Bidding Document
for
Design, Supply, Installation, Testing and Commissioning of Solar Power Generating Plant at various clusters of RACP (Capacity of 1.00, 1.50 and 2.00 MW cumulating to 22MW)

National Competitive Bidding
(One envelope Bidding Process without e-Procurement)

February 2020
Government of Rajasthan  
RAJASTHAN AGRICULTURAL COMPETETIVENESS PROJECT  
II FLOOR, ACADEMIC BLOCK, SIAM CAMPUS, DURGAPURA, JAIPUR-302017 
Tel.No.0141-2554215, 2554218; Fax: 0141-2554214; E-mail: pd@racpmis.com 

National Open Competitive Bidding  
(One-Envelope Bidding Process without e-Procurement)  
Design, Supply, Installation, Testing and Commissioning of Power Generating Plant at various clusters of RACP (Capacity of 1.00, 1.50 and 2.00 MW cumulating to 22MW) 

<table>
<thead>
<tr>
<th>BID REFERENCE</th>
<th>IFB No.: IN-PMU-RACP-148594-CW-RFB-2019-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE AND TIME OF PRE-BID MEETING</td>
<td>12-03-2020 at 11.00 AM</td>
</tr>
<tr>
<td>PERIOD OF SALE OF BIDDING DOCUMENT</td>
<td>27-02-2020 to 31-03-2020</td>
</tr>
<tr>
<td>LAST DATE AND TIME FOR RECEIPT OF BIDS</td>
<td>01-04-2020 up to 02.00 PM</td>
</tr>
<tr>
<td>TIME AND DATE OF OPENING OF BIDS</td>
<td>01-04-2020 at 02.30 PM</td>
</tr>
</tbody>
</table>

PLACE OF OPENING OF BIDS: RAJASTHAN AGRICULTURAL COMPETITIVENESS PROJECT, II FLOOR, ACADEMIC BLOCK, SIAM CAMPUS, DURGAPURA, JAIPUR-302018

OFFICER INVITING BIDS: PROJECT DIRECTOR, RAJASTHAN AGRICULTURAL COMPETITIVENESS PROJECT, II FLOOR, ACADEMIC BLOCK, SIAM CAMPUS, DURGAPURA, JAIPUR-302018
INVITATION FOR BIDS

(IFB)
INTEGRATIONS FOR BIDS (IFB)
(One Envelope Bidding Process without e-Procurement)
Design, Supply, Installation Testing and Commissioning of Power Generating Plant at various Clusters of RACP (Capacity of 1.00, 1.50 and 2.00 MW cumulating to 22MW)

NATIONAL COMPETITIVE BIDDING

Employer: RAJASTHAN AGRICULTURAL COMPETETIVENESS PROJECT
Contract Title: Design, Supply, Installation, Testing and Commissioning of Solar Power Generating Plant at various clusters of RACP (Capacity of 1.00, 1.50 and 2.00 MW cumulating to 22MW)
Loan No./Credit No./ Grant No.: Credit No. 5085IN
Bid No.: IFB No.: IN-PMU-RACP-148594-CW-RFB-2019-20/12319 Date: 27-02-2020

1. Government of India [GOI] has received a credit [Credit No. 5085IN] from the World Bank toward the cost of Rajasthan Agricultural Competitiveness Project and it is intended that part of the proceeds will be applied to eligible payments under the contracts for which this Invitation for Bids is issued.

2. The Project Director, Rajasthan Agricultural Competitiveness Project Management and Implementation Society (RACPMIS) (Purchaser) now invites sealed Bids from eligible Bidders for Design, Supply, Installation, Testing and Commissioning of Solar Power Generating Plant./ shown in Table below. Bidders are advised to note the clauses on eligibility (Section I Clause 4) and minimum qualification criteria (Section III – Evaluation and Qualification Criteria), to qualify for the award of the contract. In addition, please refer to paragraphs 1.6 and 1.7 of the World Bank’s Guidelines setting forth the World Bank’s policy on conflict of interest.

3. Bidding will be conducted through National Competitive Bidding procedures agreed with the World Bank. Bidding is open to all eligible bidders as defined in the World Bank’s Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, January 2011_Revised July 2014

4. Bidders from India should, however, be registered with the Government of Rajasthan or other State Governments/ Government of India, or State/ Central Government Undertakings. Bidders from India, who are not registered as above, on the date of bidding,
can also participate provided they get themselves registered by the time of contract signing, if they become successful bidders. Interested bidders may obtain further information and inspect the bidding document at the address given below during office hours.

5. A complete set of bidding documents may be purchased from the RACP office from -27-02-2020 to 31-03-2020 upon payment of a non-refundable fee of Rs. 3,000/- (Rupees Three Thousand) in the form of Demand Draft/Banker’s Cheque on any scheduled /nationalized bank payable at Jaipur in favor of Project Director, RACPMIS. Bidding documents requested by mail will be dispatched by registered/speed post on payment of an extra amount of Rs. 500/. The Project will not be responsible for the postal delay if any, in the delivery of the documents or non-receipt of the same.

6. The bid document can be seen and downloaded from the website http://www.agriculture.rajasthan.gov.in/content/agriculture/en/RACP-dep.html. The bidder will be responsible for ensuring that any addenda available on the website is also downloaded and incorporated. The downloaded bid document and addenda will be submitted along with non-refundable fee of Rs. 3,000/- (Rupees three thousand only) towards the cost of the bid document in the form of Demand Draft/Banker’s Cheque payable at Jaipur in favor of Project Director, RACPMIS. Electronic bidding is not permitted. Late bids will be rejected.

7. All Bids must be accompanied by a bid security for the amount specified for the work in the table below. Bid security will have to be submitted in the form of Bank guarantee or as a demand draft drawn in favour of Project Director, RACPMIS as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid. No bid security will be accepted after the deadline for submission of bids.

8. SITC of Solar Power Generating plant at various locations of FPC shall be successfully completed within two (02) months from the date of award of contract. The O&M cost which goes beyond the project period shall be paid by the concerned FPC.

9. Bids must be delivered to RACP office, Jaipur on or before 14.00 hours on 01-04-2020 and will be publicly opened on the same day at 14.30 hours, in the presence of the bidders designated representatives who wish to attend. If the office happens to be closed on the date of receipt of the bids as specified, the bids will be received and opened on the next working day at the same time and venue. Late Bids will be rejected.

10. A pre-bid meeting will be held on 12-03-2020, at 11.00 hours at the office of RACP, Jaipur to clarify the issues and to answer questions on any matter that may be raised at that stage as stated in ITB Clause 7.4 of ‘Instructions to Bidders’ of the bidding document. Bidders are advised to obtain and go through the bidding document prior to the pre-bid meeting in order for bidders to have a good understanding of the scope of the requirements under this contract for discussion and clarification at the pre-bid meeting.

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1 Modify or delete this para, based on registration requirement, if any for bidders from India.
2 Delete this para, if a pre-bid meeting is not scheduled for this procurement.
11. Other details can be seen in the bidding document.

12. Details of the Plants requirements (including facilities, location, delivery period, etc.) are shown in the table below:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Package / Clusters</th>
<th>Estimated Quantity</th>
<th>Total Capacity in MW</th>
<th>Bid Security* (Rs.)</th>
<th>Cost of Document (Rs.)</th>
<th>Period of Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Package-1</strong></td>
<td>Jaipur – Mokhampura, Alwar-Bansur, Dholpur-Bari and Sawai Madhopur-Bonli, Bikaner-Phoolasar, Jaisalmer-Kheruwala, Nagaur-Ladnu and Sri-Ganganagar-Z-distributary</td>
<td>1 MW – 2 Units 2 MW – 4 Units</td>
<td>10</td>
<td>65.50 Lacs</td>
<td>Within two (02) months from the date of award of contract.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Package-2</strong></td>
<td>Ajmer-Pisangan, Chittorgarh – Orai-Bassi, Banswara-Kushalgarh and Pratapgarh-Jakham, Kota – Sangod, Baran-Palitha, Jhalawar-Manoharthana, Tonk-Dooni-Deoli and Bundi-Gudha</td>
<td>1 MW – 3 Units 1.5 MW – 2 Units 2 MW – 3 Units</td>
<td>12</td>
<td>78.60 Lacs</td>
<td></td>
</tr>
</tbody>
</table>

13. The bidder may submit Bid for individual or both Packages. However, the bidder must bid for the entire scope of works for the Package. Bids quoting incomplete scope will be treated as non-responsive and rejected. The evaluation will be done for each package separately and the lowest responsive bidder in each package will be awarded the contract. In case any bidder (who has submitted bids for both packages and is found to be meeting qualification requirements for each of these packages individually) is lowest in more than one package but fails to meet the cumulative qualification requirement for both packages, consideration of contract award for specific package wherein the Bidder meets the requirement of the package, will be at the sole decision of the employer. The bid security will also be submitted as per the package applied.

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3 A brief description of the Plant requirements should be provided, including facilities, location, delivery period etc. and other information necessary to enable potential Bidders to decide whether or not to respond to the Invitation for Bids. The information shall be in line with that provided in any other para of the IFB.
14. The bidder has to use separate schedule of Rates and Prices for different capacity as mentioned in the above table.

15. The individual and overall capacity in MW under each Package are subject to change but not exceeding the overall requirement mentioned in the bidding documents.

16. Bids will be publicly opened in the presence of Bidders' designated representatives who choose to attend at the address given above on the specified date and time.

17. In the event of the date specified for bid receipt and opening being declared as a closed holiday for the purchaser’s office, the due date for submission of bids and opening of bids will be the following working day at the address for communication is as under:

(a) Name & Designation of Officer: Alok Ranjan, Project Director

(b) Official Address Rajasthan Agricultural Competetiveness Project, II Floor, Academic Block, SIAM Campus, Durgapura, Jaipur-302017

(c) Email pd@racpmis.com

(d) Telephone 0141-2554215

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(Alok Ranjan)

Project Director, RACP
PART 1 – Bidding Procedures
Section I. Instructions to Bidders
Section I. Instructions to Bidders

General

1. Scope of Bid
   1.1 In connection with the Invitation for Bids indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of Plant and Installation Services as specified in Section VI, Employer’s Requirements. The name, identification, and number of lots (contracts) of the National Competitive Bidding (NCB) are provided in the BDS.

   1.2 Unless otherwise stated, throughout this Bidding Document definitions and interpretations shall be as prescribed in the General Conditions, Section VII.

   1.3 “ESHS” means environmental, social (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), health and safety

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 World Bank (hereinafter called “the Bank”) 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 the Bank will be made only at the request of the Borrower and upon approval by the Bank in accordance with the terms and conditions of the financing agreement between the Borrower and the Bank (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the funds.

   2.3 The Loan Agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of equipment, plant, or materials, if such payment or import is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations.

3. Fraud and Corruption
   3.1 The Bank requires that Borrowers (including beneficiaries of Bank loans), as well as Bidders, Suppliers, Contractors and their agents (whether declared or not), personnel, subcontractors,
sub-consultants, service providers and suppliers, under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy, the Bank:

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

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

(ii) “fraudulent practice” is 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) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is 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;

(v) “obstructive practice” is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

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4 “Another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

5 “Party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

6 “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non-competitive levels.

7 “Party” refers to a participant in the procurement process or contract execution.
(bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under sub-clause 3.2 below.

(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 in competing for the contract in question;

(c) will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to remedy the situation; and

(d) will sanction a firm or an individual, at any time, in accordance with prevailing Bank’s sanctions procedures\(^a\), including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated\(^b\) sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract.

3.2 In further pursuance of this policy, Bidders shall permit the Bank to inspect any accounts and records and other documents relating to the Bid submission and contract performance, and to have them audited by auditors appointed by the Bank.

3.3 Furthermore, Bidders shall be aware of the provision stated in the General Conditions (GC 42.2.1(c)).

\(^a\) A firm or an individual may be declared ineligible to be awarded a Bank-financed contract upon completion of the Bank’s sanctions proceedings as per its sanctions procedures, including inter alia: (i) temporary suspension in connection with an ongoing sanctions proceeding; (ii) cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks; and (iii) the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption.

\(^b\) A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which either has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the bidder’s pre-qualification application or the bid; or (ii) appointed by the Borrower.
4. Eligible Bidders

4.1 A Bidder may be a private entity or a government-owned entity—subject to ITB 4.5—or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent, unless otherwise specified in the BDS. In the case of a joint venture when permitted:

(a) unless otherwise specified in the BDS, all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms, and

(b) the JV 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 JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution. This authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all partners.

(c) the joint venture agreement should be registered in the place specified in BDS so as to be legally valid and binding on all partners. Unless specified in the BDS, there is no limit on the number of partners in a JV.

4.2 A Bidder, and all partners constituting the Bidder, shall have a nationality of an eligible country as defined in Guidelines: Procurement under IBRD Loans and IDA Credits, January 2011 Revised July 2014, (hereinafter referred to as the Guidelines), in accordance with Section V, Eligible Countries. A Bidder shall be deemed to have the nationality of a country if the Bidder is a national 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 have a conflict of interest with one or more parties in this bidding process, if:

(a) they have a controlling partner 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 information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

(e) a Bidder submits 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 Clause 13. This will result in the disqualification of all such bids. However, 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.

(f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Plant and Installation Services that are the subject of the bid.

(g) a Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Employer or the Borrower as Project Manager for the contract.

(h) a Bidder would be providing goods, works, or non-consulting 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 has a close business or family relationship with a professional staff of the Borrower (or of the project implementing 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 the Bank throughout the procurement process and execution of the contract.
4.4 A Bidder that has been sanctioned by the Bank in accordance with the above ITB 3.1 (d), or in accordance with the Bank's Guidelines on Preventing and Combating Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, shall be ineligible to be awarded a Bank-financed contract, or benefit from a Bank-financed contract, financially or otherwise, during such period of time as the Bank shall determine. The list of debarred firms and individuals is available at the electronic address specified in the BDS.

4.5 Government-owned entities in the Borrower’s country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under the principles of commercial law, and (iii) are not dependent agencies of the Employer or the Borrower.

4.6 Bidders shall provide such evidence of their eligibility satisfactory to the Employer, as the Employer shall reasonably request.

4.7 Deleted.

4.8 Firms shall be excluded if:

(a) as a matter of law or official regulation, the Borrower’s country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or related services required; or

(b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower’s country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.

5. Eligible Plant and Installation Services

5.1 The Plant and Installation Services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 above and all expenditures under the Contract will be limited to such Plant and Installation 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 different in its basic characteristics or in purpose or utility from its components.

## Contents of Bidding Document

### 6. Sections of Bidding Document

| 6.1 | The Bidding Document consists of Parts 1, 2, and 3, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 8. |

### PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Countries

### PART 2 Employer’s Requirements

- Section VI. Employer’s Requirements

### PART 3 Conditions of Contract and Contract Forms

- Section VII. General Conditions (GC)
- Section VIII. Particular Conditions (PC)
- Section IX. Contract Forms

| 6.2 | The Invitation for Bids 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 Invitation for Bids. |

| 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 of the Bidding Document shall contact the Employer in writing at the Employer’s address indicated in the BDS or raise his enquiries 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 prior to the
deadline for submission of bids within a period specified in the BDS. 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. If so specified in the BDS, the Employer shall also promptly publish its response at the web page identified in the BDS. *(where electronic downloading of bidding document is permitted, the Employer will upload the addenda on the website and it will be the responsibility of the bidders [who downloaded the bidding documents] to search the website for any addenda).* 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 23.2.

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 Installation 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 upon 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, as far as possible, to submit any questions in writing, to reach the Employer not later than one week before the 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 23.2.

**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 not 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 English. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. **Documents Comprising the Bid**

11.1 The Bid submitted by the Bidder shall comprise the following:

(a) Letter of Bid

(b) Completed schedules as required, including Price Schedules, in accordance with ITB 12 and 17;

(c) Bid Security, in accordance with ITB 20;

(d) alternative bids, if permissible, in accordance with ITB 13;
(e) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 21.2;

(f) documentary evidence established in accordance with ITB 14.1 that the Plant and Installation Services offered by the Bidder in its bid or in any alternative bid, if permitted, are eligible;

(g) documentary evidence in accordance with ITB 15 establishing the Bidder’s eligibility and qualifications to perform the contract if its Bid is accepted;

(h) documentary evidence established in accordance with ITB 16 that the Plant and Installation Services offered by the Bidder conform to the Bidding Document;

(i) in the case of a bid submitted by a JV (where permitted), JV agreement, or letter of intent to enter into a JV including a draft agreement signed by all partners, indicating at least the parts of the Plant to be executed by the respective partners;

(j) List of subcontractors, in accordance with ITB 16.2, and a letter of intent between the parties confirming their participation; and

(k) any other document required in the BDS.

11.2 The Bidder shall furnish in the Letter of Bid information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid, and to contract execution if the Bidder is awarded the contract.

12. Letter of Bid and Schedules

12.1 The Bidder shall complete the Letter of Bid, including the appropriate Price Schedules, using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed as instructed in each form.

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 III, 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 VI, Employer’s Requirements. Technical alternatives that comply with the performance and technical criteria specified for the Plant and Installation Services shall be considered by the Employer on their own merits, pursuant to ITB 35. The method for their evaluation will be stipulated in Section III. Evaluation and Qualification Criteria.

14. Documents Establishing the Eligibility of the Plant and Installation Services

14.1 To establish the eligibility of the Plant and Installation Services in accordance with ITB Clause 5, Bidders shall complete in the Technical Part of the Bid, the country of origin declarations in the declaration Form, included in Section IV, 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 III, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.

15.2 Deleted.

16. Documents establishing conformity of the Plant and Installation Services

16.1 The Bidder shall furnish the information stipulated in Section IV, in sufficient detail to demonstrate substantial responsiveness of the Bidders’ proposal to the work requirements and the completion time.

16.2 For major items of Plant and Installation Services as listed by the Employer in Section III, 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. 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.

16.3 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

17. **Bid Prices and Discounts**

17.1 Unless otherwise specified in the BDS, bidders shall quote for the entire Plant and Installation 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 including supply of mandatory spares (if any). 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.

17.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.

17.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section IV, Bidding Forms.

17.4 Depending on the scope of the Contract, the Price Schedules may comprise up to the six (6) schedules listed below. Separate numbered Schedules included in Section IV, Bidding Forms, from those numbered 1-4 below, shall be used for each of the elements of the Plant and Installation Services. The total amount from each Schedule corresponding to an element of the Plant and Installation Services shall be summarized in the schedule titled Grand Summary, (Schedule 5), giving the total bid price(s) to be entered in the Letter of Bid.
Schedule No. 1 Plant (including Mandatory Spare Parts)  
Supplied from Abroad – not used

Schedule No. 2 Plant (including Mandatory Spare Parts)

Schedule No. 3 Design Services

Schedule No. 4 Installation Services including 5(five) years comprehensive warranty

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

Schedule No. 6 Recommended Spare Parts

Bidders shall note that the plant and equipment 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 Services including 5(five) years comprehensive warranty.

17.5 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): Not used

(b) Plant manufactured within the Employer’s country (Schedule No. 2):

   (i) The price of the plant shall be quoted on an EXW Incoterm basis (such as “ex-works,” “ex-factory,” “ex-warehouse” or “off-the-shelf,” as applicable),

   (ii) Sales tax and all other taxes payable in the Employer’s country on the plant if the contract is awarded to the Bidder.

(c) Design Services (Schedule No. 3).

(d) Installation Services shall be quoted separately (Schedule No. 4) and shall include rates or prices for local transportation to named place of final destination as specified in the BDS, 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 twenty-eight (28) days prior to the deadline for submission of bids.

(e) Recommended spare parts shall be quoted separately (Schedule 6) as specified in either subparagraph (a) or (b) above in accordance with the origin of the spare parts.

17.6 The current edition of Incoterms, published by the International Chamber of Commerce shall govern.

17.7 The prices shall be either fixed or adjustable as specified in the BDS.

17.8 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 non-responsive and rejected.

17.9 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 not be rejected, but the price adjustment will be treated as zero.

17.10 If so indicated in ITB 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 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.

17.11 Bidders wishing to offer any unconditional discount shall specify in their Letter of Bid the offered discounts and the manner in which price discounts will apply.

17.12 Bidders may like to ascertain availability of tax/duty exemption benefits available in India. They are solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits for reasons whatsoever, the Employer will not compensate the bidder (Contractor). The bidder shall furnish along with his bid a
declaration to this effect in the Declaration Format provided in Section IV of the bidding documents.

Where the bidder has quoted taking into account such benefits, it must give all information required for issue of certificates in terms of the Government of India’s relevant Notifications as per the declaration format. In case the bidder has not provided the required information or has indicated to be furnished later on in the Declaration Format, the same shall be construed that the plant/ goods/ equipment for which certificate is required is Nil.

To the extent the Employer determines the quantities indicated therein are reasonable keeping in view the Employer’s Requirements, construction program and methodology, the certificates will be issued within 60 days of signing of the contract and no subsequent changes will be permitted. In case of materials pertaining to Variation items and quantities the certificate shall be issued only on request from the Contractor when in need and duly certified by the Project Manager.

No certificate will be issued for items where no quantity/capacity of equipment is indicated in the statement.

If the bidder has considered the tax/duty exemption for plant/ goods/ equipment to be bought for the work, the bidder shall confirm and certify that the Employer will not be required to undertake any responsibilities of the Government of India Scheme or the said exemptions being available during the contract execution, except issuing the required certificate. The bids which do not conform to the above provisions or any condition by the bidder which makes the bid subject to availability of tax/duty exemption for plant/ goods/ equipment or compensation on withdrawal of any variations to the said exemptions will be treated as non-responsive and rejected.

Any delay in procurement of the plant/ goods/ equipment as a result of the above shall not be a cause for granting any extension of time.

18. Currencies of Bid and Payment
   18.1 The currency of the bid and the currency of payments shall be Indian Rupees only.
   18.2 Deleted.

19. Period of Validity of Bids
   19.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Employer. A bid valid for a shorter period shall be rejected by the Employer as non-responsive.
19.2 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 20, the Bidder granting the request shall also extend the bid security for forty-five (45) days beyond the deadline of the extended 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, except as provided in ITB 19.3.

19.3 In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the Contract price shall be adjusted by a factor or factors specified in the BDS. Bid evaluation shall be based on the Bid Price without taking into consideration the above correction.

20. Bid Security

20.1 The Bidder shall furnish as part of its bid, a bid security as specified in the BDS, in original form and in the amount specified in the BDS.

20.2 Deleted.

20.3 If a bid security is specified pursuant to ITB 20.1, the bid security shall be a demand guarantee in any of the following forms at the Bidder’s option:

(a) an unconditional guarantee issued by a Nationalized or Scheduled bank located in India;

(b) an irrevocable letter of credit issued by a Nationalized or Scheduled bank located in India;

(c) a cashier’s or certified check or demand draft issued by a Nationalized or Scheduled bank located in India; or

(d) another security indicated in the BDS,

In the case of a bank guarantee, the bid security shall be submitted using the Bid Security Form included in Section IV, Bidding Forms. The form must include the complete name of the Bidder. The bid security shall be valid for forty-five days (45) beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 19.2.
20.4 If a bid security is specified pursuant to ITB 20.1, any bid not accompanied by a substantially responsive bid security shall be rejected by the Employer as non-responsive.

20.5 If a bid security is specified pursuant to ITB 20.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder’s signing the Contract and furnishing the performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security pursuant to ITB 42.

20.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security.

20.7 The bid security may be forfeited:

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, or any extension thereto provided by the Bidder in accordance with ITB 19.2; or

(b) if the Bidder does not accept the correction of its Bid Price pursuant to ITB 32; or

(c) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB 41; or

(ii) furnish a performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security in accordance with ITB 42.

20.8 The Bid Security of a JV shall be in the name of the JV that submits the bid. If the JV has not been legally constituted into a legally enforceable JV at the time of bidding, the Bid Security shall be in the names of all future partners as named in the letter of intent referred to in ITB 4.1.

21. Format and Signing of Bid

21.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it “ORIGINAL.” 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 them “COPY.” In the event of any discrepancy between the original and the copies, the original shall prevail.
21.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid where entries or amendments have been made shall be signed or initialed by the person signing the bid.

21.3 A bid submitted by a JV where permitted, shall comply with the following requirements:

(a) Unless not required in accordance with ITB 4.1 (a), be signed so as to be legally binding on all partners and

(b) Include the Representative’s authorization referred to in ITB 4.1 (b), consisting of a power of attorney signed by those legally authorized to sign on behalf of the JV.

21.4 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

Submission and Opening of Bids

22. Submission, Sealing and Marking of Bids

22.1 Bidders may always submit their bids by mail or by hand. When so specified in the BDS, bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows:

(a) Bidders submitting bids by mail or by hand shall enclose the original 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 sub-Clauses 22.2 and 22.3.

(b) Bidders submitting bids electronically shall follow the electronic bid submission procedures specified in the BDS.

22.2 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;

(c) bear the specific identification of this bidding process indicated in accordance with ITB 1.1; and

(d) bear a warning not to open before the time and date for bid opening.

22.3 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.

23. **Deadline for Submission of Bids**

23.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.

23.2 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.

24. **Late Bids**

24.1 The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 23. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

25. **Withdrawal, Substitution, and Modification of Bids**

25.1 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 21.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be:

(a) prepared and submitted in accordance with ITB 21 and ITB 22 (except that withdrawals notices 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 23.

25.2 Bids requested to be withdrawn in accordance with ITB 25.1 shall be returned unopened to the Bidders.
25.3 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 Bid or any extension thereof. This will result in the forfeiture of the Bid Security pursuant to ITB 20.7.

26. Bid Opening

26.1 The Employer shall conduct the bid opening in public, in the presence of Bidders' designated representatives and anyone who choose to attend, and at the address, date and time specified in the BDS. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 22.1, shall be as specified in the BDS.

In the event of the specified date of bid opening being declared a holiday for the Employer, the bids will be opened at the appointed time and location on the next working day.

26.2 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. Next, envelopes marked “SUBSTITUTION” shall be opened and read out and exchanged with the corresponding bid being substituted, and the substituted bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked “MODIFICATION” shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only bids that are opened and read out at bid opening shall be considered further.

26.3 All other envelopes shall be opened one at a time, reading out: the name of the Bidder and the Bid Price(s), including any discounts and alternative bids, and indicating whether there is a modification; the presence or absence of a bid security or Bid-Securing Declaration; and any other details as the Employer may consider appropriate. Only discounts and alternative bids read out at bid opening shall be considered for evaluation. No bid shall be rejected at bid opening except for late bids, in accordance with ITB 24.1.

26.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and
whether there is a withdrawal, substitution, or modification; the Bid Price, per lot if applicable, including any discounts and alternative bids; and the presence or absence of a bid security or a Bid-Securing Declaration. 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 in time, and posted online when electronic bidding is permitted.

**Evaluation and Comparison of Bids**

27. **Confidentiality**

27.1 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 information on Contract award is communicated to all Bidders.

27.2 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.

27.3 Notwithstanding ITB 27.2, 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.

28. **Clarification of Bids**

28.1 To assist in the examination, evaluation, and comparison of the 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 prices or substance of the 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 32.

28.2 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.

29. **Deviations, Reservations, and Omissions**

29.1 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.

30. Determination of Responsiveness

30.1 The Employer’s determination of a bid’s responsiveness is to be based on the contents of the bid itself, as defined in ITB11.

30.2 A substantially responsive 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 Installation 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.

30.3 The Employer shall examine the technical aspects of the bid in particular, to confirm that all requirements of Section VI, Employer’s Requirements have been met without any material deviation, reservation, or omission.

30.4 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.

31. Nonmaterial Nonconformities

31.1 Provided that a bid is substantially responsive, the Employer may waive any nonconformity in the bid that does not constitute a material deviation, reservation or omission.

31.2 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 or substance of the bid. Failure of the Bidder to comply with the request may result in the rejection of its bid.

31.3 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 non-conforming item or component in the manner specified in the BDS.

<table>
<thead>
<tr>
<th>32. Correction of Arithmetical Errors</th>
<th>32.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:</th>
</tr>
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<tbody>
<tr>
<td>(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 former shall prevail and the latter will be corrected accordingly;</td>
<td></td>
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<tr>
<td>(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 former shall prevail and the latter will be corrected accordingly; and</td>
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<tr>
<td>(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.</td>
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</table>

32.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 32.1, shall result in the rejection of the Bid, and the Bid Security may be forfeited in accordance with ITB Sub-Clause 20.7.

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<tr>
<th>33. Conversion to Single Currency</th>
<th>33.1 Deleted.</th>
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<tr>
<td>34. Margin of Preference</td>
<td>34.1 Deleted.</td>
</tr>
<tr>
<td>35. Evaluation of Bids</td>
<td>35.1 The Employer shall use the criteria and methodologies indicated in this Clause. No other evaluation criteria or methodologies shall be permitted.</td>
</tr>
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</table>

Technical Evaluation
35.2 The Employer will carry out a detailed technical evaluation of the bids not previously rejected 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 (or maximum, as the case may be) requirements for specified functional guarantees, will be rejected for non-responsiveness. In order to reach its 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; conformity of the Plant and Installation Services offered with specified performance criteria, including conformity with the specified minimum (or maximum, as the case may be) requirement corresponding to each functional guarantee, as indicated in the Specification and in Section III Evaluation and Qualification Criteria; suitability of the Plant and Installation 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;

(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 III, Evaluation and Qualification Criteria.

35.3 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.

Economic Evaluation

35.4 To evaluate a 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 arithmetic errors in accordance with ITB 32.1;
(c) price adjustment due to discounts offered in accordance with ITB 17.10 and ITB17.11;

(d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 31.3;

(e) not used

(f) the evaluation factors indicated in Section III, Evaluation and Qualification Criteria.

35.5 If price adjustment is allowed in accordance with ITB 17.7, 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.

35.6 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 Bid, is specified in Section III, Evaluation and Qualification Criteria.

35.7 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.

36. Comparison of Bids

36.1 The Employer shall compare all substantially responsive bids in accordance with ITB 35.4 to determine the lowest evaluated bid.

37. Eligibility and Qualification of the Bidder

37.1 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid is eligible and meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

37.2 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. The determination shall not take into consideration the qualifications of other firms such as the Bidder’s subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Subcontractors if permitted in the bidding document) or any other firm(s) different from the Bidder.

37.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Employer shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder’s qualifications to perform satisfactorily.

37.4 The capabilities of the manufacturers and subcontractors proposed in its Bid to be used by the lowest evaluated Bidder for identified major items of supply or services will also be evaluated for acceptability in accordance with Section III, Evaluation and Qualification Criteria. Their participation should be confirmed with a letter of intent between the parties, as needed. 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.

38. **Employer’s Right to Accept Any Bid, and to Reject Any or All Bids**

38.1 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.

**Award of Contract**

39. **Award Criteria**

39.1 Subject to ITB 38.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be eligible and qualified to perform the Contract satisfactorily.

40. **Notification of Award**

40.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the “Letter of Acceptance”) shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Plant and Installation Services (hereinafter
and in the Conditions of Contract and Contract Forms called “the Contract Price”).

40.2 At the same time the Purchaser shall publish in a website http://www.agriculture.rajasthan.gov.in/content/agriculture/en/RACP-dep.html the results identifying the bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at Bid Opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded.

40.3 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

40.4 The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 40.2, requests in writing the grounds on which its bid was not selected.

41. **Signing of Contract**

41.1 Promptly upon notification, the Employer shall prepare the Contract Agreement, and keep it ready in the office of the Employer for the signature of the Employer and the successful Bidder, within 28 days following the date of Letter of Acceptance. The Contract Agreement shall incorporate all agreements between the Employer and the successful Bidder.

41.2 Within twenty-eight (28) days of receipt of the Letter of Acceptance, the successful Bidder shall (a) furnish the performance security in accordance with ITB Clause 42 and if required, the Environmental, Social, Health and Safety (ESHS) Performance Security; (b) if the successful bidder is a JV, it shall also furnish the JV agreement duly signed by all the partners, if it had submitted only a letter of intent to execute the JV agreement along with the bid; and (c) shall sign, date, and return the Agreement to the Employer along with the documents stated at (a) and (b) above.

41.3 Deleted.

42. **Performance Security**

42.1 Within twenty-eight (28) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security in accordance with the General Conditions, subject to ITB 35.7, using for that purpose the Performance Security and
ESHS Performance Security Forms included in Section IX, Contract Forms, or another form acceptable to the Employer.

42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security. 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.

42.3 Upon the successful Bidder’s signing the Agreement and furnishing of the Performance Security and if required the Environmental, Social, Health and Safety (ESHS) Performance Security pursuant to ITB Clause 42.1, the Employer shall promptly notify the name of the winning bidder to each unsuccessful bidder and shall discharge the Bid Securities of the bidders pursuant to ITB Clause 20.5 and 20.6.

43. Adjudicator

43.1 The Employer proposes the person named in the BDS to be appointed as Adjudicator under the Contract, at the daily fee specified in the BDS, plus reimbursable expenses (actual boarding, lodging, travel and other incidental expenses). If the Bidder disagrees with this proposal, the Bidder should so state in his Bid. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the Particular Conditions of Contract (PC) pursuant to Clause 46.1 of the General Conditions of Contract (GC), to appoint the Adjudicator.
Section II. Bid Data Sheet

The following specific data for the Facilities to be procured shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in ITB.

<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITB 1.1</strong></td>
</tr>
<tr>
<td><strong>ITB 1.1</strong></td>
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<tr>
<td><strong>ITB 1.1</strong></td>
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<td><strong>ITB 2.1</strong></td>
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<td><strong>ITB 2.1</strong></td>
</tr>
<tr>
<td><strong>ITB 4.1</strong></td>
</tr>
<tr>
<td><strong>ITB 4.2</strong></td>
</tr>
</tbody>
</table>

**Bidding Document**

| **ITB 7.1** | For **clarification purposes** only, the Employer’s address is: Project Director |
Rajasthan Agricultural Competitiveness Project  
II Floor, Academic Block, SIAM Campus,  
Durgapura, Jaipur-302018  
Rajasthan, India  
Ph. No. - 0141-2554215, 2554214  
Fax: 0141-2554214  
Email-pd@racpmis.com  
Requests for clarification should be received by the Employer no later than 14 days prior to deadline for submission of bids. The Employer will also upload its response on the Employer’s website i.e. [http://www.agriculture.rajasthan.gov.in/content/agriculture/en/RACP-dep.html](http://www.agriculture.rajasthan.gov.in/content/agriculture/en/RACP-dep.html)  
without identifying the source.

**ITB 7.4**  
A Pre-Bid meeting shall take place at the following date, time and place:  
Date: 12-03-2020  
Time: 11.00 AM  
Place: Conference Hall, PMU, RACP, Durgapura, Jaipur  
A site visit conducted by the Employer shall not be organized. However the Bidders are free to visit the Clusters to satisfy themselves on the site conditions and other related issues to make a comprehensive bid.

## Preparation of Bids

**ITB 11.1 (k)**  
The Bidder shall submit with its bid the following additional documents:

(i) **Code of Conduct (ESHS)**  

The Bidder shall submit its Code of Conduct that will apply to its employees and subcontractors, to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract. *[Note: Complete and include the risks to be addressed by the Code in accordance with Section VI-Employer’s Requirements, e.g. Risks associated with: labor influx, including health facilities and grievance redressal spread of communicable diseases, sexual harassment, gender based violence, sexual exploitation and abuse, illicit behavior and crime, and maintaining a safe environment etc.]*

In addition, the Bidder shall detail how this Code of Conduct will be implemented. This will include a detailed prevention and response action plan indicating: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches.

The Contractor shall be required to implement the agreed Code of Conduct upon contract award that includes the agreed Management Strategies and Implementation Plans (MSIP) described here.

(ii) **Management Strategies and Implementation Plans (MSIP) to manage the (ESHS) risks**
The Bidder shall submit Management Strategies and Implementation Plans (MSIP) to manage the following key Environmental, Social, Health and Safety (ESHS) risks.

- Traffic Management Plan to ensure safety of local communities from construction traffic
- Detail management strategy to offset project risks associated with environmental and social clearances/NOCs/permits/approvals applicable for project implementation vis-à-vis opening of quarry or borrow pit, establishment of plants, hiring of labour etc.
- [e.g. Strategy for obtaining Consents/Permits prior to the start of relevant works such as opening a quarry or borrow pit;]
- Labour management procedure to address issues of labour in project.
- Hazardous and non-hazardous waste management plan;
- Gender based violence and sexual exploitation and abuse (GBV/SEA) prevention and response action plan
- Community health and safety plan to minimize risk from exposure to, but not limited to air, water, noise and soil pollution;
- Emergency response plan to respond to accident and natural calamity at project site
- Boundary Marking and Protection Strategy for mobilization and construction to prevent offsite adverse impacts
- Water Resource Protection Plan to prevent contamination of drinking water
- Response and progress reports to address actions stated in the project’s GBV risk mitigation plan.

The Contractor shall be required to submit for approval, and subsequently implement, the Contractor’s Environment and Social Management Plan (C-ESMP), in accordance with the Particular Conditions Sub-Clause 8.3, that includes the agreed Management Strategies and Implementation Plans described above.

(iii) Contractor Registration certificate if specified (as per IFB);
(iv) Manufacturer’s authorization for major items of supply under the contract, that the Bidder did not manufacture or otherwise produce;
(v) Subcontractor Agreement or a letter of intent between the parties to enter into a Subcontractor Agreement for major items of services under the contract, that the Bidder did not otherwise provide.

| ITB 13.1 | Alternative bids are not permitted. |
| ITB 13.2 | Alternatives to the Time Schedule shall not be permitted. |
| ITB 13.4 | Alternative technical solutions shall be permitted for the following parts of the Plant and Installation Services: Not permitted. |
| ITB 17.5 (d) | Named place of final destination is: RACP clusters as described in the IFB |
| ITB 17.6 | Incoterms edition is: 2010 |
| ITB 17.7 | The prices quoted by the Bidder **shall not be** subject to adjustment during the performance of the Contract. |
| ITB 19.1 | The bid validity period shall be: 90 days. |
| ITB 19.3 | The Bid price shall be adjusted by the factor: 7 (% per annum) |
| ITB 20.1 | A bid securing declaration is not required. |
| | A bid security is required, the amount of the bid security shall be Rs. 65.50 Lacs for Package 1 and RS. 78.60 Lacs for Package 2. |
| | Note: Bid Security is required for each Package as per amounts indicated against each Package. No bid security will be accepted after the deadline for submission of bids |
| ITB 20.3 (d) | Other types of acceptable securities are: |
| | Fixed Deposit/Time Deposit certificate issued by a Nationalized or Scheduled Bank located in India for equivalent or higher values are acceptable provided it is pledged in favour of Project Director, RACPMIS (implementing agency) and such pledging has been noted and suitably endorsed by the bank issuing the certificate |
| ITB 21.1 | In addition to the original of the bid, the number of copies is: Two |
| ITB 21.2 and 21.3 | The written confirmation of authorization to sign on behalf of the Bidder shall consist of |
| | *Legally valid Power of Attorney is required to demonstrate the authority of the signatory to sign the Bid* |

### D. Submission and Opening of Bids

| ITB 22.1 & 22.1(b) | Electronic bidding is not permitted, bidders shall not have the option of submitting their bids electronically. |
| ITB 23.1 | For **bid submission purposes** only, the Employer’s address is: |
| | **Project Director** |
| | Rajasthan Agricultural Competitiveness Project |
| | II Floor, Academic Block, SIAM Campus, |
| | Durgapura, Jaipur-302018 |
| | Ph. No. - 0141-2554215, 2554214 |
| | Fax: 0141-2554214 |
| | Email-pd@racpmis.com. **The deadline for bid submission is:** |
| | Date: 01-04-2020 |
### Time: 02.00 P.M.

#### ITB 26.1
The bid opening shall take place at:

**Project Director**  
Rajasthan Agricultural Competitiveness Project  
II Floor, Academic Block, SIAM Campus,  
Durgapura, Jaipur-302018  
Ph. No. - 0141-2554215, 2554214  
Fax: 0141-2554214  
Email: pd@racpmis.com

The deadline for the opening of bids is:

- **Date:** 01-04-2020  
- **Time:** at 2:30 PM

#### ITB 26.1
Electronic bidding is not permitted, bids **shall not be opened** electronically

### Evaluation, and Comparison of Bids

#### ITB 31.3
The adjustment shall be based on the highest price of the item or component as quoted in other substantially responsive Bids, subject to a maximum of the estimated price of the item. If the price of the item or component cannot be derived from the price of other substantially responsive Bids, the Employer shall use its best estimate.

### Award of Contract

#### ITB 42.1
The successful Bidder shall be required to submit an ESHS performance Security.

#### ITB 43
The Adjudicator proposed by the Employer is: Mr. Mukund Joshi and has been identified from the list provided by Indian Council of Arbitration (ICA). The daily fee for this proposed Adjudicator shall be: **not less than Rs. 10,000 per day**. The biographical data of the proposed Adjudicator is as follows:

- **Membership No.:** IL/ICA/5748  
- **Mr. Mukund Joshi**  
- **Civil Engineer**  
- **OA5, Shankar Sadan,**  
- **Adinath Marg, C-Scheme,**  
- **Opposite SMS Hospital**  
- **Jaipur 302001 Rajasthan**  
- **Phone:** 8800552725/23383763  
- **Email:** mukundjoshi30@yahoo.com  
- **Date of Birth:** 7/30/1956  
- **Particulars:** Former Special Director General, CPWD/PWD, New Delhi. Specialization in Engineering/Technical, Construction, Environment. Dealt with 10 arbitration cases.
Section III. Evaluation and Qualification Criteria

This Section contains all the criteria that the Employer shall use to evaluate bids and qualify Bidders. In accordance with ITB 35 and ITB 37, no other factors, methods or criteria shall be used. The Bidder shall provide all the information requested in the forms included in Section IV, Bidding Forms.
1. Evaluation

1.1 Technical Evaluation

In addition to the criteria listed in ITB 35.2 (a) – (c) the following factors shall apply:

1.2 Economic Evaluation

The following factors and methods will apply:

(a) Time Schedule:

Time to complete the Plant and Installation Services from the effective date specified in Article 3 of the Contract Agreement for determining time for completion of pre-commissioning activities is: Two months from the date of award of contract. No credit will be given for earlier completion.

(b) Operating and Maintenance Costs

Since the operating and maintenance costs of the facilities being procured form a major part of the life cycle cost of the facilities, these costs will be evaluated according to the principles given hereafter, including the cost of spare parts for the initial period of operation of 5 years after successful commissioning stated below and based on prices furnished by each Bidder in Price Schedule Nos. 1 and 2, as well as on past experience of the Employer or other Employers similarly placed. Such costs shall be added to the bid price for evaluation.

Option 1: The operating and maintenance costs factors for calculation of the life cycle cost are:

(i) number of years for life cycle 5 years

(ii) operating costs As quoted by the Bidder in Schedule 4A year wise for 5 years

(iii) maintenance costs, including the cost of spare parts for the initial period of operation to be included in schedule 4A [state how they will be determined], and

(iv) rate, in percent 8%, to be used to discount to present value all annual future costs calculated under (ii) and (iii) above for the period specified in (i).

The price of recommended spare parts quoted in Price Schedule No. 6 shall not be considered for evaluation.

(c) Work, services, facilities etc., to be provided by the Employer

Where bids include the undertaking of work or the provision of services or facilities by the Employer in excess of the provisions allowed for in the bidding document, the
Employer shall assess the costs of such additional work, services and/or facilities during the duration of the contract. Such costs shall be added to the bid price for evaluation.

(d) **Specific additional criteria**

The relevant evaluation method, if any, shall be as follows:

Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an “Evaluated Bid Price.” Bid prices quoted by bidders shall remain unaltered.

All taxes, duties and levies must be included in the Bid price. The GST amount will not be included in the evaluation and will be reimbursed / paid by Purchaser as per law.

**1.3 Technical alternatives:** Not permitted

**1.4 Multiple Contracts (ITB 35.6) Not Applicable.**

Bidders are required to quote for all the Clusters for the entire scope on Single Source Responsivity basis for one or both package. Each Package will be evaluated and awarded separately although invited together in one IFB.
## 2. Qualification (Joint venture not permitted)

<table>
<thead>
<tr>
<th>Factor</th>
<th>2.1 Eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Factor</td>
<td>Criteria</td>
</tr>
<tr>
<td></td>
<td>Requirement</td>
</tr>
<tr>
<td>2.1.1 Nationality</td>
<td>Nationality in accordance with ITB 4.2.</td>
</tr>
<tr>
<td>2.1.2 Conflict of Interest</td>
<td>No conflicts of interests as described in ITB 4.3.</td>
</tr>
<tr>
<td>2.1.3 Bank Ineligibility</td>
<td>Not having been declared ineligible by the Bank as described in ITB 4.4.</td>
</tr>
<tr>
<td>2.1.4 Government Owned Entity</td>
<td>Compliance with conditions of ITB 4.5</td>
</tr>
<tr>
<td>2.1.5 Ineligibility based on a United Nations resolution or Borrower’s country law</td>
<td>Not having been excluded as a result of the Borrower’s country laws or official regulations, or by an act of compliance with UN Security Council resolution, in accordance with ITB 4.8</td>
</tr>
<tr>
<td>Sub-Factor</td>
<td>Criteria</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>2.2.1 History of non-performing contracts</strong></td>
<td>Non-performance(^8) of a contract did not occur within the last Five (5) years prior to the deadline for application submission, based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one 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.</td>
</tr>
<tr>
<td><strong>2.2.2 Pending Litigation</strong></td>
<td>All pending litigation shall in total not represent more than five percent (5%) of the Bidder’s net worth and shall be treated as resolved against the Bidder.</td>
</tr>
<tr>
<td><strong>2.2.3 Declaration: Environmental, Social, Health, and Safety (ESHS) past performance</strong></td>
<td>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, or social, (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), or health or safety requirements or safeguard in the past five years(^9).</td>
</tr>
</tbody>
</table>

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\(^8\) 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.

\(^9\) The Employer may use this information to seek further information or clarifications in carrying out its due diligence.
## 2.3 Financial Situation

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sub-Factor</th>
<th>Criteria</th>
<th>Bidder Single Entity</th>
<th>Documentation Required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.3.1 Historical Financial Performance</td>
<td>Submission of audited balance sheets or if not required by the law of the bidder’s country, other financial statements acceptable to the Employer, for the last five [5] years to demonstrate the current soundness of the bidders’ financial position and its prospective long term profitability. &lt;br&gt; (a) Turnover &lt;br&gt; (b) Total Assets and Liabilities &lt;br&gt; (c) Current Assets and Liabilities &lt;br&gt; (d) Total Revenue &lt;br&gt; (e) Profit before Tax &lt;br&gt; (f) Net worth</td>
<td>Must meet requirement</td>
<td>Form FIN – 3.1 with attachments</td>
</tr>
<tr>
<td></td>
<td>2.3.2 Average Annual Turnover</td>
<td>Minimum average annual turnover of Rs. 6600.00 Lacs for Package 1 and Rs. 7800.00 Lacs for Package 2 calculated as total certified payments received for contracts in progress or completed, within the last five (5) years</td>
<td>Must meet requirement</td>
<td>Form FIN – 3.2</td>
</tr>
<tr>
<td></td>
<td>2.3.3 Financial Resources</td>
<td>The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credit, and other financial means, other than any contractual advance payments to meet: (i) the following cash-flow requirement: Rs. 6600.00 Lacs for Package 1 and Rs. 7800.00 Lacs for Package 2 and (ii) the overall cash flow requirements for this contract and its current commitments.</td>
<td>Must meet requirement</td>
<td>Form FIN – 3.3</td>
</tr>
</tbody>
</table>

Financial turnover of previous years shall be given weightage @5% per year based on rupee value to bring them to the price level of the financial year in which bids are received.

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10 In case the bidder submits a letter of intent from a commercial bank with the bid, firm commitment from the bank to provide line of credit shall be required before contract signing.
<table>
<thead>
<tr>
<th>Factor</th>
<th>2.4 Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-Factor</strong></td>
<td><strong>Criteria</strong></td>
</tr>
<tr>
<td><strong>2.4.1 General Experience</strong></td>
<td>Experience in successful SITC of Solar Power Generating Plant under contracts in the role of contractor, subcontractor, or management contractor for at least the last five [5] years prior to the applications submission deadline, and with activity in at least nine (9) months in each year.</td>
</tr>
<tr>
<td><strong>2.4.2 Specific Experience</strong></td>
<td>(a) Participation as contractor, joint venture partner(^{11}), management contractor, or subcontractor, in at least Five (05) &amp; Six (06) contracts within the last) Five (5) years**, each with a value of at least Rs. 350.00 Lacs for each package respectively, that have been successfully and substantially(^*) completed and that are similar to the proposed Plant and Installation Services. The similarity shall be based on the capacity of plant in MW as per Employer’s Requirements.</td>
</tr>
<tr>
<td><strong>2.4.2 Specific Experience</strong></td>
<td>(b) For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum experience in any three (03) of the past five (05) years with activity in at least nine (9) months in each year in the Operation and Maintenance of similar Solar Plant as contractor, joint venture partner(^{12}), management contractor, or through a nominated subcontractor.</td>
</tr>
</tbody>
</table>

\(^{11}\) For contracts under which the Bidder participated as a joint venture partner or sub-contractor, only the Bidder’s share, by value, shall be considered to meet this requirement

\(^{12}\) For contracts under which the Bidder participated as a joint venture partner or sub-contractor, only the Bidder’s share, by value, shall be considered to meet this requirement

\(^*\) Cost of completed works of previous years shall be given weightage @5% per year based on rupees value to bring them to the price level of the financial year in which bids are received.

\(^*\) Substantial completion shall be based on 80% or more plant and installation completed under the contract.
2.5 Personnel

The Bidder must demonstrate that it will have the personnel on company pay-roll for the key positions that meet the following requirements for each package:

<table>
<thead>
<tr>
<th>No.</th>
<th>Position</th>
<th>Educational Qualification</th>
<th>Total Work Experience (years)</th>
<th>In Similar Works Experience (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Manager (1 No.)</td>
<td>Bachelor's degree in engineering with MBA in Operations Management or equivalent.</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Solar Energy Expert (1 No.)</td>
<td>Bachelor's degree, typically in mechanical or electrical engineering</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Electrical Engineer (1 No.)</td>
<td>Bachelor's degree in Electrical engineering</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Civil Engineer (1 No.)</td>
<td>Bachelor's degree in Civil engineering</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Technician / Supervisor (4 Nos)</td>
<td>Diploma / ITI in Civil / Mechanical / Electrical / Electronics</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Suitable experts in the following specializations

<table>
<thead>
<tr>
<th>No.</th>
<th>Position</th>
<th>Educational Qualification</th>
<th>Total Work Experience (years)</th>
<th>In Similar Works Experience (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Environment Specialist</td>
<td>Degree in relevant environmental field</td>
<td>8</td>
<td>5 years in similar work environments</td>
</tr>
<tr>
<td>2</td>
<td>Health and Safety</td>
<td>Degree in Civil Engineering &amp; must have worked as Environmental Engineer for similar contracts. Most desirable to have certificates on Environmental health and safety</td>
<td>8</td>
<td>5 years in health and safety field.</td>
</tr>
<tr>
<td>3</td>
<td>Social cum Community Liaison Officer Social</td>
<td>Degree in Social Science</td>
<td>8</td>
<td>5 years of monitoring and managing risks related to GBV/SEA</td>
</tr>
</tbody>
</table>

The Bidder must not have in his employment:
[i] the near relations (defined as first blood relations, and their spouses, of the bidder or the bidder’s spouse) of persons of the following Government Departments.
[ii] without Government permission, any person who retired as gazetted officer within the last two years.

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Bidding Forms.

2.6 Equipment

The Bidder shall provide details of proposed items of equipment for each package using the relevant Form in Section IV.
Section IV. Bidding Forms
Letter of Bid

INSTRUCTIONS TO BIDDERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE DOCUMENT

The Bidder must prepare this Letter of Bid on stationery with its letterhead clearly showing the Bidder’s complete name and business address.

Note: All italicized text is to help Bidders in preparing this form.

Date: __________________________
NCB No.: _______________________
Invocation for Bid No.: ____________
Alternative No¹³: ________________

To

Project Director,
Rajasthan Agricultural Competitiveness Project (R.A.C.P.)
II Floor, Academic Block,
SIAM Campus, Durgapura,
Jaipur-302018, Rajasthan

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 offer to _______________________, in conformity with the Bidding Document, the following Plant and Installation Services: ________________________________

(c) The price of our Bid, excluding GST and excluding any discounts offered in item (d) below is INR : _______________________, (_______), and ________________________, (_______) for the complete scope of works for all clusters including Operation and Maintenance for 5 Years. We have considered all benefits including deemed export benefit as available in World Bank funded Projects, duty exemptions as available in the price and will be solely responsible for the same and no claim whatsoever will be made to you. The Amount of GST is INR ……………………………shown separately in the Price Schedules.

(d) The discounts offered and the methodology for their application are: ________________________

________________________________________

________________________________________

________________________________________

¹³ insert identification No. if this is a Bid for an alternative
(e) Our bid shall be valid for a period of ________________ days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our bid is accepted, we commit to obtain a performance security [and an Environmental, Social, Health and Safety (ESHS) Performance Security, in accordance with the Bidding Document;

(g) We, 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;

(h) We, including any subcontractors or manufacturers for any part of the contract, do not have any conflict of interest in accordance with ITB-4.3;

(i) We are not submitting more than one bid in this bidding process as a Bidder, either individually or as a partner in a joint venture, in accordance with ITB-4.3, except for alternative offers permitted under ITB Clause 13;

(j) We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by a member of the World Bank Group or a debarment imposed by the World Bank Group in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the World Bank and other development banks. Further, we are not ineligible under the Employer’s country laws or official regulations or pursuant to a decision of the United Nations Security Council;

(k) We are not a government owned entity/ We are a government owned entity but meet the requirements of ITB-4.5;14

(l) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract:

<table>
<thead>
<tr>
<th>Name of Recipient</th>
<th>Address</th>
<th>Reason</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(If none has been paid or is to be paid, indicate “none.”)

---

14 Bidder to use as appropriate
(m) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;

(n) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive;

(o) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption; and

(p) **Adjudicator**: We accept the appointment of **Mr. Mukund Joshi** as the Adjudicator.

Name _____________________________ In the capacity of ____________________________

Signed __________________________

Duly authorized to sign** the bid for and on behalf of ____________________________

Dated on _____________________________ day of ________________________, _____

**: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid. In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder.
# Schedules of Rates and Prices

The bidder has to use separate schedule of Rates and Prices for 1.00 MW, 1.50 MW and 2.00 MW for each Package as details given below:

<table>
<thead>
<tr>
<th>Package</th>
<th>Clusters</th>
<th>Estimated Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jaipur – Mokhampura, Alwar-Bansur, Dholpur-Bari and Sawai Madhopur-Bonli, Bikaner- Phoolasar, Jaisalmer-Kheruwala, Nagaur-Ladnu and Sri-Ganganagar-Z-distributary</td>
<td>1 MW – 2 Units, 2 MW – 4 Units</td>
</tr>
<tr>
<td>2</td>
<td>Ajmer-Pisangan, Chittorgarh – Orai-Bassi, Banswara-Kushalgarh and Pratapgarh-Jakham, Kota – Sangod, Baran-Palitha, Jhalawar-Manoharthana, Tonk-Dooni-Deoli and Bundi-Gudha</td>
<td>1 MW – 3 Units, 1.5 MW – 2 Units, 2 MW – 3 Units</td>
</tr>
</tbody>
</table>
Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad

Not Used
## Schedule No. 2. Plant and Mandatory Spare Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty (Ls)</th>
<th>Currency</th>
<th>Unit EX Works Price</th>
<th>Total EX Works Price</th>
<th>Goods &amp; Service Tax (GST) in absolute figures</th>
<th>% (Percentage) of Goods &amp; Service Tax (GST) considered</th>
<th>Total Ex Works Price with GST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply of PV Modules as specified in the Tender Documents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Supply of Inverters as specified in the Tender Documents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Supply of Inverter Transformer as specified in the Tender Documents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Supply of MV Switchgear and RMU as specified in the Tender Documents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Supply of Module Mounting Structure as specified in the Tender Documents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Spare Modules (As Mandatory Spares, 0.25% of total supply of solar modules)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Mandatory Spares excluding Modules</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9=6+7</td>
</tr>
<tr>
<td>8</td>
<td>Cables (All DC, LT &amp; HT)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Weather Monitoring Station</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Manufacture &amp; Supply of Balance of System including all Equipments, Materials, Spares, Accessories, Safety &amp; Fire Fighting System etc. excluding in above Solar Part supply and any other Supplies specified in the Tender Documents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 All rates and prices shall be specified in Rs. only in accordance with ITB 18.1.
2 Indicate GST rate for each item
# Schedule No. 3. Design Services

<table>
<thead>
<tr>
<th>No.</th>
<th>Description of Item</th>
<th>Quantity (Ls)</th>
<th>Price</th>
<th>Total value of Applicable GST / Taxation in absolute figures</th>
<th>% (Percentage) of Goods &amp; Service Tax (GST)/Taxation considered</th>
<th>Total Price including GST / Taxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design &amp; Engineering in respect of all the Equipments Supplied under SOR 1 &amp; SOR 2 for Part A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Schedule No. 3
## Schedule No. 4. Installation

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Item</th>
<th>Quantity (Ls)</th>
<th>Price</th>
<th>Total value of Applicable GST / Taxation in absolute figures</th>
<th>% (Percentage) of Goods &amp; Service Tax (GST)/Taxation considered</th>
<th>Total Price including GST / Taxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inland Freight and Transit Insurance upto Site for all the mentioned supply portion under SOR 1 &amp; SOR 2 for Part A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Installation, Erection, Testing and Commissioning including Performance Testing and insurance in respect of all the Equipments Supplied under SOR 1 &amp; SOR 2 for Part A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Civil and allied works including construction and installation of Trenches, Module Mounting Structure, foundations, etc. of all the Equipments Supplied</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Schedule No. 4</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
## Schedule No. 4A Operation and Maintenance

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Item</th>
<th>Year</th>
<th>Currency</th>
<th>Yearly O&amp;M Price in INR (Excluding GST)</th>
<th>Total O&amp;M Price (INR) (Excluding GST) in figures</th>
<th>Total value of Applicable GST in absolute figures [GST to be calculated on absolute O&amp;M Price]</th>
<th>% (Percentage of Goods &amp; Service Tax (GST) considered)</th>
<th>Total O&amp;M Price including GST</th>
<th>Presen t Value</th>
<th>Total NPV of O&amp;M Price including GST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O&amp;M for FIRST YEAR</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>O&amp;M for SECOND YEAR</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>O&amp;M for THIRD YEAR</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Operation and Maintenance of the Plant Facility

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Item</th>
<th>Year</th>
<th>Currency</th>
<th>Yearly O&amp;M Price in INR (Excluding GST)</th>
<th>Total O&amp;M Price (INR) (Excluding GST) in figures</th>
<th>Total value of Applicable GST in absolute figures [GST to be calculated on absolute O&amp;M Price]</th>
<th>% (Percentage of Goods &amp; Service Tax (GST) considered)</th>
<th>Total O&amp;M Price including GST</th>
<th>Presen t Value</th>
<th>Total NPV of O&amp;M Price including GST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O&amp;M for FIRST YEAR</td>
<td>1</td>
<td>Solar PV - Part -A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>O&amp;M for SECOND YEAR</td>
<td>2</td>
<td>Wind - Part-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>O&amp;M for THIRD YEAR</td>
<td>3</td>
<td>BES - Part-C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>O&amp;M for THIRD YEAR</td>
<td>3</td>
<td>Common Infra - Part-D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:***

- **PV** refers to Present Value.
- **NPV** refers to Net Present Value.
- GST calculations are based on absolute figures of O&M Price.
<table>
<thead>
<tr>
<th>Schedule No. 4 A</th>
<th>O&amp;M for FOURTH YEAR</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O&amp;M for FIFTH YEAR</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total Schedule No. 4 A</td>
<td></td>
</tr>
</tbody>
</table>

1 All rates and prices shall be specified in Rs. only in accordance with ITB 18.1.

*Present Value will be calculated as under:

\[ PV = FV \times \frac{1}{(1 + r)^n} \]

Where,

- PV = Present Value
- FV = Future Value
- \( r \) = Rate of Return (8%)
- \( n \) = Number of Years/Periods
### Schedule No. 5. Grand Summary

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Total Price¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total Schedule No. 2. Plant, and Mandatory Spare Parts Supplied from Within the Employer’s Country</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Total Schedule No. 3. Design Services</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Total Schedule No. 4. Installation</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Total Schedule no 4 A ; Operation and maintenance for 5 years</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL (to Letter of Bid)

| Name of Bidder | __________________ |
| Signature of Bidder | __________________ |

¹ All rates and prices shall be specified in Rs. only in accordance with ITB 18.1
## Schedule No. 6. Recommended Spare Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(1)</td>
<td>EXW (2)</td>
<td>(1) x (2)</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name of Bidder ___________________________

Signature of Bidder ______________________
Technical Proposal

- Site Organization
- Method Statement
- Mobilization Schedule
- Construction Schedule
- ESHS Management Strategies and Implementation Plans
- Code of Conduct (ESHs)
- Plant
- Contractor’s Equipment
- Functional Guarantees
- Personnel
- Proposed Subcontractors for Major Items of Plant and Installation Services
- Country of Origin Declaration Form
- Others
Site Organization

[Insert Site Organization Information in compliance with the Technical Specification]
**Method Statement**

[insert Method Statement - A detailed note should be submitted outlining bidders proposed methodology and program for the provision of Plant and Installation Services, backed with equipment, materials and manpower planning and deployment, and quality control procedures proposed to be adopted, justifying Bidder’s capability for execution and timely completion of the work as per technical specifications, and achieve Commissioning and Acceptance of the Facilities within the specified Times for Completion].
Mobilization Schedule

[Insert Mobilization Schedule]
Construction Schedule

[Insert Construction Schedule - a detailed note should be submitted outlining bidder’s proposed construction schedule showing the sequence and time schedules for successive parts of the specified Plant and Installation Services, and achieve Commissioning and Acceptance of the Facilities within the stipulated time frame.]
ESHS Management Strategies and Implementation Plans

(ESHS-MSIP)

The Bidder shall submit comprehensive and concise Environmental, Social, Health and Safety Management Strategies and Implementation Plans (ESHS-MSIP) as required by ITB 11.1 (k) of the Bid Data Sheet. These strategies and plans shall describe in detail the actions, materials, equipment, management processes etc. that will be implemented by the Contractor, and its subcontractors.

In developing these strategies and plans, the Bidder shall have regard to the ESHS provisions of the contract including those as may be more fully described in the following:

i) [The Employer’s requirements described in Section VI];

ii) [Environmental and Social Impact Assessment (ESIA) and the Environmental and Social Management Plan (ESMP)];

iii) [Labour Management Procedure (LMP)];

iv) [Consent Conditions (regulatory authority conditions attached to any permits or approvals for the project)]; and

v) [specify any other relevant document/s].

Selection of the Bidder and award of the Contract (of which the ESHS-MSIP will be a part) does not absolve the Contractor any obligation under this Contract to comply with the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety, and the applicable parts of the Environment and Social Management Plan of the project should such compliance be not expressly included in the ESHS-MSIP.

The Bidder shall estimate the cost of implementation of the ESHS-MSIP, and include the price of this as part of the Bills of Quantities
Code of Conduct: Environmental, Social, Health and Safety (ESHS)

The Bidder shall submit the Code of Conduct that will apply to the Contractor’s employees and subcontractors as required by ITB 11.1 (k) of the Bid Data Sheet. The Code of Conduct shall ensure compliance with the ESHS provisions of the contract, including those as may be more fully described in the ESHS MSIP (i to v above).

In addition, the Bidder shall submit an outline of how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches.
Plant

[in compliance with the Technical Specification]
**Contractor’s Equipment**

**Form EQU**

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key Contractor’s equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

<table>
<thead>
<tr>
<th>Item of equipment</th>
<th>Equipment information</th>
<th>Model and power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Capacity</td>
<td>Year of manufacture</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current status</th>
<th>Current location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Details of current commitments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>Indicate source of the equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Owned □ Rented □ Leased □ Specially manufactured</td>
</tr>
</tbody>
</table>

Omit the following information for equipment owned by the Bidder.

<table>
<thead>
<tr>
<th>Owner</th>
<th>Name of owner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Address of owner</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone</td>
<td>Contact name and title</td>
</tr>
<tr>
<td>Fax</td>
<td>Telex</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agreements</th>
<th>Details of rental / lease / manufacture agreements specific to the project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Personnel

Form PER -1

Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements stated in Section III. The data on their experience should be supplied using the Form below for each candidate.

<table>
<thead>
<tr>
<th>1.</th>
<th>Title of position*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>2.</td>
<td>Title of position* [Environmental Specialist]</td>
</tr>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>3.</td>
<td>Title of position* [Health and Safety Specialist]</td>
</tr>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>4.</td>
<td>Title of position* [Social Specialist]</td>
</tr>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
</tbody>
</table>

*As listed in Section III.
### Form PER-2

**Resume of Proposed Personnel**

<table>
<thead>
<tr>
<th>Name of Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Personnel information</th>
<th>Name</th>
<th>Date of birth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Present employment</th>
<th>Name of employer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address of employer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone</th>
<th>Contact (manager / personnel officer)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fax</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job title</th>
<th>Years with present employer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize professional experience over the last 20 years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Company / Project / Position / Relevant technical and management experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Appendix to Technical Part

Country of Origin Declaration Form

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Country Code</th>
<th>Country</th>
</tr>
</thead>
</table>

[Note: Bidders shall enter the full name or code representing the country of origin of all imported plant, equipment, and spares]
Bidders Qualification

To establish its qualifications to perform the contract in accordance with Section III, Evaluation and Qualification Criteria the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.
# Form ELI 1.1  
## Bidder Information Sheet

Date: ______________________  
NCB No.: ________________  
Invitation for Bid No.: ________  
Page ________ of _______ pages

<table>
<thead>
<tr>
<th>1. Bidder’s Legal Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Bidder’s actual or intended Country of Registration:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Bidder’s Year of Registration:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Bidder’s Legal Address in Country of Registration:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Bidder’s Authorized Representative Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Telephone/Fax numbers:</td>
</tr>
<tr>
<td>Email Address:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Attached are copies of original documents of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2.</td>
</tr>
<tr>
<td>In case of government owned entity from the Employer’s country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with ITB Sub-Clause 4.5.</td>
</tr>
</tbody>
</table>

Please note that a written authorization needs to be attached to this sheet as required by ITB 21.2.
**Historical Contract Non-Performance**

*The following table shall be filled in for the Bidder and if JV, for each partner of the Joint Venture*

Bidder’s Legal Name: _______________________

JV Partner Legal Name: _______________________

NCB No.: _______________

**Non-Performing Contracts in accordance with Section III, Evaluation Criteria**

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-performed portion of contract</th>
<th>Contract Identification</th>
<th>Total Contract Amount (Rs. million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[insert year]</td>
<td>[insert amount and percentage]</td>
<td>Contract Identification: [indicate complete contract name/number, and any other identification]</td>
<td>[insert amount]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name of Employer: [insert full name]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Address of Employer: [insert street/city/country]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reason(s) for nonperformance: [indicate main reason(s)]</td>
<td></td>
</tr>
</tbody>
</table>

**Pending Litigation, in accordance with Section III, Evaluation Criteria**

No pending litigation in accordance with Sub-Factor 2.2.2 of Section III, Evaluation Criteria

Pending litigation in accordance with Sub-Factor 2.2.2 of Section III, Evaluation Criteria, as indicated below

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount in Dispute (Rs. million)</th>
<th>Contract Identification</th>
<th>Total Contract Amount (Rs. million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Employer</td>
<td>Address of Employer</td>
<td>Matter in dispute</td>
<td>Party who initiated the dispute</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Form CON – 3: Environmental, Social, Health, and Safety
Performance Declaration

[The following table shall be filled in for the Bidder, each partner of a Joint Venture and each Specialized Subcontractor]

Bidder’s Name: [insert full name]
Date: [insert day, month, year]
Joint Venture Partner’s or Specialized Subcontractor’s Name: [insert full name]
NCB No. and title: [insert ICB number and title]
Page [insert page number] of [insert total number] pages

<table>
<thead>
<tr>
<th>Year</th>
<th>Suspended or terminated portion of contract</th>
<th>Contract Identification</th>
<th>Total Contract Amount (current value, in Rs. million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[insert year]</td>
<td>[insert amount and percentage]</td>
<td>Contract Identification: [indicate complete contract name/ number, and any other identification]</td>
<td>[insert amount]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name of Employer: [insert full name]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Address of Employer: [insert street/city/country]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reason(s) for suspension or termination: [indicate main reason(s) e.g. for GBV/SEA breaches]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contract Identification: [indicate complete contract name/ number, and any other identification]</td>
<td>[insert amount]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name of Employer: [insert full name]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Address of Employer: [insert street/city/country]</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Contract Identification</td>
<td>Total Contract Amount (current value, in Rs. million)</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------------------</td>
<td>-----------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>[insert year]</td>
<td>Contract Identification: [indicate complete contract name/ number, and any other identification]</td>
<td>[insert amount]</td>
<td></td>
</tr>
<tr>
<td>Name of Employer: [insert full name]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address of Employer: [insert street/city/country]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason(s) for calling of performance security: [indicate main reason(s), e.g. for GBV/SEA breaches]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Form CCC

Current Contract Commitments / Works in Progress

Bidders and each partner to a JV 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.

<table>
<thead>
<tr>
<th>Name of contract</th>
<th>Employer, contact address/tel/fax</th>
<th>Value of outstanding work (Rs. million)</th>
<th>Estimated completion date</th>
<th>Average monthly invoicing over last six months (Rs. million/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
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<td>3.</td>
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<td>5.</td>
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<tr>
<td>etc.</td>
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<td></td>
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</tr>
</tbody>
</table>
Form FIN – 3.1

Financial Situation

Historical Financial Performance

Bidder’s Legal Name: _______________________

Date: ___________________

NCB No.: __________________

To be completed by the Bidder

<table>
<thead>
<tr>
<th>Financial information in Rs.</th>
<th>Historic information for previous ______ (__) years (in Rs. million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
</tr>
</tbody>
</table>

Information from Balance Sheet

- Total Assets (TA)
- Total Liabilities (TL)
- Net Worth (NW)
- Current Assets (CA)
- Current Liabilities (CL)

Shareholder’s Funds (Net Worth) = (Paid up equity + Reserves) - (revaluation reserves + Miscellaneous expenditure not written off)

Depreciation

Information from Income Statement

- Total Revenue (TR)
- Profits Before Taxes (PBT)

Cash Flow Information

- Cash Flow from Operating Activities
Net cash accruals = Profit after Tax + depreciation

This information should be extracted from the Annual Financial Statements/ Balance sheets, which should be enclosed. Year 1 will be the latest year for which audited financial statements are available. Year 2 shall be the year immediately preceding year 1 and year 3 shall be the year immediately preceding Year 2.

☐ Attached are copies of financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following conditions:

(a) Must reflect the financial situation of the Bidder or partner to a JV, and not sister or parent companies

(b) Historic financial statements must be audited by a certified accountant

(c) Historic financial statements must be complete, including all notes to the financial statements

(d) Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted)
Form FIN – 3.2

Average Annual Turnover

[The following table shall be filled in for the Bidder]

Bidder’s Legal Name: ___________________________  Date: ____________________
NCB No.: __________________

Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Year</th>
<th>Rs. million</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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<tr>
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</tr>
</tbody>
</table>

*Average Annual Turnover

*Average annual turnover calculated as total certified payments received for work in progress or completed, divided by the number of years specified in Section III, Evaluation Criteria, Sub-Factor 2.3.2.

** This should be certified by a Chartered Accountant.
Form FIN 3.3

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as indicated in Section III, Evaluation and Qualification Criteria

<table>
<thead>
<tr>
<th>Source of financing</th>
<th>Amount (Rs. million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CASH FLOW

[To be given from a Nationalized or Scheduled Bank in India]

Clause 2.3.3(ii) of Section III – Qualification Criteria

(1) AVAILABILITY OF CASH FLOW (WORKING CAPITAL)

This is to certify that M/s. ______________________________ is a reputed company with a good financial standing.

If the contract for the works, namely ______________________________ [funded by the World Bank] is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs. ______ to meet their capital requirements for executing the above contract.

-- Sd. --

Name of Bank Manager

Senior Bank Manager

Address of the Bank
Form EXP 2.4.1

Experience - General Experience

[The following table shall be filled for the Bidder. Identify contracts that demonstrate continuous construction work over the past \([5^{15}]\) years pursuant to Section III, Qualification Criteria and Requirements, Sub-Factor 2.4.1. List contracts chronologically, according to their commencement (starting) dates]

Bidder’s Legal Name: ____________________________ Date: ___________________
NCB No.: __________________
Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Starting Month / Year</th>
<th>Ending Month / Year</th>
<th>Years *</th>
<th>Contract Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Contract name:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Brief Description of the Works performed by the Bidder:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Name of Employer:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Amount of Contract</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Actual Completion Value</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Address:</strong></td>
</tr>
</tbody>
</table>
|                       |                     |         | **Role of Bidder** [
|                       |                     |         | **“Contractor” or** |
|                       |                     |         | **“Subcontractor” or** |
|                       |                     |         | **“Contract Manager”**] |
|                       |                     |         | ______________________ |

15 Modify to the number of years specified in Section III, Qualification Criteria and Requirements, Sub-Factor 2.4.1, if different from 5.
<table>
<thead>
<tr>
<th>Starting Month / Year</th>
<th>Ending Month / Year</th>
<th>Years *</th>
<th>Contract Identification</th>
<th>Role of Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td>[“Contract or” or “Subcontractor” or “Contract Manager”]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Amount of Contract</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Actual Completion Value</td>
<td></td>
</tr>
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<td></td>
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<td>Address:</td>
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<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Amount of Contract</td>
<td></td>
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<td>Actual Completion Value</td>
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<td>Address:</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Amount of Contract</td>
<td></td>
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<td></td>
<td></td>
<td>Actual Completion Value</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Address:</td>
<td></td>
</tr>
</tbody>
</table>

*List calendar year for years with contracts with at least nine (9) months activity per year starting with the earliest year
Form EXP – 2.4.2(a)

Specific Experience

[The following table shall be filled in for contracts performed by the Bidder]

Bidder’s Legal Name: ___________________________  Date: _____________________  NCB No.: __________________

Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Similar Contract Number: ___ of ___ required.</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Identification</td>
<td></td>
</tr>
<tr>
<td>Award date</td>
<td></td>
</tr>
<tr>
<td>Stipulated Completion date</td>
<td></td>
</tr>
<tr>
<td>Actual Completion date (provide explanation in case of delayed completion)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role in Contract</th>
<th>Contractor</th>
<th>Management Contractor</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total contract amount</th>
<th>Rs. million</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____________________</td>
<td>____________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If partner in a JV or subcontractor, specify participation of total contract amount</th>
<th>Rs. million</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>_____________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total contract amount on completion (if over original contract amount, provide explanation)</th>
<th>Rs. Million</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>____________</td>
</tr>
</tbody>
</table>

Employer’s Name: __________________________

Address: __________________________

Telephone/fax number: __________________________

E-mail: __________________________
Form EXP – 2.4.2(a) (cont.)

Specific Experience (cont.)

Bidder’s Legal Name: ___________________________  Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Similar Contract No. __[insert specific number] of [total number of contracts] ___ required</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of the similarity in accordance with Sub-Factor 2.4.2(a) of Section III:</td>
<td></td>
</tr>
<tr>
<td>Amount</td>
<td>Rs. million ______________________________</td>
</tr>
<tr>
<td>Physical size</td>
<td>______________________________</td>
</tr>
<tr>
<td>Complexity</td>
<td>______________________________</td>
</tr>
<tr>
<td>Methods/Technology</td>
<td>______________________________</td>
</tr>
<tr>
<td>Physical Production Rate</td>
<td>______________________________</td>
</tr>
</tbody>
</table>
Form EXP – 2.4.2(b)

Specific Experience in Key Activities

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidder’s Legal Name: __________________________</td>
</tr>
<tr>
<td>Date: ____________________</td>
</tr>
<tr>
<td>NCB No.: ____________________</td>
</tr>
</tbody>
</table>

Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Contract Identification</th>
<th>____________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award date</td>
<td>____________________</td>
</tr>
<tr>
<td>Completion date</td>
<td>____________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role in Contract</th>
<th>Contractor</th>
<th>Management Contractor</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total contract amount</td>
<td>____________________</td>
<td>Rs. Million</td>
<td></td>
</tr>
</tbody>
</table>

If partner in a JV or subcontractor, specify participation of total contract amount

<table>
<thead>
<tr>
<th>%</th>
<th>____________________</th>
<th>Rs. Million</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Employer’s Name:</th>
<th>____________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>____________________</td>
</tr>
<tr>
<td>Telephone/fax number:</td>
<td>____________________</td>
</tr>
<tr>
<td>E-mail:</td>
<td>____________________</td>
</tr>
</tbody>
</table>
Form EXP – 2.4.2 (b)(cont.)

Specific Experience in Key Activities (cont.)

Bidder’s Legal Name: ___________________________  Page ______ of ______ pages
Subcontractor’s Legal Name: __________________________

<table>
<thead>
<tr>
<th>Description of the key activities in accordance with Sub-Factor 2.4.2(b) of Section III:</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
Form of Bid Security (Bank Guarantee)

[Guarantor letterhead or SWIFT identifier code]

Bid Guarantee No……………………. [insert guarantee reference number]
Date…………………………. [insert date of issue of the guarantee]

WHEREAS, ________________________ [name of Bidder]16 (hereinafter called "the Bidder") has submitted his Bid dated ______________________ [date] or will submit his Bid for the execution of ________________________________ [name of Contract] (hereinafter called "the Bid") under Invitations for Bids No……………………… [insert number] (hereinafter called “the IFB”)

KNOW ALL PEOPLE by these presents that We ______________________________ [name of bank] of __________________________ [name of country] having our registered office at ___________________________________ (hereinafter called "the Bank") are bound unto __________________________ [name of Employer] (hereinafter called "the Employer") in the sum of ___________________ 17 for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _________ day of __________ 20____.

THE CONDITIONS of this obligation are:

(1) If after Bid opening the Bidder (a) withdraws his bid during the period of Bid validity specified in the Letter of Bid; or (b) does not accept the correction of the Bid Price pursuant to ITB 32;

or

(2) If the Bidder having been notified of the acceptance of his bid by the Employer during the period of Bid validity:

(a) fails or refuses to execute the Contract Agreement in accordance with the Instructions to Bidders, if required; or

(b) fails or refuses to furnish the Performance Security and the Environmental, Social, Health and Safety (ESHS) Performance Security, in accordance with the Instruction to Bidders.

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the four conditions, specifying the occurred condition or conditions.

16 Insert name of the Bidder, which in the case of a joint venture shall be (a) the name of the joint venture that submits the bid if the JV has been constituted into a legally enforceable JV, or (b) the names of all future partners of the JV as named in the letter of intent to execute the JV Agreement submitted by the bidder along with its bid.

17 The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 20.1 of the Instructions to Bidders.
This Guarantee will remain in force up to and including the date ____________________ \(^{18}\) days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE _____________    SIGNATURE OF THE BANK ________________________

WITNESS ___________    SEAL ________________________________________

_________________________________________________________________

[signature, name, and address]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

\(^{18}\) 45 days after the end of the validity period of the Bid.
Manufacturer’s Authorization

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer, should be signed by a person competent and having Power of Attorney to sign documents that are binding on the Manufacturer, and shall be registered or notarized so as to be legally enforceable. The Bidder shall include it in its Bid, if so indicated in the BDS.]

Date: __________________
NCB No.: _______________

To: ______________________

WHEREAS

We _________________ [insert: name of Manufacturer], who are official manufacturers of ___________________ [insert: name and/or description of the plant & equipment], having factories at ___________________ [insert: address of factory], do hereby authorize _________________ [insert: name & address of Bidder] to submit a bid the purpose of which is to provide the following goods, manufactured by us ___________________ [list: items for which the Manufacturer’s Authorization applies], and to subsequently negotiate and sign the Contract against IFB [insert: title and reference number of Invitation for Bids].

We hereby extend our full guarantee and warranty in accordance with Clause 27 of the General Conditions, with respect to the goods offered by the above firm.

We also hereby declare that we and ……………., [insert: name of the Bidder] have entered into a formal relationship in which, during the duration of the Contract (including warranty / defects liability) we, the Manufacturer or Producer, will make our technical and engineering staff fully available to the technical and engineering staff of the successful Bidder to assist that Bidder, on a reasonable and best effort basis, in the performance of all its obligations to the Purchaser under the Contract.

For and on behalf of the Manufacturer
Signed: __________________________

Name: ______________________________

Title: ________________________________

Duly authorized to sign this Authorization on behalf of:

____________________________________

Dated on __________ day of _____________. _______
(Declaration regarding tax/duty exemption for Plant/ Goods/ Equipment bought for the work)

(Bidder’s Name and Address)  

To: ..........................  
(Name of the Employer & address)

Dear Sir:

Re: [Name of Work]......................  
Certificate for Import/Procurement of Plant/ Goods/ Equipment  
Government Order/Circular Number under which tax/duty Exemption is being sought: …

1. We confirm that we are solely responsible for obtaining tax/duty waivers which we have considered in our bid and in case of failure to receive such waivers for reasons whatsoever, the Employer will not compensate us.

2. We are furnishing below the information required by the Employer for issue of the necessary certificates in terms of the Government of India’s relevant Notifications.

3. The Plant/ Goods/ Equipment for which certificates are required are as under:

<table>
<thead>
<tr>
<th>Items (modify the list suitably for each specific work)*</th>
<th>Make/ Brand Name</th>
<th>Capacity [where applicable]</th>
<th>Quantity</th>
<th>Value</th>
<th>State whether it will be procured locally or imported [if so from which country]</th>
<th>Remarks regarding justification for the quantity and their usage in works.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>[a] _____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[b] _____</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>[c] _____</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. We agree that no modification to the above list is permitted after bids are opened.

5. We agree that the certificate will be issued only to the extent considered reasonable by the Employer for the work, based on the Employer’s Requirements and the construction program and methodology as furnished by us along with the bid.

6. We confirm that the above plant, goods and equipment will be exclusively used for the construction of the above work and the construction equipment will not be sold or otherwise disposed of in any manner for a period of five years from the date of acquisition.

Date: ___________________ (Signature)______________________
Place:___________________ (Printed Name)__________________
                        (Designation)____________________
                        (Common Seal) ______________

[This certificate will be issued within 60 days of signing of contract and no subsequent changes will be permitted.]

* Modify the above to suit the requirements given in Government of India’s Notifications as current of date of bidding.
Section V. Eligible Countries

Eligibility for the Provision of Goods, Works and Non Consulting Services in Bank-Financed Procurement

In reference to ITB 4.8 and 5.1, for the information of the Bidders, at the present time firms, goods and services from the following countries are excluded from this Bidding process:

Under ITB 4.8 (a) and 5.1: none.

Under ITB 4.8 (b) and 5.1: none
PART 2 –
Section VI. Employer’s Requirements

See Attached Technical Specification Annexure A
Technical Specification

Attached as Annexure-A
Environmental, social, health and safety requirements

The Employer should use the services of a suitably qualified environmental, social, health and safety specialist/s to prepare the specifications for ESHS working with a procurement specialist/s. The Employer should attach or refer to the Employer’s environmental, social, health and safety policies that will apply to the project. If these are not available, the Employer should use the following guidance in drafting an appropriate policy for the Plant Supply & Installation.

SUGGESTED CONTENT FOR AN ENVIRONMENTAL AND SOCIAL POLICY (STATEMENT)

The Works’ policy goal, as a minimum, should be stated to integrate environmental protection, occupational and community health and safety, gender, equality, child protection, vulnerable people (including those with disabilities), sexual harassment, gender-based violence (GBV), sexual exploitation and abuse (SEA), HIV/AIDS awareness and prevention and wide stakeholder engagement in the planning processes, programs, and activities of the parties involved in the execution of the Works. The Employer is advised to consult with the World Bank to agree the issues to be included which may also address: climate adaptation, land acquisition and resettlement, indigenous people, etc. The policy should set the frame for monitoring, continuously improving processes and activities and for reporting on the compliance with the policy.

The policy shall include a statement that, for the purpose of the policy and/or code of conduct, the term “child” / “children” means any person(s) under the age of 18 years.

The policy should, as far as possible, be brief but specific and explicit, and measurable, to enable reporting of compliance with the policy in accordance with the Particular Conditions of the Contract Sub-Clause 18.3 and Appendix A to the General Condition.

As a minimum, the policy is set out to the commitments to:

1. apply good international industry practice to protect and conserve the natural environment and to minimize unavoidable impacts;
2. provide and maintain a healthy and safe work environment and safe systems of work;
3. protect the health and safety of local communities and users, with particular concern for those who are disabled, elderly, or otherwise vulnerable;
4. ensure that terms of employment and working conditions of all workers engaged in the Works meet the requirements of the ILO labor conventions to which the host country is a signatory;
5. be intolerant of, and enforce disciplinary measures for illegal activities. To be intolerant of, and enforce disciplinary measures for GBV, inhumane treatment, sexual activity with children, and sexual harassment;
6. incorporate a gender perspective and provide an enabling environment where women and men have equal opportunity to participate in, and benefit from, planning and development of the Works;
7. work co-operatively, including with end users of the Works, relevant authorities, contractors and local communities;
8. engage with and listen to affected persons and organisations and be responsive to their concerns, with special regard for vulnerable, disabled, and elderly people;
9. provide an environment that fosters the exchange of information, views, and ideas that is free of any fear of retaliation and protects whistleblowers;
10. minimise the risk of HIV transmission and to mitigate the effects of HIV/AIDS associated with the execution of the Works;

The policy should be signed by the senior manager of the Employer. This is to signal the intent that it will be applied rigorously.

**MINIMUM CONTENT OF ESHS REQUIREMENTS**

In preparing detailed specifications for ESHS requirements, the specialists should refer to and consider:

- project reports e.g. ESIA/ESMP
- consent/permit conditions
- required standards including World Bank Group EHS Guidelines
- relevant international conventions or treaties etc., national legal and/or regulatory requirements and standards (where these represent higher standards than the WBG EHS Guidelines)
- relevant international standards e.g. WHO Guidelines for Safe Use of Pesticides
- grievance redress mechanisms.
- grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality e.g. of those reporting allegations of GBV/SEA
- GBV/SEA prevention and management

The detail specification for ESHS should, to the extent possible, describe the intended outcome rather than the method of working.

The ESHS requirements should be prepared in manner that does not conflict with the relevant General Conditions and Particular Conditions, and in particular Conditions related to:

*General Conditions*
- Law and Language
- Subcontracting
- Other Contractors
- Contractor’s Personnel and Equipment
Contractor’s Risks
Contractor to Construct the Works
Safety and Protection of environment
Payments

**MINIMUM REQUIREMENTS FOR THE BIDDER’S CODE OF CONDUCT**

A minimum requirement for the Code of Conduct should be set out, by the Employer taking into consideration the issues, impacts, and mitigation measures identified for example in:

- project reports e.g. ESIA/ESMP
- consent/permit conditions (regulatory authority conditions attached to any permits or approvals for the project)
- required standards including World Bank Group EHS Guidelines
- relevant international conventions, standards or treaties, etc., national legal and/or regulatory requirements and standards (where these represent higher standards than the WBG EHS Guidelines)
- relevant standards e.g. Workers’ Accommodation: Process and Standards (IFC and EBRD)
- relevant sector standards e.g. workers accommodation
- grievance redress mechanisms.

The types of issues identified could include: risks associated with: labor influx, spread of communicable diseases, sexual harassment, gender based violence, illicit behavior and crime, and maintaining a safe environment etc.

[Amend the following instructions to the Bidder taking into account the above considerations.]

A satisfactory code of conduct will contain obligations on all Contractor’s personnel (including sub-contractors and day workers) that are suitable to address the following issues, as a minimum. Additional obligations may be added to respond to particular concerns of the region, the location and the project sector or to specific project requirements. The code of conduct shall contain a statement that the term “child” / “children” means any person(s) under the age of 18 years.

The issues to be addressed include:

1. Compliance with applicable laws, rules, and regulations
2. Compliance with applicable health and safety requirements to protect the local community (including vulnerable and disadvantaged groups), the Employer’s and Project Manager’s personnel, and the Contractor’s personnel, including sub-contractors and day workers, (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment)
3. The use of illegal substances
4. Non-Discrimination in dealing with the local community (including vulnerable and disadvantaged groups), the Employer’s and Project Manager’s personnel, and the
Contractor’s personnel, including sub-contractors and day workers (for example on the basis of family status, ethnicity, race, gender, religion, language, marital status, age, disability (physical and mental), sexual orientation, gender identity, political conviction or social, civic, or health status)

5. Interactions with the local community(ies), members of the local community (ies), and any affected person(s) (for example to convey an attitude of respect, including to their culture and traditions)

6. Sexual harassment (for example to prohibit use of language or behavior, in particular towards women and/or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate)

7. Violence including sexual and/or gender based violence (for example acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion, and deprivation of liberty)

8. Exploitation including sexual exploitation and abuse (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading behavior, exploitative behavior or abuse of power)

9. Protection of children (including prohibitions against sexual activity or abuse, or otherwise unacceptable behavior towards children, limiting interactions with children, and ensuring their safety in project areas)

10. Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by their employer and not open areas)

11. Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection)

12. Respecting reasonable work instructions (including regarding environmental and social norms)

13. Protection and proper use of property (for example, to prohibit theft, carelessness or waste)

14. Duty to report violations of this Code

15. Non retaliation against workers who report violations of the Code, if that report is made in good faith.

The Code of Conduct should be written in plain language and signed by each worker to indicate that they have:

- received a copy of the code;
- had the code explained to them;
- acknowledged that adherence to this Code of Conduct is a condition of employment; and
- understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.

A copy of the code shall be displayed in a location easily accessible to the community and project affected people. It shall be provided in languages comprehensible to the local community, Contractor’s personnel (including sub-contractors and day workers), Employer’s and Project Manager’s personnel, and affected persons.
PAYMENT FOR ESHS REQUIREMENTS

The Employer’s ESHS and procurement specialists should consider how the Contractor will cost the delivery of the ESHS requirements. In the majority of cases, the payment for the delivery of ESHS requirements shall be a subsidiary obligation of the Contractor covered under the prices quoted for other Bill of Quantity items or activities. For example, normally the cost of implementing workplace safe systems of work, including the majors necessary for ensuring traffic safety, shall be covered by the Bidder’s rates for the relevant works. Alternatively, provisional sums could be set aside for discrete activities for example for HIV counselling service, and, GBV/SEA awareness and sensitization or to encourage the contractor to deliver additional ESHS outcomes beyond the requirement of the Contract.
Forms and Procedures
Form of Completion Certificate

Date: _____________________
Loan/Credit №: ________________
IFB №: ________________

______________________________

To: __________________________________

Dear Ladies and/or Gentlemen,

Pursuant to GC Clause 24 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated ______________, relating to the _____________________. 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: ________________________________

2. Date of Completion: ________________

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,

______________________________
Title
(Project Manager)
Form of Operational Acceptance Certificate

Date: ____________________
Loan/Credit Nº: ____________________
IFB Nº: ____________________

To: ____________________

Dear Ladies and/or Gentlemen,

Pursuant to GC Sub-Clause 25.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated ______________, relating to the ____________________, 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: ____________________
2. Date of Operational Acceptance: ____________________

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,

________________________________________
Title
(Project Manager)
Change Order Procedure and Forms

CONTENTS

1. General
2. Change Order Log
3. References for Changes

ANNEXES

Annex 1  Request for Change Proposal
Annex 2  Estimate for Change Proposal
Annex 3  Acceptance of Estimate
Annex 4  Change Proposal
Annex 5  Change Order
Annex 6  Pending Agreement Change Order
Annex 7  Application for Change Proposal
Annex 9  Sample clauses [delete if not used]
Change Order Procedure

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 GC Clause 39 (Change in the Facilities) of the General Conditions.

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, as Annex 8. 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.

3. **References for Changes**

   (1) Request for Change as referred to in GC Clause 39 shall be serially numbered CR-X-nnn.

   (2) Estimate for Change Proposal as referred to in GC Clause 39 shall be serially numbered CN-X-nnn.

   (3) Acceptance of Estimate as referred to in GC Clause 39 shall be serially numbered CA-X-nnn.

   (4) Change Proposal as referred to in GC Clause 39 shall be serially numbered CP-X-nnn.

   (5) Change Order as referred to in GC 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.
Annex 1. Request for Change Proposal

(Employer’s Letterhead)

To: _____ [Contractor’s name and address] Date: ________________

Attention: ______________ [Name and title]

Contract Name: ______________________________
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 ____________ days of the date of this letter ________________.

1. Title of Change: __________________________

2. Change Request No. ______________________

3. Originator of Change: Employer: ______________________

Contractor (by Application for Change Proposal No. ________):

4. Brief Description of Change: ________________________________

5. Facilities and/or Item No. of equipment related to the requested Change: ____________

6. Reference drawings and/or technical documents for the request of Change:

<table>
<thead>
<tr>
<th>Drawing No./Document No.</th>
<th>Description</th>
</tr>
</thead>
</table>

7. Detailed conditions or special requirements on the requested Change: ______________

8. General Terms and Conditions:

(a) Please submit your estimate to us 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 completion of the requested Change.

---

19 Refer to Annex 7
(c) If you have any opinion negative 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 of your opinion 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)
Annex 2. Estimate for Change Proposal

(Contractor’s Letterhead)

To: [Employer’s name and address] Date: __________

Attention: [Name and title]

Contract Name: ________________________
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 of preparing the below-referenced Change Proposal in accordance with GC Sub-Clause 39.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GC Sub-Clause 39.2.2, is required before estimating the cost for change work.

1. Title of Change: ______________________

2. Change Request No./Rev.: ______________________

3. Brief Description of Change: ______________________

4. Scheduled Impact of Change: ______________________

5. Cost for Preparation of Change Proposal: _________

   (a) Engineering (Amount)

      (i) Engineer ______ hrs x ______ rate/hr = _______
      (ii) Draftsperson ______ hrs x ______ rate/hr = _______

      Sub-total ______ hrs

      Total Engineering Cost _______

   (b) Other Cost _______

      Total Cost (a) + (b) _______

---

20 Costs shall be in Rs.
(Contractor’s Name)

(Signature)

(Name of signatory)

(Title of signatory)
Annex 3. Acceptance of Estimate

(Employer’s Letterhead)

To: _______ [Contractor’s name and address] Date: ________________

Attention: ________ [Name and title]

Contract Name: ___________________________
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: ___________________________

2. Change Request No./Rev.: ___________________________

3. Estimate for Change Proposal No./Rev.: ___________________________

4. Acceptance of Estimate No./Rev.: ___________________________

5. Brief Description of Change: ___________________________

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 preparation of Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GC Clause 39 of the General Conditions.

________________________________________
(Employer’s Name)

________________________________________
(Signature)

________________________________________
(Name and Title of signatory)
Annex 4. Change Proposal

(Contractor’s Letterhead)

To: _______ [Employer’s name and address]  

Date: ________________

Attention: _______ [Name and title]

Contract Name: ____________________________
Contract Number: __________________________

Dear Ladies and/or Gentlemen:

In response to your Request for Change Proposal No. _______________________, we hereby submit our proposal as follows:

1. Title of Change: __________________________

2. Change Proposal No./Rev.: _______________________

3. Originator of Change:
   Employer: ____________________________
   Contractor: ____________________________

4. Brief Description of Change: _______________________

5. Reasons for Change: __________________________

6. Facilities and/or Item No. of Equipment related to the requested Change: _______________________

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 Change Proposal:  
   
   (Amount)

   (a) Direct material  ________________

   (b) Major construction equipment  ________________

___________________________________________________________________

21 Costs shall be in Rs.
(c) Direct field labor (Total ____ hrs) ________________

(d) Subcontracts ________________________

(e) Indirect material and labor ________________________

(f) Site supervision ________________________

(g) Head office technical staff salaries

<table>
<thead>
<tr>
<th>Role</th>
<th>Hours</th>
<th>Rate/hr</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process engineer</td>
<td>_____</td>
<td>_______</td>
<td>______</td>
</tr>
<tr>
<td>Project engineer</td>
<td>_____</td>
<td>_______</td>
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<tr>
<td>Equipment engineer</td>
<td>_____</td>
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<tr>
<td>Procurement</td>
<td>_____</td>
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<tr>
<td>Draftsperson</td>
<td>_____</td>
<td>_______</td>
<td>______</td>
</tr>
<tr>
<td>Total</td>
<td>_____</td>
<td>_______</td>
<td>______</td>
</tr>
</tbody>
</table>

(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 ____________ 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:²

[Note: 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 GC Clause 39 of the General Conditions of Contract.]

_________________________________
(Contractor’s Name)

_________________________________
(Signature)

_________________________________
(Name of signatory)

_________________________________
(Title of signatory)

² Specify where necessary.
Annex 5. Change Order

(Employer’s Letterhead)

To: ___________ [Contractor’s name and address] Date: _______________

Attention: ___________ [Name and title]

Contract Name: ____________________________
Contract Number: ____________________________

Dear Ladies and/or Gentlemen:

We approve the Change Order for the work specified in the Change Proposal (No. ______), and agree to adjust the Contract Price, Time for Completion and/or other conditions of the Contract in accordance with GC Clause 39 of the General Conditions.

1. Title of Change: ____________________________

2. Change Request No./Rev.: ____________________________

3. Change Order No./Rev.: ____________________________

4. Originator of Change: Employer: ____________________________
                     Contractor: ____________________________

5. Authorized Price:

   Ref. No.: ____________________________ Date: ____________________________
   Rs. ___________

6. Adjustment of Time for Completion

   None           Increase _______ days            Decrease _______ days

7. Other effects, if any

   Authorized by: ____________________________ Date: ___________
   (Employer)

   Accepted by: ____________________________ Date: ___________
   (Contractor)
Annex 6. Pending Agreement Change Order

(Employer’s Letterhead)

To: __________ [Contractor’s name and address] Date: ________________

Attention: __________ [Name and title]

Contract Name: ______________________
Contract Number: ______________________

Dear Ladies and/or Gentlemen:

We instruct you to carry out the work in the Change Order detailed below in accordance with GC Clause 39 of the General Conditions.

1. Title of Change: ______________________

2. Employer’s Request for Change Proposal No./Rev.: ______________________ dated: ________

3. Contractor’s Change Proposal No./Rev.: ______________________ dated: ________

4. Brief Description of Change: ______________________

5. Facilities and/or Item No. of equipment related to the requested Change: ______________________

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)
Annex 7. Application for Change Proposal

(Contractor’s Letterhead)

To: __________ [Employer’s name and address] Date: ________________

Attention: __________ [Name and title]

Contract Name: ____________________________
Contract Number: ____________________________

Dear Ladies and/or Gentlemen:

We hereby propose that the below-mentioned work be treated as a Change in the Facilities.

1. Title of Change: ____________________________

2. Application for Change Proposal No./Rev.: ____________________________ dated: ____________________________

3. Brief Description of Change: ____________________________

4. Reasons for Change:

5. Order of Magnitude Estimation (in the currencies of the Contract):

6. Scheduled Impact of Change:

7. Effect on Functional Guarantees, if any:

8. Appendix:

________________________________________________________________________

(Contractor’s Name)

________________________________________________________________________

(Signature)

________________________________________________________________________

(Name of signatory)

________________________________________________________________________

(Title of signatory)
SAMPLE

Annex 9. Sample Formats from a Project for Guidance

[Note: This annex lists some Sample Formats that were used by a Project where Equipment had to be handed over to the contractor for due performance of the Contract. Any of these Formats if required, for a specific contract, should be suitably adapted]

22 These sample clauses, if not required, should be deleted from the final bidding document
SAMPLE

Annex 9.1

Form of Trust Receipt for Plant, Equipment and Materials Received

We M/s (Contractor’s Name) having our Principal place of business at having been awarded a Contract No. Dated for (Contract Name) by (Name of Employer).

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR23 etc. and in the schedule annexed hereto, which shall form an integral part of this receipt as “Trustee” of (Name of Employer). The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid Contract and for no other purpose whatsoever. We undertake not to create any charge, lien or encumbrance over the aforesaid materials etc. in favour of any other person/institution(s)/Banks.

For M/s ........................................

(Contractor’s Name)

Dated: ..............................

(AUTHORISED SIGNATORY)

Place: ..............................

SEAL OF COMPANY

---

23 RR – Railway Receipt; LR – Lorry Receipt
SAMPLE
Annex 9.2

Form of Indemnity Bond to be Executed by the Contractor for the Equipment Handed Over by the Employer for Performance of its Contract

(Entire Equipment Consignment in one Lot)
(On non-Judicial stamp paper of appropriate value)

INDEMNITY BOND

THIS INDEMNITY BOND is made this ........................................ Day of .......................... 19 ........................................ by ....................................... (Contractor’s Name) a Company registered under the Companies Act, 1956/Partnership-firm/Proprietary concern having its Registered Office at .................................. (Hereinafter called as ‘Contractor’ or “Obligor” which expression shall include its successors and permitted assigns) in favour of ....................................... (Name of Employer), a Company incorporated under the Companies Act, 1956 having its Registered Office at .................................. and its project at .................................. (hereinafter called “...........................”...{Abbreviated name of the Employer} which expression shall include its successors and assigns) :

WHEREAS .................@................... has awarded to the Contractor a Contract for .................vide its Notification of Award/Contract No.............dated................................. and its Amendment No. ........................................... and Amendment No. ......................... (Applicable when amendments have been issued) hereinafter called the Contract) in terms of which .................@................... is required to hand over various Equipments to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No............... of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of .................@...........for the Equipments handed over to it by .................@........... for the purpose of performance of the Contract/ Erection portion of the contract (hereinafter called the “Equipments”)

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (Currency and amount in Figures).......................................................... currency and amount in words).......................................................... handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep .................@................... indemnified, for the full value of the Equipments. The Contractor hereby acknowledges actual receipt of the Equipment etc. as pre despatch title documents handed over to the Contractor as detailed in the Schedule appended hereto. The Contractor shall hold such Equipment etc. in trust as a “Trustee” for and on behalf of .................@...................
2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at ..........@.......... Project site against all risks whatsoever till the ecumenist are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract is taken over by ..........@............ The Contractor undertakes to keep ..........@............ harmless against any loss or damage that may be caused to the Equipments.

3. The Contractor undertakes that the Equipments shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.

4. That ..........@.......... is and shall remain the exclusive owner of the Equipments free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by the Project Manager or other employees/agents authorized by him in this regard. Further, ..........@.......... shall always be free at all times to take possession of the Equipments in whatever form the Equipments may be, if in its opinion, the Equipments are likely to be endangered, mis-utilized or converted to uses other than those specified in the Contract, by any acts or omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the contractor binds himself and undertakes to comply with the directions of demand of ..........@.......... to return the Equipments without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipments or the same or any part thereof is mis-utilized in any manner whatsoever, than the Contractor hereby agrees that the decision of the project manager of ..........@.......... as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipments at its own cost and/or shall pay the amount of loss to ..........@.......... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to ..........@.......... against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of ..........@............... then the above shall be void, but otherwise, it shall remain in full force and virtue.

@  Fill in abbreviated name of the Employer

IN WITNES WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.
# SAMPLE

## SCHEDULE 1

<table>
<thead>
<tr>
<th>Particulars of the Equipments handed over</th>
<th>Quantity</th>
<th>Particulars of Despatch title Documents</th>
<th>Value of the Equipments</th>
<th>Signature of Attorney in token of receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR/GR/ Bill of lading No &amp; Date</td>
<td>Carrier</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**For and on behalf of**

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

*(Contractor’s Name)*

**WITNESS**

1. 1. Signature .......................  
    2. Name ..............................  
    3. Address ..........................

2. 1. Signature .......................  
    2. Name ..............................  
    3. Address ..........................

---

*Indemnity Bond is to be executed by the authorized person and (i) in case of contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the Company with authority to execute Indemnity Bond, (iii) in case of (ii), the original Power of Attorney if it is specifically for this Contract or photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.*
SAMPLE

Annex 9.3

Form of Indemnity Bond to be Executed by the Contractor for the Equipment Handed Over in Instalments by the Employer for Performance of its Contract

(On non-Judicial stamp paper of appropriate value)

INDEMNITY BOND

THIS INDEMNITY BOND is made this ........................................ day of ................................ 19
................................ by .................................(Contractor’s Name) a Company registered under the Companies
Act, 1956/Partnership firm/Proprietary concern having its Registered Office at ...........................
(Hereinafter called as ‘Contractor’ or “Obligor” which expression shall include its successors and
permitted assigns) in favour of ....................................
.................(Name of Employer), a Company incorporated
under the Companies Act, 1956 having its Registered Office at .............................. and its project at
...........................(hereinafter called “...........................”)
.................(Abbreviated name of the Employer)
(On non-Judicial stamp paper of appropriate value)

WHEREAS ........................@................... has awarded to the Contractor a Contract for .............vide its
Notification of Award/Contract No.............dated................................. and its Amendment No.
........................................... and Amendment No. ........................ (Applicable when amendments have
been issued) hereinafter called the Contract) in terms of which ........@.......... is required to hand over
various Equipments to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No............... of the said Contract, the Contractor is required
to execute an Indemnity Bond in favour of ........@........for the Equipments handed over to it by
............................@............. for the purpose of performance of the Contract/ Erection portion of the contract
(hereinafter called the “Equipments”)

AND THEREFORE, This Indemnity Bond witnesses as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (Currency
and amount in Figures).................................(currency and amount in words).................................

To be handed over to the Contractor in installments from time to time for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep .............@............. indemnified, for the full
value of the Equipments. The Contractor hereby acknowledges actual receipt of the initial
installment of the Equipment etc. as per details in the Schedule appended hereto. Further, the
Contractor agrees to acknowledge actual receipt of the subsequent installments of the
Equipments etc. as required by ...........@........ in the form of Schedules consecutively
numbered which shall be attached to this Indemnity Bond so as to form an integral parts of this
Bond. The Contractor shall hold such Equipment etc. in trust as a “Trustee” for and on behalf of
.................@.............


2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at ............@............... Project site against all risks whatsoever till the equipments are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract is taken over by ..........@........... . The Contractor undertakes to keep ..........@................. harmless against any loss or damage that may be caused to the Equipments.

3. The Contractor undertakes that the Equipments shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.

4. That ..........@........... is and shall remain the exclusive owner of the Equipments free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by the Project Manager or other employees/agents authorized by him in this regard. Further, ..........@........... shall always be free at all times to take possession of the Equipments in whatever form the Equipments may be, if in its opinion, the equipments are likely to be endangered, mis-utilized or converted to uses other than those specified in the Contract, by any acts or omission or commission on the part of Contractor or any other person on account of any reason whatsoever and the contractor binds himself and undertakes to comply with the directions of demand of ..........@................. to return the Equipments without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipments or the same or any part thereof is mis-utilized in any manner whatsoever, than the Contractor hereby agrees that the decision of the project manager of ..........@............. as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipments at its own cost and/or shall pay the amount of loss to ..........@............. without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to ..........@................. against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of .................@ ................. then the above bond shall be void, but otherwise, it shall remain in full force and virtue.

@  Fill in abbreviated name of the Employer

IN WITNES WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.
## SAMPLE

### SCHEDULE NO. 1

<table>
<thead>
<tr>
<th>Particulars of the Equipments handed over</th>
<th>Quantity</th>
<th>Particulars of Despatch title Documents</th>
<th>Value of the Equipments</th>
<th>Signature of Attorney in token of receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR/GR/Bill of lading No &amp; Date</td>
<td>Carrier</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**For and on behalf of**

`Contractor’s Name`

**WITNESS**

1. 1. Signature ....................  
   2. Name .........................  
   3. Address ......................  

2. 1. Signature ....................  
   2. Name .........................  
   3. Address ......................

*(Common Seal)*

*(In case of Company)*

---

*Indemnity Bond is to be executed by the authorized person and (i) in case of contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the Company with authority to execute Indemnity Bond, (iii) in case of (ii), the original Power of Attorney if it is specifically for this Contract or photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.*
SAMPLE
Annex 9.4
Form of Authorization Letter

(NAME OF EMPLOYER)

(PROJECT ........................ )

REF. NO. : ____________________________

DATE : ____________________________

To,

M/s (Contractor’s Name) .................................................................

Ref: Contract No.................. Dated.................................
For ......................... Awarded by (Name of Employer)

Dear Sirs,

Kindly refer to Contract No.................. Dated .................. For ....................... (Contract Name) You are hereby authorized on behalf of ...................(Name of Employer) having its registered office at ...................... And its Project at ................................. to take physical delivery of materials/equipments covered under despatch Document/ Consignment Note No....................... * .................. Dated ..................... and as detailed in the enclosed Schedule for the sole purpose of successful performance of the aforesaid contract and for no other purposes, whatsoever.

(Signature of Project Authority)

Designation: ........................

Date ..................................................
SAMPLE

SCHEDULE OF MATERIAL/EQUIPMENT COVERED UNDER DESPATCH TITLE DOCUMENT (RR NO./LR NO..................)

<table>
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</tbody>
</table>

(SIGNATURE OF THE PROJECT AUTHORITY)

(DESIGNATION) ..............................................

(DATE) ........................................................
Drawings
Supplementary Information
PART 3 – Conditions of Contract and Contract Forms
Section VII. General Conditions (GC)
General Conditions

Contract and Interpretation

1. Definitions

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


“GC” means the General Conditions hereof.

“PC” means the Particular Conditions.

“day” means calendar day.

“year” means 365 days.

“month” means calendar month.

“Party” means the Employer or the Contractor, as the context requires, and “Parties” means both of them.

“Employer” means the person named as such in the PC 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 GC Sub-Clause 17.1 (Project Manager) hereof and named as such in the PC to perform the duties delegated by the Employer.

“Contractor” means the person(s) whose bid to perform the Contract has been accepted by the Employer and is 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 GC Sub-Clause 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 GC Sub-Clause 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.

“The Adjudicator” is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GC 46.

“The Bank” means the financing institution named in the PC.

“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, materials, 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 GC Sub-Clause 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 PC.

“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, from which the Time for Completion shall be counted.

“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 GC 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 GC 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 GC 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 GC Sub-Clause 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 to the Contract Agreement titled Functional Guarantees, in accordance with the provisions of GC Sub-Clause 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 GC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GC 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 GC Clause 27 (Defect Liability) hereof.

“ESHS” means environmental, social (including sexual exploitation and abuse (SEA) and gender based violence (GBV), health and safety.

2. **Contract Documents**

   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**

   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 recorded 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 hand-written, type-written, 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 1er, 75008 Paris, France.

3.3 **Entire Agreement**

Subject to GC Sub-Clause 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 GC Sub-Clause 3.7.2 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 PC.

5.2 The ruling language of the Contract shall be that stated in the PC.

5.3 The language for communications shall be the ruling language
unless otherwise stated in the PC.
6. **Fraud and Corruption**

6.1 If the Employer determines that the Contractor and/or any of its personnel, or its agents, or its Subcontractors, subconsultants, services providers, suppliers and/or their employees has engaged in corrupt, fraudulent, collusive coercive, or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 42 shall apply as if such expulsion had been made under Sub-Clause 42.2.1 (c).

For the purposes of this Sub-Clause,

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party\(^{24}\);

(ii) “fraudulent practice” is 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\(^{25}\);

(iii) “collusive practice” is an arrangement between two or more parties\(^{26}\) designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party\(^{27}\) or the property of the party to influence improperly the actions of a party;

(v) “obstructive practice” is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or

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\(^{24}\) “Another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

\(^{25}\) “Party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

\(^{26}\) “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non-competitive levels.

\(^{27}\) “Party” refers to a participant in the procurement process or contract execution.
threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 9.8.

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, and the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Precommissioning 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 GC Sub-Clause 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 to the Contract Agreement titled Scope of Works and Supply by the Employer.

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 PC and the provisions, if any, specified in the PC. 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 therefor 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 PC and without prejudice to GC Sub-Clause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Appendix to the Contract Agreement titled Time Schedule.

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 PC or within such extended time to which the Contractor shall be entitled under GC Clause 40 hereof.

8.3 The Contractor shall not carry out any work, including mobilization and/or pre-construction activities, unless the Project Manager is satisfied that appropriate measures are in place to address environmental, social, health and safety risks and impacts. At a minimum, the Contractor shall apply the Management Strategies and Implementation Plans and Code of Conduct, submitted as part of the Bid and agreed as part of the Contract. The Contractor shall submit, on a continuing basis, for the Project Manager’s prior approval, such supplementary Management Strategies and Implementation Plans as are necessary to manage the ESHS risks and impacts of ongoing works. These Management Strategies and Implementation Plans collectively comprise the Contractor’s Environmental and Social Management Plan (C-ESMP). The C-ESMP shall be approved prior to the commencement of construction activities. The approved C-ESMP shall be reviewed, periodically (but not less than every six (6) months), and updated in a timely manner, as required, by the Contractor to ensure that it contains measures appropriate to the Works activities to be undertaken. The updated C-ESMP shall be subject to prior approval by the Project Manager.”

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 twenty-eight (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 GC Sub-Clause 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 GC Sub-Clause 10.1 hereof.

9.5 Any Plant and Installation Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GC Clause 1 (Country of Origin). Any subcontractors retained by the Contractor shall be from a country as specified in GC Clause 1 (Country of Origin).

9.6 The Contractor shall permit the Bank to inspect the Contractor’s accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Bank, if so required by the Bank.

9.7 If the Contractor is a joint venture (JV) 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, unless otherwise specified in the PC, and shall designate one of such persons to act as a leader with authority to bind the JV. The composition or the constitution of the JV shall not be altered without the prior consent of the Employer.

9.8 The Contractor shall permit, and shall cause its Subcontractors and subconsultants to permit, the Bank and/or persons appointed
by the Bank to inspect the Site and all accounts and records relating to the performance of the Contract and the submission of the Bid, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Contractor’s and its Subcontractors’ and subconsultants’ attention is drawn to Sub-Clause 6.1 [Fraud and Corruption] which provides, inter alia, that acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 9.8 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank’s prevailing sanctions procedures).

9.9 The Contractor shall comply with the specified Environmental, Social, Health, and Safety requirements, including ESHS Code of Conduct that will apply to its employees and subcontractors.

10. Employer’s Responsibilities

10.1 All information and/or data to be supplied by the Employer as described in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, 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 to the Contract Agreement titled Scope of Works and Supply by the Employer. 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).

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 Precommissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, at or before the time specified in the program furnished by the Contractor under GC Sub-Clause 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 GC Sub-Clause 24.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GC Sub-Clause 25.2.

10.7 All costs and expenses involved in the performance of the obligations under this GC Clause 10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GC Sub-Clause 25.2.

10.8 In the event that the Employer shall be in breach of any of his obligations under this Clause, the additional cost incurred by the Contractor in consequence thereof shall be determined by the Project Manager and added to the Contract Price.

Payment


11.2 Unless an adjustment clause is provided for in the PC, 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 GC Sub-Clauses 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 to the Contract Agreement titled Terms and Procedures of Payment, 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 to the Contract Agreement titled Terms and Procedures of Payment, for the period of delay until payment has been made in full, whether before or after judgment or arbitrage award.

12.4 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, 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.

12.5 If the Contractor was, or is, failing to perform any ESHS obligations or work under the Contract, the value of this work or obligation, as determined by the Project Manager, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the Project Manager, may be withheld until rectification or replacement has been completed. Failure to perform includes, but is not limited to the following:

(i) failure to comply with any ESHS obligations or work described in the Employer’s Requirements which may include: working outside site boundaries, excessive dust, failure to keep public roads in a safe usable condition, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land e.g. from oils, human waste,
damage to archeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion;

(ii) failure to regularly review C-ESMP and/or update it in a timely manner to address emerging ESHS issues, or anticipated risks or impacts;

(iii) failure to implement the C-ESMP e.g. failure to provide required training or sensitization;

(iv) failing to have appropriate consents/permits prior to undertaking Works or related activities;

(v) failure to submit ESHS report/s (as described in Appendix A), or failure to submit such reports in a timely manner;

(vi) failure to implement remediation as instructed by the Project Manager within the specified timeframe (e.g. remediation addressing non-compliance/s).

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 twenty-eight (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 to the Contract Agreement titled Terms and Procedures of Payment, 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 twenty-eight (28) days of the notification of contract award, provide security for the due performance of the Contract in the amount specified in the PC.

13.3.2 The performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance 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 the forms provided in Section IX, Contract Forms, corresponding to the type of bank guarantee stipulated by the Employer in the PC, or in another form acceptable to the Employer.

13.3.3 Unless otherwise specified in the PC, 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, five hundred and forty (540) days after Completion of the Facilities or three hundred and sixty five (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 GC Sub-Clause 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 GC Sub-Clause 27.10, is liable for an extended defect liability obligation, the performance security shall be extended for the period specified in the PC pursuant to GC Sub-Clause 27.10 and up to the amount specified in the PC.

13.3.4 The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract. The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

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 GC Sub-Clause 14.1 above, the Employer shall bear and promptly pay

(a) all customs and import duties for the Plant specified in Price Schedule No. 1; and

(b) other domestic taxes such as, sales tax and value added tax (VAT) on the Plant specified in Price Schedules No. 1 and No. 2 and that is to be incorporated into the Facilities, and on the finished goods, imposed by the law of the country where the Site is located.

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 twenty-eight (28) days prior to the date of bid submission in the country where the Site is located (hereinafter called “Tax” in this GC Sub-Clause 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 GC Clause 36 hereof.

**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 non-transferable license (without the right to sub-license) 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 non-exclusive and non-transferable
right (without the right to sub-license) 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 GC 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 GC Sub-Clauses 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

(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 GC 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 GC Clause 16 shall survive termination,
for whatever reason, of the Contract.

Execution of the Facilities

17. Representatives

17.1 Project Manager

If the Project Manager is not named in the Contract, then within
fourteen (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 a 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 & Construction Manager

17.2.1 If the Contractor’s Representative is not named in the
Contract, then within fourteen (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 fourteen (14) days, the Contractor’s Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefor, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 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, a suitable person shall be appointed 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, undertakes behavior which breaches the Code of Conduct (ESHS) (e.g. spreading communicable diseases, sexual harassment, gender-based violence (GBV), sexual exploitation or abuse, illicit activity or crime, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GC Sub-Clause 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 GC Sub-Clause 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 twenty-one (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 twenty-eight (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 precommission 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 to the Contract Agreement titled Time Schedule, 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 specified in the PC pursuant to Sub-Clause 8.2 and any extension granted in accordance with GC 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 GC Sub-Clause 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.

In addition to the progress report the Contractor shall also provide a report on the Environmental, Social, Health and Safety (ESHS) metrics set out in Appendix A. In addition to Appendix A reports, the Contractor shall also provide immediate notification to the Project Manager of incidents in the following categories. Full details of such incidents shall be provided to the Project Manager within the timeframe agreed with the Project Manager.

(a) confirmed or likely violation of any law or international agreement;

(b) any fatality or serious (lost time) injury;

(c) significant adverse effects or damage to private property (e.g. vehicle accident, damage from fly rock, working beyond the boundary)
(d) major pollution of drinking water aquifer or damage or destruction of rare or endangered habitat (including protected areas) or species; or

(e) any allegation of gender based violence (GBV), sexual exploitation or abuse, sexual harassment or sexual misbehavior, rape, sexual assault, child abuse, or defilement, or other violations involving children.

18.4 Progress of Performance

If at any time the Contractor’s actual progress falls behind the program referred to in GC Sub-Clause 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 GC Sub-Clause 8.2, any extension thereof entitled under GC Sub-Clause 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 to the Contract Agreement titled List of Major Items of Plant and Installation Services and List of Approved Subcontractors, specifies major items of supply or 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 GC Sub-Clause 19.1.

19.3 For items or parts of the Facilities not specified in the Appendix to the Contract Agreement titled List of Major Items of Plant and Installation Services and List of Approved Subcontractors, the Contractor may employ such Subcontractors as it may select, at its discretion.

19.4 Each sub-contract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GC 19.5 (if and when applicable), or in event of termination by the Employer under GC 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 twenty-eight (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 GC 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 to the Contract Agreement titled List of Documents for Approval or Review, for its approval or review as specified and in accordance with the requirements of GC Sub-Clause 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.

GC Sub-Clausess 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 fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager’s approval in accordance with GC Sub-Clause 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 fourteen (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.
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 GC Sub-Clause 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 an Adjudicator for determination in accordance with GC Sub-Clause 46.3 hereof. If such dispute or difference is referred to an Adjudicator, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed.

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 GC Sub-Clause 20.3.

If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GC Clause 39 shall apply to such request.

21. Procurement

21.1 Plant

Subject to GC Sub-Clause 14.2, the Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.

21.2 Employer-Supplied Plant
If the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, 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 GC Sub-Clause 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 GC Sub-Clause 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 GC 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 GC Sub-Clause 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 GC Clause 40.

22. Installation

22.1 Setting Out/Supervision

22.1.1 Bench Mark: 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.

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

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.

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.

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.

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

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.

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.

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

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.

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

No work shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the PC, unless:

(a) otherwise stated in the Contract,

(b) the Project Manager gives consent, or

(c) 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.

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.

This Sub-Clause shall not apply to any work which is customarily carried out by rotary or double-shifts.

22.2.6 Facilities for Staff and Labor

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.

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

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.

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.

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.

The Contractor shall throughout the contract (including the Defects Notification 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 Sub-Contractors 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; (ii) provide male or female condoms for all Site staff and labor as appropriate; and (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.

The Contractor shall include in the program to be submitted for the execution of the Facilities under Sub-Clause 18.2 an alleviation program for Site staff and labor and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (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 Sub-Clause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related sub-contracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation this program shall not exceed the Provisional Sum dedicated for this purpose.

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 PC.

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, genders, 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 Foodstuffs

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 impede 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 GC Sub-Clause 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 Adjudicator for determination in accordance with GC Sub-Clause 46.3.

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 GC Sub-Clause 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 GC Sub-Clause 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 seven (7) days after receipt of the notice from the Contractor under GC Sub-Clause 24.1, the Employer shall supply the operating and maintenance personnel specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer for Precommissioning of the Facilities or any part thereof.

Pursuant to the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, the Employer shall also provide, within the said seven (7) day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Precommissioning 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 GC Sub-Clause 24.2, the Contractor shall commence Precommissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GC Sub-Clause 25.5.

24.4 As soon as all works in respect of Precommissioning 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 fourteen (14) days after receipt of the Contractor’s notice under GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 24.4.

If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within seven (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 seven (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 fourteen (14) days after receipt of the Contractor’s notice under GC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor’s repeated notice under GC Sub-Clause 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 GC Sub-Clause 24.5, or immediately after the date of the deemed Completion, under GC Sub-Clause 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 GC Sub-Clause 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 to the Contract Agreement titled Functional Guarantees. 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 PC 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 GC Sub-Clausesc 28.2 and 28.3 shall not apply.

25.3 Operational Acceptance
25.3.1 Subject to GC Sub-Clause 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 PC pursuant to GC Sub-Clause 25.2.2 above or any other period agreed upon by the Employer and the Contractor; or

(c) the Contractor has paid the liquidated damages specified in GC Sub-Clause 28.3 hereof; and

(d) any minor items mentioned in GC Sub-Clause 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 GC Sub-Clause 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 seven (7) days after receipt of the Contractor’s notice, issue an Operational Acceptance Certificate.

25.3.4 If within seven (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 Precommissioning and/or Guarantee Test

25.5.1 In the event that the Contractor is unable to proceed with the Precommissioning of the Facilities pursuant to Sub-Clause 24.3, or with the Guarantee Test pursuant to Sub-Clause 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 Contractor’s control, the provisions leading to “deemed” completion of activities such as Completion, pursuant to GC Sub-Clause 24.6, and Operational Acceptance, pursuant to GC Sub-Clause 25.3.4, and Contractor’s obligations regarding Defect Liability Period, pursuant to GC Sub-Clause 27.2, Functional Guarantee, pursuant to GC Clause 28, and Care of Facilities, pursuant to GC Clause 32, and GC 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 Sub-Clause 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 GC Sub-Clause 26.2;

(b) payments due to the Contractor in accordance with the provision specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which would not have been payable in normal circumstances due to non-
completion 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 Sub-Clause 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 GC Sub-Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause 25.5.4 below. The provision of GC Sub-Clause 33.2 shall apply to the Facilities during the same period.

25.5.3 In the event that the period of suspension under above Sub-Clause 25.5.1 actually exceeds one hundred eighty (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 Precommissioning, the Contractor shall proceed without delay in performing Precommissioning in accordance with Clause 24.

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 PC pursuant to GC Sub-Clause 8.2, or within such extended time to which the Contractor shall be entitled under GC 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 GC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount specified in the PC 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”\textit{ in the PC} as a percentage rate of the Contract Price. Once the “Maximum” is reached, the Employer may consider termination of the Contract, pursuant to GC Sub-Clause 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 GC 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 GC Sub-Clause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the Appendix to the Contract Agreement titled Time Schedule, and/or other program of work prepared pursuant to GC Sub-Clause 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 GC Clause 40, the Employer shall pay to the Contractor a bonus in the amount specified in the PC. The aggregate amount of such bonus shall in no event exceed the amount specified as “Maximum”\textit{ in the PC}.

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 five hundred and forty (540) days from the date of Completion of the Facilities (or any part thereof) or one year from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, unless specified otherwise in the PC pursuant to GC Sub-Clause 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 GC Clause 27 shall not apply to:

(a) any materials that are supplied by the Employer under GC Sub-Clause 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 GC Sub-Clause 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 GC 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 fifteen (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 GC 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, or 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 PC, 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 GC Sub-Clause 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 to the Contract Agreement titled Functional Guarantees, 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 to the Contract Agreement titled Functional Guarantees, 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 GC Sub-Clause 42.2.2.

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, 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 to the Contract Agreement titled Functional Guarantees.

28.4 The payment of liquidated damages under GC Sub-Clause 28.3, up to the limitation of liability specified in the Appendix to the Contract Agreement titled Functional Guarantees, shall completely satisfy the Contractor’s guarantees under GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 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 twenty-eight (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 twenty-eight (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) neither Party shall be liable to the other Party, 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, which may be suffered by the other Party in connection with the Contract, other than specifically provided as any obligation of the Party in the Contract, and

(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the amount resulting from the application of the multiplier specified in the PC, to the Contract Price or, if a multiplier 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.

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 GC 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 GC 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 GC 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 GC Sub-Clauses 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 GC 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 GC 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 GC 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 GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clauses 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 GC Sub-Clause 38.1, the provisions of GC Sub-Clause 38.3 shall apply.

33. **Loss of or Damage to Property; Accident or Injury to Workers; Indemnification**

33.1 Subject to GC Sub-Clause 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 GC Sub-Clause 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 twenty-eight (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 twenty-eight (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 GC 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 GC 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 to the Contract Agreement titled Insurance Requirements, 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 to the Contract Agreement titled Insurance Requirements.

34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 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 GC Sub-Clause 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 to the Contract Agreement titled Insurance Requirements, 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 twenty-one (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 to the Contract Agreement titled Insurance Requirements, 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 twenty-one (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 GC Sub-Clause 34.5.

34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GC Sub-Clause 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 GC 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 GC 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 GC Sub-Clause 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 GC Sub-Clause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

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 GC Sub-Clause 35.1, the Time for Completion shall be extended in accordance with GC Clause 40.

36. Change in Laws and Regulations

36.1 If, after the date twenty-eight (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 PC pursuant to GC Sub-Clause 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

(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 fourteen (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 GC 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 GC Sub-Clauses 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 GC Sub-Clauses 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 sixty (60) days or an aggregate period of more than one hundred and twenty (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 GC Sub-Clause 38.5.

37.7 In the event of termination pursuant to GC Sub-Clause 37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GC Sub-Clauses 42.1.2 and 42.1.3.

37.8 Notwithstanding GC Sub-Clause 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 GC Sub-Clause 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

(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 GC 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 GC Sub-Clause 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 GC 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 GC Sub-Clauses 38.3 or 38.5, the rights and obligations of the Employer and the Contractor shall be specified in GC Sub-Clauses 42.1.2 and 42.1.3.

**Change in Contract Elements**

39. Change in the Facilities

39.1 Introducing a Change

39.1.1 Subject to GC Sub-Clauses 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 GC Sub-Clauses 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 GC Sub-Clauses 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 GC Sub-Clauses 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  
(f) impact of the change on ESHS risks  
(g) 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 GC Sub-Clause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GC Sub-Clause 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 GC 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 fifteen percent (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 fourteen (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 fourteen (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 fourteen (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 GC Sub-Clause 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 sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Adjudicator in accordance with the provisions of GC Sub-Clause 46.1.

39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to GC Sub-Clause 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 GC Sub-Clause 39.2.1.

Upon receipt of the Application for Change Proposal, the Parties shall follow the procedures outlined in GC Sub-Clauses 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 PC pursuant to GC Sub-Clause 8.2 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 GC Clause 39

(b) any occurrence of Force Majeure as provided in GC Clause 37, unforeseen conditions as provided in GC Clause 35, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GC Sub-Clause 32.2

(c) any suspension order given by the Employer under GC Clause 41 hereof or reduction in the rate of progress pursuant to GC Sub-Clause 41.2 or
(d) any changes in laws and regulations as provided in GC Clause 36 or

(e) any default or breach of the Contract by the Employer, Appendix to the Contract Agreement titled, or any activity, act or omission of the Employer, or the Project Manager, or any other contractors employed by the Employer, or

(f) 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 sub-clause, or

(g) delays attributable to the Employer or caused by customs, or

(h) any other matter specifically mentioned in the Contract

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 an Adjudicator, pursuant to GC Sub-Clause 46.1.

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 GC 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 there after 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 GC 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 ninety (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 twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GC 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 GC Clause 39 or, where it affects the whole of the Facilities, as termination of the Contract under GC Sub-Clause 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 to the Contract Agreement titled Terms and Procedures of Payment, 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 GC Sub-Clause 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 fourteen (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 GC Sub-Clause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may by fourteen (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 GC Clause 41, then the Time for Completion shall be extended in accordance with GC Sub-Clause 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 GC Sub-Clause 42.1.

42.1.2 Upon receipt of the notice of termination under GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 42.1.2

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 GC Sub-Clause 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 GC Clause 43.

(c) if the Contractor, in the judgment of the Employer has engaged in corrupt, collusive, coercive, or fraudulent practices, as defined in GC 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 GC Sub-Clause 41.2, the progress of Contract performance for more than twenty-eight (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 GC Sub-Clause 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 fourteen (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 GC Sub-Clause 42.2.

42.2.3 Upon receipt of the notice of termination under GC Sub-Clauses 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

(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 GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 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 the 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 to the Contract Agreement titled Terms and Procedures of Payment, 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 GC Sub-Clause 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 fourteen (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 twenty-eight (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 twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clauses 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 GC Sub-Clause 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 GC Sub-Clauses 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in GC Sub-Clause 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 GC Sub-Clause 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 GC Sub-Clause 42.3.

42.4 In this GC 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 GC 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 to the Contract Agreement titled Terms and Procedures of Payment.

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.

44. Export Restrictions

44.1 Notwithstanding any obligation under the Contract to complete all export formalities, any export restrictions attributable to the Employer, to the country of the Employer or to the use of the Plant and Installation Services to be supplied which arise from trade
regulations from a country supplying those Plant and Installation Services, and which substantially impede the Contractor from meeting its obligations under the Contract, shall release the Contractor from the obligation to provide deliveries or services, always provided, however, that the Contractor can demonstrate to the satisfaction of the Employer and of the Bank that it has completed all formalities in a timely manner, including applying for permits, authorizations and licenses necessary for the export of the Plant and Installation Services under the terms of the Contract. Termination of the Contract on this basis shall be for the Employer’s convenience pursuant to Sub-Clause 42.1.

**Claims, Disputes and Arbitration**

45. **Contractor’s Claims**

45.1 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 Sub-Clause 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 Sub-Clause, 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
Contract or 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 GC Clause 40, and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause 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 Sub-Clause.

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 Adjudicator pursuant to GC 46 hereof.

46. Disputes and Arbitration

46.1 Appointment of the Adjudicator

The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer’s issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the PC, to appoint the Adjudicator within 14 days of receipt of such request.

The Adjudicator should be in position before “notice to proceed with work” is issued to the Contractor and an agreement should be signed with the Adjudicator jointly by the Employer and the Contractor in the form attached – Appendix B.

46.2 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority designated in the PC at the request of either party, within 14 days of receipt of such request.

46.3 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager’s decision.

46.4 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

The Adjudicator shall be paid daily at the rate specified in the PC, together with reimbursable expenses of the types specified in the PC, and the cost shall be divided equally between the Employer and the Contractor. Whatever decision is reached by the Adjudicator, either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator’s
written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator’s decision shall be final and binding.

46.5 Arbitration

The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the PC.

The Arbitrator(s) shall give a decision in writing within 120 days of start of the proceedings unless otherwise agreed to by the Parties. The Arbitrators shall entertain only those issues which have been earlier referred to the Adjudicator and either party is dissatisfied with the decision given by the Adjudicator.

Notwithstanding any reference to the Adjudicator or arbitration herein,
(a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree

(b) the Employer shall pay the Contractor any monies due the Contractor.
APPENDIX A to General Conditions

Environmental, Social, Health and Safety (ESHS)

Metrics for Progress Reports

[Note to Employer: the following metrics may be amended to reflect the Employer’s environmental, social, health and safety policies and/or the ESHS requirements of the project. The metrics that are required should be determined by the ESHS risks of the Works and not necessarily by the scale of the Works]

Metrics for regular reporting:

a. environmental incidents or non-compliances with contract requirements, including contamination, pollution or damage to ground or water supplies;

b. health and safety incidents, accidents, injuries and all fatalities that require treatment;

c. interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);

d. status of all permits and agreements:
   i. work permits: number required, number received, actions taken for those not received;
   ii. status of permits and consents:
      - list areas/facilities with permits required (quarries, asphalt & batch plants), dates of application, dates issued (actions to follow up if not issued), dates submitted to resident engineer (or equivalent), status of area (waiting for permits, working, abandoned without reclamation, decommissioning plan being implemented, etc.);
      - list areas with landowner agreements required (borrow and spoil areas, camp sites), dates of agreements, dates submitted to resident engineer (or equivalent);
      - identify major activities undertaken in each area in the reporting period and highlights of environmental and social protection (land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation);
      - for quarries: status of relocation and compensation (completed, or details of activities and current status in the reporting period).

e. health and safety supervision:
   i. safety officer: number days worked, number of full inspections & partial inspections, reports to construction/project management;
ii. number of workers, work hours, metric of PPE use (percentage of workers with full personal protection equipment (PPE), partial, etc.), worker violations observed (by type of violation, PPE or otherwise), warnings given, repeat warnings given, follow-up actions taken (if any);

f. worker accommodations:
   i. number of expats housed in accommodations, number of locals;
   ii. date of last inspection, and highlights of inspection including status of accommodations’ compliance with national and local law and good practice, including sanitation, space, etc.;
   iii. actions taken to recommend/require improved conditions, or to improve conditions.
   iv. number and date of GBV /SEA sensitization and/or training, number of workers receiving training on code of conduct (in the reporting period and in the past), etc.

g. HIV/AIDS: provider of health services, information and/or training, location of clinic, number of non-safety disease or illness treatments and diagnoses (no names to be provided);

h. gender (for expats and locals separately): number of female workers, percentage of workforce, gender issues raised and dealt with (cross-reference grievances or other sections as needed);

i. training:
   i. number of new workers, number receiving induction training, dates of induction training;
   ii. number and dates of toolbox talks, number of workers receiving Occupational Health and Safety (OHS), environmental and social training;
   iii. number and dates of HIV/AIDS sensitization and/or training, no. workers receiving training (this reporting period and in the past); same questions for gender sensitization, flag person training.
   iv. number and date of GBV /SEA sensitization and/or training, number of workers receiving training on code of conduct (in the reporting period and in the past), etc.

j. environmental and social supervision:
   i. environmentalist: days worked, areas inspected and numbers of inspections of each (road section, work camp, accommodations, quarries, borrow areas, spoil areas, swamps, forest crossings, etc.), highlights of activities/findings (including violations of environmental and/or social best practices, actions taken), reports to environmental and/or social specialist/construction/site management;
ii. sociologist: days worked, number of partial and full site inspections (by area: road section, work camp, accommodations, quarries, borrow areas, spoil areas, clinic, HIV/AIDS center, community centers, etc.), highlights of activities (including violations of environmental and/or social requirements observed, actions taken), reports to environmental and/or social specialist/construction/site management; and

iii. community liaison person(s): days worked (hours community center open), number of people met, highlights of activities (issues raised, etc.), reports to environmental and/or social specialist/construction/site management.

k. Grievances: list new grievances (e.g. allegations of GBV / SEA) received in the reporting period and unresolved past grievances by date received, complainant, how received, to whom referred to for action, resolution and date (if completed), data resolution reported to complainant, any required follow-up (Cross-reference other sections as needed):

   i. Worker grievances;

   ii. Community grievances

l. Traffic and vehicles/equipment:

   i. traffic accidents involving project vehicles & equipment: provide date, location, damage, cause, follow-up;

   ii. accidents involving non-project vehicles or property (also reported under immediate metrics): provide date, location, damage, cause, follow-up;

   iii. overall condition of vehicles/equipment (subjective judgment by environmentalist); non-routine repairs and maintenance needed to improve safety and/or environmental performance (to control smoke, etc.).

m. Environmental mitigations and issues (what has been done):

   i. dust: number of working bowsers, number of waterings/day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); % of rock/spoil lorries with covers, actions taken for uncovered vehicles;

   ii. erosion control: controls implemented by location, status of water crossings, environmentalist inspections and results, actions taken to resolve issues, emergency repairs needed to control erosion/sedimentation;

   iii. quarries, borrow areas, spoil areas, asphalt plants, batch plants: identify major activities undertaken in the reporting period at each, and highlights of environmental and social protection: land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation;

   iv. blasting: number of blasts (and locations), status of implementation of blasting plan (including notices, evacuations, etc.), incidents of off-site damage or complaints (cross-reference other sections as needed);
v. spill cleanups, if any: material spilled, location, amount, actions taken, material disposal (report all spills that result in water or soil contamination;

vi. waste management: types and quantities generated and managed, including amount taken offsite (and by whom) or reused/recycled/disposed on-site;

vii. details of tree plantings and other mitigations required undertaken in the reporting period;

viii. details of water and swamp protection mitigations required undertaken in the reporting period.

n. compliance:

i. compliance status for conditions of all relevant consents/permits, for the Work, including quarries, etc.: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;

ii. compliance status of C-ESMP/ESIP requirements: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;

iii. compliance status of GBV/SEA prevention and response action plan: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;

iv. compliance status of Health and Safety Management Plan re: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;

v. other unresolved issues from previous reporting periods related to environmental and social: continued violations, continued failure of equipment, continued lack of vehicle covers, spills not dealt with, continued compensation or blasting issues, etc. Cross-reference other sections as needed.
APPENDIX B\textsuperscript{28}

Appointment of Adjudicator

Suggested Draft\textsuperscript{29} of Letter of Appointment of Adjudicators

Sub:____________________________________________________(Name of the Contract)

To

Name and address of the Adjudicator

We hereby confirm your appointment as Adjudicator for the above contract to carry out the assignment specified in this Letter of Appointment.

For administrative purpose____________________(name of the officer representing the Employer) has been assigned to administer the assignment and to provide the Adjudicator with all relevant information needed to carry out the assignment on behalf of both the employer and the contractor. The services will be required during the period of contract for the work of (Name of the Contract).______________________.

The Adjudicator shall visit the worksite once in 3 (three) months till the completion of the work indicated above or as specifically requested by Employer/Contractor for the period up to the end of defects liability period with prior intimation to the Employer and the contractor. The duration of each visit shall ordinarily be for one day only. These durations are approximate and (Name of the employer and Name of the Contractor) may find it necessary to postpone or cancel the assignment and/or shorten or extend the duration.

The appointment will become effective upon confirmation of letter by you. The appointment of Adjudicator shall be liable for termination under a 30 (thirty) days written notice from the date of issue of the notice, if both Employer and the Contractor so desire. Also the appointment shall automatically stand terminated 14 days after the defect notice/correction period as stated in Clause 27 of the Conditions of Contract is over.

The Adjudicator will be paid a fee of Rs.______ (Rupees ____________ only) per each day of visit at the worksite. The actual expenses for boarding and traveling in connection with the assignment will be reimbursed to the Adjudicator. The Adjudicator will submit a pre-receipted bill in triplicate to the employer indicating the date of the visit, fees for the visit and a proof in support of the actual expenditure [only for items valued above Rs. 200 each] incurred by him against boarding, lodging

\textsuperscript{28} If ITB 46 makes provision of an Adjudicator from list provided by an institution, kindly modify Appendix A to state that the fee and reimbursable payable to the adjudicator shall be as per the rules of the Institution.

\textsuperscript{29} The draft letter may be modified as necessary.
and traveling expenses after performing the visit on each occasion. The Employer will make the
admissible payment (both the Employer’s and the Contractor’s share) to the Adjudicator within 30
days of the receipt of the bill. The Contractor’s share on this account (half the paid amount) will
be recovered by the Employer from the Contractor’s bills against the work.
In accepting this assignment, the Adjudicator should understand and agree that he is responsible
for any liabilities and costs arising out of risks associated with travel to and from the place of
emergency repatriation, loss or damage to personal/professional effects and property. The
Adjudicator is advised to effect personal insurance cover in respect of such risks if he does not
already have such cover in place. In this regard, the Adjudicator shall maintain appropriate
medical, travel, accident and third-party liability insurance. The obligation under this paragraph
will survive till termination of this appointment.

Procedures for resolution of disputes by the Adjudicator is described in the contract of
_____________(name of the contract) between the employer and the contractor vide clause no.46
of the General Conditions of Contract. Your recommendation should be given in the format
attached, within 28 days of receipt of a notification of dispute.

The Adjudicator will carry out the assignment in accordance with the highest standard of
professional and ethical competence and integrity, having due regard to the nature and purpose of
the assignment, and will conduct himself in a manner consistent herewith. After visiting the
worksite, the Adjudicator will discuss the matter with the Employer and if necessary with the
Contractor before arriving at any decision.

The Adjudicator will agree that all knowledge and information not within the public domain, which
may be acquired while carrying out this service shall be all time and for all purpose, regarded as
strictly confidential and held in confidence, and shall not be directly or indirectly disclosed to any
party whatsoever, except with the permission of the employer and the contractor. The
Adjudicator’s decision should be communicated in the form of a speaking order specifying the
reasons.

The Adjudicator will agree that any manufacturing or construction firm with which he might be
associated with, will not be eligible to participate in bidding for any goods or works resulting from
or associated with the project of which this consulting assignment forms a part.

Read and Agreed

Name of Adjudicator

Signature

Place:

Date:

Name of Employer
Signature of authorized representative of Employer

Name of the Contractor
Signature of authorized representative of Contractor
Attachment: Copy of contract document between the employer and contractor and format for recommendation.
SUMMARY OF AJUDICATOR’S RESPONSIBILITIES

The Adjudicator has the following principal responsibilities:

1. Visit the site periodically.

2. Keep abreast of job activities and developments.

3. Encourage the resolution of disputes by the parties.

4. When a dispute is referred to it, conduct a hearing (no legal presentation), complete its deliberations, and prepare a recommendations in a professional and timely manner (as per sample format)
Sample Format of Adjudicator’s Recommendation

[Project Name]
Recommendation of Adjudicator

Dispute No. XX [NAME OF DISPUTE]

Hearing Date: ______________

Dispute

Description of dispute. A one or two sentence summation of the dispute.

Contractor’s Position

A short summation of the contractor’s position as understood by the Adjudicator.

Employer’s Position

A short summation of the Employer’s position as understood by the Adjudicator.

Recommendation

The Adjudicator’s specific recommendation for settlement of the dispute. (The recommended course is consistent with the explanation).

Explanation

(This section could also be called Considerations, Rationale, Findings, Discussion, and so on.)

The Adjudicator’s description of how each recommendation was reached.

Respectfully submitted,

Date: ________________________  ________________________

Date: ________________________  ________________________

Date: ________________________  ________________________
Salient Features of Labour & Environment Protection Laws

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK

(a) **Employees Compensation Act 1923**: The Act provides for compensation in case of injury, disease or death arising out of and during the course of employment.

(b) **Payment of Gratuity Act 1972**: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years’ service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

(c) **Employees P.F. and Miscellaneous Provision Act 1952** *(since amended)*: The Act provides for monthly contribution by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are:

(i) Pension or family pension on retirement or death, as the case may be.
(ii) Deposit linked insurance on the death in harness of the worker.
(iii) Payment of P.F. accumulation on retirement/death etc.

(d) **Maternity Benefit Act 1961**: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(e) **Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013**: This Act defines sexual harassment in the workplace, provides for an enquiry procedure in case of complaints and mandates the setting up of an Internal Complaints Committee or a Local Complaints Committee.

(f) **Contract Labour (Regulation & Abolition) Act 1970**: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.

(g) **Minimum Wages Act 1948**: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

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30 This list is only illustrative and not exhaustive. Bidders and Contractors are responsible for checking the correctness and completeness of the list. The law as current on the date of bid opening will apply.
(h) **Payment of Wages Act 1936**: It lays down the mode, manner and by what date the wages are to be paid, what deductions can be made from the wages of the workers.

(i) **Equal Remuneration Act 1976**: The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

(j) **Payment of Bonus Act 1965**: The Act is applicable to all establishments employing 20 or more employees. Some of the State Governments have reduced this requirement from 20 to 10. The Act provides for payments of annual bonus subject to a minimum of 8.33% of the wages drawn in the relevant year. It applies to skilled or unskilled manual, supervisory, managerial, administrative, technical or clerical work for hire or reward to employees who draw a salary of Rs. 10,000/- per month or less. To be eligible for bonus, the employee should have worked in the establishment for not less than 30 working days in the relevant year. The Act does not apply to certain establishments.

(k) **Industrial Disputes Act 1947**: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations, a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(l) **Trade Unions Act 1926**: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(m) **Child Labour (Prohibition & Regulation) Act 1986**: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in the Building and Construction Industry.

(n) **Inter-State Migrant workmen’s (Regulation of Employment & Conditions of Service) Act 1979**: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.

(o) **The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996** and **The Building and Other Construction Workers Welfare Cess Act, 1996 (BOCWW Cess Act)**: All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under these Acts. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be notified by the Government. The Employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as Canteens, First – Aid facilities, Ambulance, Housing accommodations for workers
near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(p) Factories Act 1948: the Act lays down the procedure for approval of plans before setting up a factory engaged in manufacturing processes, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power.

(q) Weekly Holidays Act -1942

(r) Bonded Labour System (Abolition) Act, 1976: The Act provides for the abolition of bonded labour system with a view to preventing the economic and physical exploitation of weaker sections of society. Bonded labour covers all forms of forced labour, including that arising out of a loan, debt or advance.

(s) Employer’s Liability Act, 1938: This Act protects workmen who bring suits for damages against employers in case of injuries endured in the course of employment. Such injuries could be on account of negligence on the part of the employer or persons employed by them in maintenance of all machinery, equipment etc. in healthy and sound condition.

(t) Employees State Insurance Act 1948: The Act provides for certain benefits to insured employees and their families in case of sickness, maternity and disablement arising out of an employment injury. The Act applies to all employees in factories (as defined) or establishments which may be so notified by the appropriate Government. The Act provides for the setting up of an Employees’ State Insurance Fund, which is to be administered by the Employees State Insurance Corporation. Contributions to the Fund are paid by the employer and the employee at rates as prescribed by the Central Government. The Act also provides for benefits to dependents of insured persons in case of death as a result of an employment injury.

(u) The Personal Injuries (Compensation Insurance) Act, 1963: This Act provides for the employer’s liability and responsibility to pay compensation to employees where workmen sustain personal injuries in the course of employment.

(v) Industrial Employment (Standing Order) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

SALIENT FEATURES OF SOME OF THE MAJOR LAWS THAT ARE APPLICABLE FOR PROTECTION OF ENVIRONMENT.

1. The Environment (Protection) Act, 1986 and as amended: This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of
hazards to human beings, other living creatures, plants and property. ‘Environment’ includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

2. The Forest Conservation Act, 1980, as amended, and Forest (Conservation) Rules, 1981 as amended: These provide for protection of forests by restricting conversion of forested areas into non-forested areas and prevention of deforestation, and stipulates the procedures for cutting any trees that might be required by the applicable rules. Permissions under the Act also stipulates the norms and compliance requirements of the employer and any contractor on behalf of the employer.

3. State Tree Preservation Acts as may be in force: These provide for protection of trees of important species. Contractors will be required to obtain prior permission for full or partial cutting, uprooting, or pruning of any such trees.

4. The Wildlife (Protection) Act, 1972, and as amended: This provides for protection of wildlife through notifying National Parks and Sanctuaries and buffer areas around these zones; and to protect individuals of nationally important species listed in the Annex of the Act.

5. The Biological Diversity Act, 2002: This provides for conservation of biological diversity, sustainable use of components of biological diversity, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.

6. The Public Liability Insurance Act, 1991 as amended and The Public Liability Insurance Rules, 1991 as amended: These provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

7. The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010, the Ancient Monuments and Archaeological Sites and Remains Rules, 1959 amended 2011, the National Monuments Authority Rules, 2011 and the similar State Acts: These provide for conservation of cultural and historical remains found in India. Accordingly, area within the radii of 100m and 300m from the “protected property” are designated as “protected area” and “controlled area” respectively. No development activity (including building, mining, excavating, blasting) is permitted in the “protected area” and development activities likely to damage the protected property is not permitted in the “controlled area” without prior permission of the Archaeological Survey of India (ASI) or the State Departments of Art and Culture or Archaeology as applicable.

8. The Environmental Impact Assessment Notification, 2006 and as amended: This provides for prior environmental clearance for new, modernization and expansion projects listed in Schedule 1 of the Notification. Contractors will be required to ensure that no work starts until applicable clearances under the Notification is not available. Contractors will be responsible for implementation of any environmental management plan stipulated as per the
permission under this Notification; and will be required to prepare and submit to the employer and compliance report stipulated in the permission under the Notification.

9. The Water (Prevention and Control of Pollution) Act, 1974 as amended, and the Water (Prevention and Control of Pollution) Rules, 1975 as amended: These provide for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. ‘Pollution’ means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water(whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms. Contractors will need to obtain consent for establishment and consent for operation of any item of work or installation of equipment that generates waste water, and observe the required standards of establishment and operation of these items of work or installations; as well as install and operate all required waste water treatment facilities.

10. The Water (Prevention and Control of Pollution) Cess Act, 1977 and The Water (Prevention and Control of Pollution) Cess Rules, 1978: These provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution under the Water (Prevention and Control of Pollution) Act, 1974.

11. The Air (Prevention and Control of Pollution) Act, 1981 as amended, and the Air (Prevention and Control of Pollution) Rules, 1982: These provides for prevention, control and abatement of air pollution. ‘Air Pollution’ means the presence in the atmosphere of any ‘air pollutant’, which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment. Contractors will need to obtain consent for establishment and consent for operation of any item of work or installation of equipment that generates air pollution such as batching plants, hot mix plants, power generators, backup power generation, material handling processes, and observe the required standards of establishment and operation of these items of work or installations.

12. Noise Pollution (Control and Regulation) Rules, 2000, and as amended: This provides for standards for noise for day and night for various land uses and specifies special standards in and around sensitive receptors of noise such as schools and hospitals. Contractors will need to ensure compliance to the applicable standards, and install and operate all required noise control devices as may be required for all plants and work processes.


14. The Explosives Act 1884 and the Explosives Rules, 2008: These provide for safe manufacture, possession, sale, use, transportation and import of explosive materials such as diesel, Oil and lubricants etc.; and also for regulating the use of any explosives used in blasting and/or demolition. All applicable provisions will need compliance by the contractors.
15. The Petroleum Rules, 2002: This provides for safe use and storage of petroleum products, and will need to be complied by the contractors.

16. The Gas Cylinder Rules 2004 and amendments: This provides for regulations related to storage of gas, and possession of gas cylinder more than the exempted quantity. Contractors should comply with all the requirements of this Rule.

17. Manufacture, Storage and Import of Hazardous Chemical Rules of 1989 and as amended: These provide for use and storage of hazardous material such as highly inflammable liquids like HSD/LPG. Contractors will need to ensure compliance to the Rules; and in the event where the storage quantity exceeds the regulated threshold limit, the contractors will be responsible for regular safety audits and other reporting requirements as prescribed in the Rules.

18. Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016: These provide for protection of general public from improper handling storage and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal. Contractors will need to obtain permission from the State Pollution Control Boards and other designated authorities for storage and handling of any hazardous material; and will to ensure full compliance to these rules and any conditions imposed in the permit.

19. The Bio Medical Waste Management Rules, 2016: This provides for control, storage, transportation and disposal of bio-medical wastes. As and where the contractor has any first aid facility and dispensaries, established in either temporary or permanent manner, compliance to these Rules are mandatory.

20. Construction and Demolition Waste Management Rules, 2016: This provides for management of construction and demolition waste (such as building materials possible to be reused, rubble and debris or the like); and applies to all those waste resulting from construction, re-modelling, repair or demolition of any civil structure. Contractor will need to prepare a waste disposal plan and obtain required approval from local authorities, if waste generation is more than 20 tons in any day or 300 tons in any month during the contract period; and ensure full compliance to these rules and any conditions imposed in the regulatory approval.

21. The E-Waste (Management) Rules, 2016: This provides for management of E-wastes (but not covering lead acid batteries and radio-active wastes) aiming to enable the recovery and/or reuse of useful material from e-waste, thereby reducing the hazardous wastes destined for disposal and to ensure the environmentally sound management of all types of waste of electrical and electronic equipment. This Rule applies to every manufacturer, producer, consumer, bulk consumer, collection centers, dealers, e-retailer, refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment listed in Schedule I, including their components, consumables, parts and spares which make the product operational.

22. Plastic waste Management Rules, 2016: This provides for control and management of the plastic waste generated from any activity. Contractors will ensure compliance to this Rule.

23. The Batteries (Management and Handling) Rules 2001: This provides for ensuring safe disposal and recycling of discarded lead acid batteries likely to be used in any equipment
during construction and operation stage. Rules require proper control and record keeping on
the sale or import of lead acid batteries and recollection of the used batteries by registered
recyclers to ensure environmentally sound recycling of used batteries. Contractors will ensure
compliance to this Rule.

24. The Ozone Depleting Substances (Regulation and Control) Rules, 2000 and as amended: This
provides for regulation of production and consumption of ozone depleting substances in the
country, and specifically prohibits export to or import from countries not specified in the
Rules, and prohibits unless specifically permitted, any use of ozone depleting substance.

25. The Coastal Regulation Zone Notifications, 1991 and as amended: This provides for
regulation of development activities within the 500m of high tide line in coastal zone and
100m of stretches of rivers and estuaries influenced by tides. Contractors will be required to
ensure that no work starts until applicable clearances under the Notification is not available.
Contractors will be responsible for implementation of any plan stipulated as per the permission
under this Notification; and will be required to prepare and submit to the employer and
compliance report stipulated in the permission under the Notification.

26. The Motor Vehicle Act 1988 as amended (and State Motor Vehicle Acts as may be in force)
and the Motor Vehicle Rules, 1989, and as amended (and State Motor Vehicle Rules as may
be in force): To minimize the road accidents, penalizing the guilty, provision of compensation
to victim and family and check vehicular air and noise pollution. Contractors will be required
to ensure full compliance to these rules.

27. Easement Act, 1882: This provides for the rights of landowners on groundwater. Contractors
will need to ensure that other landowners’ rights under the Act is not affected by any
groundwater abstraction by the contractors.

28. State Groundwater Acts and Rules as may be in force and the Guidelines for Groundwater
Abstraction for drinking and domestic purposes in Notified Areas and Industry/Infrastructure
project proposals in Non-Notified areas, 2012: These provide for regulating extraction of
ground water for construction/industrial and drinking and domestic purposes. Contractors will
need to obtain permission from Central/State Groundwater Boards prior to groundwater
abstraction through digging any bore well or through any other means; and will to ensure full
compliance to these rules and any conditions imposed in the permit.

29. The Mines Act, 1952 as amended; the Minor Mineral and concession Rules as amended; and
the State Mineral (Rights and Taxation) Acts as may be in force: These provide for safe
and sound mining activity. The contractors will procure aggregates and other building
materials from quarries and borrow areas approved under such Acts. In the event the
contractors open any new quarry and/or borrow areas, appropriate prior permission from the
State Departments of Minerals and Geology will need to be obtained. Contractors will also
need to ensure full compliance to these rules and any conditions imposed in the permit.

30. The Insecticides Act, 1968 and Insecticides Rules, 1971 and as amended: These provide for
regulates the manufacture, sale, transport, distribution, export, import and use of pesticides
to prevent risk to human beings or animals, and for matters connected therewith. No one
should import or manufacture; sell, stock or exhibit foe sale; distribute, transport, use: (i) any
misbranded insecticides, (ii) any insecticide the sale, distribution or use of which is for the
time being prohibited under the Act; and (iii) any insecticide except in accordance with the condition on which it was registered under the Act.

31. National Building Codes of India, 2005 and as amended: This provides guidelines for regulating the building construction activities in India. The code mainly contains administrative regulations, development control rules and general building requirements; stipulations regarding materials, structural design and construction; and building and plumbing services. Contractors will be required to comply with all Bureau of Indian Standards Codes dealing with: (i) use and disposal of asbestos containing materials in construction; (ii) paints containing lead; (iii) permanent and temporary ventilations in workplace; (iv) safety, and hygiene at the workplace; (v) prevention of fire; (vi) prevention of accidents from faulty electrical gadgets, equipment and accessories; and all other such codes incidental to the Contract.
Section VIII. Particular Conditions

The following Particular Conditions shall supplement the General Conditions in Section VII. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions.
# Particular Conditions

The following Particular Conditions (PC) shall supplement the General Conditions (GC). Whenever there is a conflict, the provisions herein shall prevail over those in the GC. The clause number of the PC is the corresponding clause number of the GC.

| **PC 1. Definitions** | The Employer is:  Rajasthan Agricultural Competitiveness Project  
| | The Project Manager is: Project Director  
| | The Bank is: State Bank of India, Secretariat Jaipur  
| | Country of Origin: all countries and territories as indicated in Section V of the bidding document, Eligible Countries. |
| **PC 2. Contract Documents** | The following documents also form part of the Contract:  
| | (i) the ESHS Management Strategies and Implementation Plans; and  
| | (ii) Code of Conduct (ESHS). |
| **PC 5. Law and Language** | PC 5.1 The Contract shall be interpreted in accordance with the laws of: Union of India.  
| | PC 5.2 The ruling language is: English  
| | PC 5.3 The language for communications is: English |
| **PC 7.1 Scope of Facilities** | GC 7.1 In line 6, delete the word” and” after “completion” and insert a “(,)”. Also, add in line 7, the words “and performance testing” after the word “commissioning”. |
| **PC 7. Scope of Facilities [Spare Parts] (GC Clause 7)** | PC 7.3 The Contractor agrees to supply spare parts (Schedule 2 and Section VII) for a period of years: *Five 05*  
| | **Addition to PC 7.3**  
| | The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the Plant. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order. In addition, in the event of termination of the production of spare parts, advance notification will be made to the Employer of the pending termination, with sufficient time to permit the Employer to procure the needed requirement. Following such termination, the Contractor will furnish to the extent possible and at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested. |
| **PC 8. Time for Commencement and Completion** | PC 8.1 The Contractor shall commence work on the Facilities from the Effective Date for determining Time for Completion as specified in the Contract Agreement.  
| | PC 8.2 The Time for Completion of the whole of the Facilities shall be two (02) months for all the clusters in both the Packages |
from the Effective Date as described in the Contract Agreement.

| PC 12. Terms of Payment | GC 12.3 - add the words “which have become due” after the word, “payment” in line 1.  
- Delete the words “whether before or after judgment or arbitral award” in the last line. |
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<tbody>
<tr>
<td>PC 12. Terms of Payment</td>
<td>PC 12.4 The currency in which payments are made to the Contractor under this Contract shall be Indian Rupees (Rs.)</td>
</tr>
</tbody>
</table>
| PC 13. Securities       | GC 13.2.1 – Add at the end of para (before full stop), “with a validity of ninety (90) days beyond the day of completion of facilities in accordance with GC Clause 24.”  
GC 13.2.2 Delete the portion in line 1 ‘or in another form acceptable to the Employer’  
- Delete the portion starting from line 2 “in proportion ... till the end of this Sub-Clause ... after its expiration” and substitute with, “as per the procedures specified in PC. The security shall be discharged after Completion of the Facilities or relevant part thereof”.  
- Procedure for effecting reduction in the Advance Payment Security: The Advance Payment Security shall be allowed to be reduced every three (3) months after First Running Account Bill/Stage payment under the Contract. The cumulative amount of reduction at any point of time shall not exceed seventy five percent (75%) of the advance corresponding to cumulative value of the Facilities completed as per a certificate to be issued by the project manager. It should be clearly understood that reduction in the value of security for advance should not in any way dilute the Contractor’s responsibility and liabilities under the Contract including in respect of the Facilities for which reduction in the value of security is allowed.  
PC 13.3.1 (a) The amount of Performance Security, as a percentage of the Contract Price for the Facility or for the part of the Facility for which a separate Time for Completion is provided, shall be: 9% of contract price  
(b) The amount of Environmental, Social, Safety and Health (ESHS) Performance Security, as a percentage of the Contract Price for the Facility or for the part of the Facility for which a separate Time for Completion is provided, shall be: 1% of contract price  
The performance security of a Joint Venture shall be in the name of the Joint Venture so as to commit fully all partners to the Joint Venture.  
Add the following at the end of GC 13.3.1:  
If the performance security is a bank guarantee, it shall be issued either by a Nationalized or Scheduled Bank in India or a by foreign bank through a correspondent Nationalized or Scheduled Bank located in India.  
- Add the following at the end of Sub-Clause after the word, “PC”: |
“with a validity upto sixty (60) days beyond the Defect Liability period.”

PC 13.3.2 The Performance Security and if applicable, the Environmental, Social, Health and Safety (ESHS) Performance Security, shall be in the forms of the bank guarantee attached hereto in Section IX, Contract Forms.

PC 13.3.3 Delete the first sentence reading “Unless otherwise specified ……. of the Operational Acceptance”

In cases where partial acceptance (GC 25.4) is provided retain GC 13.3.3 with the following changes;

Add the following at the start of Para:

“The performance security shall be reduced prorata to the contract price of a part or the facilities for which a separate time for completion is provided for”.

-- In lines 5 & 9, after the word “Facilities”, add the words “(or the relevant part thereof).”

(The following provision should be used when the Facilities have warranty obligations beyond the Defect Liability Period, pursuant to the provisions in the PC under GC Clause 27.)

PC 13.3.3 The Performance Security shall be reduced to ten percent (10%) of the value of the component covered by the extended defect liability to cover the Contractor’s extended defect liability in accordance with the provision in the PC, pursuant to GC Sub-Clause 27.10. [To be inserted only when an extended warranty is requested].

PC 13.3.4 Deleted.

PC 14 Taxes and Duties

GC 14.2 - replace it with the following:

GC 14.2 – “The Employer shall bear and reimburse to the Contractor domestic taxes such as GST, in respect of direct transaction between the Employer and the Contractor imposed upon, on the Plant and Equipment and mandatory spare parts specified in Price Schedule No.2 to be incorporated into the Facilities, by the Laws of Union of India”.

GC 14.3 – Deleted.

GC 14.4 – Add the following at the end of the Sub-Clause:

“However, these adjustments, after ascertaining the facts, would be restricted to direct transactions between the Employer and the Contractor and not on procurement of raw materials, intermediary components etc. by the Contractor. Further, no adjustment of the Contract Price shall be made on account of variation in deemed export benefits.”

PC 15.1 License/Use of Technical Information

GC 15.1 - Add the following at the end of the Sub-Clause:

“The Employer shall however be free to reproduce all drawings, documents and other material furnished to the Employer for the purpose of the Contract including, if required, for operation and maintenance.”
| **PC 17 Representatives** | GC 17.1 - In line 8, delete the word “No” and replace with the words, “The Employer shall take all reasonable care to see that no”.  
-- In line 8, substitute the words, “shall be” with “is”.  
-- In line 10-11, delete the sentence “Such appointment shall only take effect upon receipt of such notice by the Contractor”.  

**Sample Provision** *to be inserted only if requirement of Contract Coordination Procedure is envisaged*.  
-- Add the following Sub-Clause after GC Sub-Clause 17.2.3:  
17.2.3.1 “Notwithstanding anything stated in GC Sub-Clause 17.1 and 17.2.1 above, for the purpose of execution of Contract, the Employer and the Contractor shall finalize and agree to a Contract Coordination Procedure and all the communication under the Contract shall be in accordance with such Contract Coordination Procedure.”  

GC 17.2.4 - In line 2, substitute the word “Completion” with “Operational Acceptance”. |
| **PC 18 Work Program** | GC 18.2 - In line 1, substitute the words “Effective Date” with “Notification of Award”. |
| **PC 20 Design and Engineering** | GC 20.3.2 - Delete the last sentence of the Sub-Clause “If the Project Manager … by the Project Manager”.  
GC 20.3.4 - In line 7, after the words “modification(s)”, delete the word “whereupon” and substitute with “and upon resubmission with the required modifications”.  
GC - Add the following at the end of the Sub-Clause:  
“The procedure for submission of the documents by the Contractor and their approval by the Project manager shall be discussed and finalized with the Contractor”. |
| **PC 21 Procurement** | GC 21.4 – substitute this sub-clause with the following:  
“GC 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.” |
| **PC 22 Installation** | GC 22.2.3 - Add the following at the end of GC 22.2.3:  
“Salient features of major labour and other laws that are applicable to construction industry in India are given as Appendix C to these General Conditions of Contract.”  
PC 22.2.5 Working Hours  
Normal working hours are: 9.30 AM to 5.00 PM IST  
PC 22.2.8 Funeral Arrangements: _As per applicable law
### PC 24 Completion of the Facilities

- **GC 24.3** - In line 4, after the word “matters”, add, “if so specified in Appendix 6 (Scope of Works and Supply by the Employer).

- **GC 24.4** – In line 4, add the following after the word “shall”: “commence Commissioning as per procedures stipulated in Technical Specification, and as soon as Commissioning is satisfactorily completed, the Contractor shall”.

### PC 24.3 and 25.2

#### Completion – Guarantee Test – Acceptance

<table>
<thead>
<tr>
<th>Provision for ‘deemed completion of activities’</th>
</tr>
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<tbody>
<tr>
<td>In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 24.3, or with the Guarantee Test pursuant to Sub-Clause 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 the reasons beyond the Employer’s control, the provisions leading to “deemed” completion of activities such as Completion, pursuant GC Sub-Clause 24.6, and Operational Acceptance, pursuant to GC Sub-Clause 25.3.4, and Contractor’s obligations regarding Defect Liability Period, pursuant to GC Sub-Clause 27.2, Functional Guarantee, pursuant to GC Clause 28, and care of Facilities, pursuant to GC Clause 32, and GC Clause 41.1, Suspension, shall not apply. In this case, the following provisions shall apply.</td>
</tr>
</tbody>
</table>

[1] When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to the above Sub-Clause 13.1, 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 GC Sub-Clause 26.2.

- **(b)** Payments due to the Contractor in accordance with the provision specified in Appendix 1 (Terms and procedures of Payment) to the Contract Agreement, which would not have been payable in normal circumstances due to non-completion 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 these payments, subject to the provision of para 3 below;

- **(c)** The expenses towards the security and extension of other securities under the contract, of which validity need to be extended, shall be reimbursed to the Contractor by the Employer; and

- **(d)** The additional charges towards the care of the Facilities pursuant to GC Sub-Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in
para 4 below. The provision of GC Sub-Clause 33.2 shall apply to the Facilities during the same period.

[3] In the event that the period of suspension under the above Sub-Clause 13.1 actually exceeds one hundred eighty (180) days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor.

[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.

*The above SC Clause may be used when performance of Pre-commissioning activities and/or Functional Guarantees will be tied to the completion of other facilities which and are not under the responsibilities of the Contractor.*

<table>
<thead>
<tr>
<th>PC 25. Commissioning and Operational Acceptance</th>
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<tbody>
<tr>
<td>GC 25.1.1 replace the existing clause with the following: Commissioning of the Facilities or any part thereof shall be completed by the Contractor as per procedures detailed in Technical Specifications.</td>
</tr>
<tr>
<td>GC 25.1.2 - In line 1, after the word “shall”, add, “unless otherwise specified in Technical Specifications”</td>
</tr>
<tr>
<td>PC 25.2.2 The Guarantee Test of the Facilities shall be successfully completed within 15 days from the date of Completion.</td>
</tr>
<tr>
<td><em>Parts and separate times for the respective Guarantee Tests shall be specified where applicable</em>.</td>
</tr>
<tr>
<td>GC 25.3.1(b) - In the last line, after the word “the Contractor” add the words “but successful completion of the Facilities has been achieved”.</td>
</tr>
<tr>
<td>Add the following Sub-Clause:-</td>
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<tr>
<td>GC 25.3.1(e) – Three sets of as built drawings of (in scale 1 cm = 100 mtr.……..) and operating and maintenance manuals and CD’s (as required) are furnished.</td>
</tr>
<tr>
<td>GC 25.3.3 - in line 2, substitute the word “Seven (7)” with “Twenty one (21)”.</td>
</tr>
<tr>
<td>GC 25.3.4 - In line 1, substitute the word “Seven (7)” with “Twenty one (21)”.</td>
</tr>
<tr>
<td>PC 26. Completion Time Guarantee</td>
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<tr>
<td>PC 26.2</td>
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<tr>
<td>Applicable rate for liquidated damages: <strong>0.05% per week, and the maximum amount for the permissible delay is below 10% in all clusters for both the Packages</strong>.</td>
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<tr>
<td>The above rate applies to the price of the part of the Facilities, as quoted in the Price Schedule, for that part for which the Contractor fails to achieve Completion within the particular Time for Completion.</td>
</tr>
<tr>
<td>[The above provision may be used where separate Times for Completion have been prescribed for parts of the Facilities].</td>
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<tr>
<td>Maximum deduction for liquidated damages: <strong>10%</strong></td>
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<tr>
<td>[The percentage shall be at least equivalent to the percentage specified in Section III for completion beyond the minimum period for each week of permissible delay from that minimum period. The applicable rate shall not exceed one-half percent (0.5%) per week, and the maximum shall not exceed ten percent (10%) of the Contract price.]</td>
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<tr>
<td>PCPC 26.3</td>
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<tr>
<th>PC 27. Defect Liability</th>
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<tr>
<td>GC 27.2 – Required Defect Liability Period is 1 year.</td>
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<tr>
<td>GC 27.6 - Substitute the last sentence of the second para with the following:</td>
<td></td>
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<tr>
<td>“The tests in character shall in any case be not less than what has already been agreed by the Employer and the Contractor for the original equipment/part of the Facilities”.</td>
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<tr>
<td>GC 27.8 - Add the following at the end of the Sub-Clause:</td>
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<tr>
<td>“Upon correction of the defects in the Facilities or any part thereof by repair/replacement, such repair/replacement shall have the Defect Liability Period extended by a period of twelve (12) months from the time such replacement/repair of the facilities or any part thereof”.</td>
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<tr>
<td>GC 27.8 - -- Add the following as a new Sub-Clause 27.8.1:</td>
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<tr>
<td>“GC 27.8.1 At the end of the Defect Liability Period, the Contractor’s liability ceases except for latent defects. The Contractor’s liability for latent defects warranty shall be limited to period of three (3) years from the end of Defect Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the Defect Liability Period defined in this GC Clause 27, but later.”</td>
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<tr>
<td>GC 27.9 – Replace the word “completion of facilities” with “operational acceptance” in line 5.</td>
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</tr>
<tr>
<td>PC 27.10 The critical components covered under the extended defect liability are PV Module, Inverter, Transformer, LT &amp; HT Switchgear, Cables, WMS, Switchyard, Isolators and protection system, Earthing and Lighting system and the period shall be <strong>5 years</strong> (the period shall not exceed 5 years, and to be inserted <strong>only when an extended defect liability is requested</strong>).</td>
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</table>
| PC 28 Functional Guarantees | GC 28.2 - Add the following after the words “GC Sub-Clause 42.2.2” in the last sentence:
“and recover the payments already made to the Contractor”.

GC 28.3 (a) - In line 3, after the word “expense” add the words “within a mutually agreed time”.

GC 28.4 - Substitute the word “The “ appearing in the beginning of the Sub-Clause with the following:
“In case the employer exercises its option to accept the equipment after levy of liquidated damages, the” |
| PC 31 Transfer of Ownership | PC 31.1 – deleted

GC 31.2 - loaded on to the mode of transport to be used to convey the Plant and equipment from the works to the Site and upon endorsement of the despatch documents in favour of the Employer”.

GC 31.4 - Add the following after the word “Facilities” in the last line: “provided quantity of any Plant and Equipment specifically stipulated in the Contract shall be the property of the Employer whether or not incorporated in the Facilities.” |
| PC 34 Insurance | GC 34.7

-- In line 4, after the word “Contractor” add the words “as per the procedure outlined in PC.”

Add Clause GC 34.8 as under:

**GC 34.8 – Appropriation of Insurance Proceeds**

Should any loss or damage occur for a period of five (05) years, the Supplier shall:
a) initiate and pursue claim till settlement; and
b) promptly make arrangements for repair and/or replacement of the damaged or lost item/s and ensure supply/commissioning in terms of the contract, irrespective of settlement of claim by the insurance company.

Keeping in view the above the Employer shall give, from time to time, written authorization to the insurance company to directly pay monies payable by the insurer to the supplier after excluding any payment including advances already paid by the employer in respect of those items. Such excluded payments will be payable to the Employer only and insurer will accordingly make the payment as advised by the employer from time to time. All subsequent payments, if any, due under the Contract, shall be regulated by the relevant terms of payment. |
| PC 36 Change in Laws and Regulations | GC 36.1 - Add the following before the last sentence of the Sub-Clause:
“However, these adjustments, after ascertaining the facts, would be restricted to direct transactions between the Employer and the Contractor and not on procurement of raw materials, intermediary components etc. by the Contractor. Further, no adjustment of the
<table>
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<tr>
<th>Section</th>
<th>Details</th>
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</table>
| PC 37 Force Majeure | GC 37.6 - In line 6-7-8-9, replace the words “failing which either party may terminate the Contract by giving a notice of the other, but without prejudice to either party’s right to terminate the Contract under GC Sub-Clause 38.5” with the words “failing which the dispute will be resolved in accordance with GC Clause 46”.

GC 37.7 - Delete this Sub-Clause.

GC 37.8 - Renumber this Sub-Clause as “37.7” |
| PC 38 War Risks | GC 38.5 - In lines 12-13, replace the words “failing which either party may terminate the Contract by giving a notice to the other” with the words “failing which the dispute will be resolved in accordance with GC Clause 46”.

GC 38.6 - In line 1-2, delete the words “or 38.5” |
| PC 39. Change in the Facilities | GC 39.2.5 - In the last sentence of first sub Para substitute the words “shall withdraw the proposed change and shall notify the Contractor in writing thereof” with the words “and the Contractor shall agree on specific rates for valuation of the Change”

GC 39.2.6 - Add the following sentence in the beginning of the Sub-Clause:

“If rates and prices of any change are not available in the Contract, the parties thereto shall agree on specific rates for the valuation of the change.” |
| PC 42 Termination | GC 42.3.1(b) - At the end of the para, after the word “Facilities”, add the words “which the Employer is required to obtain as per provision of the Contract as per relevant applicable laws of the country”.

PC 44.1 Export Restrictions | GC 44.1 – deleted. |
| PC 46. Disputes and Arbitration | PC 46.1 and PC 46.2

Name of the agreed Adjudicator ………………………………………

(insert name before signing contract).

Appointing Authority for the Adjudicator: [insert name of Authority].

[Note: if ITB 43 provides for an Adjudicator from list provided by an Institution, insert the name of the same institution as the appointing authority] |
| PC 46.4 | Daily rate and types of reimbursable expenses to be paid to the Adjudicator: [insert daily fees - not less than Rs. 10,000 per day, and reimbursable expenses – boarding/ lodging/ travel etc.]. |
PC 46.5

The procedure for adhoc arbitration will be as follows:

(a) In case of Dispute or difference arising between the Purchaser and a Contractor relating to any matter arising out of or connected with this contract, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 Arbitrators one each to be appointed by the Purchaser and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the Arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the* International Chamber of Commerce India (ICC India)/ Indian Council of Arbitration/ President of the Institution of Engineers (India).

(b) If one of the parties fails to appoint its Arbitrator in pursuance of sub-clause (a) above within 30 days after receipt of the notice of the appointment of its Arbitrator by the other party, then the * International Chamber of Commerce India (ICC India)/ Indian Council of Arbitration/ President of the Institution of Engineers (India), both in cases of Foreign Contractor as well as Indian Contractor, shall appoint the Arbitrator. A certified copy of the order of the* International Chamber of Commerce India (ICC India)/ Indian Council of Arbitration/ President of the Institution of Engineers (India), making such an appointment shall be furnished to each of the parties.

(c) Arbitration may be commenced prior to or after completion of the Works, provided that the obligations of the Employer, the Project Manager, the Contractor and the Adjudicator shall not be altered by reason of the arbitration being conducted during the progress of the Works.

(d) Arbitration proceedings shall be held at Jaipur, India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.
(e) The decision of the majority of Arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the Arbitrator appointed by such party or on its behalf shall be borne by each party itself.

(f) Where the value of the contract is Rs.50 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority, namely the * International Chamber of Commerce India (ICC India)/ Indian Council of Arbitration/ President of the Institution of Engineers (India).

(g) The Arbitrator should give final award within 120 days of starting of the proceedings [indicate the days (Between 120-180) by which arbitrator should give award], unless otherwise agreed to by the Parties.

(h) Performance under the contract shall continue during the arbitration proceedings and payments due to the Contractor by the Purchaser shall not be withheld, unless they are the subject matter of the arbitration proceedings.

* Choose one alternative, or any other appropriate institution (depending on nature of the work).

Alternatively

[Apart from the adhoc arbitration services obtained through mutually agreed Arbitrator(s) as above, Institutional arbitration services are also available in India. Institutional arbitration (and mediation) dispute resolution mechanisms can be gainfully used, preferably for relatively larger contracts. Following clause may be included, if it is decided to use Institutional Services for arbitration for resolution of disputes, and in such a case other clauses related to Arbitration/Arbitrator would be deleted. In the sample clause below, substitute the reference to ‘Rules of Domestic Commercial Arbitration of the Indian Council of Arbitration’ by the specific institution that is sought to be engaged e.g. The International Chamber of Commerce (India), Centre for Alternative Dispute Resolution (ICADR), The Indian Institute of Arbitration and Mediation (IIAM), Indian Chamber’s Council of Arbitration, Delhi International Arbitration Centre (DAC), Council For National and International Commercial Arbitration, London Court of International Arbitration (India Centre) or the like.]

"Any dispute or difference whatsoever arising between the parties out of or relating to the Work, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by
arbitration in accordance with the Rules of Domestic Commercial Arbitration of the Indian Council of Arbitration and the award made in pursuance thereof shall be binding on the parties. The arbitral tribunal shall consist of 3 Arbitrators, arbitration proceedings shall be held at Jaipur, India and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English”. ICA rules provide for arbitration tribunal of 3 arbitrators if the value of claim is over Rs. 1 crore unless the parties have agreed otherwise for a sole arbitrator.

Section IX. - Contract Forms
Notification of Award - Letter of Acceptance

[on letterhead paper of the Employer]

[The Letter of Acceptance shall be the basis for formation of the Contract as described in ITB Clause 40. This Standard Form of Letter of Acceptance shall be filled in and sent to the successful Bidder only after evaluation of bids has been completed, subject to any review by the World Bank required under the Loan Agreement.]

____________________

To: ______________________

This is to notify you that your Bid dated __________ for execution of the ______________ for the Contract Price in the aggregate of ______________ ______________, as corrected and modified31 in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security and an Environmental, Social, Health and Safety Performance Security [Delete ESHT Performance Security if it is not required under the contract] within 28 days in accordance with the Conditions of Contract, using for that purpose the Performance Security Form and the ESHT Performance Security Form [Delete ESHT Performance Security if it is not required under the contract] included in Section IX - Contract Forms, of the Bidding Document

[Choose one of the following statements:]

We accept that ______________________ [insert the name of Adjudicator proposed by the Bidder] be appointed as the Adjudicator32.

[or]

We do not accept that ______________________ [insert the name of the Adjudicator proposed by the Bidder] be appointed as the Adjudicator, and by sending a copy of this Letter of Acceptance to ______________________ [insert name of the Appointing Authority], the Appointing Authority, we are hereby requesting such Authority to appoint the Adjudicator in accordance with ITB 43.1 and GC 46.133.

We have reviewed the Method Statement and Construction Schedule submitted by you along with the bid (Technical Proposal) and our comments are given in the attachment. You are

31 Delete “corrected and” or “and modified” if not applicable.
32 To be used only if the Contractor disagrees in the Bid with the Adjudicator proposed by the Employer in the Instructions to Bidders, and has accordingly offered another candidate.
33 To be used only if the Contractor disagrees in the Bid with the Adjudicator proposed by the Employer in the ITB, has accordingly offered another candidate, and the Employer does not accept the counterproposal.
requested to submit a revised detailed Program of Performance of the Contract as per Clause 18.2 of General Conditions of Contract within 28 days of this Notification of Award.

Authorized Signature: ______________________________________
Name and Title of Signatory: ______________________________________
Name of Agency: ______________________________________

Attachment: Contract Agreement
Contract Agreement

THIS AGREEMENT is made the ________ day of ________________________, ____.

BETWEEN

(1) ____________________, a corporation incorporated under the laws of ________ and having its principal place of business at ______________ (hereinafter called “the Employer”), and (2) ____________________, a corporation incorporated under the laws of __________________________ and having its principal place of business at __________________________ (hereinafter called “the Contractor”).

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, complete and commission certain Facilities, viz. ______________ (“the Facilities”), and the Contractor has 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 GC 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 Appendices hereto

(b) Letter of Bid and Price Schedules submitted by the Contractor

(c) Particular Conditions

(d) General Conditions

(e) Specification

(f) Drawings

(g) Other completed bidding forms submitted with the Bid

(h) Any other documents forming part of the Employer’s Requirements

(i) Program of Performance, Methodology, Quality Assurance Program and ESHS Environmental Management Strategies and Implementation Plan

(j) Any other documents shall be added here

1.2 **Order of Precedence** (Reference GC 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.
Article 2. Contract Price and Terms of Payment

1.3 Definitions (Reference GC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

2.1 Contract Price (Reference GC 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: ____________, ____________ as specified in Price Schedule No. 5 (Grand Summary), and__________, ____________, or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment (Reference GC 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 may 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 for an amount of ____________; and shall be subject to the Uniform Customs and Practice for Documentary Credits 1993 Revision, ICC Publication No. 600.

In the event that the amount payable under Schedule No. 1 is adjusted in accordance with GC 11.2 or with any of the other terms of the Contract, the Employer shall arrange for the documentary credit to be amended accordingly.

Article 3. Effective Date

3.1 Effective Date (Reference GC Clause 1)

The Effective Date from which the Time for Completion of the Facilities shall be counted 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;

(d) The Contractor has been advised that the documentary credit referred to in Article 2.2 above has been issued in its favor.

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 two (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 Contract Price and the Time for Completion and/or other relevant conditions of the Contract.

**Article 4. Communications**

4.1 The address of the Employer for notice purposes, pursuant to GC 4.1 is: ____________________.

4.2 The address of the Contractor for notice purposes, pursuant to GC 4.1 is: ____________________.

**Article 5. Appendices**

5.1 The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

5.2 Reference in the Contract to any Appendix shall mean the Appendices 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 ________________________
Signed by, for and on behalf of the Contractor

[Signature]

[Title]

in the presence of ________________________________

APPENDICES

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 Installation 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

[Note: Sample Forms of Appendices are provided herein. However, since the provisions of Appendices would be contract specific, these may be finalized by the Employer on a case-to-case basis.]
Appendix 1. Terms and Procedures of Payment

[The following Terms and Procedures of Payment are given as a guideline suitable for Supply and Installation Contracts. In the event that the Employer wishes to introduce substantially different terms of payment, it may be done in consultation with the Bank. If additional Price Schedules are introduced, suitable terms of payment for such additional schedules must be added]

In accordance with the provisions of GC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on Price Schedules. 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 and payment shall be made only after due verification by the technical committee of RACP.

TERMS OF PAYMENT

Schedule No. 1. Plant and Equipment Supplied from Abroad – Not used

Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 2. Plant and Equipment Supplied from within the Employer’s Country

In respect of plant and equipment (including Mandatory Spare Parts), the following payments shall be made in Rs. In the following manner:

Ten percent (10%) of the total EXW 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. The advance payment security may be reduced in proportion to the value of the plant and equipment delivered to the site, as evidenced by shipping and delivery documents.

Sixty percent (60%) of the total or pro rata EXW amount upon Incoterm “Ex-Works,” upon delivery to the carrier within forty-five (45) days after receipt of invoice and documents.

Fifteen percent (15%) of the total or pro rata EXW amount upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Fifteen percent (15%) of the total or pro rata EXW amount upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 3. Design Services

In respect of design services, payments shall be made in Rs, in the following manner:

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 or pro rata design services amount upon acceptance of design in accordance with GC Clause 20 by the Project Manager within forty-five (45) days after receipt of invoice.

Schedule No. 4. Installation Services

In respect of installation services, payments shall be made in Rs. in the following manner:

Ten percent (10%) of the total installation 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. The advance payment security may be reduced in proportion to the value of work performed by the Contractor as evidenced by the invoices for installation services.

Forty percent (40%) of the measured value of work performed by the Contractor, as identified in the said Program of Performance, during the preceding month, as evidenced by the Employer’s authorization of the Contractor’s application, will be made monthly within forty-five (45) days after receipt of invoice.

Twenty Five percent (25%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer’s authorization of the Contractor’s monthly applications, upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Twenty Five percent (25%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer’s authorization of the Contractor’s monthly applications, upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 4 (A). Operation & Maintenance

The payment terms for O&M will be decided at the time of signing of contract with the successful bidder

Applicable Sales and similar other taxes and duties will be reimbursed on submission of bill with documentary evidence of payment within forty-five [45] days of receipt of documents.

In the event that the Employer fails to make any payment on its respective due date, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the rate of seven (7) percent (07%) per month for period of delay until payment has been made in full.

PAYMENT PROCEDURES

The procedures to be followed in applying for certification and making payments shall be as follows: [insert appropriate procedures, normally through bank transfer, crossed cheque for specific account number, letter of credit etc.]
Appendix 2. Insurance Requirements

Details to be completed by the Employer prior to issuing the bidding documents. In the event that the Employer provides any insurances under the Contract, appropriate details must be given.

Insurances to be Taken Out by the Contractor

In accordance with the provisions of GC 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 insurances 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 therefor) and to the construction equipment to be provided by the Contractor or its Subcontractors.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>

(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.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>

(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.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>

(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 supply and installation of the Facilities. Comprehensive insurance in accordance with statutory requirements.

(e) **Workers’ Compensation**

---

34 Contractors’ may also take out and maintain Contractor’s All Risks (CAR) Insurance policies, provided the policy covers all risks listed herein.
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 Insurances**
The Contractor is also required to take out and maintain at its own cost the following insurances:

**Details:**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 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 GC Sub-Clause 34.1, except for the Cargo, 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.
Appendix 3. Time Schedule

The Employer should normally provide a Time Schedule to be followed by the Contractor during the performance of the Contract. This schedule should be provided with the bidding documents under this Appendix. All completion times indicated must be in accordance with the information regarding Time(s) for Completion given in the Bid Data Sheet.

Except under exceptional circumstances, the Time Schedule should indicate periods of time (e.g., weeks or months) and not specify calendar dates. All periods should be shown from the Effective Date of the Contract.

Should it become necessary to amend the Time Schedule to reflect any agreements made with the selected Bidder prior to award of Contract, the amended Time Schedule shall replace the original Time Schedule prior to signature of the Contract Agreement.

If the bidding documents contain no Time Schedule, the Bidder shall be required to submit with its bid a detailed program, showing how and the order in which it intends to perform the Contract and showing the key events requiring action or decision by the Employer. In preparing this Program, the Bidder shall adhere to the Time(s) for Completion given in the Bid Data Sheet. The Time Schedule submitted by the selected Bidder and amended as necessary prior to award of Contract shall be included as Appendix to the Contract Agreement before the Contract is signed.

If bidders, pursuant to the provisions of the Instructions to Bidders, are to be permitted to offer an Alternative Bid based on a different Time Schedule, details of this and any resulting reduction in Price from their conforming bid based on the Time Schedule included in the bidding documents shall be submitted as an Attachment to their bid.
Appendix 4. List of Documents for Approval or Review

Pursuant to GC Sub-Clause 20.3.1, the Contractor shall prepare, and present to the Project Manager in accordance with the requirements of GC Sub-Clause 18.2 (Program of Performance), the following documents for:

A. Approval
   1. 
   2. 
   3. 

B. Review
   1. 
   2. 
   3.
Performance Security - Bank Guarantee

[including Additional Performance Security for unbalanced bids]

[Guarantor letterhead or SWIFT identifier code]

Performance Guarantee No……………………. [insert guarantee reference number]
Date…………………………. [insert date of issue of the guarantee]

To: __________________________________________ [name of Employer]
______________________________________________ [address of Employer]

WHEREAS _________________________ [name and address of Contractor] (hereinafter
called "the Applicant") has undertaken, in pursuance of Contract No. _____ dated ________________
to execute __________________________ [name of Contract and brief description of Facilities]
(hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Applicant shall
furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for
compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Applicant such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on
behalf of the Applicant, up to a total of ____________________ [amount of guarantee]
in words, and we undertake to pay you, upon your first written
demand and without cavil or argument, any sum or sums within the limits of ____________________
(amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for
your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Applicant before
presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract
or of the Works to be performed thereunder or of any of the Contract documents which may be made

35 In the case of a JV, insert the name of the Joint Venture
36 The Bank Guarantee from a Scheduled Bank in India is acceptable to the Employer.
37 An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the
   Contract less provisional sums, if any, and denominated in Indian Rupees.
between you and the Applicant shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall (a) be reduced by half upon our receipt of a copy of the Operational Acceptance Certificate; and (b) expire no later than the earlier of: 38 (i) twelve months after our receipt of either (a) above; or (ii) eighteen months after our receipt of a copy of the Completion Certificate; or (iii) the ____ day of _____, 2___.

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

Signature and seal of the guarantor ________________________________

Name of Bank ____________________________________________

Address ____________________________________________

Date ____________________________________________

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

38 This text shall be revised as and where necessary to take into account (i) partial acceptance of the Facilities in accordance with Sub-Clause 25.4 of the GC; and (ii) extension of the performance security when the Contractor is liable for an extended warranty obligation pursuant to Sub-Clause 27.10 of the GC (although in this latter case the Employer might want to consider an extended warranty security in lieu of the extension of the performance security).

39 Insert the date twenty-eight days after the expected expiration date of the Defect Liability Period. 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 [six months][one 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.”
ESHS Performance Guarantee No………………….[insert guarantee reference number]
Date………………………….[insert date of issue of the guarantee]
To: __________________________________________________ [name of Employer]
________________________________________________ [address of Employer]

WHEREAS _________________________ [name and address of Contractor40] (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _______ to execute __________________________ [name of Contract and brief description of Facilities] (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank41 for the sum specified therein as security for compliance with Environmental, Social, Health and/or Safety (ESHS) obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of ______________________ [amount of guarantee42] ____________________ [in words], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____________________ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

40 In the case of a JV, insert the name of the Joint Venture
41 The Bank Guarantee from a Scheduled Bank in India is acceptable to the Employer.
42 An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract less provisional sum if any, and denominated in Indian Rupees.
This guarantee shall be valid until …… 43, and consequently any demand for payment under it must be received by us at this office on or before that date.

Signature and seal of the guarantor _____________________________

Name of Bank ____________________________________________

Address ___________________________________________

Date ____________________________________________

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

43 Insert the date twenty-eight days after the expected expiration date of the Defect Liability Period. 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 [six months][one 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.”
Advance Payment Security
Demand Guarantee
[Guarantor letterhead or SWIFT identifier code]

Advance Payment Guarantee No……………………. [insert guarantee reference number]
Date…………………………. [insert date of issue of the guarantee]

To: __________________________________________ [name of Employer]
__________________________________________ [address of Employer]
___________________________________________ [name of Contract]

Gentlemen:

In accordance with the provisions of the Conditions of Contract, Sub-clause 13.2 ("Advance Payment Security") of the above-mentioned Contract, __________________________________________ [name and address of Contractor] (hereinafter called "the Applicant") shall deposit with __________________________ [name of Employer] a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____________ [amount of guarantee] __________________________________ [in words].

We, the __________________________ [bank], as instructed by the Applicant, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to __________________________ [name of Employer] on his first demand without whatsoever right of objection on our part and without his first claim to the Applicant, in the amount not exceeding __________________________ [amount of guarantee] __________________________________ [in words].

We further agree that no change or addition to or other modification of the terms of the Contract or of work to be performed thereunder or of any of the Contract documents which may be made between __________________________ [name of Employer] and the Applicant, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until __________________________ [name of

44 In the case of a JV, insert the name of the Joint Venture.
45 The Bank Guarantee from a Scheduled Bank in India is acceptable to the Employer.
46 An amount shall be inserted by the bank representing the amount of the Advance Payment, and denominated in Indian Rupees.
Employer] receives full repayment of the same amount from the Applicant. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

Yours truly,

Signature and seal: _______________________________
Name of Bank: _____________________________
Address: _______________________________________
Date: ___________________

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]
GENERAL SCOPE OF WORK

Scope of Supply & Work includes all design & engineering, procurement & supply of equipment and materials, testing at manufacturers works, multi – level inspections, packing and forwarding, supply, receipt, unloading and storage at site, associated civil works, services, permits, licenses, installation and incidentals, insurance at all stages, erection, testing and commissioning of 1.0 MW, 1.5 MW and 2 MW (AC) Grid Interactive Solar PV Power Plant for various FPC’s totaling to 22 MW at different clusters in the state of Rajasthan and performance demonstration with associated equipment and materials on turnkey basis and Five (5) years comprehensive operation and maintenance from the date of commissioning or Operational Acceptance, whichever is later.

Planning and Designing:

i. The Contractor shall plan and design for the electrical / mechanical / civil requirements including but not limited to plant configuration, space optimization, distance between rows of modules, sufficient passage for vehicle and man-power movement in the plant, mounting structures, location of Control room, cable routing, selection of equipment and items, procurement plan etc. to enhance plant output.

ii. The Contractor has to carry out the complete soil investigation of the site, through Government approved laboratory before designing various civil structures. The design of all civil foundations, R.C.C structures, buildings etc. will be carried out considering appropriate seismic zone of the area. All appropriate loads, wind velocity, seismic factors etc. will be considered as per the relevant IS Specifications while designing any Civil/Mechanical/Electrical structure. Also, the environmental conditions, soil characteristics, atmospheric effect, ground water table level, rain water data, land profile, etc. will be considered as per site condition and accordingly appropriate precautions, preventive measures such as applications of the Epoxy to Underground concrete structure and application of sufficient galvanization to steel structure will be taken while designing the structures. RCC of appropriate grade will be adopted considering surrounding...
weather and soil effect of site and as per the relevant I.S standard specifications. The concrete mix design of required strength shall be carried out in Govt. approved laboratory and shall be submitted to client for approval.

ii. The Contractor shall take into consideration all parameters like wind speed, seismic zone, safety factor and safe Soil Bearing Capacity (SBC) etc. for the purpose design and construction of civil foundations for all civil work as per relevant IS codes.

iv. The Contractor shall carry out Shadow Analysis at the site and accordingly design strings and arrays layout considering optimal usage of space, material and labor.

v. All designs & drawings have to be developed based on the governing standards and requirements of the project and also keeping in mind basic design specifications. Purchaser may approve minor deviations or suggest required modifications in the same which are meant for increasing plant performance without sacrificing quality / workmanship norms.

vi. All designs, specifications, reports, etc. submitted or used by the Contractor at any point in time shall first be approved by the Purchaser and revised by Purchaser, if required, prior to execution.

vii. The technology offered shall be commercially established technology and at least one Project based on this technology shall be satisfactorily operational for at least one year in India. Details of the Project with location and the successful operational period of the Project utilizing this technology shall also be mentioned before the submission of first set of drawings for approvals.

viii. The Purchaser reserves right to modify the specifications at any state as per local site conditions / requirements and EPC contractor shall comply with modification without any extra cost and time.
Approval of Designs / Drawings:

i. The following procedure has to be followed for assessment and approval of designs, specifications and drawings during the course of the project: The Contractor shall submit to the Purchaser the documents in hard copy and soft copy to both with proper reference and drawing numbers. The respective documents for selection, supply, installation, erection, commissioning of equipment/ structures have to be submitted at least 15 days in advance to the planned start of the activity as per Contractor’s project schedule. The Contractor shall submit documents as required for this project according to his design and specifications. The Purchaser will assess and approve the documents within 10 days of submission of documents; and only after the approval the Contractor shall release the documents on site for execution. The documents shall be revised by the Contractor as per instructions /comments given by the Purchaser if required, prior to execution. Subsequent revisions and the final version of the documents shall also be submitted in hard and soft copy to the Purchaser. The Contractor has to take into account the above mentioned process of revisions (if required) and adjust the preparation and delivery of the documents such that the overall planned project schedule is not affected.

ii. The Contractor has to submit all drawings, which are related to plant for approval and the Contractor, shall not claim any drawing as their intellectual property. Drawing which is developed for project will be the intellectual property of the Purchaser.

iii. The Contractor shall submit a comprehensive project management schedule in the form of a Gantt chart CPM/PERT chart and shall be liable for abiding by the schedule.

iv. The Bidder shall submit in the Bid, basic engineering drawings of all civil work, including but not limited to, layout of the power plant indicating rows of photovoltaic modules, layout of different buildings, basic MMS design, civil foundations, location of control panels, DC and AC Distribution Boxes and anchoring design / details, electrical SLD, shading analysis and generation estimation report etc.

v. The bidder shall submit in the Bid technical specifications / drawings / designs and datasheets for all electrical work including but not limited to electrical component of the power plant including photovoltaic modules, cables, connectors, junction boxes,
inverters, transformers, monitoring and auxiliary systems, etc.

vi. The Contractor shall submit a comprehensive maintenance schedule for operation and maintenance of the photovoltaic power plant along with checklists before commencement of work on site and shall be liable for abiding by the schedule. All construction, operation and maintenance procedures shall be carried out through appropriate relevant standards, regulations and labour laws.

Evacuation of Power & Metering Point:

For the purpose of this project, the evacuation voltage shall be at 11/33 kV AC (three phase) wherein evacuating point cum metering point shall be installed at 11/33 kV interconnection point at the Discom network. The Bidder has to carry out all necessary arrangement to evacuate 11/33 KV power supply up to Discom. ABT meter to measure net power evacuation shall be installed at 11/33 kV interconnection point.

Generation Guarantee

a) The Contractor shall provide a minimum generation guarantee corresponding to a capacity utilization factor (CUF) of 17.00% (the “Guaranteed CUF”) with respect to the AC capacity of the PV system.

b) This Guaranteed CUF shall be calculated on an annual-basis and shall be verified by the Discom at the end of each year during the 5 (five) year guarantee period.

c) There shall be no year-on-year reduction on the Guaranteed CUF during the 5 (five) year guarantee period.

d) In case of energy generation corresponding to the average of surrounding 10 such locations is less or less than the Guaranteed CUF, whichever is higher, a penalty at the rate of Rs. 7.00 per kWh from the Contractor for such shortfall at the end of the contract year will be compensated to the FPC. DISCOM will provide the information of CUF and penalty to be imposed to the FPC.

e) In case of energy generation corresponding to less than the Guaranteed CUF, It is clarified that the penalty for loss in generation shall not be duplicated with the penalty for delay in rectification of fault beyond 72 hours of complaint.
Operation and Maintenance (O&M):

The scope of work includes Operation and Maintenance (O&M) of the plant for five (05) years, wherein the plant shall generate at least equivalent to the guaranteed Performance of Plant. The Bidder shall submit in the Bid a comprehensive project execution schedule as well as Operation and Maintenance (O&M) schedule with resource planning in the form of Gantt chart and shall be liable for abiding by the schedule. It is the responsibility of the Contractor to perform the necessary maintenance/ timely replacement of all Civil /Mechanical or Electrical components of the project during this O&M period such that the guaranteed performance of the plant is not compromised. Any damage to CIVIL/ ELECTRICAL/ MECHANICAL components of the plant is to be reworked/ replaced/ supplied without any extra cost and time by the Contractor during complete O&M period. The Operation and Maintenance shall be comprehensive. The maintenance service provided shall ensure project functioning of the Solar PV system as a whole and 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 and 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 Plant, cleaning of module surface, tightening of all electrical connections, and any other activity that may be required for proper functioning of the Plant as a whole. Necessary maintenance activities, preventive and routine for Transformers and associated switchgears also shall be included. Schedule for maintenance activities shall be furnished by Bidder

b. Breakdown/ Corrective Maintenance: Whenever a fault has occurred, the Contractor has to attend to rectify the fault, the fault must be rectified within 72 hrs time from the time of occurrence of fault failing which a penalty at the rate of Rs. 7.00 per kWh from the Contractor for such shortfall will be compensated to the FPC.

c. The date of Comprehensive Operation and Maintenance Contract period of the Plant shall begin on the date as defined in the NIT of this Tender. Detailed scope of comprehensive operation & maintenance has been described in the document. However, operation of the Power Plant means operation of system as per bidding schedule and workmanship in order to
keep the project trouble free covering the guarantee period.

**Tracking Structures:**

The Purchaser encourages Bidders to employ proven and reliable seasonal tracking system, however the Bidder should note that total land available is approximately 5 acres for 1 MW Project. The Bidder shall submit in the Bid details / specifications / designs / guarantees and warranties / and any other claims on performance / output of the solar tracking solutions in the Bid document.

**Electrical Work:**

Consisting of installation of solar PV modules, junction boxes, grid-tied inverters, isolation transformers, meters, control panel, 11 kV switchgear for evacuation, interconnection through wires, cables, bus bars, etc.; plant lighting system, automatic weather station, SCADA and remote web-based communication & monitoring hardware, software etc.; plant and human safety and protection equipment including danger signs etc.

**Civil and Other Non-Electrical Work:**

**Module Mounting Structures (MMS):** Successful Contractor shall design, fabrication, supply and install module mounting structures with all required accessories like clamps, nuts, bolts, cable ties etc.; Fixed/Single Axis/Double Axis type structures can be accepted OR The structures can be of only seasonal are accepted;

**Foundations:** Successful Contractor shall design and construct appropriate civil foundations for MMS, prefabricated structures, transformers, switchyard equipments, feeder bay etc.

**Prefabricated Structures:** The following prefabricated structures are to be planned and constructed by the Contractor for the projects.

- Control room including Invertors and office room with toilet unit : 1 number
- Security cabin near plant gate : 1 number
- Necessary Approach Road and Drainage System shall be considered.
**Solar PV Module Cleaning System:** The Contractor shall plan for one wash of all solar PV modules on weekly basis. For this, contractor shall create and operate 20,000 litre capacity water storage tank with the cPVC pipeline network. The Contractor has to design and construct water supply network as per the requirement of water for cleaning of PV modules (at least once in a week) and for daily uses.

**Chain-Link Fencing:** The Contract or shall provide chain-link fencing of the entire plant boundary.

**Cable Trenches:** Construction of RCC cable trenches with cable trays and chequered plate covers in control rooms, earthen excavated cable trench with alternate layers of sand and brick as per relevant IS from PV arrays to control room to 11 KV Evacuation & up to Take over point shall be provided by the Contractor.

**Main Gate:** The Contractor shall provide main gate of structural steel material of appropriate design.

**Site leveling:** The Contractor shall level the site, as required, so as to compact the plant in minimum possible area and also minimize shading losses because of solar PV module structures.

**Communication:** The Contractor shall provide complete plant SCADA with SCADA server having string level monitoring capabilities over remote server. Contractor shall lay the cable in appropriate cable trench, connect with suitable connectors and terminate to the SCADA server inside control room. The Contractor shall also provide necessary internet connection through GPRS enabled modem along with LAN connectivity / Broadband for data communication over remote server and shall bear the cost of the same during the Contract period including O&M. The Contractor shall provide necessary provision of RTU for communication with SLDC. The Contractor shall submit the below mentioned Technical Data Sheet for String RTU, TCP String, Central RTU in the prescribed format.

<table>
<thead>
<tr>
<th>Type Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Entry Characteristics</td>
</tr>
<tr>
<td>AC input voltage range ($V_{ac, min} \leq V_{ac, max}$)</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Nominal AC input voltage ($V_{ac,n}$)</td>
</tr>
<tr>
<td>Rated frequency ($f_r$)</td>
</tr>
<tr>
<td>DC Input Voltage Range ($V_{dc,min} \leq V_{dc,max}$)</td>
</tr>
<tr>
<td>Nominal DC input voltage ($V_{dc,n}$)</td>
</tr>
</tbody>
</table>

**RS485 Section**
- Serial interface type
- Baud rate
- Protocol
- Number of devices
- Line biasing resistor (wherever necessary)
- Termination resistor

**RS485 MODBUS section**
- Serial interface type
- Baud rate
- Protocol
- Number of devices
- Line biasing resistor (wherever necessary)
- Termination resistor

**Physical and Environmental**
- Environmental protection rating
- Ambient temperature range
- Relative humidity

**Compliance**
- Isolation
- Marking
- Safety and EMC standard

Essential list of I/O and equipment is given herewith, but scope is not limited to the Essential List, contractor is fully responsible to provide complete SCADA System which can be extensible / communicable with add additional / future solar plant.
<table>
<thead>
<tr>
<th>Sr.</th>
<th>Equipment to be monitored</th>
<th>Data to Be Monitor (Real Time)</th>
<th>Type of IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>String Monitoring / Array Monitoring</td>
<td>Each PV string needs to be monitored</td>
<td>Through Communication with SJB PLC/Card</td>
</tr>
<tr>
<td>2</td>
<td>String Junction Box / Array Junction Box (SJB = AJB)</td>
<td>SJB internal temperature and SJB Bus Voltage and Current</td>
<td>Through Communication with SJB PLC/Card</td>
</tr>
<tr>
<td>3</td>
<td>Inverter</td>
<td>All Electrical Parameters of Inverter along with Scanning, Records &amp; Error communication</td>
<td>Through Communication with SJB PLC/Card</td>
</tr>
<tr>
<td>4</td>
<td>Inverter Transformer</td>
<td>Oil and Winding Temp Monitoring</td>
<td>Analog Input</td>
</tr>
<tr>
<td>5</td>
<td>11KV VCB Panel</td>
<td>ON/OFF and Trip position of Each Breaker and Energy Meter communication</td>
<td>Through DI and Communication and RS-485/MODDBUS for Energy Measurement</td>
</tr>
<tr>
<td>6</td>
<td>Weather Monitoring Station</td>
<td>Two no. of Class I Pyranometer (one for GHI, one at PV plane collector angle), Two numbers of contact type temperature sensors one at module front and the other at backside of the module. Ambient temperature sensor, Wind velocity and speed sensor.</td>
<td>Through Communication</td>
</tr>
<tr>
<td>7</td>
<td>Main and Check Meter</td>
<td>All electrical parameters recorded by energy meter</td>
<td>Through RS-485/MODDBUS communication</td>
</tr>
</tbody>
</table>
Plant Safety Equipment:

The Contractor shall provide appropriate numbers of foam type fire extinguishers / CO₂ extinguishers, sand buckets and transformer discharge rod at Inverter Rooms, Control Room, Security Cabin and Switchyard/Substation. Further, all high voltage places to be provided with danger sign boards with appropriate size and material to last for 25 years.

Statutory Requirements:

All construction, operation and maintenance procedures shall be carried out through appropriate relevant standards, regulations laid by MNRE and/or any other agency as and when applicable. Further, this shall comply with the applicable labor laws. The Bidder shall make themselves aware of such requirements and shall not solely depend on the Purchaser to avail full information.

Final Commissioning:

The commissioning procedure shall be as per Chief Electrical Inspector to Government (CEIG) requirements. The Contractor shall also ensure the following:

i. Obtaining written certificate of commissioning of the facility and permission to connect to the grid from the office of the Chief Electrical Inspector of the state and any other authorized representative from Government of India (GoI).

ii. Inspection and successful electrical commissioning certificate.

iii. Obtaining all certificates required by Discom from agency appointed by them.

iv. Satisfactory completion certificate towards completion of all other contractual obligations by the Contractor as stipulated.

Comprehensive Operation and Maintenance Contract:

The Bidder shall separately quote for Operation and Maintenance of the power plant for Five (05) Years, wherein the plant should perform at a minimum annual CUF of 17.00%. Any damage to CIVIL/ELECTRICAL/MECHANICAL components of the plant is to be reworked/replaced/supplied without any extra cost and time by the Contractor during maintenance period. This means after completion of O & M period every component of the plant should be in good and working condition.
Disclaimer: Any civil / electrical / other work, which is not mentioned or included in this Tender document but necessary for the construction and O&M of Solar PV plants shall be borne by the Contractor. The Contractor shall, unless specifically excluded in the Contract, perform all such works and /or supply all such items and materials not specifically mentioned in the Contract/ Tender Document but can be reasonably inferred from the Contract as being required for attaining completion, commissioning and performance of the facilities, delivering and maintaining the plant & achieving the required minimal annual CUF of 17% during O&M period of Solar PV plants, as if such work and / or items and materials were expressly mention in the Contract without any extra cost implication and liability. All specifications mentioned in this Tender indicates minimum technical requirement. The Contractor may propose alternate specifications or design though the final acceptance of the same is subject to the Purchaser’s discretion.

Bill of Material:
The equipment and material for (AC) Grid Interactive Solar Photovoltaic Power Plant with associate system (typical) shall include, but not limited to the following:

<table>
<thead>
<tr>
<th>Item Details</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV Modules</td>
<td>Nos.</td>
</tr>
<tr>
<td>Module Mounting Structures</td>
<td>Set</td>
</tr>
<tr>
<td>Main Junction Boxes with monitoring capabilities</td>
<td>Lot</td>
</tr>
<tr>
<td>Solar module array to Junction box Interconnection cable (Cu)</td>
<td>RM</td>
</tr>
<tr>
<td>Junction box to Inverter Interconnection Cable</td>
<td>RM</td>
</tr>
<tr>
<td>Connection accessories – lugs, ferrules, glands etc.</td>
<td>Lot</td>
</tr>
<tr>
<td>DC cables &amp; AC (LT/ HT) Cable of appropriate sizes</td>
<td>RM</td>
</tr>
<tr>
<td>Power Conditioning Units/ Inverters</td>
<td>Nos.</td>
</tr>
<tr>
<td>Meteorological station with sensors and data logger</td>
<td>Lot</td>
</tr>
<tr>
<td>String monitoring system (SCADA) and ancillaries</td>
<td>Set</td>
</tr>
<tr>
<td>Inverter Transformers (Power)</td>
<td>Set</td>
</tr>
<tr>
<td>Auxiliary Transformers</td>
<td>Set</td>
</tr>
<tr>
<td>Power Transformers</td>
<td>Set</td>
</tr>
<tr>
<td>Circuit breakers, CT and PT set</td>
<td>Set</td>
</tr>
<tr>
<td>First step-up voltage level Indoor/outdoor interfacing panels with CT, VCB, PT</td>
<td>Set</td>
</tr>
<tr>
<td>XLPE Outgoing feeder cable and supports</td>
<td>Set</td>
</tr>
<tr>
<td>Item</td>
<td>Unit</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>AC &amp; DC distribution panels/ boards</td>
<td>Lot</td>
</tr>
<tr>
<td>Control and Relay Panel</td>
<td>Lot</td>
</tr>
<tr>
<td>Second step-up voltage level outdoor switchyard with CT, VCB, PT, Relays</td>
<td>Set</td>
</tr>
<tr>
<td>Lightning Arresters of suitable ratings</td>
<td>Nos.</td>
</tr>
<tr>
<td>Earth mat for switch yard, DC field array and equipment</td>
<td>Lot</td>
</tr>
<tr>
<td>Control and power cables</td>
<td>Lot</td>
</tr>
<tr>
<td>Surge Protection devices and Fuses</td>
<td>Set</td>
</tr>
<tr>
<td>Earth cables, flats and earthing pits</td>
<td>Lot</td>
</tr>
<tr>
<td>Equipment and Control cum office Building</td>
<td>Lot</td>
</tr>
<tr>
<td>Rubber Mats for specific kV ratings</td>
<td>Lot</td>
</tr>
<tr>
<td>Foam type Fire extinguisher</td>
<td>Lot</td>
</tr>
<tr>
<td>CO2 Extinguisher</td>
<td>Lot</td>
</tr>
<tr>
<td>Sand Buckets</td>
<td>Lot</td>
</tr>
<tr>
<td>Discharge Rods</td>
<td>Lot</td>
</tr>
<tr>
<td>XLPE cable/overhead line from take off point upto grid substation along with associated equipment</td>
<td>Lot</td>
</tr>
<tr>
<td>Power efficient peripheral lighting arrangement for the plant safety</td>
<td>Nos.</td>
</tr>
<tr>
<td>Fire – fighting automation and signboards in buildings</td>
<td>Lot</td>
</tr>
<tr>
<td>Metering Equipment (Meters, and associated CT and PT”s)</td>
<td>Set</td>
</tr>
<tr>
<td>Protection Equipment</td>
<td>Set</td>
</tr>
<tr>
<td>Solar Observatory and remote monitoring assistance</td>
<td>Set</td>
</tr>
<tr>
<td>Module cleaning system</td>
<td>Lot</td>
</tr>
<tr>
<td>CCTV cameras</td>
<td>Lot</td>
</tr>
<tr>
<td>Danger plates, anti-climbing, bird protection etc.</td>
<td>Lot</td>
</tr>
<tr>
<td>Battery/Battery Charger and UPS</td>
<td>Lot</td>
</tr>
<tr>
<td>Balance equipment other than specified above</td>
<td>Lot</td>
</tr>
</tbody>
</table>

All the material shown here is indicative only and may vary as per design and planning by the bidder. The bidder must provide the BOM of the plant as per the design during the time of bidding. The technical features of major equipment are described here under.
DETAILED ELECTRICAL WORK WITH TECHNICAL PARAMETERS

Photovoltaic modules:

i. The Contractor shall employ solar PV module of Crystalline-Si (Mono / Poly / Multi) solar technology only. The Contractor shall provide detail Technical Data Sheets, Certifications of Standard Testing Conditions (STC: defined as Standard Testing Condition with air mass AM1.5, irradiance 1000W/m², and cell temperature 25°C) as per the latest edition of IEC 61215 and as tested by IEC / MNRE recognized test laboratory. The Bidder shall also specify the minimum guaranteed energy output of solar PV module as per the Site Condition in the Bid.

ii. The PV modules to be employed shall be of minimum 72 cell configuration with rated power of module ≥ 305/310Wp as certified for solar PV module power performance test as prescribed by latest edition of IEC 61215 and as tested by IEC / MNRE recognized test laboratory. The maximum tolerance in the rated power of solar PV module shall have maximum tolerance of +3%. No negative tolerance in the rated capacity of solar PV module is allowed.

iii. All modules shall be certified IEC 61215 2nd Ed. (Design qualification and type approval for Crystalline Si modules), IEC 61730 (PV module safety qualification testing @ 1000 V DC or higher).

iv. Minimum certified module efficiency shall be minimum 15% for crystalline. The temperature co-efficient of the module shall not be more than -0.45% / °C.

v. All photovoltaic modules should carry a performance warranty of >90% during the first 10 years, and >80% during the next 15 years. Further, module shall have minimum performance warranty of > 97% during the first year of installation.

vi. The module mismatch losses for modules connected to an inverter should be less than 1%.

vii. SPV module shall have module safety class-II and should be highly reliable, light weight and must have a service life of more than 25 years.
viii. The SPV module shall be made up of high transitivity glass & front surface shall give high encapsulation gain and the module shall consists of impact resistance, low iron and high transmission toughened glass. The module frame shall be made of corrosion resistant material, which shall be electrically compatible with the structural material used for mounting the modules.

ix. The SPV modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from environment. The encapsulation arrangement shall ensure complete moisture proofing for the entire life of solar modules.

x. The module frame should have been made of Aluminium or corrosion resistant material, which shall be electrolytically compatible with the structural material used for mounting the modules with sufficient no. of grounding/installation.

xi. PV modules to be used in highly corrosive atmosphere throughout their lifetime. They must qualify to IEC 61701 / IS 61701.

xii. All materials used for manufacturing solar PV module shall have a proven history of reliability and stable operation in external applications. It shall perform satisfactorily in relative humidity up to 95% with temperature between -40°C to +85°C and shall withstand adverse climatic conditions, such as high speed wind, blow with dust, sand particles, saline climatic / soil conditions and for wind 180 km/hr on the surface of the panel.

xiii. Modules only with the same rating and manufacturer shall be connected to any single inverter. Modules shall compulsorily bear following information in the form of ID encapsulated with solar cell in the manner so as not to cast shadow on the active area and to be clearly visible from the top.

xiv. The Bidder shall provide in the Bid, power performance test data sheets of all modules. The exact power of the module shall be indicated if the data sheet consists of a range of modules with varying output power.
xv. Only those crystalline modules which are supplied for a capacity more than 20 MW in other projects across the world and is successfully operational for at least one year shall be considered for this Project. On this account, the Contractor shall provide full information, to the satisfaction of Purchaser before placing final order for the modules. The Contractor shall also submit the proof of original purchase.

xvi. Purchaser or its authorized representative reserves the right to inspect the modules at the manufacturer’s site prior to dispatch.

xvii. The Bidder is advised to check and ensure the availability of modules prior to submitting the Tender Document.

xviii. The Contractor would be required to maintain accessibility to the list of module IDs along with the above parametric data for each module.

**Information to be displayed on solar PV module**

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the manufacturer of the PV module and RFID code</td>
</tr>
<tr>
<td>2</td>
<td>Name of the manufacturer of solar cells</td>
</tr>
<tr>
<td>3</td>
<td>Month &amp; year of the manufacture (separate for solar cells and modules)</td>
</tr>
<tr>
<td>4</td>
<td>Country of origin (separately for solar cells and module)</td>
</tr>
<tr>
<td>5</td>
<td>Wattage, Imp, Vmp, Isc, Voc, temperature co-efficient of power and FF for the module</td>
</tr>
<tr>
<td>6</td>
<td>Unique Serial No. and Model No. of the module</td>
</tr>
<tr>
<td>7</td>
<td>Date and year of obtaining IEC PV module qualification certificate</td>
</tr>
<tr>
<td>8</td>
<td>Name of the test lab issuing IEC certificate</td>
</tr>
<tr>
<td>9</td>
<td>Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001</td>
</tr>
</tbody>
</table>

xix. Solar Modules should be tested with relevant dust standards i.e. IEC 60068-2-68.

xx. I-V curve for the module at standard test condition should be provided by bidder.
Module Mounting Structure (MMS):

i. The MMS should be designed for a seasonal tracker optimised for at least 3 positions (1 number for summer, 1 number for winter and 1 number for latitude) so as to meet the offered CUF and the angle should be systematically optimized for maximum energy generation throughout the year based on location and local weather variables for each module technology.

ii. Material for the structure mounting should be as per IS 2062/IS 4759.

iii. The MMS should be designed for an optimum tilt angle so as to meet the required minimal annual CUF of 17%. The angle should be systematically optimized for maximum energy generation throughout the year based on location and local weather variables for each module technology.

iv. The MMS should be safe, and designed to allow easy replacement of any module and easy access to the O&M staff.

v. The array structure shall be so designed that it withstand severe cyclonic storm with wind speed up to maximum 180 kmph. None of the MMS component shall have thickness less than 1mm irrespective of design calculations.

vi. The structure shall be designed for simple mechanical and electrical installation. It shall support Solar PV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly. There shall be no requirement of welding or complex machinery at site and is strictly not allowed.

vii. Seismic factors for the site to be considered while making the design of the foundation/ramming etc. or any technology. The design of array structure shall be based on soil test report of the site and shall be approved from the Client/Consultant.

viii. All modules shall be appropriately grounded using a continuous copper conductor as per appropriate IS but not less than cross section area of 6 sqmm. The frames and leg assemblies of the array structures shall be made of hot dip Galvanized steel per ASTM A123.
ix. In case of galvanization of structures, specific requirement for thickness of galvanization should be at least minimum 80 microns but at no point it should be less than 60 microns. Ensure inner side should also be galvanised with same thickness of coating.

x. All fasteners shall be of Stainless steel - SS 304. Nut & bolts, supporting structures including the entire MMS shall have to be adequately protected against all climatic condition..

xi. Modules shall be clamped / bolted with the structure properly. The material of construction shall be Al / Steel. Clamps / bolts shall be designed in such a way so as not to cast any shadow on the active part of a module.

xii. Module mounting structures shall also be earthed through proper separate earthing.

xiii. The material of construction, structural design and workmanship shall be appropriate with a factor of safety of not less than 1.5 as per IS 456.

xiv. For module installed in single table the horizontal/vertical tolerance in alignment shall not more than 5mm is allowed. The horizontal/vertical in alignment for tolerance for table installed in the single array shall not be more than 10mm

xv. The Contractor shall provide to Purchaser the detailed design, specifications and calculations of the MMS and take approval from client/consultant.

xvi. The Bidder / manufacturer shall specify installation details of the Solar PV modules and the support structures with appropriate diagrams and drawings.

xvii. The Module Mounting Structure design shall be certified by a chartered/Licensed structural engineer.

xviii. The Bidder should design the structure height considering highest flood level (can be considered from the nearest bridge/culvert) at the site. The minimum clearance between the lower edge of the module and the ground shall be the higher of (i) above highest flood level at the site or (ii) minimum 750 mm clearance above ground level.
The Bidder shall be permitted ramming of the module mounting structure provided that they obtain consent of the Purchaser. The Purchaser shall provide such consent once it is convinced that such ramming shall not in any way deteriorate the strength of the structure and shall not reduce the structure’s strength to enjoy a working life of more than 25 years.

Civil foundation design for Module Mounting Structures (MMS) as well as control room including inverter, Panel placement, office room, pantry and toilet unit shall be made in accordance with the Indian Standard Codes and soil conditions, with the help of Chartered/licensed Structural Designer having substantial experience in similar work.

**Junction Box / Combiner Box:**

i. The Contractor shall provide sufficient no. of Array Junction Boxes / PV combiner boxes / DCDBs.

ii. All switch boards shall be provided with adequately rated copper bus-bar, incoming control, outgoing control etc. as a separate compartment inside the panel to meet the requirements of the Chief Electrical Inspector of Government (CEIG). All live terminals and bus bars shall be shrouded. The outgoing terminals shall be suitable to receive suitable runs and size of cables required for the Inverter rating.

iii. The degree of protection for following equipment shall be:

   - Indoor Junction box : IP 21
   - Outdoor Junction Box : IP 65

iv. All junction/ combiner boxes including the module junction box, string junction box, array junction box and main junction box should be equipped with appropriate functionality, safety (including fuses, grounding, etc.), string monitoring capabilities, and protection.
v. 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 cable ferrules will be fitted at the cable termination points for identification.

Each Array Junction Box shall have suitable Reverse Blocking Diodes / Fuses of maximum DC blocking voltage of 1000 V with suitable arrangement for its connecting. The Array Junction Box shall also have suitable surge protection device. In addition, over voltage protection shall be provided between positive and negative conductor and earth ground such as Surge Protection Device (SPD) or on-load DC disconnectors with shoes. All incoming & outgoing cables must be terminated with Brass Gland for Cu Cables & Steel Gland for Al Cables. All Glands must be of Double Compression type for Outdoor duty & Single Compression type for Indoor duty. The rating of the Junction Boxes shall be suitable with adequate safety factor to inter connect the Solar PV array.

vi. The Junction Boxes shall have suitable arrangement for the followings

vii. Combine groups of modules into independent charging sub-arrays that will be wired into the controller.

viii. Provide arrangement for disconnection for each of the groups.

ix. Provide a test point for each sub-group for quick fault location.

x. To provide group array isolation

xi. The rating of the Junction Boxes shall be suitable with adequate safety factor to inter connect the Solar PV array.

xii. The junction boxes shall be dust, vermin, and waterproof and made of thermoplastic 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 21(indoor) and Protection Class II.
xiii. 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.

xiv. The current carrying rating of the Junction Boxes shall be rated with standard safety factor to interconnect the Solar PV array.

xv. Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.

xvi. Adequate capacity solar DC fuses & isolating miniature circuit breakers / MCCB should be provided if required. The Junction Box must have space for the maintenance and 10% Spare Install Capacity for future integration.

xvii. Other Sub systems and components used in the SPV power plants (Cables, connectors, Junction Boxes, Surge Protection devices, etc.) must also confirm to the relevant international /national standards for electrical safety besides that for quality required for ensuring expected service life and weather resistance. It is recommended that the interim, the cables of 600-1800 Volts Dc for outdoor installations should comply with the draft EN 50618 or Equivalent to other Indian / American / European Standard for service life expectancy of 25 years.
Inverter and Power Conditioning Unit (PCU):

i. The Contractor has to provide sufficient information to the satisfaction of Purchaser before placing the final order for PCUs/Inverters. Power Conditioning Unit (PCU) shall consist of an electronic inverter with latest technology available in the market along with associated control, protection and data logging devices and must be fully communicable to SCADA with OPEN Communication Protocol. If any software required for the communication & SCADA, the same to be made available within the EPC package by the Contractor.

ii. All PCUs should consist of associated control, protection and data logging devices and remote monitoring hardware, software for string level monitoring.

iii. Dimension and weight of the PCU shall be indicated by the Bidder in the Bid.

iv. No. of inverters to be supplied shall be worked out by Supplier based on DC rating of inverter, Pnom ratio (Pnominal array / Pnominal inverter ≤ 1.1) and limit on overloading capacity (i.e. overload losses ≤ 0.2%)

v. The Bidder shall guarantee average annual power loss due to non-threshold condition to be less than 0.1% and shall support the claim with necessary document / data / graphs in the Bid.

vi. Example Calculation for the Selection of Inverter Capacity:

If two (2) no. of 500 kW inverter (DC rated power) is allowed to cater to a 1000 kW array (cumulative DC power of solar array at module level under Standard Test Conditions “STC” of 1000 W/m², AM of 1.5, 25 OC). This corresponds to Pnom ratio ≤1.1. Supplier shall extend the same analogy for other capacity of inverters.

For inverter capacity below 1 MW, two inverters aggregating to a capacity of > 1 MW shall be treated as a ‘set’ and shall be installed in physical proximity in the same inverter room connecting with one transformer i.e. two units of 550 kW inverter shall be
connected with a single 11 kV transformer unit of capacity > 1.25 MVA. Also contractor can propose Transformer / Inverter to step up voltage at 11 kV of appropriate capacity suitable to 1 MW > 1.25 MVA Transformer Capacity. The Bidder has to indicate the selected parameters in the Bid.

vii. DC input terminals must be in enough numbers so as each terminal is connected to dedicated single input. Two DC inputs cannot be connected on the single input DC terminal of the inverter. If adequate number of input are not available in the selected inverter by the Contractor then a weather proof DC junction box with copper busbar, protection devices such as fuse, DC disconnects may be incorporated in to design. The Bidder has to indicate the selected parameters in the Bid.

viii. The minimum European efficiency of the inverter shall be not less than 98% above measured at 100% load as per IEC 61683 standards for measuring efficiency. The Bidder shall specify the conversion efficiency of different loads i.e. 25%, 50%, 75% and 100% in the Bid. The Bidder should specify the overload inverter capacity in the Bid.

ix. The PCU shall be tropicalized and design shall be compatible with conditions prevailing at site. Provision of exhaust fan with proper ducting for cooling of PCU’s should be incorporated in the PCU’s, keeping in mind the extreme climatic condition of the site.

x. The inverters shall have minimum protection to IP 65(Outdoor)/ IP 21(indoor) and Protection Class II.

xi. Nuts & bolts and the PCU enclosure shall have to be adequately protected taking into consideration the atmosphere and weather prevailing in the area.

xii. (Grid Connectivity) Relevant regulations and grid code as amended and revised from time to time shall be complied. The system shall incorporate a uni-directional 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.

xiii. All three phases shall be supervised with respect to rise/fall in programmable threshold values of frequency.
xiv. 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.

xv. This should be capable of synchronize maximum within 2 Minutes.

xvi. The PCU shall be capable of controlling power factor dynamically.

xvii. 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 and make of MPPT shall be mentioned by the Bidder in the Bid. The MPPT must have provision for constant voltage operation. The MPPT unit shall confirm to IEC 62093 for design qualification.

xviii. 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.

xix. Sleep Mode: Automatic sleep mode shall be provided so that unnecessary losses are minimized at night. The power conditioner must also automatically re-enter standby mode when threshold of standby mode reached.

xx. Stand – By 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.

xxi. 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.

xxii. 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.

a. **Earth Leakage Faults:** The PCU shall have the required protection arrangements against earth leakage faults and –Ve DC directional protection.

b. **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).

c. **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.**

d. **Galvanic Isolation:** The PCU inverter shall have provision for galvanic isolation but other suitable option is also acceptable. 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.

e. **Anti-islanding (Protection against Islanding of grid):** The PCU shall have anti islanding protection. (IEEE 1547/UL 1741/ equivalent BIS standard).

f. **Unequal Phases:** The system shall tend to balance unequal phase voltage.

g. **Heat Transfer / Cooling / Built in Ventilation Systems must be provided with 20% Spare capacity. Bidders to Submit Heat Rejection / Transfer calculation for Air Conditioning of Inverter Room.**

h. **Inverter must be provided with –Ve grounding for protection of PV modules against possible “Potential Induced Degradation” with provision of 1000V DC Fuses.**

xxiii. **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.

xxiv. **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.

xxv. **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. Circuit breakers used in the DC lines must be rated suitably.**
a. Sinusoidal current modulation with excellent dynamic response.

b. Compact and weather proof housing.

c. Direct use in the outdoors with outdoor housing.

d. Comprehensive network management functions (including the LVRT and capability to inject reactive power to the grid).

e. No load loss < 1% of rated power and maximum loss in sleep mode shall be less than 0.05%.

f. Unit wise & integrated Data logging

g. Dedicated Prefab compartment required for Ethernet for networking.

h. PCU shall have protection against over current, sync loss, over temperature, DC bus over voltage, cooling fan failure (if provided), short circuit, lightening, earth fault, surge voltage induced at output due to external source, power regulation in the event of thermal overloading.

i. An emergency switch has to be provided on the inverter cabinet.

xxvi. It shall have bus communication via interface for integration, remote control via telephone model or mini web server, integrated protection in the DC and three phase system, insulation monitoring of PV array with sequential fault location.

xxvii. Ground fault detector which is essential for large PV generators in view of appreciable discharge current with respect to ground.

xxviii. The power conditioner must be entirely self-managing and stable in operation. A self-diagnostic system check should occur on start up. Functions should include a test of key parameters on start up.

xxix. Over voltage protection against atmospheric lightning discharge to the PV array is required.

xxx. The power conditioner must be entirely self-managing and stable in operation. A self-diagnostic system check should occur on start up. Functions should include a test of key parameters on start up.

xxxi. Standards and Compliances:
The Bidder also has to confirm the PCU specifications in the Bid.

**Detailed Specifications of PCU**

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<th>Particulars</th>
<th>Details</th>
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<td>PCU Mounting</td>
<td>As per the design</td>
</tr>
<tr>
<td>2</td>
<td>Nominal AC Output Power</td>
<td>≥ 500 kW (Rating of Inverter must be Identical)</td>
</tr>
<tr>
<td>3</td>
<td>Nominal AC Output Voltage</td>
<td>415 Volts +15%/-10% AC / 270 V / As per design</td>
</tr>
<tr>
<td>4</td>
<td>Maximum Input Voltage</td>
<td>800 V DC Extendable up to 1000 V</td>
</tr>
<tr>
<td>5</td>
<td>Wave Form</td>
<td>Pure Sine wave</td>
</tr>
<tr>
<td>6</td>
<td>DC voltage range, MPPT</td>
<td>450 to 800 volts DC</td>
</tr>
<tr>
<td>7</td>
<td>Minimum Efficiency at 100% load</td>
<td>&gt; 98% as IEC- 61683(Efficiency)</td>
</tr>
<tr>
<td></td>
<td>The rated European efficiency</td>
<td>&gt; 98%, measured as per IEC 61683 standard for measuring efficiency.</td>
</tr>
<tr>
<td></td>
<td>(Euro Eta Efficiency) and peak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>efficiency</td>
<td>* Inverter No Load / Full Load Loss Calculation must be submitted by the Bidder.</td>
</tr>
<tr>
<td>8</td>
<td>Output frequency</td>
<td>50 Hz +3% to - 5% Hz</td>
</tr>
<tr>
<td>9</td>
<td>Power Factor</td>
<td>0.8 lag- 0.8 lead</td>
</tr>
<tr>
<td>10</td>
<td>Max. THD at rated power</td>
<td>Less than 3 %</td>
</tr>
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<td>11</td>
<td>Ambient dry bulb temperature range</td>
<td>0 to 50˚ deg C</td>
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<tr>
<td>12</td>
<td>Humidity</td>
<td>15% to 95 % non-condensing</td>
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<tr>
<td>13</td>
<td>Enclosure</td>
<td>IP 4X / IP 65 (Indoor/ Outdoor rated) IEC-60068-2 (environmental)</td>
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<td>14</td>
<td>Protection rating (as per IEC-60721-3-3)</td>
<td>Classification of chemically active substances: 3C2</td>
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<tr>
<td></td>
<td></td>
<td>Classification of chemically active substances: 3S2</td>
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<tr>
<td>15</td>
<td>Grid Specifications</td>
<td>IEC 61727, VDE 0126</td>
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### Nominal Voltage & Frequency

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<tr>
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<th>415 Volts &amp; 50 Hz</th>
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<td>16</td>
<td>Nominal Voltage &amp; Frequency</td>
</tr>
</tbody>
</table>

### Voltage Tolerance

+ 10% and -10%

### a. PCU shall confirm to IEC 60068-2 standards for Environmental Testing.

### b. All inverters shall be IEC 61000 compliant for electromagnetic compatibility, harmonics, etc.

### c. All inverters shall be safety rated as per IEC 62109 (1 &2), EN 50178 or equivalent DIN or UL standard.

### d. Each PCU shall be compliant with IEEE standard 929 – 200 or equivalent. The Bidder should select the inverter (Central / String) as per its own system design so as to optimize the power output.

### xxiii. Display

### a. The PCU shall have local LCD (Liquid crystal display) and keypad for system control, monitoring instantaneous system data, event logs, data logs and changing set points. Control and read-out should be provided on an indicating panel integral to the Inverter. Display should be simple and self-explanatory. Display to show all the relevant parameter relating to PCU operational data and fault condition in form of front panel meters/ LEDs or two line LCD Display.

### b. PCU front panel shall be provided with display (LCD or equivalent) to monitor the following

- Instantaneous DC power input
- DC input voltage
- DC Current
- Instantaneous active AC power output
- Instantaneous reactive AC power output
- AC voltage (all the 3 phases and line)
- AC current (all the 3 phases and line)
- Power Factor
- kWh Produced during entire day
- Total kWh produced during its life time
• Thermal loading (percentage)
• Inverter Status

PCU must be provided with display and also the same has to be made available at the SCADA monitoring & controlling desk installed in Main Control Room through Universal Open Protocol of Communication.

xxiv. Documentary Requirements & Inspection.

a. The bill of materials associated with PCUs should be clearly indicated while delivering the equipment.

b. The Contractor shall provide to the Purchaser data sheet containing detailed technical specifications of all the inverters and PCUs. Operation & Maintenance manual should be furnished by the Bidder before dispatch of PCUs.

**Note:** The Purchaser or its authorized representative reserves the right to inspect the PCUs/Inverters at the manufacturer’s site prior to dispatch.

Cables 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 for 25 years and voltages as per latest IEC standards. (Note: IEC standards for DC cables for PV systems is under development, the cables of 600-1800 volts DC for outdoor installations should comply with the draft EN 50618 for service life expectancy of 25 years and alternate American / European / Indian Standards are accepted with detail report.)

ii. 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 1.5% (including diode voltage drop). PV Modules should be connected with USE-2/RHW-2 cables array to junction box conductors and junction box to photovoltaic disconnector with the THHN/THWN-2 sunlight resistant with 90°C wet rated insulation cable. 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. The Contractor shall provide voltage drop calculations in excel sheet.

iii. All cables shall be supplied in the single largest length to restrict the straight-through joints to the minimum number. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All wires used on the LT side shall conform to IS and should be of appropriate voltage grade. Only copper conductor wires of reputed make shall be used.

iv. All wires used for connecting the modules and array should conform to the NEC standards. Modules should be connected with USE-2/RHW-2 cables array to junction box conductors and junction box to photovoltaic disconnector with the THHN/THWN-2 sunlight resistant with 90°C wet rated insulation cable.

v. 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.

vi. Irrespective of utilization voltage and current rating all type of power cables shall be minimum of 1100 V grade PVC insulated conforming to IS 1554 / IS 694/IEC 60502 for working voltage less than 150 V control cable shall be of minimum 500 V grade, the control and power cable has to be laid separately. All LT XLPE cables shall confirm to IS: 7098 Part I & II. All HT XLPE Cables (11 kV) Shall confirm IS: 7098 PART- 2,3 & IEC -60287, IEC-60332 and the Contractor to submit technical data sheet, Voltage drop calculation, Power Loss Calculation and type test report for the approval of client / consultants

vii. The cables shall be adequately insulated for the voltage required and shall be suitably color coded for the required service. Bending radius for cables shall be as per manufacturer's recommendations and IS: 1255

viii. Packing and marking shall be as per clause No. 18 of IS 7098 (part I)/1988 amended up to date.
ix. Cables inside the 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 brick sidewalls and provided with removable RCC covers.

x. 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.

xi. All cable/wires shall be provided with Punched Aluminium tags only. 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.

xii. The wiring for modules interconnection shall be in the GI pipe /HD Pipe as per applicable standards.

xiii. Data sheets of individual cable sizes (HT & LT) shall be submitted for approval by the Purchaser. Drum numbers and drum length details shall be submitted with each consignment.

xiv. Cable end terminations and joint kits shall comply with the latest version of the relevant IS standard.

xv. The cable ends shall be terminated with adequate size copper lugs and sockets etc, single/double compression cable glands. Cable glands shall be of robust construction capable of clamping cable and cable armor (for armored cables) firmly without injury to insulation. The metallic glands shall be earthed at two locations. Suitable lock type crimping lugs shall be used for cable end terminations. Where cables are raising from ground, suitable PVC pipe guarding shall be provided for cable raising with sealing of the guarding PVC pipe including a suitable clamp.

xvi. HT cable termination kits and straight through joints shall be selected as per the cable specifications. Installation shall be as per the instructions given in the manufacturer’s manual. Heat shrinkable type kits only shall be used for HT and LT cables.
Data sheets of the joints and kits shall be submitted for approval by Purchaser.

### Relevant Codes & Standards for Cable

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<td>from 1 KV upto 30 KV</td>
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<td>Test methods for insulations and sheaths of electric cables and</td>
<td></td>
<td>IEC: 540</td>
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<td>chords.</td>
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<td>5</td>
<td>Test on cable over a sheath which has special protective functions</td>
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<td>IEC: 229</td>
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<td></td>
<td>and are applied by extrusion.</td>
<td></td>
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<td>6</td>
<td>Calculations of continuous current rating of cables (100% load</td>
<td></td>
<td>IEC: 287</td>
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<td></td>
<td>factor).</td>
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<td>7</td>
<td>Cross-linked polyethylene insulated PVC sheathed cable for voltage</td>
<td>IS: 7098 (Part</td>
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<td>from 3.3 KV upto 33 KV.</td>
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<td>PVC insulation &amp; sheath of electrical cables.</td>
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<td>Electrical test methods for electric cables partial discharge test.</td>
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<td>Methods of test for cables.</td>
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<td>Impulse test on cables &amp; other accessories</td>
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<td>14</td>
<td>Cable termination for gas insulated switchgear.</td>
<td></td>
<td>IEC: 859</td>
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</table>
TECHNICAL SPECIFICATION OF LT XLPE CABLES:

General Constructional Features
The medium voltage cables shall be supplied, laid, connected, tested and commissioned in accordance with the drawings, specifications, relevant Indian Standards specifications, manufacturer’s instructions. The cables shall be delivered at site in original drums with manufacturer’s name, size, and type, clearly written on the drums.

A. Material:
Medium voltage cable shall be XLPE insulated. PVC sheathed, aluminium or copper conductor, armoured conforming to IS: 7098 Part I.

B. Type:
The cables shall be circular, multi core, annealed copper or aluminium conductor, XLPE insulated and PVC sheathed, armoured.

C. Conductor:
Uncoated, annealed copper, of high conductivity up to 4 mm² size, the conductor shall be solid and above 4 mm², conductors shall be concentrically stranded as per IEC:228. Allowable solid Cu. Conductor up to 4 mm² for power wiring. All control wiring must be through Flexible Cu. Conductor.

D. Insulation:
XLPE rated 70° c. extruded insulation.

E. Core Identification:
Two core : Red and Black
Three core : Red, Yellow and Blue
Four core : Red, Yellow, Blue and Black
Single core : Green cable with Yellow strips for earthing

Black shall always be used for neutral.
F. **Assembly:**

Two, three or four insulated conductors shall be laid up, filled with non-hygroscopic material and covered with an additional layer of thermoplastic material.

G. **Armour:**

Galvanised steel flat strip / round wires applied helically in single layers complete with covering the assembly of cores.

- For cable size upto 25 Sq. mm. : Armour of 1.4 mm dia G.I. round wire
- For cable size above 25 Sq. mm. Armour of 4 mm wide 0.8 mm thick G.I strip

H. **Sheath:**

The cable shall be rated extruded for XLPE 90 deg.c. Inner sheath shall be extruded type and shall be compatible with the insulation provided for the cables. Outer sheath shall be of an extruded type layer of suitable PVC material compatible with the specified ambient temp 50 deg. C and operating temperature of cables. The sheath shall be resistant to water, ultraviolet radiation, fungus, termite and rodent attacks. The colour of outer sheath shall be black. Sequential length marking required at every 1.0 meter interval on outer sheath shall be available. The contractor has to furnish resistance / reactance / capacitances of the cable in the technical datasheet.

I. **Rating:**

Up to and including 1100 Volts.

**TECHNICAL SPECIFICATION OF HT XLPE CABLES:**

**General Constructional Features**

A. **Conductors:**

The conductor shall be of circular stranded Aluminium confirming to IS 7098-II, IS: 8130 & IEC: 228. It shall be clean, reasonably uniform in size & shape smooth & free from
harmful defects. Any other form of conductor may also be accepted if in line with modern trends.

B. **Semi-Conductor Barrier Tape/Tapes:**

The semi-conducting barrier tape/tapes shall be provided over the conductors.

C. **Conductor Screen:**

The conductor screen shall consist of an extruded layer of thermosetting semi-conducting compound which shall be extruded simultaneously with the core insulation.

D. **Insulation:**

The insulation shall be super clean XLPE compound applied by extrusion and vulcanized to form a compact homogenous body.

E. **Insulation Screen:**

a. Each insulation have an insulation screen in two parts consisting of:

b. A water barrier tape/Non-metallic semi-conducting swellable tape part and a metallic screen part.

c. The non-metallic part shall be directly applied upon the insulation of each core and may consist of an impregnated but nylon/PVC tape or a similar approved material or, an extruded semi-conducting material extruded simultaneously with the conductor screen and insulation (triple extrusion).

d. The semi-conductor shall be readily strippable and must not be bonded in such a manner that it has to be shaved or scraped to remove.

e. The metallic part shall consist of a copper tape helical applied with a 30% overlap over the water barrier tape/blocking tape. A binder tape of copper shall be applied over the copper wire metallic screen.

F. **Laying Up:**

a. The cores shall be identified on the non-metallic part of the insulation screen by legible printing on the length of each conductor or, by the inclusion of a marker tape.

b. The cores shall be laid up with a right hand direction of lay.

c. Binder tape/Moisture barrier: During layup, a suitable open spiral binder may be applied, at the manufacturer's discretion, before the application of an extruded inner
covering.

G. Fillers:
Fillers shall be polypropylene.

H. Inner Covering/Sheath:
The inner covering shall be extruded over the laid up cores to form compact and circular bedding for the metallic layer.

I. Metallic Layer:
The metallic layer shall be galvanised steel wire.

J. Outer Sheath:
The tough outer sheath, black coloured best resisting PVC polyethylene compound type ST-2 as per IS: 5831 for the operating temperature of the cable shall be provided over the armour as specified in relevant standards by extrusion process.

K. Cable Marking:
   a. Embossing on outer sheath:
The following particulars shall be properly legible embossed on the cable sheath at the intervals of not exceeding one meter throughout the length of the cable. The cables with poor and illegible embossing shall be liable for rejection.
   - Voltage grade
   - Year of manufacture
   - Manufactures name
   - Successive Length
   - Size of cable
   - ISI mark

Clamps and Connectors:
   i. The bus-support clamps, spacers, T-connectors and various equipment connectors shall be supplied as per the enclosed drawings.
ii. The materials shall be of the best workmanship, and all the sharp edges and corners shall be rounded off. The thickness of tinning, wherever applicable, shall be not less than 10 microns. The minimum thickness of pads made of copper shall be 10 mm and those made out of Aluminium/Aluminium Alloy, shall be 12 mm, unless otherwise indicated in the specifications.

iii. All the clamps and connectors shall be designed to carry a continuous current not less than 125% of the rated current of the conductor (twin/single as the case may be)/equipment terminal to which these are to be connected. Temperature rise of the connector under the above condition shall not be more than 50% of the temperature of the main conductor/equipment terminal.

### Clamps & Connectors

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Application</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bolted type connection</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>For connection to ACSR/AAAC/Aluminum terminal</td>
<td>Aluminum Alloy conforming to designate A6 as per IS 617</td>
</tr>
<tr>
<td>3.</td>
<td>For connection to copper terminals, with crimping facility to connect ACSR/AAAC jumper</td>
<td>Electrolytic grade copper, forged and tinned</td>
</tr>
<tr>
<td>4.</td>
<td>Crimping type connection</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>For connection to ACSR/AAAC jumper</td>
<td>Electrolytic grade aluminum</td>
</tr>
</tbody>
</table>

iv. All the fasteners (i.e. nut-bolts, washers, check-nuts, etc.) used in the clamps and connectors shall be of non-magnetic stainless steel. The straight bolts shall be fully threaded, and the U-bolts shall be threaded up to 30 mm from the ends. For connectors made out of Aluminium/Aluminium Alloy, the bolts shall be of 12 mm diameter, and for copper connectors the bolts shall be of 10 mm diameter.

v. The clamps and connectors meant for ACSR and AAAC (525 sq.mm) shall have the same crimping dimensions. It shall be possible to use the same clamp/connector for ACSR or AAAC, as would be required, without any modification/change at site.
vi. The length of bolt shall be chosen such that after fully tightening the nut and check-nut, minimum 5 (five) threads of the bolt shall project outside the nut/check-nut.

vii. As an alternative to the various types of clamps and connectors detailed under 2.0 above, the Contractors may offer connectors of Power Fired Wedge Pressure Technology (PFWPT). However, the same needs to be specified in the Bid.

viii. Connectors of PFWPT type shall meet the general requirements for various connections/joints as indicated in the relevant drawings.

ix. PFWPT type connectors shall comprise of:
   a. Tapered `C' - shaped spring member
   b. Wedge for connecting solid/stranded conductor, along with handle, suitable for connection between:
      • Aluminium & Aluminium
      • Copper & Copper
      • Aluminium & Copper
      • Aluminium & Al. Alloy
      • Copper & Al. Alloy
      • Al. Alloy & Al. Alloy

x. Components of the PFWPT type connectors shall be made of Aluminium Alloy suitably heat-treated to ensure that the required Mechanical & Electrical parameters are in line with ANS 1 specification no. C 119.4-1991. The connectors shall have `self-cleaning' capability during application. The connector shall ensure stable and low contact resistance under varying load conditions and the thermal cycling effects.

xi. The special tools and tackles required for installation of the PFWPT type connectors shall be identified in the offer. One set of these bolts and tackles shall be included in the scope of supply.

xii. The Contractor shall furnish the following information in their bill of material:
xiii. Availability of the PGWT connectors indigenously.

xiv. Unit rate of each item

xv. Notwithstanding anything stated above, the final decision regarding acceptance of the type of clamps and connectors (conventional/PFWPT type) shall rest with Purchaser.

**Lightening Protection for PV Array:**

i. The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components as per IEC 62305, IS: 2309 – 1989 (Reaffirmed – 2005), Edition 3.1 (2006-01).

ii. Necessary foundation / anchoring for holding the lightning conductor in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.

iii. The lightning conductor shall be earthed through flats and connected to the earth mats as per applicable Indian Standards with earth pits. Minimum Two earth pits shall be provided for each lightening arrestor. Each lightning conductor shall be fitted with individual earth pit in parallel as per required Standards including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS & Earth Resistance of Lightening System must be less than one (1) Ohm.

a. If necessary more numbers of lightning conductors may be provided. The Contractor is also free to provide Franklin rod / Early Streamer type of lightning arrestors on the MMS structure designed in such a way not to cast shadow on the next raw of solar PV modules. The Contractor to submit necessary calculations based upon rolling sphere method for the Lightening protection system.

b. The Contractor shall submit the drawings and detailed specifications of the PV array lightning protection equipment to Purchaser for approval before installation of system.
AC Network:

i. AC converted by the inverter is transmitted through the appropriate cables from the Inverter to appropriately sized power transformer. And from transformer to 11 kV VCB Panel should consist of adequate size voltage safely as per the relevant, IS standards. 11kV VCB Panel should be equipped with adequate protection relays, fuses, annunciations and remote operating and controlling facility from the Main Control Room. Relevant national & international codes to be follows :-

**Relevant National & International Code**

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Item</th>
<th>Relevant IS</th>
<th>Relevant IEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power transformer</td>
<td>IS 2026</td>
<td>IEC 76</td>
</tr>
<tr>
<td>2</td>
<td>Fittings &amp; Accessories</td>
<td>IS 3639</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Climate Proofing</td>
<td>IS 3202</td>
<td>IEC 354</td>
</tr>
<tr>
<td>4</td>
<td>Loading of Transformer</td>
<td>IS 6600</td>
<td>IEC 296</td>
</tr>
<tr>
<td>5</td>
<td>Oil</td>
<td>IS 335</td>
<td>IEC 137</td>
</tr>
<tr>
<td>6</td>
<td>Bushings</td>
<td>IS 20650</td>
<td>IEC 144</td>
</tr>
<tr>
<td>7</td>
<td>Degree of Protection</td>
<td>IS 2147</td>
<td>IEC 76</td>
</tr>
<tr>
<td>8</td>
<td>Testing, Tolerances on guaranteed Particulars</td>
<td>IS 2026</td>
<td>IEC 76</td>
</tr>
<tr>
<td>9</td>
<td>Buchholz Relay</td>
<td>IS 3637</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Electrical Insulation</td>
<td>IS 1271</td>
<td>IEC 85</td>
</tr>
</tbody>
</table>

ii. 11kV VCB Panel shall be provided in Inverter room. It shall have circuit breaker of suitable rating for connection and disconnection of PCU from grid. The busbar shall connect the AC distribution board to the transformer. It shall have provision to measure bus voltage, current and power of the transformer.

iii. Bus-bars shall be of high conductivity Aluminium alloy or Copper of adequate size. The bus-bars shall be adequately supported by non-hygroscopic, non-combustible track resistant and high strength type polyester fibre glass moulded insulators. Separate supports shall be provided for each phase and neutral busbar. The bus-bars joints shall be provided with high tensile steel bolts, bellevelle washers and nuts, so as to ensure good contacts at the joints. The bus-bars shall be colour coded as per IS 375.
iv. The Bidder shall submit the detailed specifications of the AC bus and panel in the Bid.

v. Contractor shall design a best suitable scheme for the connection of power distribution for local consumption and evacuation of excess generated power in to the local grid. Detailed scheme should be submitted for approval.

vi. 11kV VCB Panel with thermal over current and earth fault releases, transformer protection relays. The rating shall be selected minimum one size higher than the required rating as per Type 2 selection chart.

vii. Removable gland plates with gaskets shall be provided in the cable alleys for glanding the power and control cables. The distance between the gland plate and the incomer terminals shall not be less than 450 mm.

viii. The Contractor should submit theoretical design calculations and detailed explanations along with drawings shall be provided and approved.

11kV SUBSTATION BLOCK:

Step-Up Transformer:

i. The Contractor shall provide the complete turnkey design, supply, erection, testing and commissioning of transformers and transformer substation to first step-up the output of the inverter to 11 kV at the location of the inverter. Solar plant with provision of rated 11 kV Vacuum Circuit Breaker Stand Alone Panel. Provision of ABT meter will be connected with 11 kV VCB panel as mentioned in Error! reference source not found..

ii. 3 phase, Oil Filled, 11 kV, 50 Hz, Step Up Transformer with min power rating 1.25 times of the selected inverter rating and associated Switchgear of approved make should be utilized. 11 KV transformer can be off-load tap change type. The transformer shall be suitable for outdoor installation with 3 phase 50 Hz 11 KV system in which the neutral
is effectively earthed and they should be suitable for service under fluctuations in supply voltage up to plus 10% to minus 15%.

ii. Cumulative loss shall be as per IGBC guidelines. All electrical equipment and installation shall confirm to the latest Indian Electricity Rules as regards safety, earthing and other essential provisions specified for installation and operation of electrical plants.

iv. Relevant national and international standards in this connection are mentioned in

v. Table below for General Standards for Transformers.

vi. All working parts, insofar as possible, are to be arranged for convenience of operation, inspection, lubrication and ease of replacement with minimum downtime. All parts of equipment or of duplicate equipment offered shall be interchangeable.

vii. The quality of materials of construction and the workmanship of the finished products/components shall be in accordance with the highest standard and practices adopted for the equipment covered by the specification.

**General Standards for Transformers**

<table>
<thead>
<tr>
<th>IS: 2026 (Part 1 to 4)</th>
<th>Specifications for Power Transformer</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS: 2099</td>
<td>Bushings for alternating voltage above 1000 V</td>
</tr>
<tr>
<td>IS: 3639</td>
<td>Fittings and accessories for power transformer</td>
</tr>
<tr>
<td>IEC: 60076 (Part 1 to 5)</td>
<td>Specifications for Power Transformer</td>
</tr>
<tr>
<td>IS: 9921 Part 1 to 5</td>
<td>Alternating currents disconnectors (isolators) and earthing switches rating, design, construction, tests etc.</td>
</tr>
<tr>
<td>IS: 2705 Part 1 to 4 &amp; IEC: 185</td>
<td>Current transformer</td>
</tr>
<tr>
<td>IS: 3156 Part 1 to 4</td>
<td>Voltage Transformer</td>
</tr>
<tr>
<td>IS: 3070 part 1</td>
<td>Lightning arrestors</td>
</tr>
</tbody>
</table>
to 3

| IS: 2544 | Porcelain insulators for system above 1000 V |
| IS: 5350 | Part III – post insulator units for systems greater than 1000 V |
| IS: 5621 | Hollow Insulators for use in electrical equipment |
| IS: 5556 | Serrated lock washers – specification |
| IEC: 186 | Voltage transformer |

viii. All items of equipment and materials shall be thoroughly cleaned and painted in accordance with relevant Indian Standards. The finish paint shall be done with two coats of epoxy based final paint of colour Shade RAL 7032 of IS:5 for indoor equipment.

ix. Any fitting or accessories which may not have been specifically mentioned in the specification but which are usual or necessary in the equipment of similar plant or for efficient working of the plant shall be deemed to be included in the contract and shall be provided by the Contractor without extra charges. All plant and apparatus shall be complete in all details whether such details are mentioned in the specifications or not.

x. All equipment shall be designed for operation in tropical humid climate at the required capacity in an ambient air temperature of 50°C. Equipment shall be suitable for an ambient temperature of 50°C. Maximum relative humidity of 100% shall also be taken into consideration for design of equipment.

xi. The rating and electrical characteristics of the MV / 11 kV Outdoor type transformer (typical) shall be as mentioned in Table below.

**Rating and electrical characteristics of 11kV Power Transformer**

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Continuous kVA ratings</td>
<td>1.25 times the rated power output of Inverter MVA</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Oil immersed (Natural)</td>
</tr>
<tr>
<td>3</td>
<td>Frequency</td>
<td>50 Hz</td>
</tr>
<tr>
<td>4</td>
<td>Type of cooling</td>
<td>ONAN</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Details</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>No. of phases</td>
<td>Three</td>
</tr>
<tr>
<td>6</td>
<td>Rating voltage H.V. side</td>
<td>11 KV</td>
</tr>
<tr>
<td>7</td>
<td>Highest System voltage on H.V. side</td>
<td>As per IS</td>
</tr>
<tr>
<td>8</td>
<td>Rated voltage on L.V. side</td>
<td>LV (Output of the Inverter) kV r.m.s.</td>
</tr>
<tr>
<td>9</td>
<td>Vector Group</td>
<td>Dy11/As per Design</td>
</tr>
<tr>
<td>10</td>
<td>Connections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) H.V. Winding</td>
<td>Delta</td>
</tr>
<tr>
<td></td>
<td>b) L.V. winding</td>
<td>Star</td>
</tr>
<tr>
<td>11</td>
<td>On load taps on H.V. Side (for H.V.Variation)</td>
<td>+ 10 to – 15.0 % (in steps of 1.25%)</td>
</tr>
<tr>
<td>12</td>
<td>Impedance voltage (%) as per IS 2026</td>
<td>5-6%</td>
</tr>
<tr>
<td>13</td>
<td>Minimum Creepage distance at 31 mm/kV</td>
<td>400 phase to earth</td>
</tr>
<tr>
<td>14</td>
<td>Transformer connections</td>
<td>LV side – Bus Duct with weather proof enclosure, HV Side – Bushing with enclosure</td>
</tr>
</tbody>
</table>

Functional Specification for New Natural Ester Less-Flammable Transformer Dielectric Coolant

**Scope:** This specification describes a non-toxic (in acute aquatic, and oral toxicity tests), biodegradable, fire resistant, bio-based natural ester dielectric fluid. It is intended for use in electrical equipment as an environmentally preferred, less-flammable insulating and cooling medium complying to IEC 62770 standards.

**Requirements**

i. Fluid Manufacture: Fluid manufacturer shall have a minimum of ten (10) years’ experience of producing and testing dielectric coolants with at least one plant in India to assure long-term supplies. Manufacturer upon request shall provide AC withstand and impulse withstand for both gap and creep from 3mm to 150mm for the supplied fluid.

ii. Dielectric Coolant:
a. The dielectric coolant shall be a bio based biodegradable, be FM Global Approved or UL® Classified as a less-flammable fluid for transformer application.
b. The base fluid shall be derived from naturally occurring seed oils.
c. The offered dielectric coolant should have undergone accelerated aging studies via sealed tube and Locke test methods, and have published it’s A & B factors.
d. The offered fluid should have been used in Indian environmental conditions for at least 3 years with at least one 20MVA or higher rating transformer also commissioned in India.
e. The offered fluid should have DGA guidelines published in IEEE standards

Acceptable values for receipt of shipments of new natural fluid are shown in Table below:

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Characteristics of NATURAL ESTERs (NE) Insulating oil</th>
<th>Requirement</th>
<th>Method of Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Appearance</td>
<td>clear, free from sediments and suspended matter.</td>
<td>Visual</td>
</tr>
<tr>
<td>2</td>
<td>Viscosity, mm²/sec</td>
<td>Max. 15</td>
<td>ISO 3104</td>
</tr>
<tr>
<td></td>
<td>- At 1000 C</td>
<td>Max. 50</td>
<td>ISO 3104</td>
</tr>
<tr>
<td></td>
<td>- At 400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pour point</td>
<td>Max. 100°C</td>
<td>ISO 3016</td>
</tr>
<tr>
<td>4</td>
<td>Water content, mg/kg (ppm)</td>
<td>Max. 200</td>
<td>IEC 60814</td>
</tr>
<tr>
<td>5</td>
<td>Density, gm/Cm³ @ 200°C</td>
<td>Max. 1.0</td>
<td>ISO 3675 or ISO 12185</td>
</tr>
<tr>
<td>6</td>
<td>Dielectric breakdown voltage (2.5 mm gap)</td>
<td>Min 35 kV</td>
<td>IEC 60156</td>
</tr>
<tr>
<td>7</td>
<td>Dielectric Dissipation factor (Tanδ) at 900°C</td>
<td>Max. 0.05</td>
<td>IEC: 60247</td>
</tr>
<tr>
<td>8</td>
<td>Soluble acidity, mg</td>
<td>Max. 0.06</td>
<td>IEC: 62021-3</td>
</tr>
<tr>
<td>KOH/gm</td>
<td>Appearance</td>
<td>Visual</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>clear, free from sediments and suspended matter.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10</th>
<th>Viscosity, mm2/sec</th>
<th>Max. 15</th>
<th>ISO 3104</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- At 1000 C</td>
<td>Max. 50</td>
<td>ISO 3104</td>
</tr>
<tr>
<td></td>
<td>- At 400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11</th>
<th>Pour point</th>
<th>Max -100 C</th>
<th>ISO 3016</th>
</tr>
</thead>
</table>

| 12 | Water content, mg/kg (ppm) | Max.200 | IEC 60814 |

iv. Environmental and Health Third Party Validations: The fluid shall have a US EPA Environmental Technology Verification (ETV) Statement published. The offered fluid should be aquatic non-toxic as well as ultimately biodegradable as per US EPA OPPTS method 835.3110.

v. Packaging: The electrical insulating fluid shall be furnished in sealed vessels suitable for the purpose, including 208-Liter drums, 1000 Litre totes, or in bulk. Each vessel shall have tampering indicating devices.

**Applicable Standard**

- IEC 60076-1 – Power Transformers – Part 1: General
- IEC 60076-14 – Power transformers – Liquid-immersed power transformers using high-temperature insulation materials
- IEC 62770 – Fluids for electro technical applications – Unused natural esters for transformers and similar electrical equipment
- IEEE C57.147 - IEEE Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers
- IEEE C57.155 - IEEE Guide for Interpretation of Gases Generated in Natural Ester and Synthetic Ester-Immersed Transformers
Circuit Breaker:

i. The scope generally describes to design, manufacture, assemble, connect, wire, supply, test and commission 11KV vacuum circuit breaker panel. The unit shall consist of a spring assisted three position, three pole vacuum circuit breaker. All equipment and materials shall be designed, manufactured and tested in accordance with the latest applicable Indian Standards (IS) except where modified and/or supplemented by this specification. The equipment shall meet the requirements of Indian Electricity Rules as amended up to date and relevant IS Codes of Practice. In addition, other rules and regulations as applicable to the work shall be followed. In case of any discrepancy, the more restrictive rule shall be binding.

ii. The switchgear enclosure shall conform to the degree of protection IP-4X. The minimum thickness of sheet steel used shall be 2mm CRCA steel. The switch gear assembly shall comprise a continuous, dead-front, line-up of free standing, vertical cubicles. Each cubicle shall have a front hinged door with latches and a removable back cover. All covers and doors shall be provided with recessed neoprene gaskets. All doors shall have pad locking arrangement. Switchgear shall be fire retardant type. Circuit breakers, instrument transformers, bus-bars, cable compartment etc., shall be housed in totally isolated air tight separate compartments within the cubicle. The design shall be such that failure of one equipment shall not affect the adjacent units. Suitable venting arrangement shall be provided to release the gas pressure developed due to the operation of the breaker or due to live arc of fault. Each cubicle shall be separated from adjacent one by grounded sheet steel barrier and bus sealing arrangement. The switchgear panel shall be of arc proof version. Test report as per DIN VDE 0670 part 601, IEC-694/IEC-298 shall be furnished.

iii. All relays, meters, switches and lamps shall be flush mounted on the respective cubicle door or on control cabinet built on the front of the cubicle. Each switchgear cubicle shall be provided with a thermostat controlled space heater and single phase plug point operated at 230 V AC. 50 Hz. Bus connection from bus compartment to breaker compartment & breaker compartment to cable compartment and bus compartment to adjacent panels shall be through sealed resin cast bushing assembly. Each breaker cubicle shall be provided with ‘service’ and ‘test’ position limit switches, each having at least 4 NO & 4 NC contacts. All fixing bolts, screws, etc. appearing on
the panel shall be so arranged as to present a neat appearance. The swing of the door shall be more than 90 deg C. Each breaker cubicle shall be provided with ‘service’ and ‘test’ position limit switches, each having at least 4 NO & 4 NC contacts. All fixing bolts, screws, etc. appearing on the panel shall be so arranged as to present a neat appearance. The swing of the door shall be more than 90 deg C.

iv. The main buses and connections shall be of high conductivity copper, sized for specified continuous and fault current ratings with maximum temperature limited to 85 deg C (i.e.35 deg C rise over 50 deg C ambient). Adequate contact pressure shall be ensured by means of two bolts connection with plain and spring washers and locknuts. Bimetallic connectors shall be furnished for connections between dissimilar metals. All Busbars, Jumpers and connection shall be fully insulated for working voltage with adequate phase/ground clearances. Epoxy cast-resin shrouds for joints shall be provided. All jointing hardware shall have nylon caps. All busbars, links, jumpers etc. shall be sleeved with sleeves of Raychem/DSG make and non-in flammable heat shrinkable type. Busbars, links, live parts etc. shall have nonflammable shrouds. No paper/cotton based insulation shall be used any where in the switch gear. Minimum amount of combustible and low smoke generation type insulating material shall be used. Safety shutter, phase barrier, busbar seal-off bushing plate, support insulators etc. shall be non-inflammable high tracking fiber glass/epoxy insulation system of grade 94V-O as per UL. All buses and connections shall be supported and braced to withstand dynamic electro-magnetic stresses due to maximum short circuit current and also to take care of any thermal expansion. Busbars shall be colour coded for easy identification and so located that the sequence R-Y-B shall be from left to right, top to bottom or front to rear, when viewed from front of the switchgear assembly. The successful tenderer shall submit the calculation in support of selection of busbar conductor size, spacing and short time withstand capability.

v. Circuit breaker shall be triple pole, single throw, Vacuum type. Circuit breaker shall be draw out type, having SERVICE, TEST and DISCONNECTED positions with positive indication for each position. Circuit breakers of identical rating shall be physically and electrically interchangeable. Circuit breaker shall have motor wound spring charging facility with Mechanical & Electrical anti-pumping features and shunt trip. In addition facility for manual charging of spring shall be provided. The motor shall be suitable for
operation with voltage variation from 85% to 110% of rated voltage. Spring charging motor shall be in a standard enclosure. For motor wound mechanism, spring charging shall take place automatically after each breaker closing operation. One open-close-open operation of the circuit breaker shall be possible after failure of power supply to the motor.

vi. Mechanical safety interlock shall be provided to prevent the circuit breaker from being racked in or out of the service position when the breaker is closed. Racking in the circuit breaker unless the control plug is fully engaged. Closing & opening of the breaker in an intermediate position between ‘service’ & ‘test’ and between ‘Test’ and ‘Disconnected’ position. Automatic safety shutters shall be provided to fully cover the female primary contacts when the breaker is withdrawn from service position. Each breaker shall be provided with an emergency manual trip, mechanical ON-OFF indication, an operation counter and mechanism charge/discharge indicator. The manual trip device shall be located on the front door. Indicators with shrouds will be visible from front door even when breaker is closed. Suitable padlocking arrangement shall be provided as stated below:

- Circuit Breaker operating handle in the OFF position.
- Each feeder panel operating handle in CLOSED, OPEN, EARTH position.

Each breaker shall be provided with following:

- Auxiliary switch, with 6 NO + 6 NC contacts, mounted on the draw out portion of the switchgear Position/cell switch with minimum 3 NO + 1 NC contacts, one each for TEST and SERVICE position.

vii. Auxiliary switch, with 4 NO + 4 NC contacts, mounted on the stationary portion of the switchgear and operated mechanically by a sliding lever from the breaker in SERVICE position.

viii. Limit/auxiliary switches shall be convertible type that is facility for changing N.O. contact to N.C. and vice-versa. Switch contact shall be rated 10A A.C. and 2A D.C. at operating voltage. Circuit breaker shall be draw out type, complete with transfer trunks,
self-aligning primary and secondary disconnects, positive guides to ensure proper alignment. Each breaker shall be provided with suitable encased rollers. The trip coils shall be operated satisfactorily at voltage between 70% and 110% of rated control supply voltage. Each circuit breaker cubicle shall be provided with an earthing facility to earth the incoming or outgoing feeders by the arrangement specified below. Earthing facilities shall be fully interlocked to prevent faulty operation e.g. earthing of live parts. Separate earthing trunk, which can be inserted in place of circuit breakers, one trunk suitable for incoming and the other for outgoing circuits shall be provided. Positive earthing of circuit breaker frame shall be maintained when it is in the connected position and in all other positions in which the safety shutters are in open position. Insulation used for auxiliary switches shall be anti tracking type.

Each breaker cubicle shall be equipped with following:

One (1) number heavy duty spring return type TRIP-NORMAL-CLOSE control switch with pistol grip handle Three (3) indicating lights front of compartments:

- **GREEN**: Breaker Open
- **RED**: Breaker Closed
- **AMBER**: Trip

ix. **CURRENT TRANSFORMER**: Current transformers shall be bar primary, cast resin type. All secondary connections shall be brought out to terminal blocks where Y or D connection will be made.

- Class PS for differential & restricted earth fault relaying.
- Class 5P20 for other relaying.
- Accuracy Class 0.2s and ISF < 5 for metering

The current transformer shall be capable of safely withstanding the short circuit, stresses corresponding to the fault level as indicated & shall be able to meet the short-time requirement specified. All CT secondary shall be earthed through separate switch link on terminal block. The secondary terminals of the CTS shall have the provision of shorting
and disconnecting facilities by links. CT terminals & their polarities shall be clearly marked.

x. **VOLTAGE TRANSFORMER:** Voltage Transformer shall be cast-resin, draw out type and shall have an accuracy class of 2.0, 3P. Voltage Transformer mounted on breaker carriage is not acceptable. High voltage windings of voltage transformer shall be protected by current limiting fuses. The voltage transformer and fuses shall be completely disconnected and visibly grounded in fully draw-out position. Low voltage fuses, sized to prevent overload, shall be installed in all ungrounded secondary leads. Fuses shall be suitably located to permit easy replacement while the switchgear is energised. The connections from main circuit to PT shall be capable of withstanding short circuit stresses.

xi. **RELAYS:** Protective relay shall be micro processor based. Relays shall be of draw out design with built-in site testing facilities. Small auxiliary relays may be in non-draw out execution and mounted within the cubicle. Relays shall be rated for operation on 110 V secondary voltage and 5 A secondary current as shown on drawings. Number and rating of relay contacts shall suit the job requirements.

dii. Circuit Breaker Panel must be with all Analogue Voltmeter, Ammeter as well as KWH Meter. Protection & Metering Compartment must be separate and at the top of the panel. All the meters & Annunciator must be positioned at the eye level. Annunciator must be with Hooter sound. All type of fault tripping and alarm must be provided. Minimum 12 Window Annunciator is must for each Circuit Breaker.

xiii. Applicable Standards: The materials shall conform in all respects to the relevant Indian Standard Specifications/ IEC Standards, with latest amendments indicated below in Table:
Applicable Standards for Circuit Breakers

<table>
<thead>
<tr>
<th>Indian Standard</th>
<th>Title</th>
<th>International &amp; Internationally recognized standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISS-2705/1992</td>
<td>Current Transformers</td>
<td></td>
</tr>
<tr>
<td>ISS-2099/1986</td>
<td>Bushings for alternating voltages above 1000 V</td>
<td></td>
</tr>
<tr>
<td>ISS-2633/1964</td>
<td>Methods of testing uniformity of coating of zinc coated articles</td>
<td></td>
</tr>
<tr>
<td>ISS-3231/1986</td>
<td>Electrical relays for power system protection</td>
<td></td>
</tr>
<tr>
<td>ISS-1248/1983</td>
<td>Specification for Ammeters &amp; Voltmeters</td>
<td></td>
</tr>
<tr>
<td>ISS-335/1983</td>
<td>New insulating oils Electrical Clearances</td>
<td>IEC 71 (For oils in CTs)</td>
</tr>
<tr>
<td>ISS-2147/1962</td>
<td>Degree of protection provided by enclosures for low voltage switchgear &amp; control gear</td>
<td></td>
</tr>
</tbody>
</table>

xiv. **General Parameters of Circuit Breaker:** General parameters: Indoor vacuum type Circuit Breaker.

**General Parameters for Vacuum Type Circuit Breakers**

<table>
<thead>
<tr>
<th>SR. NO.</th>
<th>PARTICULAR</th>
<th>DETAILS</th>
<th>DATA TO BE FILLED BY THE BIDDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 0</td>
<td>GENERAL :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 1</td>
<td>Make</td>
<td>As per Tender</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Model &amp; Type no.</td>
<td>Pl. Furnish</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Ambient temperature</td>
<td>45 deg. C</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Atmosphere</td>
<td>Corrosive, Humid, Dusty</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Location</td>
<td>Indoor</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td><strong>ELECTRICAL DATA:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Type of breaker</td>
<td>Vacuum Circuit Breaker</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Service</td>
<td>Continuous</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Voltage</td>
<td>11 KV ± 10%</td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>System earthing</td>
<td>Solidly earthed</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Frequency</td>
<td>50 Hz. + 5% to - 5%</td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td>No. of phase</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td>System fault level</td>
<td>75 MVA</td>
<td></td>
</tr>
<tr>
<td>2.8</td>
<td>Fault current</td>
<td>18.37 KA</td>
<td></td>
</tr>
<tr>
<td>2.9</td>
<td>Max. system voltage</td>
<td>12 KV</td>
<td></td>
</tr>
<tr>
<td>2.10</td>
<td>Power Pack unit</td>
<td>110V D.C derived from power pack connected on incoming P.T. supply. The rating suitable for min. three breaker operations</td>
<td></td>
</tr>
<tr>
<td>2.11</td>
<td>Rated short time current</td>
<td>18.37 KA (1 sec.) rms</td>
<td></td>
</tr>
<tr>
<td>2.12</td>
<td>Making capacity</td>
<td>46 KA (peak)</td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td>Busbar current rating</td>
<td>400 A min.</td>
<td></td>
</tr>
<tr>
<td>2.14</td>
<td>Cable entry</td>
<td>Bottom</td>
<td></td>
</tr>
<tr>
<td>2.15</td>
<td>Cable size</td>
<td>3c x 240 sq.mm. XLPE armored cable (incoming) (E) 3c x 240 sq.mm. XLPE armored cable (outgoing) (E) Or As Per Design Calculation.</td>
<td></td>
</tr>
<tr>
<td>2.16</td>
<td>Breaker particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Operating duty</td>
<td>0 – 3 min- CO – 3 min – CO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Operating mechanism</td>
<td>Motor charged spring / manual trip &amp; close</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) Spring charging motor</td>
<td>230 V AC, 200 W[or as per manufacturer design]</td>
<td></td>
</tr>
<tr>
<td>(d) Trip / Closing coil</td>
<td>110 V DC, 180 W[or as per manufacturer design]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) Anti pumping feature</td>
<td>To be provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f) Latching requirement</td>
<td>Trip free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(g) Emergency trip push button</td>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(h) Space heater and cubicle lamp</td>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Earthing truck</td>
<td>Required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.17 Constructional requirements

<table>
<thead>
<tr>
<th>(a) Thickness of sheet steel for frame, enclosure, doors, covers and partitions</th>
<th>CRCA sheet &amp; thickness as per tender specification, hinge type door with neoprene rubber gasket</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) Degree of protection</td>
<td>IP 4X</td>
</tr>
<tr>
<td>(c) Colour</td>
<td>Epoxy powder coating – Siemens grey</td>
</tr>
<tr>
<td>(d) Earth bus size</td>
<td>50 □ 6 mm GI</td>
</tr>
<tr>
<td>(e) Foundation frame</td>
<td>ISMC-75, Suitable for three breakers with necessary bed plate and foundations bolt.</td>
</tr>
<tr>
<td>(f) Over all dimension</td>
<td>Pl furnish</td>
</tr>
<tr>
<td>(g) Minimum area required on front side as well as rear side</td>
<td>Pl furnish</td>
</tr>
</tbody>
</table>

2.18 Annunciation Provision

| Min. 12 Windows |

2.19 RELAYS

| Over Current, Short Circuit, Earth Fault, Transformer Protection etc. |

| (a) Relay no. & type | O/C (51) | E/F (51N) |
(b) Type of relay | Numerical | Numerical  
---|---|---
(c) PlugSettingRange | 5-200% | 20-80%  

2.20 CURRENT TRANSFORMER  
(a) Type of CT | Cast Resin, dual core, dual ratio as per Design  

(b) Accuracy class | As per Design  
(c) VA burden | As per Design  
(d) CT ratio | As per Design  

2.21 POTENTIAL TRANSFORMER  
(a) Type of PT | Cast Resin  
(b) Accuracy class | As per Design  
(c) VA burden | As per Design  
(d) PT ratio | As per Design  

2.22 PANEL ACCESSORIES  
(a) Toggle switch for space heater and socket | 230 V A.C, 10 A  
(b) Socket | 5 pin 5/15 A with switch  
(c) MCB for spring charging motor circuit | 6 A, DP MCB  
(d) MCB for ON / OFF | Double pole, 16 A, 110 V D.C for D.C ckt.  
| | Double pole, 16 A, 230 V A.C for A.C ckt.  
(e) Local / Remote selector switch | 4 ways, 2 positions, lockable in any position, angular movement, stayput, lever type handle.  
(f) Auto- Off – Manual switch | 18 way, 3 position, lockable in all position, stay put, wing type handle.
(g) Breaker control switch (Trip – Neutral – Trip) | 6 way, 3 position, spring return to neutral, angular movement, pistol grip type handle.

(h) LED indicating lamp (230V A.C) | Breaker On - Red colour Breaker Off - Green colour Auto trip - Amber colour Trip ckt healthy - Amber colour Spring charged - Blue colour 100 ohm, 3 / 4 W resistor

(i) LED indicating lamp 230V A.C | 2 / 3 W bulb for R, Y, B, Healthy indication

(j) Space Heater 230 V A.C, 100 W

(k) Panel Illumination 11 W CFL with switch for each panel

(l) Limit switch for test and service position. | Required

xv. Co-ordination of rated voltages, short circuit breaking current and rated normal current for guidance as per IS 13118 for rated voltage 11 kV and above as commonly used.

xvi. Circuit Breaker protection against

- Over Current
- Earth fault
- Under voltage & over voltage protection
- Under frequency & over frequency
- Transformer Protection.
- DC supply failure
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, reverse power relays, differential protection relays, Transformer Protection and earth fault relays have to be essentially provided. All relay should be numerical type & should be remote operating and controlling facility from the control room.

ii. 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. 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 the Purchaser/Electricity Authority.

Earthing for PV Array:

i. The photovoltaic modules, BOS and other components of power plant requires adequate earthing for protecting against any serious faults as guided by IEC 60364.

ii. The earthing system shall be designed with consideration of the earth resistivity of the project area. The earth resistivity values shall be measured prior to designing the earthing system. Unless otherwise specified, earthing system shall be in accordance with IS: 3043 and IEEE 80, Indian Electricity Rules, Codes of practice and regulations existing in the location where the system is being installed.

iii. The permissible system fault power level at 11 kV also shall be kept in consideration while designing the earthing system. Each array structure of the PV yard, LT power system, earthing grid for switchyard, all electrical equipment, control room, PCU, All junction boxes, ACDB & DCDB, all motors and pumps etc. shall be grounded properly as per IS 3043 - 1987. All metal casing / shielding of the plant shall be thoroughly grounded in accordance with Indian electricity act / IE Rules.

iv. The earthing for array and LT power system shall be made of 3.0 m long 40 mm diameter perforated Cu/GI/ chemical compound filled, double walled earthing electrodes
including accessories, and providing masonry enclosure with cast iron cover plate having pad-locking arrangement, chemical compound mix as required as per provisions of IS: 3043.

v. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.

vi. Each string/ array and MMS of the plant shall be grounded properly. The array structures are to be connected to earth pits as per IS standards. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.

vii. The complete earthing system shall be mechanically & electrically connected to provide independent return to earth.

viii. For each earth pit, a necessary test point shall be provided.

ix. In compliance to Rule 11 and 61 of Indian Electricity Rules, 1956 (as amended up to date), all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.

x. The Contractor should submit the earthing system design calculations along with the system layout for the approval prior to the installation of the system

xi. Unless otherwise specified, the earthing system primary and secondary grid conductors, equipment connections shall be constructed with galvanized iron flat. However the earthing of transformer neutrals, plc and inverter terminals and electronic earthing shall be provided using copper earthing conductor only.

xii. Earthing Mesh is to prepared and installed in entire power plant.
Lightening Protection for PV Plant & Earthing:

i. The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components as per IEC 60099 / IS: 2309 – 1989 (Reaffirmed – 2005), Edition 3.1 (2006-01). Lightening Protection System required for Solar PV Plant, Inverter Room, and Substation Structure & Control Room within the EPC scope of work. The intent of specification can be conventional as per IS : 2309 or can be Early Streamer Emission Type depending upon Area, Protected Equipment & Technical feasibility. Necessary concrete foundation for holding the lightning conductor in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future. We recommended going with Early Stream Emission Air Terminal Technology as per NFC 17-102 / IEC 62305-2. Level of Protection must be defining as per Rolling Sphere Method LPL-I, LPL-II, LPL-III & LPL-IV where the radius shall be of 20mtr, 30mtr, 45mtr & 60mtr respectively.

ii. Rp(h) : Protection radius at a given height (h) Rp(h) = \sqrt{2rh - h^2 + \Delta(2r + \Delta)} (for h ≥ 5 m)
For h < 5 m, refer to the table below h : Height of the OPR tip above the surface(s) to be protected r(m) : Standardized striking distance \( \Delta(m) = 106 . \Delta T \) (OPR efficiency)

<table>
<thead>
<tr>
<th>OPR radius of protection</th>
<th>1 ( h \leq 5 ) m</th>
<th>2 ( h = 30 ) m</th>
<th>3 ( h = 45 ) m</th>
<th>4 ( h = 60 ) m</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPR</td>
<td>OPRI</td>
<td>OPRI</td>
<td>OPRI</td>
<td>OPRI</td>
</tr>
<tr>
<td>h [m]</td>
<td>Rp [m]</td>
<td>Rp [m]</td>
<td>Rp [m]</td>
<td>Rp [m]</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>25</td>
<td>31</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>36</td>
<td>47</td>
<td>30</td>
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<td>38</td>
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<td>48</td>
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<td>58</td>
<td>74</td>
<td>91</td>
<td>66</td>
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<td>7</td>
<td>68</td>
<td>82</td>
<td>106</td>
<td>77</td>
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<td>8</td>
<td>78</td>
<td>90</td>
<td>112</td>
<td>90</td>
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<tr>
<td>9</td>
<td>88</td>
<td>100</td>
<td>120</td>
<td>102</td>
</tr>
<tr>
<td>10</td>
<td>98</td>
<td>108</td>
<td>130</td>
<td>115</td>
</tr>
</tbody>
</table>

iii. The lightning conductor shall be earthed through flats and connected to the earth mats as per applicable Indian Standards with earth pits. Each lightning conductor shall be fitted with individual earth pit as per required Standards including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, chemical compound as per provisions of IS.

iv. If necessary more numbers of lightning conductors may be provided as per design
calculation

v. The Contractor shall submit the drawings and detailed specifications of the PV array lightning protection equipment.

vi. The design, manufacture, inspection, testing and performance of Lightning Arrester shall comply with all currently applicable statutes, safety codes, provision of latest Indian Electricity Act, Indian Electricity Rules and Regulations of Statutory Authorities.

vii. Contractor shall provide dedicated two earth pits for Lightening Arrestor as per relevant IS standard.

Isolators cum Earthing Switches, Contacts, Insulators, Busbars (If Applicable):

i. This specification covers design, manufacture, testing and supply of. Manually operated 11 KV, 800 Amps Upright mounting type with manually operated with earth switch Isolators. The Isolators and Isolator-cum-Earthling Switched shall comply with the requirements of the IS: 9921 and IEC: 129 (latest edition) except specified herein. The Insulators shall comply with the requirements of IS : 2544 and IEC : 168-1988 (latest edition) for 11 kV pole mounted structure wherever required. 11kV pole mounted structure would be supplied, installed and commissioned by the Contractor wherever required.

ii. The isolator shall be of the manual operated type with earthing switches and shall complete with all parts and accessories including insulator operating rods, mounting attachments, necessary for their efficient operation. The equipment shall confirm in all respect to high standards of engineering Equipment shall capable of performing in continuous commercial operation up to the suppliers guarantee in a manner acceptable to the client, The equipment offered shall be complete with all components necessary for its effective and trouble free operation along with associated equipments, interlock, protection schemes, etc. Such components shall be deemed to be within the scope of the Contractor's supply irrespective of whether those are specifically brought out in this specification or not. All similar parts particularly removable ones shall be interchangeable.
iii. Each pole shall have three Pedestal type of Insulator’s stacks. Necessary arrangements shall be provided for proper alignment of the contacts. Gange operated links shall be so designed that all phases shall make and break simultaneously. The design of Isolators and Isolator-cum-Earthing Switches shall be provided for positive control of blades in all positions with minimum mechanical stress on the Insulators. Fixed guides shall be so provided that proper setting of contacts shall be obtained, when a blade is out of alignment even by 25mm in either direction. All movable parts which may be in current path shall be shunted by flexible copper conductor of adequate cross-section and capacity, which shall be furnished under bill of material.

11 kV Two Pole Structure:
The pole structure comprising of following items:-

i. All M.S. elements of channels, angles, and flat shall be painted with two coats of primer and further painted with two coats of Aluminium paint. All nut & bolts, washer etc. used shall be hot dip galvanized.

ii. Vertical pole of minimum ISMB - 175 (175 mm x 90 mm) size of 9.0 mtr. length as indicated in the drawing, with 400 x 400 x 8 mm size base plate welded to one end of both the joists.

iii. Cross member of minimum ISMC - 100 (100 mm x 50 mm) size channels approximately 3.5 m each Length wherever required as indicated in the drawing.

iv. Cross bracing angle of minimum ISA - 50 ( 50 mm x 50 mm x 6 mm) size of 4.5 m. each Length wherever required as indicated in the drawing.

v. Side clamps, stay clamps, cleats, patties, etc. Fabricated from minimum 50 mm x 6 mm size M.S flats as per actual requirement.

vi. All nuts, bolts, washers etc. shall be of minimum 15 mm size.

vii. Erection of poles and fixing of all structural members as per drawing and instruction of Site engineer. The structure shall be erected in plumb, line level, properly facing the
incoming and outgoing lines. Cross member shall be firmly tightened.

viii. All member shall be fabricated to suit the mounting / fixing of GOD, L.A, DOF, DISC/PIN/POST insulators, cable end termination kit / box etc. as per the drawing.

ix. All necessary hardware, nut-bolts, extra members, sundry items are included in the scope of work.

x. All M.S parts shall be painted with primer and aluminium paint.

xi. Earthing terminal shall be provided by welding 12 mm size bolt / cleat of 50 x 6 mm size M.S flat shall be fixed to each joist with a hole of 15 mm size and cadmium coated nuts, bolts, washers shall be provided as earthing terminals. Fixing or joining of any members is allowed by nut and bolt only welding is strictly not allowed.

xii. Suitable M.S. flat supports and cleats shall be fixed to ISMB poles for supporting / fixing the earthing protection strip in the manner approved by the Client.

xiii. Vitreous enameled caution boards or any other requirements shall be provided.

xiv. All drawing shall be prepared and submitted to Industry Mines & energy Dept. for approval. Obtain the approval from I.M. & E. Dept.

xv. C.T.P.T. mounting channels, clamps, bracing angles, nut-bolts, hardwares, etc. shall be supplied and erected.

xvi. Guy wire with suitable turn buckle, stay insulator at required location and direction as per the site requirement.

**Air Break Switch:**

i. The air break switch should be constructed as per IS: 9920 / 1985 and provide test certificate.

ii. The A.B. switch should be triple pole type with movable center pole. All the poles should
be opened / closed simultaneously by a lockable operating mechanism.

ii. The porcelain insulator shall be sound free from defects, thoroughly vitrified and smoothly glassed. Insulators shall have compressing type glassed with a good luster and of uniform brown color.

iv. The air break switch should be provided with 1 year guarantee and the test report.

v. The A.B. switch should be manually operated and shall be able to:
   - Carry rated current without excessive temperature rise.
   - Withstand the short circuit forces developed during fault.
   - Carry the inrush current of transformer.
   - Interrupt small inductive / capacitive current.

vi. The contacts shall be of silver faced copper ensuring sufficient contact pressure.

vii. The male & female contacts should be of self aligning type to ensure trouble free operation during opening and closing. Mild steel arcing horn capable of breaking the magnetizing current shall be provided.

Drop Out Fuse:

i. The D.O. Fuse assembly should be suitable for 11 KV supply and in accordance with IS 9385 / 1985. and provided with a test certificate

ii. The assembly shall be mounted on double pole structure complete with 3 fuse elements of required ampere rating. The fuse link shall consist of iron channel base, stack insulator per phase, fuse carrier bakelite tube, non-ferrous metal parts and spring loaded phosphor-bronze contacts. The insulator shall comply with impulse voltage test in accordance with IS 3106.

Lightning Arrestor Type and Ratings:
Lightning arrestor shall be station class, heavy duty, non-linear resistance type with rating as 11 KV. The arrestor shall have adequate thermal discharge capacity for severe switching surges, long duration surges and multiple strokes.

Constructional Features
i. The arrestor shall be single pole and hermetically sealed off. It shall be of robust construction with excellent electrical and mechanical characteristics.
ii. Insulators must be non-hygrosopic and shall be wet process porcelain, brown glazed and free from imperfection. All metal parts and hardware shall be hot dip galvanized.

iii. Creepage distance shall correspond to heavily polluted atmosphere. Grading ring if required shall be provided to maintain voltage gradient within permissible limit.

iv. The arrestor shall be provided with pressure relief device if applicable to prevent shattering of approach in case excessive gas pressures build up.

**Accessories**

i. Lightning arrester shall be furnished complete with insulating base, surge counter and anchoring hardware for mounting on steel structure.

ii. A surge counter shall be mounted at a convenient height for reading counter. Terminals shall be such as to permit connections with minimum bends.

iii. A leakage current detector shall be furnished with the counter as an integrative part. This is for monitoring the leakage to indicate any possible breakdown.

iv. A suitable sized bypass shunt along with necessary terminals shall be furnished for bypassing the discharge counter if required.

**Terminals**

i. All connection terminals shall be of corrosion resistant material and shall be provided with complete connection hardware.

ii. High voltage line terminal connector suitable for ACSR, AAAC conductor.

**Related Civil Work**

Foundation require for two pole structure in switch yard area shall be carried out by vendor with respective civil material as required to complete the job successfully as mentioned in drawing.

**Low Voltage Switchgear:**

i. This specification is for the 415V TP&N Power Control Centre (PCC).
ii. The PCC shall be rated for the maximum output of the supply transformer feeding the system.

iii. The short circuit withstand rating (1 sec) at rated voltage of the switchgear shall be minimum of 20 kA (rms) and corresponding dynamic rating shall be 50 kA (peak).

iv. The configuration of the PCCs shall be as per the Single Line Diagram of the system.

**Execution:**

i. Single front / compartmentalized, modular design, degree of protection IP52 with provision of extension on both sides.

ii. Incomer feeders: mains incomer - Electrically operated draw out type Air Circuit Breakers (ACBs).

iii. Outgoing feeders: Electrically operated draw out type Air Circuit Breakers (ACBs) / Moulded Case Circuit Breakers (MCCBs)

iv. The colour 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 PURCHASER, the same shall be intimated to the supplier.

v. 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.

vi. The gland plates shall be 3 mm thick.

**Control & Relay Panel Specifications for 415 V TP&N Power Control Centre (PCC):**

i. This specification is for the 415V TP&N Power Control Centre (PCC).

ii. The PCC 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 minimum of 20 kA (rms) and corresponding dynamic rating shall be 50 kA (peak)

iii. The configuration of the PCCs shall be as per the Single Line Diagram of the system.

**Execution**

Power Control Centres (Construction)

a. Single front / compartmentalized, modular design, degree of protection IP52 with provision of extension on both sides.
b. Incomer feeders: mains incomer - Electrically operated draw out type Air Circuit Breakers (ACBs).
c. Outgoing feeders: Electrically operated draw out type Air Circuit Breakers (ACBs) / Moulded Case Circuit Breakers (MCCBs)
d. The colour finish shade of switchgear enclosure for interior shall be glossy white & for exterior it shall be light grey, RAL 7032 of IS: 5. If a different exterior shade is desired by the PURCHASER, the same shall be intimated to the supplier.
e. 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
f. The gland plates shall be 3 mm thick

**Control Circuit**

a. Control supply for breaker closing / tripping - 110V DC
b. Air Circuit Breaker spring charge motor – 240 V AC, 1 phase
c. Moulded Case Circuit Breakers – 240 V AC, 1 phase
d. Indications, annunciation – 110V DC
e. Space heater, sockets, etc. – 240 V AC, 1 phase

**Busbar and Cable Cavity**

a. The material for main bus bars and tap off bus bars shall be electrolytic grade aluminum with HR PVC sleeved insulation
b. Bus bars shall be suitable for short circuit rating and current suitable for all connected load.
c. Bottom cable entry for incoming and outgoing cables
d. A suitable gland plate shall be supplied for termination of power, control and instrumentation cables.
e. Whenever feeders are housed in multi-tier configuration, these tiers shall be segregated by sheet metal barriers

**Control Room Electrical Wiring:**

i. Electrification of building shall be carried out as per IS 732-1989, IS 46481968 and other relevant standards. Suitable AC Distribution Board should be designed to Supply AC power in Control room.

ii. Control room AC distribution Board theoretical design, calculations and detailed explanations along with drawing shall be provided and approved.

**Auxiliary Power Supply:**

The Contractor shall install a separate 11 kV / 415 V step down transformer to supply power for internal equipment such as power for control equipment, area lighting, water pumps, and conference room fixtures, control room lighting and air-condition, etc. A separate kWh energy meter is to be provided by contractor for accounting of electricity consumed for auxiliary equipments.

**DC Battery & Charger:**

i. Adequate capacity DC battery Bank should be provided for emergency control supply of inverters, control / protection system & emergency lighting. A appropriate capacity battery charger with relevant IS/IEC standards & protection and automatic change over system should be provided to charge the battery bank along with relay circuit, fuses, annunciations and remote operating and controlling facility from the Main Control Room.

ii. A DC power supply Distribution panel/board should be supplied along with the Charger as per relevant IS standards. Control room DC Battery Bank & DC supply system theoretical design, calculations and detailed explanations along with drawing shall be provided and approved.

iii. DC Batteries the batteries shall have the following specifications
a. Type : Nickel Cadmium Stationary, sealed type, storage battery
b. Rating : 110 V D.C., Minimum 80 Ah at 8 Hour rate of discharge
c. Standard : IS 1651 – 1979 ; performance as per IS 8702
d. Container : Plastic Resin, ABS or PP
e. Terminal Post : Designed suitably to accommodate external bolted connections

iv. The battery shall be provided with epoxy paint coated exhaust fan for removal of gasses released from the battery cells.

v. The data sheet for the battery shall be submitted along with the Bid for evaluation.

**Earthing:**

i. 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.

**Terminals**

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

**Specific Requirements**

1. All ACBs 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.
2. ACBs shall be complete with microprocessor release and shall be provided with over current, short circuit and earth fault protections.
3. Minimum 10% spare feeders of each rating shall be provided in the switchgear.
4. All current transformers shall have 5/1A secondary and all meters shall be suitable for 5/1A operation.
5. 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.
6. All indicating instruments shall be flush mounting, Digital, 96 sq.mm size.
7. Window annunciator with hooter and accept, test, reset button shall be provided. Necessary auxiliary relays for contact multiplication shall be provided in the panel.
8. The maximum temperature of the bus bars, droppers and contacts at continuous current rating under site reference ambient temperature of 50º C shall not exceed 105º C.

Instrumentation: Switchgear instrumentation shall be provided as follows:

a. Mains Incomer – Voltmeter with selector switch
b. Ammeter with selector switch
c. Power Factor meter
d. Frequency meter
e. TVM + MD meter
f. Potential indicating lamps
g. Outgoing Feeders
h. Ammeter with selector switch on all feeders

General Technical Specifications of Control Panel:

i. The panel shall be self-supporting, free standing, floor mounted, modular type with construction having degree of protection of IP 54 as per IS 2147.

ii. The panel shall be fabricated from 14 SWG CRCA sheet steel for frame & load bearing surfaces. Partitions may be fabricated from 16 SWG CRCA if no components are mounted on them.

iii. The panel shall be painted with 2 coats of primer after pre-treatment and 2 coats of Polyurethane / epoxy paint with shade as decided by the Purchaser.

iv. Stiffeners shall be provided at corners & between modules to make panel rugged. The
stiffeners will necessarily be required for relay compartments or doors where heavy components are mounted.

v. The openable covers shall be provided with lift off type hinges, quarter turn door locks and flexible copper wire for earth connection.

vi. The panel shall be dust and vermin proof. Synthetic or neoprene gaskets shall be provided at all openings.

vii. The panel shall be of dead front construction suitable for front operated and back maintained functioning.

viii. Panel shall be provided with fl. lamp of 20 w capacity operated by door operated limit switch. Panel shall also have space heaters and thermostat arrangement.

ix. Panel shall be provided with 3 pin switch socket combined unit of 5 Amp capacity.

x. Lifting hooks shall be provided at the top of the panel.

xi. The hardware components used in the panel shall be hot dipped galvanized.

xii. The control components shall be fixed on mounting plate by drilling & tapping.

xiii. Aluminum anodized legend plates shall be provided for all the components. For components mounted on front face, legend plate from inside shall also be provided.

xiv. Pretreatment by 7 tank process shall be done before painting / powder coating the panel.

xv. Panel shall have provision of drawing pocket.

xvi. The panel shall be designed to ensure maximum safety during operation inspection, connection of cables and maintenance. Inside panel, checking and removal of components shall be possible without disturbing other units.
Cable entries will be from bottom. The opening of cable entry shall be covered by 3 mm thick gland plates.

The panel shall be provided with all necessary components / devices and instruments as per the enclosed schematic diagram and functional requirements.

The components such as protective relays, auxiliary relays, push buttons, switches, instruments shall be flush mounted on the front side of a panel.

The control wiring shall be done with PVC insulated flexible copper wire. For CT secondary circuits 2.5 sq.mm. wire shall be used. For control wiring 1.5 sq.mm. wire shall be used.

Earthing busbar of suitable cross section shall be provided throughout the length of panel.

The panel shall be fully wired all the terminals shall be brought out for cable connections. 10% spare terminals shall be provided on each terminal block. Separate terminal block shall be provided for different voltages. All wire shall have P.V.C. ferrules as per wiring diagram.

Proper shrouding to incoming and outgoing terminals shall be provided to ensure safety during operation, inspection and maintenance.

Indicating lamps shall be with multiple LEDs & shall be suitable for the voltage specified.

All the components in the panel shall be properly labeled. The labels shall be made of non-rusting metal or engraved PVC material properly fixed by screws.

The panel layout shall be made in such a way that it will always facilitate easy removal and reconnection of control cables without disturbing other wiring.

Centre lines of control switches, push buttons and indicating lamps shall be matched so
as to give neat appearance. Similarly top lines of indicating instruments and relays shall also be matched.

xxvii. The panel shall be provided with electrolytic grade aluminum busbar of suitable cross section so as to maintain max current density of 0.8 AMP/ Sq.mm.

xxix. Bus bars shall be provided with color coded heat shrinkable sleeves.

xxx. Bus bars shall be supported by high quality epoxy insulators provided at specified distances so as to withstand to the given fault level.

xxxi. The busbar chambers shall be provided with suitable ventilation arrangements so as to limit the maximum temperature of 85°C while carrying rated current.

xxxi. Proper clearance of minimum 25 mm shall be maintained between phase bus bars and between bus bars.

xxvii. The panel shall be inspected at manufactures works before dispatch to site at the discretion of Purchaser.

xxiv. All routine tests shall be carried out on the panel in presence of the Purchaser. These tests shall include following:
   a. Verification of components ratings and operation.
   b. High voltage measurement test.
   c. Insulation Resistance measurement.

xxv. Control testing.

xxvi. Approval on following drawings shall be obtained before manufacturing the panels
   a. General arrangement drawing.
   b. Wiring Diagram.
   c. Detail bill of material.
   d. 11 kV Transmission Line
The Contractor shall provide 11 kV transmission with bay and metering on Turnkey basis as per client’s requirement as per the application. Bidder shall confirm the same in the Bid.

**Electrical Panel for Prefabricated Control Room cum Operator Room:**

Electrical panels shall have electrical panel adequate inputs to take in from the centralized Push Button Switching Unit having suitable mimic with power flow indicator & status indicator of different PCU’s. The Panel shall be floor-mounted type.

i. All the measuring instruments such as feeder voltmeter, ammeter, frequency meter, Electronic Energy Meter (for measuring the deliverable units (kWh) for sale), selector switches, Mimic etc. shall be in the front panel.

ii. All the Power cables shall be taken through backside of the Panel via sufficient /concrete cable trench and cable trays with cover at top.

iii. The Panel shall be fitted with suitable rating & size, HRC fuses/circuit breaker/isolators, indicators for all incomer and outgoing terminals, voltmeter & ammeter with suitable selector switches to monitor & measure the power to be evacuated.

iv. Nuts & bolts including metallic cubicle shall have to be adequately protected against atmosphere and weather prevailing in the area.

v. The dimension, weight, sheet thickness, painting etc. should be indicated by the Contractor. The bill of material associated with the equipment should be clearly indicated while delivering the equipment.

vi. Pre-fab Control room cum Inverters Room shall be of adequate size and of standard manufacturer with sufficient lighting points and RCC cable trenches with covers and shall have exhaust chimney and also sufficient ventilation.

vii. All prefab control room cum Inverters room shall be layed on RCC plinth with sufficient foundation and Grad Slab. The plinth shall minimum 450 mm high from formation level of the plant.
viii. All the design & drawing related to 11 KV Substation / 11 KV Two Pole Structure/interconnection with grid should be as per requirement.

ix. The Contractor shall provide to the Purchaser detailed civil, electrical, plumbing, etc. drawings and equipment specifications for the inverter/ control room and take approval from client.

x. The drawings of Panels with the make of components should be approved from the Purchaser. All the design & drawing related to switch yard / interconnection with grid should be as per requirement of state electricity rules as approved by competent authority. Pre-fab structure shall have sufficient number of lighting point/ACDB/MCB board.

xi. The Contractor shall provide to the Purchaser detailed civil, electrical, plumbing, etc. drawings and equipment specifications for the inverter/ control room and take approval from the Purchaser.

**Area Lighting:**

i. This scope includes design, supply, installation and testing, commissioning, operating & maintaining LED based area lighting for the solar farm covering all key areas for O&M purpose.

ii. Fixture shall be minimum IP 66 rated along with minimum IP 65 rated control gear, luminance efficacy of the fixture shall be more than 70%, colour temperature shall be 3000–4000 K to match the peripheral area lighting of the campus

iii. GI / PU Painted poles as per IS guideline, shall be used made of B class pipes with preferable integral junction box & sufficient protection per pole. This shall includes all necessary electrical cabling, earthing Timer based control panel etc as required to complete the system. The connector box shall be made of stainless steel, Dust & Vermin Proof, which is to be recessed at the base of each Yard Lighting system. The connector box shall have suitable brass or copper made connector terminal

iv. Average 15 Lux to be maintained through the solar farm when all the lights are on. No flood lighting to be done for the purpose.
v. Area lighting arrangement shall be made to illuminate the entire site at an appropriate lux level for night hours or bad light hours. Area lighting arrangement shall have adequate numbers of lights poles (50 mm diameter with 3 mm thick at 25 meter spacing) on the sides of peripheral roads, etc) as per requirement.

vi. All the yard lighting towers and lighting fixtures shall be effectively grounded using adequate size of GI earthing wires / GI earthing strips.

vii. The lighting poles shall be concreted with 600 mm coping above ground level for pole protection with sufficient reinforced concrete foundation below ground.

viii. Solar Bollard lighting only on internal roads with height of 1 meter on both the sides of the roads with sufficient foundation. The control gear box (non-integral type) shall be encased in the coping.

ix. Loop in – Loop out power cables shall be brought up to the control gear box through of adequate size for cable protection.

x. The cables shall be properly glanded to the control gear box gland plate.

xi. XLPE / PVC insulated armored Cu/Al cables of adequate size shall be used for interconnection and supply of power to Yard lighting systems.

xii. 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 connector box and at the entry point to MCB distribution Box for controlling the yard lighting system.

xiii. Lighting fixtures shall be installed close to fencing.

**Metering System:**

i. ABT energy meter shall be provided as approved by DisCom to measure the delivered quantum of energy to the grid for sale. The responsibility of arranging for the meter, its inspection/calibration/testing charges etc. rests with the Contractor. All charges incurred on Meter testing, shall be borne by the Contractor. ABT energy metering system is to be approved by DisCom.

ii. Meter must be provided with the necessary data cables.

iii. Power requirement for the internal plant use must not consider in total generation
capacity. It will be net metered with import & export power utilisation and the auxiliary power should interfere with accounting of solar electricity feed in to the grid. Contractor to consider necessary Electrical Distribution for internal plant requirement from common network.

iv. The Bidder shall provide ABT compliant meters at the interface points. Interface metering shall conform to the Central Electricity Authority (Installation and Operation Meters) Regulation 2006 and amendment thereof.

v. Meter shall be suitable for interfacing for synchronizing the built-in clock of the meter by GPS time synchronization equipment existing at the station either through a synchronization pulse received from the time synchronization equipment or through a remote PC synchronized to GPS clock shall also be in the scope of Bidder.

vi. All charges for testing and passing of the meter with relevant government agency shall be borne by Bidder.

vii. ABT compliant Energy Meters shall have technical specification as given below (not limited to specified requirement, Bidder can provide Meter with latest facilities):

viii. Shall be microprocessor-based conforming to IEC 60687 / IEC 6205211/ IEC 62053-22 / IS 14697

ix. Shall carry out measurement of active energy (both import and export) and reactive energy (import) by 3-phase, 4 wire principle suitable for balanced/ unbalanced 3 phase load.

x. Shall have an accuracy of energy measurement of at least Class 0.2 for active energy and at least Class 0.5 for reactive energy according to IEC 60687, and shall be connected to Class 0.2 CT cores and Class 0.2 VT windings.

xi. The active and reactive energy shall be directly computed in CT & VT primary ratings.

xii. Shall compute the net MWh and MVARh during each successive 15-minute block
metering interval along with a plus/minus sign, instantaneous net MWh, instantaneous net MVARh, average frequency of each 15 minutes, net active energy at midnight, net reactive energy for voltage low and high conditions at each midnight.

xiii. Each energy meter shall have a display unit with a seven digit display unit. It shall display the net MWh and MVARh with a plus/minus sign and average frequency during the previous metering interval; peak MW demand since the last demand reset; accumulated total (instantaneous) MWh and MVARh with a plus/minus sign, date and time; and instantaneous current and voltage on each phases.

xiv. All the registers shall be stored in a non-volatile memory. Meter registers for each metering interval, as well as accumulated totals, shall be downloadable. All the net active/reactive energy values displayed or stored shall be with a plus /minus sign for export/import.

xv. At least the following data shall be stored before being over-written for the following parameters:

**Metering Co-ordination parameters**

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Parameters</th>
<th>Details</th>
<th>Min No of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Net MWh</td>
<td>15 min Block</td>
<td>90 days in meter</td>
</tr>
<tr>
<td>2</td>
<td>Average Frequency</td>
<td>15 min Block</td>
<td>90 days in meter</td>
</tr>
<tr>
<td>3</td>
<td>Net MVARh for &gt; 103 %</td>
<td>15 min Block</td>
<td>90 days in meter</td>
</tr>
<tr>
<td>4</td>
<td>Cumulative Net MWh</td>
<td>At every Mid-night</td>
<td>30 days in meter / 90 days in PC</td>
</tr>
<tr>
<td>5</td>
<td>Cumulative Net MVARh for v &gt; 103 %</td>
<td>At every Mid-night</td>
<td>30 days in meter / 90 days in PC</td>
</tr>
<tr>
<td>6</td>
<td>Date and time blocks of VT failure on any phase</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
xvi. Shall have a built in clock and calendar with an accuracy of less than 15 seconds per month drift without assistance of external time synchronizing pulse.

xvii. Date/time shall be displayed on demand. The clock shall be synchronized by GPS time synchronization equipment existing at the station provided by Bidder.

xviii. The meter shall be suitable to operate with power drawn from the VT supplies. The burden of the meters shall be less than maximum 2 VA.

xix. The power supply to the meter shall be healthy even with a single-phase VT supply. An automatic backup, in the event of non-availability of voltage in all the phases, shall be provided by a built in long life battery and shall not need replacement for at least 10 years with a continuous VT interruption of at least 2 years. Date and time of VT interruption and restoration shall be automatically stored in a non-volatile memory.

xx. Even under the absence of VT input, energy meter display shall be available and it shall be possible to download data from the energy meters.

xxi. Shall have an optical port on the front of the meter for data collection from either a hand held meter reading instrument (MRI) having a display for energy readings or from a notebook computer with suitable software.

xxii. The meter shall have means to test MWh and MVARh accuracy and calibration at site in-situ and test terminal blocks shall be provided for the same.

xxiii. The meter shall have a unique identification code provided by the Purchaser and shall be permanently marked on the front of the meter and stored in the non-volatile memory of the meter.

xxiv. The Purchaser shall have the right to carry out surprise inspections of the Metering Systems from time to time to check their accuracy.

xxv. A separate kWh energy meter is to be provided by contractor for accounting of
electricity consumed for auxiliary equipments

**SCADA and Remote Monitoring System**

i. The plant shall be automatically operated and shall be controlled by microprocessor based control system SCADA. 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.

ii. An integrated SCADA shall be supplied which should be capable of communicating with all inverters and provide information of the entire Solar PV Grid interactive power plant.

iii. 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 & software, which will be robust & rugged suitable to operate in the control room Environment.

iv. Reliable sensors for solar insolation, temperature, and other weather and electrical parameters are to be supplied with the data logger unit.

v. The data acquisition system shall measure and continuously record electrical parameters at inverter output, 11 kV ABT meter at evacuation point, ambient temperature near array field, control room temperature, AC and DC side electrical parameters of each inverter, power characteristics of the HT side.

vi. All data shall be recorded chronologically date wise. The data file should be MS Excel compatible. 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.

vii. The Bill of Materials associated with the equipment must clearly indicate especially the details about the PC and Printers, etc.
The Data Acquisition System should be housed in a desk made of steel sheet.

SCADA shall provide following data at a 5-15 minute interval.

a. Power at 11 kV ABT meter at switchyard

b. Ambient temperature near array field.

c. Wind Speed

d. AC and DC side Power of each inverter

e. Solar irradiation/isolation

f. Voltage of the HT Side

Any other parameter considered necessary by supplier based on current prudent practice

SCADA shall provide 15 minute daily, monthly and annual average of following parameters:

- Exported Energy to grid at 11 kV
- Energy of each inverter
- Solar Radiation
- Temperature

The SCADA server PC shall be of Industrial type, rugged & robust in nature to operate in a hostile environment. The PC shall have minimum Intel Core i5 processor having 2 X 500 GB HDD with 4 GB RAM. The PC shall also have 42” TFT Color monitor, DVD Drive with Writer, Floppy Drive, USB drive, Scroll Mouse and UPS for 4 hours Power back up.

The printer shall be of industrial type, rugged & robust in nature and of reputed make. The printer shall be equipped for printing, scanning, copying and fax.

String Monitoring System: String Monitoring System designed exclusively for parallel connection of the photovoltaic field strings, allowing for protection in the case of breakdown & monitoring the entire photovoltaic field, by means of the following checks.
• Reading the string currents (10 channels available)
• Reading the total voltage of the field
• Checking the fuses positioned in the system, to protect the photovoltaic panels.
• Checking the state of the internal protection against over-voltages.
• Should be very low power consumption.

a. Monitoring of various parameters at string level should be made possible in the main control room at site by installing the suitable string monitoring system any fault at string level could be recognizable by that system.
b. A provision should be present for remote monitoring of the power plant at string detail over the web.
c. The Contractor shall provide the detailed specifications, and all administrative rights/privileges/passwords to the string monitoring system.

d. Monitoring of various parameters at string level should be made possible in the main control room at site by installing the suitable string monitoring system any fault at string level could be recognizable by that system.

xv. Weather Station and Data logger
a. Contractor shall provide the data over remote web-server with rights to control or modify the same through appropriate arrangements.
b. Contractor shall provide necessary licensed software and hardware solution to offer monitoring of electrical parameters of grid and solar generator monitored at individual string level over remote web server. The Contractor shall provide all necessary accessories like power supply, connection cords, sensors, active SIM card with appropriate data plan etc. so as to make the system complete in all respect.
c. The cost of data plan during the project and O&M shall be borne by the Contractor. At the end of the O&M, the same shall be transferred to Purchaser at no extra cost.
d. It shall also have local data logging and communication through Bluetooth / Wi Fi and Ethernet port.
e. The Remote Monitoring System shall be capable of sustaining maximum – minimum temperature, rainfall, wind gusts and UV radiation. The enclosure shall be IP65 for outdoor installation / IP21 for indoor installation.

f. The Remote Monitoring System shall have capability to log and send data from weather sensors.

g. The data shall be available for every minimum 15 minutes interval.

h. The system shall have sufficient internal memory storage to retain data for one complete year and shall have provision of expanding memory through external memory card / USB drive.

i. The system shall be able to communicate wirelessly in a close proximity

j. The Contractor shall provide to the Purchaser the detailed specifications, and all administrative rights/ privileges / passwords to the string monitoring system.

k. The Contractor shall provide following measuring instruments with all necessary software & hardware compatible with the Data logging and web based monitoring system.

i. **Pyranometer**: The Contractor shall provide two no. of pyranometers for measuring incident global solar radiation, one each on the horizontal surface and in the same orientation (inclination and azimuth) as the photovoltaic modules. The pyranometers shall have following specifications mentioned in Table below:

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Particulars</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Class</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td>Spectral Response</td>
<td>0.31 to 2.8 micron</td>
</tr>
<tr>
<td>3</td>
<td>Sensitivity</td>
<td>Approx. 9 micro - volt/w/m2</td>
</tr>
<tr>
<td>4</td>
<td>Time response (95%)</td>
<td>Max 15 sec.</td>
</tr>
<tr>
<td>5</td>
<td>Non linearity</td>
<td>±0.5%</td>
</tr>
<tr>
<td>6</td>
<td>Temperature Response</td>
<td>±2% (-20°C to +50 °C)</td>
</tr>
<tr>
<td>7</td>
<td>Temperature Response</td>
<td>Max ±2%</td>
</tr>
<tr>
<td>8</td>
<td>Tilt error</td>
<td>±0.5%.</td>
</tr>
<tr>
<td>9</td>
<td>Zero offset thermal radiation</td>
<td>±7 w/m2</td>
</tr>
<tr>
<td>10</td>
<td>Zero offset temperature change</td>
<td>±2 w/m2</td>
</tr>
<tr>
<td>11</td>
<td>Operating temperature range</td>
<td>- 40 deg. to +80 deg.</td>
</tr>
<tr>
<td>12</td>
<td>Uncertainty(95% confidence Level)</td>
<td>Hourly- Max-3%</td>
</tr>
<tr>
<td></td>
<td>Daily-</td>
<td>Max -2%</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>14</td>
<td>Non stability</td>
<td>Max ±0.8%</td>
</tr>
<tr>
<td>15</td>
<td>Resolution</td>
<td>Min + / - 1 W/m²</td>
</tr>
<tr>
<td>16</td>
<td>Input Power for Instrument &amp; Peripherals</td>
<td>230 VAC (If required)</td>
</tr>
<tr>
<td>17</td>
<td>Output Signal</td>
<td>Analogue form which is compatible with the data</td>
</tr>
</tbody>
</table>

ii. **Temperature Sensor**: The Contractor shall provide suitable nos. of RTD type temperature sensors with required weather shield as per Indian Standards, so as to individually and simultaneously measure both, ambient temperature, and module temperature. To measure module temperature, the temperature sensors shall be located on the back of representative modules and on front glass surface. Care must be taken to ensure that the temperature of the cell in front of the sensor is not substantially altered due to the presence of the sensor. Instrument shall have a range of -5°C to 60°C.

iii. **Anemometer and Wind Vane**: The Contractor shall provide double cup anemometer on tubular type made up of hot dipped Galvanized Iron. Velocity range upto 65 m/s, accuracy limit of 0.1 m/s. the anemometer shall have valid calibration certificates which should be produced during one month of the installation.

iv. 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. Bidder shall provide Instrument manual in hard and soft form.

v. The data acquisition system shall measure, continuously record power at PV module ambient temperature near array field, cell temperature, wind velocity, AC and DC (string level) side power of each inverter, power characteristics of the HT side, fault messages, alarms etc. in Indian Standard Time.

vi. All data shall be recorded chronologically date wise. The data file should be MS Excel
compatible. 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 worksheet chronologically. Representation of monitored data in graphics mode or in tabulation form. All instantaneous data can be shown in the Computer Screen.

**vii.** Provision should be available for Remote Monitoring and Data Retrieval over web server. Moreover, Successful Bidder shall also provide one no. of PC with required hardware and licensed copies of software to make it fully functional for normal operation and data logging through Bluetooth / Wi Fi / RS port from the site.

**viii.** The Bill of Materials associated with the equipment must clearly indicate especially the details about the PC and other accessories.

**ix.** The Data Acquisition System should be housed in appropriate enclosure to sustain outdoor environment as per generation design guidelines laid for enclosures. The same shall have provision of locking the same to prevent unauthorized operation. Remote Monitoring System (RMS) shall provide following data at a 15 minute interval.

- Power, Current and Voltage at individual solar PV strings (Instantaneous)
- Ambient temperature near array field, cell temperature measured at module front and back surface
- Wind Speed
- Cumulative AC and DC side Power of each inverter
- Cumulative AC and DC energy of each inverter

a. Solar irradiation/isolation over horizontal and in-plane of the module
b. Voltage, frequency and other important electrical parameters etc. in the local grid.
c. Any other parameter considered necessary by supplier based on current prudent practice
d. All data shall be recorded chronologically date wise. The data file should be MS Excel compatible. 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. Representation of monitored data should be in graphics mode or in tabulation form. All instantaneous data should be shown in the Computer Screen.

e. RMS 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 Bidder shall provide compatible software and hardware so that data can be transmitted via Standard modem.

f. RMS shall be provided with independent solar PV based power supply along with maintenance free battery having 3 days autonomy.

g. The RMS shall be compatible to the requirements for measuring and reporting the performance-ratio of the power plant.

h. The contractor shall provide all administrative rights/ privileges/ passwords of the RMS system to Purchaser.

i. The Bidder shall submit the data sheet with technical specifications of the RMS system in the Bid.

**Testing Instruments for Electrical & Electronic:**

The Contractor shall also provide required set of onsite testing instruments/equipment viz. earth resistance tester, rheostats, insulation tester, millimeters, clamp meters, CRO, Function Generator, Transformer oil BDV kit, Relay testing kit, infra-red thermal imaging hand held temperature meter, inverter testing kit etc.

**Electronic LED Display Board:**

The Contractor shall provide an electronic LED Display board that can display the Solar PV plant parameters like total generation till date, daily generation, instantaneous generation, instantaneous frequency, etc. The LED display board has to be erected at a height of 8 feet above ground level and should be large enough to be read from a distance. The LED display board is to be placed between the Control Room and the main gate, the exact location of which will be provided by the Purchaser after award of the project.
DETAILED CIVIL AND OTHER NON-ELECTRICAL WORK

All material, installations, fixtures, accessories etc. to be provided shall be as per the relevant IS specifications. These shall be of best quality and of standard manufacturer as approved by the Engineer-In-Charge (EIC) on site, when there are no standard specifications.

The fresh OPC of 43 grade cement and TMT steel reinforcement bars Fe 415 shall be used confirming to relevant IS specifications. The agency has to provide best workmanship with skilled manpower for all the civil items as per the standard specifications/ best practice as approved by the EIC. The booklet Standard Specifications for Civil Works will be applicable wherever there is dispute in the items of civil works. Purchaser will not supply any material for this work.

Topographical Survey:

Topographical survey shall have to be done by the Successful Bidder of the proposed site at his discretion but not more than 25 mtr intervals with the help of Total Station or any other suitable standard method of survey. All necessary Reduced Levels (RL) as entered in the Field Book have to be submitted along with pre contour layout of the total site. The formation levels of the proposed power plant have to be fixed with reference to High Flood Level of the proposed site (from nearest bridge or culvert etc). The ground level and plinth level of structures shall be fixed taking into consideration the highest flood level and surrounding ground profiles.

Soil Test:

i. Bidder has to carry out detailed Geotechnical investigation to ascertain soil parameters of the proposed site for the use of planning / designing / construction / providing guarantee / warranty of all civil work including but not limited to foundations / piling for module mounting structures, etc. The Contractor shall carry out soil investigation through Govt. approved / certified soil consultant. These reports shall be furnished to the Purchaser prior to commencing work. All RCC works shall be provided of Minimum M20 grade with 340 kg cement/cu.mtr of concrete as per relevant IS specifications as well as soil data considering appropriate earthquake seismic zone, wind velocity, whether effect, soil characteristics etc.
ii. The scope of soil investigation covers execution of complete soil exploration including boring, drilling, collection of undisturbed soil sample where possible, otherwise disturbed soil samples, conducting laboratory test of samples to find out the various parameters mainly related to load bearing capacity, ground water level, settlement, and soil condition and submission of detail reports along with recommendation regarding suitable type of foundations for each bore hole along with recommendation for soil improvement where necessary. Contractor shall provide certificate of foundation design from competent licensed engineer in support of the foundation design/Module Mounting Structure proposed by him.

**Foundations:**

The foundations should be designed considering the weight and distribution of the structure and assembly, and a maximum wind speed of 180 km per hour. Seismic factors for the site also have to be considered while making the design of the foundation.

**Designing of components:**

i. The Contractor shall carry out Shadow Analysis at the site and accordingly design strings and arrays layout considering optimal use of space, material and man-power and submit all the details / design to Purchaser for its review / suggestions / approval.

ii. The Contractor shall obtain and study earthquake and wind velocity data for design of module mounting structure, and considering all parameters related to the weathers conditions like Temperature, humidity, flood, rainfall, ambient air etc.

iii. Pre-fabricated structures for control room including inverter cum office rooms with toilet and Pantry shall be strictly as per relevant IS standards and designed for 180 Km per hour.
Storage, Construction Power and Water:

The Contractor shall also plan for transport and storage of materials at site. The Bidder shall estimate the water requirements for cleaning the photovoltaic modules at least once in every week in order to operate the plant at its guaranteed plant performance.

Land Development and Cleaning:

The site is found to be more or less flat. However, the Contractor shall visit the site and do the topographical survey to ensure land development work such that land is perfectly flat. Also, the Contractor shall take reasonable care to ensure that the plant is aesthetically designed. Contractor is not allowed to follow the land natural profile for erection of module mounting structure.

Fencing:

Plant shall be protected by chain link fencing. The minimum height of the fencing shall be 1.5m from the ground level. The chain link of 50mm x 50mm diamond mesh of 10 gauge galvanized steel wire with 12 gauge barbed wires at top (3numbers) is to be provided. Providing and fabricating and fixing aligning vertical post of 75mm x75mm x 6mm with cross bracing both side of ISA 45mm x 45mm x 5mm and is to be provided. Also line wire at top, middle and bottom of chain link mesh of 8 gauges is to be provided. Chain link fencing shall be fixed in ground up to 200mm by sufficient foundation.

Main Entrance Gate:

- An all-weather main gate with width of at least 6 meter shall be erected at the entrance of the plant site.
- The Prefabricated Watchmans Cabin of 2.5 meter x 2.5 meter at the main entrance gate shall be designed in the Bid document and constructed by the Successful Bidder keeping in view the safety and security of the power plant.
- The Bidder shall provide detailed civil, electrical, plumbing, etc. drawings and equipment specifications for the Prefabricated Watchmans cabin
Safe working condition: The contractor shall ensure

- Frequent and periodic inspection of construction, operation and maintenance of equipment, work areas, conditions and methods to prevent fires and other accidents by taking advanced corrective actions.
- Review and suggest/upgrade of the conditions, procedures and human actions wherever needed.
- To have complete knowledge of the potential hazards that may lead to accident and take advance corrective actions needed to avoid accidents.

Awareness on Safety

- Once in a fortnight, before the start of work, the contractor shall explain about Safety and its importance to all the workers under his jurisdiction.
- During this briefing the contractor shall explain to all the workers about the importance of Safety equipment like Hand Glove, Safety Belt, Earthing Rod, Helmet etc.
- The contractor shall prevail upon and insist the use of specified safety gadgets/ equipment during the work.
- The contractor shall also instruct the workers not to take up the work without proper Line Clear, Work Permit and Safe Zone, etc.

Worker Awareness on safety

- General safety awareness
- First aid
- Emergency procedures including shock treatment
- Use of Personal Protective Equipment
- Safety precautions while handling electro-mechanical equipment
- Use of different types of fire-fighting equipment
- Response in the event of emergencies including fire, floods, landslides, earthquakes etc.
- Site specific hazards
• Relevant Safety acts, rules and regulation

General Safety Precautions

All voltages shall be considered dangerous even though it may not be high enough to produce serious shock. All electrical circuits are to be treated as live and no work (maintenance, repairs, cleaning) is to be carried out on any part of electrical apparatus or circuit unless such parts are:

• Dead
• Isolated and all practicable steps taken to lock off from live conductors.
• Efficiently connected to earth between such points and points of work.
• Released for work by taking of Line clear
• By checking that equipment for its de-energized condition.

Safety Precautions for Work on overhead Mains, Service Lines:

a) Working on Dead line and equipment:

• No person shall work on line supports or conductors unless they are discharged and earthed as follows:
  • The circuit or conductor to be worked on shall be made dead by switching off or opening the isolator links or fuses and by locking isolator/circuit breakers in the off position. A danger notice board with the words
• "MEN ON LINE” should be fixed securely, below the switch or link/circuit breakers/isolators.
• After switching off the supply before touching the lines, each of the conductors shall be tested for pressure (voltage) by discharge rod. The discharge wires should be kept at least 1.5 meter away from the body. The procedure is necessary in order to make sure that the line to be worked on is actually the line that has been isolated. Rubber gloves or preferably gauntlets, and runner boots should be used on both hands.
• All the conductors shall then be short circuited together and adequately earthed; this shall be done at the points on each side of the place thereby creating a safety zone where the work is carried out. Rubber gloves or gauntlets, and rubber boots shall be used while doing this work. Poles on which work is actually to be carried out should also be earthed.
• A working section at either end of which the conductors are earthed shall not exceed 0.5 km in length.
• In the case of lines meeting or crossing at any pole which forms the site of work, all the lines crossing or ending at that pole shall be earthed as stated above unless work on the one line with any or all the remaining lines alive is otherwise permissible and so specified in the LC form.
• Ensure that there is no possibility of back feed.
• All phases shall be earthed even if work is to be carried out on one phase only.
• When work is to be carried out on lines of all insulated conductors where grounding points are not provided at point of work, temporary grounding shall be connected at point of work to an efficient portable earth spike driven into the ground. The line shall also be grounded at the nearest line grounding point on either side of the point of work.
• Where two or more crews are working independently on the same line or equipment, each crew shall properly protect themselves by placing their own temporary earths.

b) Working on lines and equipment adjacent to live equipment or lines:

• When working near live lines or apparatus, each worker should plan their moves and take extreme care in moving from one position to another
• Where impractical to erect barriers between workers at work and live parts within reach of their hands and objects being handled, continuous watch shall be kept by the Contractor or someone specifically designated by them for that purpose.
• When a truck is used near live parts, all workers, except the driver, should stay away from the truck, and the truck should carry adequate iron ropes for grounding. Driver should see that truck is clear from live lines before leaving and entering the truck.
• Work on Double Circuit Overhead lines & HT/LT lines with one circuit alive shall not be carried out.

Water tank:
The Contractor has to provide 20000 litre tank rested on sufficient foundation/platform such that it cannot create any shadow.

**Water supply:**

All necessary arrangement for pipeline network with valve and pumping assembly for wet cleaning of the solar panels shall be in the scope of the bidders and accordingly the agency has to provide all the necessary equipments, accessories, tool & tackles, pumps and piping arrangement which are required for the same. The successful bidder has to plan pipeline network such that it shall not block the passage between two arrays. Contractor shall have to provide water softener plant as per daily washing requirement of module.

Prefabricated Control Room including space for Inverters, panels, office room, scada room Pantry & Toilet Unit.

The Contractor has to plan Control room such that it should have sufficient space for installation of Invertors and Panels etc. It shall have sufficient space for SCADA room with work station CPU and monitor.

Control Room shall be designed in such way that it shall have sufficient space for Inverters and panels placement, office room with conference table for 15 persons, Pantry and toilet unit.

All the Power cables shall be taken through backside of the Panel via sufficient reinforced cement concrete cable trench and cable trays with 8mm thick checker plate cover at top.

The Panel shall be fitted with suitable rating & size, HRC fuses/circuit breaker/isolator indicators for all incomer and outgoing terminals, voltmeter & ammeter with suitable selector switches to monitor & measure the power to be evacuated.

Nuts & bolts including metallic cubicle shall have to be adequately protected against atmosphere and weather prevailing in the area.

Pre-fab Control Room shall be of adequate size and of standard manufacturer with sufficient lighting points and RCC cable trenches with covers and shall have exhaust chimney (if required)
and also sufficient ventilation. Prefab Control room shall be laid on RCC grad slab, RCC plinth with sufficient foundation. The plinth shall minimum 450 mm high from formation level of the plant and shall have 1m plinth protection on the periphery of control room. It shall have steps and ramp for equipment transferring.

SCADA room shall be provided with Work station, Monitor, CPU, Table and Chairs of standard manufacturer. Office, Passage and SCADA room shall have False Ceiling of Gypsum board tiles with Armstrong suspended channel system.

Control room shall have sufficient number of lighting point/ACDB/MCB board along with fans, exhaust fans and Lights of standard makes. Pantry unit shall have sandwich type platform with sufficient plumbing fixtures.

The Contractor shall provide to the Purchaser detailed civil, electrical, plumbing, etc. drawings and equipment specifications for the control room and take approval from client/consultant. The drawings of Panels with the make of components should be approved from Client

**Flooring:** Best quality vitrified tile flooring having min size of 600 mm x 600 mm x 8-10 mm thickness with 100mm skirting of same tile of standard manufacturers as approved by EIC or as per approved make of the Purchaser.

**Doors and Windows for Inverter rooms, Control room and Security Cabin:**

Doors and windows shall be made of aluminium sections. All sections shall be 20 microns anodized. Sections of door frame and window frame shall be adopted as per industrial standards(minimum 1.2mm thickness). Door shutters shall be made of aluminium sections and combination of compact sheet and clear float/wired glass. The control room shall require a number of windows/ louvers to provide ventilation/ fresh air circulations.

**Air Conditioner for Control Room:** The control room shall be equipped with appropriate numbers of fans for effective heat dissipation. The SCADA cabin and office room shall have split type air conditioning units of 1 Ton capacity.
Structural Steel Work:

i. The structural steelwork required for termination incoming 11 kV line/ Cable, equipment supports, lighting masts and for shielding towers together with all foundation bolts shall be included by the Bidder in its scope of work. The steel work shall be fabricated from galvanized structural sections. Specific requirement for thickness of galvanization should be at least/ minimum 80 microns at any point on any component of module mounting structure when measured.

ii. The height of structures for incoming line shall be as per the design developed by the Bidder in line with standard practice followed by Discom and drawings are to be submitted. The necessary modification in existing 11KV substation is in the scope of bidder.

iii. The incoming line gantry shall be designed on the basis of ACSR conductor/Cable considered in the design and also considering that terminal tower will be located at a distance of approximate 0.5 Km from the incoming gantry at SPV power station switchyard. The Bidder shall take into account wind load, temperature variation etc. while designing the gantry structure. The column shall be provided with step bolts and anti-climbing devices.

iv. The entire structural steel work shall conform to IS: 802 and if other applicable. The Bidder shall furnish design calculations for approval by the Purchaser before procuring the material.

v. All structure pertaining to 11 kV switchyard have to be applied outdoor with white paint (lime wash).

Hardware:

i. Metal fittings of specified material for string hardware meant for power conductor and earth wire shall have excellent mechanical properties such as strength, toughness and high corrosion resistance. The suspension and tension clamps shall be made from Aluminium alloy having high mechanical strength. Suspension and tension clamps offered shall be suitable for ACSR / AAAC conductor as per design.
ii. All hooks, eyes, pins, bolts, suspension clamps and other fittings for attaching insulators to the tower or to the power conductor shall be so designed as to reduce (to a minimum) the damage to the conductor, insulator or the fitting arising from conductor vibration.

iii. All drop-forged parts shall be free-from flaws, cracks, or other defects and shall be smooth, close-grained and of true forms and dimensions. All machined surfaces shall be true, smooth and well-finished.

iv. All ferrous parts of hardware shall be galvanized in accordance with IS 2629. The galvanization shall withstand four dips of 1-minute duration each in copper-sulphate solution as per the test procedure laid down in the relevant ISS.

v. The threads in nuts and tapped holes shall be cut after galvanizing, and shall be well-lubricated/greased. All other threads shall be cut before galvanizing.

vi. Both the suspension and the tension hardware shall be of ball and socket type, and shall be with ‘R’ and ‘W’ type security clip of stainless steel or phosphor Bronze conforming to IS 2486. The tension clamps of both compression type and bolted type as shown in the relevant drawings shall be offered. Arcing horns shall be provided on the line side for both the suspension type and compression type hardware.

**Fire Extinguishers:**

Liquefied CO2 fire extinguisher shall be upright type of capacity 10 kg having IS: 2171. 7 and 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.

**Sand Buckets:**

Sand buckets should be wall mounted made from at least 24 SWG sheet with bracket fixing on wall conforming to IS 2546. Bucket stands with four buckets on each stand shall be provided in
the Transformer Yard, Switchyard, Inverter Rooms, Control Cum Conference room, Security cabin and one (1) number each for the area covered for a plant.

**Sign Boards:**

The signboard for nomenclature of sufficient size which can visible from a distance containing brief description of various components of the power plant like switchyard, control room, inverter room etc. as well as the complete power plant in general shall be installed at appropriate locations of the power plant. Contractor shall also have to provide the signboards to the units of control room. Contractor shall also provide signage for fire and safety wherever required. The Signboard shall be made of steel plate of not less than 3 mm thick. Letters on the board shall be with appropriate illumination arrangements. The Contractor shall provide to the Purchaser, detailed specifications of the signboards. The language of instructions shall be English/ Hindi as per approval.

**Roads:**

All internal and peripheral roads shall be of Asphalt type. The Contractor has to design as per relevant IS, submit and take approval from the Purchaser for Asphalt Road. Asphalt Road shall connect Control Room, Switchyard, all Invertor rooms and main gate. Asphalt road shall also be provided at periphery of the entire plant area. An asphalt road shall have sufficient courses like a subgrade, subbase, base courses, and surface course as per IS specifications. The width of asphalt road shall be of 4 metres carriageway with 0.5 mtr shoulders on both side and with sufficient thickness for access of heavy equipment like transformers/ Inveters/ Switchyard equipment during construction as well as subsequent maintenance.

**Storm Water Drains:**

The Contractor has to design, submit and take approval from the Purchaser for disposal of storm water of the plant. It shall be designed in a such that rain water and water required for module cleaning can be easily drained off by providing sufficient slope to the drain. Storm water drain shall be of Trapezoidal section. The sides of peripheral and internal(sides of the internal road)
drain shall be of brick masonry in C.M 1:5, which is backed up by cement mortar bed and all joints to be are filled up with cement mortar. Plastering in CM 1:4 is required.

Security cabins:

The contractor has to provide pre-fabricated security cabins atleast at two (2) opposite corners of the plant. The size of the security cabin shall be 1.5 x 1.5 x 3 mtr height which is rested on RCC foundation.

CCTV cameras:

Contractor shall also includes to design, supply, installation, testing, commissioning, operating & maintaining a complete day night CCTV Surveillance system for the solar farm covering all key areas from surveillance point of view(at least at 5 places). The system shall include high quality day/night vision outdoor rated IP base cameras with required mounting arrangement, IP rated termination boxes, cables, hoods, etc along with a centralised DVR system which shall be capable to have last 15 days’ 24X7 Data Storage of CCTV footage in it. Remote base operation facility shall be provided for the system. All the components of the system shall be in line with latest IEC codes & relevant standards.

General Guideline:

Any civil or electrical work, which is not mentioned or included in this Tender Document but necessary for the plant shall be borne by the Bidder. Successful Bidder shall prepare all designs / drawings have based on the specifications given in the Tender and in light of relevant BIS standard. The Purchaser reserves the right to modify the design at any stage, to meet local site conditions / project requirements. 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.

Disclaimer:

1. Any civil / electrical / other work, which is not mentioned or included in this Tender Document but necessary for the plant shall be borne by the Bidder. All specifications mentioned
in this Tender indicates minimum technical requirement.

2. The Contractor may propose alternate specifications or design though the final acceptance of the same is subject to the Purchaser’s discretion.

3. Unless otherwise specified, all equipment and materials shall confirm 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.

**ERECITION CONDITIONS OF CONTRACT GENERAL**

**General conditions:**
The following provisions shall supplement the conditions already contained in the other parts of these specifications and documents and shall govern that portion of the work of this contract which is to be performed at site. The erection requirements and procedures not specified in these documents shall be in accordance with the recommendations of the equipment manufacturer, or as mutually agreed to between the Employer and the Contractor prior to commencement of erection work.

The Contractor upon signing of the Contract shall, in addition to a Project Co-ordinator, nominate another responsible officer as his representative at Site suitably designated for the purpose of overall responsibility and co-ordination of the Works to be performed at Site. Such a person shall function from the Site office of the Contractor during the pendency of Contract.

**CODE REQUIREMENTS**
The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant Government of India Rules & Codes, accepted good practices in the industry and shall fulfill all statutory requirements.

**ELECTRICAL SAFETY REGULATIONS**
The contractor shall ensure that entire electrical installation work is executed by adopting applicable statutory safety regulations and best practices in the industry. The Contractor shall employ the necessary number of qualified, full time electricians to maintain his temporary electrical installation.
INSPECTION AND TESTING INSPECTION CERTIFICATES
The provisions of the clause entitled Inspection and Testing in the Technical Specification, shall also be applicable to the erection portion of the Works. The Employer shall have the right to re-inspect any equipment though previously inspected and approved by him at the Contractor’s works, before and after the same are erected at Site. If by the above inspection, the Employer rejects any equipment, the Contractor shall make good for such rejections either by replacement or modification/repairs as may be necessary to the satisfaction of the Employer. Such replacements will also include the replacements or re-execution of such of those works of other Contractors and/or agencies, which might have got damaged or affected by the replacements or re-work done to the Contractor’s work.

CONTRACTOR’S SITE OFFICE ESTABLISHMENT
The Contractor shall establish an Office at the Site and keep posted an authorised representative for the purpose of the Contract. Any written order or instruction of the Employer or his duly authorised representative shall be communicated to the said authorised resident representative of the Contractor and the same shall be deemed to have been communicated to the Contractor at his legal address.

CONTRACTOR’S FIELD OPERATION
The Contractor shall keep the Employer informed in advance regarding his field activity plans and schedules for carrying out each part of the works. Any review of such plan or schedule or method of work by the Employer shall not relieve the Contractor of any of his responsibilities towards the field activities. Such reviews shall also not be considered as an assumption of any risk or liability by the Employer or any of his representatives and no claim of the Contractor will be entertained because of the failure or inefficiency of any such plan or schedule or method of work reviewed. The Contractor shall be solely responsible for the safety, adequacy and efficiency of plant and equipment and his erection methods.

The Contractor shall have the complete responsibility for the conditions of the Work-Site including the safety of all persons employed by him or his Sub-Contractor and all the properties under his custody during the performance of the work. This requirement shall apply continuously
till the completion of the Contract and shall not be limited to normal working hours. The construction review by the Employer is not intended to include review of Contractor’s safety measures in, on or near the Work-Site, and their adequacy or otherwise.

**PROTECTION OF WORK**
The Contractor shall have total responsibility for protecting his works till it is finally taken over by the Employer. No claim will be entertained by the Employer or the representative of the Employer for any damage or loss to the Contractor’s works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings. Should any such damage to the Contractor’s Works occur because of any other agency/individual not being under his supervision or control, the Contractor shall make his claim directly with the party concerned. The Contractor shall not cause any delay in the repair of such damaged Works because of any delay in the resolution of such disputes. The Contractor shall proceed to repair the Work immediately and no cause thereof will be assigned pending resolution of such disputes.

**FACILITIES / AMENITIES TO BE PROVIDED BY THE CONTRACTOR**

**Contractor's site office Establishment**
The Contractor shall establish a site office at the site and keep posted an authorized representative for the purpose of the contract.

**Tools, tackles and scaffoldings**
The Contractor shall provide all the construction equipment’s, tools, tackles and scaffoldings required for pre-assembly, installation, testing, commissioning and conducting Guarantee tests of the equipment’s covered under the Contract. The Contractor shall arrange machinery & equipment such as Dozer, Hydra, Cranes, Trailer, etc. wherever required for the purpose of fabrication, erection and commissioning.

**Testing Equipment and Facilities:**
The contractor shall provide the necessary testing, equipment and facilities.
**Testing of construction material at the site:**
Contractor shall make arrangements for the testing of construction material at the site wherever required, under the scope of services of the contract.

**First-aid**
The Contractor shall provide necessary first-aid facilities for all his employees, representatives and workers working at the Site. Enough number of Contractor’s personnel shall be trained in administering first-aid.

**Water**
Contractor shall make all arrangements himself for the supply of construction water as well as potable water for labour and other personnel at the worksite/colony.

**Toilets:**
Toilet shall be designed for 10 persons; and constructed with following finish:

a. Floor : Vitrified tiles/ ceramic tiles
b. Dado: dado tiles shall be provided in Toilet units.
c. Door window: made out of aluminum sections, 6mm wired and float glass.
d. Ventilators: Mechanical exhaust facility with exhaust fans above it.
e. Plumbing fixtures
f. Sanitary ware
g. EWC: 390 mm high with health facet, toilet paper rolls holder and all fittings.
h. Urinal (430 x 260 x 350 mm size) with all fittings
i. Wash basin (550 x 400 mm) with all fittings.
j. Bathroom mirror (600 x 450 x 6 mm thick) hard board backing
k. CP brass towel rail (600 x 20 mm) with C.P. brass brackets
l. Soap holder and liquid soap dispenser.
m. Water Supply for Toilets: GI pipes (B class). Overhead water tank shall be of 1,000-litre capacity with proper resting facility.
n. Drainage for Toilets: Drainage pipes shall be of PVC (6 kg/cm². Gully trap, inspection chambers, septic tank for 15 person and also soak well to be constructed for above mentioned requirement.
WORK & SAFETY REGULATIONS
The Contractor shall ensure proper safety of all the workers, materials, plant and equipments belonging to them or to Employer or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislation and the Employer as they may deem necessary.
Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in petroleum act 1934, explosives act, 1948, and petroleum and carbide of calcium manual published by the chief inspector of explosives of India. All such storage shall have prior approval of the employer. In case, any approvals are necessary from the chief inspector (explosives) or any statutory authorities, the contractor shall be responsible for obtaining the same.
Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practices/Rules framed under Indian Explosives Act pertaining to handling, storage and use of explosives.
All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All construction and erection equipment’s shall be strictly operated and maintained by the Contractor in accordance with statutory safety regulations. Periodical Examinations and all tests for all lifting/ hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated Laws/Rules in force from time to time.
The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workers according to the need, as may be directed by Employer who will also have right to examine these safety equipment’s to determine their suitability, reliability, acceptability and adaptability.
Working platforms should be fenced and shall have means of access.

Ladders in accordance with statutory safety rules for construction and erection shall be used. Rungs shall not be welded on columns. All the stairs shall be provided with handrails immediately after its erection.

The Contractor shall provide safe working conditions to all workers and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall be used by the Contractor.

The Contractor employing more than 250 workers whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as Safety Officer to supervise safety aspects of the equipments and workers, who will co-ordinate with the Employer Safety Officer. In case of work being carried out through sub-Contractors, the Sub-Contractor’s workers/employees will also be considered as the Contractor’s employees/workers for the above purpose.

In case any accident occurs during the construction/errection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to their employees due to any reason, what so ever, it shall be the responsibility of the Contractor to promptly inform the same to the Employer and also to all the authorities envisaged under the applicable laws.

The Contractor shall follow and comply with relevant provisions of applicable laws pertaining to the safety of workers, employee’s plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservation.

**FIRE PROTECTION**

The work procedures that are to be used during the erection shall be those which minimise fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the Site regularly. Fuels, oils and volatile or flammable materials shall be stored away from the construction and equipment and materials storage areas in safe containers. Untreated canvas, paper, plastic or other flammable flexible materials shall not at all be used at Site for any other purpose unless otherwise specified. If any such materials are received with the
equipment at the Site, the same shall be removed and replaced with acceptable material before moving into the construction or storage area.

All materials used for storage or for handling of materials shall be of water proof and flame resistant type. All the other materials such as working drawings, plans etc. which are combustible but are essential for the works to be executed shall be protected against combustion resulting from welding sparks, cutting flames and other similar fire sources.

All the Contractor’s supervisory personnel and sufficient number of workers shall be trained for fire-fighting and shall be assigned specific fire protection duties. Enough of such trained personnel must be available at the Site during the entire period of the Contract.

The Contractor shall provide suitable quantity & type fire protection equipment for the warehouses, office, temporary structures etc.

SECURITY

The Contractor shall have total responsibility for all equipment and materials in his custody stores, loose, semi-assembled and/or erected by him at Site. The Contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss.

PACKAGING AND TRANSPORTATION

All the equipment’s shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at Site till the time of erection. While packing all the materials, the limitation from the point of view of the sizes of railway wagons available in India should be taken account of. The Contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. The Contractor shall ascertain the availability of Railway wagon sizes from the Indian Railways or any other agency concerned in India well before effecting dispatch of equipment. Before dispatch it shall be ensured that complete processing and manufacturing of the components is carried out at shop, only restricted by transport limitation, in order to ensure that site works like grinding, welding, cutting & preassembly to bare minimum. The Employer’s Inspector shall have right to insist for completion of works in shops before dispatch of materials for transportation.
CRATING

All equipment and materials shall be suitably coated, wrapped, or covered and boxed or crated for moist humid tropical shipment and to prevent damage or deterioration during handling and storage at the site.

Equipment shall be packed with suitable desiccants, sealed in waterproof vapour-proof wrapping and packed in lumber of plywood enclosures, suitably braced, tied and skidded. Lumber enclosures shall be solid, not slatted.

Desiccants shall be either silica gel or calcium sulphate, sufficiently ground to provide the required surface area and activated prior to placing in the packaging. Calcium sulphate desiccants shall be of a chemical nature to absorb moisture. In any case, the desiccant shall not be of a type that will absorb enough moisture to go into solution. Desiccants shall be packed in porous containers, strong enough to withstand handling encountered during normal shipment. Enough desiccant shall be used for the volumes enclosed in wrapping.

Packaging or shipping units shall be designed within the limitations of unloading facilities and the equipment which will be used for transport. Complications involved with ocean shipment and the limitations of ports, railways and roads shall be considered. It shall be the Contractor's responsibility to investigate these limitations and to provide suitable packaging to permit safe handling during transit and at the job site.

Electrical equipment, control and instrumentation shall be protected against moisture and water damage. All external gasket surfaces and flange faces, couplings, motor pump shafts, bearing and like items shall be thoroughly cleaned and coated with rust preventive compound as specified above and protected with suitable wood, metal or other substantial type covering to ensure their full protection.

Equipment having antifriction or sleeve bearings shall be protected by weather tight enclosures. Coated surfaces shall be protected against impact, abrasion, discoloration and other damage. Surfaces which are damaged shall be repaired.
All exposed threaded parts shall be greased and protected with metallic or other substantial type protectors. All female threaded openings shall be closed with forged steel plugs. All pipings, tubing, and conduit equipment and other equipment openings shall be sealed with metallic or other rough usage covers and tapped to seal the interior of the equipment piping, tubing, or conduit. Provisions shall be made to ensure that water does not enter any equipment during shipment or in storage at the plant site.

Returnable containers and special shipping devices shall be returned by the manufacturer's field representative at the Contractor's expense.

While packaging the material, care shall be taken for the limitation from the point of view of availability of railway wagon sizes in India.

MATERIALS HANDLING AND STORAGE

All the equipment’s furnished under the Contract and arriving at Site shall be promptly received, unloaded and transported and stored in the storage spaces by the Contractor. Contractor shall be solely responsible for any shortages or damage in transit, handling and / or in storage and erection of the equipment at Site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor.

The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the store shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at Site.

All electrical panels, controls gear, motors and such other devices shall be properly dried by heating before they are installed and energised. Motor bearings, slip rings, commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion due to prolonged storage. All the electrical equipment such as motors, etc. shall be periodically tested for insulation resistance from the date of receipt till the date of commissioning and a record of such measured
insulation values maintained by the Contractor. Such records shall be open for inspection by the Employer.

The Contractor shall ensure that all the packing materials and protection devices used for the various equipment’s during transit and storage are removed before the equipment are installed. The consumables and other supplies likely to deteriorate due to storage must be thoroughly protected and stored in a suitable manner to prevent damage or deterioration in quality by storage. All the materials stored in the open or dusty location must be covered with suitable weatherproof and flameproof covering material wherever applicable.

**CONSTRUCTION MANAGEMENT**

Contractor shall be responsible for performance of his works in accordance with the specified construction schedule. If at any time, the Contractor is falling behind the schedule, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise accelerate the progress of the work to comply with the schedule and shall communicate such actions in writing to the Employer, satisfying that his action will compensate for the delay. The Contractor shall not be allowed any extra compensation for such action.

The Employer shall however not be responsible for provision of additional labour and/or materials or supply or any other services to the Contractor.

**FIELD OFFICE RECORDS**

The Contractor shall maintain at his Site Office up-to-date copies of all drawings, specifications and other Contract Documents and any other supplementary data complete with all the latest revisions thereto. The Contractor shall also maintain in addition the continuous record of all changes to the above Contract Documents, drawings, specifications, supplementary data, etc. effected at the field and on completion of his total assignment under the Contract shall incorporate all such changes on the drawings and other Engineering data to indicate as installed conditions of the equipment furnished and erected under the Contract. Such drawings and Engineering data shall be available for inspection & review to the Employer.
PROTECTION OF PROPERTY AND CONTRACTOR’S LIABILITY
The Contractor shall be responsible for any damage resulting from his operations. He shall also
be responsible for protection of all persons including members of public and employees of the
Employer and his own employees and all public and private property including structures,
building, other plants and equipment’s and utilities either above or below the ground.

The Contractor will ensure provision of necessary safety equipment such as barriers, sign-boards,
warning lights and alarms, etc. to provide adequate protection to persons and property.

PAINTING
All exposed metal parts of the equipment including pipings, structure railings, etc. wherever
applicable, after installation unless otherwise surface protected, shall be first painted in accordance
with relevant codes & standards, after thoroughly cleaning all such parts of all dirt, rust, scales,
greases, oils and other foreign materials by wire brushing, scraping or sand blasting.

UNFAVOURABLE WORKING CONDITIONS
The Contractor shall confine all his field operations to those works which can be performed
without subjecting the equipment and materials to adverse effects during inclement weather
conditions, like monsoon, storms, etc. and during other unfavorable construction conditions. No
field activities shall be performed by the Contractor under conditions which might adversely affect
the quality and efficiency thereof, unless special precautions or measures are taken by the
Contractor in a proper and satisfactory manner in the performance of such Works and with the
concurrence of the Employer. Such unfavorable construction conditions will in no way relieve the
Contractor of his responsibility to perform the Works as per the schedule.

PROTECTION OF MONUMENTS AND REFERENCE POINTS
The Contractor shall ensure that any finds such as relic, antiquity, coins, fossils, etc. which he may
come across during the course of performance of his Works either during excavation or elsewhere,
are properly protected and handed over to the Employer.
FOUNDATION DRESSING & GROUTING FOR EQUIPMENT/ EQUIPMENT BASES

The surfaces of foundations shall be dressed to bring the top surface of the foundations to the required level, prior to placement of equipment/equipment bases on the foundations.

All the equipment/equipment bases shall be grouted and finished as per these specifications unless otherwise recommended by the equipment manufacturer.

The concrete foundation surfaces shall be properly prepared by chipping, grinding as required to bring the top of such foundation to the required level, to provide the necessary roughness for bondage and to assure enough bearing strength.

GROUT

The grout shall be high strength grout having a minimum characteristic compressive strength of 60 N/mm² at 28 days. The grout shall be chloride-free, cement based, free flowing, non-metallic grout. The Grout shall have good flow ability even at very low water/grout powder ratio.

The Grout shall have characteristics of controlled expansion to be able to occupy its original volume to fill the voids and to compensate for shrinkage. Grout shall be of pre-mix variety so that only water needs to be added before use.

The mixing of the Grout shall conform to the recommendations of the manufacturer of the Grout.

PLACING OF GROUT

After the base has been prepared, its alignment and level has been checked and approved and before actually placing the grout, a low dam shall be set around the base at a distance that will permit pouring and manipulation of the grout. The height of such dam shall be at least 25mm above the bottom of the base. Suitable size and number of chains shall be introduced under the base before placing the grout, so that such chains can be moved back & forth to push the grout into every part of the space under the base.

The grout shall be poured either through grout holes if provided or shall be poured at one side or at two adjacent sides to make the grout move in a solid mass under the base and out in the opposite side. Pouring shall be continued until the entire space below the base is thoroughly filled and the grout stands at least 25 mm higher all around than the bottom of the base. Enough care should be taken to avoid any air or water pockets beneath the bases.

In addition to the above, recommendations of Grout manufacturer shall also be followed.
FINISHING OF THE EDGES OF THE GROUT

The poured grout should be allowed to stand undisturbed until it is well set. Immediately thereafter, the dam shall be removed and grout which extends beyond the edges of the structural or equipment base plates shall be cut off, flushed and removed. The edges of the grout shall then be pointed and finished with 1:2 cement mortar pressed firmly to bond with the body of the grout and smoothened with a tool to present a smooth vertical surface. The work shall be done in a clean and scientific manner and the adjacent floor spaces, exposed edges of the foundations, and structural steel and equipment base plates shall be thoroughly cleaned of any spillage of the grout.

SHAFT ALIGNMENTS

All the shafts of rotating equipment shall be properly aligned to those of the matching equipment’s to as perfect accuracy as practicable. The equipment shall be free from excessive vibration so as to avoid overheating of bearings or other conditions which may tend to shorten the life of the equipment. The vibration level of rotating equipment’s measured at bearing housing shall conform to VDI 2056. All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

DOWELLING

All the motors and other equipment shall be suitably doweled after alignment of shafts with tapered machined dowels as per the direction of the Employer.

CABLING

All cables shall be supported by conduits or cable tray run in air or in cable channels. These shall be installed in exposed runs parallel or perpendicular to dominant surfaces with right angle turns made of symmetrical bends or fittings. When cables are run on cable trays, they shall be clamped at a minimum intervals of 2000mm.

Each cable, whether power or control, shall be provided with a metallic or plastic tag of an approved type, bearing a cable reference number indicated in the cable and conduit list (prepared by the Contractor), at every 5 meter run or part thereof and at both ends of the cable adjacent to
the terminations. Cable routing is to be done in such a way that cables are accessible for any maintenance and for easy identification.

Sharp bending and kinking of cables shall be avoided. Installation of other cables like high voltage, coaxial, screened, compensating, mineral insulated shall be in accordance with the cable manufacturer’s recommendations. Wherever cables cross roads and water, oil, sewage or gaslines, special care should be taken for the protection of the cables in designing the cable channels. In each cable run some extra length shall be kept at a suitable point to enable one or two straight through joints to be made, should the cable develop fault at a later date.

Control cable terminations shall be made in accordance with wiring diagrams, using identifying codes subject to the Employer’s approval. Multicore control cable jackets shall be removed as required to train and terminate the conductors. The cable jacket shall be left on the cable, as far as possible, to the point of the first conductor branch. The insulated conductors from which the jacket is removed shall be neatly twined in bundles and terminated. The bundles shall be firmly but not tightly tied utilising plastic or nylon ties or specifically treated fungus protected cord made for this purpose. Control cable conductor insulation shall be securely and evenly cut.

The connectors for control cables shall be covered with a transparent insulating sleeve so as to prevent accidental contact with ground or adjacent terminals and shall preferably terminate in terminals and washers. The insulating sleeve shall be fire resistant and shall be long enough to over pass the conductor insulation. All control cables shall be fanned out and connection made to terminal blocks and test equipment for proper operation before cables are corded together.

EQUIPMENT INSTALLATION
General Requirements
The Contractor shall furnish all construction materials, tools and equipment and shall perform all work required for complete installation of all control and instrument equipment furnished under this specification.
Contractor shall prepare detailed installation drawings for each equipment furnished under this specification. Installation of all equipment/systems furnished by this specification shall be as per
installation drawings. Erection procedures not specified herein shall be in accordance with the recommendations of the equipment manufacturers. The procedures shall be acceptable to the Employer.

The Contractor shall coordinate his work with other suppliers where their instruments and devices are to be installed under specifications.

**Installation Materials**

All materials required for installation, testing and commissioning of the equipment shall be furnished by the Contractor.

**Regulatory Requirements**

All installation procedures shall confirm with the accepted good engineering practice and with all applicable governmental laws, regulations and codes.

**Cleaning**

All equipment shall be cleaned of all sand, dirt and other foreign materials immediately after removal from storage and before the equipment is installed.

**Installation of Field Mounted Instruments/Devices and Non-free Standing Equipment**

The installation drawings for all field mounted equipment/instrument/devices furnished under this specification shall meet the requirements of this specification, applicable codes and standards and recommendations of manufacturers of instruments/devices. In addition to above relevant Portion as specified elsewhere in technical specification may be referred.

Field mounted instruments and accessories shall be bracket or sub panel mounted on the nearest suitable firm steel work or masonry. The brackets, stands, supports and other miscellaneous hardware required for mounting instruments and accessories such as receiver gauge, air set, valve manifold, purge-meter etc. shall be furnished and installed. No field mounted instruments shall be installed such that it depends for support or rigidity on the impulse piping or on electrical connection to it.

All free standing instrumentation cabinets and panels shall be located within the construction tolerances of +/- 3 mm of the location dimensions indicated on the plant arrangement drawings.
Non-free standing local enclosures and cabinets shall be mounted in accessible locations on columns, walls, or stands. Bracket and stands shall be fabricated as required to install the local enclosures and cabinets in a workman like manner. Rough edges and welds on all fabricated supports shall be ground smooth. The supports shall be finished with two coats of primer and two coats of paint as specified in this part.

**Defects**

All defects in erection shall be corrected to the satisfaction of the Employer and the Project Manager. The dismantling and reassembly of Contractor furnished equipment to remove defective parts, replace parts, or make adjustments shall be included as a part of the work under these specifications.

The removal of control and instrument equipment in order to allow bench calibration, if required, and the re-installation of the said equipment after calibration shall also be included as a part of the work under these specifications.

**Equipment Protection**

All equipment to be erected under these specifications shall be protected from damage of any kind from the time of contract award until commissioning of each unit.

The equipment shall be protected during storage as described herein. Equipment shall be protected from weld spatter during construction.

Suitable guards shall be provided for protection of personnel on all exposed rotating or moving machine parts. All such guards with necessary spares and accessories shall be designed for easy removal and maintenance.

Equipment having glass components such as gauges, or equipment having other easily breakable components, shall be protected during the construction period with plywood enclosures or other suitable means. Broken, stolen, or lost components shall be replaced by the Contractor.
Machine finished surfaces, polished surfaces, or other bare metal surfaces which are not to be painted, such as machinery shafts and couplings shall be provided temporary protection during storage and constructional periods by a coating of a suitable non-drying, oily type, rust preventive compound.

**DEVIATIONS DISPOSITIONING:**
Any deviation to the contract and employer approved documents shall be properly recorded in the format prescribed by RACP. All the deviations shall be brought to the knowledge of employer’s representative for suitable dispositioning.

**STATUTORY REQUIREMENTS**
In addition to the local laws and regulations, the Contractor shall also comply with the Minimum Wages Act and the Payment of Wages Act (both of the Government of India) and the rules made there under in respect of its labour and the labour of its sub-contractors currently employed on or connected with the contract.

All registration and statutory inspection fees, if any, in respect of his work pursuant to this Contract shall be to the account of the Contractor. However, any registration, statutory inspection fees lawfully payable under the provisions of any statutory laws and its amendments from time to time during erection in respect of the plant equipment ultimately to be owned by the Employer, shall be to the account of the Employer. Should any such inspection or registration need to be re-arranged due to the fault of the Contractor or his Sub-Contractor, the additional fees for such inspection and/or registration shall be borne by the Contractor.

**EMPLOYMENT OF LABOUR**
In addition to all local laws and regulations pertaining to the employment of labour to be complied with by the Contractor pursuant to GCC, the Contractor will be expected to employ on the work only his regular skilled employees with experience of the particular work. No female labour shall be employed after darkness. No person below the age of eighteen years shall be employed.
All travelling expenses including provisions of all necessary transport to and from Site, lodging allowances and other payments to the Contractor’s employees shall be the sole responsibility of the Contractor.

In case the Employer becomes liable to pay any wages or dues to the labour or any Government agency under any of the provisions of the Minimum Wages Act, Workmen Compensation Act, Contact Labour Regulation Abolition Act or any other law due to act of omission of the Contractor, the Employer may make such payments and shall recover the same from the Contractor’s Bills.