasons for the breakdowns steps have taken to attend the breakdown duration of the breakdown including action taken to avoid the same in future.
- v. The Schedules will be drawn such that some of the jobs other than breakdown, which may require comparatively long stoppage of the power plant, shall be carried out preferably during the non-sunny days/night. An information shall be provided to Engineer-in-charge for such operation prior to start.
- vi. The Contractor will attend to any breakdown jobs immediately for repair/replacement /adjustments and complete it at the earliest working round the clock. During breakdowns (not attributable to normal wear and tear) at O&M period, the Contractor shall immediately report the accidents, if any, to the Engineer In-charge showing the circumstances under which it happened and the extent of damage and or injury caused.
- vii. The Contractor shall comply with the provision of all relevant acts of Central or State Governments including but not limited to Payment of Wages Act 1936, Minimum Wages Act 1948, Liability Act 1938, Workmen's Compensation Act 1923, Industrial Dispute Act 1947, Maturity Benefit Act 1961, Mines Act 1952, Employees State Insurance Act 1948, Contract Labour (Regulations & Abolishment) Act 1970, Electricity Act 2003, Grid Code, Metering Code, MNRE guidelines or any modification thereof or any other law relating whereto and rules made there under or amended from time to time.
- viii. The contractor shall at his own expense provide all amenities to his workmen as per applicable laws and rules.
- ix. The Contractor shall ensure that all safety measures are taken at the site to avoid accidents to his or his sub-contractor or EESL/MSEDCL/MAHAGENCO's Workmen.
- x. If negligence / mal-operation of the contractor's operator results in failure of equipment such equipment should be repaired replaced by contractor at free of cost.

e) Quality Spares & Consumables

In order to ensure longevity and safety of the core equipment and optimum performance of the system the contractor should use only genuine spares of high quality standards.

#### f) Testing Equipment, Tools and Tackles

The Contractor shall arrange for all the necessary testing equipment, tools and tackles for carrying out all the construction, operation and maintenance work covered under this contract. All the instruments are required to be calibrated from NABL accredited lab before put in use. The certificate of the same shall be submitted to EESL/ MSEDCL/ MAHAGENCO for verification.

#### g) MAHAGENCO's Scope of Work

MAHAGENCO will provide the support to contractor for grid connectivity & SLDC clearance. However, fees for grid connectivity, commitment charges, MEDA related fees and all other fees shall be in the scope of bidder.

#### h) Connectivity with the Grid:

- i. The projects should be designed for delivery of energy at 11 / 33 kV level of substation of MSEDCL.
- ii. All the necessary permissions from Electrical Inspector, MEDA, MSETCL, MSEDCL, SLDC, MAHAGENCO etc., as may be required, shall be taken up by the Contractor for the purpose of interconnection of the solar power plant with the grid.
- iii. Contractor will construct & erect complete evacuation line along with & ABT meters (main and check meter) from the switchyard of solar power project to the nearest MSEDCL substation. Energy meter (ABT) will be located at substation end.
- iv. The responsibility of getting the grid connectivity with MSEDCL shall entirely be of the Contractor. The Contractor shall submit documentary evidence for securing connectivity with grid from MSEDCL within 180 days from the date of issuance of NTP.
- v. The transmission of power up to the interconnection point i.e. ABT meters at MSEDCL substation and energy accounting infrastructure shall be the responsibility of the Contractor at his own cost. The maintenance of Transmission / Distribution system up to the interconnection point shall be responsibility of the Contractor.
- vi. The arrangement of connectivity can be made by the Contractor through a dedicated line or sharing of a line.
- vii. The Contractor shall not be entitled to deemed generation in case of any delay in grant of connectivity.

#### i) Clearances required from the Central/State Government and other local bodies

The Bidders are required to obtain necessary clearances and permits as required for setting up the Solar Power Projects.

### **a.6 Warranty**

- a) PV modules used in grid connected decentralised solar power plants by considering a linear degradation must be warranted for peak output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. Bidder to submit and take the approval on the quality plan (including Visual, Dimensional, HV, IV, EL etc.) for solar PV modules from EESL. Bidder to ensure atleast following testing of solar PV modules:
  - i. VIS, STC, EL, PID and LID testing conducted on sufficient sample (AQL 1.0) of modules, THI-testing on running system conducted by an institute accredited in accordance with IEC 17025 by and internationally recognized accreditation body.

- ii. Durability testing of modules, either manufacturer tests DHT 1500 and TCT 400 or higher on modules from relevant lines every quarter or factory inspection and POT and EGC testing conducted on sufficient sample (AQL 1.0) by an institute accredited in accordance with IEC 17025 by an internationally recognized accreditation body.
- b) Inspection and/or testing of the project material for quality control purpose will be conducted on sufficient sample (AQL 1.0) for pass/fail criteria. Any batch of project material which fails during testing and/or inspection shall not be used for any of the project site(s). Contractor shall arrange the new batch of project material within 15 days for testing and/or inspection by EESL. All the expenses incurred for arranging the new batch of material shall be borne by the contractor.
- c) EESL/MAHAGENCO/EESL appointed agency officials reserves the right to carry out the Pre Dispatch Inspection of solar PV modules and other components at manufacturer facility (ies) before dispatch to site/s. At least 15 days' notice to be given by bidder to EESL for carrying out the PDI.
- d) The Inverters/PCUs installed in the solar power plant must have a warranty for the project period.
- e) The mechanical structures, electrical works and overall workmanship of the grid connected Solar Power Plant must be warranted for a period of 25 years from the date of Commercial Operation Date.
- f) The Contractor must ensure that the goods supplied under the contract are new, unused and of most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.
- g) During the period of Warranty / Guarantee the Contractor shall remain liable to replace any defective parts, that becomes defective in the Plant, of its own manufacture or that of its sub-Contractors, under the conditions provided for by the Contract under and arising solely from faulty design, materials, workmanship or any reason attributable to works carried out by the contractor, provided such defective parts are not repairable at Site. After any replacement, the defective parts shall be returned to the Contractor's works at the expense of the Contractor unless otherwise arranged.
- h) During the Operation & Maintenance, the Contractor shall be responsible for any defects in the work due to faulty workmanship or due to use of sub-standard materials in the work. Any defects in the work during the O&M period shall therefore, be rectified by the Contractor without any extra cost to the EESL/MSEDCL/MAHAGENCO within a reasonable time as may be considered from the date of receipt of such intimation from the EESL/MSEDCL/MAHAGENCO failing which the EESL/MSEDCL/MAHAGENCO reserves the right to take up rectification work at the risk and cost of the Contractor.
- i) Warranty certificate issued by the manufacturer shall be submitted and individual factory test report of manufacturer shall also be submitted along with invoice of the supply order after delivery. Every item should bear serial number provided during the manufacturing process. These serial numbers should be mentioned by manufacturer in all the following documents, while submission of bills after delivery of the order items:-
  - Invoice
  - Factory test report (In house test report generated during manufacturing)
  - Warranty certificate
- j) If contractor does not rectify/supply the said problem after written notices then the defected equipment as per BOM noticed shall be rectified/purchased through CPG amount of contractor deposited in EESL.

## **a.7 Rejection of Materials**

The EESL/MAHAGENCO's decision in regard to the quality of the material and workmanship will be final. The Contractor at its own cost and risk without any compensation shall immediately remove any material rejected by the EESL/MAHAGENCO from the site of work.

## **a.8 Labour Engagement**

The Contractor shall be responsible to provide all wages and allied benefits to its labours engaged for execution of the project work and also to carry out Operation & Maintenance service. The Contractor shall remain liable to the authorities concerned for compliance of the respective existing rules and regulations of the government for this purpose and shall remain liable for any contravention thereof. The contractor is encouraged to use local manpower as per the local statutory (labour) requirement, if any.

## **a.9 Training of Personnel**

On successful commissioning of the Plant, the Bidder shall provide training on Plant operations and maintenance to a team (Engineers and Technician/ Operators) as nominated by EESL/MSEDCL/MAHAGENCO, within first three months of Operation of Plant.

## **a.10 Authorized Test Centers for test certificates**

The Modules/transformers/ inverters/ cables and other Balance of system equipment deployed in the solar PV power Plant shall have valid test certificates for their qualification as per specified IEC/ IS Standards/BIS by one of the NABL Accredited Test Centers in India. In case of module types/ equipment for which such Test facilities may not exist in India, test certificates from reputed ILAC Member body accredited Labs abroad (with proof of accreditation) will be acceptable.

## **a.11 Decentralised Solar Power Generating System (s) Performance Guarantee**

- a) The plant performance will be evaluated through number of generated energy generation in any year from each project at metering point of designated substation as per 'Guaranteed Energy Generation' clause mentioned below.
- b) During O&M contract, the plant performance will be evaluated based on guaranteed energy generation. For guaranteed energy generation, please refer to the following:

### **Guaranteed Energy Generation**

- Minimum number of units generated by each system is tabulated below:

For a system capacity of 1 kW (AC) system	
Energy Generation in kWh for 1st year	1,664
Energy Generation in kWh for 2nd year	1,658
Energy Generation in kWh for 3rd year	1,651
Energy Generation in kWh for 4th year	1,645
Energy Generation in kWh for 5th year	1,638
Energy Generation in kWh for 6th year	1,631
Energy Generation in kWh for 7th year	1,625
Energy Generation in kWh for 8th year	1,618
Energy Generation in kWh for 9th year	1,612

Energy Generation in kWh for 10th year	1,605
Energy Generation in kWh for 11th year	1,599
Energy Generation in kWh for 12th year	1,593

- This guaranteed energy generation would be net energy generation which is fed to the grid through commercial meter i.e. at interconnection point.
- c) Bidders are expected to make their own study of solar radiation profile and other related parameters of the area & make sound commercial judgment about the guaranteed energy generation. It shall be the responsibility of the Bidder to assess the corresponding solar insolation values and related factors of solar Plant along with expected grid availability.

#### **a.12 Operation & Maintenance (O&M)**

The Operation and Maintenance shall be comprehensive. The maintenance service provided shall ensure project functioning of the Solar PV system as a whole and Land development cum Power Evacuation System to the extent covered in the Contract. All preventive / routine maintenance and breakdown / corrective maintenance required for ensuring maximum uptime shall have to be provided. Accordingly, the Comprehensive Operation & Maintenance shall have two distinct components as described below:

##### a) Preventive / Routine Maintenance:

This shall be done by the Contractor regularly and shall include activities such as cleaning and checking the health of the Solar PV system, cleaning of module surface, tightening of all electrical connections, and any other activity including the associated civil works, wear and tear that may be required for proper functioning of the Solar PV system as a whole. Necessary maintenance activities, Preventive and Routine for transformers and associated switch gears and transmission line also shall be included.

##### b) Breakdown / Corrective maintenance:

Whenever a fault/failure/breakdown/malfunctioning occurs, the Contractor has to attend to rectify the fault & the fault must be rectified within the 48 hours from the time of occurrence of fault, failing which LD will be applicable in line with 'Liquidated Damages' clause depending upon nature of fault/failure/defect/breakdown/malfunctioning. The contractor must maintain all the records pertaining to such faults/failure/breakdown/malfunctioning and necessary measures taken. The date of Comprehensive Operation & Maintenance Contract period shall begin on the date of commissioning. However, operation of the Power Plant means operation of system as per bid and workmanship in order to keep the project trouble free covering the guarantee period. The contractor must demonstrate the guaranteed energy generation at the end of every year in accordance with this bid document.

#### **a.13 Serviceability Level Agreement (SLA)**

- a) Contractor shall make efforts to maintain 100 % serviceability of complete Plant including all other associated infrastructure developed by the Contractor during execution of project as its scope of work.
- b) Contractor shall produce monthly serviceability report for individual components of the plant & associated infrastructure to the EESL by 3rd of next month.
- c) Contractor shall maintain a Complaint log book, which shall include the timing of logging of complaint including unique Complaint number, time of closure of complaint & its Root Cause Analysis.
- d) Such rectification work carried out by EESL doesn't exempts/relieves Contractor from its responsibility towards subsequent operation, maintenance, repair & replacement of such component/ infrastructure of the Plant or meeting the performance parameters of the Plant.

- e) O&M Routine & Manpower: Contractor shall provide Preventive / Routine Maintenance schedule based on Original Equipment manufacturer and good engineering practices.

#### a.14 Project Timelines

The project would be developed in two parts.

- I. Part I: Site Surveys, submission of drawings for approval, Minutes of Meeting, project design document.
- II. Part II: Implementation of Decentralised SPGS including comprehensive O&M for 12 years

##### Part I:

The Contractor shall submit the plan for carrying out site surveys within one week from the date of issuance of LoA. The contractor shall complete the site surveys of all the allotted locations within twenty-one (21) days from the date of issuance of LoA. The contractor shall submit the final array layout, Electrical Single Line Diagram (SLD), site survey reports, ESMP (as per sl no. 3 of this document) and project design document as per the timelines shown below:

S No	Activity	Milestone date from the Effective Date
1	Submission of Site Survey Plan of all sites	7 days
2	Site Survey by Contractor	21 days
3	Signing of MoM, draft layout by MSEDCL/MAHAGENCO, EESL & Contractor	21 days
4	Submission of Final Array layouts, SLD & Site survey reports by contractor to EESL/MSEDCL/MAHAGENCO Zonal/District office	28 days
5	*Submission of ESMP/EMP (as per sl no. 3) to EESL	40 days

\*Site specific ESMP/EMP shall be submitted by the contractor. An NOC to be issued for site specific ESMP/EMP from EESL project manager/ADB followed by the issuance of Notice to Proceed (NTP)/Purchase order (PO) (site-wise).

Contractor to strictly adhere to the timelines mentioned above. In case of any failure to meet the above timelines, a suitable action shall be taken against the contractor for any delay in completion of the Part 1, including the right to cancel or termination of contract at EESL's discretion.

##### Part II:

The date of handover of site (s) to the contractor for implementation of Decentralised Solar Power Generating System (SPGS) shall be treated as Zero date. The contractor shall submit the detailed execution plan (MS Projects/PERT/GANTT chart etc.) within one week (07 days) from the date of issuance of NTP/PO. All the sites/lands under a lot will be handed over to the successful bidder/contractor within 1 month of issuance of site wise NOC on ESMP.

The timelines for completion of the EPC Works is 240 days from the Zero date.

Note: However, extended timeline due to delay in handing over of land to the Contractor shall not have financial liability on EESL.

## Timelines for Scope of work in Days

S. No.	Stage	Reference from D
1	Issue of NTP i.e., Site Handover	Zero Date (D)
2	The contractor shall submit the detailed execution plan (MS Projects/PERT/GANTT chart etc.)	D + 7 days
3	Land Development + Boundary wall/fences + Transmission Line with bay feeder	D + 53
4	Commencement of civil and allied works	D + 75
5	Supply of major equipment like Solar PV modules, Modules Mounting Structures, Power Conditioning Units (PCU)/Inverter, Transformers, BoS etc.	D +150
6	Installation of all major equipment including MMS, Solar PV modules, Inverters / PCU, Transformers, Power Evacuation line etc.	D + 180
7	Complete installation, testing and Pre-commissioning of Solar PV Power Plant/Solar Power Generating System	D + 210
8	Commissioning of Plant (SPGS) along with Completion of Facilities in line with Technical/Functional/Performance Requirement stated under this Tender Document.	D + 240

**\*Contractor is required to commission the project on or before 240 days from the date of NTP/PO.**

Guaranteed energy generation demonstration as per Clause 15 'Guaranteed Energy Generation' of 'Specifications' 1 year after commissioning of Plant & Completion of all associated infrastructure as mentioned under 'Specifications'.

### a.15 Part Commissioning

Contractor is allowed to commission any of the allocated site(s) with a minimum capacity of 2000 kW (AC) and above only. However, the contractor shall submit the final testing and commissioning reports for claiming the same.

### a.16 Liquidated Damages

In case of shortfall in guaranteed energy generation or any delay in the execution of the order beyond the stipulated time schedule decided including any extension permitted in writing, EESL reserves the right to recover from the Contractor for the loss incurred due to delay in commissioning or shortfall in guaranteed energy generation as indicated below.

#### Liquidated Damages (LD) for delay in commissioning



In case the commissioning of project is delayed or the contractor is not able to meet the timelines as mentioned in a.14 'Project Timelines' then the contractor shall pay the Liquidated Damages (LD) at the rate mentioned below for the un-commissioned capacity:

<b>Delay Period</b>	<b>Penalty</b>
Upto 30 days	1.15 x loss of generation in no. of unit for days of delay (calculated on guaranteed generation per kW AC capacity as per Clause 15 of 'Specification') X Rs. 3.11/ kWh
From 31-60 days	1.2 x loss of generation in no. of unit for period of delay (calculated on guaranteed generation per kW AC capacity as per Clause 15 of 'Specification') X Rs. 3.11/ kWh
From 61 & above days	1.25 x loss of generation in no. of unit for period of delay (calculated on guaranteed generation per kW AC capacity as per Clause 15 of 'Specification') X Rs. 3.11/ kWh

If contractor fails to commission the project beyond 90 days of the date of commissioning as mentioned in 'Project Timelines' under a.14, EESL reserves the right to terminate the contract and the contractor shall reimburse to EESL, the loss incurred.

Note: Contractor shall inform in writing to EESL at least 30 days in advance regarding the date of Commissioning Day of the respective site(s). However, the delay in synchronization and commissioning due to EESL/MAHAGENCO/MSEDCL may be excluded from LD.

### **Liquidated Damages (LD) for deviation in Guaranteed Energy Generation**

The Contractor shall guarantee the energy generation from the project as per the table in Clause 15 of 'Specifications' of this document.

In case the contractor is not able to meet the guaranteed energy generation then the contractor shall be liable to pay the Liquidated Damages (LD) as per below mentioned formula:

<b>Description</b>	<b>Calculation</b>
Liquidated Damage	1.15 x No. of kWh shortfall in a year (calculated on yearly basis as per Clause 15 of 'Specification') X Rs. 3.11/kWh

The Liquidated damages amount calculated may be adjusted from any amount payable by EESL to the contractor or CPG.

In case the Project fails to generate any power continuously for 30 days any time during the O&M period, apart from the force majeure and grid outages as certified by competent authority from MSEDCL/MAHAGENCO/STU/CTU, it shall be considered as "an event of default". In the case of default the entire CPG will be encashed. In case the amount discovered in an event of default is more than the encashed CPG amount, then EESL reserves the right to recover the differential amount from other ongoing projects (if any) or by other means, as applicable from the bidder. The contractor has to rectify the solar power plant(s) without any extra cost to

EESL/MAHAGENCO/MSEDCL. The contractor shall take necessary corrective measures to guarantee the minimum energy generation as per this bid document.

In case of partial or full encashment of CPG by EESL, the bidder shall recoup the CPG within 28 days.

**a.17 Incentive for Excess Energy Generation**

Contractor has to guarantee the minimum energy generation in any year as per this bid document. In case, the net energy generated by the project is more than the minimum guaranteed energy generation, the contractor will be paid an incentive as per the below calculation:

Description	Calculation
Incentive	<p>No. of excess kWh generated in a year from a particular solar plant (over and above 1664 kWh per kW) x Rs. One (1)/ kWh</p> <p>(Subject to sale of this excess electricity to MAHAGENCO over and above 1664 kWh per kW per year for the first year and thereof as per Clause 15 of the Specifications) (Inclusive of all taxes, duties, cesses, etc.)</p>

The incentive amount shall be calculated at the end of every O&M Year and paid to the Contractor in the next O&M bill amount.

**a.18 Third Party Inspection Agency**

- a) A third party inspection agency (“Third Party Inspectors” or “TPI”) may be appointed by EESL/MAHAGENCO, at its sole discretion, to conduct any kind of inspection regarding but not limited to procurement, fabrication, installation, hook-up and commissioning during the execution of the Project. The Contractor shall provide necessary access and coordination to conduct such inspections. The extent of third party inspectors’ involvement shall be finalized after mutual discussions between the Contractor and EESL/MAHAGENCO.
- b) EESL/MAHAGENCO or its authorized representatives, reserve the right to inspect the project components, as per project schedule to ensure compliance of the quality of Components/ material as per the specification and data sheet, before dispatch to site. EESL/ MAHAGENCO at its own discretion will visit the premises for inspection with prior intimation to the Contractor. It is the responsibility of the contractor to inform EESL/MAHAGENCO at least 14 days prior to the dispatch of the project equipment. All administrative expenses for EESL /MAHAGENCO or its authorized representatives, will be borne by EESL /MAHAGENCO for above inspections. However, all the expenses related to testing and inspection at manufacturer/ supplier premises or at project site shall be borne by the contractor only. In case contractor fails to show the compliance for the component under inspection as per Technical Specification & approved drawing /design & same is not approved for mass production or dispatch, in such cases Contractor shall bear the expenses towards visit of EESL/MAHAGENCO’s team for subsequent visit/s for inspection of same component.

**a.19 Transportation, Demurrage, Wharf age, etc.**

Contractor is required under the contract to transport the Goods to place of destination defined in Section 2 (Bid Data Sheet).

## 2. Specifications

### Minimum Technical Specifications of Solar Power Generating System(s) are as follow:

The main objective of the design philosophy is to construct the plant with in-built Quality and appropriate redundancy to achieve high availability and reliability with minimum maintenance efforts. In order to achieve this, the following principles shall be adopted while designing the system.

Adequate capacity of SPV modules, PCUs, Junction boxes etc. to ensure generation of power as per design estimates. This will be done by applying liberal de-rating factors for the array and recognizing the efficiency parameters of PCUs, transformers, conductor losses, system losses, site conditions etc. Strict compliance with approved and proven quality assurance (QA) systems and procedures during different stages of the project, starting from sizing, selection of make, shipment, storage (at site), during erection, testing and commissioning. System design shall have intelligent protection mechanism which may include very fast responsive microprocessor-based relays etc., so that any disturbance from the grid will not cause any damage to the equipment of the Solar Power Plant.

Shadow free plant layout to ensure minimum losses in generation during the daytime. Higher system voltage and lower current options to be followed to minimise ohmic losses. Selection of PCUs with proven reliability and minimum downtime. Ready availability of requisite spares.

Careful logging of operational data / historical information from the Data Monitoring Systems, and periodical analysis of the same to identify any abnormal or slowly deteriorating conditions.

Each component offered by the bidder shall be of established reliability. The bidder may be allowed to install a higher solar PV array as per s.no. xxiii of clause a.3 (a) of Specifications. In case the bidder wishes to install a higher DC side capacity other than the one mentioned as per s. no. xxiii of clause a.3 (a) of Specifications, prior approval must be required from EIC for any additional higher DC side capacity. However, EESL reserves the right to accept or reject any additional DC side capacity. The minimum target reliability of each equipment shall be established by the bidder considering its mean time between failures and mean time to restore, such that the availability of complete system is assured. Bidder's recommendation of the spares shall be on the basis of established reliability.

Bidder shall design the plant and equipment in order to have a minimum sustained life of 25 years with minimum maintenance efforts.

### 1. Bill of Material:

The equipment and material for 2 to 10 MW Grid Interactive Solar Power Generating Systems (SPGS) with associate system (typical) shall include, but not limited to the following:

Item Details (along with make & specifications)	Unit
Solar PV modules	Nos.
Module Mounting Structures including fasteners and clamps	Set
Main Junction Boxes with monitoring capabilities	Lot
Solar module array to Junction box Interconnection cable (Cu), MC4 Connectors	RM

Junction box to Inverter Interconnection Cable (Cu/ Al)	RM
Connection accessories – lugs, ferrules, glands, terminations etc.	Lot
AC Cable (LT/ HT) of appropriate sizes	RM
Inverters/ Power Conditioning Units	Nos.
String level monitoring system (SCADA) and ancillaries	Set
Transformer(s)	Set
Circuit breakers, CT and PT set (at all voltage levels used)	Set
11 kV or 33 kV Indoor/ outdoor interfacing panels with CT, VCB, PT, Relays etc.	Set
11 kV or 33 kV XLPE Outgoing feeder cable and associated infrastructure	Set
AC & DC distribution panels/ boards, PDB, LDB etc.	Lot
Control and Relay Panel	Lot
Lightning Arresters of suitable ratings	Nos.
Earth mat for switch yard, DC field array and equipment	Lot
Control and power cables	Lot
Surge Protection devices and Fuses	Set
Earth cables, flats and earthing pits	Lot
Equipment and Control room with associated equipment	Lot
Rubber Mats for specific kV ratings and safety gadgets, PPE etc.	Lot
Fire extinguisher - Foam type, CO2 type, ABC type etc., as applicable	Lot
Sand Buckets	Lot
Discharge Rods	Lot
Cable for power evacuation with suitable support system.	Lot
Power efficient peripheral lighting arrangement for the Plant safety	Nos.
Fire – Alarm system and signboards	Lot
Danger sign plates, anti-climbing etc.	Lot

All the information shown here is indicative only and may vary as per design and planning by the Contractor. The Contractor must provide the BOM of the Plant as per the design during the time of bidding.

## 2. Photovoltaic Modules

### Technical Specs of Solar PV Modules

- All the components shall be in accordance with technical specifications given in relevant IS/IEC standards. Use of PV modules with higher power output is preferred.
- PV module (s) containing crystalline silicon should be used. Mono crystalline solar PV modules are preferred.

- Each of the Solar PV module shall be rated for a minimum of 540 Watts peak with 144 cells. The Solar PV modules shall have a positive power tolerance.
- The efficiency of the PV modules should be minimum 19% and fill factor should be more than 75%.
- Power Output Warranty: PV modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80 % at the end of 25 years.
- Any damage/rejection should be made good or replaced immediately without any extra cost or loss to EESL.
- The Contractor shall obtain the approval of the Quality plan prior to manufacturing/ inspection call. The cells used for module making shall be free from all defects like edge chipping, breakages, printing defects, discoloration of top surface etc. Only Class A solar cells shall be used. The modules shall be uniformly laminated without any lamination defects. Modules have to be grouped and rated as per the below table:

<b>Power Output of the solar PV modules</b>	<b>Rated power output of the Modules (Rating sticker)</b>
540 – 544.99 Wp	540 Wp
545 – 549.99 Wp	545 Wp
550 – 554.99 Wp	550 Wp
555 – 559.99 Wp	555 Wp
560 – 564.99 Wp	560 Wp
565 – 569.99 Wp	565 Wp
570 – 574.99 Wp	570 Wp

Note: Grouping of any of the modules (as per above table or higher wattage) have to be done as per the above order. The band of any of the modules supplied by the contractor shall have to be arranged in a similar manner as per the range mentioned in the above table.

- The PV modules used in the grid connected solar power projects must qualify to the latest edition of the following IEC or BIS qualification test or standards.

<b>SI No.</b>	<b>Code/Standard</b>	<b>Description</b>
1	IEC 61215	Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval
2	IEC 61701	Salt mist corrosion testing of photovoltaic (PV) modules
3	IEC 62716	Photovoltaic (PV) Modules – Ammonia (NH <sub>3</sub> ) Corrosion Testing
4	IEC 61730 Photovoltaic (PV) Module Safety Qualification – Part 1 and Part 2	Modules must qualify to Part 1: Requirements for Construction, Part 2: Requirements for Testing

5	IEC 62804	test methods for detection of PID (potential-induced degradation)
7	IEC 60068	Environmental testing

\*Supplier to submit all the above requisite test certificates of solar PV modules at the time of submission of the bid. In case, test certificates are not available with the bidder, bidder is required to submit the requisite certificate before start of supply of solar PV module at any of the site.

\*Bidder must submit valid Construction Data Form (CDF) in support of Bill of Material (BoM). The Solar PV module shall be free of potential induced degradation (PID). The PID test of module, the system voltage will be subject to a conditioning of three cycles at 85 degree C and 85% RH for a period of 96 hours. In case of expiration of standards or inapplicability, local standards and regulations may apply.

**Note-** Equivalent standards may be used. In case of clarification the following person/agencies may be contacted.

- Ministry of New and Renewable Energy (MNRE, Govt. of India)
- National Institute of Solar Energy (NISE)
- The Energy & Resources Institute (TERI)
- UL
- MNRE / NABL accredited labs

### **Identification and Traceability**

Each PV module used in any solar power Project must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions)

- i. Name of the manufacturer of PV Module
- ii. Name of the Manufacturer of Solar cells
- iii. Month and year of the manufacture (separately for solar cells and module)
- iv. Country of origin (separately for solar cells and module)
- v. I-V curve for the module at Standard Test Condition (1000 W/m<sup>2</sup>, AM 1.5, 25 degreeC)
- vi. Peak Wattage, I<sub>m</sub>, V<sub>m</sub> and FF for the module
- vii. Unique Serial No. and Model No. of the module
- viii. Date and year of obtaining IEC PV module qualification certificate
- ix. Name of the test lab issuing IEC certificate
- x. Other relevant information on traceability of solar cells and module as per ISO-9000

### **Required Testing**

#### **Factory Acceptance Tests (FAT)**

The Quality Plan/ test program for the Factory Acceptance Tests (FAT) shall be submitted to EESL for approval at least 4 weeks prior commencing of tests. The test report shall be submitted prior to shipment of material. EESL reserves the right to visit the PV module factory at any time during manufacturing process to assess quality and production scheduling status.

#### **Additional Independent Test**

Additional independent certified Third-Party testing of the PV modules is required. The bidder shall propose a list of Third-Party testing laboratories for EESL approval. The bidder shall organize and facilitate the EESL visit and/or testing in the factory or laboratory, if required.

EESL reserves the right to select PV modules randomly for the following tests:

- Module performance tests
- Module behavior test (irradiation and temperature)
- Module electroluminescence tests
- All testing must be included in the proposal and be supported by the bidder.

### **Site Tests**

- The PV modules shall be subject to witness testing onsite to ensure their performance.
- The testing should be performed during the following phases of the project:
  - Pre-commissioning
  - Commissioning and test on completion
  - Performance tests

The site tests shall be witnessed by the EESL. The commissioning test program shall be submitted at least 2 weeks prior in advance of any testing.

### **Authorized Test Centres**

The PV modules deployed shall have valid test certificates for their qualification as per above specified IEC/ BIS Standards by one of the NABL Accredited Test Centres in India. In case of module types/ equipment for which such Test facilities may not exist in India, test certificates from reputed ILAC Member Labs abroad will be acceptable.

### **Inspection**

EESL reserves the right to test the Solar PV Modules before the dispatch to confirm their standards to the contract specifications. If required, the pre dispatch testing of the Solar PV Modules shall be done at the manufacture's place. These tested parameters should match the IEC/ISI/MNRE/BEE standards of tender. If components of the system are not as per the standards,, entire lot has to be replaced with new components which shall confirm to the standards mentioned in the tender at Supplier's cost. EESL, reserves the right to verify flash test reports of Solar PV modules.

### **Transportation, Handling, Storage and Installation**

Transportation, handling, storage and installation of modules shall be in accordance with the manufacturer manual so as not to breach warranty conditions. The Standard Operating Procedure (SOP) for the same shall be shared by the Contractor prior to dispatch.

It is required to construct a temporary platform (graded) while keeping the modules at least above the highest flood level. If the contractor scheduled/ planned to mount the modules immediately after the receipt at site, then the module shall be kept in contractor's custody at a common storage area (which may be developed by contractor locally) with proper arrangement.

The stacked modules, in any case, shall be stacked as per the manufacturer's recommendation only and shall be covered with tarpaulin sheet, if required.

### 3. PV Array Configurations

The Solar array shall be configured in multiple numbers of sub-arrays, providing optimum DC power to auditable number of sub arrays. The Contractor shall submit their own design indicating configuration of PCU and respective sub arrays and associated bill of material.

- UV resistant Cable-ties (suitable for outdoor application shall be used to hold and guide the cables/wires from the modules to junction boxes or inverters. All the cables were aesthetically tied to module mounting structure.
- In case the string monitoring unit (SMU) is mounted on the module mounting structure, Contractor to take into consideration of the load thus added on the MMS. Accordingly, suitable supporting members for mounting the SMU must be designed and supplied. Separate structure for mounting of SMU can also be proposed.
- Every major Component of the Plant should be suitably named/ numbered & marked for ease of traceability, identification and maintenance.

### 4. String Monitoring Unit (SMU)

All SMUs should be equipped with appropriate functionality, safety (including fuses, grounding, contacts etc.) and protection.

The terminals will be connected to copper bus-bar arrangement of proper sizes to be provided. The junction boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables. Suitable markings shall be provided on the bus-bars for easy identification and weather resistant cable ferrules will be fitted at the cable termination points for identification.

The standards and codes:

Standard/Code	Description
IEC 60529	Enclosure Ingress Protection
IEC 62262	Enclosure Impact Protection
IEC 60269	Fuse
IEC 61643-12	Surge Protection Device
IEC 62852 or EN 50521	Solar cable connector

The Junction Boxes shall have suitable arrangement for the followings:

- Provide arrangement for disconnection for each of the groups/incomers.
  - Provide a test point for each sub-group for quick fault location and to provide group array isolation.
  - Suitable space for workability and natural cooling.
- The junction boxes shall be dust, vermin, and waterproof and made of thermoplastic/ metallic in compliance with IEC 62208, which should be sunlight/ UV resistive as well as fire retardant & must have minimum protection to IP65 (Outdoor) and Protection Class II.



- c) Array Junction Box will also have suitable surge protection. In addition, over voltage protection shall be provided between positive and negative conductor and earth ground such as Surge Protection Device (SPD). The maintenance free earthing shall be done as per the relevant standards.
- d) Array Junction Box should have adequate ratings of solar DC fuses & isolating miniature circuit breakers at both the terminals (+ve as well as -ve), provided in recommendation with the inverter manufacturer. The fuses should be so designed that it should protect the modules from the reverse current overload.
- e) At outgoing side DC Disconnecter switches Switch of suitable capacity shall be provided.
- f) Contractor shall submit all the test reports/ test certificates and compliance certificates during Detailed Design Engineering & before installation at site.

## 5. Inverter/ Power Conditioning Unit (PCU)

- Power Conditioning Unit (PCU)/ Inverter shall consist of an electronic inverter along with associated control, protection and data logging devices.
- Central inverter/ String Inverter of appropriate capacity may be used.
- The rated power/name plate capacity of the inverters shall be the AC output of the inverter at 50°C.
- All PCUs should consist of associated control, protection and data logging devices and remote monitoring hardware and compatible with software used for string level monitoring.
- Dimension, weight, cooling arrangement etc. of the PCU shall be indicated by the Bidder in the offer. Type (in- door & out-door) of installation also to be indicated.
- Contractor has to provide sufficient information about the inverter to be installed at the project site to the satisfaction of the EESL/MAHAGENCO before placing the final order for PCUs/Inverters. Service centre of the PCU manufacturer must be in India.
- The minimum European efficiency of the inverter shall be 98% load as per IEC 61683 standard for measuring efficiency. The Bidder/ Contractor shall specify the conversion efficiency of different loads i.e. 25%, 50%, 75% and 100% in its offer. The Bidder/ Contractor should specify the overload capacity in the bid.
- The inverters shall have minimum protection to IP 65 (Outdoor)/IP 54(indoor) and Protection Class II.
- Nuts & bolts and the PCU enclosure shall have to be adequately protected taking into consideration the atmosphere and weather prevailing in the area.
- Grid Connectivity: Relevant CERC regulations and grid code as amended and revised from time to time shall be complied. The system shall incorporate a unidirectional inverter and should be designed to supply the AC power to the grid at load end. The power conditioning unit shall adjust the voltage & frequency levels to suit the Grid.
- All three phases shall be supervised with respect to rise/fall in programmable threshold values of frequency.
- The inverter output shall always follow the grid in terms of voltage and frequency. This shall be achieved by sensing the grid voltage and phase and feeding this information to the feedback loop of the inverter. Thus control variable then controls the output voltage and frequency of the inverter, so that inverter is always synchronized with the grid.
- **Operational Requirements for Inverter/ PCU**
  - i. The PCU must have the feature to work in tandem with other similar PCU's and be able to be successively switched "ON" and "OFF" automatically based on solar radiation variations during the day. Inverters must operate in synergy and intelligently to optimize the generation at all times with minimum losses.

- ii. The PCU shall be capable of controlling power factor dynamically.
- iii. Maximum power point tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array. The MPPT should be microprocessor based to minimize power losses. The details of working mechanism of MPPT shall be mentioned by the Bidder in its offer. The MPPT unit shall conform to IEC 62093 for design qualification.
- iv. The system shall automatically “wake up” in the morning and begin to export power provided there is sufficient solar energy and the grid voltage and frequency is in range.
- v. Basic System Operation (Full Auto Mode): The control system shall continuously monitor the output of the solar power Plant until pre-set value is exceeded & that value to be indicated.
- vi. PCU shall have provisions/features to allow interfacing with monitoring software and hardware devices.

- **Protection against faults for PCU**

The PCU shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging.

Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices. In addition, it shall have following minimum protection against various possible faults.

- i. Grounding Leakage Faults: The PCU shall have the required protection arrangements against grounding leakage faults.
- ii. Over Voltage & Current: In addition, over voltage protection shall be provided between positive and negative conductor and earth ground such as Surge Protection Devices (SPD).
- iii. Galvanic Isolation: The PCU inverter shall have provision for galvanic isolation with external transformer, if required.
- iv. Anti-islanding (Protection against Islanding of grid): The PCU shall have anti-islanding protection. (IEEE 1547/UL 1741/ equivalent BIS standard)
- v. Unequal Phases: The system shall tend to balance unequal phase voltage (with 3- phase systems).
- vi. Reactive Power: The output power factor of the PCU should be of suitable range to supply or sink reactive power. The PCU shall have internal protection arrangement against any sustained fault in the feeder line and against lightning in the feeder line.
- vii. Isolation: The PCU shall have provision for input & output isolation. Each solid- state electronic device shall have to be protected to ensure long life as well as smooth functioning of the PCU.
- viii. PCU shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.
- ix. Each solid state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.
- x. All inverters/ PCUs shall be three phase using static solid state components. DC lines shall have suitably rated isolators to allow safe start up and shut down of the system. Fuses & Circuit breakers used in the DC lines must be rated suitably.

- **Standards & Compliances (PCU)**

- i. PCU shall conform to the following standards and appropriately certified by the labs:

IEC 61683	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency
EN 50530:2010 with 2013 Amendment 1	Overall efficiency of grid connected photovoltaic inverters
IEC 62109-1 Ed. 1	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements
IEC 62109-2 Ed. 1	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters
IEC 61000-6-2 Ed. 2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments, Harmonics etc.
IEC 61000-6-4 Ed. 2.1	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
IEC 62116 Ed. 2	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
IEEE 1547:2003 with 2014 Amendment 1	IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems
IEC 60068-2-1:2007	Environmental testing - Part 2-1: Tests - Test A: Cold
IEC 60068-2-2:2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing - Part 2-14: Tests - Test N: Change of Temperature
IEC 60068-2-30:2005	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
CEA Technical Standards for Connectivity to the Grid Regulations 2007 with 2013 Amendment or as amended from time to time.	

ii. The Bidder/Contractor should select the inverter as per its own system design so as to optimize the power output, however selected inverter must comply with the Technical/functional requirement of Plant as per this Tender Document.

iii. **Desired Technical requirements of PCU.**

Parameter	Specification
Rated AC power	As per design
Maximum input voltage	1500 V
Rated AC output voltage	As per design
Tolerance on rated AC output voltage	+/-10%

Rated frequency	50 Hz
Operating frequency range	47.5 Hz to 52 Hz
Power factor control range	0.9 lag to 0.9 lead
European efficiency	Minimum 98%
Maximum loss in Sleep Mode	0.05% of rated AC power
Total Harmonic Distortion	Less than 3% at 100% load
Degree of protection (Minimum)	IP 20 (Indoor)/IP 54 (Outdoor)

- The rated/ name plate AC capacity of the PCU shall be AC power output of the PCU at 50°C.
- Maximum power point tracker (MPPT) shall be integrated in the PCU to maximize energy drawn from the Solar PV array. The MPPT voltage window shall be sufficient enough to accommodate the output voltage of the PV array at extreme temperatures prevailing at site.
- The PCU output shall always follow the grid in terms of voltage and frequency. The operating voltage and frequency range of the PCU shall be sufficient enough to accommodate the allowable grid voltage and frequency variations.
- Construction:
  - Power Conditioning Unit (PCU) shall consist of an electronic three phase inverter along with associated control, protection, filtering, measurement and data logging devices.
  - Every DC input terminal of PCU shall be provided with fuse of appropriate rating. The combined DC feeder shall have suitably rated isolators for safe start up and shut down of the system.
  - Type-II surge protective device (SPD) conforming to IEC 61643-12 shall be connected between positive/ negative bus and earth.
  - In case external power supply is required, standalone UPS shall be used to meet auxiliary power requirement of PCU. It shall have a backup storage capacity of 2 hours.
  - Circuit Breaker of appropriate voltage and current rating shall be provided at the output to isolate the PCU from grid in case of faults.
  - The PCU shall be tropicalized and the design shall be compatible with conditions prevailing at site. Suitable number of exhaust fan with proper ducting shall be provided for cooling keeping in mind the extreme climatic condition of the site as per the recommendations of OEM to achieve desired performance and life expectancy.
  - All the conducting parts of the PCU that are not intended to carry current shall be bonded together and connected to dedicated earth pits through protective conductor of appropriate size. DC negative terminal shall be grounded.
  - Dedicated communication interface shall be provided to monitor the PCU from SCADA.
  - PCU front panel shall be provided with LCD/ LED to display all the relevant parameters related to PCU operation and fault conditions. It shall include, but not limited to, the following parameters.
    - DC input power
    - DC input voltage
    - DC input current
    - AC output power
    - AC output voltage (all the 3 phases and line)

- (vi) AC output current (all the 3 phases and line)
- (vii) Frequency
- (viii) Power Factor
- Operating Modes
  - Operating modes of PCU shall include, but not limited to, the following modes. These operating modes and conditions for transition are indicative only. The Contractor shall provide the detailed flow chart indicating the various operating modes and conditions for transition during detailed engineering.
- Standby Mode
  - The PCU shall continuously monitor the input DC voltage and remain on Standby Mode until it reaches the pre-set value.
- MPPT Mode
  - When the input DC voltage is above the pre-set value and AC grid connection conditions are fulfilled, the PCU shall enter into MPPT mode.
- Sleep Mode
  - When the AC output power/DC input voltage decreases below the pre-set value for pre-set time delay, the PCU shall switch into Sleep Mode.
- Protection Features
  - The PCU shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices.
- The PCU shall provide protection against the following type of faults, among others.
  - DC/AC over current
  - DC/AC over voltage
  - DC reverse polarity
  - DC earth fault
  - AC under voltage
  - AC under frequency/over frequency
  - Islanding
  - Over temperature
  - Lightning surges
  - Cooling fan failure
  - Auxiliary supply failure
  - Grid Support Functions
  - Active power regulation
- The PCU shall be able to limit the active power exported to the grid based on the set point provided through PCU front control panel. The PCU shall also be able to automatically the limit the active power after an increase in grid frequency above a pre-set value. The ramp rate shall be adjustable during operation and start-up after fault. The applicability of the requirement shall be as per CEA regulation and compliance.
- Reactive power control
  - The PCU shall be able to inject /absorb reactive power to/ from the grid based on the set point provided through PCU front control panel. The same shall be performed automatically with adjustable ramp rate based on dynamic changes in grid voltage or reactive power reference.
- Voltage Ride Through

- The PCU shall remain connected to the grid during temporary dip or rise in grid voltage as per the LVRT and HVRT requirements of CEA Technical Standards for Connectivity to the Grid Regulations. The PCU shall also be able to inject reactive power during the period of voltage dip.

Test Certificates/Reports

All the test certificates as per the standards mentioned above shall be submitted for approval. The tests should have been conducted at a test laboratory compliant with ISO 17025 for testing and calibration and accredited by an ILAC member signatory. Laboratory accreditation certificate or weblink along with scope of accreditation shall also be submitted. It is the responsibility of the Contractor to substantiate the compliance for CEA Regulations using test reports.

**6. Inverter Transformer**

Standards and Codes

Inverter transformer, wherever applicable, shall comply with the latest edition of the following standards and codes including amendments

Standard	Description
IS:2026, IEC:60076	Specification of Power Transformers
IS:2099, IEC:60137	Bushings for alternate voltage above 1000 V
IS: 335, IEC 60296	Insulating oil
IS: 3639	Fittings and Accessories for Power Transformers

- Technical Requirements

Parameters	Inverter Transformer
VA Rating	As per system requirement and SLD
Voltage Ratio	11 kV or 22 kV / Inverter output voltage
Duty, Service & Application	Continuous Solar Inverter application and converter Duty (Outdoor)
Winding	As per system design requirement
Frequency	50 HZ
Nos. of Phase	3
Vector Group & Neutral Earthing	As per system/inverter manufacturer requirement and SLD
Cooling	ONAN
Tap Changer	OCTC, No. of steps shall be as per the SLD and system requirement

Impedance at 75°C	As per Inverter Manufacturer requirement and SLD
Permissible Temperature rise over an ambient of 50°C (irrespective of tap)	
Top Oil	50°C
Winding	55°C
SC withstand time (thermal)	2 second
Termination	As per system requirement and SLD
Bushing rating, Insulation class (Winding & bushing)	HV side - 12 kV porcelain bushings LV side – 1.1 kV porcelain bushings
Noise level	As per NEMA TR-1
Loading Capability	Continuous operation at rated MVA on any tap with voltage variation of +/-3%, also transformer shall be capable of being loaded in accordance with IEC 60076-7
Flux density	Not to exceed 1.9 Wb/sq.m. at any tap position with combined frequency and voltage variation from rated V/f ratio by 10% corresponding to the tap. Transformer shall also withstand following over fluxing conditions due to combined voltage and frequency fluctuations:  a) 110% for continuous rating b) 125% for at least one minute c) 140% for at least five seconds. Bidder shall furnish over fluxing characteristic up to 150%
Air Clearance	As per CBIP
* Single Line Diagram (SLD) will be finalized during detailed engineering.	

### Construction

- The transformer shall be provided with conventional single compartment conservator with prismatic toughened glass oil gauge. The top of the conservator shall be connected to the atmosphere through indicating type cobalt free silica gel breather with transparent enclosure. Silica gel shall be isolated from atmosphere by an oil seal. Inverter transformers shall be provided with Magnetic Oil Gauge (MOG) with low oil level alarm contact.
- It is the responsibility of the Contractor to ensure that the inverter transformer comply with all the requirements of inverter provided by the inverter manufacturer.

- Inverter Transformer shall be designed for at least 5% total harmonic distortion (THD) to withstand distortion generated by the inverter as well as possible outside harmonics from the network.
- The transformer shall be suitable for continuous operation with a frequency variation of  $\pm 2.5\%$  from nominal frequency of 50 Hz without exceeding the specified temperature rise.
- Inverter Transformer shall have shield winding between LV & HV windings. Each LV winding must be capable of handling non-sinusoidal voltage with voltage gradient as specified by the inverter manufacturer. Also, shield winding shall be taken out from tank through shield bushing and the same shall be brought down to the bottom of the tank using copper flat and support insulator for independent grounding.
- Neutral bushing of Inverter duty transformer shall be brought outside the tank for the testing purpose. It shall be covered with MS sheet and a sticker "For testing purpose only. Do not earth". Neutral bushing of auxiliary transformer shall be brought outside the tank for earthing.
- Transformer shall have 150 mm dial type Oil Temperature Indicator (OTI) and Winding Temperature Indicator (WTI) with alarm and trip contacts. All indicators shall have accuracy class of  $\pm 2$  deg. For inverter transformers, WTI shall be provided for all the windings.
- The radiators shall be detachable type, mounted on the tank with shut off valve at each point of connection to the tank, lifts, along with drain plug/ valve at the bottom and air release plug at the top.
- Marshalling Box shall be of sheet steel, dust and vermin proof provided with proper lighting and thermostatically controlled space heaters. The degree of protection shall be IP 55. Marshalling Box of all transformers shall be preferably Tank Mounted. One dummy terminal block in between each trip wire terminal shall be provided. At least 10% spare terminals shall be provided on each panel. The gasket used shall be of neoprene rubber. Wiring scheme (TB details) shall be engraved in a stainless steel plate with viewable font size and the same shall be fixed inside the Marshalling Box door.
- Suitable relay, double float type with alarm and trip contacts, along with suitable gas collecting arrangement shall be provided. RTCC panel, as per design, to be provided.
- Inverter transformer shall be provided with spring operated Pressure Relief Device (with trip contacts) with suitable discharge arrangement for oil.
- Filter valve at top the tank and drain cum sampling valve at bottom of the tank shall be provided.
- All external surface of the transformer shall be painted with two coats of epoxy based paint of colour shade RAL 7032. Internal surface of cable boxes and marshalling box shall be painted with epoxy enamel white paint. The minimum dry film thickness (DFT) shall be 100 microns.
- LV and HV cable box shall be provided with disconnecting chamber to facilitate the movement of transformer without disturbing cable box and termination.
- Air release plug, bi-directional wheel/skids, cover lifting eyes, transformer lifting lugs, jacking pads, towing holes, core and winding lifting lugs, inspection cover, rating plate, valve schedule plate, accessories and terminal marking plates, two nos. of earthing terminals shall be provided.
- Rain hoods to be provided on MOG & PRD. Entry points of wires shall be suitably sealed.
- The accessories listed above are indicative only. Accessories which are not mentioned above but required for satisfactory operation of the transformers are deemed to be included in the contract without extra charges.

### **General Standards**

- i. All equipment shall be designed for operation in coastal climate at the required capacity. The reference parameters for which the transformers are to be designed are as under:-

<b>Particulars</b>	<b>Condition</b>
Maximum ambient temperature	50°C
Maximum daily average ambient temp	40°C
Maximum yearly weighted average ambient temp	35°C



Minimum ambient air temperature (Cooling)	-5°C
Max. Relative Humidity	95%
Yearly Avg. number of thunder storms	30-50
Average Number of rainy days	60 days
Fog	In winter
Number of months during which topical monsoon	5 months
Dust storms	May occur
Cyclone	Area is cyclone prone
Average Annual rain fall	100 cms.
Maximum wind speed	180 kmph

ii. **Efficiency:**

The percentage loading for the maximum efficiency shall be clearly stated at unity power factor as well as at 0.9 and 0.9 power factor (lead and lag).

iii. **Insulation:**

The dielectric strength of the winding, given insulation and the bushings shall conform to the values given in IS: 2026 (Part III)/1981 (or its latest amendment) for highest system voltage and shall be suitable for the impulse test/power frequency test voltages.

iv. **Factory Assembly and Tests:**

The transformer shall be completely assembled and tested at the Factory. Routine and Acceptance tests as per specification/ standards are to be conducted and no deviation in respect of conducting these tests will be acceptable. No extra charges for these tests will be paid. Test charges shall be part of cost of the equipment. If EESL/DISCOM/ MAHAGENCO selects to send a representative, all tests shall be carried out in his presence. Type test certificate shall be furnished before start of supply.

v. **Routine Tests:**

Each completed transformer shall be subjected to following routine tests as per IS: 2026

Part. I & III (latest amendment). No extra charges for any of the tests shall be paid. No deviation shall be acceptable. If the supplier desires, he may not fix radiators on transformers (other than the one which is to be type tested) during routine testing. However in that case, radiator manufacturer's test certificate shall be furnished for reference of inspecting officer with undertaking that supplier shall be responsible for proper alignment/fixing of radiator on transformer at site.

- Measurement of resistance of each winding.
- Measurement of turn's ratio between HV-LV windings at each tap.
- Checking of polarity and phase relationships for each winding.
- Measurement of no load loss and no load current.
- Positive phase sequence impedance/short circuit impedance between HV-LV windings on minimum, maximum and normal taps.
- Separate source voltage withstand test.
- BDV test on transformer oil.
- Induced over voltage withstand test.
- Measurement of neutral unbalance current.
- Regulation at rated load at unity, 0.90 and 0.80 lagging power factor.
- Load losses measured at rated frequency by applying voltage sufficient to produce the rated relevant current in one winding with the other winding short circuited.
- Measurement of insulation resistance.

- The total losses shall comprise of the No Load Losses, load losses at rated output duly converted at 75 deg. C average winding temperature and shall also be indicated in the test report. Load losses shall be that corresponding to rated load on HV & LV winding.
- Routine dielectric tests as per IS: 2026(Part. I & III), 1981 and any amendments thereto.
- Check complete transformer against approved outline drawing, provision for all fittings, finish oil level etc.

#### vi. **Tests at Site**

After erection at site all transformer(s) shall be subjected to the following tests:

- i. Insulation resistance test.
- ii. Ratio and polarity test.
- iii. Dielectric test on oil.
- iv. Physical check

In case the equipment is not found as per the requirements of the Technical Specification of NIT document, all expenses incurred during site testing will be to the tenderer's account and the material shall be replaced by him at site, free of cost.

#### **Further Tests:**

The EESL/MSEDCL/MAHAGENCO reserves the right of having other reasonable tests carried out at his own expenses either before dispatch or during performance guarantee period from Govt. approved/ Govt. recognized lab to ensure that the transformer complies with the requirements of this specification after due intimation to the supplier. In case the equipment is not found meeting the requirement of Technical Specification of Tender Document, all expenses incurred for such testing will be on supplier's account and the material shall be replaced by the supplier at site free of cost.

#### vii. **Frequency and System Voltage:**

The transformer shall be suitable for continuous operation with a frequency variation of  $\pm 2.5\%$  from normal of 50Hz without exceeding the specified temperature rise. The system shall be designed for a suitable voltage range as per the Grid code of the state or as per MAHAGENCO standard. However, the flux density requirements shall be as per this specification.

#### viii. **Installation & Commissioning**

Mainly following activities are required to be carried out before commissioning of Power Transformers:-

- Assembling of Power Transformer accessories as per GA drawing.
- Testing activities in presence of EESL/MSEDCL/MAHAGENCO such as
  - Ratio Test
  - Megger Value
  - Magnetic balance.
  - Oil BDV
  - Earth Resistance
  - Buchhloz Relay checking.
  - WTI/OTI/MOLG (oil level) checking.
  - Checking of points of leakage of oil from Transformer body/ Radiator/Valve
  - Setting of Relays in Panel

## 7. Circuit Breakers

- i. The circuit breakers shall be capable of rapid and smooth interruption of currents under all conditions completely suppressing all undesirable phenomena even under the most severe and persistent short circuit conditions or when interrupting small currents or leading or lagging reactive currents. The circuit breakers shall be 'Restrike-Free' under all operating conditions. The details of any device incorporated to limit or control the rate of rise of re-striking voltage across, the circuit breaker contacts shall be stated. The over voltage across, the circuit breaker contacts shall be stated. The over voltage caused by circuit breaker while switching inductive or capacitive loads shall not exceed 2.5 times the highest phase to neutral voltage. The actual make and break times for the circuit breakers throughout the ranges of their operating duties shall be stated in the offer and guaranteed
- ii. **Applicable Standards:** The materials shall conform in all respects to the relevant Indian Standard Specifications/ IEC Standards, with latest amendments indicated (reference only) below:

IS-13118/1991	General requirements for Circuit breakers for voltage above 1000 V IEC 62271-100-1/2001
IS-2705/1992	Current Transformers
IS-2099/1986	Bushings for alternating voltages above 1000 V
ISS-2633/1964	Methods of testing uniformity of coating of zinc coated articles
IS-3231/1986	Electrical relays for power system protection
IS-1248/1983	Specification for Ammeters & Voltmeters
IS-335/1983	New insulating oils Electrical IEC 71 (For oils in CTs) Clearances
IS-2147/1962	Degree of protection provided by enclosures for low voltage switchgear & control gear

- iii. The arc quenching chambers shall have devices to ensure almost uniform distribution of voltage across the interrupters.
- iv. Appropriate & adequate Capacity 415V AC indoor air Circuit Breaker as per the IEC 60898 / IEC 62271 – 100 or equivalent Indian Standards along with control circuit and protection relay circuit, fuses, annunciators and remote operating and controlling facility from the Main Control Room.
- v. Circuit breaker shall be C2/MI class under all duty conditions and shall be capable of performing their duties without opening resistor. The circuit breaker shall meet the duty requirement of any type of fault or fault location and shall be suitable for line charging and dropping when used on 6kV effectively grounded or ungrounded systems and perform make and break operations as per the stipulated duty cycles satisfactorily.
- vi. The circuit breaker shall be capable for breaking the steady & transient magnetizing current corresponding to transformers. It shall also be capable of breaking line charging currents as per IEC-62271-100 with a voltage factor of 1.4
- vii. The rated transient recovery voltage for terminal fault and short line faults shall be as per IEC: 62271-100.
- viii. The Contractor may note that total break time of the breaker shall not be exceeded under any duty conditions specified such as with the combined variation of the trip coil voltage, pneumatic pressure etc. While furnishing the proof of the total break time of complete circuit breaker, the Contractor may specifically bring out the effect of non-simultaneity between same pole and poles and show how it is covered in the guaranteed total break time.
- ix. Contractor shall indicate the noise level of breaker at distance of 50 to 150 m from base of the breaker.

- x. While furnishing particulars regarding the D.C. component of the circuit breaker, the Contractor shall note that IEC-62271-100 requires that this value should correspond to the guaranteed minimum opening time under any condition of operation.
- xi. The critical current which gives the longest arc duration at lock out pressure of extinguishing medium and arc duration shall be indicated.
- xii. Contractor has to provide the type test reports for the CB before the dispatch.
- xiii. All the duty requirements specified above shall be provided with the support of adequate test reports.

**• Operating Mechanism of Circuit Breakers**

- i. Circuit shall be vacuum type with electrically spring charged mechanism.
- ii. The operating mechanism shall be anti-pumping and trip free (as per IEC definition) electrically under every method of closing. The mechanism of the breaker shall be such that the position of the breaker is maintained even after the leakage of operating media and / or gas. The circuit breaker shall be able to perform the duty cycle without any interruption.
- iii. Electrical tripping shall be performed by shunt trip coil. Provision shall also be made for local electrical control. 'Local / remote' selector switch and close & trip push buttons shall be provided in the breaker central control cabinet. Remote located push buttons and indicating lamps shall also be provided. The VCB coil DC supply through appropriately rated battery bank and charger to be supplied by the Contractor.
- iv. Operating mechanism and all accessories shall be in local control cabinet. A central control cabinet for the three poles of the breaker shall be provided along with supply of necessary tubing, cables, etc.
- v. Mounting and supporting structure for Circuit Breaker: The circuit breakers should be self-supporting type. However, if necessary for the purpose of minimum ground clearance the circuit breakers should be mounted on raised steel structures which should be included in the scope of supply of circuit breaker. Bidder/Contractor to obtain the necessary information and data required for design of foundations of the circuit breaker be obtained from the CB supplier.
- vi. Max. Impact loading in terms of equivalent static load both compression and upward due to opening/closing of the breakers. It shall be clearly stated whether these forces shall act simultaneously or at different timing.
- vii. Necessary connecting materials such as clamps, bolts, nuts, washers etc. and fixing bolts for mounting the equipment on the supporting structures wherever required should be obtained from the circuit breaker supplier.
- viii. General parameters: Vacuum type Circuit Breaker:

Particulars	Details
Type of circuit breaker	Vacuum type
Highest System Voltage	As per system design
Rated operating voltage	As per system design
Rated frequency	50 Hz (+3% to -5%)
Number of poles	Three (3)
Rated/ minimum power frequency	As per system design
Rated lightning impulse Withstand	As per system design
Rated operating duty cycle	0 - 0.3 sec. - CO – 3 min. – CO
Rated line charging breaking	As per IEC
Reclosing	Single and three phase high speed
Maximum fault level	As per system design

Auxiliary contacts	As required plus 6NO and 6NC
Noise level	Maximum 140dB at 50m distance
Seismic acceleration	0.4 g horizontal

- ix. Co-ordination of rated voltages, short circuit breaking current and rated normal current for guidance as per IS 13118 for rated voltage 33 kV and above
- x. Circuit Breaker Protection against
- Over Current
  - Earth fault
  - Under voltage & over voltage protection
  - Under frequency & over frequency
  - SF6 gas pressure low (where applicable)
  - DC supply failure

## 8. Isolators

- i. The isolators and accessories shall conform in general to IEC 62271-102 (or equivalent Indian standard) except to the extent explicitly modified in specification.
- ii. Each isolating switch should have the following particulars under the site conditions for the system under design (typical values for 36 kV system are given).
- iii. General Parameters: Isolators

Particulars	Details
Operating mechanism of Isolator and Earth Switch	Motor operated
Nominal system voltage	As per system design
Highest system voltage	As per system design
Type	Outdoor (IP 65)
Rated short time current of isolator and earth switch	As per system design
Rated dynamic short time with stand current of isolator and earth switch	As per system design
Impulse withstand voltage with 1.2/50 micro sec. wave	As per system design
One minute power frequency withstand	As per system design
Temperature rise	As per Table-IV of IS: 9921
Rated mechanical terminal load	As per 62271-102

## 9. Indicating and Integrating Meters/Instruments

- i. All indicating instruments shall be of switchboard type, back connected, suitable for flush mounting and provided with dust and vermin proof cases for tropical use and finished in suitable color. All instruments shall have practical laboratory means for adjustment of accuracy. The limits of errors for ammeters/voltmeters shall be those permissible for class 1.5 instruments as per IS: 1248.
- ii. A.C. Static HT Tri Vector Meter:  
A.C. Static HT Tri Vector Meter shall be installed as per STATE DISCOM's/STU's norms and shall be intimated while placement of order. The meters shall be located at eye level to facilitate observations of readings correctly.
- iii. The ammeters and voltmeters shall be suitably scaled to indicate the current/voltage for all the rating of current/voltage transformers. A phase selector switch with four/six position shall be used to measure the current/voltage of each phase/line. The Contractor shall provide test certificate and calibration certificate along with the supply of the instrument.
- iv. The meters shall be located at normal eye level to facilitate observation of readings correctly.

## 10. Surge Arrestors

- i. The surge arrestors (SAs) shall conform in general to IEC 60099-4 or IS: 3070 except to the extent modified in the specification. Arrestors shall be of hermetically sealed units, self-supporting construction, suitable for mounting on lattice type support structures. Contractor shall furnish the technical particulars of Surge arrester.
- ii. The SA's shall be of heavy duty station class and gapless Metal Oxide type without any series or shunt gaps. The SAs shall be capable of discharging over-voltages occurring during switching of unloaded transformers, and long lines.
- iii. Arrestors shall be complete with insulating base for mounting on structure. Suitably enclosed for outdoor use and requiring no auxiliary or battery supply for operation shall be provided for each single pole unit with necessary connection.
- iv. The surge arrestors shall conform to type tests and shall be subjected to routine and acceptance tests in accordance with IEC-60099-4.
- v. Each lightning arrestors should have the following particulars under the site conditions for the system under design:

- **Codes and Standard**

IS: 2309: Code of Practice for the protection of building and allied structures against lightning.

NF C 17-102: Lightning Protection with Early Streamer Air Termination rod

- Complete Solar Array with associated structure shall be protected from Direct Lightning Stroke. Lightning Protection for solar array shall be achieved with any or both of the following two systems as per specification provided in the following section;

- (1) Single Rod Air Terminal (Faraday Rods),
- (2) Early Streamer Emission (ESE) Air Terminal.

Suitable earthing and equipotential bonding shall be ensured for the air termination rods as per applicable standard/Equipment manufacturer guidelines. Current carrying parts and accessories such as clamps, fasteners, down conductor, Test links and earth termination etc. shall be preferably procured from OEM of Air Terminals if it is supplied by them as part of lighting protection system.

- **Lightning Protection System for solar array with single rod air terminal**

Solar array of Plant shall be protected from direct lightning strike with straight or angled air termination rods of suitable class as per IS:2309 to be fixed with the module mounting structure (MMS). Air termination rods shall have minimum two clamps to be fixed with MMS and must be capable of carrying full lightning current. Contractor to ensure proper fixing of the clamps with MMS to allow lightning current to pass through the clamp without damage and to sustain the rods during high velocity wind. Contractor shall submit the calculation to determine the no. and location of air termination rods to be fixed on structure to provide the lightning protection to each solar module and structure. Earth riser shall be connected to that part/pole of MMS which is nearest to air termination rod.

- **Lightning Protection System for solar array with E.S.E air terminal**

Solar array shall be protected from direct lightning stroke with Early Streamer Emission air terminal in accordance to NF C 17-102 (Latest revision). Number and location of ESE air terminal shall be decided during detail engineering. For this purpose, design calculation and AutoCAD drawing of the layout of ESE terminal shall be submitted to EESL/MSEDCL/MAHAGENCO for approval. ESE air terminal shall be type tested in any national/international approved lab for advance triggering time ( $\Delta T$ ) and lightning Impulse current test and type test report shall be submitted to EESL/MSEDCL/MAHAGENCO for approval.

1. Each ESE air terminal shall be provided with separate earthing termination and test link for equipotential bonding of Lighting Protection System as per OEM guidelines/NFC 17 -102. Each ESE air terminal shall be equipped with lightning stroke counter to be fixed at suitable height in serial on the down conductor.
2. ESE air terminal shall be erected on isolated foundation to be approved by EESL/DISCOM. If required, Suitable guy wire shall be used to support the mast of ESE terminal against the wind.
3. Location and layout of ESE terminal shall be in such a manner that it cast no shadow on the PV Modules during 08:30 AM to 04:30 PM.
4. Lightning Protection System for Inverter Room (LCR) and MCR Contractor needs to provide the Lightning Protection for each inverter, Switchyard building and Main Control Room building in accordance to IS:2309.

- **Protective Relays**

- i. The Solar PV system and the associated power evacuation system interconnections should be protected as per IEC 61727 Ed.2, norms. Over current relays, differential protection relays (for grid tie power Transformer only) and earth fault relays have to be essentially provided. All relay should be numerical type & should also be remote operation and control enabled from the control room.
- ii. All the relays must be solid state type and based on open access communication protocol. The numerical relays shall have RS 485 port for communication.
- iii. The operating voltage of the relays shall be 110 V DC/220 V DC as per battery bank rating.
- iv. Necessary battery bank shall also be provided in order to supply uninterrupted power to relays and control & protection circuit of the Plant.
- v. Detailed Design calculations shall be provided on fault power computations and the philosophy of protective relaying with respect to short circuit kA calculations. Design, drawing and model of protection relay shall be approved by EESL/DISCOM/ state DISCOM.

- vi. The Contractor must submit the relay setting chart as a part of design documents in coordination with the connecting substation.

- **Contacts**

- i. The moving & fixed contacts shall be made of hard drawn electrolytic grade copper strips and shall be heavy duty self-aligning & high pressure type preferably which applies pressure to the contact surfaces after the blades are fully closed and release the pressure before they start to open. High pressure type contacts shall wipe the contact surfaces, while opening and closing. The contacts shall be so designed that wiping action shall not cause securing or abrasion on the contact surfaces. The wiping action shall be sufficient to remove oxide film, formed during the operation of the switches. The pressure shall be developed by rotation of the entire blade.
- ii. The temperature rise of contacts due to the flow of rated short circuit current for a period of 3 seconds shall not cause any annealing or welding of contacts.
- iii. The moving contacts, if provided, shall close first and open last so that no damage is caused due to arcing whatever to the main contacts. The Contractor shall give full details of such contacts with necessary drawings.
- iv. The arcing contacts, if provided shall close first and open last so that no damage is caused due to arcing whatever to the main contacts. The tender shall give full details of such contacts with necessary drawings.
- v. The female contact and its tensioning by spring shall be such that there will, always, be a positive contact with adequate pressure to give enough contact surface for the passing of current. The springs provided should not go out of alignment or get entangled with the male contact during operation. The details of springs shall be furnished on the G.A. drawing.

- **Earthing Blades**

- i. The Isolators controlling the transmission line (underground transmission cables) shall be equipped with earthing blades. The Earthing blades shall be counter balanced to ensure easy operation.
- ii. Line earth switch shall consist of three Earthing links per Isolator which will normally rest against the frames, when the connected Isolator is in closed position. The Earthing links of all three phases shall be suitable for fitting on either side of the Isolator.
- iii. Short time current withstand capacity of earthing blades of Isolator Earthing Switch shall be same as that of the main blades of Isolator. The material of the earthing Isolator, Each earthing blade shall be provide with flexible copper connections of adequate length of not less than 60mm<sup>2</sup> are for connection between the operating shall and the base frame.
- iv. The rated making capacity of earthing switches shall be as specified in the applicable standard of isolators

- **Insulators**

- i. Bushings shall be manufactured and tested in accordance with IS: 2099 & IEC: 137. Hollow column insulators shall be manufactured and tested in accordance with IEC: 60233/IS: 5261. The support insulators shall be manufactured and tested as per IS: 2544 / IEC: 600168/IEC: 600273. The insulators shall also conform to IEC 815 as applicable. Contractor shall furnish the technical particulars of all type of insulators used.
- ii. Porcelain insulator shall comply IS: 731-1976 or equivalent international standard and shall be homogenous, free from laminations, cavities and other flaws or imperfections that might affect the



mechanical or dielectric quality and shall be thoroughly vitrified, tough and impervious to moisture. Hollow porcelain should be in one integral piece in green & fired stage.

- iii. Contractor may offer silicone rubber housed composite type insulator as an alternative to the above porcelain insulator with equivalent creep age distance.
- iv. Data sheets for the insulators with cantilever strength and compression strength, etc. shall be submitted.
- v. Insulators shall be rated for not less than 6kN for bus bar supports and 4kN for isolators.

- **Bus Bar**

- i. The outdoor bus-bars and equipment connections shall be of suitable size as per norms of MSEDCL/MAHAGENCO.
- ii. The bus-bars and the connection jumpers shall be supported on post insulators wherever required.
- iii. The ACSR bus bars are an over ground system of wires strung between two supporting structures and supported by strain type insulators. The stringing tension may be limited to 500-900 kg depending upon the size of the conductor used. These types of bus bars are suitable for earthquake prone areas. All the bus bars are to be provided with insulating sleeves with appropriate color code.
- iv. Bus bar Material – The materials in common use for bus bars and connections of the strain type are ACSR conductor or as per DISCOMs requirement.
- v. Since aluminium oxides rapidly, great care is necessary in making connections. In the case of long spans expansion joints should be provided to avoid strain on the supporting insulators due to thermal expansion or contraction of pipe.
- vi. The bus bar sizes should meet the electrical and mechanical requirements of the specific application for which they are chosen.

Note: Unless otherwise specified, all equipment and materials shall conform to the latest applicable Indian Standards. Equipment complying with any other International Standards will also be considered if it ensures performance of equipment equal to a superior to Indian Standard.

- **Control & Relay Panel**

- i. General Requirement:
  - The control & relay panel shall be free standing, simplex type, floor mounting type, fabricated from 2 mm thick MS sheet for main enclosure and 1.6 mm thick MS sheet for internals and partitions. The main enclosure shall be mounted on a base frame fabricated out of 100x50 ISMC mild steel section.
  - The enclosure external finish color shade shall be decided by the EESL/DISCOM, The internal surface shall have a glossy white finish all over.
  - The control & relay panel shall contain the following metering and protection devices:
    1. Metering, Indications & Controls
    2. Ammeter:
    3. Ammeter selector switch
    4. Voltmeter:
    5. Voltmeter selector switch
  6. Load manager to display the following parameters: MW, MVA, MVA<sub>rh</sub>, MVA<sub>r</sub> Cos , Hz,
  7. Indication lamps for R, Y, B phases, Breaker 'ON' (R), Breaker 'OFF' (G), Breaker 'TRIP' (A), Spring charged (W), Trip Circuit Healthy (B)

8. TNC switch, spring return to neutral position shall be provided for circuit breaker operation.
9. Local / Remote selection switch for circuit breaker operation
10. Semaphore indicators for CB and Isolator 'Open' & 'Close' positions
11. Mimic diagram for the systems with aluminium strips and 'ON' 'OFF' indications for isolators

**Standards and Codes:**

<b>Standard/Code</b>	<b>Description</b>
IS 3231	Electrical relays for power systems protection
IEC 60255	Measuring relays and protection equipment
IEC 61850	Communication networks and systems for power utility automation
IEC 61131-3	Programmable controllers - Part 3: Programming languages
IS 9385	High voltage fuses
IS 9431	Indoor post insulators of organic material for systems with nominal voltages greater than 1000 V up to and including 300 kV
IEC 60099-4	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for A.C. systems
IS 3070-3	Lightning Arresters for Alternating Current Systems - Part 3: Metal Oxide Lightning Arresters Without Gaps
IEC 62052-11	Electricity metering equipment (A.C.) - General requirements, tests and test conditions - Part 11: Metering equipment
IEC 62053	Electricity metering equipment (A.C.) - Particular requirements
IS 14697	AC Static Transformer Operated Watthour and Var-hour Meters, Class 0.2S and 0.5S

• **Control Circuit**

- i. Control supply for breaker closing / tripping - 110V DC
- ii. Air Circuit Breaker spring charge motor – 240 V AC, 1 phase
- iii. Moulded Case Circuit Breakers – 240 V AC, 1 phase
- iv. Indications, annunciation – 110V DC
- v. Space heater, sockets, etc. – 240 V AC, 1 phase

• **Bus Bar & Cable Cavity**

- i. The material for main bus bars and tap off bus bars shall be electrolytic grade aluminum with properly color coded HR PVC sleeved insulation
- ii. Bus bar shall be suitable for short circuit rating and current suitable for all connected load.
- iii. Cable entry for incoming and outgoing cables shall be from Bottom.
- iv. A suitable gland plate shall be supplied for termination of power, control and instrumentation cables.
- v. Whenever feeders are housed in multi-tier configuration, these tiers shall be segregated by sheet metal barriers.
- vi. Earthing: Earthing bus bar shall be terminated at both ends of the switchgear to suit the connections to outside earthing conductor. All components inside the module are required to be earthed individually and are to be

looped and connected to the horizontal earth bus. All the non-current carrying parts of the panels, e.g., enclosure, must be connected to earth as per the regulations.

- **Terminals**

- i. CT circuit - Isolating link type terminals with shorting facility
- ii. PT circuit – clip on type terminals
- iii. Spare contacts shall be wired up to terminal block. 10% spare terminals shall be provided for each module

- **Specific Requirement**

- i. All ACBs/ VCBs, as applicable, shall be 4 pole, electrically operated, draw-out type, with closing coil, spring charge motor, trip coil, TNC switch for close and trip, manual closing and tripping push buttons, door I/L, test and service position micro switches, emergency P.B., safety shutters, etc. The circuit breaker shall be provided with anti-pumping feature.
- ii. ACBs/ VCBs, as applicable, shall be complete with microprocessor release and shall be provided with over current, short circuit and earth fault protections.
- iii. Minimum 10% spare feeders of each rating shall be provided in the switchgear.
- iv. All current transformers shall have 5/1A secondary and all meters shall be suitable for 5/1A operation.
- v. All indicating lamps shall be of LED cluster type. ACB feeders shall be provided with ON, OFF, AUTOTRIP, SPRING CHARGED, TEST, SERVICE, TRIP CIRCUIT HEALTHY indications
- vi. All indicating instruments, including MFM, shall be flush mounting, Digital type and of standard size.
- vii. Window annunciator with hooter and accept, test, reset button shall be provided. Necessary auxiliary relays for contact multiplication shall be provided in the panel.
- viii. The maximum temperature of the bus bars, droppers and contacts at continuous current rating under site reference ambient temperature of 50° C shall not exceed 105° C.
- ix. Instrumentation: Switchgear instrumentation shall be provided as follows:
  - Mains Incomer – Voltmeter with selector switch
  - Ammeter with selector switch
  - Power Factor meter
  - Frequency meter
  - TVM + MD meter
  - Potential indicating lamps
  - Outgoing Feeders
  - Ammeter with selector switch on all feeders

## **2. LT/HT Switchgear**

- Standards and Codes for HT switchgear
  - All equipment provided under HT switchgear shall comply with latest editions and amendments of the relevant IEC standards and IS codes. In particular, the switchgear shall comply with the following standards and codes.

Standards and Codes:

<b>Standard/Code</b>	<b>Description</b>
IS/IEC 62271-1	High Voltage Switchgear and Control gear - Part 1: Common Specifications
IS/IEC 62271-100	High Voltage Switchgear and Control gear - Part 100: AC Circuit Breakers
IS/IEC 62271-102	High Voltage Switchgear and Control gear - Part 102: AC Disconnectors and Earthing Switches
IS/IEC 62271-200	High Voltage Switchgear and Control gear - Part 200: AC Metal Enclosed Switchgear and Control gear for Rated Voltages Above 1 kV and Up to and Including 52 kV
IEC 61869	Instrument Transformers
IS 3231	Electrical relays for power systems protection
IEC 60255	Measuring relays and protection equipment
IEC 61850	Communication networks and systems for power utility automation
IEC 61131-3	Programmable controllers - Part 3: Programming languages
IS 9385	High voltage fuses
IS 9431	Indoor post insulators of organic material for systems with nominal voltages greater than 1000 V up to and including 300 kV
IEC 60099-4	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for A.C. systems
IS 3070-3	Lightning Arresters for Alternating Current Systems - Part 3: Metal Oxide Lightning Arresters Without Gaps
IEC 62052-11	Electricity metering equipment (A.C.) - General requirements, tests and test conditions - Part 11: Metering equipment
IEC 62053	Electricity metering equipment (A.C.) - Particular requirements
IS 14697	IS 14697 AC Static Transformer Operated Watthour and Var-hour Meters, Class 0.2S and 0.5S

• **Low/ High Voltage Switchgear Panels**

- i. The LT/ HT switchgear panels shall be designed as per the relevant IS codes and as per the approved design for the panel. All the parts of the panel must be rated as per the relevant rated voltage level. All the panels must have multifunction meters (MFM) flushed with the surface of the panels. However, the outgoing feeder can have Tri vector meter (TVM) for the energy accounting.
- ii. The HT switchgear would be connected with a separate ABT meters which shall be of same specification as the commercial meter. The meter shall be connected with modem to communicate with the server for data storage. The meter shall record generation data in 15mins time packet and record all events of grid outage in 15mins time packet. The bidder shall make sure that any such meter installed shall have current class as the HT Panel CT class. This meter be installed in the solar plant switch yard area. The bidder shall make all arrangement in terms of fabrication to connect ABT meter with the HT Panel and ensure the container of the meter should at least be of IP65/66 rating.
- iii. The Power Control Centre (PCC)/ Switchgear shall be rated for the maximum output of the supply transformer feeding the system. The short circuit withstand rating (1 sec) at rated voltage of the switchgear shall be relevant to the existing electrical system short circuit ratings.
- iv. The configuration of the PCCs shall be as per the Single Line Diagram of the system.

v. Power Control Centers (Construction)

- Single front / compartmentalized, modular design, degree of protection IP52 with provision of extension on both sides.
- Incomer feeders: mains incomer - Electrically operated draw out type Air Circuit Breakers (ACBs)/ Vacuum Circuit breakers (VCBs), as applicable.
- Outgoing feeders: Moulded Case Circuit Breakers (MCCBs)/ electrically operated draw out type Air Circuit Breakers (ACBs) / Vacuum Circuit Breakers (VCBs), as applicable.
- The color finish shade of switchgear enclosure for interior shall be glossy white & for exterior it shall be light grey, semi glossy shade 631 of IS: 5. If a different exterior shade is desired by the EESL/DISCOM, the same shall be intimated to the supplier.
- The PCC shall be fabricated out of CRGO sheet steel; 2 mm thick for the outer shall all-round. The internal walls and separators shall be of 1.6 mm thick CRGO sheet steel.
- The gland plates shall be 3 mm thick.

The detailed requirements are however discussed in the previous sections.

Type Test for HT switchgear:

Test Standard	Relevant	IEC Clause
<b>Switchgear Panel</b>		
Dielectric tests		
Power frequency voltage test	IEC 62271-200	6.2.6.1
Lightning impulse voltage test	IEC 62271-200	6.2.6.2
Dielectric tests on auxiliary and control circuits	IEC 62271-200	6.2.10
Measurement of the resistance of the main circuit	IEC 62271-200	6.4.1
Temperature-rise tests	IEC 62271-200	6.5
Short-time withstand current and peak withstand current tests	IEC 62271-200	6.6
Verification of the IP coding	IEC 62271-200	6.7.1
Verification of making and breaking capacities	IEC 62271-200	6.101
Mechanical operation test	IEC 62271-200	6.102
Internal arc test	IEC 62271-200	6.106
<b>Circuit Breaker</b>		
Mechanical operation test at ambient air temperature (M2 Class)	IEC 62271-100	6.101.2
Basic short-circuit test-duties	IEC 62271-100	6.106

<b>Relays</b>		
Vibration tests	IEC 60255-21-1	
Shock and bump tests	IEC 60255-21-2	
Seismic tests	IEC 60255-21-3	
Electromagnetic compatibility requirements	IEC 60255-26	
Product safety requirements	IEC 60255-27	
Common requirements	IEC 60255-1	
Functional requirements	Relevant parts of IEC 60255-100 series	
Communication requirements	IEC 61850	
<b>Current Transformers</b>		
Temperature-rise test	IEC 61869-2	7.2.2
Impulse voltage withstand test on primary terminals	IEC 61869-2	7.2.3
Tests for accuracy	IEC 61869-2	7.2.6
Short-time current tests	IEC 61869-2	7.2.201
<b>Voltage Transformer</b>		
Temperature-rise test	IEC 61869-3	7.2.2
Impulse voltage withstand test on primary terminals	IEC 61869-3	7.2.3
Electromagnetic Compatibility tests	IEC 61869-3	7.2.5
Test for accuracy	IEC 61869-3	7.2.6
Short-circuit withstand capability test	IEC 61869-3	7.2.301
Communication requirements	IEC 61850	
<b>Current Transformers</b>		
Temperature-rise test	IEC 61869-2	7.2.2
Impulse voltage withstand test on primary terminals	IEC 61869-2	7.2.3
Tests for accuracy	IEC 61869-2	7.2.6
Short-time current tests	IEC 61869-2	7.2.201
<b>Voltage Transformer</b>		
Temperature-rise test	IEC 61869-3	7.2.2
Impulse voltage withstand test on primary terminals	IEC 61869-3	7.2.3
Electromagnetic Compatibility tests	IEC 61869-3	7.2.5
Test for accuracy	IEC 61869-3	7.2.6
Short-circuit withstand capability test	IEC 61869-3	7.2.301

## 11. DC Cable and Wires

- i. All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. (Note: DC cables for outdoor installations should comply with the TUV 2PFG 1169/09.07 for service life expectancy of 25 years)
- ii. **Insulation:** Outer sheath of cables shall be electron beam cross-linked XLPO type and black in colour. In addition, Cable drum no. / Batch no. to be embossed/ printed at every one meter. Cable Jacket should also be electron beam cross-linked XLPO, flame retardant, UV resistant and black in colour. DC positive current carrying cables should have marking of red line on black outer sheath.
- iii. All the DC cables from SMU to Inverter must be Single Core cable.
- iv. DC cables used from solar modules to array junction box shall be solar grade copper (Cu) with XLPO insulation and rated for 1.1kV only. However, the cables used from array junction box to inverter can be XLPE Aluminium with 1.1kV rating as per relevant standards.
- v. In addition to manufacturer's identification on DC cables as per relevant standard, following marking shall also be provided over outer sheath.
  - a. Cable size and voltage grade
  - b. Word 'FRNC/ FRLS' (as applicable) at every metre
  - c. Sequential marking of length of the cable in metres at every metre
- vi. Wires with sufficient ampacity and parameters shall be designed and used so that maximum voltage-drop at full power from the PV modules to inverter should be less than 0.5%. Successful Bidder/Contractor shall provide voltage drop calculations in unlocked excel sheet.
- vii. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. Necessary bimetallic connectors have to be used for connecting Cu bus bar and Al cables or vice-versa. All wires used on the LT side shall conform to IS and should be of appropriate voltage grade. Only copper conductor wires (up to Array Junction Box) compliant with IEC 60228, Class 5 of reputed make shall be used.
- viii. All high voltage cables connecting the main junction box/string inverters to the transformers should be PVC insulated grade conforming to IS 1554 and cables shall also conform to IEC 60189 for test and measuring the methods.
- ix. Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles.
- x. All cable/wires shall be provided with UV resistant printed ferrules for DC side however, for HT cables, punched/ embossed aluminium tags are required. The marking on tags shall be done with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.
- xi. The wiring for modules interconnection should be weather resistant. However, for crossing with road, drain and trenches etc., the cable must pass through GI / Hume pipe of appropriate size with proper protection at ends to prevent any damage inflicted by the edge of the pipe.
- xii. Type test reports and Data sheets of individual cable sizes (HT & LT) shall be submitted for approval by EESL/DISCOM.

### Standards and codes:

Cable	From	To	Conductor/ Insulation	Voltage Rating	Applicable Standard

Solar Cable*	Module	SMU	Copper/ XLPO	1.1 kV DC	TUV 2 PfG 1169/08.2007
DC Cable	SMU	Power Conditioning Unit	Copper or Aluminium/ XLPE	1.1 kV DC	IS 7098 Part I
* Cable used for module interconnection shall also be referred as solar cable.					

- **Switchboard box / DC Distribution Box (DCDB) / AC Distribution Box (ACDB) Panels**

- i. Successful Bidder/Contractor shall provide sufficient no. of switchboards / DCDB/ ACDB wherever required.
- ii. All boxes/ panels should be equipped with appropriate functionality, safety (including fuses, grounding, etc.) and protection.
- iii. The terminals will be connected to bus-bar arrangement of proper sizes to be provided. The panels/ boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables.
- iv. Adequate rating fuses & isolating MCB/ MCCB should be provided.
- v. The panels/ boxes shall have suitable arrangement for the followings:
  - o Provide arrangement for disconnection
  - o Provide a test point for quick fault location
  - o To provide isolation
  - o The current carrying rating of the boxes/ panels shall be suitable with adequate safety factor
  - o The rating of the boxes/ panels shall be suitable with adequate safety factor to interconnect to the local/ internal grid
  - o Thermal/ heat dissipation arrangement/ Vent for safe operation.
  - o Adequate number of spare terminals to receive suitable runs and size of cables required for the Inverter/Transformer rating
- vi. The boxes/ panels must be grounded properly to ensure all safety related measures for safe operation. The parts of panel, wherever applicable, must be insulated properly.
- vii. All the Panels to be manufactured with sufficient space for working and must have temperature suitability up to 85<sup>o</sup> C with separate cable and bus bar alley.
- viii. The boxes/ panels shall be dust, vermin, and waterproof and made of thermoplastic/ metallic in compliance with IEC 62208, which should be sunlight/ UV resistive as well as fire retardant & must have minimum protection to IP 65(Outdoor)/ IP 20(indoor) and Protection Class II.

All panels/ boxes shall be provided with adequately rated bus-bar, incoming control, outgoing control etc. as a separate compartment inside the panel to meet the requirements of the Chief Electrical Inspector General (CEIG)/CEA. All live terminals and bus bars shall be shrouded.



## 12. AC Cables:

Standards and Codes:

IS 7098	Crosslinked polyethylene insulated PVC sheathed cables, Part 1: For working voltage up to and including 1100 V
IS 7098	Crosslinked Polyethylene Insulated Thermoplastics Sheathed Cables Part 2: for Working Voltages from 3.3 kV up to and Including 33 kV

1. All AC cables shall be flame retardant, low smoke (FRLS) type designed to withstand all mechanical, electrical and thermal stresses develop under steady state and transient operating conditions.
2. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. However, cable joints may be allowed if the route length is more than maximum available drum length subject to Owner's approval.
3. In addition to manufacturer's identification on cables as per relevant standard, following marking shall also be provided over outer sheath.
  - a. Cable size and voltage grade
  - b. Word 'FRLS' at every metre
  - c. Sequential marking of length of the cable in metres at every metre
4. Cables shall be sized based on the following considerations:
  - a. Rated current the equipment
  - b. Maximum voltage drop in LT cable (from inverter to inverter transformer) shall be limited to 2% of the rated voltage. For HT cables (from inverter transformer to interconnection point), maximum voltage drop shall be limited to 2% of the rated voltage. Successful Bidder shall provide voltage drop calculations in excel sheet.
  - c. Short circuit withstand capability as per design for 1s.
  - d. De-rating factors according to laying pattern

## 13. Earthing

Earthing system shall comply with latest revisions and amendments of the relevant IEC standards and IS codes. In particular, earthing system shall comply with the following standards and codes.

Standard/Code	Description
IS 3043	Code of Practice for Earthing
IEEE 80	IEEE Guide for Safety in AC Substation Grounding
IEEE 142	IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
Indian Electricity Rules	

1. Earthing system shall be designed based on system fault current and soil resistivity value obtained from geo-technical investigation report. Earth grid shall be formed consisting of

number of earth electrodes sufficient enough to dissipate the system fault current interconnected by earthing conductors.

2. The earth electrode shall be made of high tensile low carbon steel rod, molecularly bonded by high conductivity copper on outer surface with coating thickness not less than 250 micron as per relevant standards. Suitable earth enhancing material shall be filled around the electrode to lower the resistance to earth. Inspection chamber and lid shall be provided as per IS 3043.
3. Earth conductors shall be made of copper bonded steel or galvanized steel of sufficient cross section to carry the fault current and withstand corrosion.
4. Earth electrodes shall not be situated within 1.5m from any building whose installation system is being earthed. Minimum distance between earth electrodes shall be the driven depth of the electrode.
5. Every alternate post of the transformer yard and switchyard fence shall be connected to the earth grid by one GS flat and gates by flexible lead to the earthed post.
6. All welded connections shall be made by electric arc welding. For rust protection the welds should be treated with red lead compound and afterwards thickly coated with bitumen compound.

#### **14. Lightning Protection System**

1. Lightning Protection System for entire plant against direct lightning strokes shall be provided with Early Streamer Emission (ESE) Air Terminal as per NFC 17-102:2011.
2. Protection Level for the entire plant shall be level – I.
3. Each ESE air terminal shall be provided with following accessories.
  - a. Highly insulated poly-plastic adaptor to fix the ESE air terminal with the FRP mast
  - b. Fiberglass Reinforced Plastic (FRP) mast
  - c. Coupler to connect FRP mast with GI mast
  - d. Galvanized Iron mast with base plate and guy wire kit
  - e. Down-conductor: PVC insulated flexible copper cable of suitable size complying with EN 50164-2 or equivalent standard. It shall be routed along the mast with suitable fixings and connectors.
  - f. Test joint with each down conductor
  - g. Lightning event counter complying with EN 50164-6 or equivalent standard. It shall be fixed at suitable height in series with the down conductor.
  - h. Earth termination system in accordance with NFC 17-102. Earth electrodes shall comply with the EN 50164-2 or equivalent standard. Earth enhancing compounds complying with EN 50164-7 or equivalent standard, may be used where soil resistivity is higher and making it impossible to achieve system resistance within specified limit.
4. Accessories listed above are indicative only and any other fittings or accessories, which are usual or necessary for satisfactory operation of the lightning protection shall be provided by the Contractor without extra charges.
5. Necessary foundation/anchoring for holding the lightning mast in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.

#### **15. SCADA and Remote Monitoring System**

1. Each of the solar plant shall be automatically operated and shall be controlled by microprocessor based control system SCADA and should be Open Platform Communications (OPC) compliant. There

shall be simultaneous data logging, recording and display system for continuous monitoring of data for different parameters of different sub systems, power supply of the power Plant at DC side and AC side.

2. An integrated SCADA shall be supplied for each of the power plant which should be capable of communicating with all inverters and provide information of the entire Solar PV Grid interactive power Plant.
3. The SCADA shall be string level monitoring compatible and shall have features of remote access to the real time data. SCADA shall have features for generating the day ahead schedule of generation based on historical data/ suitable logic. Also, system must be capable of sending the telemetry data to the local SLDC via GPRS/ GSM/ suitable mode.
4. Computer-aided data acquisition unit shall be a separate & individual system comprising of different transducers to read the different variable parameters, A/D converter, multiplexer, de-multiplexer, interfacing hardware and software which will be robust & rugged suitable to operate in the control room Environment.
5. Reliable sensors for solar insolation, temperature, and other weather and electrical parameters are to be supplied with the data logger unit.
6. The Data Acquisition System should be housed in a desk made of steel sheet at each of the site/plant.
7. All data shall be recorded chronologically date wise. The data file should be MS Excel/ CSV compatible. The data, if needed, can be accessible remotely through authorized access. The data logger shall have internal reliable battery backup and data storage capacity to record all sorts of data simultaneously round the clock. All data shall be stored in a common work sheet chronologically and representation of monitored data shall be in graphics mode or in tabulation form. All instantaneous data can be shown in the Computer Screen. Provision should be available for Remote Monitoring.
8. SCADA shall measure and continuously record electrical parameters and provide following data (but not limited to) at a 5-15 minute interval.
9. SCADA shall have feature to be integrated with the local system as well remotely via the web using either a standard modem or a GSM/WIFI modem. The Contractor shall provide compatible software and hardware so that data can be transmitted via. Standard modem.
10. In addition, Contractor shall also provide the live data (in required format) from various instrument such as Inverter, SMU, HT Panel, WMS, Temperature sensors etc. via APIs, FTP etc. at 5-15 minute interval, as and when required by EESL.
11. This will be the contractor's responsibility to apply and get the suitable connection for SCADA, office & control room on behalf of the EESL/MSEDCL/MAHAGENCO & all the expenditures including payment of periodic bills of Internet provider shall be met by the Contractor.
12. SCADA shall be provided with reliable power supply along with backup supply for at least one hour to cater to outage of grid.
13. The SCADA shall be compatible to the requirements for measuring and reporting the performance-ratio (PR) of the Plant.
14. The Contractor shall provide all administrative rights/ privileges/passwords of the SCADA system to the EESL/MAHAGENCO. The EESL/MSEDCL/MAHAGENCO have rights over the data generated in the Plant.

## **16. Power and Control Cables specifications on AC side**

- i. The size of each type of cable selected shall be based on minimum voltage drop; however the maximum drop shall be limited to 2%. Due consideration shall be made for the de-rating of the cables with respect to the laying pattern in buried trenches / on cable trays, while sizing the cables.

- ii. All cables shall be supplied in the single largest length to restrict the straight- through joints to the minimum number.
- iii. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily. The ferrules used must be UV resistant. However, for HT cables, embossed ferrules can be used.
- iv. Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles.
- v. The cables shall be adequately insulated for the voltage required and shall be suitably colour coded for the required service. Bending radii for cables shall be as per manufacturer's recommendations and IS: 1255.
- vi. Cables inside the equipment room, control room and in the switchyard shall be laid in Galvanized Cable Trays mounted on mild steel supports duly painted, in constructed trenches with RCC raft and sidewalls or bricks sidewalls and provided with removable RCC covers.
- vii. All the communication cables (RS 485, fibre optics etc.) must be supplied with type test reports and shall laid in accordance with the relevant IS codes. It must be laid so that there is no interference with the power cables.
- viii. Type test reports and Data sheets of individual cable sizes (HT & LT) shall be submitted for approval by EESL/DISCOM. Drum numbers and drum length details shall be submitted with each consignment

### **Codes and Standards**

- i. IS: 1255 Code of practice for installation and maintenance of power cables Up to and including 33kV rating.
- ii. IS: 9537 Conduits for electrical installation.
- iii. IS: 13573 Joints and termination for polymer cables for working voltages from 6.6kV up to and including 33kV performance requirements and type tests.
- iv. VDE 0278 Tests on cable terminations and straight through joints.
- v. BS 6121 Specification for mechanical cable glands for elastomers and Plastic insulated cables.
- vi. Indian Electricity Act
- vii. Indian Electricity Rules

### **Design and Constructional Features**

Inter Plant Cabling for main routes shall be laid in Cable trenches/cable trays/buried/duct banks. In case of Duct banks, pull-pits shall be filled with sand and provided with a PCC covering. All buried cables shall be armoured.

### **Cable glands**

Cable shall be terminated using double compression type cable glands. Cable glands shall conform to BS: 6121 and be of robust construction capable of clamping cable and cable armour (for armoured cables) firmly without injury to insulation. Cable glands shall be made of heavy duty brass machine finished and nickel chrome plated. Thickness of plating shall not be less than 10 micron. All washers and hardware shall also be made of brass with nickel chrome plating Rubber components shall be of neoprene or better

synthetic material and of tested quality. Cable glands shall be suitable for the sizes of cable supplied/erected.

### **Cable lugs/ferrules**

Cable lugs/ferrules for power cables shall be tinned copper solder less crimping type suitable for aluminum compacted conductor cables. Cable lugs and ferrules for control cables shall be tinned copper type. The cable lugs for control cables shall be provided with insulating sleeve and shall suit the type of terminals provided on the equipments. Cable lugs and ferrule shall conform to relevant standard.

### **Trefoil clamps**

Trefoil clamps for single core cables shall be pressure die cast aluminum or fibre glass or nylon and shall include necessary fixing accessories like G.I. nuts, bolts, washers, etc. Trefoil clamps shall have adequate mechanical strength to withstand the forces generated by the peak value of maximum system short circuit current.

### **Cable Clamps & Straps**

The cable clamps required to clamp multicore cables on vertical run shall be made up of suitable size. For clamping the multicore cables, self- locking, de-interlocking type nylon clamps/straps shall be used. The clamps/straps shall have sufficient strength and shall not get affected by direct exposure to sun rays and outdoor environment.

## **• Installation**

### **• Cable tray and Support System Installation**

- i. Cables shall run in cable trays mounted horizontally or vertically on cable tray support system which in turn shall be supported from floor, ceiling, overhead structures, trestles, pipe racks, trenches or other building structures.
- ii. Horizontally running cable trays shall be clamped by bolting to cantilever arms and vertically running cable trays shall be bolted to main support channel by suitable bracket/clamps on both top and bottom side rails at an interval of 2000 mm in general.
- iii. For vertical cable risers/shafts cable trays shall be supported at an interval of 1000mm in general. Fixing of cable trays to cantilever arms or main support channel by welding shall not be accepted. Cable tray installation shall generally be carried out as per the approved guidelines/ drawings.
- iv. The cantilever arms shall be positioned on the main support channel with a minimum vertical spacing of 300 mm unless otherwise indicated.
- v. All cable way sections shall have identification, designations as per cable way layout drawings and painted/stenciled at each end of cable way and where there is a branch connection to another cable way.

### **• Conduits/Pipes/Ducts Installation**

- i. The Contractor shall ensure for properly embedding conduit pipe sleeves wherever necessary for cabling work. All openings in the floor/roof/wall /cable tunnel/cable trenches made for conduit installation shall be sealed and made water proof by the Contractor.
- ii. GI pull wire of adequate size shall be laid in all conduits before installation. Metallic conduit runs at termination shall have two lock nuts wherever required for junction boxes etc.

- iii. Conduit runs/sleeves shall be provided with PVC bushings having round edge at each end. All conduits/pipes shall have their ends closed by caps until cables are pulled. After cables are pulled, the ends of conduits/pipes shall be sealed with Glass wool/Cement Mortar/Putty to prevent entrance of moisture and foreign material.
- iv. Exposed conduit/pipe shall be adequately supported by racks, clamps, straps or by other approved means. Conduits /pipe support shall be installed square and true to line and grade with an average spacing between the supports as given below, unless specified otherwise.

#### • Cable Installation

Cable installation shall be carried out as per IS: 1255 and other applicable standards. For Cable unloading, pulling etc. Following guidelines shall be followed in general:

- i. Cable drums shall be unloaded, handled and stored in an approved manner on hard and well drained surface so that they may not sink. In no case shall be drum be stored flat i.e. with flange horizontal. Rolling of drums shall be avoided as far as possible. For short distances, the drums may be rolled provided they are rolled slowly and in proper direction as marked on the drum. In absence of any indication, the drums may be rolled in the same direction as it was rolled during taking up the cables. For unreeling the cable, the drum shall be mounted on suitable jacks or on cable wheels and shall be rolled slowly so that cable comes out over the drum and not from below. All possible care shall be taken during unreeling and laying to avoid damage due to twist, kink or sharp bends. Cable ends shall be provided with sealed plastic caps to prevent damage and ingress of moisture.
- ii. While laying cable, ground rollers shall be used at every 2 meter interval to avoid cable touching ground. The cables shall be pushed over the rollers by a gang of people positioned in between the rollers. Cables shall not be pulled from the end without having intermediate pushing arrangements. Pulling tension shall not exceed the values recommended by cable manufacturer. Selection of cable drums for each run shall be so planned so as to avoid using straight through joints. Care should be taken while laying the cables so as to avoid damage to cables. If any particular cable is damaged, the same shall be repaired or changed to the satisfaction of Project Manager.
- iii. Bending radii for cables shall be as per manufacturer's recommendations and IS: 1255.
- iv. Where cables cross roads/rail tracks, the cables shall be laid in Hume pipe/HDPE pipe.
- v. No joints shall be allowed in trip circuits, protection circuits and CT/PT circuits. Also joints in critical equipment in main plant area shall not be permitted. Vendor shall identify and accordingly procure the cable drum length.
- vi. In each cable run some extra length shall be kept at suitable point to enable one LT/two HT straight through joints to made, should the cable develop fault at a later stage. Control cable termination inside equipment enclosure shall have sufficient lengths so that shifting of termination in terminal blocks can be done without requiring any splicing.

#### • Separation

At least 300mm clearance shall be provided between:

- HT power & LT power cables,
- LT power & LT control/instrumentation cables

#### • Directly Buried Cables

- i. Cable trenches shall be constructed for directly buried cables. Construction of cable trench for cables shall include excavation, preparation of sieved sand bedding, riddled soil cover, supply and installation of brick or concrete protective covers, back filling and compacting, supply and installation of route markers and joint markers. Laying of cables and providing protective covering shall be as per IS: 1255.

- ii. RCC cable route and RCC joint markers shall be provided wherever required. The voltage grade of the higher voltage cables in route shall be engraved on the marker. Location of underground cable joints shall be indicated with cable marker with an additional inscription "Cable Joint".

#### • Cable Terminations & Connections

- i. Work shall include all clamps, fittings etc. and clamping, fitting, fixing, plumbing, soldering, drilling, cutting, taping, preparation of cable end, crimping of lug, insulated sleeving over control cable lugs, heat shrinking (where applicable), connecting to cable terminal, shorting and grounding as required to complete the job.
- ii. The equipment will be generally provided with undrilled gland plates for cables/conduit entry. The Contractor shall be responsible for punching of gland plates, painting and touching up. Holes shall not be made by gas cutting. The holes shall be true in shape. All cable entry points shall be sealed and made vermin and dust proof. Unused openings shall be effectively sealed by 2mm thick aluminium sheets.
- iii. Control cable cores entering control panel/switchgear/MCC/ miscellaneous panels shall be neatly bunched, clamped and tied with self-locking type nylon cable ties with de interlocking facility to keep them in position.
- iv. All the cores of the control cable to be terminated shall have identification by providing ferrules at either end of the core, each ferrule shall be indelible, printed single tube ferrule and shall include the complete wire number and TB number as per the drawings. The ferrule shall fit tightly on the core. Spare cores shall have similar ferrules with suffix sp1, sp2, etc. along with cable numbers and coiled up after end sealing.
- v. All cable terminations shall be appropriately tightened to ensure secure and reliable connections.

Note: Contractor must comply with the relevant grid regulations, DISCOM'S, State Transco's and CEA's guidelines with respect to all the works corresponding to power evacuation, transmission, **termination along with metering at designated substation.**

#### • Danger Plates

Size of each Danger Notice plates shall be 200 mm x 150 mm made of mild steel sheet and at least 2 mm thick, and vitreous enameled white on both sides and with inscription in signal red colours on front side as required. The inscriptions shall be in Hindi, Local Language and English.

#### • Fire alarm System

- i. Any rooms shall have fire detection and alarm system installed as per relevant standards and regulations. The installation shall meet all applicable statutory requirements, safety regulations in terms of fire protection.
- ii. Liquefied CO2/ Foam/ ABC type fire extinguisher shall be upright type of capacity 5/10 kg having IS: 2171. 7 IS: 10658 marked. The fire extinguisher shall be suitable for fighting fire of Oils, Solvents, Gases, Paints, Varnishes, Electrical Wiring, Live Machinery Fires, and all Flammable Liquid & Gas. Contractor shall provide portable fire extinguisher as per the recommendation by relevant fire safety authority.
- iii. The minimum 2 no. of fire extinguishers (CO2 and Foam type each) shall be provided at every buildings/enclose, however Contractor must comply with existing building code for fire Protection by NFPA, IS & State Fire Protection Department.

- iv. Sand bucket should be wall mounted made from at least 24 SWG sheet with bracket fixing on wall conforming to IS 2546 at strategic locations.
- v. The plan for fire extinguishing must be provided by the Contractor to EESL/DISCOM/MAHAGENCO for the approval.

• **Testing Instruments for Electrical & Electronic**

Contractor shall also provide required set of onsite testing instruments/equipment viz

(i) Earth resistance tester:

Sl. No	Parameters	Specification
1	Display	LCD Digital Display with backlight
2	Range	Earth Resistance: up to 2000 $\Omega$ Earth Voltage : 200 V
3	Safety Ratings	IP 56
4	Programmable Limits setting	Enabled
<b>Accessories</b>		
1	Earth Ground Stakes (4 Nos)	
2	Three cable reels with cable length up to 20 m	
3	Carry Case-1 (capable of handling tester along with accessories)	
4	1 set of spare battery	

(ii) Array Tester:

Sl. No	Parameters	Specification
1	Display	LCD Digital Display with backlight
2	Functionality	All electrical tests required by IEC 62446-1:2016
3	Memory	Up to 200 records & USB downloadable to Computer
<b>Accessories</b>		
1	A set of two, 4mm fused leads for extra protection during installation tests.	
2	Leads which enable the Solar PV100 to connect directly to PV arrays which use MC3 connectors	



3	1 set of spare battery
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(iii) Insulation tester:

SI. No	Parameters	Specification
1	Display	LCD Digital Display with backlight
2	Insulation Test Range	0.1 MΩ to 10 GΩ
3	Test Voltage	50 V, 100 V, 250 V, 500 V, 1000 V
4	Test Voltage accuracy	+20% on positive side only no negative variation is allowed
5	Insulation Test Current	1 mA nominal
6	Auto Discharge	Discharge time < 0.5 Second for C=1
7	Open Circuit test Voltage	>4 V, <8 V
8	AC/DC Voltage measurement	600 V (0.1 V Resolution)
8	Short Circuit Current	> 200 mA
<b>Accessories</b>		
1	Heavy duty Test Lead Set – 4 Nos.	
2	Carry Case with sufficient space for accommodating accessories.	

(iv) Multi-meters:

SI. No	Parameters	Specification
1	Display	LCD Digital Display with backlight
2	AC/DC Current	500 μ A to 10 A (Accuracy 0.15 %)
	AC/DC Voltage	50 mV to 1000 V (Accuracy 0.025 %)
3	Resistance	50 Ω to 5000 Ω (Accuracy 0.05 %)
4	Capacitance	1 nF to 100 mF (Accuracy 1.0 %)
5	Frequency	99.999 Hz, 999.99 Hz, 9.9999 Hz, 99.999 kHz, 999.99 kHz (Accuracy 0.005 %)
<b>Accessories</b>		
1	Temperature Probe	

2	Silicon Test Lead
3	Alligator Clip
4	Carry Case with sufficient space for accommodating accessories.

(v) Clamp meters:

Sl. No	Parameters	Specification
1	Display	LCD Digital Display with backlight
2	Jaw Opening	30 mm
3	Maximum Wire Size	600 MCM
3	Current Range	0 to 400 A
4	Accuracy Current	2.0 %
5	Voltage range	0 to 600 V
6	Voltage Accuracy	1.5 %
7	Resistance Range	0 to 4000 $\Omega$
<b>Accessories</b>		
1	Test leads	
2	Electrical test leads	
3	Probe light & extender	
4	Carry Case with sufficient space for accommodating accessories.	

(vi) Transformer oil BDV kit:

Sl. No	Parameters	Specification
1	Display	LCD Digital Display with backlight
2	Input:	230 Volts, 50 Hz, Accuracy +/- 10%
3	Output	0 - 100 KV
3	Capacity	1 kVA
4	Duty Cycle	Continuous
5	Compliance	IS-6792

(vii) Infra-red thermal imaging hand held Camera:

Sl. No	Parameters	Specification
1	Temperature measurement Range	Up to 650°C° Accuracy $\pm 2^{\circ}\text{C}^{\circ}$
2	On-screen emissivity Correction	Possible
3	On-screen reflective background temperature Correction	Enabled
3	On screen transmission Correction	Enabled
4	Detector Type	Focal Plane Array, uncooled micro-bolometer, 320 x 240 pixels or better
5	Total Pixels	> 75000
6	Infrared spectral Band	7.5 $\mu\text{m}$ to 14 $\mu\text{m}$ (long wave)
7	Field of view	46° x 34°
8	Spatial Resolution (IFOV)	2.62 mRad
9	Wi-Fi Connectivity	Enabled
10	Data Storage	USB & memory card enabled

Note:

- a) All testing equipment shall possess valid calibration certificate issued from approved NABL / accredited labs.
- b) Instruments of superior rating is allowed after seeking consent of the DISCOM
- c) Maintenance, calibration, up keeping, repair & replacement of these tools will be in the scope of Contractor during 12 years of O&M.
- d) It is Contractor's responsibility to arrange for tools, tackles, logistics, test kits, manpower, experts etc. required for trouble free operation of Plant

- **General Guidelines**

- i. Any civil, electrical, mechanical & plumbing work which is not mentioned or included in this tender document but necessary for the Plant shall be borne by the Contractor.
- ii. Successful Bidder/ Contractor shall prepare all designs / drawings have based on the specifications given in the tender and in light of relevant BIS/IS/ equivalent standard.
- iii. The Contractor shall provide type test reports and datasheet/ GTP for all equipment used for the project.
- iv. The EESL/DISCOM/MAHAGENCO reserves right to modify the design at any stage, to meet local site conditions / project requirements.
- v. All work shall be carried out in accordance with the latest edition of the Indian Electricity Act and rules formed there under and as amended from time to time.

## 17. Guaranteed Energy Generation

- **Number of units generated per Annum**

For every 'KILO WATT (kW)' of solar plant installed by the contractor, the contractor shall guarantee the minimum energy generation (net energy exported to grid i.e. after deducting auxiliary consumption/import ,if any) as tabulated below. The guaranteed energy generation per annum at a particular site will be calculated based on on the total installed plant capacity (kW-AC). The guaranteed energy generation shall be calculated based on the energy reading recorded at the main billing meter/ABT meter at MSEDCL sub-station.

Minimum Guaranteed Energy generated by each of the solar PV power plant at the end of the first year for the state of Maharashtra shall be as per tabulated below:

For a system capacity of 1 kW:	
Energy Generation in kWh for 1st year	1,664
Energy Generation in kWh for 2nd year	1,658
Energy Generation in kWh for 3rd year	1,651
Energy Generation in kWh for 4th year	1,645
Energy Generation in kWh for 5th year	1,638
Energy Generation in kWh for 6th year	1,631
Energy Generation in kWh for 7th year	1,625
Energy Generation in kWh for 8th year	1,618
Energy Generation in kWh for 9th year	1,612
Energy Generation in kWh for 10th year	1,605
Energy Generation in kWh for 11th year	1,599
Energy Generation in kWh for 12th year	1,593

- The annual guaranteed energy generation is calculated for 12 months from the date of Commissioning Date. The annual guaranteed energy generation from SPGS shall be calculated after deducting the auxiliary power consumption (including imports), if any and it will be net energy generation i.e energy fed to the grid at interconnection point through commercial meters.
- i. Generation Compensation in offtake constraint due to transmission/Distribution network:
    - In any given year during the contract, if the availability of the distribution line/transmission line after inter-connection point (ABT/billing meter at MSEDCL substation) for evacuation of power (during 8

am to 6 pm) falls below 98% i.e. the line unavailability is more than 2% i.e. 175.20 hours (2% x 365 days x 24 hours), and the power is not evacuated, for reasons not attributable to the bidder, then the generation loss shall be compensated by EESL at the 75% of Purchase Per Unit Rate by MAHAGENCO from EESL (Purchase per unit rate is Rs. 3.11/kWh) so as to offset this loss as given below:

Duration of Grid unavailability Provision for Generation Compensation

Grid unavailability in a contract year (only period from 8 am to 6 pm to be counted):

Generation Loss = [(Average Generation per hour during the contract year) × (number of hours of grid unavailability beyond 175.20 hours i.e. 2% during the contract year)]

Where, Average Generation per hour during the contract year (kWh) = Total generation in the contract year (kWh) ÷ Total hours of generation in the contract year Producer

ii. Generation compensation due to Backed Down:

In case of backing down situation, the bidder/contractor will be eligible for Minimum Generation Compensation from EESL after receipt of State Energy Account or any other relevant documents certified by MSEDCL/MAHAGENCO as under:

Duration of Back down Minimum Generation Compensation

Hours of back down during monthly billing cycle Minimum Generation Compensation = 100% of (Average Generation per hour during the month) x (number of back down hours during the month) x Rs. 3.11/kWh

Where, Average Generation per hour during the month(kWh) = Total generation in the month(kwh)/Total hours of generation in the month.

- The contractor shall make the necessary arrangements to keep the record of Energy Generation, Plant Outages and Grid unavailability period via remote/manual monitoring. The loss of energy due to faults from the solar plant side shall not be considered for estimating the annual energy generation. The grid unavailability period shall be duly certified by the MSEDCL/MAHAGENCO officials. The grid unavailability report shall be submitted by contractor to MSEDCL/MAHAGENCO and EESL on a monthly basis with Joint Metering Reading (JMR).

Note:

MRC of SPGS components (Solar PV module, inverters, BoS etc.) shall be carried out by EIC/EIC authorised site incharge only after completion of Land development (LD) and Power Evacuation work (PE) work. LD and PE work completion shall be duly verified by the EIC/ EIC authorised site incharge along with photographic evidence of the LD and PE work completion is to be submitted by the vendor.

- Contractor may deploy String or Central grid-tie string inverters at plant(s).

## 18. Weather Monitoring System

As a part of weather monitoring system, the Contractor shall provide the following measuring instruments with all necessary software and hardware required to integrate with SCADA.

## Pyranometer

The Contractor shall provide minimum 2 (two) number of secondary standard pyranometers (ISO 9060 classification) along with necessary accessories for measuring the incidental solar radiation at horizontal and inclined plane of array at each site.

Specification of the pyranometer shall be as follows.

<b>Parameter</b>	<b>Specifications</b>
Spectral Response	0.31 to 2.8 micron
Time Response (95%)	Maximum 15s
Nonlinearity	+/-0.5%
Temperature Response	+/-2%
Tilt Error	<+/-0.5%
Zero offset temperature change	+/-2W/m <sup>2</sup>
Operating temperature range	0°C to +80°C
Non-stability	Maximum ±0.8%
Resolution	Minimum +/- 1W/m <sup>2</sup>
Output	Analog output: 4 – 20 mA Serial output: RS485

Each instrument shall be supplied with necessary cables. Calibration certificate with calibration traceability to World Radiation Reference (WRR) or World Radiation Centre (WRC) shall be furnished along with the equipment. The signal cable length shall not exceed 20m. The Contractor shall provide instrument manual in hard and soft form.

## Temperature Sensor

The Contractor shall provide minimum 3 (three) temperature sensors (1 (one) for ambient temperature measurement with shielding case and 2 (two) for module temperature measurement) at each site. The temperature sensor shall be Resistance Temperature Detector (RTD)/ Semiconductor type with measurement range of 0°C to 80°C. The instrument shall have valid calibration certificate.

## Anemometer

Contractor shall provide minimum one no. ultrasonic wind sensor (no moving parts) for wind speed and direction monitoring.

## **19. Civil, Mechanical & Plumbing Works**

This section of Technical Specifications describes detailed technical and functional requirements of all civil, Mechanical & Plumbing works included in the scope. All the Civil, Mechanical & Plumbing works must be done considering coastal environmental/climatic condition existing at site.

All design and construction of civil works shall conform to relevant Indian standards such as BIS, IRC, MORST, NBC etc. Design of steel structures shall conform to IS: 800, 802 or 802 as applicable with working stress method (WSD) of design. Design of concrete structure shall conform to IS: 456. For design of liquid retaining structure IS: 3374 shall be followed. Only in case of non-availability of Indian standard, equivalent American or British standard may be used for design with prior approval of the EESL/MSEDCL/MAHAGENCO and the

contractor shall submit proper justification along with his request to the EESL/MSEDCL/MAHAGENCO for his review. All the design/ drawings shall be prepared/ approved by the chartered structural engineer. The design calculations for MMS, RCC structure, steel structure, foundation system, road work, drainage work, etc. shall be submitted for prior approval of EESL/MSEDCL/MAHAGENCO before commencement of construction.

The design calculations shall be supplemented with a neat sketch showing the structure geometry, node and member nos., Lengths of various typical members, support points and type of supports, types of materials with design properties considered, type of sections used in analysis & design. The report shall also include back-up calculations for various loads adopted in design, brief write-up on primary load cases and load combinations considered and conclusions on design results with supporting sketches for easy reference and clarity. Where a computer program (other than STAAD Pro) is used for analysis and design, the contractor shall also include a write-up on the computer program used along with validation check. Input and output file shall also be given in the design report to facilitate its review and approval by the EESL/DISCOM.

The construction methodology for MMS and its foundations, road works, drains and pile load test procedure shall also be submitted for prior approval of EESL/DISCOM/MAHAGENCO before start of works. The construction shall be done only as per approved drawings

## **20. Other Investigations**

1. The contractor shall also obtain and study other input data at proposed project site for design of the project. This shall include data related to earthquake and wind, rainfall, maximum & minimum ambient temperature, humidity, high flood level (HFL) etc.
2. Topographical survey, area grading, as applicable.
3. The contractor shall carry out Shadow Analysis at proposed site and accordingly design strings and array layout with optimum use of space, material and man power. In case of large and steep variations in topography the study shall also include the effect of topographical variations on array layout. The contractor shall submit all the details/design to the EESL/DISCOM/MAHAGENCO for approval.
4. The contractor shall also identify potential quarry areas for coarse and fine aggregates to be used for concrete and shall carry out the concrete mix design for different grades of concrete to be used in the work. The concrete mix shall be designed for each source of cement and quarry as per provisions of relevant Indian Standard.

## **21. Foundations**

1. Contractor shall design all foundations for buildings, equipment, Switch yard structures, Transformer, MMS & other structures as per relevant BIS standards and recommendations of Geotechnical investigation report.
2. In case the contractor proposes to provide pile foundation for support of module mounting structure (MMS); the type, dia. and length of pile shall be as per recommendations of Geotechnical Investigation Report corresponding to prevalent soil characteristics at site,.
3. In case collapse of foundation strata during drilling of the pile bore, removal steel liner shall be used to maintain design depth and diameter of the pile for proper concreting.
4. The design pile capacity under direct compression, lateral load and pull out shall be verified through field trials by conducting initial load tests on test piles to be specially cast for this purpose. The tests shall conform to IS 2911 – Part 4. The no. and location of such tests shall be as discussed and

finalized with Engineer-in-charge. However, min. 3 no. of Tests shall be conducted under each category.

5. Contractor shall also carry out routine tests on 0.5 % of the total no. of working piles as per provisions of IS: 2911 – Part 4.
6. Contractor must take into account that the site is prepared by filling of sand from coastal area.

## **22. Module Mounting Structure (MMS)**

1. The ground mounting structure design must follow the existing land profile.
2. The structure shall be designed to allow easy replacement of any module and shall be in line with the site requirements.
3. The MMS stub/ column, rafter, purlin, ties and bracing members shall conform to Indian standards as mentioned in the list of codes and standards: IS: 2062 – Hot rolled Medium and High tensile structural steel IS: 811 – Cold formed light gauge structural steel sections IS: 1161 – Steel tubes for structural purposes IS: 4923 – Hollow steel sections for structural use.
4. The minimum thickness (BMT) of various elements of MMS structure shall be as following: Stub/ column & Bracing/Purlin & other members. Final thickness of the members shall be arrived by structural analysis considering combination of all possible loads.
5. The contractor can also propose new light gauge structural steel or structural aluminium sections other than specified above subject to approval of the EESL/MAHAGENCO. In this case the contractor shall submit his proposal stating the technical advantages of the proposed sections for EESL/DISCOMs review along with supporting literature.
6. MMS column post shall be supported with base plate secured to foundation using anchor bolts for easy maintenance/ repair/ replacement.
7. The primary loads and load combinations for design of MMS structure shall be as specified under “Design Load”.
8. The support structure design shall be as per relevant Indian standard(s) and shall be with working stress method considering appropriate factor of safety. No increase in permissible stress under wind/ Seismic load combination shall be permitted.
9. The maximum permissible deflection/side sway limits for various elements of MMS under serviceability conditions shall be as following: Lateral deflection for Column/ stub– Span/ 240 & Vertical deflection for Rafter and Purlin – Span.
10. In case of fundamental time period of MSS table structure more than 1 Sec, the structure design shall be checked against dynamic effects of wind as per provisions of IS – 875 (Part-3).
11. MMS shall support SPV modules at a given orientation & tilt, absorb and transfer the mechanical loads to the ground properly.
12. Welding of structure at site shall not be allowed and only bolted connections shall be used.
13. The MMS structure shall be hot dip galvanized with minimum thickness of coating not less than 80 microns on each side. Galvanization shall conform to IS-2629, 4759 & 4736 as applicable, considering coastal environmental condition. It is to ensure that before application of this coating, the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or such foreign material as are likely to interfere with the coating process. The Contractor should ensure that inner side should also be coated. The galvanization shall be done after fabrication of members to ensure galvanization of all cut surfaces. In case the proposed section is made up of Aluminium, anodized coating shall be Gr AC25 and shall conform to IS: 1868. 10.13 The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
14. Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each module shall be provided. All the fasteners and washers (packing & spring) for Module



- Mounting Structure and Module shall be adequately protected from atmosphere and weather prevailing in the area. Fasteners and washers to be used for erection of mounting structures and those for fixing Module over MMS shall be of stainless steel grade SS 316 equivalent and must sustain the adverse climatic conditions to ensure the life of the structure for atleast 25 years.
15. Modules shall be clamped & bolted with the structure properly. The material of clamps shall be Anodized Al / Stainless Steel. Clamp/bolt shall use EPDM rubber and must be designed in such a way so as not to cast any shadow on the active part of a module. In case bolts are used, Spring Washers shall be used bolt head end and EPDM rubber shall be used in between Module & purlin.
  16. The MMS foundation shall be designed as per the loads specified under clause "Design Loads". The anti-theft bolts, nuts etc shall be provided by the Contractor.
  17. The array structure shall be grounded properly using maintenance free earthing kit
  18. The Contractor shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.
  19. The Contractor should design the structure height considering highest flood level at the site and the finished grade level.
  20. For multiple module mounting structures located in a single row, the alignment of all modules shall be within an error limit of maximum 10mm.
  21. The Successful Bidder/ Contractor shall submit the detailed foundation & structural design basis and the list of reference standards, in this Bid, duly certified by a Chartered Structural Engineer having adequate successful experience in similar works.
  22. The contractor shall submit the detailed design calculations and drawings for MMS structure, bill of materials and their specifications/ standards to the EESL/MAHAGENCO for approval within 30 days from issue of LOA/ NTP before start for fabrication work.
  23. Contractor must submit the complete quality documents i.e. test certificates for all tests conducted starting from raw material stage, in process, final testing w.r.t structure.

### **23. Concrete Works**

1. All RCC works shall be with design mix as per IS 456 and the materials used viz.
2. Cement, coarse & fine aggregate, Reinforcement steel etc. shall conform to relevant BIS standards.
3. The minimum grade of RCC shall be M25 except for underground (UG) water tank where the grade of concrete shall be min. M30. PCC shall be of min. grade M10 (equivalent nominal Mix – 1:3:6) unless otherwise specified.
4. Reinforcement steel shall be of high strength TMT bars of grade Fe500 D conforming to IS: 1786. Ductile detailing in accordance with IS: 13920 shall be adopted for superstructure and sub-structure of all RCC buildings and structures.
5. For grouting works anti shrink ready mix grout of approved make or cement mortar (CM) grout with non-shrink additive shall be used. The grout shall be high strength grout having min. characteristic strength of 30 N/ mm<sup>2</sup> at 28 days.

### **24. Miscellaneous Steel Works**

1. Unless otherwise specified all structural steel work shall be designed as per provisions of IS: 800 with working stress method of design (WSD).
2. Structural steel hot rolled sections, flats and plates shall conform IS: 2062.
3. Structural Pipes shall be medium (M)/high (H) grade conforming to IS: 1161.
4. Chequered plate shall conform to IS: 3502 and Hollow steel sections for structural purposes shall conform to IS: 4923.

## **25. Pipe and Cable Trenches**

1. All cable trenches shall be of RCC. The min. wall and base slab thickness shall be 100mm for depth  $\leq$  750mm and 150mm for depths  $>$  750mm. The trench shall be designed for lateral load due to external soil fill, ground water table at FGL and 50 KN/ Sqm surcharge. External trenches shall be kept min. 100mm above FGL to avoid entry of rain water.
2. Internal cable trench shall be provided with chequered plate (min. 8mm thick) covers, the trench cover shall be provided with suitable lifting hooks. Both top edges of the cable trench shall be provided with min. 50x50x6 mm edge protection angle.

## **26. Transformer Yard Civil Works**

1. Transformer and equipment foundations shall be founded on piles/isolated spread footings depending on the final geotechnical investigation report.
2. Transformer foundations shall have its own pit which would cover the area of the transformer and cooler banks, so as to collect any spillage of oil or oil drainage in case of emergency.
3. The oil pit shall be filled with granite stone gravel of 40 mm size uniformly graded. The retention capacity of the transformer pit shall be min. 1/3 volume of the transformer oil which is filled with gravel with 300mm free space above gravel fill.
4. The individual transformer oil pit shall be connected to an oil collection pit which shall be sized to accommodate full oil volume of the transformer connected to it, without backflow. The oil collection pit shall be connected to oily water drainage system. Dimensions of the discharge pipe shall consider rainfall intensity also. The water shall be discharged into the nearest drain by gravity flow or pumping.
5. Both, the transformer pit and the oil collection pit shall be of RCC. The oil collection pit shall be provided with RCC cover.
6. The area around the transformer and equipment shall be covered with gravel. The transformer yard fencing work shall conform to CEIG requirements.
7. Transformer track rails shall conform to IS: 3443. The requirement of fire barrier wall between transformers shall be as per Electricity Rules and IS: 1646 recommendations. Minimum wall thickness shall be 230mm for RCC wall and 300mm for masonry wall.

## **27. Water Supply & Cleaning of Modules**

1. The contractor has to plan and install the effective module cleaning system as per the prevailing conditions at Site. The system may include the storage water tanks, pumps, laying of GI/HDPE/UPVC pipes, flexible pipes, taps/ valves, pressure gauges etc. as per the planning by the Contractor. Contractor has to submit the drawing/ plan for the proposed module cleaning system. Water supply for cleaning/O&M is in the scope of contractor.
2. All the pipes thus laid must be buried in ground at least 150mm below FGL. Road crossings and drain crossings, the pipes must be passed through GI/ Hume pipes as applicable.
3. Alternatively, it is advisable that suitable dry-cleaning systems may be adopted and deployed at plant site(s).

## **28. Inspection & Testing Inspection:**

1. EESL/MAHAGENCO shall have free access to Contractor's manufacturer's works to inspect, expedite and witness shop floor tests. Any materials or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at Contractor's cost. EESL/MAHAGENCO reserves the right to carry out stage wise inspection of fabrication and components. The Contractor shall furnish a detailed quality assurance plan (QAP) for review by the EESL/MAHAGENCO.
2. The test & inspection shall be carried out at manufacturer's work and at the site with the Contractor's obligation. The test and Inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commission at site. The Contractor shall give the list of tests that they will carry out at site to show the performance of Plant.
3. A detailed 'QAP' for Manufacturing and Inspection shall be submitted by the Contractor for EESL/MAHAGENCO's approval. The data of each test and inspection shall be recorded and submitted as soon as the test/ trials are conducted and will also be a part of final documentation.
4. The shop test shall be carried out to prove the performance parameters of the offered model. The testing shall be done in the presence of the representatives of the department.
5. The EESL/MAHAGENCO will nominate its representatives for inspection of stage manufacturing and testing at works & 7 days training at premises of SPV module and PCU manufacturer.
6. Manufacturer has to submit procedure for Test carried out at their Factory:
  - Start Up Trials
  - Load Test
  - Records & Measurements
  - Safety Device List
  - Setting values for all sensors for Pressure and Temperature
  - Dimensional Check-up, Overall Inspection, Completeness of Scope of Supply
  - Shop Test/Load Test for Solar Power Plant

## **29. Load Trials & Reliability test at Site**

1. Performance Guarantee Test at Site for Grid Connect Solar Power Plant, HT Panel etc.
2. These tests will be conducted at site as per site conditions at available load and after performing all pre-commissioning check and trials and after readiness of the entire Solar Power Plant system which are required to carry out the load trials
3. All the tests which are mentioned in the load test of Solar Power Plant will be carried out in presence of EESL/MAHAGENCOs' Representative at Site under site conditions and the parameters checked in accordance with the data sheet and guaranteed parameters given by the Contractor.
4. All the equipment supplied by the vendor will be tested as per relevant standard/ Quality assurance plan at site conditions and the performance monitored.

## **30. Quality Considerations**

The contractor will submit and get finalized detailed comprehensive Standard Field Quality Plan (SFQP) within 30 days from date of issue of the LOA/NTP/PO for bought out items and items manufactured by them. The Standard Field Quality Plan shall equipment till final inspection and testing to be followed for bought out items and items manufactured by Contractor. Accordingly, the Manufacturing Quality Plan shall be submitted broadly under following sub-heads:-

- i. Raw material/Bought Out items and Components.
- ii. In process inspection and test/checks to establish successful completion/ accomplishment of the process.
- iii. Final tests/checks in accordance with relevant national/ international standards/specification.
  1. The quantum of check for each and every inspection/test items shall be based on an established sampling method and the quantum of check indicated in the SFQP should be designed adequate quality protection.
  2. In case reference documents/acceptance norms are indicated as per Plant standards then the same shall be duly substantiated/properly explained by well-established and proven engineering practices. All submissions will be in English language only.
  3. Contractor will to allow EESL/MAHAGENCO to carry out Quality/Audit/Quality surveillance on Contractor's and our sub-vendor's work with reference to contractual obligations to ensure that the quality management practices/norms as detailed out in the Quality Manual are adhered to. To facilitate this activity, you shall keep EESL/MAHAGENCO informed all progress of work in this contract on monthly basis.
  4. Contractor will associate/fully witness in each inspection being carried out at their/their sub-vendor's works by our authorized inspection engineer(s).
  5. EESL/MAHAGENCO shall also carry out quality audit and quality surveillance of your systems, procedures and quality control activities. However, this shall not relieve you of any of your contractual responsibilities under the contract.

### **31. Performance and Functional Warranty / Guarantees**

1. During the period of Warranty / Guarantee the Contractor shall remain liable to replace any defective parts, that becomes defective in the Plant, of its own manufacture or that of its sub-Contractors, under the conditions provided for by the Contract under and arising solely from faulty design, materials or workmanship, provided such defective parts are not repairable at Site to the extent that it operates at its full efficiency, reliability capacity.
2. At the end of guarantee period, the Contractor's liability shall cease. In respect of goods not covered by the first paragraph of this clause, the EESL /MAHAGENCO shall be entitled to the benefit of such guarantee given to the Contractor by the original Contractor or manufacturer of such goods.

During the first year of assured performance demonstration and Operation & maintenance thereafter, the Contractor shall be responsible for any defects in the work due to faulty workmanship or due to use of sub-standard materials in the work. Any defects in the work during the guarantee period shall therefore, be rectified by the Contractor without any extra cost to the EESL/MAHAGENCO within a reasonable time as may be considered from the date of receipt of such intimation from the EESL/MAHAGENCO failing which the EESL /MAHAGENCO shall take up rectification work at the risk and cost of the Contractor.

### 3. Environmental, Health and Safety Management Requirement

1. The Contractor shall comply with all applicable national and state environmental, health and safety (labor) laws and regulations and International labour standards of International labour organization (ILO)
2. The Contractor shall comply with the Employer's project financier's safeguard requirements [ADB's Safeguard Policy Statement (2009)] and the International Finance Corporation's Environmental Health and Safety General Guidelines and the guidelines on Electric Power Transmission and Distribution.
3. The Contractor shall implement the mitigation measures and carry out the monitoring requirements assigned to them as set forth in the initial environmental examination ("IEE") to be prepared by the Employer in accordance with the project financier's safeguard requirements [ADB's Safeguard Policy Statement (2009)] and environmental management plan ("EMP") and any subsequent update to it. Mitigation and monitoring plans extracted from the outline EMP are attached in Annexure-B to this section. This is to be updated and the definitive version of the EMP to be complied with by the Contractor will be that disclosed on the Employer's project financier's [ADB] website. The Contractor shall ensure mitigation measures are implemented at construction sites as well as at any workers camps or accommodation provided by them or their subcontractors. The Contractor shall allocate the budget and staff resources required to ensure that such requirements are met, and implement any corrective actions required by the Employer. The Contractor shall cover the cost of corrective action required in response to non-compliance with the definitive version of the EMP or property damage caused by the Contractor, subcontractors and third parties employed by them.
4. The Contractor shall appoint at least one appropriately qualified and experienced, dedicated Environment Specialist to be based full-time on site to support, supervise and monitor EMP implementation on a day-to-day basis for the duration of "Physical Works" under the contract and also act as grievance redress mechanism focal to keep the affected persons informed of works and be available to receive, document, and deal with any grievances at the project site level.
5. The Contractor shall appoint a part-time ecologist to undertake ecology surveys and advise on implementation of ecological mitigation measures and supervise and monitor EMP implementation full-time on-site for the duration of all "Physical Works" involving tree and vegetation clearance activities, if so recommended in the EMP disclosed on the Employer's project financier's [ADB] website.
6. The Contractor shall employ suitably qualified and experienced third-party monitoring experts to carry out field tests and laboratory analysis required by the definitive version of the EMP in respect of environmental monitoring for air quality, noise, surface water and groundwater quality, and soil.
7. The Contractor shall appoint at least one appropriately qualified and experienced, dedicated Health and Safety Specialist with NEBOSH/IOSH certification or similar qualification, as well as one appropriately qualified and experienced, dedicated Labor Specialist, to be based full-time on site to support, supervise and monitor EMP implementation with respect to health and safety (labor) on a day to day basis for the duration of "Physical Works" under the contract and also act as grievance redress mechanism focal in respect of health and safety to keep the affected persons (workers) informed and be available to receive, document, and deal with any grievances at the project site level.

8. The Contractor will ensure that if multiple sites are operated each active construction site has adequate health and safety supervision to ensure the health and safety of all workers and local communities. This is to include a suitably qualified and experienced Health and Safety Officer having NEBOSH/IOSH certification or similar qualification who is at the active construction site full time and nominated to the role of environment, health and safety site supervisor. The Health and Safety Officer will be supported by dedicated, full-time on-site occupational health and safety steward(s) present at each active construction site with at least one steward for each team of up to 50 persons.
9. The Contractor shall not commence any "Physical Works" including site establishment and tree or vegetation clearance until (i) written confirmation is received from the Employer that all project financier clearances have been obtained, (ii) the Contractor has obtained all required environment, health and safety (labor) permits or licenses, (iii) the Contractor has undertaken and reported to the Employer on the findings of all applicable pre-construction environmental survey work and baseline environmental monitoring requirements as set out in the definitive version of the EMP, (iv) the Contractor has incorporated all the applicable requirements of the definitive version of the EMP into their detailed designs; (v) the Contractor has submitted the detailed designs and all environmental, health and safety sub-plans required by the definitive version of the EMP and received written confirmation from the Employer of their approval.
10. The Contractor shall ensure that all its design and construction staff, as well as the staff of subcontractors and third-parties employed by them, regardless they are formally or informally contracted, understand their responsibilities to implement the disclosed version "EMP" with appropriate environment, health and safety (EHS) training being provided by the Contractor including construction-site EHS inductions, emergency procedure drills, monthly refresher trainings, and daily toolbox talks. The Contractor shall ensure all construction staff, including the staff of subcontractors and third-parties employed by them, have attended the necessary specialized, task-specific training and are medically fit to perform their role.
11. The Contractor shall establish an operational system for managing and monitoring environmental, health and safety impacts and risks, progress with implementation, and compliance to the definitive version of the EMP requirements. The Contractor's management and EHS staff will attend monthly EHS meetings convened by the Employer and submit monthly reports on EMP progress and compliance to the Employer documenting the mitigation measures and monitoring activities carried out, issues encountered including statistics and details of all near misses and accidents, grievances received, and follow-up actions that were taken (or will be taken) to correct any issues.
12. In case of (i) an unanticipated impact not considered in the IEE, including changes to substation sites or route alignments during detailed design, to enable the Employer to update the IEE and EMP for clearance by their project financier before any changes are implemented, or (ii) non-compliance with the definitive version of the EMP the Contractor will inform the "Employer" in writing and implement corrective actions agreed.
13. In case of a chance find or any pollution or health and safety incident including near misses the Contractor will inform the "Employer" within 24 hours with details of the incident and the corrective action being taken.
14. The Employer may withhold payment if monthly reports are not submitted within 15 working days of month end or in the event corrective actions required by the Employer have not been addressed by the Contractor within 30 days.
15. The Contractor will ensure no CFCs, no PCBs and no asbestos containing materials are used in the project.
16. The Contractor will ensure no forced or child labor or persons under 18 are employed on the project.
17. The Contractor shall undertake a health and safety risk assessment and building on the EMP requirements the Contractor shall develop a Construction Environmental Management Plan and sub-plans, including a Health and Safety Plan, incorporating emergency preparedness and response plans for approval of the Employer.

The contractor shall take all measures and precautions necessary to ensure the health, safety and welfare of all persons entitled to be on the site and will ensure that works are carried out in a safe and efficient manner. Such precautions shall include those that, in the opinion of the Employer, are reasonable to prevent unauthorized entry upon the site and to protect members of the public from any activities under the control of the contractor.

18. The Contractor shall keep a record of the waste disposed according to the requirements of employer and the relevant State regulations including the relevant permits and/or waste destruction certificates. The Borrower shall submit, as part of Project progress report, a waste management monitoring summary which shall include the amount and methodology of waste collected, stored, transported and disposed of following the requirements of employer and the relevant State regulations and authorities.
19. The Contractor will ensure that its construction staff, as well as the staff of subcontractors and third parties employed by them, regardless they are formally or informally contracted, are provided with and wear at all times when they on the construction site adequate Personal Protective Equipment appropriate to their role. This will include but not be limited to the safety helmets, gloves, safety boots, goggles and other eye protectors, hearing protectors, and safety harnesses.
20. The Contractor will be required to comply with national restrictions for containing the spread of communicable diseases, if any. If any pandemic is declared by WHO, the Contractor will undertake a pandemic specific health and safety risk assessment and as part of the Health and Safety Plan prepare a management plan following national guidance and WHO recommendations. It will also carry out communicable diseases awareness programs for labor, disseminate information at worksites on the risks of the pandemic and other communicable viral diseases, and provide adequate handwashing facilities and personal protective equipment, as part of health and safety measures for those employed during construction.
21. The Contractor shall provide and maintain a suitably equipped and staffed first aid station. First aid equipment and free access for workers to a qualified nurse and/or doctor must be provided. Ambulance for moving injured persons to the nearest hospital must also be provided in ready to move condition. First-aid kits shall contain an adequate supply of unexpired sterilized dressings and bandages with other necessary first aid equipment as per national health and safety (labor) laws and regulations and the EMP requirements.
22. The Contractor shall provide and maintain all necessary temporary fire protection and firefighting facilities during the construction of the Works and shall comply with all national and state fire safety requirements. These facilities must include in-date, serviced, portable fire extinguishers suitable for fighting the potential hazards on the construction site.
23. The provision of lighting, including standby facilities in the event of failure that, in the opinion of the Employer, is adequate to ensure the safe execution of any works that are to be carried out in light.
24. The contractor is to ensure sufficient sanitation and welfare facilities (with all wastewater discharges connected to a sewerage system or bio septic tank with soakaway or self-contained portable bio-toilets ) are available at each construction site and at any worker camps or accommodation provided by them or their subcontractors with a ratio of at least 1 toilet per every 6 persons. Open defecation and urination are prohibited. Use of pit latrines is prohibited, and no direct discharge of untreated wastewater to surface water or groundwater is allowed.

25. The contractor is to ensure any worker camps or accommodation provided by them or their subcontractors complies with all national and state requirements as well as the ILO guidelines on worker accommodation.
26. If a local water source is to be used as drinking water supply it must be licensed for abstraction and be subject to adequate treatment to enable GoB and WHO drinking water standards to be maintained, the quality of raw and treated water to be tested regularly to confirm drinking water standards are met.
27. The Contractor shall ensure adequate collection, separation, and storage of inert, solid, and hazardous waste on site and safe transportation for recycling through reputable, legitimate, licensed third parties and/or to suitably licensed and engineered waste management facilities suitable for the type of waste, with all waste transfer records retained.
28. The Contractor shall put in place a prohibition on firewood collection, fishing, hunting, or poaching by construction staff, as well as the staff of subcontractors and third-parties employed by them, regardless they are formally or informally contracted and ensure adequate alternative fuel is provided at any worker camps or accommodation for cooking and heating purposes.
29. Stack emissions of any temporary diesel generator set or hot mix to comply with national emission standards with the stack height design according to both Gol requirements and international good industry practice (as per IFC EHS General Guidelines).
30. The Contractor shall communicate at least one month prior to the commencement of any "Physical Works" including site establishment tree or vegetation clearance advance notice to all local communities within 500m of the substation through notices, pamphlets or similar in local languages about the agreed schedule of, final plan for solar plant and alignment of power line, and details of planned construction works in their area.
31. The Contractor shall ensure that throughout "Physical Works" including site establishment and tree or vegetation clearance signage is prominently visible for local communities and workers detailing Contractor and Employer Grievance Redress Mechanism focal contacts.
32. equipment design shall minimize the need to use SF6. If SF6 is used in circuit breakers comply with international norms and standards for handling, storage, and management of SF6; SF6 insulated equipment shall be "sealed for life" where such equipment is available on the market and in all cases tested and guaranteed by the supplier at less than 0.1% per year leakage rate. Leakage alarm system will be provided. Provide SF6 leakage detector at each substation with SF6.
33. Tree cutting shall be minimized by design, Contractors shall undertake tree enumeration to quantify the number, size, and species of trees to be cut. Contractors shall ensure the tree felling permits are obtained in advance and follow any other applicable national and state requirements prior to felling of any trees.
34. Disturbed areas shall be revegetated to the extent practicable using locally native species immediately following the completion of works.
35. Cut and fill requirements shall be minimized by design to reduce changes in topography and the extent of earthworks and thus dust generation during construction. The Contractor shall quantify the extent of earthworks required and locations for disposal of excavated spoil through landscaping within the site.



36. Detailed design to ensure operational noise will be limited to acceptable limits as per standards at the site boundary, a silent zone if located within 100m – this will enable noise levels at adjacent receptors to be complied with. If noise standards/guidelines are already exceeded by the background level, the Contractor will ensure that the standards/guidelines are met by the project design alone, and that substation operation will not result in >3dB(A) increase above background levels. The Contractor shall ensure transformers and other noise generating equipment are appropriately located within the substation to ensure noise standards/guidelines can be met at the site boundary. If any properties are within 500m of the substation boundary then noise calculations (modelling) considering low frequencies associated with transformer hum undertaken by the Contractor to demonstrate that noise standards/guidelines can be met. If noise levels cannot be met through siting alone, incorporate acoustic barrier(s) designed to international good practice around either the noise source and/or substation boundary to attenuate noise to level such that noise standards/guidelines will be met.
37. Detailed design to ensure EMF levels within the site boundary are within international good practice levels as per ICNRP (reference and peak values) for the occupational exposure and at the site boundary are as per the levels for community exposure
38. The Contractor shall undertake a Drainage Assessment to inform the detailed design. Drainage shall be designed so that the discharge is no more than the greenfield runoff rate (if necessary, using retention ponds) so as not to exacerbate flooding on land outside of the substation. No surface water drainage will be permitted to discharge direct to surface water, sediment traps and oil interceptors shall be fitted, including on all the inflows to drainage ditches.
39. During construction, a solid temporary fencing shall be installed around the substation boundary to minimize the dispersion of dust, it will also function as a temporary acoustic noise fence to minimize the noise and visual impact.
40. Adequate sanitation and welfare facilities for O&M staff including indoor kitchen with provision for cooking facilities and separate eating area, indoor toilets (at 1:6 staff ratio) and washrooms with a hot and cold running water supplies, drinking water supply meeting GoB and WHO drinking water standards, and rest areas will be incorporated into the control building in accordance with national requirements and ILO guidelines on worker accommodation.
41. Detailed design will ensure all transformers are mounted on an impermeable plinth with spill containment bund of 110% capacity.
42. Detailed design will provide a storage area with enclosed garbage bins where solid wastes can be segregated and stored for reuse, recycling or disposal in an undercover area with an impermeable floor.
43. Detailed design will provide a storage area where hazardous wastes and all liquids (fuel, oil, and chemicals, empty drums, old transformers, etc.) can be stored in a locked, undercover area with an impermeable floor with spill containment bund of 110% capacity with notice boards for material data sheets.

44. Emergency eye wash and shower facilities shall be located adjacent to the storage areas at the substation. Spill prevention kits (sorbent pads, absorbent material, etc.) shall also be available at storage areas and other at-risk locations within clearly labelled containers. The Control Building shall also have fully equipped first aid kits at key locations in the clearly labelled containers.
45. On all individual items of electrical equipment provide written and visual warning signs to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of risk of electrocution with an internal fence for high-risk equipment.
46. Transformers purchased shall be accompanied by a letter from the manufacturer they are guaranteed PCB free and labelled as PCB free before installation. The Contractor shall provide the Employer with material data sheets for insulating oil meeting their technical specifications for use in new transformers.
47. Materials and equipment purchased shall be accompanied by a letter from the supplier or manufacturer saying they are guaranteed asbestos free.
48. Sand and stone will only be obtained from existing approved quarries with environmental clearance and all sources of water will have abstraction license. Records will be kept of the volume of all the materials used and their source.

**I. Potential Environmental Impacts and Mitigations—Generic Environmental Management Plan for Solar Plants**

<b>Phase/ Parameters</b>	<b>Risks/ Impacts</b>	<b>Mitigation Measures</b>
Pre-Construction		
Biodiversity	<ul style="list-style-type: none"> <li>o Loss of or damage to habitat outside of existing substations</li> <li>o Bird collision and electrocution along the transmission line (category B)</li> </ul>	<p>Comply with EARF eligibility criteria.</p> <p>Bird sensitive design of pole and powerline to minimize electrocution.</p>
Physical Cultural Resources	<p>➤ Loss of or damage to physical cultural resources outside of existing substations</p>	<p>Comply with EARF eligibility criteria</p>

Water Resources and Quality	<ul style="list-style-type: none"> <li>➤ Water quality impact from surface run-off.</li> </ul>	<p>Groundwater study will be required to assist Contractor in taking informed decision on controlled abstraction limit on the amount of water that can be extracted per time.</p> <p>The panels are to be installed in a way that surface run off is not blocked. Design site drainage to reduce flow velocity and sediment load.</p>
Community disruption and disturbance	<ul style="list-style-type: none"> <li>○ Change in land use</li> <li>○ Disruption to traffic/access; damage to roads</li> <li>○ Damage to property or public Utility on site on in ROW</li> <li>○ Disruption of community infrastructure (electricity, water supply, etc.).</li> <li>○ Deterioration of access roads.</li> <li>○ Visual impact</li> <li>○ Stress on community resources e.g., water supply</li> <li>○ Reduction of grazing lands for animal grazing. Land for animal grazing/pasture.</li> <li>○ Raise in temperature in surrounding area due to panel installation.</li> <li>○ Blockage of surface run off</li> <li>○ Loss of groundwater due to solar plant.</li> <li>○ Access to water sources/ forests.</li> </ul>	<p>Contractor to take up communication campaigns as a part of the Community Engagement Plan to dispel the misconception of a Raise in Temperature due to Solar Power Projects.</p> <p>Contractor to take up rainwater harvesting in the project area. Even the wastewater from the operations needs to be treated and used for groundwater recharge.</p> <p>Contractor to not block the access to the resources, such as forest, water resources, farms, etc. or not close any of them. If these accesses can be improved it would be good, say like building platforms at water resources for collection of water and washing platforms for clothes washing, etc.</p>

Phase/ Parameters	Risks/ Impacts	Mitigation Measures
Construction		

<p>Biodiversity</p>	<ul style="list-style-type: none"> <li>○ Clearance of vegetation</li> <li>○ Disturbance to remaining vegetation during construction</li> <li>○ Increased risk of spread of invasive species</li> <li>○ Habitat loss, barrier, fragmentation, disturbance, and displacement</li> <li>○ Human-wildlife conflict</li> <li>○ Vegetation loss during clearing including trees and other obstacles to avoid shade and site excavation and wildlife habitat disturbance.</li> </ul>	<ul style="list-style-type: none"> <li>• Site clearance following legal permission from concerned authorities/departments and compensatory afforestation as applicable</li> <li>• For existing substations, the site clearance will be done by the DISCOMs as per national regulations in consultation with the Department of Forests. In addition, EESL will encourage applications to replant the trees if there is space within the boundary of the substations. For sites outside substations, the EPC Contractor would do site clearance and replanting if space at the solar park as per the regulations.</li> <li>• Good site management practices will be observed to ensure that disturbance of habitats off-site are minimized. Restricting personnel and vehicles to site boundaries, lay down areas, and access roads (access only to the site areas).</li> <li>• Minimise vegetation clearance during site preparation.</li> <li>• Re-vegetation of native species in open spaces post-construction.</li> <li>• Prevention of animal hunting by construction workers.</li> <li>• Prevention of animal hunting by construction workers.</li> </ul>
<p>Physical Cultural Resources</p>	<p>➤ Damage to chance finds</p>	<ul style="list-style-type: none"> <li>• If fossils, coins, articles of value or antiquity, structures, and their remains of geologic or archaeological interest are found, local government shall be immediately informed of such discovery and excavation shall be stopped until identification of cultural relics by the authorized institution and clearance is given for proceeding with work. All the above discovered on site shall be the property of the government and will be dealt with as per provisions of the relevant legislation.</li> </ul> <p>The contractor will take reasonable precaution to prevent his workers or any other persons from removing and damaging any such article or thing. Immediately upon discovery thereof and before removal acquaint EESL of such a discovery and carry out EESL's instructions for dealing with the same, awaiting which all work shall be stopped.</p> <p>EESL will seek direction from the Archaeological Society of India (ASI) before instructing the Contractor to recommence work on the site.</p>

Topography and drainage	<ul style="list-style-type: none"> <li>○ Change in landform and slope (topography)</li> <li>○ Erosion</li> <li>○ Disruption of existing surface water drainage</li> <li>○ Storm water drainage and management</li> </ul>	Development of effective site drainage systems and storm water managed for groundwater recharge. Management of excavations to avoid the generation of drainage pathways to underlying aquifers.
Requirement of Water	➤ Additional water resources for construction	Water conservation measures through recycling and reuse.
Sediment Laden Runoff	<ul style="list-style-type: none"> <li>○ Sediment laden runoff from exposed soils/stockpiles</li> <li>○ Water quality impact from surface run-off.</li> </ul>	Proper site management to minimize surface water run-off, soil erosion. Temporary channels to facilitate run-off discharge into the suitable watercourses, via a silt retention pond.
Sanitary Arrangements and Generation of Wastewater	<ul style="list-style-type: none"> <li>○ Disposal of untreated effluent (wastewater)</li> <li>○ Contamination of water bodies.</li> </ul>	Proper site management to minimize the impacts of sewage effluents. Untreated wastewater not to be disposed in water bodies Temporary water/ toilet facilities will be provided. Contracts will include compliance to EHSS of EESL (SOP 02 – waste management)

Phase/ Parameters	Risks/ Impacts	Mitigation Measures
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<p>Oils, Fuels, and Chemicals (Spills and Leaks)</p>	<ul style="list-style-type: none"> <li>○ Inadequate storage and spills of oils, fuels and chemicals, poor waste disposal practices</li> <li>○ Accidental spill of lubricant, chemicals, or oils.</li> <li>○ Sediment contamination from hazardous waste disposal, oil spillage of chemicals.</li> </ul>	<p>Provision of impermeable bunded areas for storage of hazardous materials (e.g., fuel) and equipment maintenance to prevent absorption of spillages.</p>
<p>Ambient Air Quality</p>	<p>➤ Generation of dust and emission of air pollutants caused by site clearing, grading, levelling, foundations, vehicular traffic, and construction equipment</p>	<p>Removal of debris and clearance of stockpiles at frequent intervals. Appropriate siting and maintenance of stockpiles of friable materials so as to minimize dust blow.  Covering stockpiles of friable materials with tarpaulin.  Wetting of roads via a water sprinkler tanker.  Compacting roads where necessary and repairing damaged roads once construction is completed.  Restricting onsite vehicle speed limits to &lt;20 km/h.  Use of well-maintained vehicles and equipment.</p>
<p>Noise and vibration</p>	<p>➤ Generation of nuisance (noise and vibrations) due to movement of heavy-duty equipment and vehicles.</p>	<p>Select project locations, as far as possible, to be away from residential areas; so, noise from the sites cannot reach these areas.  Machinery, vehicles, and instruments that emit high levels of noise should be used on a phased basis to reduce the overall impact.  Workers should be supplied with ear plugs and ear muffs to reduce the risk of hearing impairment.  Prolonged exposure to noise should be reduced where possible  Plan work activities to avoid traffic movement during peak hours.  Consult with communities and plan project activities accordingly.  Limit movement and work activities to daytime only.  Ensure equipment is properly maintained.</p>

<p>Geology and soils</p>	<ul style="list-style-type: none"> <li>○ Excavation and compaction of topsoil/subsoil</li> <li>○ Erosion of exposed soils</li> <li>○ Contamination of soils from inadequate storage and spills of oils, fuels and chemicals, poor waste disposal practices</li> </ul>	<p>Stockpile topsoil for site rehabilitation.</p>
<p>Materials and waste generation</p>	<ul style="list-style-type: none"> <li>○ Use of construction materials</li> <li>○ Inappropriate disposal of inert soil</li> <li>○ Inappropriate disposal of solid waste</li> <li>○ Inappropriate disposal of hazardous waste</li> </ul>	<p>Disposal of waste materials at appropriately licensed/approved sites. Hazardous wastes must be disposed of by a licensed contractor.</p> <p>Designated waste storage areas for solid wastes</p> <p>Waste disposal trucks must be adequately covered to minimize windblown litter</p> <p>Storage areas for hazardous materials must be sealed and banded</p> <p>Regular collection and proper disposal of solid waste at a licensed disposal site</p>

	<ul style="list-style-type: none"> <li>○ Site contamination from litter</li> <li>○ Soil and ground water contamination from spill of hazardous waste</li> <li>○ Disposal of damaged and replaced solar PV panels</li> <li>○ Disposal of waste from temporary labour camps and installation site debris and waste</li> </ul>	<p>Provision of spill kits for on-site management of accidental spills and leaks of contaminants</p> <p>Dispose of used solar PV panels following the requirements of SPCB or through buy-back agreement Contracts will include compliance to EHSS of EESL (SOP 02 –waste management)</p> <p>Verify the record and/or declaration regarding waste disposal based on applicable laws and regulations</p>
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Occupational H&S	<ul style="list-style-type: none"> <li>○ Improper handling or work practices and unsafe working conditions at installation which may cause accidents and safety issue</li> <li>○ Risk related to construction</li> <li>○ Risk related to sanitation and welfare</li> </ul>	<p>Prepare overall health and safety (H&amp;S) plan for solar PV component to minimize risks to workers</p> <p>Provide workers with proper training on associated risks and safe practices for uses</p> <p>Use of personal protective equipment for workers.</p> <p>Provision of adequate fire-fighting equipment onsite.</p> <p>Emergency response/ evacuation plan. Implementation of HSE procedures as a condition of contract.</p> <p>Implementation of a Fire Safety Plan prior to starting activities at the site. Clear marking of worksite and hazard recognition.</p> <p>Maintenance of a high standard of housekeeping at all times.</p>
Community H&S	<ul style="list-style-type: none"> <li>➤ Risk of accident from access to construction site</li> </ul>	<p>Community health and safety awareness campaigns</p> <p>Traffic control and speed limits. Police patrol and organized community vigilance</p>



	<ul style="list-style-type: none"> <li>○ Risk of traffic congestion and road accident</li> <li>○ Risk of accident from access to solar PV plant</li> <li>○ Slips, trips, and falls</li> <li>○ Electrocution</li> <li>○ Fires</li> <li>○ Increase noise level by equipment</li> <li>○ Communicable diseases</li> <li>○ Increased prevalence of sexually transmitted diseases including HIV/AIDS</li> <li>○ SEAH</li> <li>○ Community conflict</li> <li>○ Violation of sociocultural values,</li> <li>○ Social tension and violence.</li> </ul>	<p>Specifications for noise level for heavy equipment. Curfew on operation of heavy equipment and vehicles. Sensitization of construction workers to community cultural values.</p>
<p>Community Disruption and Disturbance; Income/ Livelihoods</p>	<ul style="list-style-type: none"> <li>○ Loss of livelihood due to loss of grazing lands</li> <li>○ Increased traffic, heavy equipment and machinery transport</li> </ul>	<p>Job creation (contract, temporary and permanent). Average income and local economy improvement. Livelihoods restoration of affected people. Repeat communication conducted during pre-construction. Scheduling of traffic to avoid peak hours on major local roads. Implement traffic management plan. Optimize/ schedule material movement to non-peak hours.</p>

	Risks/ Impacts	Mitigation Measures
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Phase/ Parameters		
Employment /Social Demography	<ul style="list-style-type: none"> <li>○ Employment</li> <li>○ Influx of skilled and unskilled workers</li> </ul>	Localisation of employment opportunities.
Operation and Maintenance		
Biodiversity	<ul style="list-style-type: none"> <li>○ Habitats disturbance because of noise, vehicle, and personnel movement</li> <li>○ Bird collision and electrocution along the transmission line</li> </ul>	<p>Restrict personnel and vehicle movements to site boundaries only</p> <p>Bird-friendly pole designs to minimise electrocution</p>
Requirement for Water	<ul style="list-style-type: none"> <li>○ Additional water resources for operation</li> <li>○ Over abstraction can lead to rivers drying up thereby leading to mortality of fish and invertebrates or the level of groundwater aquifers reducing unacceptably.</li> </ul>	Water conservation measures through recycling and reuse.
Use of Hazardous Materials	<ul style="list-style-type: none"> <li>➤ Spillage of oils, chemicals, or fuels on site.</li> </ul>	<p>Regular checks of bunds and drainage systems to ensure containment and efficient operation.</p> <p>Develop an oil spill contingency plan.</p>
Sanitary arrangements and generation of wastewater	<ul style="list-style-type: none"> <li>○ Chemicals used in washing water</li> </ul> <p>Discharge of PV module wash-water, domestic wastewater, sewage.</p>	<p>Regular maintenance of site drainage system to ensure efficient operation. Treatment of wash water before discharge.</p> <p>All discharges will comply with national and IFC EHS guidelines.</p>

	<ul style="list-style-type: none"> <li>➤ Wastewater from cleaning of panels during operation phase</li> </ul>	<p>Off-site disposal of sewage (septic tank sludge) by appropriate waste collection and disposal authority Contracts will include compliance to EHSS of EESL (SOP 02 –waste management)</p>
Materials and waste generation	<ul style="list-style-type: none"> <li>➤ Poor disposal practice</li> </ul>	<p>Records of final disposal of waste for recycling and disposal to engineered sanitary landfill for solid waste etc. Log of waste generated</p>
Occupational health and safety	<ul style="list-style-type: none"> <li>○ Labour and other workers safety</li> <li>○ Risk related to O&amp;M</li> <li>○ Risk related to sanitation and welfare</li> </ul>	<p>GIIP HSE Practice to be employed on site Use of personal protective equipment Clear marking of work site hazards and training in recognition of hazard symbols Development of site emergency response plans</p>
Community health and safety		
Community disruption and disturbance	<ul style="list-style-type: none"> <li>➤ Visual image of solar plant from surrounding areas.</li> </ul>	<p>Visual effect of the solar plant will be improved through creation and maintenance of landscaped boundary around the plant.</p>
Decommissioning		
Biodiversity	<ul style="list-style-type: none"> <li>➤ Vegetation loss during clearing and site excavation and wildlife habitat disturbance</li> </ul>	<p>Good site management practices will be observed to ensure that disturbance of habitats off-site are minimized Restricting personnel and vehicles to site boundaries, lay down areas, and access roads Re-vegetation of native species in open spaces post-construction</p>

Phase/ Parameters	Risks/ Impacts	Mitigation Measures
Topography and drainage	<ul style="list-style-type: none"> <li>○ Erosion of soil due to surface disturbance and exposure from removal of structures</li> <li>○ Exposure of land surface.</li> <li>○ Water quality impact from surface run-off</li> </ul>	<p>Ensure minimal surface area disturbance during decommissioning. Grading activities to be limited to areas previously disturbed</p> <p>Ensure disturbed areas are levelled, restored, and re-vegetated in order to minimise soil erosion. Ensure site is regraded to leave it smooth, regular and maintain natural drainage patterns. Ensure open gaps from the removal of structures in the ground are backfilled with topsoil and subsoil and graded to ensure adequate drainage.</p> <p>Ensure appropriate erosion control measures are adopted according to best practices including soil de- compaction and re-contouring to blend with the surrounding areas.</p>
Sanitary arrangements and generation of wastewater	<ul style="list-style-type: none"> <li>○ Disposal of untreated effluent (wastewater)</li> <li>○ Contamination of water bodies.</li> </ul>	<p>Proper site management to minimize the impacts of sewage effluents. Untreated wastewater not to be disposed in water bodies</p> <p>Temporary water/ toilet facilities will be provided.</p> <p>Contracts will include compliance to EHSS of EESL (SOP 02 –waste management)</p>
Oils, fuels and chemicals (spills and leaks)	<ul style="list-style-type: none"> <li>○ Accidental spill of lubricant, chemicals or oils</li> <li>○ Sediment contamination</li> </ul>	<p>Ensure adequate spill protection is employed during decommissioning</p>
Ambient Air Quality	<ul style="list-style-type: none"> <li>○ Localised gaseous emissions from machinery and vehicles.</li> <li>○ Fugitive dust emissions in adjacent areas.</li> </ul>	<p>Use of well-maintained vehicles and equipment</p>

Phase/ Parameters	Risks/ Impacts	Mitigation Measures
Noise and Vibration	<ul style="list-style-type: none"> <li>○ Temporary elevated noise levels from equipment and vehicular traffic.</li> <li>○ Use of heavy equipment and vehicles</li> </ul>	<p>Ensure work is restricted to day-time hours  Enforcement of vehicle speed limits  Strict controls of vehicle routing Vehicles/equipment to be fitted with silencers</p>
Materials and waste generation	<ul style="list-style-type: none"> <li>○ Site contamination from litter</li> <li>○ Soil and ground water contamination from spill of hazardous waste</li> </ul>	<p>Ensure recycling of solar modules at the end of their useful life through an approved facility or contractor Ensure reusable materials are transferred to an approved contractor or off-taker.  Ensure complete removal of waste materials and adequate disposal through an approved contractor</p>
Occupational health and safety	<ul style="list-style-type: none"> <li>○ Improper handling or work practices and unsafe working conditions at installation which may cause accidents and safety issue</li> <li>○ Risk related to decommissioning works</li> <li>○ Risk related to sanitation and welfare</li> </ul>	<p>Use of personal protective equipment for workers  Provision of adequate fire-fighting equipment onsite  Emergency response/ evacuation plan Implementation of HSE procedures as a condition of contract  Implementation of a Fire Safety Plan prior to starting activities at the site  Clear marking of worksite and hazard recognition  Maintenance of a high standard of housekeeping at all times</p>
Community health and Safety	<ul style="list-style-type: none"> <li>○ Increased prevalence of sexually transmitted diseases including HIV/AIDS</li> <li>○ Road accidents</li> </ul>	<p>Ensure electrical components are properly isolated and demolished Public health awareness  Traffic control and speed limits Schedule of traffic to avoid peak hours on major local roads  Implement traffic management plan optimize/ schedule material movement to non-peak hours</p>

	<ul style="list-style-type: none"> <li>○ Increased traffic, heavy equipment</li> </ul>	
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	<p>and machinery transport</p> <ul style="list-style-type: none"> <li>○ Increase noise level by equipment</li> <li>○ Slips, trips and falls</li> <li>○ Fires</li> </ul>	<ul style="list-style-type: none"> <li>✓ Specifications for noise level for heavy equipment</li> <li>✓ Curfew on operation of heavy equipment and vehicles</li> </ul>
Community disruption and disturbance; social impacts	<ul style="list-style-type: none"> <li>○ Reversal of land use from construction and operation</li> <li>○ Increased traffic, heavy equipment and machinery transport</li> <li>○ Influx of skilled and unskilled workers</li> <li>○ Disruption of community infrastructure (electricity, water supply, etc.)</li> <li>○ Deterioration of access roads</li> <li>○ Influx of skilled and unskilled workers</li> </ul>	<ul style="list-style-type: none"> <li>✓ Schedule of traffic to avoid peak hours on major local roads</li> <li>✓ Implement traffic management plan optimize/ schedule material movement to non-peak hours</li> <li>✓ Maintain minimal interference with community infrastructure</li> <li>✓ Replacement of any damaged infrastructure.</li> <li>✓ Implement a code of conduct for construction workers.</li> </ul>

Employment Income/ Livelihoods	<ul style="list-style-type: none"> <li>○ Loss of livelihood due to disengagement of personnel</li> <li>○ Availability of land for alternative uses</li> </ul>	<ul style="list-style-type: none"> <li>✓ Localisation of employment opportunities</li> <li>✓ Ensure early disengagement notification</li> <li>✓ Relevant government agencies together with stakeholders to work out processes for land relinquishment or alternative uses as at the time of decommissioning.</li> </ul>
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**Note: This is a generic EMP and site specific EMP for the mentioned sites in Annexure-1 is attached at Annexure B of Section 6.** This Environment Management Plan (EMP), which is a part of Initial Environmental Examination Report which is available at ADB website.

## Human and Financial Resources to Implement Safeguards Requirements

The Bidder shall ensure that all necessary budgetary and human resources to fully implement the EARF, RF, and IPPF, as required, are made available on a timely basis.

### Safeguards

The Bidder shall ensure the following:

1. comply with the measures relevant to the contractor as set forth in the EARF, RF, or IPPF as applicable (to the extent they concern impacts on affected people during construction) and any corrective or preventive actions set out in the Safeguards Monitoring Report;
2. make available a budget for all such environmental and social measures;
3. provide the employer with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the EARF, RF or IPPF as applicable;
4. adequately record the condition of roads, agricultural land, if any, and other infrastructure prior to starting to transport materials and installation; and
5. fully reinstate pathways, other local infrastructure, and agricultural land, if any, to at least their pre-Project condition upon the completion of installation.

### Safeguards Monitoring and Reporting

The contractor shall ensure the following:

1. submit Safeguards Monitoring Reports to ADB on a semi-annual basis, and disclose relevant information from such reports to affected persons promptly upon submission;

2. if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the EARF, RF and the IPPF as applicable, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and
3. report any breach of compliance with the measures and requirements set forth in the EARF, RF and IPPF as applicable, promptly after becoming aware of the breach.

#### **Land Acquisition and/ Involuntary Resettlement**

- a. The Employer will facilitate, to the extent possible, that all land and all rights-of-way required for the Subprojects, and all Project facilities are made available to the contractor in accordance with the schedule agreed under the related contract and all land acquisition and resettlement activities if any are implemented in compliance with
  - (i) all applicable laws and regulations of the Guarantor and relevant State relating to land acquisition and involuntary resettlement.
  - (ii) the Involuntary Resettlement Safeguards; and
  - (iii) all measures and requirements set forth in the RF, and any corrective or preventive actions set forth in the Social Due Diligence Report.
- b. Without limiting the application of the Involuntary Resettlement Safeguards, the contractor shall ensure that no physical or economic displacement takes place in connection with a Subproject until:
  - i. compensation and other entitlements have been provided to affected people in accordance with the RF as applicable; and
  - ii. a comprehensive income and livelihood restoration program has been established in accordance with the RF as applicable.

#### **Indigenous Peoples**

The contractor shall ensure that the Project does not have any indigenous people's impact, all within the meaning of SPS. In the unforeseen event of any indigenous people's impact in the Project, the contractor shall ensure to take all steps required to ensure compliance with all applicable laws and regulations of the Guarantor and relevant State and the SPS and IPPF.

Note: The contractor shall comply with ADB's social safeguards policies and implement the subproject in accordance with the SDDR suggestions and measures. Any deviation from SDDR shall be promptly reported and discussed with EESL prior to the execution. SDDR would be available at the ADB website for reference.



# 4. Drawings

# 5. Supplementary Information

# 6. Certificates

## 6.1 Form of Completion Certificate

Contract: [ . . . .insert name of contract and contract identification details. . . . ]

Date: .....

Certificate No.: .....

To: [ . . . .insert name and address of contractor. . . . ]

Dear Ladies and/or Gentlemen,

Pursuant to GCC Clause 24 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated [ . . . .insert date. . . . ], relating to the [ . . . .brief description of the Facilities . . . . ], we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the Facilities or part thereof: [ . . . .description . . . . ]
2. Date of Completion: [ . . . .date . . . . ]

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

[ . . . .Signature . . . . ]

Project Manager

## 6.2 Form of Operational Acceptance Certificate

Contract: [ . . . .insert name of contract and contract identification details. . . . ]

Date: .....

Certificate No.: .....

To: [ . . . .insert name and address of contractor. . . . ]

Pursuant to GCC Subclause 25.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated [ . . .date. . . ], relating to the [ . . .brief description of the facilities. . . ], we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof: [ . . . description . . . ]
2. Date of Operational Acceptance: [ . . . date . . . ]

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

[ . . . .Signature . . . . ]

Project Manager

# 7. Change Orders

## 7.1 Change Order Procedure

- 7.1.1 General
- 7.1.2 Change Order Log
- 7.1.3 References for Changes

## 7.2. Change Order Forms

- 7.2.1 Request for Change Proposal
- 7.2.2 Estimate for Change Proposal
- 7.2.3 Acceptance of Estimate
- 7.2.4 Change Proposal
- 7.2.5 Change Order
- 7.2.6 Pending Agreement Change Order
- 7.2.7 Application for Change Proposal

## **7.1. Change Order Procedure**

### **7.1.1 General**

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with GCC Clause 39 (Change in the Facilities) of the General Conditions.

### **7.1.2 Change Order Log**

The Contractor shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Changes authorized or pending. Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

### **7.1.3 References for Changes**

- (1) Request for Change as referred to in GCC Clause 39 shall be serially numbered CR-X-nnn.
- (2) Estimate for Change Proposal as referred to in GCC Clause 39 shall be serially numbered CN-X-nnn.
- (3) Acceptance of Estimate as referred to in GCC Clause 39 shall be serially numbered CA-X-nnn.
- (4) Change Proposal as referred to in GCC Clause 39 shall be serially numbered CP-X-nnn.
- (5) Change Order as referred to in GCC Clause 39 shall be serially numbered CO-X-nnn.

Note:

- (a) Requests for Change issued from the Employer's Home Office and the Site representatives of the Employer shall have the following respective references:

Home Office	CR-H-nnn
Site	CR-S-nnn

- (b) The above number "nnn" is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal and Change Order.

## 7.2 Change Order Forms

### 7.2.1 Request for Change Proposal Form

[ *Employer's letterhead* ]

To: [ *Contractor's name and address* ]

Date:

Attention: [ *Name and title* ]

Contract Name: [ *Contract name* ]

Contract Number: [ *Contract number* ]

Dear Ladies and/or Gentlemen:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within [ *number* ] days of the date of this letter [or on or before ( *date* )].

1. Title of Change: [ *Title* ]
2. Change Request No./Rev.: [ *Number* ]
3. Originator of Change:  
*Employer: [Name]*  
*Contractor (by Application for Change Proposal No. [Number Refer to Annex 6.2.7])*
4. Brief Description of Change: [ *Description* ]
5. Facilities and/or Item No. of equipment related to the requested Change: [ *Description* ]
6. Reference drawings and/or technical documents for the request of Change:  

<i>Drawing No./Document No.</i>		<i>Description</i>
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7. Detailed conditions or special requirements on the requested Change: [ *Description* ]
8. General Terms and Conditions:
  - (a) Please submit your estimate showing what effect the requested Change will have on the Contract Price.
  - (b) Your estimate shall include your claim for the additional time, if any, for completing the requested Change.
  - (c) If you have any opinion that is critical to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract or the safety of the Plant or Facilities, please inform us in your proposal of revised provisions.
  - (d) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.
  - (e) You shall not proceed with the execution of the work for the requested Change until we have accepted and confirmed the amount and nature in writing.

[ *Employer's name* ]

[ *Signature* ]

[ *Name of signatory* ]

[ *Title of signatory* ]



## 7.2.2 Estimate for Change Proposal Form

[ Contractor's letterhead ]

To: [ Employer's name and address ]

Date:

Attention: [ Name and title ]

Contract Name: [ Contract name ]

Contract Number: [ Contract number ]

Dear Ladies and/or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost to prepare the below-referenced Change Proposal in accordance with GCC Subclause 39.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Subclause 39.2.2, is required before estimating the cost for change work.

1. Title of Change: [ Title ]
2. Change Request No./Rev.: [ Number ]
3. Brief Description of Change: [ Description ]
4. Scheduled Impact of Change: [ Description ]
5. Cost for Preparation of Change Proposal: [ insert costs, which shall be in the currencies of the contract ]

(a)	Engineering	(Amount)
(i)	Engineer _____ hours (hrs) x _____ rate/hr =	_____
(ii)	Draftsperson _____ hrs x _____ rate/hr =	_____
	Sub-total _____ hrs	_____
	Total Engineering Cost	_____
(b)	Other Cost	_____
	Total Cost (a) + (b)	_____

[ Contractor's name ]

[ Signature ]

[ Name of signatory ]

[ Title of signatory ]

### 7.2.3 Acceptance of Estimate Form

[ *Employer's letterhead* ]

To: [ *Contractor's name and address* ]

Date:

Attention: [ *Name and title* ]

Contract Name: [ *Contract name* ]

Contract Number: [ *Contract number* ]

Dear Ladies and/or Gentlemen:

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change: [ *Title* ]
2. Change Request No./Rev.: [ *Request number/revision* ]
3. Estimate for Change Proposal No./Rev.: [ *Proposal number/revision* ]
4. Acceptance of Estimate No./Rev.: [ *Estimate number/revision* ]
5. Brief Description of Change: [ *Description* ]
6. Other Terms and Conditions: In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparing the Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GCC Clause 39 of the General Conditions.

[ *Employer's name* ]

[ *Signature* ]

[ *Name of signatory* ]

[ *Title of signatory* ]

## 7.2.4 Change Proposal Form

[ Contractor's letterhead ]

To: [ Employer's name and address ]

Date:

Attention: [ Name and title ]

Contract Name: [ Contract name ]

Contract Number: [ Contract number ]

Dear Ladies and/or Gentlemen:

In response to your Request for Change Proposal No. [Number], we hereby submit our proposal as follows:

1. Title of Change: [ Name ]
2. Change Proposal No./Rev.: [ Proposal number / revision ]
3. Originator of Change: Employer: [ Name ] / Contractor: [ Name ]
4. Brief Description of Change: [ Description ]
5. Reasons for Change: [ Reason ]
6. Facilities and/or Item No. of Equipment related to the requested Change: [ Facilities ]
7. Reference drawings and/or technical documents for the requested Change:  
[ Drawing/Document No./Description ]
8. Estimate of increase/decrease to the Contract Price resulting from the Change Proposal:

Amount

[ insert amounts in the currencies of the Contract ]

- |     |  |       |
|-----|--|-------|
| (a) | Direct material                              | _____ |
| (b) | Major construction equipment                 | _____ |
| (c) | Direct field labor (Total hrs)               | _____ |
| (d) | Subcontracts                                 | _____ |
| (e) | Indirect material and labor                  | _____ |
| (f) | Site supervision                             | _____ |
| (g) | Head office technical staff salaries         |       |
|     | Process engineer _____ hrs @ _____ rate/hr   | _____ |
|     | Project engineer _____ hrs @ _____ rate/hr   | _____ |
|     | Equipment engineer _____ hrs @ _____ rate/hr | _____ |
|     | Procurement _____ hrs @ _____ rate/hr        | _____ |
|     | Draftsperson _____ hrs @ _____ rate/hr       | _____ |
|     | Total _____ hrs                              | _____ |
| (h) | Extraordinary costs (computer, travel, etc.) | _____ |

(i) Fee for general administration, % of Items \_\_\_\_\_

(j) Taxes and customs duties \_\_\_\_\_

Total lump sum cost of Change Proposal [ *Sum of items (a) to (j)* ]

Cost to prepare Estimate for Change Proposal [ *Amount payable if Change is not accepted* ]

9. Additional time for Completion required due to Change Proposal

10. Effect on the Functional Guarantees

11. Effect on the other terms and conditions of the Contract

12. Validity of this Proposal: within [Number] days after receipt of this Proposal by the Employer

13. Other terms and conditions of this Change Proposal:

(a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within [Number] days from your receipt of this Proposal.

(b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.

(c) Contractor's cost for preparation of this Change Proposal: [ . . .insert amount. This cost shall be reimbursed by the employer in case of employer's withdrawal or rejection of this Change Proposal without default of the contractor in accordance with GCC Clause 39 of the General Conditions . . . . ]

[ *Contractor's name* ]

[ *Signature* ]

[ *Name of signatory* ]

[ *Title of signatory* ]

## 7.2.5 Change Order Form

[ Employer's letterhead ]

To: [ Contractor's name and address ]

Date:

Attention: [ Name and title ]

Contract Name: [ Contract name ]

Contract Number: [ Contract number ]

Dear Ladies and/or Gentlemen:

We approve the Change Order for the work specified in the Change Proposal (No. [ number ]), and agree to adjust the Contract Price, Time for Completion, and/or other conditions of the Contract in accordance with GCC Clause 39 of the General Conditions.

1. Title of Change: [ Name ]
2. Change Request No./Rev.: [ Request number / revision ]
3. Change Order No./Rev.: [ Order number / revision ]
4. Originator of Change: Employer: [Name] / Contractor: [ Name ]
5. Authorized Price:  
Ref. No.: [ Number ] Date: [ Date ]  
Foreign currency portion [ Amount ] plus Local currency portion [ Amount ]
6. Adjustment of Time for Completion  
None            Increase [ Number ] days                            Decrease [ Number ] days
7. Other effects, if any

Authorized by: \_\_\_\_\_  
Employer

Date: \_\_\_\_\_

Accepted by: \_\_\_\_\_  
Contractor

Date: \_\_\_\_\_

## 7.2.6 Pending Agreement Change Order Form

[ *Employer's letterhead* ]

To: [ *Contractor's name and address* ]

Date:

Attention: [ *Name and title* ]

Contract Name: [ *Contract name* ]

Contract Number: [ *Contract number* ]

Dear Ladies and/or Gentlemen:

We instruct you to carry out the work in the Change Order detailed below in accordance with GCC Clause 39 of the General Conditions.

1. Title of Change: [ *Name* ]
2. Employer's Request for Change Proposal No./Rev.: [ *number/revision* ] dated: [ *date* ]
3. Contractor's Change Proposal No./Rev.: [ *number / revision* ] dated: [ *date* ]
4. Brief Description of Change: [ *Description* ]
5. Facilities and/or Item No. of equipment related to the requested Change: [ *Facilities* ]
6. Reference Drawings and/or technical documents for the requested Change:  
[ *Drawing / Document No. / Description* ]
7. Adjustment of Time for Completion:
8. Other change in the Contract terms:
9. Other terms and conditions:

[ *Employer's name* ]

[ *Signature* ]

[ *Name of signatory* ]

[ *Title of signatory* ]

## 7.2.7 Application for Change Proposal Form

[ *Contractor's letterhead* ]

To: [ *Employer's name and address* ]

Date:

Attention: [ *Name and title* ]

Contract Name: [ *Contract name* ]

Contract Number: [ *Contract number* ]

Dear Ladies and/or Gentlemen:

We hereby propose that the work mentioned below be treated as a Change in the Facilities.

1. Title of Change: [ *Name* ]
2. Application for Change Proposal No./Rev.: [ *Number / revision* ] dated: [ *Date* ]
3. Brief Description of Change: [ *Description* ]
4. Reasons for Change:
5. Order of Magnitude Estimation (amount in the currencies of the Contract): [ *Amount* ]
6. Scheduled Impact of Change:
7. Effect on Functional Guarantees, if any:
8. Appendix:

[ *Contractor's name* ]

[ *Signature* ]

[ *Name of signatory* ]

[ *Title of signatory* ]

# 8. Personnel Requirements

Using Form PER - 1 and PER - 2 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has personnel who meet the following requirements:

No.	Position	Total Experience [years]	Work Experience In Similar Work [years]
1			
2			
3			
4			
5			

Using Form EXP-6 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has EHS personnel who meet the following requirements:

### Key Personnel as determined by the EMP and other safeguard management plans

Item No.	Position/specialization	Relevant academic qualifications	Minimum years of relevant work experience	Minimum time on-site (%FTE)
1				
2				
3				



# 9. Equipment Requirements

Using Form EQU in Section 4 (Bidding Forms), the Bidder must demonstrate that it has the key equipment listed below:

No.	Equipment Type and Characteristics	Minimum Number Required
1		
2		
3		
4		
5		

**Annexure-1****Tentative list of MAHAGENCO sites in Maharashtra**

MAHAGENCO sites are divided into three (3) lots:

First lot- 30 MW approx.

Sl.	District	Name of Project Location	Name of SS	Tentative Capacity MW	Length of Line (km)	Land Required for Project (Ha.)	Co-ordinate
1	Kolhapur	Tilawani	Tilawani	4.2	6	5.48	16.718455, 74.404637
2	Sangli	Jagrbodlal	Sonyal	10	8.52	15	17.228615, 75.427269
3	Sangli	Utagi	Utagi	5.7	0.03	6	17°12'2.79"N 75°29'41.1108"E
4	Sangli	Borgaon	Borgaon	2.8	2.84	4	17°8'7.7532"N 74°33'17.2908"E
5	Satara	Vetane	Budh	4.2	4.93	6	17°45'28.32"N, 74°20'56.90"E
6	Satara	Budh	Budh	2.8	0.46	4	17.775202, 74.317842

Second Lot: - 20 MW approx.

Sl.	District	Name of Project Location	Name of SS	Tentative Capacity MW	Length of Line (km)	Land Required for Project (Ha.)	Co-ordinate
1	Ahmednagar	Akolner	Akolner	3.3	0.13	4.73	18°59'36"N 74°39'59"E
2	Ahmednagar	Hivarzare	Barbudi bend	10	3.37	17	18° 54'43.44"N 74°42'52.44"E
3	Jalna	Amba	Partur	5.7	0.73	8	19°37'24"N 76°12'44"E

Third Lot: 20 MW approx.

Sl.	District	Name of Project Location	Name of SS	Tentative Capacity MW	Length of Line (km)	Land Required for Project (Ha.)	Co-ordinate
1	Aurangabad	Chikalthan	Chikalthan	7.8	0.87	11.8	20°11'20"N 75°12'23"E
2	Nanded	Niwagha	Niwagha	4.2	0.85	6	19°35'19"N 77°33'30"E
3	Nanded	Digrass	Digrass	5.7	3.31	8	18°43'46.45"N, 77°11'18.83"E

Note- The above lot wise site list is tentative only. EESL reserves the right to cancel any of the above site and replace with any other site in the State of Maharashtra.



## Annexure-2

### Proforma for Site Survey

<b>Name of the Site and Nearest MSEDCL substation</b>	
<b>Rating of the Substation</b>	
<b>Date of Survey</b>	

#### 1. General Data

<b>Customer Name</b>	
<b>Survey Conducted By</b>	
<b>Contact/Nodal Official</b>	
<b>Designation</b>	
<b>E-Mail</b>	
<b>Telephone/Mobile</b>	

#### 2. Site Data

<b>City</b>	<input type="text"/>
<b>Address</b>	<input type="text"/>

Latitude and Longitude	<input type="text"/>
Nearest Railway Station	<input type="text"/>
Nearest Airport	<input type="text"/>
Location Type	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Defence <input type="checkbox"/> Government <input type="checkbox"/> Under-construction
Type of Area available	<input type="checkbox"/> Roof <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Roof & Ground
Power Plant Type	<input type="checkbox"/> Off-grid <input checked="" type="checkbox"/> Grid-tied <input type="checkbox"/> Grid-interactive (Hybrid)
Type of Power Available	<input checked="" type="checkbox"/> Grid (Utility) <input type="checkbox"/> Diesel Generator <input type="checkbox"/> Wind
Inverter Room Availability	<input type="checkbox"/> Available <input type="checkbox"/> Not available

### 3. Climate Data

Parameters	Summer		Winter	
	Max	Min	Max	Min
Temperature				
Wind velocity				
Average rain fall per annum				

### 4. Land Data (for Ground installations)

Land area (sq. m) for setting up the solar plant	<input type="text"/>
Land Type	<input type="checkbox"/> Flat <input type="checkbox"/> Slope
Slope of Land	East / West / North / South facing
Approach road to site	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type of Soil	
Is available area shadow free?	<input type="checkbox"/> Yes <input type="checkbox"/> Partial Any obstructions nearby _____
Water availability	

Bore wells	Nos
Water supply	
Security at the plant	
Clearance of Land	
Is fencing available for complete project land	
Type of fencing	
Availability of periphery road	

### 5. Electrical data

Grid (Utility)	Voltage (kV) :	<input type="text"/>			
Frequency [Hz]:					
Availability of bay (Bay extension)					
Energy Details	Daily	Monthly	Yearly		
Energy Consumed (kWh)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
Min. Load	_____ kW          _____ Amps				
Max. Load	_____ kW          _____ Amps				
Average Load (kW)	_____ kW          _____ Amps				
Minimum load During holidays or Weekends (kW)					
Tariff Paid (Rs.) (If any)					
Sanctioned Load (kW)	<input type="text"/>				
Duration of Power cuts at 11 kV (Avg) (interruptions only)	_____ Hours/month;          _____ Hours/Year				
Incomer duration of Power cuts	_____ Hours/Year				

(interruptions only)			
Peak hour Duration		Peak hour time range	
No of Transformers			
Rating and Capacity of each Transformer			
Total Capacity of Transformers	MVA		

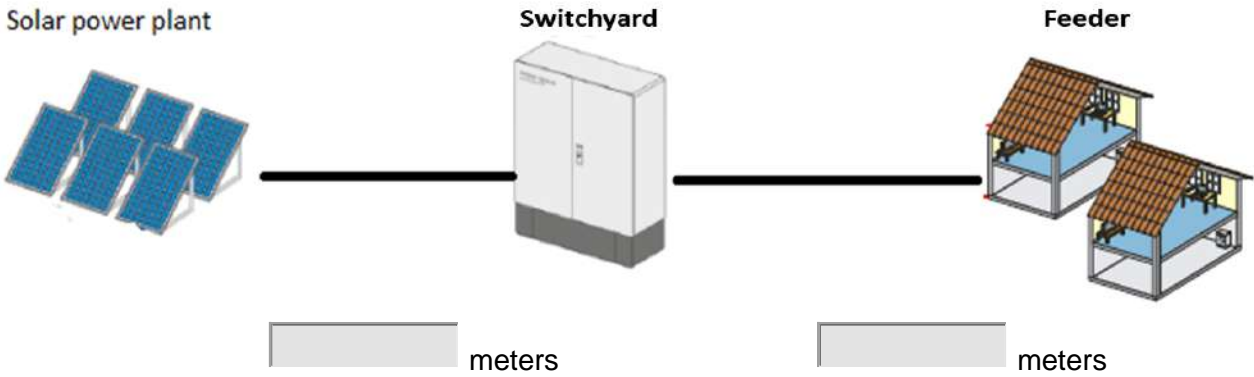
**6. Control room**

Size of the Control room	
Space availability for installation of new systems	
RMS / SLDC	

**7. Power House data**

LT panel location	
Space availability in existing LT room	<input type="checkbox"/> Yes <input type="checkbox"/> No

**8. Distances**  
**9. Control Room/**



**10. Observations**

Sl. No.	Particulars	Remarks
1	No of trees (and type, if any) in the proposed solar plant area	
2	No of LT and HT lines in the in the proposed solar plant area	
3	Availability of water (municipal, bore well etc)	
4	Any other land developmental activity required	

## 11. Drawings

Sl. No.	Drawing	hed
1	Master plant layout	
2	Single Line Diagram (SLD)	
3	Ground drawing	
4	Substation layout	

Dated:

Place:

EESL Representative

MSEDCL Representative

MAHAGENCO Representative

### Additional Points

1. Attach photographs of land or installation area facing east side
2. Give the details of obstruction for solar power plant
3. Provide photographs of Distribution board, in which power evacuation need to be done.



### **Annexure-3**

#### **Process Flow Table for Implementation of Decentralised Solar Power Generating System**

<b>S No</b>	<b>Activity</b>	<b>Milestone date from the Effective Date</b>
1	Submission of Site Survey Plan of all sites	7 days
2	Site Survey by Contractor	21 days
3	Signing of MoM, draft layout by MSEDCL/MAHAGENCO, EESL & Contractor	21 days
4	Submission of Final Array layouts, SLD & Site survey reports by contractor to EESL/MSEDCL/MAHAGENCO Zonal/District office	28 days
5	*Submission of ESMP as per Annexure 4 to EESL	40 days

\*ESMP shall be submitted site wise by the contractor. An NOC to be issued for ESMP from ADB and EESL followed by the issuance of Notice to Proceed (NTP)/Purchase order (PO) (site-wise).

**Format for MoM during Site Survey**

**Minutes of Meeting held between DISCOM/ MAHAGENCO, M/s EESL and Contractor at \_\_\_\_\_ district for Solar Plant at \_\_\_\_\_ substation**

Date: DD.MM.YYYY

A joint survey was conducted by EESL and/or DISCOM/MAHAGENCO and Contractor for finalization of available area for solar power plant. Drawings of solar array layout & structural drawings and following are the observations as tabulated below:

Sl No.	Description	Scope	Remarks
1	Tree cutting within the proposed/ marked area for solar installation	Contractor	
2	Relocation of /Removal of existing HT lines from proposed/ marked area for solar installation	Contractor	
3	Provision of spare feeder/ bay extension for the solar power evacuation	Contractor	
4	Provision for HT cable (with trenching) from solar plant HT panel to power evacuation point	Contractor	
5	Fencing and approach road to solar plant	Contractor	
6	Provision of solar material storage area	Contractor	
7	Ground levelling and clearance	Contractor	
8	DISCOM to confirm site handover date after completion of all above work	Contractor	
9	Removal of all unused items in existing old control room and Availability of same for use of solar plant	Contractor	
10	Submission of structure layout, SLD, etc. for approval to EESL/DISCOM	Contractor / LoA issuance +17 days	

*\*Contractor may add additional rows with time lines as per the scope of work by respective agencies*

Name	Designation	Signature

**Annexure-4****Site wise Completion Report Format**

S.No	Drawing Title	Location Name	Dwg. No.	Rev.	Submission Date	Dwg. Status (Approved or Not Approved)	Remarks (if any)	Size of Paper
<b>1</b>	<b>CIVIL</b>							
1.1	GA of Module Mounting Structure with Foundation Details							
<b>2</b>	<b>General</b>							
2.1	Modular Plant Layout along with Foundation Marking details.							
2.2	Shadow Analysis Report							
2.3	Lightning Arrestor Layout							
2.4	Earthing Layout							
<b>3</b>	<b>Electrical</b>							
3.1	Single Line Diagram- Supported by DC & AC Loss Calculation							
3.2	String Connection Layout							
3.3	GA & Wiring diagram of DCDB							
3.4	GA & Wiring diagram of ACDB							
3.5	DC & AC Cabling Layout along with Equipment Location, Conduit/ Cable Tray Layout.							
<b>4</b>	<b>Other Documents/ Reports</b>							
4.1	Staad Report with Design Certification from recognized Lab/Institution.							
4.2	PV Syst Report/Helio Scope report.							

4.3	Earthing Pit & Earthing Strip Size Calculation							
4.4	Technical Data Sheets( PV Module, Inverter, Metering Panel, SCADA, AC & DC Cable)							
4.5	Field Quality Plan							
4.6	BOQ for the Complete System Along With BOS							
4.7	BOQ of Structure Materials							

**Note** :

1. The above list of drawings/document for each of the site is tentative. Any drawing/document required during detail engineering to complete the system, need to be submitted by the contractor further documents if required during the work process.
2. Field Quality Plan (FQP) to be submitted for approval before starting erection activities at site.
3. Test Certificates as per Standard for all major equipment required to be submitted before Erection of Plant.

**Annexure-5**

**Tentative Format for Execution Plan**

S N o	Di st ri ct	N a m e o f S S	Fi n a l c a p a c i t y ( k W p)	Material Supply ( mention date or received/delivered)				Civil work at sites (mention date)				Installation and Commissioning (mention date)				EES L R e m a r k s
				Sol ar P V m o d u l e s	M M S	In v e r t e r s	T r a n s f o r m e r s	M a r k i n g	P i l i n g	Civ il f o u n d a t i o n	C o n t r o l r o o m	M M S e r e c t i o n	Sol ar P V M o d u l e s m o u n t i n g	W i r i n g & C a b l i n g / E a r t h i n g e t c	P e r i p h e r a l , L i g h t i n g , L A & M i s c. w o r k s	

## 8 ENVIRONMENTAL MANAGEMENT PLAN

### A. Introduction

356. The Environmental Safeguards of the ADB's Safeguard Policy Statement (SPS) 2009 requires that an Environmental Management Plan (EMP) be prepared to ensure construction and operation of new solar plants will be undertaken in accordance with its safeguard requirements. It is an overarching document that will guide environmental management implementation, supervision, and monitoring of EESL and their contractor's activities. The EMP aims to:
- i. ensure project implementation by EESL will comply with ADB's Safeguard Policy Statement 2009 requirements and international good practice as set out in the related IFC Environment, Health and Safety (EHS) guidelines,
  - ii. ensure project implementation will comply with applicable environmental, health and safety requirements of the Government of India and state government, including international agreements national government is a signatory too and
  - iii. ensure local environmental, ecological and human receptor sensitivities are taken into account.
357. Environmental Management Plan (EMP) identifies the potential project environmental impacts and defines mitigation measures and monitoring requirements for the design and pre-construction, construction, operation & maintenance and decommissioning stages of the project. The EMP focuses on potential impacts and risks to the physical, biological, and socioeconomic environment that have been identified as part of the IEE process. It also describes the anticipated adverse environmental impacts and risks of the subproject components, the measures required to avoid, reduce, mitigate, and compensate for the impacts and risks identified.
358. It also defines the institutional arrangements, roles and responsibilities of institutions involved and cost estimates for implementation of the EMP. The EMP will ensure environmental protection activities during all stages of the project implementation in order to prevent, reduce or mitigate adverse environmental impacts and risks. The project-level EMP is an overarching document that will guide environmental management implementation, supervision, and monitoring of EESL and their contractor's activities under the project.
359. Mitigation and monitoring plans are developed for the proposed project. To ensure these mitigation and monitoring plans are implemented, EESL will undertake a program of environmental supervision and monitoring during the project implementation. The EMP also provides the reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule and budget.
360. The EMP is dynamic and can be updated as appropriate during the project implementation. However, any update to the EMP will first need to be cleared by ADB. In addition, any unanticipated impacts, or requirements for corrective action due to non-compliance identified during project implementation will be reported by EESL to ADB, appropriate action will be agreed and taken by EESL and their contractors to address them and bring the project implementation back on track.
361. The EMP contains a number of components crucial to effective environmental management within the project, these include:
- i. Corrective Action Plan for existing facilities to be implemented by EESL.
  - ii. Environment management plan to be implemented during pre-construction, construction, operation & maintenance, and decommissioning phases;
  - iii. Environmental codes of practice further elaborate on the pollution prevention, health, and safety measures to be adopted and are to be implemented as an integral part of the mitigation plan;
  - iv. Environmental monitoring plan (EMoP) to be undertaken during pre-construction, construction,

- operation and maintenance, and decommissioning phases; and
- v. Implementation arrangements.
- vi. Institutional Frameworks for PMU (project Management Unit), PMC, contractors along with their roles and responsibilities.

## **B. Impacts, Mitigation, Monitoring, and Reporting**

### ***Potential Impacts to be Mitigated***

362. The EMP has been prepared to cover all the project components that are category B for environment.
363. The solar project is unlikely to cause any significant irreversible, diverse or unprecedented environmental impacts due to the following facts:
- i. The solar PV plants are in modified habitat in government lands that are considered to be mostly barren as per revenue records;
  - ii. The solar plants are in rural areas and no protected areas or internationally or nationally recognized physical cultural resources will be passed through by new distribution lines. Overall, the construction and the operation and maintenance of the solar power plants and DLs is likely to give rise to direct, indirect, and, induced environmental impacts that are mostly minor/low in magnitude, site-specific, generally reversible, temporary and of short duration primarily during construction works. Potential impacts and risks can be easily mitigated through the adoption of international good practices for environmental management as set out in the IFC EHS Guidelines. The selection and design of new equipment will comply with national requirements as well as considering international good practice per the IFC EHS Guidelines particularly with respect to avoiding the use of polychlorinated biphenyl (PCB) oil in the purchase of new transformers (already banned in India) and the use of all asbestos containing materials in the new construction.
364. All subprojects are on modified habitats and no critical habitat species are likely to be encountered.
365. No physical cultural resources were identified that would be directly impacted, but care has been taken to avoid damage to those present adjacent to the solar plants or the DL route alignments.
366. The environmental impacts and risks of the distribution component have been assessed as described in the IEE report. Potential environmental impacts were identified in relation to the design, location, construction, operation and maintenance of the distribution infrastructure and mitigation measures have been developed in respect of all potentially negative impacts identified.

**Table 8-1: Environmental Management Plan- Solar PV Plants**

The Generic EMP has been provided for the proposed Category B Solar Plants (outside the existing substations). The additional and site-specific impacts and measures are also presented for ease of understanding. Contractor in general means EPC contractor, if not otherwise mentioned. EPC contractor may have other subcontractors including labour contractors, general contractors, and O&M contractors and the EPC contractor will ensure that all follow the EMP requirements.

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
<b>Design stage</b>							
1	Land & Other Clearances	Failure to obtain necessary consents, permits, NOC etc. before starting works is a breach of National and SPS requirements and result in reputational risk of EESL.	<ul style="list-style-type: none"> <li>Avoid highly fertile land.</li> <li>Evaluate land size, topography, and legal aspects.</li> <li>No cattle grazing in the parcels of land.</li> <li>Percentage of available land that can be effectively used for solar panels.</li> <li>Obtain necessary permits from local, state authority.</li> <li>Develop a detailed project timeline with key milestones.</li> <li>Plan for civil engineering requirements, electrical design, mechanical design including plan for physical layout, panel orientation, tilt angles etc.</li> <li>Plan the connection to the electrical grid, and Distribution lines.</li> <li>Necessary permits from local and state authority should be obtained by contractor prior to any land development.</li> </ul>	<ul style="list-style-type: none"> <li>Permits approvals &amp;</li> </ul>			
2	Biodiversity	Choosing a site that avoids critical habitats, such as forests, wetlands, protected areas etc.	<ul style="list-style-type: none"> <li>A biodiversity survey should be carried out to check for animals (reptiles and active bird nests) around the agricultural tracks and trails which will be used for the transportation of the project machinery and resources. Construction activities should be planned to avoid the breeding season of these animals to reduce the impact on these animals.</li> <li>Biodiversity Survey Report (focused on the breeding of ground dwelling animals)</li> <li>Management plan including the mitigation measures are included in this IEE report.</li> </ul>	Biodiversity expert assessment results	<ul style="list-style-type: none"> <li>Prior to Development</li> <li>Land</li> </ul>	EESL/ Contractor	EESL
3	Physical and Cultural Resources	Loss of or damage to physical of cultural resources or impact to state/ASI protected monuments may lead to discordance with communities and delay in construction.	<ul style="list-style-type: none"> <li>Proposed sites are visited by EESL and confirm that there is no cultural or heritage sites, local places of worship within the proposed 12 solar project sites.</li> <li>Follow chance and find procedure.</li> </ul>	Site visit assessment results			
<b>Preconstruction stage</b>							



Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
1	Land & Other Clearances	<p>Failure to obtain necessary consents, permits, NOC etc. before starting works is a breach of National and SPS requirements and result in reputational risk of EESL, as well as potential for stoppage of work.</p>	<ul style="list-style-type: none"> <li>Obtaining and submission of copies (to EESL / PMC) all consents, permits, clearances, no objection clearances, or NOCs from various authorities/ Panchayats before the start of construction.</li> <li>Specially ensure NOC from forest revenue authorities for tree cutting if required</li> <li>Permission from Ground Water Board for water extraction through Bore well if required.</li> <li>Ensure all clearances and NOCs are in place before construction period. Specifically, ensure (i) labor licenses from labor department obtained by Contractor, (ii) labor related insurances obtained by Contractor, (iii) Contractor's tie up / MoU / contract with vendors authorized by MSPCB for hazardous and e-waste etc. (iv) Obtaining of NOC from SPCB for handling and storage of hazardous wastes by contractors.</li> <li>Selection and design of DL should not pass through any protected area or internationally or nationally recognized physical cultural resources.</li> <li>All the permits and approvals should be obtained prior to land development</li> </ul> <p><b>Site specific mitigation measures:</b></p> <ul style="list-style-type: none"> <li>No impact is envisaged as all the proposed 12 sites is on government lands in rural areas, mostly barren.</li> <li>Applicable permissions/approvals from the authority will be obtained by EESL contractor after its selection through open bidding process.</li> </ul>	<ul style="list-style-type: none"> <li>Permits &amp; approvals</li> </ul>	<ul style="list-style-type: none"> <li>Monthly document reporting of contractor</li> <li>SEMR of EESL, reporting as per monitoring schedule with copies of permits etc.</li> </ul>	Contractor and EESL Regional Solar Team	EESL
2	Topography, Geology, soils, drainage and Earthquake	<ul style="list-style-type: none"> <li>Disruption of existing surface water drainage as the changes in the slope and presence of impermeable surfaces will affect the natural recharge of the site to groundwater due to reduction in open land.</li> <li>Waterlogging of the solar power plant site or adjacent land may occur if soils are compacted, or the topography is altered</li> </ul>	<ul style="list-style-type: none"> <li>EESL to undertake the slope stability and land development studies as a part of their technical feasibility work.</li> <li>Minimize the compaction of soil. Detailed design to minimize disturbance to natural drainage lines that are to be retained.</li> <li>CEMP (Construction Environment Management Plan) will incorporate mitigation measures to minimize soil erosion, such as, minimizing the removal of existing vegetation and topsoil within the project footprint to that which is necessary and using a sequenced construction method, revegetating areas immediately after construction activities are completed in one area rather than undertaking earthworks on all parts of the site at the same time to minimize the area of bare ground exposed etc.</li> <li>No drainage will be permitted to discharge directly to surface water bodies and design to include for sediment and oil traps.</li> <li>Detailed design must provide drains including along the site boundary and as per the topography to ensure that engineered structures are protected from waterlogging, flash rains and water flows with drainage designed to not exacerbate flooding on adjacent land.</li> </ul>	<ul style="list-style-type: none"> <li>Slope &amp; Elevation</li> <li>Soil erosion</li> <li>Catchment area</li> <li>Drainage pattern</li> <li>Flood inundated area</li> <li>Flood frequency</li> </ul>	<p>Prior to and During Land Development.</p> <p>SEMR of EESL, reporting as per monitoring schedule with copies of permits etc.</p>	Contractor, EESL Regional Solar Team	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<ul style="list-style-type: none"> <li>Land below the solar photovoltaic panels shall be retained for groundwater recharge with detailed design to minimize impermeable surfaces</li> <li>Ensure that all solar plant structures are designed as per GOI seismological requirements and specifications.</li> </ul> <p><b>Site specific mitigation measures:</b></p> <ul style="list-style-type: none"> <li>All the proposed 12 solar sites are mostly plain or slightly undulating. Only in Budh site pink floss tree plantation have been observed. Obtain necessary permits from local, state forest authority.</li> <li>All the proposed sites fulfill the EARF eligibility criteria.</li> </ul>				
3	Biodiversity	<ul style="list-style-type: none"> <li>Habitat at all the project footprint area was modified with almost no presence of large native trees. No felling of mature, healthy, and native tree species is envisaged while establishing new solar plants and Distribution Lines (DLs) for connecting the solar plant to the respective substations.</li> <li>The project area can have adverse impacts on the habitat surrounding the project footprint area. This can be due to the vehicular movement for the transportation of the project infrastructure material and resources to the site.</li> </ul>	<ul style="list-style-type: none"> <li>There should be a speed limit for the vehicles to avoid road kills of animals on the agricultural trails and tracks. Also, the vehicular horns should be used only in unavoidable scenarios. The drivers and contractors should be made aware of the impacts of vehicular movement on wildlife and it can be mitigated.</li> <li>DL for connecting the nearest SS with solar plants will travel along roads or through villages only via pre-existing DLs. There will be short stretches of new DLs at some of the sites. However, the new lines will also travel along existing trails and farm tracks. So, no felling of trees is expected. In addition, the transmission poles will be around 10 m in height and thus shall be passing over the trees in general. In case of unavoidable circumstances, branches shall be trimmed. No major impacts are envisaged on the trees due to the Distribution Lines.</li> <li>Report of workshops or session on awareness about impact of vehicular movement on wildlife should be prepared.</li> </ul>	<ul style="list-style-type: none"> <li>Number of environmental awareness workshops for workers/drivers/pr object staff.</li> </ul>	Six Monthly	EESL Regional Solar Team, Contractor <sup>49</sup> (EHS Manager / Qualified Ecologist).	EESL
4	Physical and Cultural Resources	<ul style="list-style-type: none"> <li>Loss of or damage to physical of cultural resources or impact to state/ASI protected monuments may lead to discordance with communities and delay in construction.</li> </ul>	<ul style="list-style-type: none"> <li>Comply with EARF guidelines.</li> <li>And a chance find protocol will be adopted as a part of CEMP.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>Chance finds protocol to be adopted for all the proposed sites. Though none of the 12 proposed solar sites has any cultural or ASI protected monuments.</li> </ul>	Records of Chance and finds procedure	--	Contractor	EESL

<sup>49</sup> EPC contractors may have other subcontractors including labor contractors, general contractors, and O&M contractors and EPC contractor will ensure that all follow the EMP requirements.

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
5	Contractual Requirement and contractor's site-specific construction EMP	<ul style="list-style-type: none"> <li>Failure to have EMP in contract document and a CEMP (Construction environment management plan) considering site specific risks, health and safety risk assessment and health and safety plan approved by EESL before commencing of works increases the risk of incidents occurring etc.</li> </ul>	<ul style="list-style-type: none"> <li>Development and approval of a Construction Environment Management Plan (CEMP) including site-specific risks and Occupational H&amp;S Plan, to provide details on how the Contractor plans to comply with GOI laws and regulations and implement project EMP and relevant parts of the EHS Guidelines on Construction and Demolition and ILO guidelines on safety, health and construction activities.</li> <li>The CEMP will also identify the temporary facilities required for the construction e.g., laydown area, stores, workers facilities etc. There will be planning by the Contractor on the transportation of equipment and materials to the site ready for their installation.</li> <li>CEMP to include an emergency preparedness response / evacuation plan developed in consultation with relevant local authorities, EESL and communities.</li> <li>Inclusion of the EMP in all the EPC contract document for all sites considered in this IEE.</li> <li>CEMP will include a construction waste management plan (CWMP), Emergency preparedness and response plan.</li> <li>Prepare overall health and safety (H&amp;S) plan for solar PV component to minimize risks to workers.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>Akholner, Amba, Bargaon, Niwagha sites have surface water bodies.</li> <li>At Amba, Tilawani, Aholner, Chikalthan and Niwagha have receptors like school and pucca house near to the proposed project site. Therefore, EMP measures should be taken care of during construction stage. Prior planning &amp; procedures should be taken accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly and regular reporting documents of contractors</li> </ul>	Contractor and EESL Regional Solar Team	EESL	
6	Socio-economics	<ul style="list-style-type: none"> <li>Potential positive impacts relating to employment and job creation with indirect employment.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate employment estimates, timeframes and skills requirements clearly to the stakeholders on a continuous basis.</li> <li>Skills training to enable greater employment of local people.</li> <li>Plan for local hiring</li> <li>Stakeholder Engagement Plan</li> </ul>	<ul style="list-style-type: none"> <li>Breakdown of employment numbers.</li> <li>Gender Management Plan.</li> </ul>	Six Month	Contractor	EESL Regional Team
<b>Construction Phase</b>							
<b>A Physical Environmental Management Plan</b>							
1	Landuse and visual	<ul style="list-style-type: none"> <li>Permanent and temporary changes in land use.</li> <li>Land use classification will change into industrial land use after the development of solar power plant.</li> <li>Impacts on Visual and landscape envisaged due to</li> </ul>	<ul style="list-style-type: none"> <li>The land use in and around permanent project facilities should not be disturbed.</li> <li>Use erosion-resistant materials and engineering techniques to reinforce slopes where necessary</li> <li>Implement best management practices such as vegetation establishment, erosion control blankets, and sediment traps.</li> <li>Ensure that all the machineries in the construction site will be kept in an orderly manner at the end of each working day.</li> <li>Construction machinery, equipment, and vehicles not in use will be removed in a timely manner to the extent possible.</li> </ul>		Monthly Monitoring	Contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
2	Topography and Drainage	<p>presence of machinery during the construction phase</p> <ul style="list-style-type: none"> <li>• Change in landform and slope (topography)</li> <li>• Erosion</li> <li>• Disruption of existing surface water drainage</li> <li>• Storm water drainage and management</li> </ul>	<ul style="list-style-type: none"> <li>• Design stormwater management systems wherever possible.</li> <li>• Develop erosion and sediment control measures to prevent soil erosion and sedimentation resulting from contour modifications wherever applicable.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>• No site-specific measures needed and all the above measures shall be applicable for all the 12 proposed project sites</li> <li>• Changes in contour level should be avoided to the extent possible;</li> <li>• Development of effective site drainage systems and storm water managed for groundwater recharge.</li> <li>• Management of excavations to avoid the generation of drainage pathways to underlying aquifers.</li> <li>• Once earthworks are completed all disturbed areas are to be revegetated using native grass species sourced from the site.</li> <li>• EESL and their contractors will a) minimize the removal of any further existing vegetation and topsoil within the project footprint to that which is necessary post land development, b) schedule earthworks during the dry season to minimize exposed areas subject to erosion by surface water runoff, and c) topsoil disturbed during earthworks and foundation excavations will be separately stripped and stored and used to restore the surface of the excavated area on completion.</li> <li>• Debris generated from the earthworks will eventually be used for levelling and therefore, the subproject will not require specific area for dumping of the muck generated.</li> <li>• Plan for effective site drainage systems and storm water management for groundwater recharge.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>• No site-specific measures needed. All the above measures shall be applicable for all the 12 proposed project sites.</li> </ul>			Contractor	EESL
3	Ground water	<ul style="list-style-type: none"> <li>• Abstraction of ground water can lead to the depletion of water level</li> </ul>	<ul style="list-style-type: none"> <li>• The contractor will arrange separate water supply arrangement for construction work and will not interfere with the normal public water supply and avoid ground water extraction;</li> <li>• water should be supplied by authorized vendors for which no permission needed from CGWB. Ground water extraction should be avoided.</li> <li>• Planning and construction of bioswales to recharge the ground water.</li> <li>• Storage of DG oil shall be undertaken on paved impervious surface.</li> </ul>	Data Analysis and Reporting	Reported in monthly reports.	Contractor	EESL

Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
		<ul style="list-style-type: none"> <li>Construction activity may temporarily deteriorate <b>ground water quality</b> in the project area through a possibility of contaminated spillage of oil, wastewater from toilets constructed for site office &amp; labour camp etc.</li> </ul>	<ul style="list-style-type: none"> <li>Storage of oil shall be undertaken on paved impervious surface.</li> <li>Hazardous waste shall be stored with secondary containment and spill proof impervious surface.</li> <li>Provision of bioswales to recharge the ground water is recommended.</li> <li>Leak-proof holding tanks for sanitary wastewater shall be constructed to protect the seepage of wastewater.</li> <li>Machinery and vehicles shall be thoroughly checked for the presence of leaks if any.</li> <li>Wastewater holding tanks / septic tank shall be located at more than 500 m away from bore wells or any other underground water holding tanks.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>During site visit it is observed that there is no bore wells in any of the proposed 12 project sites.</li> </ul>				
		<ul style="list-style-type: none"> <li>Additional water resources for construction and domestic uses.</li> <li>Approximately 1000 LPD of water is required per site for domestic usage as per CPHEEO considering an average of 20 workers.</li> </ul>	<ul style="list-style-type: none"> <li>It shall be ensured that the wastewater does not find its way into surface waters or water wells.</li> <li>Employ sedimentation basins and traps to capture sediment runoff and prevent it from entering water bodies.</li> <li>Water conservation measures through recycling and reuse</li> <li>No diversion of flows from their natural flow pathways, thus depriving downstream watercourses of water.</li> <li>Avoidance of disturbance of flows into natural watercourses i.e., provision shall be made for temporary or permanent measures that allow for attenuation, control of velocities and capturing of sediment upstream of natural watercourses.</li> <li>Adequate drainage facility for easy escape of surface run-off from the project site shall be provided.</li> <li>Undertaking works in the dry season.</li> <li>Undertaking works particularly for installation of open trenches will be avoided during monsoon season, so as prevent the need to pump out water and minimize impacts on the quality of surface water runoff entering the surface water drainage system, and from there the waterbodies connected.</li> <li>Incorporate features such as retention ponds, and green infrastructure wherever feasible to manage stormwater effectively.</li> <li>Revegetation of exposed soil upon completion of earthworks with native grasses.</li> </ul>	<ul style="list-style-type: none"> <li>Data Analysis and Reporting</li> </ul>	Reported in monthly reports.	Contractor	EESL
4	Surface water						

Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
5	Air Quality	<ul style="list-style-type: none"> <li>• Generation of fugitive Dust due to movement of vehicles inside the project area during construction period and Emission from Diesel Generators.</li> <li>• Potential respiratory effects from dust generated by construction activities.</li> <li>• Short term worsening of the ambient air quality due to (a) dust from soil excavation for the construction of plant, and (b) emissions from the operation of diesel-fuelled equipment; excavators, construction vehicles and other construction equipment</li> </ul>	<p><b>Site specific Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• There is a farm pond ~225m (SW) at the Akholner project site. Due to low lying area water accumulate at the proposed site and all the measures should be considered to avoid any disturbance in natural watercourse and contamination during construction stage at site.</li> <li>• There is a pond ~260m (N) at Amba. There is an Irrigation Canal ~167m (NE);</li> <li>• 116m (SW) – Seasonal Water Body (Small) at Borgaon site.</li> <li>• 333m SW – Seasonal water body at Niwagha</li> </ul> <p>The area of natural water accumulation at site shall be converted into bioswell to increase holding, groundwater recharge and treatment of contamination if any. Silt fence to be installed if water body is at downslope.</p> <p>All the above measures shall be applicable to all the proposed solar sites.</p> <ul style="list-style-type: none"> <li>• Select project locations, as far as possible, to be away from residential areas; so, dust from the sites cannot reach these areas.</li> <li>• Vehicles speed to be restricted to 20-30 km/hr on unpaved road. This will reduce dust emission.</li> <li>• Use of well-maintained vehicles and equipment. All the project vehicles shall have valid PUC certificate.</li> <li>• Ensure regular maintenance of project vehicles during construction and operational phase</li> <li>• Compacting roads where necessary and repair of damaged roads once construction is completed. Access road shall be paved and improved to minimise road dust.</li> <li>• Raw material shall be covered with tarpaulin sheet during transportation and in storage area.</li> <li>• Removal of debris and clearance of stockpiles at frequent intervals.</li> <li>• The Contractor will frequently sprinkle water at the project sites, unpaved roads/haul road and along the transport routes using specialized water tankers to minimize dust.</li> <li>• Emission standard of the DG sets operated in the project area shall be maintained as per MoEFCC/SPCB guidelines.</li> <li>• DG sets preferably placed away from settlement area.</li> <li>• Exhaust emissions of construction equipment shall be adhered to emission norms as set out by MoEFCC/ CPCB/ SPCB.</li> <li>• Utilize modern, low-emission construction equipment whenever possible to minimize emissions of pollutants.</li> <li>• Conduct a thorough assessment of the project site's air quality before construction begins. This baseline data will help in evaluating any changes during and after construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Training records.</li> <li>• Health inspection records</li> </ul>	Reported in ESHS reports.	contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No sensitive receptors like schools &amp; health centres are there in any of the 12 proposed sites except Kastarva Gandhi Balika Vidyalaya ~98m (SE) at Amba and Sajani High school~318m (SW) at Tilawani. The nearest residential house is ~188 m (N) at Akholner, 176m SE, 180m E, 184m E- Pucca Structure at Chikalthan; 66 m (SW) – Pucca House at Niwagha; Dust screens shall be provided around construction sites when adjacent to any habitations/ schools especially during earthworks.</li> </ul>				
6	Noise & vibration	<ul style="list-style-type: none"> <li>Ground preparation works have the potential to result in increased noise levels. Duration of work time and distance from the receptors should be considered. However, that ground preparation works are considered to be short term temporary and intermittent in nature.</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>Best practicable means followed to ensure quietest available and construction techniques will be used to limit noise as far as possible.</li> <li>Construction only undertaken during daylight hours.</li> <li>All machinery will be regularly maintained.</li> <li>Project construction traffic routing through community areas outside the Project access road will be avoided.</li> <li>Project grievance mechanism developed This will be utilized to record, monitor and respond to / mitigate any noise related impacts raised by nearby farmers and ensure compliance with noise limits is achieved at Noise Sensitive Receptors.</li> <li>Integral noise shielding to be used where practicable and fixed noise sources to be acoustically treated, for example with silencers and enclosures</li> <li>Adherence to low-speed limits and regular maintenance of vehicles utilizing the road during construction. Monitoring will be in place to ensure adherence to these measures.</li> <li>Provide personal protective equipment to workers working near DG sets and other high noise source</li> <li>Plan work activities to avoid traffic movement during peak hours.</li> <li>Post warning signs in high noise areas and implement hearing protection program for work areas where noise levels exceed 85 dBA.</li> <li>Contractor will be required to comply with the Noise Pollution (Control and Regulation) Rules, 2000 – in the vicinity of residential properties noise levels must be limited to 55dB(A) as 1-hour LAeq during the daytime and if nighttime work is permitted, although it will seek to be avoided, it must be limited to 45dB(A) as 1-hour LAeq to comply with the WHO noise guidelines.</li> <li>Traffic and transport management plan</li> <li>Noise management procedures within CEMP.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p>	<ul style="list-style-type: none"> <li>Number of noise related grievances raised and closed.</li> <li>Number of exceedances in speed limits.</li> </ul>	Monthly monitoring or in the event of a complaint.	Contractor (EHS Manager).	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
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7	Soil	<ul style="list-style-type: none"> <li>Soil compaction and soil erosion</li> </ul>	<ul style="list-style-type: none"> <li>No sensitive receptors like schools &amp; health centres are there in any of the 12 proposed sites except Kastarva, Gandhi, Bailika, Vidyalya ~98m (SE) at Amba and Sajani High school ~318m (SW) at Tilawani. The nearest residential house is ~188 m (N) at Akholner; 176m SE, 180m E, 184m E, 204m E, 230m NW - Pucca Structure at Chikalthan; 66 m (SW) – Pacca House at Niwagha.</li> <li>All the above measures shall be applicable for the 12 proposed solar sites considered in this IEE.</li> </ul>	<ul style="list-style-type: none"> <li>Record of monitoring report helps to identify potential soil degradation due to construction activities and allows for appropriate soil amendment measures if needed.</li> </ul>	Reported in ESHS reports.	Contractor (EHS Manager).	EESL Regional Solar Team, EESL SDU
			<ul style="list-style-type: none"> <li>Stripping of top soil will be conducted only when required and properly stored in stockpiles by locating them in designated areas away from water bodies.</li> <li>Stockpile topsoil for site rehabilitation.</li> <li>Stripping of top soil, excavation and access road construction will not be carried out during the monsoon season or during heavy winds to minimize erosion and run-off.</li> <li>Cleared areas no longer required for construction activities will be rehabilitated by reseeding with locally found grasses and shrubs (where appropriate) to increase soil stability.</li> <li>Carefully planning construction activities and avoiding unnecessary excavation or grading.</li> <li>Plan to use topsoil at the time of plantation on the approach road.</li> <li>Construction debris shall be reused in paving on site approach road to prevent dust generation due to vehicular movement.</li> </ul>	<ul style="list-style-type: none"> <li>Baseline data record will help establish the extent of contamination and guide remediation efforts.</li> </ul>			
8	Archaeology & cultural heritage.	<ul style="list-style-type: none"> <li>Potential for moderate impacts relating to disturbance to local cultural heritage aspects and intangible assets.</li> </ul>	<ul style="list-style-type: none"> <li>In case of any accidental oil spill, the soil of that area shall be taken out and stored separately for disposal as hazardous waste.</li> <li>Store hazardous material (like used oil) in isolated room with impervious surface.</li> <li>Filling and transfer of oil to and from the container shall be on impervious surface.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 proposed solar sites considered in this IEE.</li> </ul>	<ul style="list-style-type: none"> <li>Number of grievances raised and closed relating to impacts on the historical archaeological landscape if or</li> </ul>	Site inspection reports	Contractor	EESL



Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<p>with work. All the above discovered on site shall be the property of the government and will be dealt with as per provisions of the relevant legislation.</p> <ul style="list-style-type: none"> <li>EESL will seek direction from the Archaeological Society of India (ASI) before instructing the Contractor to recommence work on the site.</li> <li>Detailed and regular information to local community members should be provided about Project activity to mitigate community concerns as a result of misinformation. should consider scheduling construction activities to minimize the effects on local communities and farmers and to reduce impacts on the nearby cemeteries in case of rituals.</li> <li>Construction planning in relation to archaeology and the chance finds procedure will be detailed in the Construction Environmental Management Plan (CEMP).</li> <li>The contractor to prevent his workmen or any other persons from removing and damaging any such article or thing. They shall, immediately upon discovery thereof and before removal acquaint EESL such discovery and carry out EESL's instructions for dealing with the same, awaiting which all work shall be stopped.</li> <li>Chance finds procedure to be followed.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>There is no significant cultural heritage site nor ASI notified area in any of the 12 proposed solar project site. However, few cultural important structures observed in the nearby area of the mentioned project sites. There is a temple approximately 390 m (NW) at Akholner, Amba Bai Temple ~350m (N), ~Shiva Temple- ~375 m (N) &amp; Ambiya Masjid ~435m (NW) at Amba, Hanuman Mandir ~51m (SE) at Digress; Shri Dant Mandir at small hillocks~250m (W) at Niwagha; Mosque ~20m (NW) at Jadar Bodai; Small temple~496m (SW) at Tilawani.</li> <li>It should be ensured that for all these PCRs access is not impacted. Further, all the above measures shall be applicable for the 12 proposed solar sites.</li> </ul>	whenever received.			
9	<b>Transport &amp; access.</b>	<ul style="list-style-type: none"> <li>Dust pollution; Accidents</li> </ul>	<ul style="list-style-type: none"> <li>Vehicles only permitted to use designated routes with no off-road driving permitted.</li> <li>Speed limits adhered to for all construction traffic.</li> <li>Regular maintenance of vehicles and use of manufacturer-approved parts.</li> <li>Maintain / repair of access roads as required.</li> <li>Temporary site compound to have appropriate parking including heavy vehicles, and holding and unloading areas too.</li> <li>Training program conducted before site activities commence for all drivers.</li> </ul>	<ul style="list-style-type: none"> <li>Number of road safety complaints (raised and closed) received via grievances.</li> <li>Number of accidents / near misses recorded.</li> <li>Grievance records</li> </ul>	<p>Inspection reports prior to the start of construction.</p> <p>Six monthly</p>	Contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
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			<ul style="list-style-type: none"> <li>• Procedure for check of licenses and permits for all drivers with suitable training conducted. Measures to control delivery / departure of all heavy vehicles to reduce conflict with other road users.</li> <li>• Caution signs set up in the vicinity of entrance points and Flagmen available at the entry-exit points of the Project site.</li> <li>• Construction times to avoid local peak times especially school opening and dispersal times the routing arrangements, particularly for heavy vehicles should be controlled.</li> <li>• Traffic movements in settlement areas to be limited to daytime only. Traffic and transport management plan (TTMP) helps in ensuring the efficient flow of traffic, minimizing disruptions to surrounding areas, and ensuring the safety of workers and the public.</li> <li>• Assessment of transportation infrastructure surrounding the project site, including roadways, intersections, and access points. Identify any existing traffic congestion points, potential safety hazards, and areas of concern for local residents.</li> <li>• Establish hauling routes for transporting construction materials and equipment to and from the project site. Choose routes that minimize impacts on local communities, avoid sensitive areas such as schools or residential neighbourhoods.</li> <li>• Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.</li> <li>• ROW over Natural Habitats/Water Bodies/ Settlements/ standing crops to be avoided to the extent possible.</li> </ul>				
10	Laying of Distribution Lines	<ul style="list-style-type: none"> <li>• Exposure to safety related risks</li> <li>• Impact on Natural Habitats &amp; settlements</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>• Adjacent to the outside boundary (W) there is a village settlement at Budh; village settlement ~196m(E) at Utagi; there is a settlement ~367m (N) at Akolner. The nearest settlement is ~119m NE at Chikalthan, nearest village settlement is ~284m (N) at Amba; Settlement ~95m (W) at Bargaon, 100 m (S)- Village Settlement at Niwagha; 347m (SW) - Vinayak Packaging Industry at Tilawani.</li> <li>• All the above measures shall be applicable for the 12 proposed solar sites</li> </ul>	<ul style="list-style-type: none"> <li>• Number of accidents / near misses recorded.</li> <li>• Any complaints received via grievance</li> </ul>	Six Monthly	Contractor	EESL
11	Solid waste & generation of Effluent	<ul style="list-style-type: none"> <li>• Potential contamination of groundwater or surface water with poor waste management potentially affecting human and livestock health.</li> <li>• Use of construction materials</li> </ul>	<ul style="list-style-type: none"> <li>• Solid waste and Effluent will be stored in a designated area/septic tank or untreated storage tank and removed and disposed of periodically by a licensed contractor.</li> <li>• Ensure there is proper and adequate sanitation facilities at the site during construction.</li> <li>• Untreated wastewater not to be disposed in water bodies.</li> </ul>	<ul style="list-style-type: none"> <li>• Waste removable records</li> </ul>	Reported in ESHS reports.	Contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
		<ul style="list-style-type: none"> <li>Inappropriate disposal of inert oil</li> <li>Inappropriate disposal of solid waste</li> <li>Site contamination from litter</li> </ul>	<ul style="list-style-type: none"> <li>It is suggested to have environment friendlier options for sewage management that is feasible in site specific climatic condition- such as bio toilets, bio septic tanks.</li> <li>Waste disposal trucks must be adequately covered to minimize windblown litter</li> <li>Ensure all required licenses / permits are in place where third party wastewater/waste disposal &amp; transport companies are to be utilized and that they facilities are audited to ensure that they are fit for purpose.</li> </ul>				
	<ul style="list-style-type: none"> <li>There will be some generation and disposal of garbage / wastes by construction workers during the work packaging materials, such as plastic bottle and containers, cans, paper cups, hazardous wastes like waste panels, waste oil, oily cloths, lubricants, etc. This waste will likely pollute the neighborhoods if not properly collected / stored by the contractors and recycled or disposed of by licensed waste operators, but left on site or dumped without authorization in the rural area.</li> </ul>	<ul style="list-style-type: none"> <li>The reusable wastes like wooden waste and cardboard from packing materials, empty cement bags, construction debris, etc. can also be given to locals for their use or give it back to original equipment manufacturer (OEM).</li> <li>Distribute appropriate number of properly contained litter bins and containers properly marked.</li> <li>The recyclable and non-recyclable non-hazardous solid waste generated onsite shall be collected, segregated and stored in a temporary waste storage facility from where all wastes will be sent for recycling and disposal to appropriate facilities.</li> <li>Compliance to EHSS of EESL –waste management.</li> <li>For each project site, the Contractor shall provide an adequate number (at least 1 per 6 workers, at least 3 for up to 20 construction workers) of self-contained portable / prefabricated toilets or toilets having septic tanks with soak aways.</li> <li>Use of pit latrines will be prohibited as will be open defecation and urination and uncivil use of roads or private premises by construction workers.</li> <li>The contractor must seek to minimize the amount of waste generated, for example, by reusing excavated soil for filling the low-lying areas, and recovering any recyclable wastes that could be reused or sold to recyclers, such as defunct solar panels and oils to the extent possible</li> <li>Construction waste will be inert and can preferably be reused / recycled for aggregates. It must be ensured that this inert waste is not contaminated with solid and hazardous waste by maintaining good housekeeping for collection / storage.</li> <li>All garbage / wastes shall be either recycled or reused. Some wastes like packaging materials, waste panels, used oils waste oil, oily cloths, lubricants, e wastes etc. be either sold to authorized vendors or disposed through SPCB authorized vendors. Records shall be maintained on the wastes generated, transferred to licensed waste operators and disposed including methods of disposal.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	Six monthly		Contractor	EESL

Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<ul style="list-style-type: none"> <li>Burning and dumping of wastes on the side of the road, in drains etc. will be prohibited</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>Village Panchayat has solid waste collection facility within the villages as it is confirmed during consultation. However, few of the proposed project site is used as a solid waste dumping area presently i.e Akholner, Chikalthan, Borgaon.</li> <li>All the above measures shall be applicable for the 12 proposed solar sites considered in this IEE.</li> </ul>				
12	<b>Hazardous waste</b>	<ul style="list-style-type: none"> <li>Inappropriate disposal of hazardous waste</li> <li>Soil and ground water contamination from spill of hazardous waste.</li> <li>Disposal of damaged and replaced solar PV panels</li> <li>Presence of SF<sub>6</sub>, a greenhouse gas in electric power systems for high voltage electrical insulation.</li> <li>The other hazardous substances that may be used are: Lead-containing paints (LCP), - Ozone depleting substance (ODS), - PCBs, - Synthetic mineral fibers (SMF), - Oils and Lubricants, and - Batteries made using hazardous substances, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Storage areas for hazardous materials must be sealed and banded.</li> <li>Solar panels installed must not contain hazardous materials e.g., cadmium, lead or selenium.</li> <li>Solar panel equipment purchased for use on the project is to be accompanied by letter from the manufacturer stating its composition and the leaching potential of any heavy metal content with MDS to be provided to determine how it is to be disposed of at end-of-life.</li> <li>It will be required to select an environmentally safe and sound solar photovoltaic panel ideally from a manufacturer who offers a facility for return of end-of-life equipment.</li> <li>EPC contractor to provide SF<sub>6</sub> leakage detector at each solar panel site.</li> <li>Hazardous wastes must be disposed of by a licensed contractor &amp; records to be maintained</li> <li>Ensure all required licenses / permits are in place where third party hazardous waste disposal &amp; transport companies are to be utilized and that they facilities are audited to ensure that they are fit for purpose.</li> <li>Dispose of used solar PV panels following the requirements of SPCB or through buy-back agreement.</li> <li>Contractor to obtain SPCB permissions for use, handling, storage and transport of hazardous materials and waste like used oil. Compliance to EHSS of EESL –waste management too.</li> <li>All transformers will need to be certified PCB free<sup>50</sup> (use is strictly prohibited)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	Six monthly	Contractor	EESL Regional Solar Team, EESL SDU

<sup>50</sup> In India, insulating oil in transformers is usually required to meet Indian Standard 335:2018 ([https://bis.gov.in/wp-content/uploads/2018/12/IPM\\_IS-335-final.pdf](https://bis.gov.in/wp-content/uploads/2018/12/IPM_IS-335-final.pdf)) – such mineral oil is flammable and also poorly biodegradable.

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<ul style="list-style-type: none"> <li>No asbestos containing materials must be used (use is strictly prohibited)</li> <li>No ozone depleting substances to be used (use is strictly prohibited)</li> <li>No lead-containing paints to be used (use is strictly prohibited)</li> <li>No Synthetic mineral fibers to be used (SMF) (use is strictly prohibited)</li> <li>Transformers are to installed on an impermeable surface with a bunding, provided in the detailed design.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>				
<b>B</b>	<b>Ecological Environmental Management Plan</b>						
<b>13</b>	<b>Ecology &amp; Biodiversity</b>	<ul style="list-style-type: none"> <li>The project site and transmission route are devoid of any kind of higher order vegetation except Bargaon (1 <i>Dalbergia sissoo</i> tree) and Chikalthan (<i>Ficus religiosa</i>, <i>Azadirachta indica</i>, <i>Acacia nilotica</i>, and <i>Butea monosperma</i>. Vegetation is very sparsely distributed, distribution lines will be laid adjacent to existing roads mostly, so no major loss or cutting of trees, pruning of branches can be needed in some sites.</li> <li>There will be minor vegetation loss due to the ground clearance. However, the vegetation is similar in the surrounding area too, and there are no threatened species present, the loss will not have major impact on the flora.</li> <li>There can be impact on the ground nesting birds such as Lapwings, Nightjars, Quails and Francollins. They build</li> </ul>	<ul style="list-style-type: none"> <li>Trees at Bargaon, and Chikalthan site should be avoided from felling. In case of felling of these trees, compensatory plantation of native species near the same location should be done, by obtaining appropriate permissions for tree felling from Forest Department.</li> <li>Most of the resident birds breed in the summers. Therefore, the impact can be mitigated by restricting the construction activity to the non-breeding season of the birds.</li> <li>All project activities shall be undertaken with appropriate noise mitigation measures to avoid disturbance to faunal population in the region.</li> <li>Movement of construction and transport vehicles shall be restricted to dedicated paths to minimize any harm to small animals within the site.</li> <li>Transportation of construction material shall be restricted to daytime hours in order to minimize the man – animal conflict.</li> <li>Speed of the vehicle should be controlled in and around the project area to minimize the accidental death of faunal population.</li> <li>General awareness regarding wildlife among the construction workers shall be enhanced through putting signage, posters, among the staff and labourers.</li> <li>During construction phase, camp and kitchen waste shall be collected in a manner that it does not attract wild animals.</li> <li>Temporary barriers shall be installed on excavated areas. Records of presence of wild animals should be maintained and report to be sent to HQ on monthly basis.</li> <li>Awareness training to be conducted for the workers regarding presence of GIB, vultures &amp; other animals in the project area.</li> </ul>	<ul style="list-style-type: none"> <li>Records of the Monitoring</li> </ul>	Monthly	Contractor	EESL Regional Solar Team, EESL SDU

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
		<p>their nest on the ground. The nesting of these species can get disturbed.</p> <ul style="list-style-type: none"> <li>The noise generated during the project activity can hamper the breeding of the birds present near the project area.</li> <li>Road kill of small mammals and ground dwelling birds.</li> </ul>	<p>Vehicle speed and use of dedicated pathways shall be checked weekly.</p> <ul style="list-style-type: none"> <li>Signages depicting GIB &amp; other key animals as listed in the study should be placed for generating awareness.</li> <li>Records of presence of wild animals should be maintained and report to be sent to HQ on monthly basis.</li> </ul>				
<b>C</b>	<b>General Management Plan</b>	<p>Potential positive impacts relating to employment and job creation with indirect employment creation</p>	<ul style="list-style-type: none"> <li>Prohibition of forced labour for Project and its supply chain.</li> <li>Risk assessment, additional actions (such as audits, review of supplier's audit and inspection records, etc.) may be undertaken to check the adequacy of existing controls and monitoring activities.</li> <li>The contracts between the EESL and all suppliers will include legally binding obligations for them to undertake their contracted scope in accordance with the ESMS (this includes adherence to ADB standards/policy requirements).</li> <li>Localization of employment opportunities.</li> <li>A register of all Project suppliers will be maintained so that a central record is available.</li> <li>Skills training to enable greater employment of local people if possible.</li> <li>Occupational Health and Safety Plan (OHSP).</li> <li>Workers' grievance mechanism as a part of EESL GRM system</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with contractual terms.</li> <li>Number of Project suppliers.</li> <li>Number of risk assessment and audits completed.</li> </ul>	Reported in ESHS reports.	Contractor EESL Regional Team	EESL
14	<b>Socioeconomic</b>	<p>Pressure on existing social infrastructure during the peak of construction activities.</p> <p>Risks to community health from construction activities such as accidents, Noise etc.</p>	<ul style="list-style-type: none"> <li>Development of workers' health and safety procedures ensuring appropriate wash and sanitary facilities for workers with the provision of medical facilities within the site and proper communications with available medical officers in PHCs (public health centres) of the village in case of emergency or consultation.</li> <li>Worker Code of Conduct (EPC).</li> <li>Stakeholder Engagement Plan (SEP).</li> <li>Grievance mechanism.</li> <li>Community health and safety measures developed for construction within relevant management plans (including TTMP, Security and Human Rights Management Plan, elements of the OHSP and EPRP) and updated for operational phase.</li> <li>Development and implementation of EPRP.</li> <li>Communicate Project risk to local communities and address concerns accordingly. Monitor any complaints filed via grievance redress mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>Number of grievances raised and closed.</li> <li>Accidents recorded.</li> </ul>	Reported in ESHS reports.	Contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
	Engagement of local & migrant labour	<ul style="list-style-type: none"> <li>Conflicts between labour and contractor</li> </ul>	<ul style="list-style-type: none"> <li>Provisions related with non-engagement of forced and child labour, gender equity, non-discrimination on employment and opportunity and freedom to express their view in contractor's agreement and HR policy.</li> <li>Contractors shall ensure that labour is being adequately paid by contractors. Also ensure that wages are being paid as per the requirement of minimum wages Act.</li> <li>Contractor shall ensure that labour receive training on health and safety issues involved in the project.</li> <li>Conduct internal audits as when required to monitor the performance of contractor.</li> <li>contractor inform the labour about emergency preparedness plan and communication system to be followed during emergency situation.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>	<ul style="list-style-type: none"> <li>register minimum wages paid to the workers</li> </ul>	<ul style="list-style-type: none"> <li>Periodic audits should be conducted to monitor the contractor engaging the laborers are following proper code of conduct</li> </ul>	Contractor EESL Regional Team	EESL
15	<b>Occupational Health &amp; Safety</b>	<ul style="list-style-type: none"> <li>Potential worker migration could increase risk of introducing spreadable communicable diseases.</li> <li>Risk related to sanitation and welfare</li> </ul>	<ul style="list-style-type: none"> <li>Ensure health screening is being conducted for employees and contractors before contracting workers and on a periodic basis throughout their employment/contract. As part of health and safety induction for workers, provide awareness training on communicable disease prevention. Provide this training on an ongoing basis.</li> <li>Identify opportunities to support local public health campaigns that focus on prevention of communicable diseases.</li> <li>Workers will stop working in extreme natural climatic conditions i.e. heat wave, heavy rain etc.</li> <li>Project Workers should be provided with training on Code of Conduct and internal HR policies as well as potential interactions, conflicts, the community's sensitivities, culture, local traditions, communication and behaviors to prevent any potential conflicts.</li> <li>Health conditions of the workers to be checked daily.</li> <li>Emergency response and preparedness plan to be prepared.</li> <li>Emergency contact details to be displayed and disseminated at all the sites.</li> <li>Develop and implement Project-specific management measures for the Project site area.</li> <li>Ensure provision and maintenance of drinking water and sanitation facilitation for construction workers in accordance with the provision of Contract Labour Act and Building and Other Construction Workers Act.</li> <li>Maintenance of a high standard of housekeeping at all times.</li> </ul>	<ul style="list-style-type: none"> <li>Number of reported health incidents.</li> <li>Training records.</li> <li>Worker Code of Conduct.</li> <li>Records of pollution incidents</li> <li>Surface and groundwater quality reports</li> </ul>	<p>Monthly and regular reporting documents of contractors.</p>	Contractor	EESL Regional Solar Team, EESL SDU

Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
		<ul style="list-style-type: none"> <li>Accidental spill of lubricant, chemicals, or oils.</li> <li>Sediment contamination from hazardous waste disposal, oil spillage of chemicals.</li> <li>Improper handling or work practices and unsafe working conditions at installation which may cause accidents and safety issue</li> <li>Risk related to construction to the construction workers from dust emission, noise exposure, and working with live electricity.</li> </ul>	<p>Provide workers with proper training on associated risks and safe practices for users.</p> <ul style="list-style-type: none"> <li>Provision of impermeable bunded areas for storage of hazardous materials (e.g. fuel) and equipment maintenance to prevent absorption of spillages.</li> <li>Spill equipment materials (sorbent pads, loose sorbent material, etc.) will be kept on hand at each project site for immediately soaking up any leaks or spills that do accidentally occur.</li> <li>Ensure effective work permit system for critical activities such as electrical work and working at height.</li> <li>All work places including switchyard building shall have adequate fire alarms, sand buckets and firefighting equipment's to handle any incident of fire.</li> <li>Sufficient light and ventilation shall be provided for workers working in confined space.</li> <li>All work areas shall have First Aid Kits to manage injuries occurring in the area.</li> <li>EPC contractors to follow CEMP and ensure appropriate health and safety measures (e.g., warning boards for ongoing construction, works boundary fence, and traffic management) are enforced at the sites</li> <li>Ensure that all potentially affected stakeholders know how to contact the company and to file grievances or concerns about security arrangements.</li> <li>Security arrangements at the Project site will be developed in accordance with relevant Guidance.</li> <li>Provision of task-appropriate personal protective equipment (PPE) such as hard hats, safety gloves, safety belt, ear protection to protect from noise exposure, dust masks with additional PPE provided as needed, ensuring it is worn at all times during construction</li> <li>The contractor only allows suitably trained and qualified workers to work on electrical equipment, in relation to connecting the solar power to the grid system, and, at height, with strict adherence to safety and insulation standards including those listed IFC EHS Guidelines on Electric Power Transmission and Distribution.</li> <li>Tagging (ID) system shall be followed to ensure that only a trained person is allowed to do work that requires specific trainings such as working at height</li> <li>For emergency scenarios a qualified first aider and trained fire marshal will always be available on-site with an appropriately equipped first aid kit and appropriate fire extinguisher and other firefighting equipment immediately available for use; first aid and fire procedures will be displayed on-site.</li> <li>The Contractor shall collaborate with the nearest hospital and keep an ambulance stationed at work site with necessary medical</li> </ul>	<ul style="list-style-type: none"> <li>Training Record</li> </ul>	Reported in monthly ESHS reports.	Contractor.	EESL



Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<p>kits and medical practitioner to ensure the necessary emergency care of workers. Contact details for these to be posted on notices on-site.</p> <ul style="list-style-type: none"> <li>To ensure their welfare during their shifts the construction workers will need to have access at the project site to a clean source of potable drinking water, clean toilets (at ratio of 1:6 workers) and hand washing facilities, a clean eating area, and shaded rest area.</li> <li>If an authorized supplier of canned water is not used the drinking water source must be regularly tested to confirm it meets the drinking water standards.</li> <li>The working schedule will need to comply with labor laws and be developed to allow enough breaks and enough rest time in-between the shifts.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> </ul>				
16	Community Health & safety	<ul style="list-style-type: none"> <li>Risk of accident from access to construction site</li> <li>Risk of traffic congestion and road accident</li> <li>Risk of accident from access to solar PV plant</li> <li>Slips, trips, and falls</li> <li>Electrocution</li> <li>Fires</li> <li>Increase noise level by equipment</li> <li>Communicable diseases</li> <li>SEAH (Sexual exploitation, Abuse, and Harassment)</li> <li>Community conflict</li> <li>Violation of socio-cultural values,</li> <li>Social tension and violence</li> </ul>	<ul style="list-style-type: none"> <li>Community health and safety awareness campaigns</li> <li>Traffic control and speed limits.</li> <li>Specifications for noise level for heavy equipment.</li> <li>Sensitization of construction workers to community cultural values</li> <li>Community health and safety awareness campaigns</li> <li>The contractor must not leave any hazardous conditions (e.g., unsigned, unfenced, and unlit open excavations without means of escape and emergency contacts in case an accident occurs) overnight unless absolutely no access by the public can be ensured.</li> <li>Contractors to provide regular awareness programs, trainings, and TBT to the workers regarding HIV/AIDS, other communicable diseases and GBV – SEAH (Sexual Exploitation, Abuse and Harassment) with strict penalties (e.g., immediate removal from site and service) for any non-compliance to an agreed code of practice for contractor and subcontractor workers</li> <li>Conflict situations with communities will be avoided by early consultation before the start of work and keeping open communication channels throughout</li> <li>All work areas shall be properly barricaded / fenced, the contractor will keep the working area and temporary facilities within the confines of the site boundary, follow design drawings, and implement careful construction practices.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> </ul>	<ul style="list-style-type: none"> <li>Monthly and regular reporting documents of EPC contractors</li> </ul>	<ul style="list-style-type: none"> <li>EESL</li> </ul>	

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
<b>Operation Stage</b>							
<b>A Physical Environmental Management Plan</b>							
1	Landuse & Visual impact	<ul style="list-style-type: none"> <li>The visual presence of solar panels and associated infrastructure can affect the landscape's aesthetics, impacting the visual appeal of the area.</li> </ul>	<ul style="list-style-type: none"> <li>Plant screening vegetation or install natural barriers around the perimeter of the solar farm to reduce visual impacts.</li> <li>Consider the aesthetic design of the solar array and associated infrastructure to blend with the surrounding landscape.</li> </ul>	•			EESL O&M Solar Team, EESL SDU
2	Ground water	<ul style="list-style-type: none"> <li>Water is required both for domestic uses (drinking and sanitation needs), of the O&amp;M staff and for panel washing purposes in the sites.</li> <li>Contamination from Maintenance Activities</li> <li>Impermeable surfaces, such as access roads and other infrastructure, can alter natural water infiltration patterns, potentially reducing groundwater recharge</li> </ul>	<ul style="list-style-type: none"> <li>Water conservation measures through recycling and reuse.</li> <li>Adopt an alternative method of cleaning that will require no or minimum quantity of water including use of mops for panel washing or robotic cleaning.</li> <li>Borewells to be fitted with a flow meter to measure the amount of extraction of groundwater if installed</li> <li>Blockage of filter to be checked twice a year during pre-monsoon &amp; post monsoon</li> <li>Conduct regular inspections of storage and handling facilities to identify and address potential leak sources.</li> <li>Spill Prevention and Management</li> <li>Dry/ robotic cleaning or best emerging practices/ process can be adopted for solar panel cleaning.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> </ul>	Analyze groundwater data to detect any changes in quality or levels that could indicate contamination or depletion	Monthly and regular reporting documents of EPC contractors	Contractor	EESL
3	Surface water	<ul style="list-style-type: none"> <li>Accidental spills or leaks of cleaning agents, lubricants, fuels, and other hazardous substances can contaminate nearby surface water bodies</li> </ul>	<ul style="list-style-type: none"> <li>Incorporate infiltration trenches, and permeable pavements to manage stormwater effectively and reduce the velocity of runoff</li> <li>Outline all mitigation measures, monitoring protocols, and response strategies to address potential surface water impacts.</li> <li>Design and implement stormwater management systems, such as retention ponds, swales, and buffer zones wherever possible to manage runoff and prevent contamination of surface water.</li> <li>Ensure the plan is integrated into the overall environmental management system of the project.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>There is a pond and an Irrigation Canal at Amba, seasonal Water Body (Small) at Borgaon site and at Niwagha.</li> </ul>	• Analyze surface water data to detect trends and identify potential sources of contamination.	Monthly and regular reporting documents of contractors	O&M Contractor	EESL O&M Solar Team, EESL SDU

Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
4	Air Quality	<ul style="list-style-type: none"> <li>Maintenance activities, such as landscaping or panel cleaning, may disturb soil and create dust.</li> <li>Dust can be generated from the movement of maintenance vehicles on unpaved roads.</li> </ul>	<ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> <li>Routine inspections and timely repair of equipment, including inverters and transformers, to prevent malfunctioning that could lead to emissions or the release of harmful substances</li> <li>Planting ground cover vegetation around the solar arrays to reduce soil erosion and dust generation.</li> <li>Analysing air quality data to identify trends and potential sources of emissions, allowing for timely corrective actions</li> <li>Regularly reporting air quality monitoring results to regulatory authorities and stakeholders as required</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> </ul>	<ul style="list-style-type: none"> <li>Air quality Monitoring data</li> </ul>	Monthly and regular reporting documents of EPC contractors	Contractor	EESL
5	Noise	<ul style="list-style-type: none"> <li>While the Project will only be operational during daylight hours, as the transformers are permanently energised, they may emit some noise by way of magnetostrixtion hum during nighttime.</li> </ul>	<ul style="list-style-type: none"> <li>Periodical maintenance of plant components such as inverters, transformers and other equipment and vehicles used for transportation to and from the site will be carried out to ensure their good working conditions.</li> <li>Installation of acoustic enclosures of equipment causing radiating noise. Barriers should be located as close to the source or to the receptor location to be effective.</li> <li>Community grievance mechanism.</li> <li>Stakeholder engagement plan</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> </ul>	<ul style="list-style-type: none"> <li>Number of grievances raised and closed.</li> </ul>	Monthly monitoring or in the event of a complaint (grievance)	Contractor	EESL
6	Soil	<ul style="list-style-type: none"> <li>Erosion and degradation of soils related to vehicle traffic and potential contamination of soils.</li> <li>Composting</li> </ul>	<ul style="list-style-type: none"> <li>Confine all vehicles to roadways. Monitor road condition regularly; then repair damaged and rutted roads rather than bypassing damaged sections.</li> <li>Monitor erosion controls and repair as needed. Where possible, maintain grass cover</li> <li>Reduce wastes to the extent possible and maximize re-use of materials with recycling opportunities investigated by the O&amp;M Contractor. Collect, segregate and store all waste and garbage before disposal at the designated site or authorized vendors.</li> <li>Promote composting of organic waste to reduce landfill use and improve soil health.</li> <li>Clean up and store oily and chemical waste and contaminated material before transport to the designated disposal site to reduce risk of soil and groundwater contamination.</li> <li>The panels and supports will be dismantled or replaced with new ones and steel and other useful materials will be recycled. Inert</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	Yearly and regular reporting documents of contractors	Contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
7	Transport and Access	<ul style="list-style-type: none"> <li>Limited vehicular movement is anticipated during operational phase considering only the daily movement of project personnel any impacts arising from the same can be effectively addressed</li> </ul>	<p>materials which cannot be recycled will be taken to a suitable disposal site.</p> <ul style="list-style-type: none"> <li>Procedures will be in place for handling and storing redundant/broken PV panels on the Project site (for example, ensuring these are banded or stored in a covered area of the site).</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> <li>Use of horns near the villages along the access road to villages, main plant and internal roads shall be restricted</li> <li>All the vehicles entering the access roads and plant shall have Pollution under Control (PUC) certificates.</li> <li>The speed limit in the internal roads shall be restricted to 25 km/hr. Proper warning signs and road safety awareness posters should be displayed to create road safety awareness among the personnel accessing the site.</li> <li>Periodic Road Safety and Traffic Management campaigns and awareness sessions shall be carried out among the villagers and the plant workers/personnel to develop road safety awareness among the people likely to be impacted by the project.</li> <li>The drivers shall be given an induction on road safety and traffic management policy.</li> <li>Implement a "No Drug No Alcohol" Policy to prevent road accidents/incidents.</li> <li>A permanent parking lot shall be provided within the main plant site (in individual work areas) and the associated facilities.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>All the above measures shall be applicable for the 12 new sites considered in this IEE.</li> </ul>		Monthly and regular reporting documents of contractors	Contractor	EESL
8	Use of Hazardous Material	<ul style="list-style-type: none"> <li>Spillage of oils, chemicals, or fuels on site.</li> <li>Soil pollution from hazardous materials</li> </ul>	<ul style="list-style-type: none"> <li>Regular checks of drainage systems to ensure containment and efficient operation.</li> <li>Hazardous waste shall be stored with secondary containment and spill proof impervious surface.</li> <li>Broken solar panels shall be collected in closed containers and disposed as per the standards. Logbook will be maintained of waste generated and its disposal routes</li> <li>Regular maintenance of transformers</li> <li>Regular daily visual inspections and observations at solar plant sites for leaks and spills.</li> <li>Provision of trainings to O&amp;M staff on hazardous materials management</li> </ul>		Six Monthly and regular reporting documents of contractors	O&M Contractor	EESL O&M Solar Team, EESL SDU

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<ul style="list-style-type: none"> <li>At the end of life ensure that the equipment containing SF6 and other hazardous wastes are appropriately disposed through a SPCB certified vendor</li> <li>Disposal of oil, oil containing equipment (e.g., transformers) and batteries to be as per the Hazardous and Other Wastes (Management, &amp; Trans-boundary Movement) Rules.</li> <li>Hazardous wastes and end of life e-wastes shall be either sent to hazardous waste treatment plants through approved vendors per E-Waste (Management) Rules, 2022.</li> <li>Periodic EHS audits shall be conducted to monitor the same.</li> </ul> <p>Site specific Mitigation Measures:</p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>				
9	Solid waste	<ul style="list-style-type: none"> <li>Contamination of land and soil</li> </ul>	<ul style="list-style-type: none"> <li>Periodic collection and disposal of Solid waste from the project site.</li> <li>Domestic waste shall be composted. Recyclable wastes viz. paper, plastic, glass, scrap metal waste etc. shall be properly segregated and stored in designated waste bins/containers and periodically sold to local recyclers.</li> <li>Log record of waste generated to be maintained.</li> <li>Awareness shall be created among the project personnel.</li> <li>EPC contractor is required to clear all the debris / scrap / equipment in line with Government of India's guidelines and rules for waste management and disposal of waste, at the end of the 25 years of O&amp;M period at no extra cost to EESL. It will also be necessary to remove it during the lifetime of the project rather than lettering the debris / scrap / equipment build up on site.</li> <li>Ensure recycling of solar modules at the end of their useful life through an approved facility or contractor</li> <li>Ensure reusable materials are transferred to an approved contractor or off-taker</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>		Periodic EHS audits should be conducted to monitor the same	O&M Contractor	EESL O&M Team EESL SDU
10	Sanitary Arrangements and Generation of Wastewater including Cleaning of Solar panel	<ul style="list-style-type: none"> <li>Chemicals used in washing</li> <li>Discharge of PV module wash water, domestic wastewater, sewage.</li> </ul>	<ul style="list-style-type: none"> <li>Necessary permits for use of water, including groundwater where applicable, shall be obtained in advance of beginning of operations.</li> <li>The waste water to be properly channelized through drains and stored in settling tank.</li> <li>Off-site disposal of sewage (septic tank sludge) by appropriate</li> </ul>		Monthly and regular reporting documents of contractors	O&M Contractor	EESL O&M Solar Team, EESL SDU

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
		<ul style="list-style-type: none"> <li>Wastewater from cleaning of panels during operation phase.</li> <li>Pollution of water and soil</li> <li>Open defecations by workers and unhygienic site conditions</li> </ul>	<p>waste collection and disposal authority</p> <ul style="list-style-type: none"> <li>Regular maintenance of site drainage system to ensure efficient operation.</li> <li>Treatment of wash water before discharge.</li> <li>All discharges will comply with national and IFC EHS guidelines</li> <li>Compliance to EHSS of EESL (SOP 02 –waste management)</li> <li>Ensure that toilets are fully functioning and regularly cleaned.</li> <li>It is advisable to consider reusing the treated water for washing of the solar panels</li> <li>Septic tank sludge will need to be removed and disposed with the assistance of the Local authorized Bodies.</li> <li>Records of pollution incidents, Effluent discharge quality wherever required should be maintained.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>				
<b>B</b>	<b>Ecological &amp; Biodiversity Management plan</b>	<ul style="list-style-type: none"> <li>Risk of collision and electrocution to birds due to the DL connecting the solar plants with the SS.</li> <li>"Lake-view Effect" can lead to collision of aquatic birds with the solar panels.</li> </ul>	<ul style="list-style-type: none"> <li>Higher design standards for distribution poles and towers.</li> <li>Change routes of overhead lines along roads away from trees, and use covered and/or insulated conductors and more underground cables.</li> <li>At present there is no definite mitigation measure for Lake-view effect, it is still under research. It is likely there will be some solution, it will be adopted in future.</li> </ul> <p><b>Site Specific Mitigation Measure:</b></p> <ul style="list-style-type: none"> <li>Bird Diverters at Akolner, Amba, Bargaon, Tilawani, Digrass, and Vetane is recommended. The bird diverters should be installed as per the recommendations of Wildlife Institute of India ("Marking earth wire with 1 diverter at every 10m, and marking conductors with 1 diverter at 15 m in a staggered way, such that power-line as a whole has at least 1 diverter every 5-6 m.") The technical specifications of the bird diverters should be in accordance with the recommendations of the Central Electricity Authority (January 2021).</li> <li>Undergrounding of new DL is recommended at Hivazare and Chikalthan. Another alternative can be use of covered insulators for the distribution lines.</li> <li>Any potential bird collisions with the solar panels will be monitored and noted. A bird protection plan will be produced that will provide the protocol for monitoring (which will be standardized, to best</li> </ul>	Number of bird carcasses identified during inspections.	Monthly ESHS reporting.	Contractor	EESL
11	Ecology & Biodiversity	<ul style="list-style-type: none"> <li>The project may act as a potential barrier which may affect the dispersal/movement of birds.</li> </ul>					

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
12		<ul style="list-style-type: none"> <li>international practice and appropriate for detailed analysis of data) will be adaptive so that it can react to changes in noted collisions.</li> <li>Plantation of native, fast-growing trees in the nearby barren areas may provide alternate habitat to birds, and also maintaining ecological balance.</li> </ul>	<ul style="list-style-type: none"> <li>Carcass management plan for Akolner, Hivazare, Amba, Niwagha, Budh, Vetane and Utagi.</li> <li>Contractor must assist the villagers in creating a plan for disposing of carcasses that complies with CPCB regulations<sup>51</sup>. The EPC contractor can prevent scavengers from being present at or close to the site with the use of an efficient carcass disposal management, which will lessen any unfavourable interactions between the scavengers and the project infrastructure.</li> <li>Trees allowed growing up to a height within the RoW by maintaining adequate clearance between top of tree and the conductor as per the regulations</li> <li>Trees that can survive pruning to comply should be pruned instead of clearing.</li> <li>Felled trees and other pruned vegetation to be disposed of as authorized by the statutory bodies.</li> <li>Necessary permits from local and state forest authority should be obtained by contractor prior to any tree felling or trimming.</li> </ul>	Decrease in number of cattle carcasses in the project area	Six monthly monitoring report	O&M Contractor	EESL O&M Solar Team, EESL SDU
	Trimming & cutting of trees within RoW	<ul style="list-style-type: none"> <li>Fire hazards</li> <li>Loss of vegetation or loss of avifauna</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>			Contractor	EESL
<b>C</b>	<b>General Management Plan</b>						
13	Socioeconomic	<ul style="list-style-type: none"> <li>Positive impact</li> </ul>	<ul style="list-style-type: none"> <li>Employment shall be provided to local people wherever possible, especially as unskilled construction workers and security guards.</li> </ul>	CSR Activities shall be documented	Periodic audit	O&M Contractor.	EESL Solar O&M Team and SDU
	Social Responsibility	<ul style="list-style-type: none"> <li>Community Empowerment</li> </ul>	<ul style="list-style-type: none"> <li>Developmental needs and expectations (such as employment in the project or up-gradation of educational, health care facilities, training, cultural property and infrastructure) of local communities shall be identified through the Gram Panchayat, villagers and local administration.</li> </ul>				
	Community Health and safety	<ul style="list-style-type: none"> <li>Increased prevalence of sexually transmitted diseases including HIV/AIDS</li> <li>Slips, trips and falls, fires</li> </ul>	<ul style="list-style-type: none"> <li>O&amp;M contractor's staff shall be given training in relation to preventing the spread of HIV/AIDS, and other communicable diseases.</li> </ul>	<ul style="list-style-type: none"> <li>Records of health and safety incidents.</li> </ul>	Monthly and regular reporting documents of contractors.	Contractor	EESL

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
		No major health and safety issues are envisaged during O&M stage.	<ul style="list-style-type: none"> <li>No water shall be allowed to be stagnated and become breeding grounds for mosquitoes</li> <li>No packaging materials and other solid wastes generated during O&amp;M shall be disposed outside the boundary and the contractor shall dispose it either through an authorized vendor or through local municipal authorities by paying a service fee</li> <li>Ensure electrical components are properly isolated</li> <li>Proper GM register shall be maintained for any health and safety issues</li> </ul>				
14	Occupational Health & Safety	<ul style="list-style-type: none"> <li>Electrocution</li> <li>Firing due to short-circuit</li> <li>Possible injuries associated with working at height</li> <li>Diseases due to unhygienic condition</li> <li>Labor and other worker's safety</li> <li>Risk related to O&amp;M</li> <li>Risk related to sanitation and welfare</li> <li>Improper handling or work practices and unsafe working conditions at installation which may cause accidents and safety issue</li> </ul>	<ul style="list-style-type: none"> <li>Operators are provided with adequate PPEs depending upon nature of the operation and occupation health and safety risks associated with it viz. electrical maintenance activities, replacement of solar panels etc.</li> <li>GIIP HSE Practice to be employed on site.</li> <li>Clear marking of work site hazards and training in recognition of hazard symbols</li> <li>Ensure effective work permit system following the laws of the state and central level for critical activities such as electrical work and working at height</li> <li>all employees will be trained in electrical safety and First Aid</li> <li>Periodic medical examination shall be undertaken for workers including contractor and subcontractor of the plant.</li> <li>An EHS coordinator shall effectively implement and monitor the OHS Management System and ESMP.</li> <li>Ensure that all electrical equipment have visual and written warning signages including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution will be installed by the contractor as part of the works</li> <li>Plant to be fenced with locked gates and restricted access</li> <li>EPC contractor to ensure emergency procedures are posted and fire extinguishers available at the location of the switchgear and in other places in the plant in the event of a fire.</li> <li>EPC contractor to provide regular training and tool box talks to its staff at solar plant site on OHS, fire hazard and first aid</li> <li>All cases of fire accidents to be reported by EPC contractor to EESL</li> <li>Implementation of a Fire Safety Plan prior to starting activities at the site</li> <li>Leakage current if present on the PV array against earth. Check the earthing and equipotential bonding, module wiring etc.</li> <li>Maintenance of a high standard of housekeeping at all times</li> <li>Log books shall be maintained for any health and safety issues.</li> <li>Standard Operation Procedures (SOPs) shall be developed for operational activities.</li> </ul>	<ul style="list-style-type: none"> <li>Development of site emergency response plans</li> <li>Pollution prevention plan</li> </ul>	<ul style="list-style-type: none"> <li>Reported in monthly ESHS reports.</li> </ul>	O&M Contractor	EESL Solar O&M Team and SDU



Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
15	Distribution line	<ul style="list-style-type: none"> <li>Exposure to electromagnetic interference</li> </ul>	<ul style="list-style-type: none"> <li>Occupational Health and Safety plan and Emergency Response plan should be developed</li> <li><b>Site specific Mitigation Measures:</b></li> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> <li>Distribution line design to comply with the limits of electromagnetic interference from overhead power line.</li> <li>Distribution line alignment is away from local community and distribution line design is taken care for all safety related issue</li> </ul>	Technical specifications	<ul style="list-style-type: none"> <li>Monthly and regular reporting documents of contractors</li> </ul>	Contractor	EESL
16	Climate Change Considerations	<ul style="list-style-type: none"> <li>A rise in air temperatures and irregular rainfall events could impact on water availability</li> <li>GHG Emission</li> </ul>	<ul style="list-style-type: none"> <li>Water conservation measures should be implemented including recycling of water where possible (for example, use of grey water for dust-dampening measures as required).</li> <li>Adopt good SF6 management during operation in accordance international good practice.</li> <li>Record for any leakage</li> <li><b>Site specific Mitigation Measures:</b></li> <li>No site-specific measures needed and all the above measures shall be applicable for the 12 proposed project sites.</li> </ul>	<ul style="list-style-type: none"> <li>Quantity of water used on site.</li> <li>Quantity of water reused on the Project site.</li> <li>Monitoring record</li> </ul>	<ul style="list-style-type: none"> <li>Reported in monthly ESHS reports.</li> <li>Communicated prior to construction.</li> <li>Quarterly operational reports.</li> </ul>	Contractor.	EESL Solar O&M Team and SDU
1	Topography and drainage	<ul style="list-style-type: none"> <li>Erosion of soil due to surface disturbance and exposure from removal of structures</li> <li>Exposure of land surface.</li> <li>Water quality impact from surface run-of</li> </ul>	<ul style="list-style-type: none"> <li>Ensure minimal surface area disturbance during decommissioning.</li> <li>Grading activities to be limited to areas previously disturbed</li> <li>Ensure disturbed areas are levelled, restored, and re-vegetated in order to minimize soil erosion.</li> <li>Ensure site is regraded to leave it smooth, regular and maintain natural drainage patterns</li> <li>Ensure open gaps from the removal of structures in the ground are backfilled with topsoil and subsoil and graded to ensure adequate drainage.</li> <li>Ensure appropriate erosion control measures are adopted according to best practices including soil decompaction and re-contouring to blend with the surrounding areas.</li> </ul>		<ul style="list-style-type: none"> <li></li> </ul>	DISCOM	DISCOM

<sup>52</sup> As per the agreement with DISCOM, EESL is required to simply hand over the assets and the solar power plant in operating condition to the DISCOM at the end of the lease period. DISCOM may decide to either decommission the plant or to continue with the plant. However, impacts and mitigation measures are still provided as a logical corollary to the O&M period.

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
			<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and the above measures are applicable for all the 12 proposed solar sites.</li> <li>Use of well-maintained vehicles and equipment</li> </ul>				
2	Ambient Air Quality	<ul style="list-style-type: none"> <li>Localized gaseous emissions from machinery and vehicles.</li> <li>Fugitive dust</li> <li>Emissions in adjacent areas</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures including the measures adopted during construction phase are applicable for all the 12 sites.</li> <li>Ensure work is restricted to day-time hours</li> <li>Enforcement of vehicle speed limits</li> <li>Strict controls of vehicle routing Vehicles/equipment to be fitted with silencers</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	DISCOM	DISCOM
3	Noise and Vibration	<ul style="list-style-type: none"> <li>Temporary elevated noise levels from equipment and vehicular traffic</li> <li>Use of heavy equipment and vehicles</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures including the measures adopted during construction phase are applicable for all the 12 sites.</li> <li>Ensure adequate spill protection is employed during decommissioning.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	DISCOM	DISCOM
4	Soil (Oils, fuels, and chemicals (spills and leaks)	<ul style="list-style-type: none"> <li>Accidental spill of lubricant, chemicals, or oils</li> <li>Sediment contamination</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures including the measures adopted during construction phase are applicable for all the 12 sites.</li> </ul>	<ul style="list-style-type: none"> <li>Records of pollution incidents soil quality</li> </ul>		DISCOM	DISCOM
5	Transport & Distribution line	<ul style="list-style-type: none"> <li>Habitat disruption</li> <li>Health risks</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructures such as roads and Distribution line are being handed over to the DISCOM for use or further decision. All the safety measures should be followed.</li> </ul>			DISCOM	DISCOM
6	Sanitary arrangements and	<ul style="list-style-type: none"> <li>Disposal of untreated effluent (wastewater)</li> <li>Contamination of water bodies.</li> </ul>	<p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures including the measures adopted during construction phase are applicable for all the 12 sites</li> </ul>	<ul style="list-style-type: none"> <li>Records of pollution incidents</li> <li>Effluent discharge quality</li> </ul>		DISCOM	DISCOM

Sl. No	Aspect/Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
7	waste generation and Hazardous waste generation	<ul style="list-style-type: none"> <li>Site contamination from litter and ground water contamination from spill of hazardous waste</li> </ul>	<ul style="list-style-type: none"> <li>Ensure recycling of solar modules at the end of their useful life through an approved facility or contractor</li> <li>Ensure reusable materials are transferred to an approved contractor or off-taker</li> <li>Ensure complete removal of waste materials and adequate disposal through an approved contractor.</li> <li>Broken up concrete and removal of them to landfill site.</li> <li>All solar PV modules after their end of life (when they become defective / non-operational / non-repairable) are to be disposed in accordance with the "E-waste Management Rules, 2022" notified by the Government of India and as revised and amended from time to time. Applicable for all the sites.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures including the measures adopted during construction phase are applicable for all the 12 sites.</li> </ul>			DISCOM	DISCOM
8	Biodiversity	<ul style="list-style-type: none"> <li>Solar panels may contain hazardous materials such as cadmium and lead, which can pose risks to wildlife if not properly managed during decommissioning. Research focusing on the environmental risks associated with the disposal and recycling of solar panels is critical.</li> <li>Habitat Loss and Fragmentation: Decommissioning of solar plants can lead to habitat loss and fragmentation, affecting bird species that may have adapted to or used the site for nesting or foraging. This disruption can further exacerbate pressures on already declining bird populations.</li> </ul>	<ul style="list-style-type: none"> <li>Proper planning during decommissioning can include monitoring and managing the transition to minimize disruption to local bird populations. This might involve phased decommissioning to allow birds to adapt to changes gradually.</li> <li>To mitigate potential negative impacts on birds during decommissioning, it's important for developers and conservationists to work together to assess local bird populations and habitats, and to implement strategies that minimize disturbance and support biodiversity in the area.</li> </ul>			DISCOM	DISCOM
9	Occupational health and safety	<ul style="list-style-type: none"> <li>Improper handling or work practices and unsafe working conditions during decommissioning of equipment which may cause accidents and safety issue</li> </ul>	<ul style="list-style-type: none"> <li>Use of personal protective equipment for workers</li> <li>Provision of adequate fire-fighting equipment onsite</li> <li>Emergency response/ evacuation plan • Implementation of HSE procedures as a condition of contract</li> <li>Implementation of a Fire Safety Plan prior to starting activities at the site • Clear marking of worksite and hazard recognition</li> </ul>			DISCOM	DISCOM

Sl. No	Aspect/ Parameters	Potential Impact	Action/Mitigation measures	Key performance Indicator	Timelines/Frequency of Monitoring	Responsibility	
						Implementation	Monitoring
10	Community health and Safety	<ul style="list-style-type: none"> <li>Risk related to decommissioning works</li> <li>Risk related to sanitation and welfare</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a high standard of housekeeping at all times.</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and all the above measures including the measures adopted during construction phase are applicable for all the 12 sites.</li> </ul>				
		<ul style="list-style-type: none"> <li>Road accidents</li> <li>Increased traffic, heavy equipment, and machinery transport</li> <li>Increase noise level by equipment</li> <li>Slips, trips, and falls</li> <li>Fires</li> </ul>	<ul style="list-style-type: none"> <li>Ensure electrical components are properly isolated and demolished</li> <li>Public health awareness</li> <li>Traffic control and speed limits</li> <li>Schedule of traffic to avoid peak hours on major local roads</li> <li>Implement traffic management plan optimize/ schedule material movement to non-peak hours</li> <li>Specifications for noise level for heavy equipment</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and the above measures are applicable for all the 12 sites.</li> </ul>	DISCOM	DISCOM		
11	Employment Income/ Livelihoods	<ul style="list-style-type: none"> <li>Reversal of land use from construction and operation</li> <li>Increased traffic, heavy equipment, and machinery transport</li> <li>Influx of skilled and unskilled workers</li> <li>Disruption of community infrastructure (electricity, water supply, etc.).</li> <li>Deterioration of access roads</li> </ul>	<ul style="list-style-type: none"> <li>Schedule of traffic to avoid peak hours on major local roads</li> <li>Implement traffic management plan optimize/ schedule material movement to non-peak hours</li> <li>Maintain minimal interference with community infrastructure</li> <li>Replacement of any damaged infrastructure</li> <li>Implement a code of conduct for construction workers</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and the above measures are applicable for all the 12 sites.</li> </ul>				
		<ul style="list-style-type: none"> <li>Loss of livelihood due to disengagement of personnel.</li> <li>adverse impact on ongoing ancillary service businesses associated with this project in project influenced villages and surrounding areas owing to cessation of core project activity.</li> <li>Availability of land for alternative uses</li> </ul>	<ul style="list-style-type: none"> <li>Localization of employment opportunities</li> <li>Ensure early disengagement notification</li> <li>Relevant government agencies together with stakeholders to work out processes for land relinquishment or alternative uses as at the time of decommissioning</li> </ul> <p><b>Site specific Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>No site-specific measures needed and the above measures are applicable for the proposed 12 solar sites.</li> </ul>	DISCOM	DISCOM		

CPHEEO: Central public Health & Environmental Engineering Organization; EPC: Engineering, Procurement & Construction, GIB: Great Indian Bustard; NOC: No objection Certificate; O&M: Operation & Maintenance; SEMR: Six months environmental Monitoring Report; TBT: Tool Box Talks; TMT: Traffic & Transport management plan; SEP: Stakeholder engagement plan;

**Note:** In case of termination of EPC contract with the existing EPC contractor, till a new EPC contractor is appointed all the responsibilities shall vest with EESL.

# Section 7 - General Conditions of Contract

These General Conditions of Contract (GCC) are based on the Model Form of International Contract for Process Plant Construction published by the Engineering Advancement Association of Japan (ENAA). The Multilateral Development Banks (MDBs) participating in the procurement harmonization process gratefully acknowledge the contribution of ENAA to the advancement of good contracting practices by its borrowers. The GCC contain general clauses to be applied on all contracts. The GCC in this section, read in conjunction with the Special Conditions of Contract in Section 8 and other documents listed therein, should be a complete document expressing all the rights and obligations of the contracting parties. The General Conditions herein shall not be altered.

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# General Conditions of Contract

## A. Contract and Interpretation

### 1. Definitions

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

“Contract” means the Contract Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term “the Contract” shall in all such documents be construed accordingly.

“Contract Documents” means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).

“GCC” means the General Conditions of Contract.

“SCC” means the Special Conditions of Contract.

“day” means calendar day.

“year” means 365 days.

“month” means calendar month.

“Party” means the Employer or the Contractor, as the context requires.

“Employer” means the person named as such in the SCC and includes the legal successors or permitted assigns of the Employer.

“Project Manager” means the person appointed by the Employer in the manner provided in GCC Subclause 17.1 (Project Manager) hereof and named as such in the SCC to perform the duties delegated by the Employer.

“Contractor” means the person(s) named as Contractor in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

“Contractor’s Representative” means any person nominated by the Contractor and approved by the Employer in the manner provided in GCC Subclause 17.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

“Construction Manager” means the person appointed by the Contractor’s Representative in the manner provided in GCC Subclause 17.2.4.

“Subcontractor,” including manufacturers, means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant, is sub-contracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns.

“Dispute Board” means the person or persons named as such in the SCC appointed by agreement between the Employer and the Contractor to make a decision on or to settle any dispute or difference between the

Employer and the Contractor referred to him or her by the parties pursuant to GCC Subclause 45.1 (Dispute Board) hereof.

“The Bank” means the financing institution named in the SCC.

“Contract Price” means the sum specified in Article 2.1 (Contract Price) of the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

“Facilities” means the Plant to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.

“Plant” means permanent plant, equipment, machinery, apparatus, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GCC Subclause 7.3 hereof), but does not include Contractor’s Equipment.

“Installation Services” means all those services ancillary to the supply of the Plant for the Facilities, to be provided by the Contractor under the Contract, such as transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of Contractor’s Equipment and the supply of all construction materials required), installation, testing, precommissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc. as the case may require.

“Contractor’s Equipment” means all facilities, equipment, machinery, tools, apparatus, appliances, or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not include Plant, or other things intended to form or forming part of the Facilities.

“Country of Origin” means the countries and territories eligible under the rules of the Bank as further elaborated in the SCC.

“Site” means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.

“Effective Date” means the date of fulfillment of all conditions stated in Article 3 (Effective Date) of the Contract Agreement, upon which the period until the Time for Completion shall be counted from.

“Time for Completion” means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) is to be attained, as referred to in GCC Clause 8 and in accordance with the relevant provisions of the Contract.

“Completion” means that the Facilities (or a specific part thereof where specific parts are specified in the Contract) have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Precommissioning of the Facilities or such specific part thereof has been completed, and that the Facilities or specific part thereof are ready for Commissioning as provided in GCC Clause 24 (Completion) hereof.



“Precommissioning” means the testing, checking and other requirements specified in the Employer’s Requirements that are to be carried out by the Contractor in preparation for Commissioning as provided in GCC Clause 24 (Completion) hereof.

“Commissioning” means operation of the Facilities or any part thereof by the Contractor following Completion, which operation is to be carried out by the Contractor as provided in GCC Subclause 25.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

“Guarantee Test(s)” means the test(s) specified in the Employer’s Requirements to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement in accordance with the provisions of GCC Subclause 25.2 (Guarantee Test) hereof.

“Operational Acceptance” means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor’s fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GCC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GCC Clause 25 (Commissioning and Operational Acceptance) hereof.

“Defect Liability Period” means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC Clause 27 (Defect Liability) hereof.

- 2. Contract Documents**      2.1 Subject to Article 1.2 (Order of Precedence) of the Contract Agreement, all documents forming part of the Contract (and all parts thereof) are intended to be correlative, complementary and mutually explanatory. The Contract shall be read as a whole.
- 3. Interpretation**      3.1 In the Contract, except where the context requires otherwise,
- (a) words indicating one gender include all genders;
  - (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
  - (c) provisions including the word “agree,” “agreed,” or “agreement” require the agreement to be record in writing;
  - (d) the word “tender” is synonymous with “bid,” “tenderer” with “Bidder,” and “tender documents” with “Bidding Documents;” and
  - (e) “written” or “in writing” means handwritten, typewritten, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

3.2 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.

“Incoterms” means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1<sup>er</sup>, 75008 Paris, France.

3.3 Entire Agreement

Subject to GCC Subclause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

3.4 Amendment

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

3.5 Independent Contractor

The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture, or other joint relationship between the parties hereto. Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives, or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives, or Subcontractors and the Employer.

3.6 Non-Waiver

3.6.1 Subject to GCC Subclause 3.6.2 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, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.6.2 Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, must be 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.

3.7 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.

3.8 Country of Origin

“Origin” means the place where the plant and component parts thereof are mined, grown, produced, or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is

substantially in its basic characteristics or in purpose or utility from its components.

- 4. Communications** 4.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests, and discharges, these communications shall be
- (a) in writing and delivered against receipt; and
  - (b) delivered, sent, or transmitted to the address for the recipient's communications as stated in the Contract Agreement.

When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Project Manager, a copy shall be sent to the Project Manager or the other Party, as the case may be.

- 5. Law and Language** 5.1 The Contract shall be governed by and interpreted in accordance with laws of the country specified in the SCC.
- 5.2 The ruling language of the Contract shall be that stated in the SCC.
- 5.3 The language for communications shall be the ruling language unless otherwise stated in the SCC.

- 6. Fraud and Corruption** 6.1 ADB's Anticorruption Policy (1998, as amended to date) requires Borrowers (including beneficiaries of ADB-financed activity), as well as Contractors, Subcontractors, manufacturers, and Consultants 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) "abuse" means theft, waste or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;
    - (vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations;
    - (vii) "obstructive practice" means (a) deliberately destroying, falsifying, altering or concealing of evidence material to an

ADB investigation, or deliberately making false statements to investigators, with the intent to impede an ADB investigation; (b) threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to a Bank investigation or from pursuing the investigation; or (c) deliberate acts intended to impede the exercise of ADB's contractual rights of audit or inspection or access to information; and

(viii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vii) above and the following: 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, including declaring ineligible, either indefinitely or for a stated period of time, to participate<sup>1</sup> 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 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 performance and to have them audited by auditors appointed by ADB.

6.2 All Bidders, consultants, contractors, suppliers and other third parties engaged or involved in ADB-related activities have a duty to cooperate fully in any screening or investigation when requested by ADB to do so. Such cooperation includes, but is not limited to, the following:

- (a) being available to be interviewed and replying fully and truthfully to all questions asked;
- (b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

<sup>1</sup> 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).

- (c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;
  - (d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);
  - (e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and
  - (f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.
- 6.3 All Bidders, consultants, contractors and suppliers shall ensure that, in its contract with its sub-consultants, sub-contractors and other third parties engaged or involved in ADB-related activities, such sub-consultants, sub-contractors and other third parties similarly undertake the foregoing duty to cooperate fully in any screening or investigation when requested by ADB to do so.

## **B. Subject Matter of Contract**

### **7. Scope of Facilities**

- 7.1 Unless otherwise expressly limited in the Employer's Requirements, the Contractor's obligations cover the provision of all Plant and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, pre-commissioning and delivery) of the Plant and the installation, completion, and commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes, and any other documents as specified in the section Employer's Requirements. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor, materials, equipment, spare parts (as specified in GCC Subclause 7.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures, and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage, except for those supplies, works, and services that will be provided or performed by the Employer, as set forth in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement.
- 7.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.
- 7.3 In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the SCC and the provisions, if any, specified in the SCC. However, the identity, specifications, and quantities of such spare parts and the terms

and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedule No. 6, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price therefore and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.

**8. Time for Commencement and Completion**

8.1 The Contractor shall commence work on the Facilities within the period specified in the SCC and without prejudice to GCC Subclause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Appendix 4 (Time Schedule) to the Contract Agreement.

8.2 The Contractor shall attain Completion of the Facilities or of a part where a separate time for Completion of such part is specified in the Contract, within the time stated in the SCC or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.

**9. Contractor's Responsibilities**

9.1 The Contractor shall design, manufacture, including associated purchases and/or subcontracting, install, and complete the Facilities in accordance with the Contract. When completed, the Facilities should be fit for the purposes for which they are intended as defined in the Contract.

9.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities, including any data as to boring tests provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site if access thereto was available and of other data readily available to it relating to the Facilities as of the date 28 days prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

9.3 The Contractor shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the country where the Site is located, which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under GCC Subclause 10.3 hereof and that are necessary for the performance of the Contract.

9.4 The Contractor shall comply with all laws in force in the country where the Facilities are to be implemented. The laws will include all local, state, national, or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC Subclause 10.1 hereof.

9.5 Any plant and services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GCC Clause 1 (Country of Origin). Any Subcontractors retained by the Contractor shall be from a country as specified in GCC Clause 1 (Country of Origin).

- 9.6 The Contractor shall permit ADB to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by ADB, if so required by ADB.
- 9.7 If the Contractor is a joint venture or consortium of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfillment of the provisions of the Contract and shall designate one of such persons to act as a leader with authority to bind the joint venture or consortium. The composition or the constitution of the joint venture or consortium shall not be altered without the prior consent of the Employer.

#### 9.8 Protection of the Environment

- (a) The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise, and other results of his operations.
- (b) The Contractor shall ensure that emissions, surface discharges, and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

### **10. Employer's Responsibilities**

- 10.1 All information and/or data to be supplied by the Employer as described in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement shall be deemed to be accurate, except when the Employer expressly states otherwise.
- 10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.
- 10.3 The Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities, or public service undertakings in the country where the Site is located which (a) such authorities or undertakings require the Employer to obtain in the Employer's name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract, and (c) are specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement.
- 10.4 If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals, and/or licenses necessary for the execution of the Contract from all local, state, or national government authorities, or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

- 10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all raw materials, utilities, lubricants, chemicals, catalysts, other materials and facilities; and shall perform all work and services of whatsoever nature, including those required by the Contractor to properly carry out Pre-commissioning, Commissioning, and Guarantee Tests, all in accordance with the provisions of the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement at or before the time specified in the program furnished by the Contractor under GCC Subclause 18.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.
- 10.6 The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GCC Subclause 24.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GCC Subclause 25.2.
- 10.7 All costs and expenses involved in the performance of the obligations under this GCC Clause 10 shall be the responsibility of the Employer, except those incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GCC Subclause 25.2.
- 10.8 In the event that the Employer shall be in breach of any of his obligations imposed by the Contract, then the additional cost reasonably incurred by the Contractor in consequence thereof shall be added to the Contract Price.

### **C. Payment**

- 11. Contract Price**
- 11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.
- 11.2 Unless an adjustment clause is provided for in the SCC, the Contract Price shall be a firm lump sum not subject to any alteration, except in the event of a Change in the Facilities or as otherwise provided in the Contract.
- 11.3 Subject to GCC Subclauses 9.2, 10.1, and 35 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.
- 12. Terms of Payment**
- 12.1 The Contract Price shall be paid as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement and in the Appendix (Terms and Procedures of Payment) to the Contract Agreement, which also outlines the procedures to be followed in making application for and processing payments.
- 12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.
- 12.3 In the event that the Employer fails to make any payment by its respective due date or within the period set forth in the Contract, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the rate(s) shown in the Appendix (Terms and Procedures of Payment) to the Contract Agreement for the period of



delay until payment has been made in full, whether before or after judgment or arbitration award.

- 12.4 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the Appendix (Terms and Procedures of Payment) to the Contract Agreement, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated in the Contractor's bid.

### **13. Securities**

#### **13.1 Issuance of Securities**

The Contractor shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner, and form specified below.

#### **13.2 Advance Payment Security**

13.2.1 The Contractor shall, within 28 days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with the Appendix (Terms and Procedures of Payment) to the Contract Agreement, and in the same currency or currencies.

13.2.2 The security shall be in the form provided in the Bidding Documents or in another form acceptable to the Employer. The amount of the security shall be reduced in proportion to the value of the Facilities executed by and paid to the Contractor from time to time, and shall automatically become null and void when the full amount of the advance payment has been recovered by the Employer. The security shall be returned to the Contractor immediately after its expiration.

#### **13.3 Performance Security**

13.3.1 The Contractor shall, within 28 days of the notification of contract award, provide a security for the due performance of the Contract in the amount specified in the SCC.

13.3.2 The security shall be denominated in the currency or currencies of the Contract, or in a freely convertible currency acceptable to the Employer, and shall be in one of the forms of bank guarantees provided in the Bidding Documents, as stipulated by the Employer in the SCC, or in another form acceptable to the Employer.

13.3.3 Unless otherwise specified in the SCC, the security shall be reduced by half on the date of the Operational Acceptance. The Security shall become null and void, or shall be reduced pro rata to the Contract Price of a part of the Facilities for which a separate Time for Completion is provided, 540 days after Completion of the Facilities or 365 days after Operational Acceptance of the Facilities, whichever occurs first; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC Subclause 27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor, pursuant to GCC Subclause 27.10, is liable for an extended defect liability obligation, the performance security shall be extended for the period and up to the amount specified in the SCC.

#### **14. Taxes and Duties**

- 14.1 Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies, and charges assessed on the Contractor, its Subcontractors, or their employees by all municipal, state, or national government authorities in connection with the Facilities in and outside of the country where the Site is located.
- 14.2 Notwithstanding GCC Subclause 14.1 above, the Employer shall bear and promptly pay all customs and import duties as well as other local taxes like, e.g., a value-added tax (VAT), imposed by the law of the country where the Site is located on the Plant specified in Price Schedule No. 1 and that are to be incorporated into the Facilities.
- 14.3 If any tax exemptions, reductions, allowances, or privileges may be available to the Contractor in the country where the Site is located, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.
- 14.4 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies, and charges prevailing at the date 28 days prior to the date of bid submission in the country where the Site is located (hereinafter called "Tax" in this GCC Subclause 14.4). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, Subcontractors, or their employees in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction therefrom, as the case may be, in accordance with GCC Clause 36 hereof.

### **D. Intellectual Property**

#### **15. License/Use of Technical Information**

- 15.1 For the operation and maintenance of the Plant, the Contractor hereby grants a non-exclusive and nontransferable license (without the right to sublicense) to the Employer under the patents, utility models, or other industrial property rights owned by the Contractor or by a third party from whom the Contractor has received the right to grant licenses thereunder, and shall also grant to the Employer a nonexclusive and nontransferable right (without the right to sublicense) to use the know-how and other technical information disclosed to the Employer under the Contract. Nothing contained herein shall be construed as transferring ownership of any patent, utility model, trademark, design, copyright, know-how, or other intellectual property right from the Contractor or any third party to the Employer.
- 15.2 The copyright in all drawings, documents, and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.

#### **16. Confidential Information**

- 16.1 The Employer and the Contractor 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 termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data, and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GCC Clause 16.

- 16.2 The Employer shall not use such documents, data, and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data, and other information received from the Employer for any purpose other than the design, procurement of Plant, construction, or such other work and services as are required for the performance of the Contract.
- 16.3 The obligation of a party under GCC Subclauses 16.1 and 16.2 above, however, shall not apply to that information, which
- (a) now or hereafter enters the public domain through no fault of that party;
  - (b) 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 hereto; and
  - (c) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.
- 16.4 The above provisions of this GCC Clause 16 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 Facilities or any part thereof.
- 16.5 The provisions of this GCC Clause 16 shall survive termination, for whatever reason, of the Contract.

## **E. Execution of the Facilities**

### **17. Representatives** 17.1 Project Manager

If the Project Manager is not named in the Contract, then within 14 days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the Project Manager. The Employer may from time to time appoint some other person as the Project Manager in place of the person previously so appointed, and shall give notice of the name of such other person to the Contractor without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the Facilities. Such appointment shall only take effect upon receipt of such notice by the Contractor. The Project Manager shall represent and act for the Employer at all times during the performance of the Contract. All notices, instructions, orders, certificates, approvals, and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided.

All notices, instructions, information, and other communications given by the Contractor to the Employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.

17.2 Contractor's Representative and Construction Manager

17.2.1 If the Contractor's Representative is not named in the Contract, then within 14 days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within 14 days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within 14 days giving the reason therefor, then the Contractor shall appoint a replacement within 14 days of such objection, and the foregoing provisions of this GCC Subclause 17.2.1 shall apply thereto.

17.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the performance of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information, and all other communications under the Contract.

All notices, instructions, information, and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.

The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC Subclause 17.2.1.

17.2.3 The Contractor's Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions, and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager.

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Subclause 17.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.

17.2.4 From the commencement of installation of the Facilities at the Site until Completion, the Contractor's Representative shall appoint a suitable person as the Construction Manager. The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site throughout normal working hours except when on leave, sick, or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, the Contractor's Representative or the Construction Manager shall

appoint a suitable person to act as the Construction Manager's deputy.

17.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC Subclause 22.4. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.

17.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC Subclause 17.2.5, the Contractor shall, where required, promptly appoint a replacement.

## **18. Work Program**

### **18.1 Contractor's Organization**

The Contractor shall supply to the Employer and the Project Manager a chart showing the proposed organization to be established by the Contractor for carrying out work on the Facilities within 21 days of the Effective Date. The chart shall include the identities of the key personnel, and the curricula vitae of such key personnel to be employed shall be supplied together with the chart. The Contractor shall promptly inform the Employer and the Project Manager in writing of any revision or alteration of such an organization chart.

### **18.2 Program of Performance**

Within 28 days after the Effective Date, the Contractor shall submit to the Project Manager a detailed program of performance of the Contract, made in a form acceptable to the Project Manager and showing the sequence in which it proposes to design, manufacture, transport, assemble, install, and pre-commission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion, Commissioning, and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in the Appendix (Time Schedule) to the Contract Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion given in the SCC and any extension granted in accordance with GCC Clause 40, and shall submit all such revisions to the Project Manager.

### **18.3 Progress Report**

The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Subclause 18.2 above, and supply a progress report to the Project Manager every month.

The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.

### **18.4 Progress of Performance**

If at any time the Contractor's actual progress falls behind the program referred to in GCC Subclause 18.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GCC Subclause 8.2, any extension thereof entitled under GCC Subclause 40.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

#### 18.5 Procedures

The Contract shall be executed in accordance with the Contract Documents including the procedures given in the Forms and Procedures of the Employer's Requirements.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

### 19. Subcontracting

- 19.1 The Appendix 5 (List of Major Items of Plant and Services and List of Approved Subcontractors) to the Contract Agreement specifies major items of plant and services and a list of approved Subcontractors against each item, including manufacturers. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties, or responsibilities under the Contract.
- 19.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in GCC Subclause 19.1.
- 19.3 For items or parts of the Facilities not specified in the Appendix (List of Major Items of Plant and Services and List of Approved Subcontractors for Major Items) to the Contract Agreement, the Contractor may employ such Subcontractors as it may select, at its discretion.
- 19.4 Each subcontract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GCC 19.5 (if and when applicable), or in event of termination by the Employer under GCC 42.2.
- 19.5 If a Sub-contractor's obligations extend beyond the expiry date of the relevant Defects Liability Period and the Project Manager, prior to that date, instructs the Contractor to assign the benefits of such obligations to the Employer, then the Contractor shall do so.

### 20. Design and Engineering

#### 20.1 Specifications and Drawings

20.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice.

The Contractor shall be responsible for any discrepancies, errors, or omissions in the specifications, drawings, and other technical documents that it has prepared, whether such specifications, drawings, and other documents have been approved by the

Project Manager or not, provided that such discrepancies, errors, or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

20.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification, or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the Project Manager.

20.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date 28 days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GCC Clause 39.

20.3 Approval/Review of Technical Documents by Project Manager

20.3.1 The Contractor shall prepare or cause its Subcontractors to prepare, and furnish to the Project Manager the documents listed in the Appendix (List of Documents for Approval or Review) to the Contract Agreement for its approval or review as specified and in accordance with the requirements of GCC Subclause 18.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.

GCC Subclauses 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

20.3.2 Within 14 days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Subclause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.

If the Project Manager fails to take such action within the said 14 days, then the said document shall be deemed to have been approved by the Project Manager.

20.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with the Contract or that it is contrary to good engineering practice. If the Project Manager disapproves a document, he shall specify the reasons for his decision.

20.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Subclause 20.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s), whereupon the document shall be deemed to have been approved.

- 20.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the parties within a reasonable period, then such dispute or difference may be referred to a Dispute Board for determination in accordance with GCC Subclause 45.3 hereof. If such dispute or difference is referred to a Dispute Board, the Project Manager shall give instructions as to whether and, if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Dispute Board upholds the Contractor's view on the dispute and if the Employer has not given notice under Subclause 45.3 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Dispute Board shall decide, and the Time for Completion shall be extended accordingly.
- 20.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.
- 20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Subclause 20.3.
- If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC Clause 39 shall apply to such request.

## 21. Procurement

### 21.1 Materials

Subject to GCC Subclause 14.2, the Contractor shall procure and transport all materials in an expeditious and orderly manner to the Site.

### 21.2 Employer-Supplied Materials

If the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement provides that the Employer shall furnish any specific items to the Contractor, the following provisions shall apply:

- 21.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to GCC Subclause 18.2, unless otherwise mutually agreed.
- 21.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect, or default. The Employer shall immediately remedy any shortage, defect, or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect, or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody, and control of the Contractor. The provision of this GCC Subclause 21.2.2 shall apply to any item supplied to remedy any such



shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.

21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody, and control shall not relieve the Employer of liability for any undetected shortage, defect, or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GCC Clause 27 or under any other provision of Contract.

### 21.3 Transportation

21.3.1 The Contractor shall at its own risk and expense transport all the materials and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

21.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the materials and the Contractor's Equipment.

21.3.3 Upon dispatch of each shipment of materials and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile, or electronic means, of the description of the materials and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties.

21.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the materials and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges, or any other traffic facilities that may be caused by the transport of the materials and the Contractor's Equipment to the Site.

### 21.4 Customs Clearance

The Contractor shall, at its own expense, handle all imported materials and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer's obligations under GCC Subclause 14.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance that are not the fault of the Contractor, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to GCC Clause 40.

## **22. Installation**

### 22.1 Setting Out/Supervision

#### 22.1.1 Benchmark

(a) The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks, and lines provided to it in writing by or on behalf of the Employer.

- (b) If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level, or alignment of the Facilities, the Contractor shall forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

#### 22.1.2 Contractor's Supervision

The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

### 22.2 Labor

#### 22.2.1 Engagement of Staff and Labor

- (a) Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding, and transport.
- (b) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled, and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.
- (c) The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site into the country where the Site is located. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.
- (d) The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

#### 22.2.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer's Personnel.

### 22.2.3 Labor Laws

- (a) The Contractor shall comply with all the relevant labor Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration, and emigration, and shall allow them all their legal rights.
- (b) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous, or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.
- (c) The Contractor shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious, or other customs and all local laws and regulations pertaining to the employment of labor.

### 22.2.4 Rates of Wages and Conditions of Labor

- (a) The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.
- (b) The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

### 22.2.5 Working Hours

- (a) No work shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the SCC, unless
  - (i) otherwise stated in the Contract;
  - (ii) the Project Manager gives consent; or
  - (iii) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Project Manager.
- (b) If and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Project Manager's consent thereto, the Project Manager shall not unreasonably withhold such consent.
- (c) This Subclause shall not apply to any work which is customarily carried out by rotary or double shifts.

#### 22.2.6 Facilities for Staff and Labor

- (a) Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.
- (b) The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

#### 22.2.7 Health and Safety

- (a) The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay, and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.
- (b) The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.
- (c) The Contractor shall send to the Project Manager, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety, and welfare of persons, and damage to property, as the Project Manager may reasonably require.

#### 22.2.8 Funeral Arrangements

In the event of the death of any of the Contractor's personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial, unless otherwise specified in the SCC.

#### 22.2.9 Records of Contractor's Personnel

The Contractor shall keep accurate records of the Contractor's personnel, including the number of each class of Contractor's Personnel on the Site and the names, ages, gender, hours worked, and wages paid to all workers. These records shall be summarized on a monthly basis in a form approved by the Project Manager and shall be available for inspection by the Project Manager until the Contractor has completed all work.

#### 22.2.10 Supply of Foodstuff

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

22.2.11 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

22.2.12 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

22.2.13 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter, or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift barter, or disposal by Contractor's Personnel.

22.2.14 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

22.2.15 Prohibition of All Forms of Forced or Compulsory Labor

The contractor shall not employ "forced or compulsory labor" in any form. "Forced or compulsory labor" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

22.2.16 Prohibition of Harmful Child Labor

The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

22.3 Contractor's Equipment

22.3.1 All Contractor's Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor's Equipment is no longer required for the execution of the Contract.

22.3.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

22.3.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

22.4 Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site

and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.

## 22.5 Opportunities for Other Contractors

22.5.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.

22.5.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

22.5.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.

22.5.4 The Contractor shall notify the Project Manager promptly of any defects in the other Contractors' work that come to its notice, and that could affect the Contractor's work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.

## 22.6 Emergency Work

If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.

## 22.7 Site Clearance

### 22.7.1 Site Clearance in Course of Performance

In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store, or remove any surplus materials, clear away any wreckage, rubbish, or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

### 22.7.2 Clearance of Site after Completion

After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish, and debris of any kind from the Site, and shall leave the Site and Facilities in a clean and safe condition.

## 22.8 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

## **23. Test and Inspection**

23.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and any part of the Facilities as are specified in the Contract.

23.2 The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

23.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give a reasonable advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager or their designated representatives to attend the test and/or inspection.

23.4 The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection.

If the Employer or Project Manager or their designated representatives fails to attend the test and/or inspection, or if it is agreed between the parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.

23.5 The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor'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 work on the Facilities and/or the Contractor's performance of its other obligations

under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.

- 23.6 If any Plant or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC Subclause 23.3.
- 23.7 If any dispute or difference of opinion shall arise between the parties in connection with or arising out of the test and/or inspection of the Plant or part of the Facilities that cannot be settled between the parties within a reasonable period of time, it may be referred to an Dispute Board for determination in accordance with GCC Subclause 45.3.
- 23.8 The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Plant are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.
- 23.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC Subclause 23.4, shall release the Contractor from any other responsibilities under the Contract.
- 23.10 No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such parts of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.
- 23.11 The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Subclause 23.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

#### **24. Completion of the Facilities**

- 24.1 As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Employer's Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.
- 24.2 Within 7 days after receipt of the notice from the Contractor under GCC Subclause 24.1, the Employer shall supply the operating and maintenance personnel specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement for Pre-commissioning of the Facilities or any part thereof.



Pursuant to the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement, the Employer shall also provide, within the said 7-day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services, and other matters required for Pre-commissioning of the Facilities or any part thereof.

- 24.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services, and other matters have been provided by the Employer in accordance with GCC Subclause 24.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GCC Subclause 25.5.
- 24.4 As soon as all works in respect of Pre-commissioning are completed and, in the opinion of the Contractor, the Facilities or any part thereof is ready for Commissioning, the Contractor shall so notify the Project Manager in writing.
- 24.5 The Project Manager shall, within 14 days after receipt of the Contractor's notice under GCC Subclause 24.4, either issue a Completion Certificate in the form specified in the Employer's Requirements (Forms and Procedures), stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's notice under GCC Subclause 24.4, or notify the Contractor in writing of any defects and/or deficiencies.

If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC Subclause 24.4.

If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within 7 days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's repeated notice.

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within 7 days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

- 24.6 If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within 14 days after receipt of the Contractor's notice under GCC Subclause 24.4 or within 7 days after receipt of the Contractor's repeated notice under GCC Subclause 24.5, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be.
- 24.7 As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.
- 24.8 Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk

of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

**25. Commissioning and Operational Acceptance**

25.1 Commissioning

25.1.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the Project Manager, pursuant to GCC Subclause 24.5, or immediately after the date of the deemed Completion, under GCC Subclause 24.6.

25.1.2 The Employer shall supply the operating and maintenance personnel and all raw materials, utilities, lubricants, chemicals, catalysts, facilities, services, and other matters required for Commissioning.

25.1.3 In accordance with the requirements of the Contract, the Contractor's and Project Manager's advisory personnel shall attend the Commissioning, including the Guarantee Test, and shall advise and assist the Employer.

25.2 Guarantee Test

25.2.1 Subject to GCC Subclause 25.5, the Guarantee Test and repeats thereof shall be conducted by the Contractor during Commissioning of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test and any repeats thereof.

25.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Completion specified in the SCC or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GCC Subclauses 28.2 and 28.3 shall not apply.

25.3 Operational Acceptance

25.3.1 Subject to GCC Subclause 25.4 below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

- (a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or
- (b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion specified in the SCC, or any other agreed upon period as specified in GCC Subclause 25.2.2 above; or
- (c) the Contractor has paid the liquidated damages specified in GCC Subclause 28.3 hereof; and
- (d) any minor items mentioned in GCC Subclause 24.7 hereof relevant to the Facilities or that part thereof have been completed.

25.3.2 At any time after any of the events set out in GCC Subclause 25.3.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Employer's Requirements (Forms and Procedures) in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

25.3.3 The Project Manager shall, after consultation with the Employer, and within 7 days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate.

25.3.4 If within 7 days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as of the date of the Contractor's said notice.

#### 25.4 Partial Acceptance

25.4.1 If the Contract specifies that Completion and Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.

25.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the Project Manager shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

#### 25.5 Delayed Pre-Commissioning and/or Guarantee Test

25.5.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Subclause 24.3, or with the Guarantee Test pursuant to Subclause 25.2, for reasons attributable to the Employer either on account of non availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions leading to "deemed" completion of activities such as Completion, pursuant to GCC Subclause 24.6, and Operational Acceptance, pursuant to GCC Subclause 25.3.4, and Contractor's obligations regarding Defect Liability Period, pursuant to GCC Subclause 27.2, Functional Guarantee, pursuant to GCC Clause 28, and Care of Facilities, pursuant to GCC Clause 32, and GCC Clause 41.1, Suspension, shall not apply. In this case, the following provisions shall apply.

25.5.2 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above Subclause 25.5.1, the Contractor shall be entitled to the following:

- (a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Subclause 26.2;
- (b) payments due to the Contractor in accordance with the provision specified in the Appendix (Terms and Procedures of Payment) to the Contract Agreement, which would not have been payable in normal circumstances due to noncompletion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding those payments, subject to the provision of Subclause 25.5.3 below;
- (c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer;
- (d) the additional charges towards the care of the Facilities pursuant to GCC Subclause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Subclause 25.5.4 below. The provision of GCC Subclause 33.2 shall apply to the Facilities during the same period.

25.5.3 In the event that the period of suspension under above Subclause 25.5.1 actually exceeds 180 days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor.

25.5.4 When the Contractor is notified by the Project Manager that the plant is ready for Pre-commissioning, the Contractor shall proceed without delay in performing all the specified activities and obligations under the contract.

## F. Guarantees and Liabilities

### 26. Completion Time Guarantee

- 26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the SCC pursuant to GCC Subclause 8.2, or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.
- 26.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount specified in the SCC as a percentage rate of the Contract Price or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as "Maximum" in the SCC as a percentage rate of the Contract Price. Once the "Maximum" is reached, the Employer may consider termination of the Contract, pursuant to GCC Subclause 42.2.2.

Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GCC Clause 40. The Contractor shall have no further liability whatsoever to the Employer in respect thereof.

However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.

Save for liquidated damages payable under this GCC Subclause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the Appendix (Time Schedule) to the Contract Agreement and/or other program of work prepared pursuant to GCC Subclause 18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.

26.3 If the Contractor attains Completion of the Facilities or any part thereof before the Time for Completion or any extension thereof under GCC Clause 40, the Employer shall pay to the Contractor a bonus in the amount specified in the SCC. The aggregate amount of such bonus shall in no event exceed the amount specified as "Maximum" in the SCC.

## **27. Defect Liability**

27.1 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials, and workmanship of the Plant supplied and of the work executed.

27.2 The Defect Liability Period shall be 540 days from the date of Completion of the Facilities (or any part thereof) or 1 year from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, unless specified otherwise in the SCC pursuant to GCC Subclause 27.10.

If during the Defect Liability Period any defect should be found in the design, engineering, materials, and workmanship of the Plant supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace, or otherwise make good as the Contractor shall determine at its discretion, such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement, or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

- (a) improper operation or maintenance of the Facilities by the Employer,
- (b) operation of the Facilities outside specifications provided in the Contract, or
- (c) normal wear and tear.

27.3 The Contractor's obligations under this GCC Clause 27 shall not apply to:

- (a) any materials that are supplied by the Employer under GCC Subclause 21.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein;

- (b) any designs, specifications or other data designed, supplied, or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein; or
- (c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC Subclause 27.7.

27.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC Clause 27.

The Contractor may, with the consent of the Employer, remove from the Site any Plant or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

27.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good, as the case may be, until that part of the Facilities passes such tests. The tests shall be agreed upon by the Employer and the Contractor.

27.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than 15 days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.

27.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

27.9 Except as provided in GCC Clauses 27 and 33, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant, design, or engineering, or work executed that appear after Completion of the Facilities or any part thereof, except where such defects are the result of the gross negligence, fraud, criminal, or willful action of the Contractor.

27.10 In addition, any such component of the Facilities and during the period of time as may be specified in the SCC shall be subject to an extended Defect Liability Period. Such obligation of the Contractor shall be in

addition to the Defect Liability Period specified under GCC Subclause 27.2.

## **28. Functional Guarantees**

- 28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement, subject to, and upon the conditions therein specified.
- 28.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications, and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications, and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract, pursuant to GCC Subclause 42.2.2.
- 28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in the said Appendix to the Contract Agreement is met, the Contractor shall, at the Contractor's option, either
- (a) make such changes, modifications, and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense, and shall request the Employer to repeat the Guarantee Test or
  - (b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in the Appendix (Functional Guarantees) to the Contract Agreement.
- 28.4 The payment of liquidated damages under GCC Subclause 28.3, up to the limitation of liability specified in the Appendix (Functional Guarantees) to the Contract Agreement, shall completely satisfy the Contractor's guarantees under GCC Subclause 28.3, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.

## **29. Patent Indemnity**

- 29.1 The Contractor shall, subject to the Employer's compliance with GCC Subclause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions, or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer 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 Facilities by the Contractor or the use of the Facilities in the country where the Site is located, and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Contractor, pursuant to the Contract Agreement.

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

If the Contractor fails to notify the Employer within 28 days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the 28-day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

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

- 29.3 The Employer shall indemnify and hold harmless the Contractor 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 whatsoever nature, including attorney's fees and expenses, which the Contractor 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 Employer.

### **30. Limitation of Liability**

- 30.1 Except in cases of criminal negligence or willful misconduct,
- (a) the Contractor shall not be liable to the Employer, whether in contract, tort, or otherwise, 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 Contractor to pay liquidated damages to the Employer, and
  - (b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed a multiple of the Contract Price specified in the SCC or, if a multiple is not so specified, the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

## **G. Risk Distribution**

### **31. Transfer of Ownership**

- 31.1 Ownership of the Plant (including spare parts) to be imported into the country where the Site is located shall be transferred to the Employer



upon loading on to the mode of transport to be used to convey the Plant from the country of origin to that country.

- 31.2 Ownership of the Plant (including spare parts) procured in the country where the Site is located shall be transferred to the Employer when the Plant are brought on to the Site.
- 31.3 Ownership of the Contractor's Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.
- 31.4 Ownership of any Plant in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant in question are no longer required for the Facilities.
- 31.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant are incorporated.

### **32. Care of Facilities**

- 32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to GCC Clause 24 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC Clause 27. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Subclauses 32.2 and 38.1.
- 32.2 If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of
  - (a) insofar as they relate to the country where the Site is located, nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under GCC Clause 34 hereof; or
  - (b) any use or occupation by the Employer or any third party other than a Subcontractor, authorized by the Employer of any part of the Facilities; or
  - (c) any use of or reliance upon any design, data, or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein,

the Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed, or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed, or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GCC Clause 39. If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GCC Subclause 42.1 hereof.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in GCC Subclause 32.2 with respect to the Contractor's temporary facilities, and (ii) where such loss or damage arises by reason of any of the matters specified in GCC Subclauses 32.2 (b) and (c) and 38.1.

32.4 With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor's Equipment by reason of any of the matters specified in GCC Subclause 38.1, the provisions of GCC Subclause 38.3 shall apply.

**33. Loss of or  
Damage to  
Property;  
Accident or Injury  
to Workers;  
Indemnification**

33.1 Subject to GCC Subclause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions, or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property other than the Facilities whether accepted or not, arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers, or agents, except any injury, death, or property damage caused by the negligence of the Employer, its contractors, employees, officers, or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Subclause 33.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within 28 days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the 28-day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

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

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers, and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion, or any other perils, in excess of the amount recoverable from insurances procured under GCC Clause 34, provided that such fire, explosion, or other perils were not caused by any act or failure of the Contractor.

33.4 The party entitled to the benefit of an indemnity under this GCC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.

#### **34. Insurance**

34.1 To the extent specified in the Appendix (Insurance Requirements) to the Contract Agreement, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

(a) Cargo Insurance During Transport

Covering loss or damage occurring while in transit from the Contractor's or Subcontractor's works or stores until arrival at the Site, to the Plant (including spare parts therefor) and to the Contractor's Equipment.

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties including the Employer's personnel, and loss of or damage to property occurring in connection with the supply and installation of the Facilities.

(d) Automobile Liability Insurance

Covering use of all vehicles used by the Contractor or its Subcontractors, whether or not owned by them, in connection with the execution of the Contract.

(e) Workers' Compensation

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(f) Employer's Liability

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(g) Other Insurances

Such other insurances as may be specifically agreed upon by the parties hereto as listed in the Appendix (Insurance Requirements) to the Contract Agreement.

- 34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1, except for the Third Party Liability, Workers' Compensation, and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1 except for the Cargo Insurance During Transport, Workers' Compensation, and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.
- 34.3 The Contractor shall, in accordance with the provisions of the Appendix (Insurance Requirements) to the Contract Agreement, deliver to the Employer certificates of insurance or copies of the insurance policies as evidence that the required policies are in full force and effect. The certificates shall provide that no less than 21 days' notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy.
- 34.4 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.
- 34.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the Appendix (Insurance Requirements) to the Contract Agreement, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insureds under all such policies. All insurers' rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than 21 days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GCC Subclause 34.5.
- 34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Subclause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GCC 34.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer,

and the Contractor shall have full recourse against the Employer for any and all liabilities of the Employer herein.

34.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC Clause 34, and all monies payable by any insurers shall be paid to the Contractor. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.

### **35. Unforeseen Conditions**

35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions other than climatic conditions, or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities including any data as to boring tests, provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site if access thereto was available, or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant or Contractor's Equipment, notify the Project Manager in writing of

- (a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen;
- (b) the additional work and/or Plant and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions;
- (c) the extent of the anticipated delay; and
- (d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this GCC Subclause 35.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in GCC Subclause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

35.3 If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial

obstructions referred to in GCC Subclause 35.1, the Time for Completion shall be extended in accordance with GCC Clause 40.

**36. Change in Laws and Regulations**

36.1 If, after the date 28 days prior to the date of Bid submission, in the country where the Site is located, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated, or changed, which shall be deemed to include any change in interpretation or application by the competent authorities, that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced costs 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 the SCC, pursuant to GCC Subclause 11.2.

**37. Force Majeure**

37.1 "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:

- (a) war, hostilities, or warlike operations whether a state of war be declared or not, invasion, act of foreign enemy and civil war;
- (b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion, and terrorist acts;
- (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority;
- (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine, and plague;
- (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear, and pressure waves or other natural or physical disaster; and
- (f) shortage of labor, materials, or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either party is prevented, hindered, or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within 14 days after the occurrence of such event.

37.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered, or delayed. The Time for Completion shall be extended in accordance with GCC Clause 40.

- 37.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GCC Subclauses 37.6 and 38.5.
- 37.5 No delay or nonperformance by either party hereto caused by the occurrence of any event of Force Majeure shall
- (a) constitute a default or breach of the Contract; or
  - (b) give rise to any claim for damages or additional cost or expense occasioned thereby, subject to GCC Subclauses 32.2, 38.3 and 38.4
- if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.
- 37.6 If the performance of the Contract is substantially prevented, hindered, or delayed for a single period of more than 60 days or an aggregate period of more than 120 days on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which either party may terminate the Contract by giving a notice to the other, but without prejudice to either party's right to terminate the Contract under GCC Subclause 38.5.
- 37.7 In the event of termination pursuant to GCC Subclause 37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GCC Subclauses 42.1.2 and 42.1.3.
- 37.8 Notwithstanding GCC Subclause 37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.

### 38. War Risks

- 38.1 "War Risks" shall mean any event specified in paragraphs (a) and (b) of GCC Subclause 37.1 and any explosion or impact of any mine, bomb, shell, grenade, or other projectile, missile, munitions or explosive of war, occurring or existing in or near the country (or countries) where the Site is located.
- 38.2 Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to
- (a) destruction of or damage to Facilities, Plant, or any part thereof;
  - (b) destruction of or damage to property of the Employer or any third party; or
  - (c) injury or loss of life
- if such destruction, damage, injury or loss of life is caused by any war risks, and the Employer shall indemnify and hold the Contractor harmless from and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges, or expenses arising in consequence of or in connection with the same.
- 38.3 If the Facilities or any Plant or Contractor's Equipment or any other property of the Contractor used or intended to be used for the purposes of the Facilities shall sustain destruction or damage by reason of any war risks, the Employer shall pay the Contractor for

- (a) any part of the Facilities or the Plant so destroyed or damaged to the extent not already paid for by the Employer and so far as may be required by the Employer, and as may be necessary for completion of the Facilities;
- (b) replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged; and
- (c) replacing or making good any such destruction or damage to the Facilities or the Plant or any part thereof.

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction, or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to GCC Subclause 42.1.

If the Employer requires the Contractor to replace or make good on any such destruction or damage to the Facilities, the Time for Completion shall be extended in accordance with GCC 40.

- 38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract that are in any way attributable to, consequent on, resulting from, or in any way connected with any war risks, provided that the Contractor shall as soon as practicable notify the Employer in writing of any such increased cost.
- 38.5 If during the performance of the Contract any war risks shall occur that financially or otherwise materially affect the execution of the Contract by the Contractor, the Contractor shall use its reasonable efforts to execute the Contract with due and proper consideration given to the safety of its and its Subcontractors' personnel engaged in the work on the Facilities, provided, however, that if the execution of the work on the Facilities becomes impossible or is substantially prevented for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of any war risks, the parties will attempt to develop a mutually satisfactory solution, failing which either party may terminate the Contract by giving a notice to the other.
- 38.6 In the event of termination pursuant to GCC Subclauses 38.3 or 38.5, the rights and obligations of the Employer and the Contractor shall be specified in GCC Subclauses 42.1.2 and 42.1.3.

## H. Change in Contract Elements

### 39. Change in the Facilities

#### 39.1 Introducing a Change

39.1.1 Subject to GCC Subclauses 39.2.5 and 39.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition, or deletion to, in or from the Facilities hereinafter called "Change," provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of



the Change envisaged with the nature of the Facilities as specified in the Contract.

- 39.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer with a copy to the Project Manager, any Change that the Contractor considers necessary or desirable to improve the quality, efficiency, or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.
- 39.1.3 Notwithstanding GCC Subclauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.
- 39.1.4 The procedure on how to proceed with and execute Changes is specified in GCC Subclauses 39.2 and 39.3, and further details and forms are provided in the Employer's Requirements (Forms and Procedures).

### 39.2 Changes Originating from Employer

39.2.1 If the Employer proposes a Change pursuant to GCC Subclause 39.1.1, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the Project Manager as soon as reasonably practicable a "Change Proposal," which shall include the following:

- (a) brief description of the Change,
- (b) effect on the Time for Completion,
- (c) estimated cost of the Change,
- (d) effect on Functional Guarantees (if any),
- (e) effect on the Facilities, and
- (f) effect on any other provisions of the Contract.

39.2.2 Prior to preparing and submitting the "Change Proposal," the Contractor shall submit to the Project Manager an "Estimate for Change Proposal," which shall be an estimate of the cost of preparing and submitting the Change Proposal.

Upon receipt of the Contractor's Estimate for Change Proposal, the Employer shall do one of the following:

- (a) accept the Contractor's estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal,
- (b) advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate
- (c) advise the Contractor that the Employer does not intend to proceed with the Change.

39.2.3 Upon receipt of the Employer's instruction to proceed under GCC Subclause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC Subclause 39.2.1.

39.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the parties thereto shall agree on specific rates for the valuation of the Change.

39.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GCC Clause 39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Contract Agreement by more than 15%, the Contractor may give a written notice of objection thereto prior to furnishing the Change Proposal as aforesaid. If the Employer accepts the Contractor's objection, the Employer shall withdraw the proposed Change and shall notify the Contractor in writing thereof.

The Contractor's failure to so object shall neither affect its right to object to any subsequent requested Changes or Change Orders herein, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Contractor represents.

39.2.6 Upon receipt of the Change Proposal, the Employer and the Contractor shall mutually agree upon all matters therein contained. Within 14 days after such agreement, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.

If the Employer is unable to reach a decision within 14 days, it shall notify the Contractor with details of when the Contractor can expect a decision.

If the Employer decides not to proceed with the Change for whatever reason, it shall, within the said period of 14 days, notify the Contractor accordingly. Under such circumstances, the Contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Contractor in its Estimate for Change Proposal submitted in accordance with GCC Subclause 39.2.2.

39.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order."

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The parties shall thereafter attempt to

reach agreement on the outstanding issues under the Change Proposal.

If the parties cannot reach agreement within 60 days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Dispute Board in accordance with the provisions of GCC Subclause 45.3.

### 39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to GCC Subclause 39.1.2, the Contractor shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in GCC Subclause 39.2.1.

Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in GCC Subclauses 39.2.6 and 39.2.7. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.

## 40. Extension of Time for Completion

40.1 The Time(s) for Completion specified in the SCC shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) any Change in the Facilities as provided in GCC Clause 39;
- (b) any occurrence of Force Majeure as provided in GCC Clause 37, unforeseen conditions as provided in GCC Clause 35, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Subclause 32.2;
- (c) any suspension order given by the Employer under GCC Clause 41 hereof or reduction in the rate of progress pursuant to GCC Subclause 41.2; or
- (d) any changes in laws and regulations as provided in GCC Clause 36; or
- (e) any default or breach of the Contract by the Employer, or any activity, act or omission of the Employer, or the Project Manager, or any other contractors employed by the Employer; or
- (f) any other matter specifically mentioned in the Contract; or
- (g) any delay on the part of a sub-contractor, provided such delay is due to a cause for which the Contractor himself would have been entitled to an extension of time under this Subclause

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not

accept the Employer's estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter to a Dispute Board, pursuant to GCC Subclause 45.3.

- 40.3 The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

In all cases where the Contractor has given a notice of a claim for an extension of time under GCC 40.2, the Contractor shall consult with the Project Manager in order to determine the steps (if any) which can be taken to overcome or minimize the actual or anticipated delay. The Contractor shall thereafter comply with all reasonable instructions, which the Project Manager shall give in order to minimize such delay. If compliance with such instructions shall cause the Contractor to incur extra costs and the Contractor is entitled to an extension of time under GCC 40.1, the amount of such extra costs shall be added to the Contract Price.

#### 41. Suspension

- 41.1 The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons therefor. The Contractor shall thereupon suspend performance of such obligation, except those obligations necessary for the care or preservation of the Facilities, until ordered in writing to resume such performance by the Project Manager.

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than 90 days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within 28 days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GCC Clause 39, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC Clause 39 or, where it affects the whole of the Facilities, as termination of the Contract under GCC Subclause 42.1.

- 41.2 If
- (a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix (Terms and Procedures of Payment) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GCC Subclause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such

approval, or fails to remedy the breach or take steps to remedy the breach within 14 days after receipt of the Contractor's notice; or

- (b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas in accordance with GCC Subclause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may by 14 days' notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor's performance of its obligations is suspended, or the rate of progress is reduced pursuant to this GCC Clause 41, then the Time for Completion shall be extended in accordance with GCC Subclause 40.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.

41.4 During the period of suspension, the Contractor shall not remove from the Site any Plant, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.

## 42. Termination

### 42.1 Termination for Employer's Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GCC Subclause 42.1.

42.1.2 Upon receipt of the notice of termination under GCC Subclause 42.1.1, the Contractor shall, either immediately or upon the date specified in the notice of termination,

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below;
- (c) remove all Contractor's Equipment from the Site, repatriate the Contractor's and its Subcontractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition; and
- (d) subject to the payment specified in GCC Subclause 42.1.3,
  - (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination;
  - (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and

- (iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities.

42.1.3 In the event of termination of the Contract under GCC Subclause 42.1.1, the Employer shall pay to the Contractor the following amounts:

- (a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination;
- (b) the costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel;
- (c) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges;
- (d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Subclause 42.1.2; and
- (e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

## 42.2 Termination for Contractor's Default

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this GCC Subclause 42.2:

- (a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up, other than a voluntary liquidation for the purposes of amalgamation or reconstruction, a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt;
- (b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 43; and
- (c) if the Contractor, in the judgment of the Employer has engaged in integrity violations, as defined in GCC Clause 6, in competing for or in executing the Contract.

### 42.2.2 If the Contractor

- (a) has abandoned or repudiated the Contract;
- (b) has without valid reason failed to commence work on the Facilities promptly or has suspended, other than pursuant to GCC Subclause 41.2, the progress of Contract performance for more than 28 days after receiving a written instruction from the Employer to proceed;
- (c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause;
- (d) refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the program furnished under GCC Subclause 18.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended;

then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor, stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within 14 days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GCC Subclause 42.2.

42.2.3 Upon receipt of the notice of termination under GCC Subclauses 42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below;
- (c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination;
- (d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and
- (e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

42.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the

Employer's use of such equipment, any Contractor's Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site and shall return such Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

42.2.5 Subject to GCC Subclause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Subclause 42.2.3. Any sums due the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined.

If the sum that the Contractor is entitled to be paid, pursuant to GCC Subclause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GCC Subclause 42.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due the Contractor under GCC Subclause 42.2.5, the Employer shall pay the balance to the Contractor.

The Employer and the Contractor shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.

#### 42.3 Termination by Contractor

##### 42.3.1 If

- (a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix (Terms and Procedures of Payment) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GCC Subclause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within 14 days after receipt of the Contractor's notice; or



- (b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities;

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within 28 days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within 28 days of the said notice, the Contractor may by a further notice to the Employer referring to this GCC Subclause 42.3.1, forthwith terminate the Contract.

42.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this GCC Subclause 42.3.2, if the Employer becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

42.3.3 If the Contract is terminated under GCC Subclauses 42.3.1 or 42.3.2, then the Contractor shall immediately

- (a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii);
- (c) remove all Contractor's Equipment from the Site and repatriate the Contractor's and its Subcontractors' personnel from the Site; and
- (d) subject to the payment specified in GCC Subclause 42.3.4,
  - (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination;
  - (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and
  - (iii) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

42.3.4 If the Contract is terminated under GCC Subclauses 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in GCC Subclause 42.1.3, and reasonable

compensation for all loss, except for loss of profit, or damage sustained by the Contractor arising out of, in connection with or in consequence of such termination.

42.3.5 Termination by the Contractor pursuant to this GCC Subclause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by GCC Subclause 42.3.

42.4 In this GCC Clause 42, the expression "Facilities executed" shall include all work executed, Installation Services provided, and all Plant acquired, or subject to a legally binding obligation to purchase, by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this GCC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the Appendix (Terms and Procedures of Payment) to the Contract Agreement.

### 43. Assignment

43.1 Neither the Employer nor the Contractor shall, without the express prior written consent of the other party which consent shall not be unreasonably withheld, assign to any third party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder, except that the Contractor shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

## I. Claims, Disputes, and Arbitration

### 44. Contractor's Claims

44.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall submit a notice to the Project Manager, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Subclause shall apply.

The Contractor shall also submit any other notices, which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Project Manager. Without admitting the Employer's liability, the Project Manager may, after receiving any notice under this Subclause, monitor the record keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Project Manager to inspect all these records, and shall (if instructed) submit copies to the Project Manager.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim, which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect,

- (a) this fully detailed claim shall be considered as interim;
- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Project Manager may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Project Manager.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Project Manager and approved by the Contractor, the Project Manager shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

Each payment certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

The Project Manager shall agree with the Contractor or estimate: (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with GCC Clause 40, and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Subclause are in addition to those of any other Subclause, which may apply to a claim. If the Contractor fails to comply with this or another Subclause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Subclause.

In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either party may refer the matter to the Dispute Board pursuant to GCC 45 hereof.

#### **45. Disputes and Arbitration**

##### **45.1 Appointment of the Dispute Board**

Disputes shall be referred to a Dispute Board for decision in accordance with GCC Subclause 45.3. The Parties shall appoint a Dispute Board by the date stated in the SCC.

The Dispute Board shall comprise, as stated in the SCC, either one or three suitably qualified persons (“the members”), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of activities involved in the performance of the Contract and with the interpretation of contractual documents. If the number is not so stated and the Parties do not agree otherwise, the Dispute Board shall comprise three persons, one of whom shall serve as chairman.

If the Parties have not jointly appointed the Dispute Board 21 days before the date stated in the SCC and the Dispute Board is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members is included in the SCC, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the Dispute Board.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the General Conditions of Dispute Board Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the Dispute Board consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment of the member or such expert (as the case may be). Each Party shall be responsible for paying one-half of this remuneration.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Subclause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the Dispute Board (including each member) shall expire when the Operational Acceptance Certificate has been issued in accordance with GCC Clause 25.3.

#### 45.2 Failure to Agree Dispute Board

If any of the following conditions apply, namely:

- (a) the Parties fail to agree upon the appointment of the sole member of the Dispute Board by the date stated in the first paragraph of GCC Subclause 45.1;
- (b) either Party fails to nominate a member (for approval by the other Party) of a Dispute Board of three persons by such date;
- (c) the Parties fail to agree upon the appointment of the third member (to act as chairman) of the Dispute Board by such date; or
- (d) the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or

one of the three members declines to act or is unable to act as a result of death, disability, resignation, or termination of appointment;

then the appointing entity or official named in the SCC shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the Dispute Board. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

#### 45.3 Obtaining Dispute Board's Decision

If a dispute (of any kind whatsoever) arises between the Parties in connection with the performance of the Contract, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Project Manager, either Party may refer the dispute in writing to the Dispute Board for its decision, with copies to the other Party and the Project Manager. Such reference shall state that it is given under this Subclause.

For a Dispute Board of three persons, the Dispute Board shall be deemed to have received such reference on the date when it is received by the chairman of the Dispute Board.

Both Parties shall promptly make available to the Dispute Board all such additional information, further access to the Site, and appropriate facilities, as the Dispute Board may require for the purposes of making a decision on such dispute. The Dispute Board shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the Dispute Board and approved by both Parties, the Dispute Board shall give its decision, which shall be reasoned and shall state that it is given under this Subclause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the performance of the Facilities in accordance with the Contract.

If either Party is dissatisfied with the Dispute Board's decision, then either Party may, within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction and intention to commence arbitration. If the Dispute Board fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give notice to the other Party of its dissatisfaction and intention to commence arbitration.

In either event, this notice of dissatisfaction shall state that it is given under this Subclause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in GCC Subclauses 45.6 and 45.7, neither Party shall be entitled to commence arbitration of a dispute unless a notice of dissatisfaction has been given in accordance with this Subclause.

If the Dispute Board has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either

Party within 28 days after it received the Dispute Board's decision, then the decision shall become final and binding upon both Parties.

#### 45.4 Amicable Settlement

Where notice of dissatisfaction has been given under GCC Subclause 45.3 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of dissatisfaction and intention to commence arbitration was given, even if no attempt at amicable settlement has been made.

#### 45.5 Arbitration

Unless settled amicably, any dispute in respect of which the Dispute Board's decision (if any) has not become final and binding shall be finally settled by international arbitration. Unless otherwise agreed by both Parties,

- (a) arbitration proceedings shall be conducted as stated in the Special Conditions;
- (b) if no arbitration proceedings is so stated, the dispute shall be finally settled by institutional arbitration under the Rules of Arbitration of the International Chamber of Commerce;
- (c) the dispute shall be settled by three arbitrators; and
- (d) the arbitration shall be conducted in the language for communications defined in GCC Subclause 5.3.

The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Project Manager, and any decision of the Dispute Board, relevant to the dispute. Nothing shall disqualify the Project Manager from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence or arguments previously put before the Dispute Board to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the Dispute Board shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Project Manager and the Dispute Board shall not be altered by reason of any arbitration being conducted during the progress of the Works.

#### 45.6 Failure to Comply with Dispute Board's Decision

In the event that a Party fails to comply with a Dispute Board decision which has become final and binding, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under GCC Subclause 45.5. GCC Subclauses 45.3 and 45.4 shall not apply to this reference.

#### 45.7 Expiry of Dispute Board's Appointment

If a dispute arises between the Parties in connection with the performance of the Contract, and there is no Dispute Board in place,

whether by reason of the expiry of the Dispute Board's appointment or otherwise,

- (a) GCC Subclauses 45.3 and 45.4 shall not apply, and
- (b) the dispute may be referred directly to arbitration under GCC Subclause 45.5.

## APPENDIX A

### General Conditions of Dispute Board Agreement

#### 1 Definitions

Each "Dispute Board Agreement" is a tripartite agreement by and between

- (a) the "Employer";
- (b) the "Contractor"; and
- (c) the "Member" who is defined in the Dispute Board Agreement as being
  - (i) the sole member of the "Dispute Board" and, where this is the case, all references to the "Other Members" do not apply; or
  - (ii) one of the three persons who are jointly called the "Dispute Board" and, where this is the case, the other two persons are called the "Other Members".

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

#### 2 General Provisions

Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

- (a) the Commencement Date defined in the Contract;
- (b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement; or
- (c) when the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days' notice of resignation to the Employer and to the Contractor, and the Dispute Board Agreement shall terminate upon the expiry of this period.

#### 3 Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Project Manager. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which might appear inconsistent with his/her warranty and agreement of impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member's representations that he/she is

- (a) experienced in the work, which the Contractor is to carry out under the Contract,
- (b) experienced in the interpretation of contract documentation, and
- (c) fluent in the language for communications defined in the Contract.



#### **4 General Obligations of the Member**

The Member shall

- (a) have no interest financial or otherwise in the Employer, the Contractor or the Project Manager, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;
- (b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor, or the Project Manager, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;
- (c) have disclosed in writing to the Employer, the Contractor, and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer, or employee of the Employer, the Contractor, or the Project Manager, and any previous involvement in the overall project of which the Contract forms part;
- (d) not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor, or the Project Manager, except as may be agreed in writing by the Employer, the Contractor, and the Other Members (if any);
- (e) comply with the annexed procedural rules and with GCC Subclause 45.3;
- (f) not give advice to the Employer, the Contractor, the Employer's Personnel, or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;
- (g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor, or the Project Manager regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Board Agreement;
- (h) ensure his/her availability for all site visits and hearings as are necessary;
- (i) become conversant with the Contract and with the progress of the Facilities (and of any other parts of the project of which the Contract forms part) by studying all documents received, which shall be maintained in a current working file;
- (j) treat the details of the Contract and all the Dispute Board's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor, and the Other Members (if any); and
- (k) be available to give advice and opinions on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

#### **5 General Obligations of the Employer and the Contractor**

The Employer, the Contractor, the Employer's Personnel and the Contractor's Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the Dispute Board's activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any)

- (a) be appointed as an arbitrator in any arbitration under the Contract;
- (b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or
- (c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding paragraph.

Whenever the Employer or the Contractor refers a dispute to the Dispute Board under GCC Subclause 45.3, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.

## 6 Payment

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

- (a) a retainer fee per calendar month, which shall be considered as payment in full for
  - (i) being available on 28 days' notice for all site visits and hearings;
  - (ii) becoming and remaining conversant with all project developments and maintaining relevant files;
  - (iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and
  - (iv) all services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one-third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

- (b) a daily fee, which shall be considered as payment in full for
  - (i) each day or part of a day up to a maximum of 2 days' travel time in each direction for the journey between the Member's home and the site, or another location of a meeting with the Other Members (if any);
  - (ii) each working day on site visits, hearings, or preparing decisions; and
  - (iii) each day spent reading submissions in preparation for a hearing.

- (c) all reasonable expenses, including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, facsimiles, and telexes, and use of the internet: a receipt shall be required for each item in excess of 5% of the daily fee referred to in sub-paragraph (b) of this Clause;
- (d) any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the SCC shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the Dispute Board; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in accordance with GCC Subclause 12.3.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

## **7 Termination**

At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days' notice to the Member, or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

## **8 Default of the Member**

If the Member fails to comply with any of his obligations under Clause 4 concerning his impartiality or independence in relation to the Employer or the Contractor, he/she shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the Dispute Board which are rendered void or ineffective by the said failure to comply.

## **9 Disputes**

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.

## Annex - DISPUTE BOARD GUIDELINES

1. Unless otherwise agreed by the Employer and the Contractor, the Dispute Board shall visit the site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor, and the Dispute Board, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.
2. The timing of and agenda for each site visit shall be as agreed jointly by the Dispute Board, the Employer, and the Contractor, or in the absence of agreement, shall be decided by the Dispute Board. The purpose of site visits is to enable the Dispute Board to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to prevent potential problems or claims from becoming disputes.
3. Site visits shall be attended by the Employer, the Contractor, and the Project Manager and shall be coordinated by the Employer in cooperation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each site visit and before leaving the site, the Dispute Board shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.
4. The Employer and the Contractor shall furnish to the Dispute Board one copy of all documents which the Dispute Board may request, including Contract documents, progress reports, variation instructions, certificates, and other documents pertinent to the performance of the Contract. All communications between the Dispute Board and the Employer or the Contractor shall be copied to the other Party. If the Dispute Board comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.
5. If any dispute is referred to the Dispute Board in accordance with GCC Subclause 45.3, the Dispute Board shall proceed in accordance with GCC Subclause 45.3 and these Guidelines. Subject to the time allowed to give notice of a decision and other relevant factors, the Dispute Board shall
  - (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case; and
  - (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.
6. The Dispute Board may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.
7. Except as otherwise agreed in writing by the Employer and the Contractor, the Dispute Board shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor, and the Project Manager, and to proceed in the absence of any party who the Dispute Board is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.
8. The Employer and the Contractor empower the Dispute Board, among other things, to
  - (a) establish the procedure to be applied in deciding a dispute;
  - (b) decide upon the Dispute Board's own jurisdiction, and as to the scope of any dispute referred to it;

- (c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Guidelines;
  - (d) take the initiative in ascertaining the facts and matters required for a decision;
  - (e) make use of its own specialist knowledge, if any;
  - (f) decide upon the payment of financing charges in accordance with the Contract;
  - (g) decide upon any provisional relief such as interim or conservatory measures;
  - (h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Project Manager, relevant to the dispute; and
  - (i) appoint, should the Dispute Board so consider necessary and the Parties agree, a suitable expert at the cost of the Parties to give advice on a specific matter relevant to the dispute.
9. The Dispute Board shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the Dispute Board shall make and give its decision in accordance with GCC Subclause 45.3, or as otherwise agreed by the Employer and the Contractor in writing. If the Dispute Board comprises three persons
- (a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;
  - (b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
  - (c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless
    - (i) either the Employer or the Contractor does not agree that they do so, or
    - (ii) the absent Member is the chairman and he/she instructs the other Members to not make a decision.

### 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	The Employer's country is: India
GCC 1.1	The Employer is: Energy Efficiency Services Limited, New Delhi (to be referred as "EESL") and includes the legal successors in title to and assignee of the Employer. The Employer is also referenced as the Executing Agency ("EA") or Implementing Agency ("IA").
GCC 1.1	The Project Manager is: Mr. Anil Kumar Dabhade, General Manager (Solar) Energy Efficiency Services Ltd., 6th Floor, CORE 5, SCOPE Complex, Lodhi Road, New Delhi- 110003 Email ID: adabhade@eesl.co.in; ptewari@eesl.co.in
GCC 1.1	The Bank is: Asian Development Bank (ADB)
GCC 1.1	Country of Origin: All countries and territories as indicated in the Section 5 Eligible Countries of the bidding documents.
GCC 1.1	"Construction Manager" means the person appointed by the Contractor's Representative in the manner provided in GCC Subclause 17.2.4
GCC 1.1	"Time for Completion" means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) <b>and Operation and Maintenance work are</b> to be attained, as referred to in GCC Clause 8 and in accordance with the relevant provisions of the Contract.
GCC 1.1	"Completion" means that the Facilities (or a specific part thereof where specific parts are specified in the GCC 8.2) have been completed operationally and structurally and put in a tight and clean condition,

	and that all work in respect of Precommissioning of the Facilities or such specific part thereof has been completed; and Commissioning and O&M followed by Trial run has been completed, as provided in GCC Clause 24 & 25.
<b>GCC 1.1</b>	“Commissioning” means operation of the Facilities or any part thereof by the Contractor as specified in the Technical Specifications, which operation is to be carried out by the Contractor as provided in GCC Clause 25 hereof, for the purpose of carrying out Guarantee Test for specified period mentioned in GCC Clause 25.2
<b>GCC 1.1</b>	“Operation and Maintenance (O&M)” shall include all services required for providing O&M services in line with provision of Section-6 (Employer’s Requirements) and O&M contract.
<b>GCC 1.1</b>	“Facilities” means the Plant to be supplied and installed, as well as all the Installation and O&M Services to be carried out by the Contractor under the Contract
<b>GCC 1.1</b>	“Guarantee Test(s)” means all the necessary tests required for trial run of installed equipment or as specified in the Employer’s Requirements to be carried out to ascertain the successful commissioning of the facilities or any part thereof in accordance with the provision of GCC Subclause 25.2 (Guarantee Test) hereof.
<b>GCC 3.2</b>	The version of Incoterms shall be: Incoterms 2020
<b>GCC 5.1</b>	<p>5.1 The Contract shall be interpreted in accordance with the laws of: The Republic of India</p> <p>5.2 The ruling language is: English</p> <p>5.3 The language for communications is: English</p> <p>5.4 The Contractor has the obligation to notify the Employer of any changes in connection with the matters described in paragraphs (i), (k), (l), (m), (n), (o), (p) and (t) of the Letter of Bid for Single Stage Bidding Procedure and in paragraphs (i), (k), (l), (m), (n), (o), (p) and (r) of the Letter of Second-Stage Bid for Two Stage Bidding Procedure.</p> <p>5.5 If the Contractor is debarred or temporarily suspended by ADB, it shall inform the Employer of such debarment or suspension, and that the endorsement of ADB’s Office of Anticorruption and Integrity is required for any variations, extensions or modifications to the Contract. If the Contractor is debarred or temporarily suspended by ADB, it shall inform the Employer of such debarment or suspension, and that the endorsement of ADB’s Office of Anticorruption and Integrity is required for any variations, extensions or modifications to the Contract.</p>



<b>GCC 7.3</b>	<p>The Contractor agrees to supply and replace spare parts for a period of 12 years for reliable and trouble free operation and maintenance (O&amp;M) of the projects including guaranteed energy generation.</p> <p>The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the Plant during the O&amp;M period.</p> <p>It shall be the responsibility of the contractor to operate and maintain the plant to deliver the guaranteed output as defined in Section 6 for a period of 12 years from the date of commissioning of respective plants. The contractor shall be responsible for making all the requisite arrangements for the same.</p>
<b>GCC 8.1</b>	<p>The Contractor shall commence work on the Facilities (Part-I i.e. site survey, MoM etc.) within 7 days from date of issuance of LoA / Notice to proceed (Refer clause a.14 Project timelines of Section-6) / Effective Date for determining Time for Completion as specified in the Contract Agreement provided that access to and possession of the Site or any part thereof have been given under subclause 10.2, and shall then proceed with the work on the Facilities with due expedition and without delay.</p>
<b>GCC 8.2</b>	<p>Time to complete the plant and Installation services from the effective date specified in Article 3 of the Contract Agreement for determining the time for completion of Installation and commissioning activities is: 240 days from the date of handover of each site/Notice to Proceed (NTP). No credit will be given for earlier completion.</p> <p>EESL shall ensure that all the sites are handed over within 9 months from the date of issuance of LoA and post site handover, the Contractor shall be responsible for complete design, engineering, supply, erection and commissioning of each site within 240 days from date of NTP/handover.</p> <p>The Contractor shall also be responsible for 12 years comprehensive O&amp;M on site wise basis from the date of commissioning of each project site.</p>
<b>GCC 9</b>	<p>9.6 To add the following paragraph at the end of GCC 9.6:</p>

	<p>“ADB’s right to inspect the Site and/or the Contractor’s accounts and records relating to the performance of the Contract stated in Subclause 6.1 (e) and 9.6 shall survive termination and/ or expiration of this Contract.”</p> <p>9.8 Protection of the Environment</p> <p>At the end of the sub-clause in 9.8 Protection of the Environment, add the following paragraphs:</p> <p>“The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations. The Contractor shall also comply with all reasonable requests of the national and local authorities responsible for enforcing environmental controls.</p> <p>Within 28 days of the Effective date the Contractor shall submit a detailed Site Specific Environmental Management Plan (SSEMP), based on the Environmental Health and Safety Management Plan submitted in the technical proposal, for the Project Manager’s no objection showing how the Contractor intends to comply with environmental laws and regulations and other specific requirements prescribed in the Contract, addressing all the monitoring and mitigation measures set forth in the Environmental Impact Assessment (“EIA”) and the Environmental Management Plan (“EMP”) of the project attached in Section 6- Employer’s Requirements. Work shall not commence on the Site until the no objection of SSEMP has been obtained from the Project Manager and is being implemented. Such acceptance by the Project Manager shall not relieve the Contractor of any of his obligations or responsibilities under the Contract</p> <p>The Contractor shall (a) establish an operational system for managing environmental impacts, (b) comply with the approved SSEMP and any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the</p>
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	<p>project EMP through the SSEMP, (c) allocate the budget required to ensure that such measures, requirements and actions are carried out, (d) submit semi-annual reports on the compliance of such measures to the Employer.</p> <p>Where unanticipated environmental risks or impacts become apparent during the Contract, the Contractor is required to update the SSEMP to outline the potential impacts to site works and associated mitigation measures for the Project Manager's approval."</p>
<b>GCC 10</b>	<p><b>Employer's Responsibilities</b>  <b>Supplementing clause 10.2 with the following:</b></p> <p>10.2 There shall be no work nor construction activities at the Site or any part thereof (as the case may be) unless the Employer has granted access to the Site or part thereof (as the case may be) in accordance with the Contract Agreement.</p>
<b>GCC 10.6</b>	<p><b>Replace GCC 10.6 with the following:</b></p> <p>The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GCC Subclause 25.2.</p>
<b>GCC 11</b>	<p>11.2 The Contract Price shall remain FIRM and FIXED during execution of Contract.</p>
<b>GCC 13.2.1</b>	<p><b>Supplementing the Sub-Clause 13.2.1</b></p> <p>Add at the end of the paragraph, after "currencies", "with a validity of up to thirty (30) days beyond the date of completion of the Commissioning in accordance with GCC Clause 25."</p>
<b>GCC 13.3.1</b>	<p><b><u>13.3 Performance Security (PS):</u></b></p> <p>13.3.1 Within Twenty Eight (28) days of the receipt of Notification of Award (NOA) from EESL, the successful bidder shall furnish the PS in the form of unconditional Bank Guarantee for 10% of the total contract value. The Bank Guarantee must be valid to cover the Time for Completion as define in GCC 8.2 and Defect Liability as define in GCC 27 + 3 months claim period .</p>

	<p>EESL shall at his discretion have recourse to the said PS for the recovery of any or all amount due from the Successful Bidder in connection with the contract including of guarantee obligations. This shall include the recovery, if any, against the Liquidated damages applicable during operation and maintenance period as brought out under LD Clause (Refer Liquidated Damages).</p> <p>If any shortfall in performance is observed, as per the criteria mentioned in section 4, EESL shall have right to INVOKE BANK GUARANTEE.</p> <p>This Bank Guarantee shall be effective only when BG issuance message is transmitted by issuing bank through SFMS to ICICI Bank Ltd.</p> <p>IFSC code: ICIC0000007</p> <p>Branch Name: 9A, Phelps Building, Connaught Place, New Delhi, 110001</p> <p>Unique Identifier: EESL543840944 in field 7037</p> <p>The Message code to be used by the bank will be the following: -</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Purpose</th> </tr> </thead> <tbody> <tr> <td>IFN 760</td> <td>Confirmation of Bank Guarantee</td> </tr> <tr> <td>IFN 767</td> <td>Amendment in Bank Guarantee.</td> </tr> </tbody> </table> <p><i>Note: Successful Bidder shall not allow to start the work prior to submission of Performance Security.</i></p>	Code	Purpose	IFN 760	Confirmation of Bank Guarantee	IFN 767	Amendment in Bank Guarantee.
Code	Purpose						
IFN 760	Confirmation of Bank Guarantee						
IFN 767	Amendment in Bank Guarantee.						
<p><b>GCC 13.3.2</b></p>	<p>Supplementing with the following:</p> <p>The forms of acceptable Performance Security are:</p> <p>A bank guarantee issued by a reputable bank located in the Employer's country or abroad acceptable to the Employer in the form provided in Section 9, Contract Forms.</p> <p>The Performance Security is to be provided by the successful Bidder in the form of a bank guarantee which should be issued either:</p> <p>(a) by a reputable local bank, including a scheduled Indian Bank, which is acceptable to the Employer.</p>						

	(b) By a foreign bank located outside the Employer's country, confirmed by a reputable correspondent bank located in the country of the Employer, which is acceptable to the Employer.
<b>GCC 13.3.3</b>	Replacing with the following:  The performance security shall not be reduced on the date of the Operational Acceptance.
<b>GCC 13.3.4</b>	Addition of New Sub-Clause as GCC 13.3.4  In case of award of the contract to a Joint Venture, the performance security and the Bank Guarantee for advance payment shall be submitted in the name of all the Partner(s) of the Joint Venture.
<b>GCC 15.2</b>	Supplementing Clause GCC 15.2  The Employer shall however be free to reproduce all drawings, documents and other material furnished to the Employer by the contractor for the purpose of the Contract including, if required, for operation and maintenance.
<b>GCC 18.3</b>	Addition of New Sub Clause 18.3 (c): (c) monitoring of the obligations in Sub-Clauses 22.1.1, 22.2.1., 22.2.3, 22.2.4, 22.2.6, 22.2.7, 22.2.15, 22.2.16, 35.3 and 47
<b>GCC 19</b>	Add the following clause:  19.6 The Contractor shall not subcontract (i) works with a total accumulated value greater than the specified percentage of the Contract Price, or (ii) any part of the Works for which subcontracting is not permitted as specified below;  (i) Maximum allowable accumulated value of work subcontracted (as a percentage of the Contract Price): 50%  (ii) Parts of the Works for which subcontracting is not permitted: 50%.
<b>GCC 20.3.2</b>	Replacing with the following:  Within 21 days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Subclause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor

	<p>in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.</p> <p>If the Project Manager fails to take such action within the said 21 days, then the said document shall be deemed to have been approved by the Project Manager.</p>
<b>GCC 21.1</b>	<p>Addition of the following clause at the start of GCC 21.1:</p> <p>The Contractor shall adequately record the condition of roads, agricultural land and other infrastructure prior to the start of transporting materials, goods and equipment, and construction.</p>
<b>GCC 22</b>	<p>Installation</p> <p>22.2 Labor</p> <p>22.2.5 Working Hours: Supplement with following:</p> <p>(a) Normal working hours are: 8 hours per Shift from 9:00 AM to 6:00 PM (one hour break)</p>
<b>GCC 22.1.1</b>	<p>Addition of the following clause at the end of GCC 22.1.1:</p> <p>The Contractor shall comply with (i) the measures and requirements relevant to the Contractor which are set forth in the Resettlement Plan (“RP”)/Social Due Diligence Report (SDDR) attached hereto as Annexure-A of Section-6 of the tender document, to the extent it concerns impacts on affected people during construction; and (ii) any corrective or preventive actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor implementation of the resettlement plan.</p> <p>The Contractor shall allocate a budget for compliance with these measures, requirements and actions.</p>
<b>GCC 22.2.3</b>	<p>Addition of the following clause at the end of GCC 22.1.1:</p> <p>The Contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The Contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline.</p>

	<p>The Contractor shall (a) provide equal wages and benefits to men and women for work of equal value or type.</p>
<p><b>GCC 22.2.7</b></p>	<p>Health and Safety</p> <p>After the existing paragraph in GCC 22.2.7 (a), add the following:          “The Contractor is responsible for establishment of preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks of the construction site work to the health and safety of local communities.</p> <p>Within 28 days of the Effective Date, the Contractor shall submit a detailed Site Specific Health and Safety Management Plan (SSHSMP), based on the Environmental Health and Safety Management Plan submitted in the technical proposal, for the Project Manager’s no objection showing how he/she intends to comply with the local Health and Safety laws and regulations and other specific requirements prescribed in the Contract, taking into account the Supplementary Information in Section 6- Employer’s Requirements. Work shall not commence on the Site until the confirmation of no objection of the SSHSMP has been obtained from the Project Manager and is being implemented. Such confirmation of no objection by the Engineer shall not relieve the Contractor of any of his/her obligations or responsibilities under the Contract.</p> <p>Where unanticipated health and safety hazards or risks become apparent during the Contract, the Contractor is required to update the SSHSMP to outline the potential impacts to site works and associated mitigation measures for the Project Manager’s no objection.</p> <p>The Contractor shall comply with the approved SSHSMP and any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the project EMP through the SSHSMP.</p>

In particular, the Contractor is required to provide all personnel on site including Employer's Personnel and visitors with personal protective equipment, including protection for feet (safety boots), head, eyes, ears (safety helmets) and hands, etc., in accordance with the Contractor's SSHSMP. The Contractor should ensure that his Subcontractors comply with the SSHSMP and provide all such necessary equipment to their personnel.

The Contractor shall bear the costs to ensure that such measures, requirements and actions are carried out.

The Contractor shall submit semi-annual reports on the compliance of such measures to the Employer."

Add after the existing paragraph in GCC 22.2.7 (c) the following:

"In the event of a significant injury involving medical treatment or hospitalization and fatal accident the Contractor shall notify the Project Manager immediately by verbal communication and submit a formal report as soon as practicable after its occurrence. For all accidents, whether fatal or not, the Contractor shall also notify the appropriate local authorities in accordance with the Laws of the Country."

Add new sub clause (d) as follows:

"The Contractor shall throughout the contract (including the Defect Liability Period):

- (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's employees, all Subcontractors and Employer's and Project Manager's employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD) – or Sexually Transmitted Infections (STI) in general and HIV/ AIDS in particular;



	<p>(ii) provide male or female condoms for all Site staff and labor as appropriate; and</p> <p>(iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labor.</p> <p>The Contractor shall include in the program to be submitted for the execution of the Facilities under Subclause 18.2 an alleviation program for Site staff and labor and their families in respect of STI and STD including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Subclause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related subcontracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for the preparation and implementation this program shall not exceed the amount dedicated for this purpose."</p>
<p><b>GCC 22.2.8</b></p>	<p><b>Funeral Arrangements</b></p> <p>The funeral arrangements in the unfortunate event of the death of any of the staff engaged by the contractor shall be the sole responsibility of the contractor during the entire implementation as well as operation &amp; maintenance period. The contractor shall meet all expenses related to the funeral, including transportation of the dead body of the staff to his place of residence and / or travel expenses of immediate family members to the site</p>
<p><b>GCC 22.2.3(d)</b></p>	<p><b>Addition of Sub-Clause GCC 22.2.3(d)</b></p> <p><b>Compliance with Labour Regulations</b></p> <p>During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all applicable existing labour enactments and rules made thereunder, regulations notifications and byelaws of the State or Central Government or local authority and any other labour law (including rules), regulations bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in</p>

	<p>no case shall be treated as the employees of the Employer at any point of time.</p> <p>The Contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The Contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The Contractor shall provide equal wages and benefits to men and woman for work of equal value or type.</p>
<b>GCC 22.2.3(e)</b>	<p><b>Addition of Sub-Clause GCC 22.2.3(e)</b></p> <p>The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments.</p>
<b>GCC 22.2.3(f)</b>	<p><b>Addition of Sub-Clause GCC 22.2.3(f)</b></p> <p>If the Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or observe, or for non observance of the provisions stipulated in the notifications/ byelaws/ Acts/ Rules/ regulations including amendments, if any, on the part of the Contractor, the Employer shall have the right to deduct any money due to the Contractor under this contract or any other contract with the employer including his amount of performance security for adjusting the aforesaid payment. The Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.</p>
<b>GCC 22.2.16</b>	<p><b>Addition at the end of GCC 22.2.16:</b></p> <p>Child "means a child below the statutory minimum age specified under applicable national, provincial or local law of India</p>
<b>GCC 22.2.17</b>	<p><b>Addition of following new sub clause 22.2.17:</b></p> <p>The Contractor shall ensure that its employees and Subcontractors observe the highest ethical standards and refrain from any form of bullying, discrimination, misconduct, and harassment, including sexual harassment and shall, at all times, behave in a manner that creates an environment free of unethical behavior, bullying, misconduct, and harassment, including sexual harassment. The</p>

	<p>Contractor shall take appropriate action against any employees or Subcontractors, including suspension or termination of employment or subcontract, if any form of unethical or inappropriate behavior is identified.</p> <p>The Contractor shall conduct training programs for its employees and Subcontractors to raise awareness on and prevent any form of bullying, discrimination, misconduct, and harassment including sexual harassment, and to promote a respectful work environment. The Contractor shall keep an up to date record of its employees and subcontractors who have attended and completed such training programs and provide such records to the Employer or the Engineer at their first written request.</p>
<b>GCC 22.3.3</b>	<p>Replace with the following:</p> <p>The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract. There shall not be any additional financial liability on the Employer in this regard.</p>
<b>GCC 24</b>	<p>Replace the marginal words/headings '<b>Completion of the Facilities</b>' with '<b>Pre Commissioning</b>'.</p>
<b>GCC 24.2 &amp; 24.3</b>	<b>Stands Deleted</b>
<b>GCC 24.5</b>	<p><b>Replacing Sub-Clause GCC 24.5</b></p> <p>The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 24.4, notify the Contractor in writing of any defects and/or deficiencies.</p> <p>If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC Sub-Clause 24.3. If the Project Manager is satisfied that the Facilities or that part thereof have passed Precommissioning, the Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice/ seven (7) days after receipt of the Contractor's repeated notice, advise the Contractor to proceed with the Commissioning of the</p>

	Facilities or that part thereof. If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.
<b>GCC 24.6</b>	<b>Replacing Sub-Clause GCC 24.6</b>  If the Project Manager fails to advise the Contractor to proceed with the Commissioning of the Facilities or the relevant part thereof or to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor's repeated notice under GCC Sub-Clause 24.5, then the Facilities or that part thereof shall be deemed to have passed Precommissioning, as of the date of the Contractor's notice or repeated notice, as the case may be
<b>GCC 24.7</b>	<b>Replacing Sub-Clause GCC 24.7</b>  As soon as possible after Precommissioning, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.
<b>GCC 24.8</b>	Delete this sub-clause GCC 24.8.
<b>GCC 25</b>	Replace the marginal words/headings ' <b>Commissioning and Operational Acceptance</b> ' with ' <b>Commissioning, Completion and Operation Acceptance</b> '
<b>GCC 25.1.1</b>	<b>Replacing Sub-Clause GCC 25.1.1</b>  Commissioning of the Facilities (or specific part thereof if any) shall be commenced by the Contractor immediately after being advised by the Project manager, pursuant to sub clause GCC 24.5 or immediately after the deemed Pre-commissioning under sub clause GCC 24.6.
<b>GCC 25.1.2</b>	<b>Stands Deleted</b>
<b>GCC 25.1.3</b>	<b>Replace Sub Clause GCC25.1.3</b>  Commissioning of the Facilities (or specific part thereof where specific parts are specified in the GCC 8.2) shall be completed by the Contractor as per the procedures detailed in Employer's Requirements. The Employer's /Project Manager's advisory personnel shall attend the commissioning.

<p><b>GCC 25.2.1</b></p>	<p><b>Replacing sub clause 25.2.1:</b> Subject to GCC Subclause 25.5, the Guarantee Test and repeats thereof shall be conducted by the Contractor during Commissioning of the Facilities or the relevant part thereof to ascertain the successful commissioning of the facilities or any part thereof. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test and any repeats thereof. As soon as the Guarantee Tests are completed, the Contractor shall so notify the Project Manager in writing.</p>
<p><b>GCC 25.2.2</b></p>	<p><b>Replace Sub-Clause GCC 25.2.2 :</b>  The Project Manager shall, within fourteen (14) days after receipt of the Contractor’s notice under SCC GCC Sub-Clause 25.2.1, either issue a notice, stating that the Facilities or that part thereof have reached Commissioning as of the date of the Contractor’s notice under SCC GCC Sub-Clause 25.2.1, or notify the Contractor in writing of any defects and/or deficiencies.  If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in SCC GCC Sub-Clause 25.2.1. If the Project Manager is satisfied that the Facilities or that part thereof have reached Commissioning, the Project Manager shall, within seven (7) days after receipt of the Contractor’s repeated notice, issue a Commissioning Certificate stating that the Facilities or that part thereof have reached Commissioning as of the date of the Contractor’s repeated notice. If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor’s repeated notice, and the above procedure shall be repeated.</p>
<p><b>GCC 25.2.3</b></p>	<p><b>Add new Sub-Clause GCC 25.2.3 as follow:</b>  If the Project Manager fails to issue the Commissioning Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor’s notice under SCC GCC Sub-Clause 25.2.1 or within seven (7) days after receipt of the Contractor’s repeated notice under SCC GCC Sub-Clause 25.2.2, then the Facilities or that part thereof shall be deemed to have reached Commissioning as of the date of the Contractor’s notice or repeated notice, as the case may be.</p>

<p><b>GCC 25.2.4</b></p>	<p><b>Add new Sub-Clause GCC 25.2.4 as follows:</b></p> <p>If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Pre-Commissioning specified in the SCC or any other period agreed upon by the Employer and the Contractor, provisions of GCC Clause 25.5 and its sub-clauses shall apply.</p>
<p><b>GCC 25.2.5</b></p>	<p><b>Add new Sub-Clause GCC 25.2.5 as follow:</b></p> <p>As soon as possible after Commissioning, the Contractor shall complete all outstanding minor items, as per the Schedule mutually agreed between the Employer and the Contractor, so that the Facilities or the relevant part thereof, are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.</p>
<p><b>GCC 25.2.6</b></p>	<p><b>Add new Sub-Clause GCC 25.2.6 as follow:</b></p> <p>Upon Commissioning, the Contractor shall be responsible for the O&amp;M (as per Section - 6 (Employer's Requirements) and O&amp;M Contract) and care &amp; custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.</p>
<p><b>GCC 25.2.7</b></p>	<p><b>Add new Sub-Clause GCC 25.2.7 as follow:</b></p> <p>Upon completion of construction, the contractor shall fully reinstate pathways, other local infrastructure, and agriculture land to at least their pre-project condition as recorded by the Contractor with its obligation in clause 21.1.</p>
<p><b>GCC 25.3.1</b></p>	<p><b>Replacing Sub-Clause GCC 25.3.1</b></p> <p>Operational Acceptance shall occur in respect of the Facilities or any part thereof as mentioned below:</p> <ul style="list-style-type: none"> <li>(i) when Functional Guarantees are met or the Contractor has paid liquidated damages specified in GCC sub clause 28.3 hereof; and</li> <li>(ii) Contractor has provided O&amp;M services in line with Section-6 (Employer's Requirements) and O&amp;M Contract.</li> </ul>

<p><b>GCC 25.3.3</b></p>	<p><b>Replacing Sub-Clause GCC 25.3.3</b></p> <p>The Project Manager shall, after consultation with the Employer, and within twenty one (21) days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate or Completion (Taking Over) Certificate.</p> <p>The Operational Acceptance Certificate or Completion (Taking Over) Certificate shall not be unreasonably withheld nor shall the Employer delay the issuance thereof, on account of minor omissions or defects which do not affect the Operation and/or cause any serious risk to the Facilities or personnel, provided that a programme has been mutually agreed between the Employer and the Contractor covering the remedial action for the outstanding minor omissions/defects.</p> <p>Such certificate shall not relieve the Contractor of any of its obligations which otherwise survive, by the terms and conditions of the Contract after issuance of such certificate.</p>
<p><b>GCC 25.3.4</b></p>	<p><b>Replacing Sub-Clause GCC 25.3.4</b></p> <p>If within 21 days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as of the date of the Contractor's said notice.</p>
<p><b>GCC 25.3.5</b></p>	<p><b>Add new sub clause GCC 25.3.5</b></p> <p>Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.</p>
<p><b>GCC 25.4</b></p>	<p>"Partial Acceptance" shall be replace with "Partial Operational Acceptance"</p>
<p><b>GCC 25.5</b></p>	<p><u>Delayed Pre-Commissioning and/or Guarantee Test shall be replace Delayed Pre-Commissioning and/or Guarantee Test and/or Operational Acceptance</u></p>
<p><b>GCC 25.5.1</b></p>	<p><b>Replacing Sub-Clause GCC 25.5.1</b></p> <p>In the event that the Contractor is unable to proceed with the Precommissioning, Commissioning, , Guarantee Test and Operational Acceptance pursuant to Sub-Clause GCC 24 and GCC 25, for reasons attributable to the Employer either on account of non-availability of</p>

	<p>other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions leading to "deemed" completion of activities such as <b>Commissioning, Completion and Operation Acceptance</b> e, pursuant to GCC Sub-Clause 25.3.4, Contractor's obligations regarding Defect Liability Period, pursuant to GCC Sub Clause 27.2, Functional Guarantee, pursuant to GCC Clause 28, Care of Facilities, pursuant to GCC Clause 32, and Suspension, pursuant to GCC Sub-Clause 41.1, shall not apply. In this case, the following provisions shall apply</p>
<b>GCC 25.5.4</b>	<p><b>Replacing Sub-Clause GCC 25.5.4</b></p> <p>When the Contractor is notified by the Project Manager that the plant is ready for Pre-commissioning and /or guarantee test, and/ or operational Acceptance, the Contractor shall proceed without delay in performing all the specified activities and obligations under the contract.</p>
<b>GCC 26</b>	'Completion Time Guarantee' replace with 'Commissioning Guarantee'
<b>GCC 26.1</b>	<p>Replace sub-clause GCC 26.1 with the following:</p> <p>26.1 The Contractor guarantees that it shall attain Commissioning of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the SCC pursuant to GCC Subclause 8.2, or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.</p>
<b>GCC 26.2</b>	<p>Replace sub-clause GCC 26.2 with the following:</p> <p>26.2 If the Contractor fails to attain Commissioning of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount specified in the SCC as a percentage rate of the Contract Price or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as "Maximum" in the SCC as a percentage rate of the Contract Price. Once the "Maximum" is reached, the Employer may consider termination of the Contract, pursuant to GCC Subclause 42.2.2.</p> <p>Such payment shall completely satisfy the Contractor's obligation to attain Commissioning of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GCC Clause 40. The Contractor shall</p>



	<p>have no further liability whatsoever to the Employer in respect thereof.</p> <p>However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.</p> <p>Save for liquidated damages payable under this GCC Subclause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the Appendix (Time Schedule) to the Contract Agreement and/or other program of work prepared pursuant to GCC Subclause 18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.</p> <p>Applicable rate for liquidated damages:</p> <table border="1"> <thead> <tr> <th><b>Delay Period</b></th> <th><b>LD</b></th> </tr> </thead> <tbody> <tr> <td>Upto 30 days</td> <td>1.15 x loss of generation in no. of unit for days of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh</td> </tr> <tr> <td>From 31-60 days</td> <td>1.2 x loss of generation in no. of unit for period of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh</td> </tr> <tr> <td>From 61 &amp; above days</td> <td>1.25 x loss of generation in no. of unit for period of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh</td> </tr> </tbody> </table> <p>Maximum deduction for liquidated damages: 10% of the contract value</p> <p>Apart from above, Liquidated Damages on account of Guaranteed Energy Generation under subject Contract shall be worked out in line with the provisions mentioned under Section-6 (Employer's Requirements).</p>	<b>Delay Period</b>	<b>LD</b>	Upto 30 days	1.15 x loss of generation in no. of unit for days of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh	From 31-60 days	1.2 x loss of generation in no. of unit for period of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh	From 61 & above days	1.25 x loss of generation in no. of unit for period of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh
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From 61 & above days	1.25 x loss of generation in no. of unit for period of delay (calculated on pro rate basis as per Clause 15 of 'Specification') X Rs. 3.11/ kWh								
<b>GCC 26.3</b>	Clause stands deleted								
<b>GCC 26.4</b>	<p><b>Addition of New Sub-Clause SCC 26.4</b></p> <p><b>Indemnity</b></p>								

	<p>For the equipment/material to be provided by the Contractor, it will be the responsibility of the Contractor to take delivery, unload and store the materials at Site and shall Indemnify Employer against loss, damage and any risks involved for the full value of the materials. This Indemnity shall be valid till the scheduled date of Operational Acceptance of the equipment by the Employer.</p>
<b>GCC 27.2</b>	<p>Replace with the following:</p> <p>The Defect Liability Period shall be 540 days from the date of the date of Operational Acceptance of the Facilities (or any part thereof).</p> <p>If during the Defect Liability Period any defect should be found in the design, engineering, materials, and workmanship of the Plant supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace, or otherwise make good as the Contractor shall determine at its discretion, such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement, or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:</p> <ul style="list-style-type: none"> <li>(a) improper operation or maintenance of the Facilities by the Employer,</li> <li>(b) operation of the Facilities outside specifications provided in the Contract, or</li> <li>(c) normal wear and tear.</li> </ul>
<b>GCC 27.10</b>	Clause stands deleted.
<b>GCC 28.1</b>	<p>Replace with the following:</p> <p>The Contractor guarantees that post commissioning, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Appendix (Functional Guarantees) to the Contract Agreement, subject to, and upon the conditions therein specified.</p>
<b>GCC 30</b>	30.1 (b) The multiplier of the Contract Price is: One (1).
<b>GCC 32.1</b>	<b>Replace sub clause GCC 32.1 with the following:</b>

	<p>The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to <b>GCC Clause 24 and 25</b> or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC Clause 27. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Subclauses 32.2 and 38.1.</p>
<b>GCC 35.3</b>	<p>Addition at the end of GCC 35.3:</p> <p>In addition to notice of any Unforeseeable physical conditions, the Contractor shall provide the Engineer with a written notice of any unanticipated environmental or resettlement risks or impacts that arise during construction, implementation or operation of the Plant or Permanent Works, which were not considered in the initial environmental examination, the environmental management plan or the resettlement plan as applicable.</p>
<b>GCC 42.1.3</b>	<p><b>Addition of new sub clause</b></p> <p>42.1.3 (f) a reasonable amount of profit for the parts of the Works not executed by the Contractor as at the date of termination.</p>
<b>GCC 43.2</b>	<p><b>Addition New Clause GCC 43.2</b></p> <p><b>Construction of Contract</b></p> <p>The Contracts to be entered into with the successful Bidder shall be as under:</p> <p><u>For Foreign Bidder:</u></p> <ul style="list-style-type: none"> <li>- First Contract: For CIP Entry Border Point supply of equipment and materials including mandatory Spares to be supplied from abroad, Type Testing to be conducted abroad and Training to be imparted abroad (Off-Shore Contract);</li> <li>- Second Contract: For EXW supply of equipment and materials including mandatory Spares to be supplied from within India and Type Testing to be conducted within India and for</li> </ul>

	<p>providing all services i.e., port handling and custom clearance of imported goods and loading, inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, Testing and Commissioning including Performance Testing in respect of all equipment and materials supplied under both 'First Contract' and 'Second Contract', Training to be imparted in India and any other services specified in the Contract documents (On-Shore Contract);</p> <ul style="list-style-type: none"> <li>- Third Contract: For providing all services related to O&amp;M (O&amp;M Contract).</li> </ul> <p><u>For Domestic Bidder:</u></p> <ul style="list-style-type: none"> <li>- First Contract: For EXW supply and CIP Entry Border Point supply, if any, of all equipment and materials including mandatory Spares identifying separately the CIP Entry Border Point and EXW components of the supply and Type Testing to be conducted (whether in India or abroad) under the Contract and for providing all services i.e. port handling and custom clearance of imported goods and loading, inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, Testing and Commissioning including performance testing in respect of all the equipment and materials supplied under the "First Contract", Training to be imparted (whether in India or abroad) and any other services specified in the Contract Documents (Supply &amp; Services Contract).</li> <li>- Second Contract: For providing all services related to O&amp;M (O&amp;M Contract).</li> </ul>
<b>GCC 43.3</b>	<p><b>Addition New Clause GCC 43.3</b></p> <p>The award of two separate Contracts shall not in any way dilute the responsibility of the Contractor for the successful completion of the facilities as per Specification and a breach in one Contract shall automatically be construed as a breach of the other Contract(s) which will confer a right on the Employer to terminate the other Contract(s) also at the risk and the cost of the Contractor</p>
<b>GCC 45</b>	<p>45.1 The Dispute Board shall be appointed within 28 days after the Effective Date.</p>

	<p>The Dispute Board shall be comprised of 3 members.</p> <p>List of potential Dispute Board members is: Will be finalized within 28 days of signing the Contract Agreement</p> <p>45.2 Appointment (if not agreed) to be made by: Director of IIT Delhi.</p> <p>45.3 This sentence shall be added as last paragraph in GCC Subclause 45.3:</p> <p style="padding-left: 40px;">If the decision of the Dispute Board requires a payment by one Party to the other Party, the Dispute Board may require the payee to provide an appropriate security in respect of such payment.</p> <p>45.5 Rules of procedure for arbitration proceedings:</p> <p>(a) Contracts with foreign contractors:</p> <p style="padding-left: 40px;">International arbitration shall be conducted in accordance with the Rules UNCITRAL. If no rules have been specified, then the Rules of the Singapore International Arbitration Centre (SIAC) shall apply</p> <p style="padding-left: 40px;">Arbitration shall be administered by SIAC.</p> <p style="padding-left: 40px;">The place of arbitration shall be the place of the institution administering the arbitration.</p> <p>(b) Contracts with contractors from being nationals of the Employer's country: Any dispute between the employer and a contractor who is a national of the Employer's country arising in connection with the present contract shall be referred to arbitration in accordance with the laws of the Employer's country.</p> <p>45.6 GCC Subclause 45.6 shall be replaced with the following sentence:</p> <p style="padding-left: 40px;">In the event that a Party fails to comply with a Dispute Board decision which has become either binding or final and binding, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under Subclause 45.5 [Arbitration] for summary or other expedited relief, as may be appropriate. Subclause 45.3 [Obtaining Dispute Board's Decision] and Subclause 45.4 [Amicable Settlement] shall not apply to this reference.</p>
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<p><b>GCC 46</b></p>	<p>46. Eligibility</p> <p>46.1 The Contractor shall have the nationality of an ADB member country. The Contractor shall be deemed to have the nationality of a country if the Contractor 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.</p> <p>46.2 The materials, equipment and services to be supplied under the Contract shall have their origin in eligible source countries and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment and services.</p> <p>46.3 For purposes of SCC 46.2, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.</p>
<p><b>GCC 47</b></p>	<p>The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations.</p> <p>The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all of the monitoring and mitigation measures set forth in the Initial Environmental Examination ("IEE") or Environmental Management Plan "EMP") and (c) allocate the budget required to ensure that such measures are carried out. The Contractor shall submit semi-annual reports on the carrying out of such measures to the Employer.</p> <p>More particularly, the Contractor shall comply with (i) the measures and requirements set forth in the IEE and the EMP; and (ii) any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor implementation of the IEE and the EMP.</p> <p>The Contractor shall allocate a budget for compliance with these measures, requirements and actions.</p>



# Section 9: Contract Forms

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    Appendix 5: List of Major Items of Plant and Services and List of Approved Subcontractors ..9-Error!  
    **Bookmark not defined.**

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# Letter of Acceptance

[date]

To: [Name and address of the contractor]

Subject: Contract No. [please specify]

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 Contract Price in the aggregate of [amounts in words and figures] [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 and any additional security required as a result of the evaluation of your bid, using for that purpose one of the Performance Security Forms 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- Contract No 1

THIS AGREEMENT made on the [ *insert number* ] day of [ *insert month* ], [ *insert year* ],

BETWEEN

(1) [ *name of the employer* ], a corporation incorporated under the laws of [ *country of the Employer* ] and having its principal place of business at [ *address of the Employer* ] (hereinafter called “the Employer”), and (2) [ *name of the contractor* ], a corporation incorporated under the laws of [ *country of the contractor* ] and having its principal place of business at [ *address of the contractor* ] (hereinafter called “the Contractor”).

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, and commission certain Facilities, viz. [ *list of facilities* ] (“the Facilities”) and the Contractor have agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

## Article 1 Contract Documents

- 1.1 **Contract Documents** (Reference GCC Clause 2)  
The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:
- (a) This Contract Agreement and the Appendixes hereto
  - (b) Letter of Bid and Price Schedules submitted by the Contractor
  - (c) Special Conditions of Contract
  - (d) List of Eligible Countries that was specified in Section 5 of the Bidding Document
  - (e) General Conditions of Contract
  - (f) Specifications
  - (g) Drawings
  - (h) Other completed Bidding Forms submitted with the Letter of Bid
  - (i) Any other documents forming part of the Employer’s Requirements
  - (j) Any other documents shall be added here
- 1.2 **Order of Precedence** (Reference GCC Clause 2)  
In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.
- 1.3 **Definitions** (Reference GCC Clause 1)  
Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

**Article 2  
Contract Price and  
Terms of Payment**

2.1 **Contract Price** (Reference GCC Clause 11)  
The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of [amounts of foreign currency in words], [amounts in figures] as specified in Price Schedule No. 5 (Grand Summary), [amounts of local currency in words], [amounts in figures], or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 **Terms of Payment** (Reference GCC Clause 12)  
The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in the Appendix (Terms and Procedures of Payment) hereto.

The Employer shall instruct its bank to issue an irrevocable confirmed documentary credit made available to the Contractor in a bank in the country of the Contractor. The credit shall be time to time on pro rata basis for an amount of [amount equal to the total named in Schedule 1 or whichever applicable less the advance payment to be made for plant and mandatory spare parts supplied]; and shall be subject to the Uniform Customs and Practice for Documentary Credits 1993 Revision, ICC Publication No. 500.<sup>2</sup>

**Article 3  
Effective Date**

3.1 **Effective Date** (Reference GCC Clause 1)  
The Effective Date upon which the period until the Time for Completion of the Facilities shall be counted from is the date when all of the following conditions have been fulfilled:

- (a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor.
- (b) The Contractor has submitted to the Employer the performance security and the advance payment guarantee.
- (c) The Employer has paid the Contractor the advance payment.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the conditions listed under 3.1 are not fulfilled within 2 months from the date of this Contract notification because of reasons not attributable to the Contractor, the parties shall discuss and agree on an equitable adjustment to the Time for Completion and/or other relevant conditions of the Contract.

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<sup>2</sup> Or Uniform Customs and Practice for Documentary Credits 2007 Revision, ICC Publication No. 600 (or the latest version).

**Article 4  
Communications**

4.1 The address of the Employer for notice purposes, pursuant to GCC 4.1 is: [ Employer's address ].

4.2 The address of the Contractor for notice purposes, pursuant to GCC 4.1 is: [ Contractor's address ].

**Article 5.  
Appendixes**

- 5.1 The Appendixes listed in the attached List of Appendixes shall be deemed to form an integral part of this Contract Agreement.
- 5.2 Reference in the Contract to any Appendix shall mean the Appendixes attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Employer

[ *Signature* ]

[ *Title* ]

in the presence of

[ *Signature* ]

[ *Title* ]

Signed by, for and on behalf of the Contractor

[ *Signature* ]

[ *Title* ]

in the presence of

[ *Signature* ]

[ *Title* ]

**APPENDIXES**

Appendix 1: Terms and Procedures of Payment

Appendix 2: Price Adjustment

Appendix 3: Insurance Requirements

Appendix 4: Time Schedule

Appendix 5: List of Major Items of Plant and Services and List of Approved Subcontractors

Appendix 6: Scope of Works and Supply by the Employer

Appendix 7: List of Documents for Approval or Review

Appendix 8: Functional Guarantees

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## **Appendix 1: Terms and Procedures of Payment**

In accordance with the provisions of GCC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, based on the Price Breakdown given in the section on Price Schedules of bidding forms. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

### **(A) Terms of Payment**

#### **Schedule No. 1 - Plant and Mandatory Spare Parts Supplied from Abroad**

In respect of plant and mandatory spare parts supplied from abroad, the following payments shall be made:

Ten percent (10%) of the total CIP amount as an advance payment against receipt of invoice and an irrevocable advance payment security in the form of bank guarantee for equal amount of the advance in the prescribed format made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the plant and mandatory spare parts delivered to the site, as evidenced by delivery documents.

Seventy percent (70%) of the total CIP amount for each sub-project (means each site under the Lot) upon Incoterm "CIP", upon delivery of material, within 45 days through irrevocable letter of credit (LC) by EESL, payable upon presentation of following required documents for LC to the issuing bank. List of documents is as follows:

1. Copy of Contract Agreement
2. Copy of Lorry Receipt (LR)/bill of lading duly acknowledged and endorsed by the buyer for receipt of material.
3. Supplier's detailed invoice.
4. Packing list identifying contents of each shipment.
5. E-way bill / delivery Challan (if applicable).
6. Material Receipt Certificate
7. Transit insurance Policy/Certificate upto the delivery of material at site
8. Manufacturer's/Supplier's guarantee / warrantee certificate
9. Inspection Certificate / Material Dispatch Clearance Certificate (MDCC) for dispatch issued by EESL's representative.
10. Test certificate, if any.
11. Certificate for bank that one set of required documents have been sent to buyer as per contract.

Twenty percent (20%) of the total CIP amount for each sub-project upon successful commissioning duly certified by Engineer in charge/Project Manager or his authorized representative and on submission of insurance of the plant as per Appendix (Insurance) and Commissioning Certificate, within 45 days after receipt of invoice.

Materials will be supplied and installed in phased manner as per erection PERT chart duly approved by the Employer.

#### **Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from Within the Employer's Country**

In respect of plant and mandatory spare parts supplied from within the Employer's country, the following payments shall be made on:

Ten percent (10%) of the total EXW amount as an advance payment against receipt of invoice and an irrevocable advance payment security in the form of bank guarantee for equal amount of the advance in the prescribed format made out in favor of the Employer. The advance payment

security may be reduced in proportion to the value of the plant and mandatory spare parts delivered to the site, as evidenced by delivery documents.

Seventy percent (70%) of the total EXW amount +100% GST(as applicable) for each sub-project (means each site under the Lot), upon delivery and acceptance at site, within 45 days through irrevocable inland letter of credit (LC) by EESL, payable upon presentation of following required documents for LC to the issuing bank. List of documents is as follows:

1. Copy of Contract Agreement
2. Copy of Lorry Receipt (LR) duly acknowledged and endorsed by the buyer for receipt of material.
3. Supplier's detailed invoice.
4. Packing list identifying contents of each shipment.
5. E-way bill / delivery Challan.
6. Material Receipt Certificate
7. Transit insurance Policy/Certificate upto the delivery of material at site
8. Manufacturer's/Supplier's guarantee / warrantee certificate
9. Inspection Certificate / Material Dispatch and Receipts Clearance Certificate (MDCC) for dispatch issued by EESL's representative.
10. Test certificate, if any.
11. Certificate for bank that one set of required documents have been sent to buyer as per contract.

Twenty percent (20%) of the total EXW amount for each sub-project upon successful commissioning duly certified by Engineer in charge/Project Manager or his authorized representative and on submission of insurance of the plant as per Appendix (Insurance) and Commissioning Certificate, within 45 days after receipt of invoice.

Materials will be supplied and installed in phased manner as per erection PERT chart duly approved by the Employer.

### **Schedule No. 3 - Design Services**

In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made:

Ten percent (10%) of the total design services amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer.

Ninety percent (90%) of the total design services amount upon acceptance of design by the Project Manager within 45 days after receipt of invoice.

### **Schedule No. 4 - Installation and Other Services**

In respect of installation services for both the foreign and local currency portions, the following payments shall be made:

Hundred percent (100%) of the total value of installation and services for each sub-project (means each site under the Lot), performed by the Contractor upon successful commissioning duly certified by Engineer in charge/Project Manager or his authorized representative, within 45 days after receipt of invoice and on submission of insurance of the plant as per Appendix (Insurance) and Commissioning Certificate.

### **Payment Under Contract 2- Operations & Maintenance- Schedule 4a**

50% of the semi-annual O&M amount for each sub-project (means each site under the Lot) quoted in Schedule 4a shall be paid on semi-annual basis upon successful completion of operational and maintenance for the respective period, duly certified by Engineer in charge/Project Manager or his authorized representative, within 45 days after receipt of invoice.

Balance 50% payment of whole year shall be released at the end of each year after adjustment of Liquidated Damages on account of functional guarantee within 45 days after receipt of invoice.

GST on schedule 4 as applicable will be paid as per actual.



## (B) Payment Procedures

When applying for certification and making payments, the procedures shall be as follows:

- (i) Upon completion of supply of materials, installation and testing of the facilities or any part thereof at each designated site or for each sub-project, the Contractor shall notify the Employer in writing.
- (ii) Upon such notification, the Employer/ Employer's representative shall carry out the joint inspection along with the Contractor to verify the quantities and quality of material /work as per the employer's requirement in section 6, technical specifications.
- (iii) Subsequent to the joint inspection, joint inspection report, material receipt certificate, if any, will be issued with certified quantities of materials and works, and list of any defects and /or deficiencies (snag / defects list), jointly signed by Employer/ Employer's representative and Contractor. The delivery & installation status for payments is presumed to be completed at this stage provided there are no major defects listed.
- (iv) Pursuant to GCC clause 24, Employer will advise the Contractor to proceed with the Commissioning upon receipt of report/notice regarding pre-commissioning works in respect of the facilities or any part thereof at each designated site or for each sub-project.
- (v) Pursuant to GCC clause 25, the Contractor shall complete commissioning including required testing, pre-commissioning etc. and notify the Employer in writing.
- (vi) Pursuant GCC clause 25, Employer shall issue commissioning certificate in respect of the facilities or any part thereof at each designated site or for each sub-project after issuance of commissioning certificate by MAHAGENCO/MSEDCL.
- (vii) The Contractor shall submit the invoices at respective stages for payments according to payment terms as specified in Part (A) and (B), together with submission of applicable documents including Joint Inspection reports, material receipt certificates, and commissioning certificates as applicable, in the office of the Project Manager.
- (viii) Payments will be made, within 45 days, as per terms of payments mentioned above, after receipt of invoices and documentation in the office of Project Manager.

## **Appendix 2: Price Adjustment**

**Prices shall remain FIRM and FIXED during currency of the contract**

## Appendix 3: Insurance Requirements

### (A) Types of Insurance to Be Taken Out by the Contractor

In accordance with the provisions of GCC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the types of insurance set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

#### (a) Cargo Insurance

Covering loss or damage occurring, while in transit from the supplier's or manufacturer's works or stores until arrival at the Site, to the Facilities (including spare parts therefore) and to the construction equipment to be provided by the Contractor or its Subcontractors.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
110% of (Ex works/CIP Price)	Nil  (If applicable, shall be in the scope of Contractor)	Contractor and Employer	Dispatch Location	Site Location

#### (b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the defect liability period while the Contractor is on the Site for the purpose of performing its obligations during the defect liability period.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
110% of (Ex works/CIP Price)	Nil  (If applicable, shall be in the scope of Contractor)	Contractor /Sub-Contractor and Employer	Receipt at site	Up to defect liability period

#### (c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities that have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
As per approved safety plan, EMP	Nil  (If applicable, shall be in the	Contractor/Sub Contractor	Commencement of work	Completion of Facilities, which includes

and statutory requirements	scope of Contractor)			Construction, Commissioning and O&M period.

**(d) Automobile Liability Insurance**

Covering use of all vehicles used by the Contractor or its Subcontractors (whether owned by them or not) in connection with the supply, installation, commissioning and O&M of the Facilities. Comprehensive insurance in accordance with statutory requirements.

**(e) Workers' Compensation**

In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

**(f) Employer's Liability**

In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

**(g) Other Insurance**

The Contractor is also required to take out and maintain at its own cost the following types of insurance:

Details: Comprehensive O&M insurance on yearly basis for each of the site

Note: In addition to above, following may be noted:

- i. During the Contract period, all insurance related expenses shall be borne by the Contractor. The goods supplied under the Contract shall be fully insured against the loss or damage incidental to manufacture, transportation, storage and delivery in such a manner that EESL/MSEDCL/MAHAGENCO shall not incur any financial loss, as long as the plant continues to remain under the custody of the Contractor.
- ii. Adequate and seamless insurance coverage during construction period and O&M period to cater all risks related to construction and O&M of Plant to indemnify the EESL. The insurance during the construction and O&M period shall also cover the power output warranty of Solar PV modules. Insurance certificate of warehouse and / local storage facility at each of the site shall be submitted to EESL before the start of the erection and commissioning work.
- iii. In case of any loss or damage or pilferage or theft or fire accident or combination of the said incidents etc. under the coverage of insurance, the Contractor shall lodge the claim as per rules of insurance. Any FIR required to be lodged to local Police Station shall be the responsibility of the Contractor.
- iv. The Contractor shall arrange to supply/ rectify/ recover the materials even if the claim is unsettled for timely completion of the project. The final financial settlement with the insurance company shall rest upon the Contractor.
- v. In case of any delay of the project attributable to the Contractor, the Contractor himself in consultation with EESL should take the extension of insurance. Any financial implications shall, however, be borne by the Contractor.
- vi. The Contractor should arrange for providing insurance coverage to its workmen under Workmen's Compensation Act or similar Rules and Acts as applicable during execution of work for covering risk against any mishap to its workmen. The Contractor shall also undertake a Third Party Insurance. The EESL will not be responsible for any such loss or mishap.
- vii. All other insurance like In – transit insurance (Marine/ Cargo/ others as applicable), Contractor All Risk, Erection All Risk, workmen compensation, third party liability, insurance against theft and acts of GOD and others as required for the Construction and O&M of the Plant and to indemnify the EESL / equipment/ material and resources shall be borne by the Contractor. Fire insurance is to be arranged by the Contractor up to the years of O&M of the Contract.

- viii. All the insurance cover taken for the construction and O&M period shall be seamless in nature and in the name of EESL.
- ix. The insurance are to be suitably taken for the activity/ act which is required to cover all the risks associated to the activity / act. The contractor shall be responsible to take suitable insurance till the completion of the Construction and O&M period and indemnify the EESL from all associated risks whatsoever.
- x. The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1, except for the Third Party Liability, Workers' Compensation, and Employer's Liability Insurance, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Subclause 34.1, except for the Cargo, Workers' Compensation and Employer's Liability Insurance. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

**(B) Types of Insurance to Be Taken Out by the Employer (Not applicable)**

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurance policies.

Details: NIL


## Appendix 4: Time Schedule

Part I: Site Surveys, submission of drawings for approval, Minutes of Meeting, project design document.  
Part II: Implementation of Decentralised SPGS including comprehensive O&M for 12 years

### Part I:

The Contractor shall submit the plan for carrying out site surveys within one week from the date of issuance of LoA. The contractor shall complete the site surveys of all the allotted locations within twenty-one (21) days from the date of issuance of LoA. The contractor shall submit the final array layout, Electrical Single Line Diagram (SLD), site survey reports, ESMP (as per Annexure 4) and project design document as per the timelines shown below:

S No	Activity	Milestone period from Effective Date of contract
1	Submission of Site Survey Plan of all sites	7 days
2	Site Survey by Contractor	21 days
3	Signing of MoM, draft layout by MSEDCL/MAHAGENCO, EESL & Contractor	21 days
4	Submission of Final Array layouts, SLD & Site survey reports by contractor to EESL/MSEDCL/ MAHAGENCO Zonal/District office	28 days
5	*Submission of ESMP/EMP as per Annexure 4 to EESL	40 days

\*Site specific ESMP/EMP shall be submitted by the contractor. An NOC to be issued for site specific ESMP/EMP from EESL project manager/ADB followed by the issuance of Notice to Proceed (NTP)/Purchase order (PO) (site-wise).

Contractor to strictly adhere to the timelines mentioned above. In case of any failure to meet the above timelines, a suitable action shall be taken against the contractor for any delay in completion of the Part 1, including the right to cancel or termination of contract at EESL's discretion.

### Part II:

The date of handover of site (s) to the contractor for implementation of Decentralised Solar Power Generating System (SPGS) shall be treated as Zero date. The contractor shall submit the detailed execution plan (MS Projects/PERT/GANTT chart etc.) within one week (07 days) from the date of issuance of NTP/PO. All the sites/lands under a lot will be handed over to the successful bidder/contractor within 1 month of issuance of site wise NOC on ESMP.

The timelines for completion of the EPC Works is 240 days from the Zero date.

Note: However, extended timeline due to delay in handing over of land to the Contractor shall not have financial liability on EESL.

### Timelines for Scope of work in Days

S. No.	Stage	Reference from D
1	Issue of NTP i.e., Site Handover	Zero Date (D)
2	The contractor shall submit the detailed execution plan (MS Projects/PERT/GANTT chart etc.)	D + 7 days

3	Land Development + Boundary wall/fences +Transmission Line with bay feeder	D + 53
4	Commencement of civil and allied works	D + 75
5	Supply of major equipment like Solar PV modules, Modules Mounting Structures, Power Conditioning Units (PCU)/Inverter, Transformers, BoS etc.	D +150
6	Installation of all major equipment including MMS, Solar PV modules, Inverters / PCU, Transformers, Power Evacuation line etc.	D + 180
7	Complete installation, testing and Pre-commissioning of Solar PV Power Plant/Solar Power Generating System	D + 210
8	Commissioning of Plant (SPGS) along with Completion of Facilities in line with Technical/Functional/Performance Requirement stated under this Tender Document.	D + 240

**\*Contractor is required to commission the project on or before 240 days from the date of NTP/PO.**



## Appendix 5: List of Major Items of Plant and Services and List of Approved Subcontractors

A list of major items of plant and services is provided below.

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The contractor must notify and obtain approval for the subcontractor and/or manufacturer of the complete bill of material, which is not limited to the items listed below. In accordance with GCC Subclause 19.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Major Items of Plant and Services	Approved Subcontractors and Manufacturers	Nationality
PV Modules		
PV Inverter		
Transformer		
33 KV Switchgear		
SCADA / Control System		
Metallic Structures		

## Appendix 6: Scope of Works and Supply by the Employer

The following personnel, facilities, works, and supplies will be provided or supplied by the Employer, and the provisions of GCC Clauses 10, 21, and 24 shall apply as appropriate.

All personnel, facilities, works, and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor, in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Subclause 18.2.

Unless otherwise indicated, all personnel, facilities, works, and supplies will be provided free of charge to the Contractor.

<b>Personnel</b>	<b>Charge to Contractor (if any)</b>
NIL	

<b>Facilities</b>	<b>Charge to Contractor (if any)</b>
NIL	

<b>Works</b>	<b>Charge to Contractor (if any)</b>
NIL	

<b>Supplies</b>	<b>Charge to Contractor (if any)</b>
NIL	

## Appendix 7: List of Documents for Approval or Review

Pursuant to GCC Sub-clause 20.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GCC Sub-clause 18.2 (Program of Performance), the following documents for

### A. Approval:

#### (i) Staff and subcontractors

- a) CVs and data from the employees/contracted staff of the Contractor

The Contractor shall, within one month from the Effective Date of the Contract, submit to the Project Manager for approval the CVs and identification of all the employed staff. The CVs for the main positions should not substantially deviate from those included in the Contract Documents.

- b) List of subcontractors to be hired by the Contractor's

The Contractor shall, within one month from the Effective Date of the Contract, submit to the Project Manager for approval the information and data regarding the subcontractors planned to be hired by the Contractor. The subcontractors should not substantially deviate from those included in the Contract Documents.

#### (ii) Equipment and detailed engineering

- a) Technical specifications of the equipment required

The Contractor shall, within one month from the Effective Date of the Contract, submit to the Project Manager for approval the technical specifications and the certificates for the required equipment, namely: PV modules, PV mounting structures, inverter, DC cables, DC combiners boxes, AC cables, AC combiner boxes, switchgears and transformers. The equipment should not substantially deviate from those included in the Contract Documents.

- b) Detailed engineering and construction methodology

The Contractor shall, within one month from the Effective Date of the Contract, submit to the Project Manager for approval the detailed engineering and construction methodology, namely: fencing, internal accesses, execution of the foundations for the mounting structures and inverters, erection and mounting of the PV modules, installation of the inverter, DC and AC cables trenches, construction of the control room, erection and installation of switchgears and transformers. The methodology should not substantially deviate from those included in the Contract Documents.

#### (iii) Drawing, Document and Data

- a) Codes and Standards

The Contractor shall, within one month from the Effective Date of the Contract, submit to the Project Manager for the approval the Codes and Standards which shall govern the design, manufacture, construction, erection, test and commissioning of the Facilities.

- b) Quality Assurance System and Procedure Manual

The quality assurance system shall be submitted to the Project Manager for approval within two months from the Effective Date of the Contract. The quality assurance system shall encompass the design, procurement and manufacture, construction, erection, tests and commissioning of the Facilities.

c) General Arrangement Plans for Plant and Equipment

The Contractor shall, within one month from the Effective Date of the Contract, submit to the Project Manager for approval the plans and layouts which shall not substantially deviate from those included in the Contract Documents. These plans and layouts should indicate the relative locations of each part of equipment or systems in the Plant and Equipment, including the outline dimensions and sizes of the same.

d) General and Detailed Drawings and Specifications for Electrical Equipment

The Contractor shall, after one month from the Effective Date of the Contract, start submission for approval of the above requirements, to the Project Manager, which shall not substantially deviate from those included in the Contract Documents. Before proceeding with the manufacture of the Plant and Equipment, the Contractor shall submit to the Project Manager for approval the designs, design computations, detailed specifications, general assembly drawings, control and wiring diagrams and details to demonstrate fully that all parts will conform with the provisions and intent of the Specifications and with the requirements of their installation, operation and maintenance. The drawings shall show all necessary dimensions and tolerances, field joints, and sub-assemblies in which the equipment will be shipped, terminal boxes and wire sizes for electrical circuits and wiring diagram for power and control circuits.

e) General and Detailed Design Drawings for Civil and Architectural Works

The Contractor shall, after one month from the Effective Date of the Contract, start submission for approval of the above requirements, to the Project Manager, which shall not substantially deviate from those included in the Contract Documents. These drawings shall indicate, besides relative calculations and instructions, all data necessary for the design of supporting structures such as dimensions, weights, loads and stresses under operating conditions, dimensions and weights for installation, assembly and maintenance. In addition, these drawings shall indicate all necessary details such as foundations, trenches for cables and supports and any other data used in the design of the civil works.

f) Working Plan

The Contractor shall submit to the Project Manager for approval the Working Plan within one month from the Effective Date of the Contract. The Working Plan shall include the organization, working system, temporary yard installation, construction method, overall construction schedule, a list of Contractor's Equipment and temporary facilities to be used, etc.

g) Test Procedures and Reports on Test Results

The Contractor shall submit to the Project Manager for approval comprehensive test procedures/programs two months prior to the conduct of the actual tests of the Plant. The procedures shall be completed in every details, including but not limited to descriptive sections on the test activities to be performed, preparatory works required, extent of test and instrumentation to be employed, location or measuring points, calibration method employed for each of the test instruments, time duration and manpower requirement, methods of calculation/analysis of test results including formulas used and format for presentation of data/results. The Contractor shall submit reports or test results upon completion of the tests carried out in accordance with the Specifications.

h) Operation and Maintenance Manuals

Prior to commencement of Commissioning Test, the Contractor shall submit to the Employer and the Project Manager for approval Operation and Maintenance Manuals in accordance with the provisions stipulated in the Specifications and in sufficient detail for the Employer to

operate, maintain, dismantle, resemble, adjust and repair the Facilities. The Facilities shall not be considered to be completed for the purpose of the Operational Acceptance until Operation and Maintenance Manuals have been submitted to the Employer.

i) Contractor's Working Area, Temporary Facilities and Contractor's Equipment

The Contractor shall submit to the Project Manager for approval the required above within one month from the Effective Date of the Contract. These plans and proposals shall include the plan for access to the Site, base camp and other temporary facilities required for proper execution and completion of the Facilities. The temporary site office shall provide office space for the Employer, the Project Manager and their designated representatives as specified in the Contract. The exact location of the temporary site office and the office space required by the Employer, the Project Manager and their designated representatives shall be confirmed before establishing the plan and proposal.

j) Fire Risk Management Plan

The Contractor shall submit a Fire Risk Management Plan for the Employer's Approval at least 90 days before the commencement of the commissioning. The fire risk management plan shall include an identification of the fire risks and the way to mitigate them.

k) Any other documents required in the Specifications

The Contractor shall submit any other documents, drawings and information required by the Specifications or other part of the Contract Documents.

Print and reproducible copies of drawings, documents and other technical data shall be of quality durable for a long storage without fading. The number of copies of drawings, documents and other technical data to be submitted shall be as stipulated in the following table. Each submission shall include an electronic or soft copy on USB or email or portal.

Type of Drawing/Document	A1 Copies	A3 Copies	A4 Copies
1. Schedule of Drawings	-		3
2. Drawings for Approval or Review	3	3	-
3. Final (Approved) Working Drawings	3	3	-
4. As-built Drawings	3	3	-
5. Final (Approved) Technical Data Sheet	3	-	3
6. Approval calculations, etc	-	-	3
7. Specifications of Plant and Materials for Approval or Review	-	-	3
8. Test Procedures	-	-	3
9. Reports on Test Results	-	-	3
10. Manuals/ Instructions	-	-	3
11. Codes and Standards	-	-	1

(iv) Work progress and daily report

a) Monthly Progress Report

The Contractor shall prepare and furnish the Project Manager without cost to the Employer and the Project Manager at regular monthly intervals and in a form and number of copies to be determined by the Engineer a monthly progress report containing the following:

- (i) Physical progress of the works up to the preceding month and estimated progress for the current month
- (ii) Color photographs which are sufficient to explain the activities and determined by the Project Manager to give the Employer a complete record of performance of the works and execution of various parts of the works. Each photo shall contain its date and location of the view taken.

A monthly report shall, without limitation, include the following documents;

- a) Completion Schedule (Target and Actual)
- b) Disbursement records during the month.
- c) Climatic conditions, etc.
- d) Accident records, if any

The Contractor shall produce and submit to the Project Manager a "S" curve every month together with the Monthly Report specified above. The "S" curve shall be prepared based on the following input data:

- (i) Proportions of the contract value for each different item of work in the total price shown by percent.
- (ii) The period of execution of each different item of work
- (iii) The monthly progress percentage of the work
- (iv) The cumulative percentage of contract value for the work
- (v) Additional lines to be drawn to show the monthly and cumulative achievements of the work done during the month in terms of the contract value

a. Daily and Weekly Reports

The Contractor shall prepare daily and weekly reports to each work section as requested by the Project Manager and in a form approved by the Project Manager. The report shall contain, without limitation, the following data: conditions, staff and labor force employed on the work, materials on site, the Contractor's equipment on site, work in progress, work in preparation, laboratory test data accidents, and all other information relevant to the progress of the works.

b. Weekly Meetings

During the execution of the works, the Project Manager shall hold a weekly meeting for the purpose of monitoring the execution of the Contract. When requested by the Project Manager, responsible representatives of the Contractor shall attend such meetings without any additional payment to the Contractor.

c. Processing of drawing

- a. The specified number of A3 size copies and full-size prints with dark lines on a white background shall be furnished of each drawing submitted for approval. One print will be returned to the Contractor marked "Approved" or "Approved With Corrections Indicated" or "Returned for Corrections" within twenty-eight calendar days after receipt of each drawing.
- b. Upon approval by the Project Manager, the Contractor shall furnish the Project Manager without delay, the specific number of A3 size copies and full size prints of each final (approved) drawing with dark lines on a white-background. If minor revisions are made after a drawing has been approved, the Contractor shall furnish the Project Manager the same number of A3 size copies and full size prints subsequent to each revision. No major

revision affecting the design shall be made, after a drawing has been "Approved" without resubmitting the drawing for final approval.

- c. When prints or drawings have indicated "Approved with Corrections Indicated", or "Returned for Corrections", the Contractor shall make the necessary corrections and resubmit the same number of copies and prints for approval. Every revision shall be shown by number, date and subject in a revision block. In addition, each revised drawing shall have its latest revision clearly indicated.

d. As-built drawing

The Contractor shall provide and keep an up-to-date set of "As-Built" drawings of all structures constructed and all equipment and accessories and miscellaneous works erected or installed. These drawings shall show all changes and revisions from the original drawings and specifications, including the exact "as-built" locations, sizes and kinds of equipment and accessories, miscellaneous works, embedded piping and electrical systems and other concealed items of work.

These drawings shall be kept in the Contractor's field office but shall be made available at all times for review of the Project Manager. At the end of every item of work, all entries, changes or revisions made in the drawings by the Contractor shall be checked and approved by the Project Manager.

Prior to the Operational Acceptance of the Facilities or part thereof, the Contractor shall submit to the Project Manager all duly checked and approved "As-Built" drawings in soft copy.

The Facilities shall not be considered to be completed for the purpose of Operational Acceptance until the above drawings have been submitted to the Employer.

**Appendix 8: Functional Guarantees- As per provisions detailed at Section-6 of the Bidding Documents.**



# Performance Security

[Bank's name, and address of issuing branch or office]

**Beneficiary:** .....[Name and address of the Employer] .....

**Date:** .....

**Performance Guarantee No.:** .....

We have been informed that [name of the contractor] (hereinafter called "the Contractor") has entered into Contract No. [reference number of the contract] dated [date] with you, for the execution of [name of contract and brief description of plant and 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 Contractor, 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]<sup>1</sup> [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 Contractor 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 540 days (Defect Liability Period) + 3 months after our receipt of

- (i) a copy of the Completion Certificate; or
- (ii) a registered letter from the Contractor, attaching a copy of the notice to the project manager that the Facilities are ready for Operational Acceptance/Completion, and stating that 14 days have elapsed from receipt of such notice (or 7 days have elapsed if the notice was a repeated notice) and the project manager has failed to issue a Completion Certificate or inform the Contractor in writing of any defects or deficiencies; or
- (iii) a registered letter from the Contractor stating that no Completion Certificate has been issued but the Employer is making use of the Facilities; or

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

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

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

**-- Note to Bidder --**

If the bank issuing performance security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.

<sup>1</sup> The guarantor shall insert an amount representing the percentage of the accepted contract amount specified in the contract and denominated either in the currency(ies) of the contract or in any freely convertible currency acceptable to the Employer.

# Advance Payment Security

[Bank's name, and address of issuing branch or office]

**Beneficiary:** ..... [Name and address of the Employer] .....

**Date:** .....

**Advance Payment Guarantee No.:** .....

We have been informed that [name of the contractor] (hereinafter called "the Contractor") has entered into Contract No. [reference number of the contract] dated [date] with you, for the execution of [name of contract and brief description of plant and services] (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum [name of the currency and amount in words]<sup>2</sup> [amount in figures] is to be made against an advance payment guarantee.

At the request of the Contractor, 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]<sup>3</sup> [amount in figures] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor:

- (a) used the advance payment for purposes other than the costs of mobilization and cash flow support in respect of the Works; or
- (b) has failed to repay the advance payment when it has become due and payable in accordance with the conditions of the Contract, specifying the amount payable by the Contractor.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number [contractor's account number] at [name and address of the bank].

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates, which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate, indicating that 80% of the Contract Price has been certified for payment, or on the [date] day of [month], [year],<sup>4</sup> whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.<sup>5</sup>

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

## **-- Note to Bidder --**

<sup>2</sup> The guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the contract, or in any freely convertible currency acceptable to the Employer.

<sup>3</sup> Footnote 1.

<sup>4</sup> Insert the expected expiration date of the time for completion. The Employer should note that in the event of an extension of the time for completion of the contract, the Employer 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 Employer 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 [6 months] [1 year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

<sup>5</sup> Or the Employer may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded" as appropriate.

*If the bank issuing advance payment security is located outside the Employer's country, it shall be counter-guaranteed or encashable by a bank in the Employer's country.*

Scaling Up Demand-Side Energy Efficiency Sector Project

**Section 9b: Contract № 2  
Operation & Maintenance Services Contract**

for operating and maintaining

**Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra (hereinafter referred to as Distributed Solar Project) – Lot ..... [1,2,3 whichever is applicable]**

The successful bidder for the Distributed Solar Project – Lot ..... [1,2,3 whichever is applicable] shall also enter into a contract with the Employer of the form provided here as **Contract № 2** (Operation and Maintenance Services Contract, or O&M Services Contract). This contract defines the terms and conditions that will apply in the provision of the operation and maintenance services of the Distributed Solar Project – Lot .... [1,2,3 whichever is applicable] facilities for a term of no less than 144 months from the date of commissioning of each sub-project (means each site under the lot).

Contract № 2 is a bespoke standalone contract comprising contract conditions and annexes containing the O&M services, warranties and securities, time schedule, payments schedule and technology transfer obligations.



# Contract № 2: Operation and Maintenance Contract

## Conditions of Contract

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**ANNEX 1: O&M Services**

**ANNEX 2: O&M Performance Standards**

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**ANNEX 5: Staff Training Modules**

**ANNEX 6: Insurance Requirements**

This OPERATIONS AND MAINTENANCE SERVICES CONTRACT made on the [ *date* ] day of [ *month* ], [ *year* ],

BETWEEN

Energy Efficiency Services Ltd, a company incorporated under the laws of the Republic of India and having its principal place of business at New Delhi (hereinafter called "**the Employer**"), and [ *name of the contractor* ], a company incorporated under the laws of [ *country of the contractor* ] and having its principal place of business at [ *address of the contractor* ] (hereinafter called "**the Contractor**").

WHEREAS the Employer desires to engage the Contractor to operate and maintain certain distributed solar power facilities, viz. Distributed Solar Project – Lot..... [1,2,3 whichever is applicable] (implemented under Contract № 2) (" the Distributed **Solar Power Facilities**"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

## 1. Definitions

- 1.1 The following words and expressions shall have the meanings hereby assigned them. Other capitalized terms will have the meanings assigned to them in Contract № 1 and Contract № 2.

**Billing Month** means: (i) the period from the date of Commissioning until the last day of that calendar month, (ii) each successive period of one calendar month thereafter and (iii) the period from the first day of the last month of the O&M Term to the last day of the O&M Term.

'**Contract № 1**' means the contract for the Design, Engineering, Supply, Construction, Erection, Testing, Commissioning for upto 70 MW of Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra.– Lot ..... [1,2,3 whichever is applicable] with all associated works as specified in the Employer Requirements for that contract.

'**Delivery Point**' means the location(s) at the termination of the 11 kV connections from the Distributed Solar Power Facilities where the electrical output from the Distributed Solar Power Facilities is delivered to the grid system.

'**Force Majeure**' shall have the meaning attributed to it in GCC 37.1.

'**GCC**' means the General Conditions of Contract applicable to Contract № 1 and Contract № 2 provided in the Bidding Document as Section 7.

'**Generation Forecast**' means the generation forecast of the Distributed Solar Power Facilities for the next day.

'**Gol**' means the Government of the Republic of India.

'**Liquidated Damages**' shall have the meaning attributed to it in Clause 17.2 and *Annex 2 (O&M Performance Standards)*.

'**O&M Commencement Date**' means the date of issue of the Commissioning Certificate of each sub-project (means each site under the lot).



**'O&M Completion Date'** means the date defined in Subclause 14.3 on which the Contractor has fulfilled its obligations under the O&M Services Contract.

**'O&M Monthly Reports'** are reports to be delivered by the O&M contractor that inform and demonstrate the operation and performance of the Distributed Solar Power Facilities.

**'O&M Payments'** means the payments for the performance of the O&M Services by the Contractor as defined in **Annex 4 (O&M Payments)**.

**'O&M Services'** are services and works to be provided by the Contractor pursuant to Clause 12 and **Annex 1 (O&M Services)**.

**'O&M Term'** means the continuous period beginning on the O&M Commencement Date and concluding on the O&M Completion Date.

**'Operations and Maintenance Services Contract'** or **'O&M Services Contract'**, or **'the Contract'** means this contract for the operation and maintenance of the Distributed Solar Power Facilities.

**'Operational Acceptance'** shall have the meaning attributed to it in GCC 1.1 and **'Operational Acceptance Certificate'** shall be the certificate issued to the Contractor pursuant to GCC 25.

**'Performance Ratio'** or **'PR'** means the ratio of generated electricity by the Distributed Solar Power Facilities divided by the electricity generation of the total DC capacity of the Distributed Solar Power Facilities taking into consideration the temperature as stipulated in IEC 61724.

**'O&M Performance Standards'** shall have the meaning attributed to it in Clause 17.2 and **Annex 2**.

**'Plant'** shall have the meaning attributed to it in GCC 1.1.

**'Prudent Utility Practices'** means those practices, methods, techniques and standards that, from time to time:

- (a) are generally accepted as international good practice for use in electric utility industries, considering conditions in **Maharashtra, India** and applicable Laws; and
- (b) are commonly used in prudent electric engineering and operation to operate and maintain equipment lawfully, safely and economically as applicable to distributed solar PV, and substation facilities of the size, service and type of those facilities located within the Site..

**'SCC'** means the Special Conditions of Contract applicable to Contract № 1 and Contract № 2 provided in the Bidding Document as Section 8.

**'Distributed Solar Power Facilities'** or **'Distributed Solar Power Project'** means the Solar Power Generating System (SPGS) ranging from 2 MW to 10 MW at various locations in Maharashtra – **Lot 1/2/3**

2.

3.

**4. Communications**

4.1 The provisions of GCC and SCC 4 apply mutatis mutandis to the O&M Services Contract.

**5. Conditions Precedent**

5.1 The O&M Services Contract shall be signed together with and at the same time as the signing of Contract № 1 and its execution shall be a condition precedent to the effectiveness of these contracts.

Conditions precedent to the O&M Services Contract becoming effective are:

- a. the Contractor has obtained and maintained in force the insurances required to be obtained by the Contractor under the O&M Services Contract;
- b. the Contractor has provided the Employer with the Performance Security;

5.2 If the conditions listed under 5.1 are not fulfilled within 2 months from the date of this Contract notification because of reasons not attributable to the Contractor, the parties shall discuss and the Time for Completion and/or other relevant conditions of the Contract.

**6. Law and Language**

6.1 The provisions of GCC and SCC 5 apply mutatis mutandis to the O&M Services Contract.

**7. Intellectual Property**

7.1 The provisions of GCC 15 apply mutatis mutandis to the O&M Services Contract.

**8. Confidential Information**

8.1 The provisions of GCC 16 apply mutatis mutandis to the O&M Services Contract.

**9. Insurances**

9.1 The Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth **Annex 6 (Insurance Requirements)** in the sums and with the deductibles and other conditions specified in the said annex. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

- 9.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to Subclause 9.1, except for the Third Party Liability, Workers' Compensation, and Employer's Liability insurances, and the Contractor's agents shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to this Clause 9 except for the Workers' Compensation, and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.
- 9.3 The provisions of GCC 34.3, 34.4, 34.6 and 34.7 apply mutatis mutandis to the O&M Services Contract.
- 9.4 The parties will discuss appropriate insurance requirements and how they will interface with the Employer's insurances, so as to maximize coverage and minimize costs for the parties.

## 10. Performance Security

- 10.1 The Contractor shall, within 28 days of the notification of contract award, provide a security for the due performance of the Contract in line with GCC 13 as per **Annex 3 (Performance Security)**, or in another form acceptable to the Employer.

## 11. Taxes and Duties

- 11.1 The provisions of GCC and SCC 14 apply mutatis mutandis to the O&M Services Contract.

## 12. Scope of O&M Services

- 12.1 The Contractor shall operate and maintain the Distributed Solar Power Facilities in accordance with this Contract, including undertaking the O&M Services, and shall do all that is necessary to ensure that the Distributed Solar Power Facilities perform their intended purposes of efficiently generating, storing, transforming and metering electricity, and delivering such output safely to 11kV grid system.
- 12.2 The O&M Services to be provided by the Contractor shall include (without limitation):
- a. scheduled maintenance of the Distributed Solar Power Facilities;
  - b. unscheduled maintenance of the Distributed Solar Power Facilities, including (without limitation) the rectification of faults, defects, errors and breakdowns;
  - c. works necessary to meet the performance requirements of the Distributed Solar Power Facilities and the Plant warranties; and
  - d. other responsibilities as set out in **Annex 1 (O&M Services)** and elsewhere in the O&M Services Contract.
- 12.3 The Contractor will perform the O&M Services:
- a. In accordance with the provisions of GCC and SCC 21 and 22, as they apply mutatis mutandis to the O&M Services Contract.
  - b. in a manner which complies with applicable Laws and is in accordance

- with the terms and conditions of this O&M Services Contract;
  - c. in accordance with the technical instructions of the Employer and Prudent Utility Practices;
  - d. in accordance with Employer's policies and procedures;
  - e. in a manner that maintains the Distributed Solar Power Facilities in a condition that is commensurate with age and fit for purpose;
  - f. in a manner which minimizes the 'whole-of-life' costs of the Distributed Solar Power Facilities;
  - g. so as to maximize efficiency and meet the O&M Performance Standards; and
  - h. using materials which are new and of a merchantable quality and in accordance with the nature and the character of the O&M Services.
- 12.4 The Contractor shall modify the Plant, equipment and systems of the Distributed Solar Power Facilities, and the software for their operation, only with the express approval of the Employer and then only after justification is provided.

### **13. Ownership of Output and Revenue**

- 13.1 During the O&M Term, any electrical output and revenue produced by the Distributed Solar Power Facilities shall be the exclusive property of the Employer.

### **14. Commencement and Completion of O&M Services**

- 14.1 The Contractor shall commence the O&M Services on the O&M Commencement Date and shall thereafter proceed with the operation and maintenance of the Distributed Solar Power Facilities for the duration of the O&M Term and execute the O&M Services in accordance with the Contract.
- 14.2 The Contractor shall continue to provide the O&M Services for a period of not less than 144 months after the date of issue of the Commissioning Certificate of each sub-project (means each site under the lot).
- 14.3 Notwithstanding the provisions of Subclause 14.2, performance of the Contractor's obligations in respect of the O&M Services Contract shall not be considered to have been completed until the O&M Completion Certificate has been issued by the Employer, stating the date on which the Contractor completed his obligations under the O&M Services Contract, this being the O&M Completion Date. Pre-conditions which must be fulfilled by the Contractor before the O&M Completion Certificate will be issued are:
- a. Four weeks before the scheduled completion of the O&M Term, a joint inspection of the Distributed Solar Power Facilities will be carried out by the Parties to identify any maintenance works (excluding routine maintenance works and the correction of defects that fall within the ambit of the defects liability provisions of Contract Nos 1 and 2), replacement of items of defective or worn Plant and any other works necessary to ensure the Distributed Solar Power Facilities conform with the end-of-term requirements described in **Annex 1 (O&M Services)**, including by remedying any deficiencies identified by the end-of-term tests

- b. End-of-term tests in accordance with **Annex 1 (O&M Services)**;
- c. Updating Operations and Maintenance manuals and providing performance records and data for the Term; and
- d. Remedying defects found during the joint inspection and listed in the Completion Inspection Report prepared pursuant to the O&M Services.

14.5 At the end of the O&M Term, the O&M Services Contract shall be deemed to have expired.

## 15. Contractor's Responsibilities

15.1 The following provisions of GCC and SCC apply mutatis mutandis to the O&M Services Contract: Subclauses 9.2, 9.3, 9.4, 9.6, 9.7 and 9.8.

15.2 The Contractor shall:

- a. be responsible for the care and custody of the Distributed Solar Power Facilities or any part thereof until the date of operational acceptance.
- b. operate and maintain the Distributed Solar Power Facilities, including associated purchases and/or subcontracting, in accordance with the O&M Services Contract.
- c. ensure that the Distributed Solar Power Facilities are adequately monitored at all times, 24 hours a day and seven days a week, commencing on the O&M Commencement Date, to ensure the operation of the Distributed Solar Power Facilities in accordance with this Contract;
- d. commencing on the O&M Commencement Date, the Company shall inform the grid control center of the Generation Forecast of the Distributed Solar Power Facilities on a day ahead basis by 16:00 on the day prior to the planned dispatch and will immediately advise grid of any change in such Generation Forecast.
- e. to the extent consistent with Prudent Utility Practice and the Contract, the Contractor shall keep accurate and up to date records for the Distributed Solar Power Facilities (including a site wise break down into each of the Distributed Solar Power Facilities ) of the following:
  - i. Minute and hourly data (in kW and kWh) of the generation for each day of the O&M Term, to be supplied to grid within 24 hours of the day concerned;
  - ii. All preventive and corrective maintenance activities undertaken;
  - iii. Any accident or other occurrence at the Site that results in injury to persons or damage to property, with reasonable access to be provided to grid to such records, subject to requirements of confidentiality;

15.3 The Contractor shall make good at its own cost any loss or damage that may occur to the Distributed Solar Power Facilities or a relevant part thereof from any cause whatsoever during the O&M Term including, without limitation, operating the Distributed Solar Power Facilities outside the requirements specified in the O&M Services Contract, Contracts Nos 1 and 2 and the relevant manufacturers' instructions. The Contractor shall also be responsible for any or damage to the

Distributed Solar Power Facilities caused by the Contractor or its agents in the course of any work carried out on the Distributed Solar Power Facilities.

## **16. Employer's Responsibilities**

- 16.1 The following provisions of GCC and SCC apply mutatis mutandis to the O&M Services Contract: Subclauses 10.2, 10.3, 10.4 and 10.8.

## **17. O&M Performance Standards**

- 17.1 The Contractor shall provide a O&M Performance Standards as set out in **Annex 2 (O&M Performance Standards)** that shall remain in force for the O&M Term. During this period, the Contractor warrants that:

- a. The Distributed Solar PV plant under the Distributed Solar Power Facilities generates energy (in kWh) that equals or exceeds the warranted value in **Annex 2 (O&M Performance Standards)**.
- b. The capacity in MWac and MWp for the PV plant under the Distributed Solar Power Facilities is equal to or above the O&M Performance Standards.

- 17.2 In the event that the Contractor fails to satisfy the O&M Performance Standards, the Contractor will be liable to pay Liquidated Damages in accordance with the mechanisms set out in **Annex 2 (O&M Performance Standards)**.

The payment of Liquidated Damages for a failure to achieve the O&M Performance Standards will not limit or reduce the obligation of the Contractor to meet its other obligations under the O&M Services Contract, including the obligation to perform the O&M Services, and the obligation to compensate related losses of the Employer beyond those covered by the Liquidated Damages.

## **18. Parts Warranty**

- 18.1 Unless otherwise specified in the Contract, the Contractor shall provide parts warranty till the end of defect liability period, from the date of installation, on parts installed during the O&M Term.

## **19. Suspension**

- 19.1 The provisions of GCC & SCC 41 apply mutatis mutandis to the O&M Services Contract.

## **20. Training of Employer's Personnel**

- 20.1 Unless otherwise specified in the O&M Services Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel as outlined in **Annex 1 (O&M Services)** and shall perform all work and services of whatsoever nature, all in accordance with the provisions of Subclause 20.2.

- 20.2 Over the course of the O&M Term the Contractor shall provide the

Employer's employees with on-the-job, hands-on and classroom training to transfer to them the skills required to competently and professionally operate and maintain the Distributed Solar Power Facilities in accordance with manufacturer's warranties, Prudent Utility Practices and the instructions of grid.

- 20.3 To this end, the Employer will nominate a team comprising suitable number of its staff who will work with the Contractor's team ( Full time and Part time staff shall be nominated after award of contract) throughout the O&M Term and the Contractor shall provide them with hands-on experience in all utility operation and maintenance functions.
- 20.4 The Contractor will provide the Employer's team and others nominated by the Employer with classroom training in the operation and maintenance of the Distributed Solar Power Facilities. Such training shall include (without limitation) the program outlined in **Annex 5 (Staff Training Modules)**.

## 21. Payments

- 21.1 The Employer shall pay the Contractor in the following manner and at the following times, based on the price breakdown given in **Annex 4 (O&M Payments)**. Payments will be made in the currencies quoted in the Contractor's bid unless otherwise agreed between the Parties.
- 21.2 The Employer shall pay the Contractor the O&M Payments for the performance of the O&M Services .
- 21.3 The Contractor, when preparing his bid, shall have be deemed to have familiarized himself with the Bidding Document, the Site and other aspects of the Distributed Solar Power Facilities to ascertain all aspects involved in delivering the O&M Services.
- 21.4 The Contractor will render invoice to the employer semi annually for each sub-project. The Contractor shall submit to the Employer, as a minimum, the following documents:
- a. Commercial invoice,
  - b. O&M Monthly Report certified by the Employer. The O&M Monthly Reports shall be in a form acceptable to Employer and shall report on the following (amongst others):
    - description of activities and events occurring during the Billing Month,
    - performance of the Distributed Solar Power Facilities against the Performance Warranties under Subclause 17.1,
  - c. Any other documents as necessary, or as discussed and agreed by the Parties.

## 22. Subcontracting and Assignment

- 22.1 The Contractor may engage agent(s) to perform the O&M Services but such agent(s) shall be under the complete control of the Contractor and, subject to the provisions of the O&M Services Contract, the Contractor shall be solely

responsible for the manner in which the O&M Services Contract is performed.

22.2 The provisions of GCC 19 & 43 apply mutatis mutandis to the O&M Services Contract

### **23. Force Majeure**

23.1 The provisions of GCC 37 apply mutatis mutandis to the O&M Services Contract.

### **24. Termination by Employer**

24.1 Termination for Employer's Convenience  
The provisions of GCC 42.1 apply mutatis mutandis to the O&M Services Contract.

24.2 Termination for Contractor's Default  
The provisions of GCC 42.2 apply mutatis mutandis to the O&M Services Contract.

### **25. Termination by Contractor**

25.1 The provisions of GCC 42.3 apply mutatis mutandis to the O&M Services Contract.

### **26. Handing Over**

26.1 Upon the issuing of the O&M Completion Certificate or termination of the O&M Services Contract period by either party, the Contractor shall hand over to the Employer the Distributed Solar Power Facilities in good order, duly considering fair wear and tear. The Contractor shall be entitled to remove from the Site its personnel, spares, measuring equipment, tools and associated equipment which is the property of Contractor without hindrance from the Employer.  
The Contractor shall co-operate with the Employer prior to the expiry of the O&M Services Contract to ensure the smooth and efficient handover of the Distributed Solar Power Facilities, including delivery of all material reasonably required for the continuing operation and maintenance of the Distributed Solar Power Facilities.

26.2 Prior to the completion of the O&M Term and return of the Performance Security, the Contractor shall submit to the Engineer all updated designs, operation and maintenance manuals, as-built drawings and other documents, as well as current versions of software and licenses required to administer, configure, and manage the control systems of the Distributed Solar Power Facilities.

The provisions of GCC 25.3 apply mutatis mutandis to the O&M Services Contract.



## **27. Guarantees and Liabilities**

- 27.1 The maximum limit of penalties for failing to achieve the O&M Performance Standards of the O&M Services Contract, except for the reason not attributable to contractor, is 50% of the aggregate O&M Payments payable over the O&M Term.

Once this maximum limit is reached, the Employer may consider termination of the Contract, pursuant to O&M Service Contract subclause 21.1. The payment of penalties shall not in any way relieve the Contractor from any of its obligations to provide O&M Services for the facilities or from any other obligations and liabilities of the Contractor under the Contract.

## **28. Indemnities**

- 28.1 The provisions of GCC 33 apply mutatis mutandis to the O&M Services Contract.

## **29. Fraud and Corruption**

- 29.1 The provisions of GCC 6 apply mutatis mutandis to the O&M Services Contract.

## **30. Disputes and Arbitration**

- 30.1 The provisions of GCC 45 and SCC 45 apply mutatis mutandis to the O&M Services Contract.

## **31. Protection of the Environment**

- 31.1 The provisions of GCC and SCC 9.8 apply mutatis mutandis to the O&M Services Contract.

## **32. Workplace Health and Safety**

- 32.1 The Contractor shall comply with, and ensure that all the Contractor's personnel comply with, the Employer's occupational health and safety and environment policies and all laws relating to occupational health and safety and environmental management.

The Contractor shall submit for the Employer's review and approval its site safety management plan and environmental management plan as necessary to comply with applicable laws and international industry practice.

- 32.2 The provisions of GCC and SCC 22.2 apply mutatis mutandis to the O&M Services Contract.

- 32.3 The Contractor shall at the commencement and throughout the O&M Term conduct Information, Education and Consultation Communication (IEC) campaigns, at least every three months, addressed to all O&M staff and labor (including all employees of the Contractor and its agents) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to:

- a. Sexually Transmitted Diseases (STD) or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; and

b. COVID-19.

**33. Cross Default**

33.1 a condition of entering into the Contract, the Employer and Contractor shall also be parties to Contract № 1 (*Supply, Installation and Testing of Distributed Solar PV-Lot 1*).

In the event of a party defaulting on an obligation under the Contract, that party shall be deemed to be in default of each of Contract № 1 and Contract No 2, entitling the innocent party to all or any remedies available to it under those contracts.

## **ANNEXES**

**ANNEX 1: O&M Services**

**ANNEX 2: O&M Performance Standards**

**ANNEX 3: Performance Security**

**ANNEX 4: O&M Payments**

**ANNEX 5: Staff Training Modules**

**ANNEX 6: Insurance Requirements**

## ANNEX 1: O&M SERVICES

### O&M SERVICES

#### A. Contractor's Organization Structure and Staff

1. The Employer shall propose the organization structure for supervising the Contractor's operation and maintenance of the Distributed Solar Power Facilities. The organization will be headed by a Supervising Engineer and the organization structure will indicate designation, responsibilities and location of the Employer's personnel. In the same manner, the Contractor shall also declare the organization structure of its O&M team, indicating designation, responsibilities and location of its personnel. The Contractor's O&M team will be headed by a Site Manager who will be responsible for the operation and maintenance of the Distributed Solar Power Facilities, including the management of key resource personnel located in Maharashtra.
2. The Contractor's O&M staff will include as a minimum:
  - a. Site Manager (full time, located in Maharashtra)
  - b. Solar Photovoltaic Power Specialist
  - c. Training Officer
3. The Contractor shall provide as reasonably necessary all labor and professional, supervisory and managerial personnel to perform the required tasks. Such personnel, including (without limitation) those experts appointed to the positions listed in paragraph 2 above, shall have the qualifications, knowledge, experience and skills to competently undertake the activities described below under the Scope of O&M Services. The appointment of members of the Contractor's O&M team shall be subject to the approval of Employer.
4. The Contractor's Site Manager based in Maharashtra shall report to the Supervising Engineer appointed by the Employer.
5. The Supervising Engineer will act as a primary contact between Employer and Contractor, and shall coordinate the Contractor's operations and maintenance activities with the grid system control center.
6. The personnel employed by the Contractor shall be employees of Contractor and their working hours, rates of compensation and all other matters relating to their employment shall be the sole responsibility of the Contractor.
7. With respect to local labor hired by the Contractor, the Contractor shall comply with all laws as they apply to labor matters, hiring personnel, and employment policies in Republic of India.
8. The Contractor shall act in a reasonable manner that is consistent with the intent and purpose of the O&M Services Contract and has no authority to enter into any contracts with respect to labor matters that bind or otherwise obligate Employer.

## **B. Scope of O&M Services**

The O&M Services to be provided by the Contractor under the O&M Services Contract cover:

- a. the performance of all works and services to achieve the intended purpose of the Distributed Solar Power Facilities, including the repair or replacement of faulty or deficient Plant not covered under the defects liability provisions of Contract № 1 ; and
- b. the provision of all labor, tools, equipment, vehicles, consumables and utilities, and any incidental activities or things necessary for the execution of such works and services.

The general principles of the operation of the Distributed Solar Power Facilities shall include (without limitation) the following, as applicable:

- a. The Distributed Solar Power Facilities shall remain operational in full compliance with technical, environmental and safety requirements and in accordance with national regulations and legislation.
- b. The operation of the Distributed Solar Power Facilities and all associated Plant and equipment shall be performed in accordance with the supplied O&M manual, service manuals and manufacturer's recommendations.
- c. The Distributed Solar Power Facilities shall be capable of operating in automatic production mode under normal operating conditions.
- d. The SCADA system to control and manage the Distributed Solar Power Facilities shall be capable of (a) analyzing and interpreting operational data to provide correlations between them, (b) indicate the operations required to be done by the maintenance staff, and (c) provide the operation and maintenance manuals to interface with the SCADA system.
- e. The weather station shall be operated in accordance with the manufacturer's recommendations. The operation shall ensure that the Plant and equipment used to monitor the performance of the Distributed Solar Power Facilities have valid calibration certificates.
- f. The Contractor shall measure the energy generated by the Distributed Solar Power Facilities and delivered to the 11 kV grid system at the Delivery Point. The data shall be made available to EESL at the end of each Billing Period and at other times as instructed by the Employer.
- g. The Distributed Solar Power Facilities shall be operated with an autonomous power backup system available at all times.

## **C. Maintenance**

In order to ensure the normal and correct operation throughout the life cycle of the Distributed Solar Power Facilities, preventive and corrective maintenance tasks should be performed. As much as possible, maintenance operations shall take place at night.

The preventive and predictive maintenance to be performed consists of routine inspections and maintenance of the equipment with procedures and frequencies determined by the type of equipment, manufacturer's indications, environmental conditions and the specified project requirements. This is intended to reduce the likelihood of unplanned downtime of the Distributed Solar Power Facilities and the corresponding undesirable production failures.

**Distributed Solar PV Plant:**

The preventive maintenance activities include:

- a. Inverter maintenance operation
- b. Verification of the mounting structures
- c. Cleaning of the PV modules
- d. Verification of the PV modules by thermography tests
- e. Verification and maintenance of other electrical equipment and equipment (cables, AC and DC boxes, connections, low and medium voltage switchgears, surveillance)
- f. PUB Verification and calibration of the sensors of the weather station

The predictive maintenance activities to be performed by the Contractor shall include (without limitation):

<b>Period</b>	<b>Equipment / infrastructure</b>	<b>Maintenance activity</b>
Annual	Inverters	Maintenance
Trimester	Mounting structures	Verification and maintenance
Trimester	Batteries	Verification and maintenance
Trimester	PV modules, weather station	Cleaning
Annual	PV modules	Thermography tests
Trimester	Other electrical equipment	Verification and maintenance
Trimester	Water collection system	Verification and cleaning
Semester	Transformer	Verification and maintenance
Annual	Weather station	Verification and calibration
Trimester	Draining system	Verification and cleaning
Semester	Internal accesses	Verification and cleaning
Annual	Fences and gates	Verification

The corrective or reactive maintenance to be performed must respond to the equipment's fault repair needs after their occurrence. Performing these tasks may lead to unplanned production outages. Therefore, the corrective maintenance activities shall be carried out as soon as possible to minimize possible financial costs. The corrective maintenance activities shall include (without limitation) the following categories of tasks:

- i. Detection of faults
- ii. Correction of faults
- iii. Reporting to Employer
- iv. General spare parts management

The Contractor shall be responsible for the acquisition of any spare parts which, in the opinion of the Contractor, are required in addition to those provided under Contract № 1 as mandatory spare parts and approved recommended spare parts to assure the O&M Performance Standards of the O&M contract, namely:

i. PV plant electricity output

The Contractor shall respond to alarm conditions and to notifications by the monitoring system and others including the Employer. The required response times for indicative types of faults and malfunctions are specified below:

PV Plant:

- i. Reduction in availability of the inverters in the PV plant below 98%: 8 hours
- ii. Failure of any major component: inverter, transformer: 8 hours

In such events, the Contractor shall correct defects, replace or rectify malfunctioning Plant or otherwise restore the Distributed Solar Power Facilities to a condition where it is fit for the purposes for which they are intended as defined in the Contract and in Contract № 1 . Under no circumstances is the Contractor to justify any corrective maintenance event as a justification not to meet the O&M Performance Standards of the Contract.

The Contractor shall verify that all the Plant, equipment, materials, components and/or parts thereof, used in carrying out maintenance or repairs, are:

- i. In accordance with the specified requirements of Contract Nos 1 and 2, and the delivered O&M manuals;
- ii. Of similar or higher quality than the existing Plant, equipment, materials and components used in the original manufacture and installation of PV ;
- iii. Suitable for the O&M Services to be carried out under the Contract.

Corrective maintenance shall be carried out after the monitoring and supervision system indicates operating problems or also during preventive maintenance. This service shall include:

- i. Analysis of the problem and notification of the task and spare parts necessary.
- ii. Removal and repair/replacement of the defective Plant, components, equipment or materials, and start-up thereof.
- iii. Coordination of the transport of the corresponding spare parts to the Distributed Solar Power Facilities and assembly thereof, if not available.
- iv. Updating the inventory and re-ordering of spare parts.
- v. Detection and analysis of equipment warnings.
- vi. Ordering and supervision of service specialists.

In the event that a failure or malfunction occurs in the Distributed Solar Power Facilities, the Contractor shall do all that is within its power to correct the damage and is liable for not meeting the O&M Performance Standards under the O&M Contract, entitling the Employer to all or any remedies available to it under the O&M Contract.

**D. End of O&M Term Tests**

The capacity and functionality of the Distributed Solar Power Facilities shall be demonstrated by the successful completion of the following tests as a precondition for the issuing of the O&M Completion Certificate.

**Functional O&M tests**

- a The contractor shall submit a proposed date not less than 10 days before the test date.
- b The O&M functional tests on the PV array shall be done according to IEC 62446 and include at least:
  - 1. Continuity of earthing tests;
  - 2. Polarity test
  - 3. Insulation resistance of the DC circuits
  - 4. Thermographic tests
- c The O&M functional tests of the inverter shall be as per the equipment manufacturers' commissioning procedures and shall include also:
  - 1. Thermographic tests
- d The O&M functional tests of the low Voltage equipment test according to IEC 62446-6 and IEC 62446-7 including also
  - a Thermographic tests of cables.
- e The O&M functional tests of the monitoring equipment shall be as per the manufacturer's guidelines:
  - I. Communication at the string level is required
  - II. Verification of the weather station operation
- f The supervision engineer shall determine whether the O&M functional Tests have been successfully completed.

Note: Vendor is required to achieve the guaranteed energy generation measured at the meter at DISCOM Station at the end of each year mentioned in the Section 6 of this bid document



**ANNEX 2: O&M PERFORMANCE STANDARDS****O&M PERFORMANCE STANDARDS**

- The performance standards includes the following parameters:
- PV plant level
  - Guaranteed Energy Generation on plant wise basis as per Appendix 8: Functional Guarantees- As provisions detailed at Section-6 of the Bidding Documents
  - Minimum monthly plant AC and DC capacity

**A. PV Plant Level****(i) Guaranteed Energy generation on plant wise basis**

- Contract № 1: Refer Section-6 of this bid document

Liquidated damages/Penalty: Refer Section-6 of this bid document

**ANNEX 3: PERFORMANCE SECURITY**

**Refer Performance Security of Contract-1**

**ANNEX 4: O&M PAYMENTS**

**O&M PAYMENTS – As per  
Appendix 1: Terms and Procedures of Payment**

## **ANNEX 5: STAFF TRAINING MODULES**

### **STAFF TRAINING MODULES**

The Contractor shall prepare the following training modules and present them to EESL staff as nominated by the Employer.

- PV string monitoring and maintenance;
- PV inverter operations, monitoring and maintenance;
- PV field maintenance practices overall monitoring and performance monitoring (with irradiance sensors, fiber optics link, drone use);
- PVSYST familiarization, PR and output etc.;
- Control system interface operation as required to supplement any training provided under Contract № 1 .

## ANNEX 6 – INSURANCE REQUIREMENTS

### Insurances to be taken out by the Contractor

In accordance with the provisions of Clause 9 of the Conditions of Contract, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the types of insurance set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to Clause 9 of the Conditions of Contract, except for the Third Party Liability, Workers' Compensation, and Employer's Liability Insurance, and the Contractor's agents shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to Clause 9 of the Conditions of Contract, except for the Workers' Compensation and Employer's Liability Insurance. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

#### (a) Business Interruption Insurance

Covering the net revenue lost by the Employer and/or Contractor caused by the interruption to the operation of the Distributed Solar Power Facilities caused by direct physical loss or damage to the Distributed Solar Power Facilities during the O&M Term.

Amount [in currency(ies)]	Deductible limits (A\$)	Parties insured
[Rs. 5.2 Million per MWac/USD 0.062 Million per MWac (This is on annual basis).....]	NIL (If applicable, shall be in the scope of Contractor)	The Employer The Contractor & its agents

#### (b) Operational All Risks Insurance

Covering material loss or damage occurring after completion of the Distributed Solar Power Facilities with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the O&M Term. The cover shall include material loss or damage and production loss due to external causes (including natural disasters, fire, theft, vandalism, sabotage, flood, wind, hail damage, lightning strike, overload, operational mistakes, technical faults and animal damage).

<b>Amount</b> (in A\$)	<b>Deductible limits</b> (A\$)	<b>Parties insured:</b> <b>[names]</b>
110% of the full replacement value of Distributed Solar Power Facilities.	NIL  (If applicable, shall be in the scope of Contractor)	The Employer  The Contractor & its agents

**(c) Third Party Liability Insurance**

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Distributed Solar Power Facilities) occurring in connection with the operation and maintenance of the Distributed Solar Power Facilities.

<b>Amount</b> (A\$)	<b>Deductible limits</b> (A\$)	<b>Parties insured</b> <b>[names]</b>
At least A\$2 million (or equiv.) combined single limit for bodily injury and property damage for any one occurrence	NIL  (If applicable, shall be in the scope of Contractor)	The Employer,  The Contractor & its agents

**(d) Automobile Liability Insurance**

Covering use of all vehicles used by the Contractor or its agents (whether owned by them or not) in connection with the operation and maintenance of the Distributed Solar Power Facilities. Comprehensive insurance to be obtained and maintained in accordance with statutory requirements.

**(e) Workers' Compensation**

In accordance with the statutory requirements applicable in any country where the Distributed Solar Power Facilities or any part thereof is executed.

**(f) Employer's Liability**

In accordance with the statutory requirements applicable in any country where the Distributed Solar Power Facilities or any part thereof is executed.

