BANGLADESH POWER DEVELOPMENT BOARD

TENDER DOCUMENT

FOR

CONSTRUCTION OF 50MWp (DC) SOLAR PHOTOVOLTAIC GRID TIED POWER PLANT AT RANGUNIA, CHATTAGRAM, BANGLADESH ON TURNKEY BASIS

(One Stage Two Envelope Tendering Method)

Invitation for Tender No: 27.11.0000.101.14.013.23- Dated: /02/2023

Secretary
Bangladesh Power Development Board
Wapda Building (1st Floor), Motijheel, C/A.
Dhaka, Bangladesh

February 2023

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Tender Notice

REJECTION CLAUSES

(Tender must comply with the following criteria, otherwise tender shall be rejected)

1. Tenderer shall have to comply with Eligibility criteria (ITT 5), Experience criteria (ITT 14) & Financial criteria (ITT 15);
2. Materials to be supplied must be Eligible (ITT 6.1)
3. Tenderer shall have to submit end-user certificate as per [TDS(ITT14.1b)];
4. Tender Submission Letter (Form PG5A-1a) for Technical Proposal & (Form PG5A-1b) for Financial (Price) Proposal shall be properly filled up by the Tenderer (ITT 24.2(a) & 24.3(a));
5. Tender must be accompanied by a valid Tender Security (ITT 34.3);
6. If the Tenderer is a Joint Venture, Consortium or Associations (JVCA), JVCA agreement or Letter of Intent along with the proposed agreement duly signed by all partners of the intended JVCA and authenticated by a Notary Public must be submitted (ITT 18.1);
7. For JVCA, lead partner and its other partners must meet minimum qualification criteria (ITT 18.2);
8. The Specifications Submission and Compliance Sheet (Form PG5A-4a) shall be properly filled up by the Tenderer (ITT 24.2 q);
9. A Tenderer shall submit only one (1) Tender, either individually or as a JVCA (ITT 20);
10. If the Tenderer is not manufacturer, Manufacturer's Authorisation Letter (Form PG5A-5) furnished in Section 5: Tender and Contract Forms, for the items mentioned in TDS must be submitted to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply the Goods to Bangladesh [TDS(ITT24.2(r)(1))];
11. Tenderer must submit Guarantee/warranty certificate of the offered system/ Equipment/materials/items/spares including turnkey work and its satisfactory performance during warranty period [24 (twenty four) months from the date of issuing Operational Acceptance Certificate]as per [TDS(ITT24.2(r))];
12. The Price Schedule (Form PG5A-3) shall be properly filled up by the Tenderer ((ITT 24.2(l)). Tenderers are not allowed to change/ modify the format of Price Schedule;(Applicable for 2nd Envelope only)
13. Tender shall remain valid for the period specified in the TDS after the date of Tender submission deadline (ITT 30.2);
14. Tender must be accompanied by Letter of Authorization to sign the Tender on behalf of the Tenderer ((ITT 24.1(f));
15. Tender must comply the scope of work as stated under Section 6, Employer's Requirements, without any material deviation or reservation (ITT 49.2);
16. Tender must comply the Completion Period as specified in the [PCC (GCC 24.1)].
17. Tenderer shall have to comply with the payment terms as per *(GCC 57.1)*;
18. Tenderer shall have to submit filled up technical data sheet mentioned in Specifications Submission and Compliance Sheet (Form PG5A-4a).
19. Tenderer shall have to submit original sealed & signed (on every pages) tender document by the authorized personal which was issued by BPDB and would be enclosed with the Tender Submission letter (Copy of issued tender document will not be accepted) [ITT (TDS 24.2(r)];

Section 1.Instructions to Tenderers

A. General

1. Scope of Tender	1.1 The Purchaser named in the Tender Data Sheet **(TDS) (**hereinafter referred to as the "Purchaser") wishes to issue these Tender Documents for the supply and installation of plant & equipment incidental thereto, as specified in the **TDS** and as detailed in Section 6: Employer's Requirements.
	1.2 The name of the Tender and the number and identification of its constituent lot(s) are stated in the **TDS.**
	1.3 Unless otherwise stated, throughout this Tender Document definitions and interpretations shall be as prescribed in the Section 3: General Conditions of Contract.
2. Interpretation	2.1 Throughout this Tender Document (a) the term "in writing" means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail; (b) if the context so requires, singular means plural and vice versa; and (c) "day" means calendar days unless otherwise specified as working days; (d) "Tender Document ", means the Document provided by a Purchaser to a Tenderer as a basis for preparation of its Tender; (e) "Tender ", depending on the context, means a Tender submitted by a Tenderer for delivery of Goods and Related Services to a Purchaser in response to an Invitation for Tender ;
3. Source of Funds	3.1 The Purchaser has been allocated public funds from the source as indicated in the **TDS** and intends to apply a portion of the funds to eligible payments under the contract for which this Tender Document is issued.
	3.2 For the purpose of this provision, "**public funds**" means any funds allocated to a Purchaser under Government budget, or loan, grants and credits placed at the disposal of a Purchaser through the Government by the development partners or foreign states or organizations.
	3.3 Payments by the development partner, if so indicated in the **TDS**, will be made only at the request of the Government and upon approval by the development partner in accordance with the applicable Loan/Credit/Grant Agreement, and will be subject in all respects to the terms and conditions of that Agreement.

4. Corrupt, Fraudulent, Collusive, Coercive (or Obstructive in case of Development Partner) Practices	4.1 The Government and the Development Partner, if applicablerequires that the Procuring Entity as well as the Tenderers and Contracts (including , sub-contractors, agents, personnel, consultants, and service providers)shall observe the highest standard of ethics during implementation of procurement proceedings and the execution of Contracts under public funds. 4.2 For the purposes of ITT Sub Clause 4.3, the terms set forth below as follows: (a) "corrupt practice" means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of the Procuring Entity or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by the Procuring Entity in connection with a Procurement proceeding or Contract execution; (b) "fraudulent practice" means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution; (c) "collusive practice" means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Procuring Entity, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying the Procuring Entity the benefits of competitive price arising from genuine and open competition; (d) "coercive practice" means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of a Contract, and this will include creating obstructions in the normal submission process used for Tenders. (e) "Obstructive practice" (applicable in case of Development Partner) means deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an 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. 4.3 Should any corrupt, fraudulent, collusive, coercive (or obstructive in case of Development Partner) practice of any kind is determined by the Procuring Entity or the Development Partner, if applicable, this will be dealt in accordance with the provisions of the Public Procurement Act and Rules and Guidelines of the Development Partners as stated in the ITT sub-clause 3.3.

	In case of obstructive practice, this will be dealt in accordance with Development Partners Guidelines.
	4.4 If corrupt, fraudulent, collusive, coercive (or obstructive in case of Development Partner) practices of any kind is determined by the Procuring Entity against any Tenderer or Contracts (including sub-contractors, agents, personnel, consultants, and service providers) in competing for, or in executing, a contract under public fund: (a) Procuring Entity and/or the Development Partner shall exclude the concerned Tenderer from further participation in the concerned procurement proceedings; (b) Procuring Entity and/or the Development Partner shall reject any recommendation for award that had been proposed for that concerned Tenderer; (c) Procuring Entity and/or the Development Partner shall declare, at its discretion, the concerned Tenderer to be ineligible to participate in further Procurement proceedings, either indefinitely or for a specific period of time; (d) Development Partner shall sanction the concerned Tenderer or individual, at any time, in accordance with prevailing Development Partner' sanctions procedures, including by publicly declaring such Tenderer or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Development Partner-financed contract; and (ii) to be a nominated sub-contractor, consultant, manufacturer or Contractor, or service provider of an otherwise eligible firm being awarded a Development Partner-financed contract; and (e) Development Partner shall cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Procuring Entity or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, coercive or obstructive practices during the procurement or the execution of that Development Partner financed contract, without the Procuring Entity having taken timely and appropriate action satisfactory to the Development Partner to remedy the situation. 4.5 Tenderer shall be aware of the provisions on corruption, fraudulence, collusion, coercion (and obstruction, in case of Development Partner) of the Public Procurement Act, 2006, the Public Procurement Rules, 2008 and others as stated in GCC Clause 38. 4.6 In further pursuance of this policy, Tenderers, Contractors and their sub-contractors, agents, personnel, consultants, service providers shall permit the Government and the Development Partner to inspect any accounts and records and other documents relating to the Tender submission and

		contract performance, and to have them audited by auditors appointed by the Government and/or the Development Partner during the procurement or the execution of that Development Partner financed contract.
5. Eligible Tenderers	5.1	This Invitation for Tenders is open to all potential Tenderers from all countries, except for any specified in the **TDS.**
	5.2	Tenderers shall have the legal capacity to enter into the Contract under the Applicable law.
	5.3	Tenderers shall be enrolled in the relevant professional or trade organisations registered in Bangladesh.
	5.4	Tenderers may be a physical or juridical individual or body of individuals, or company, association or any combination of them in the form of a Joint Venture(JV) invited to take part in public procurement or seeking to be so invited or submitting a Tender in response to an Invitation for Tenders.
	5.5	Tenderers shall have fulfilled its obligations to pay taxes and social security contributions under the provisions of laws and regulations of the country of its origin.
	5.6	Tenderers should not be associated, or have been associated in the past, directly or indirectly, with a consultant or any of its affiliates which have been engaged by the Procuring Entity to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the works to be performed under this Invitation for Tenders.
	5.7	Tenderers in its own name or its other names or also in the case of its Persons in different names shall not be under a declaration of ineligibility for corrupt, fraudulent, collusive or coercive practices as stated under ITT Sub Clause 4.4 (or obstructive practice, in case of Development Partner) in relation to the Development Partner's Guidelines in projects financed by Development Partner.
	5.8	Tenderers are not restrained or barred from participating in Public Procurement on grounds of poor performance in the past under any Contract.
	5.9	Tenderers shall not be insolvent, be in receivership, be bankrupt, be in the process of bankruptcy, be not temporarily barred from undertaking business and it shall not be the subject of legal proceedings for any of the foregoing.
	5.10	Government-owned enterprise in Bangladesh may also participate in the Tender if it is legally and financially autonomous, it operates under commercial law, and it is not a dependent agency of the Procuring Entity.
	5.11	Tenderers shall provide such evidence of their continued eligibility satisfactory to the Procuring Entity, as the Procuring Entity will reasonably request.

	5.12 These above requirements for eligibility will extend, as applicable, to each JV partner and Subcontractor proposed by the Tenderers. 5.13 Tenderers shall have the up-to-date valid license(s), issued by the corresponding competent authority, as specified in the **TDS.**
6. Eligible Plant and Services	6.1 The plant and services to be supplied under the contract are eligible, unless their origin is from a country specified in the **TDS** and all expenditures under the contract will be limited to such plant, and services.
	6.2 For purposes of this Clause, the term "plant" means permanent plant, equipment, machinery, apparatus, articles and things of all kinds to be provided in the facilities; and "installation services" means all those services ancillary to the supply of the Plant for the Facilities, such as transportation and provision of marine or other similar insurance, inspection, expediting, site preparation, installation, testing, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training etc
	6.3 For purposes of this clause, "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 orcountry where the goods have been mined, grown, cultivated, produced, manufactured or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components.
	6.4 The origin of plant & equipment is distinct from the nationality of the Tenderer. The nationality of the firm that produces, assembles, distributes, or sells the goods shall not determine their origin.
7. Site Visit	7.1 The Tenderer 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 tender and entering into a contract for the provision of Plant and Installation Services.
	7.2 The Tenderer 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 Tenderer, 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.
	7.3	The Tenderer should ensure that the Purchaser is informed of the visit in adequate time to allow it to make appropriate arrangements.
	7.4	The costs of visiting the Site shall be at the Tenderer's own expense.
B. Tender Document		
8. Tender Document: General	8.1	The Sections comprising the Tender Document are listed below, and should be read in conjunction with any Addendum issued under ITT Clause 11. • Section 1 Instructions to Tenderers (ITT) • Section 2 Tender Data Sheet (**TDS**) • Section 3 General Conditions of Contract (GCC) • Section 4 Particular Conditions of Contract (**PCC**) • Section 5 Tender and Contract Forms • Section 6 Employer's Requirements • Section 7 Drawings
	8.2	The Purchaser shall reject any Tender if the Tender Document was not purchased directly from the Purchaser, or through its agent as stated in the **TDS.**
	8.3	The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document as well as addendum to Tender Documents.
9. Clarification of Tender Document	9.1	A prospective Tenderer requiring any clarification of the Tender Document shall contact the Purchaser in writing at the Purchasers address indicated in the **TDS** before **two-third** of time allowed for preparation and submission of Tender elapses.
	9.2	The Procuring Entity is not obliged to answer any clarification request received after that date as stated under ITT Sub Clause 9.1.
	9.3	The Procuring Entity shall respond in writing within five (5) working days of receipt of any such request for clarification received under ITT Sub Clause 9.1.
	9.4	The Procuring Entity shall forward copies of its response to all those who have purchased the Tender Document, including a description of the enquiry but without identifying its source.
	9.5	Should the Procuring Entity deem it necessary to revise the Tender Document as a result of a clarification, it will do so following the procedure under ITT Clause 11.

10. Pre-Tender Meeting	10.1	To clarify issues and to answer questions on any matter arising in the Tender Document, the Purchaser may, if stated in the **TDS**, hold a Pre-Tender Meeting at the place, date and time as specified in the TDS. All Potential Tenderers are encouraged to attend the meeting, if it is held.
	10.2	Minutes of the pre-Tender meeting, including the text of the questions raised and the responses given, together with any responses prepared after the meeting, will be transmitted within one week (7 days) after holding the meeting to all those who purchased the Tender Document and even those who did not attend the meeting.
	10.3	Any amendment to the Tender Documents listed in ITT Sub-Clause 8.1 that may become necessary as a result of the pre-Tender meeting shall be made by the Purchaser exclusively through the issue of an Addendum as stated under ITT Sub-Clause 11 and not through the minutes of the pre-Tender meeting.
	10.4	Non-attendance at the Pre-Tender meeting will not be a cause for disqualification of a Tenderer.
11. Addendum to Tender Document	11.1	At any time prior to the deadline for submission of Tenders, the Purchaser on its own initiative or in response to a clarification request in writing from a Tenderer, having purchased the Tender Document or as a result of a Pre-Tender meeting, may revise the Tender Document by issuing an addendum pursuant to Rule 95 of the Public Procurement Rules, 2008.
	11.2	The addendum issued under ITT Sub-Clause 11.1 shall become an integral part of the Tender Document and shall have a date and an issue number and shall be circulated by fax, mail or e-mail, to Tenderers who have purchased the Tender Documents within five (5) working days of issuance of such addendum, to enable Tenderers to take appropriate action.
	11.3	The Tenderer shall acknowledge receipt of an addendum.
	11.4	Tenderers who have purchased the Tender Documents but have not received any addendum issued under ITT Sub-clause 11.1 shall inform the Purchaser of the fact by fax, mail or e-mail before **two-third** of the time allowed for the submission of Tenders has elapsed.
	11.5	Procuring Entities shall also ensure posting of relevant addenda with the reference number and date on their website.
	11.6	To give a prospective Tenderer reasonable time in which to take an amendment into account in preparing its Tender, the Purchaser may, at its discretion, extend the deadline for the submission of Tenders, pursuant to Rule 95(6) of the Public Procurement Rule, 2008 and under ITT Clause 36.
	11.7	If an addendum is issued when time remaining is less than

	one-third of the time allowed for the preparation of Tenders, a Purchaser shall extend the deadline by an appropriate number of days for the submission of Tenders, depending upon the nature of the Procurement requirement and the addendum. The minimum time for such extension shall not be less than seven (7) days.
C. Qualification Criteria	
12. General Criteria	12.1 The Tenderer shall possess the necessary professional and technical qualifications and competence, financial resources, equipment and other physical facilities, managerial capability, specific experience, reputation, and the personnel, to perform the contract.
	12.2 In addition to meeting the eligibility criteria, as stated in ITT Clause 5, the Tenderer must satisfy the other criteria stated in ITT Clauses 13 to 15 inclusive.
	12.3 To qualify for multiple number of contracts/lots in a package made up of this and other individual contracts/lots for which tenders are invited in the Invitation for Tenders, the Tenderer shall demonstrate having resources and experience sufficient to meet the aggregate of the qualifying criteria for the individual contracts.
13. Litigation History	13.1 The maximum number of arbitration awards against the Tenderer over a period shall be as specified in the **TDS.**
14. Experience Criteria	14.1 Tenderers shall have the following minimum level of supply experience to qualify for supplying the Plant and Services under the contract: (a) a minimum number of years of general experience in the role of Contractor or Subcontractor or Management Contractor as specified in the **TDS**; and (b) Specific experience as a Contractor or Subcontractor or Management Contractor that are similar to the proposed plant and services in at least a number of contract(s) and of a minimum value over the period, as specified in the **TDS**.
15. Financial Criteria	15.1 Tenderers shall have the following minimum level of financial capacity of qualify for the supply, execution and performance of plant and services under the contract. (a) the average annual turnover as specified in the **TDS** calculated as total certified payments received for contracts in progress or completed, during the period specified in the **TDS;** (b) availability of minimum liquid assets or working capital or credit facilities, as specified in the **TDS**; and;

		(c) satisfactory resolution of all claims, arbitrations or other litigation cases and shall not have serious negative impact on the financial capacity of the Tenderer.
16. Personnel Capacity	16.1	The Tenderer shall have the following minimum level of personnel capacity to qualify for the performance of the plant and services under the Contract. A Project Manager, Engineers, and other key staff with qualifications and experience as specified in the **TDS;**
17. Equipment Capacity	17.1	The Tenderer shall own suitable equipment and other physical facilities or have proven access through contractual arrangement to hire or lease such equipment or facilities for the desired period, where necessary or have assured access through lease, hire, or other such method, of the essential equipment, in full working order, as specified in the **TDS.**
18. Joint Venture, Consortium or Association	18.1	The Tenderer may participate in the procurement proceedings forming a Joint Venture, Consortium or Associations (JVCA) by an agreement, executed case by case on a non-judicial stamp of value as stated in **TDS** or alternately with the intent to enter into such an agreement supported by a Letter of Intent along with the proposed agreement duly signed by all partners of the intended JVCA and authenticated by a Notary Public.
	18.2	The figures for each of the partners of a JVCA shall be added together to determine the Tenderer's compliance with the minimum qualifying criteria; however, for a JVCA to qualify, lead partner and its other partners must meet the criteria stated in the **TDS.** Failure to comply with these requirements will result in rejection of the JVCA Tender. Subcontractors' experience and resources will not be taken into account in determining the Tenderer's compliance with the qualifying criteria.
	18.3	Each partner of the JVCA shall be jointly and severally liable for the execution of the Contract, all liabilities and ethical and legal obligations in accordance with the Contract terms.
	18.4	The JVCA shall nominate a Representative (partner-in-charge/Lead Firm) who shall have the authority to conduct all business for and on behalf of any and all the partners of the JVCA during the tendering process and, in the event the JVCA is awarded the Contract, during contract execution including the receipt of payments for and on behalf of the JVCA.
	18.5	Each partner of the JVCA shall complete the JVCA Partner Information (**Form PG5A-2b)**for submission with the Tender
19. Subcontractor(s)	19.1	Tenderer, pursuant to Rule 53 of the PPR2008, is allowed to sub-contract a portion of the Supply.

	19.2	The Tenderer shall specify in its Tender all portion of the Plant and Services that will be subcontracted, if any, including the entity(ies) to whom each portion will be subcontracted to, subject to the maximum allowable limit for subcontracting of Plant and Services specified in the **TDS**.
	19.3	The Purchaser may require Tenderers to provide more information about their subcontracting arrangements. If any Subcontractor is found ineligible or unsuitable to carry out the subcontracted tasks, the Procuring Entity may request the Tenderer to propose an acceptable substitute.
	19.4	The Purchaser may also select nominated Subcontractor(s) to execute certain specific components of the Works and if so, those will be specified in the **TDS**.
	19.5	The successful Tenderer shall under no circumstances assign the goods/works/services or any part of it to a Subcontractor
	19.6	Subcontractors must comply with the provision of ITT Clause 5. For this purpose contractor shall complete the Subcontractor's information in Form **PG5A-2c** for submission with tender
	19.7	If the Purchaser determines that a subcontractor is ineligible, the subcontracting of such portion of the Plants and Services assigned to the ineligible subcontractor shall be disallowed

D. Tender Preparation

20. Only one Tender	1.	If a Tender for Plant and Services is invited on 'lot-by-lot' basis, each lot shall constitute a tender. A Tenderer shall submit only one (1) Tender for each lot, either individually or as a JVCA. The Tenderer who submits or participates in more than one (1) Tender for each lot will cause all the Tenders with that Tenderer's participation to be rejected.
21. Cost of Tendering	21.1	Tenderers shall bear all costs associated with the preparation and submission of its Tender, and the Purchaser shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.
22. Issuance and Sale of Tender Document	22.1	A Purchaser, pursuant to Rule 94 of the Public Procurement Rules, 2008 shall make Tender Documents available immediately to the potential Tenderers, requesting and willing to purchase at the corresponding price if the advertisement has been published in the newspaper pursuant to Rule 90 of the Public Procurement Rules, 2008.
	22.2	Full contact details with mailing address, telephone and facsimile numbers and electronic mail address, as applicable, of those to whom Tender Documents have been issued shall be recorded with a reference number by the Purchaser or its agent.

	22.3	There shall not be any pre-conditions whatsoever, for sale of Tender Document and the sale of such Document shall be permitted up to the day prior to the day of deadline for the submission of Tender.
23. Language of Tender	23.1	Tenders shall be written in the English language. Correspondences and documents relating to the Tender may be written in English or *Bangla.* Supporting documents and printed literature furnished by the Tenderers that are part of the Tender may be in another language, provided they are accompanied by an accurate translation of the relevant passages in the English or *Bangla* language, in which case, for purposes of interpretation of the Tender, such translation shall govern.
	23.2	Tenderers shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.
24. Contents of Tender (Document establishing the tender's qualification)	24.1	The Tender prepared by the Tenderers shall comprise Two Envelope submitted simultaneously, one called the **Technical Offer** (**Envelope-01**) containing the documents listed in ITT 24.2 and other called the **Financial Offer** containing the documents listed in 24.3, both envelopes enclosed together in an outer Single envelope.
	24.2	The **Technical Offer** (**Envelope-01**) prepared by the Tenderers will comprise the following: (a) Technical Submission Letter (**Form PG5A-1a**) as furnished in Section 5: Tender and Contract Forms. This form must be completed without any alterations to its format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested (b) Tenderer Information Sheet (**Form PG5A-2**)as furnished in Section 5: Tender and Contract Forms; (c) Tender Security as stated under ITT Clause 32,33 and 34; (d) Technical Proposal (Form PG5A-4) as furnished in Section 5: Tender and Contract Forms. (e) Alternatives, if permitted, as stated under with ITT Clause 25; (f) Written confirmation authorising the signatory of the Tender to commit the Tenderer, as stated under ITT Sub-Clause 37.3; (g) The completed eligibility declarations, to establish its eligibility as stated under ITT Clause 5, in the Tender Submission Sheet (Form PG5A-1a & 1b), as furnished in section 5: Tender and Contract Forms; (h) An affidavit confirming the legal capacity stating that there are no existing orders of any judicial court that prevents either the Tenderer or employees of a

	Tenderer entering into or signing a Contract with the Purchaser as stated under ITT clause 5; (i) An affidavit confirming that the Tenderer is not insolvent, in receivership or not bankrupt or not in the process of bankruptcy, not temporarily barred from undertaking their business for financial reasons and shall not be the subject of legal proceedings for any of the foregoing as stated under ITT Clause 5; (j) A certificate issued by the competent authority stating that the Tenderer is a Tax payer having valid Tax Identification Number (TIN) and VAT registration number or in lieu any other document acceptable to the Purchaser demonstrating that the Tenderer is a genuine Tax payer and has a VAT registration number as a proof of fulfillment of taxation obligations as stated under ITT Clause 5. In the case of foreign Tenderers, a certificate of competent authority in that country of which the Tenderer is citizen shall be provided ; (k) Documentary evidence demonstrating that they are enrolled in the relevant professional or trade organizations registered in Bangladesh or in case of foreign tenderer in their country of origin or a certificate concerning their competency issued by a professional institution in accordance with the law of the country of their origin, as stated under ITT Clause 5; (l) The country of origin declarations, to establish the eligibility of the Plant and Services as stated under ITT Clause 6, in the Price Schedule for Plant and Services (**Form PG5A-3**) as, applicable, furnished in Section 5: Tender and Contract Forms; (m) Documentary evidence as stated under ITT Clauses 28, that the Goods and Related Services conform to the Tender Documents; (n) Documentary evidence as stated under ITT Clause 29 that the Tenderer's qualifications conform to the Tender Documents; (o) Documents establishing legal and financial autonomy and compliance with commercial law, as stated under ITT Sub-clause 5.3 in case of government owned entity; and (p) In addition to the requirements stated under ITT Sub Clause 18.1, Tenders submitted by a JVCA or proposing a Subcontractor shall include.

	i. a Joint Venture Agreement entered into by all partners, executed on a non-judicial stamp of value or equivalent as stated under ITT Sub Clause 18.1; or ii. a Letter of Intent along with the proposed agreement duly signed by all partners of the intended JVCA with the declaration that it will execute the Joint Venture agreement in the event the Tenderer is successful; iii. the JVCA Partner Information (**Form PG5A-2b**); iv. the Subcontractor Information (**Form PG5A-2c**). (q) the completed Specifications Submission and Compliance Sheet **(Form PG5A-4a)**as stated under ITT clause 28.1; (r) Any other document as specified in the **TDS.** 24.3 The Financial Offer (**Financial Envelope -02**) prepared by the Tenderers shall comprise the following: (a) The Financial offer Submission Letter (**Form PG5A-1b**) as furnished in Section 5: (b) The Tenderer shall submit the completed Price Schedule for Plant and Services (**Form PG5A-3**), according to their origin as appropriate as furnished in section 5: Tender and Contract Forms. (c) the written confirmation authorizing the signatory of the Tender to commit the Tenderer, as stated under ITT Sub Clause 37.3; (d) any other document as specified in the **TDS**.
25. Alternatives	25.1 Unless otherwise stated in the **TDS**, alternatives shall not be considered.
26. Tender Prices, Discounts& Price adjustment	26.1 Unless otherwise **specified in the TDS,** tenderers shall quote for the entire Plant and Installation Services on a "single responsibility" basis such that the total tender price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the tender document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation and completion of the plant. This includes all requirements under the Contractor's responsibilities for testing, pre-commissioning and commissioning of the plant and, where so required by the tender 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 Tender Document, all in accordance with the requirements of the General Conditions of Contract. Items against which no price is entered by the Tenderer will not be paid for by the Purchaser when executed and shall be deemed to be covered by the prices for other items.

26.2 Tenderers are required to quote the price for the commercial, contractual and technical obligations outlined in the tender document

26.3 Tenderers shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section 5, Tender and Contract Forms.

26.4 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, Tender 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 tender price(s) to be entered in the Letter of Tender.

Schedule No. 1 Plant (including Mandatory Spare Parts) Supplied from Abroad

Schedule No. 2 Plant (including Mandatory Spare Parts) Supplied from within the Purchaser's Country

Schedule No. 3 Design Services

Schedule No. 4 Civil works part

Schedule No. 5 Installation Services

Schedule No. 6 Grand Summary (Schedule Nos. 1 to 4)

Schedule No. 7 Recommended Spare Parts

Tenderers 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.

26.5 In the Schedules, tenderers shall give the required details and a breakdown of their prices as follows:

a) Plant to be supplied from abroad (Schedule No. 1):

The price of the plant shall be quoted on CIP-named place of destination/CIF basis as **specified in the TDS** and as applicable.

(b) Plant manufactured within the Purchaser'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 Tenderer, and

(iii) The total price for the item.

(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 TDS,** 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 Tender 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 tenders. (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 26.6 The current edition of INCOTERMS, published by the International Chamber of Commerce shall govern. 26.7 The prices shall be either fixed or adjustable as specified in the **TDS**. 26.8 In the case of **Fixed Price**, prices quoted by the Tenderer shall be fixed during the Tenderer's performance of the contract and not subject to variation on any account. A tender submitted with an adjustable price quotation will be treated as non-responsive and rejected. 26.9 In the case of **Adjustable Price**, prices quoted by the Tenderer 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 tender submitted with a fixed price quotation will not be rejected, but the price adjustment will be treated as zero. Tenderers are required to indicate the source of labor and material indices in the corresponding Form in Section 5, Tender and Contract Forms 26.10 If so indicated in ITT 1.2, tenders are to be invited for individual lots or for any combination of lots (packages). Tenderers wishing to offer any price reduction (discount) for the award of more than one lot shall specify in their Tender Submission Letter 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. 26.11 Tenderers wishing to offer any unconditional discount shall specify in their Letter of Tender the offered discounts and the manner in which price discounts will apply. 26.12 If so indicated under ITT Sub Clause 26.9, Tenders are being invited with a provision for price adjustments. The unit

	rates or prices quoted by the Tenderer are subject to adjustment during the performance of the Contract in accordance with the provisions of the relevant GCC Clause and, in such case the Employer shall provide the indexes and weightings or coefficients in **Appendix to the Tender** for the price adjustment formulae specified in the **PCC.** 26.13 The Employer may require the Tenderer to justify its proposed indexes, if any of those as stated under ITT Sub Clause 26.12, are instructed to be quoted by the Tenderer in **Appendix to the Tender**. 26.14 The price adjustment stated under ITT Sub Clause 26.9and 26.12 shall be dealt with in accordance with the provisions in Section 12 and 22 of the Public Procurement Act, 2006 and Rule 5 and 38 of the Public Procurement Rules, 2008.
27.Tender Currency	27.1 For expenditures that will be incurred in Bangladesh, the Tenderer shall quote the prices in Bangladesh Taka
	27.2 Suppliers offering Goods manufactured or assembled in Bangladesh are permitted to submit their Tender in a combination of local and foreign currencies. 27.3 In case of National Tender, all quoted price shall be in local currency. 27.4 In case of international competitive tender, for expenditures that will be incurred outside Bangladesh, the Tenderer may quote the prices as specified in **TDS**.
28. Documents Establishing the Conformity of Plant, and Services	28.1 To establish the conformity of the plant and services to the Tender Documents, the Tenderer shall furnish as part of its Tender the documentary evidence that the Goods and Related services conform to the technical specifications and standards in Section 6, Employer's Requirement. a. a detailed description of the essential technical and performance characteristics of the plant and services, including the functional guarantees of the proposed plant and services, in response to the Specification b. a list giving full particulars, including available sources, of all spare parts and special tools necessary for the proper and continuing functioning of the plant for the period named in the **TDS**, following completion of plant and services in accordance with provisions of contract; and

	c. a commentary on the Employer's Specification and adequate evidence demonstrating the substantial responsiveness of the plant and services to those specifications. Tenderers shall note that standards for workmanship, materials and equipment designated by the Employer in the Tender Document are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Tenderer may substitute alternative standards, brand names and/or catalog numbers in its tender, provided that it demonstrates to the Employer's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Specification.
29. Documents Establishing Eligibility of the Tenderer	29.1 Tenderers, if applying as a sole Tenderer, shall submit documentary evidence to establish its eligibility as stated under ITT Clause 5 and, in particular, it shall: (a) complete the eligibility declarations in the Tender Submission Letter (**Form PG5A-1a**); (b) complete the Tenderer Information (**Form PG5A-2a**); (c) complete Subcontractor Information (**Form PG5A-2c**), if it intends to engage any Subcontractor(s).
	29.2 Tenderers, if applying as a partner of an existing or intended JV shall submit documentary evidence to establish its eligibility as stated under ITT Clause 5 and, in particular, in addition to as stated under ITT Sub Clause 29.1, it shall: (a) provide for each JV partner, completed JV Partner Information (**Form PG5A-2b**); (b) provide the JV agreement or Letter of Intent along with the proposed agreement of the intended JV as stated under ITT Sub Clause 18.1
	29.3 The documentary evidence of the Tenderer's qualifications to perform the contract if its Tender is accepted shall establish to the Purchaser's satisfaction: i. that the Tenderer meets each of the qualification criterion specified in Sub-Section C, Qualification Criteria of the ITT; ii. that, if required in the TDS, a Tenderer that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization Letter (Form PG5A-5) furnished in Section 5: Tender and Contract Forms, to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply the Goods to Bangladesh.; and

	iii.	that, if required in the TDS, in case of a Tenderer not doing business within Bangladesh, the Tenderer is or will be (if awarded the contract) represented by an Agent in the country equipped and able to carry out the Supplier's maintenance
30. Validity Period of Tender	30.1	Tender validities shall be determined on the basis of the complexity of the Tender and the time needed for its examination, evaluation, approval of the Tender and issuance of the Notification of Award (NOA).
	30.2	Tenders shall remain valid for the period specified in the **TDS** after the date of Tender submission deadline prescribed by the Purchaser, as stated under ITT Clause 39. A Tender valid for a period shorter than that specified will be rejected by the Purchaser as non- responsive.
31. Extension of Tender Validity and Tender Security	31.1	In justified exceptional circumstances, prior to the expiration of the Tender validity period, the Purchaser following Rule 21 of the Public Procurement Rules, 2008 may solicit, **not later than ten (10) days** before the expiry date of the Tender validity, compulsorily all the Tenderers' consent to an extension of the period of validity of their Tenders.
	31.2	The request for extension of Tender validity period shall state the new date of the validity of the Tender.
	31.3	The request from the Purchaser and the responses from the Tenderers will be made in writing.
	31.4	Tenderers consenting in writing to the request made by the Purchaser under ITT Sub-Clause 30.1 shall also correspondingly extend the validity of its Tender Security for twenty-eight (28) days beyond the new date for the expiry of Tender validity.
	31.5	Tenderers consenting in writing to the request under ITT Sub-Clause 31.1 shall not be required or permitted to modify its Tender in any circumstances.
	31.6	If the Tenderers are not consenting in writing to the request made by the Purchaser under ITT Sub-Clause 31.1, its Tender will not be considered for subsequent evaluation.
32. Tender Security	32.1	The Tender Security and its amount shall be determined sufficient to discourage the submission of frivolous and irresponsible tenders pursuant to Rule 22 of the Public Procurement Rule2008 and shall be expressed as a rounded fixed amount and, shall not be stated as a precise percentage of the estimated total Contract value.
	32.2	The Tenderer shall furnish as part of its Technical offer (**envelope-1**) Tender, in favour of the Purchaser or as otherwise directed on account of the Tenderer, a ender security in original form (not copy) and in the amount as specified in **TDS.**
	32.3	If the Tender is a Joint Venture, the Tenderer shall furnish as part of its Tender, in favour of the Procuring Entity or as

		otherwise directed on account of the title of the existing or intended JVCA or any of the partners of that JVCA or in the names of all future partners as named in the Letter of Intent of the JVCA, a Tender Security in original form and in the amount as stated under ITT Sub Clause 32.1.
33.Form of Tender security	33.1	The Tender Security shall: (a) In case of NCT, at the Tendere's option, be either; (i) In the form of a Bank Draft, Pay order or (ii) in the form of an irrevocable bank guarantee issued by any scheduled Bank of Bangladesh, in the format **(Form PG5A-6)** furnished in Section 5: Tender and Contract Forms. (b) In case of ICT, in the form of an irrevocable bank guarantee issued by an internationally reputable bank and shall require to be endorsed by its any correspondent bank located in Bangladesh, to make it enforceable, in the format **(Form PG5A-6)** furnished in Section 5: Tender and Contract Forms;
	33.2	Tender security shall be payable promptly upon written demand by the Purchaser in the case of the conditions listed in ITT Clause 36 being invoked; and
	33.3	Tender security shall remain valid for at least twenty eight (28) days beyond the expiry date of the Tender Validity in order to make a claim in due course against a Tenderer in the circumstances detailed under ITT Clause 36.
34. Authenticity of Tender Security	34.1	The authenticity of the Tender security submitted by a Tenderer shall be examined and verified by the Purchaser in writing from the Bank issuing the security, prior to finalization of the Evaluation Report pursuant to Rule, 24 of the Public Procurement Rule, 2008.
	34.2	If a Tender Security is found to be not authentic, the Tender which it covers shall not be considered for subsequent evaluation and in such case the Purchaser shall proceed to take punitive measures against that Tenderer as stated under ITT Sub-Clause 4.6, pursuant to Rule 127 of the Public Procurement Rules, 2008 and in accordance with Section 64(5) of the Public Procurement Act, 2006.
	34.3	Tender not accompanied by a valid Tender Security as stated under Sub-Clause 29, 30 and 31, shall be considered as non-responsive.
35. Return of Tender Security	35.1	No Tender security shall be returned by the Tender Opening Committee (TOC) during and after the opening of the Tenders pursuant to Rule 26 of the Public Procurement Rules 2008.
	35.2	No Tender security shall be returned to the Tenderers before contract signing, except to those who are found non-responsive.

	35.3	Tender securities of the non-responsive Tenders shall be returned immediately after the Evaluation Report has been approved by the Purchaser.
	35.4	Tender securities of the responsive Tenderers shall be returned only after the lowest evaluated responsive Tenderer has submitted the performance security and signed the contract, that being even before the expiration of the validity period specified in Clause 30.
	35.5	Tender Securities of the Tenderers not consenting within the specified date in writing to the request made by the Purchaser under ITT Sub-Clause 31.1 in regard to extension of its Tender validity shall be discharged or returned forthwith.
36. Forfeiture of Tender Security.	36.1	The Tender security pursuant to Rule 25 of the Public Procurement Rules,2008 may be forfeited if a Tenderer: (a) withdraws its Tender after opening of Tenders but within the validity of the Tender as stated under ITT Clauses 30,and 31, pursuant to Rule 19 of the Public Procurement Rules 2008; or (b) refuses to accept a Notification of Award as stated under ITT Sub-Clause 65.3, pursuant to Rule 102 of the Public Procurement Rules 2008; or (c) fails to furnish performance security as stated under ITT Sub-Clause 66.2, pursuant to Rule 102 of the Public Procurement Rules 2008; or (d) refuses to sign the Contract as stated under ITT Sub-Clause 70.2 pursuant to Rule 102 of the Public Procurement Rules 2008; or (e) does not accept the correction of the Tender price following the correction of arithmetic errors as stated under ITT Clause 55, pursuant to Rule 98(11) of the Public Procurement Rules 2008.
37. Format and Signing of Tender	37.1	Tenderers shall prepare one (1) original of the documents comprising the **Technical Offer** as described in ITT Clause 24.2 and clearly mark it "**ORIGINAL OF TECHNICAL OFFER**" In addition, the Tenderers shall prepare the number of copies of the Technical Offer, as specified in the **TDS** and clearly mark each of them "**COPY OF THE TECHNICAL OFFER**." In the event of any discrepancy between the original and the copies, the **ORIGINAL** shall prevail.
	37.2	Tenderers shall prepare one (1) original of the documents comprising the Financial Offer as described in ITT Clause 24.3 and clearly mark it "**ORIGINAL OF FINANCIAL OFFER**" In addition, the Tenderers shall prepare the number of copies of the Financial Offer, as specified in the **TDS** and clearly mark each of them "**COPY OF THE FINANCIAL OFFER**" In the event of any discrepancy between the original and the copies, the **ORIGINAL** shall prevail.
	37.3	Alternatives, if permitted under ITT Clause 25, shall be clearly marked "Alternative".

	37.4 The original and each copy of the Offer shall be typed or written in indelible ink and shall be signed by the Person duly authorized to sign on behalf of the Tenderer. This Tender specific authorization shall be attached to the Technical Offer Submission Letter (**Form PG5A-1a**) and Financial Offer Submission Letter (**Form PG5A-1b**). The name and position held by each Person(s) signing the authorization must be typed or printed below the signature. All pages of the original and of each copy of the Tender, except for un-amended printed literature, shall be numbered sequentially and signed by the person signing the Tender.
	37.5 Any interlineations, erasures, or overwriting will be valid only if they are signed or initialled by the Person (s) signing the Tender.
E. Tender Submission	
38. Sealing, Marking and Submission of Tender	**38.1** Tenderers shall enclose the original of **Technical Offer** in one (1) envelope and all the copies of the **Technical Offer**, including the alternatives, if permitted under ITT Clause 25, in another envelope, duly marking the envelopes as "**ORIGINAL OF TECHNICAL OFFER**" "**ALTERNATIVES**" (if permitted), "**COPY OF TECHNICAL OFFER","ALTERNATIVES" (if permitted)** These sealed envelopes for the original and copies of the technical Tender shall then be enclosed and sealed in one single envelope and clearly mark it "**Envelope-01: TECHNICAL OFFER".** 38.2 The inner and outer envelopes of Technical Offer shall: (a) be addressed to the Procuring Entity at the address as stated under ITT Sub Clause 39.1; (b) bear the name of the Tender and the Tender Number as stated under ITT Sub Clause 1.1; (c) bear the name and address of the Tenderer; (d) bear a statement "DO NOT OPEN BEFORE ---------- ----------" the time and date for Tender opening as stated under ITT Sub Clause 45.2 (e) bear any additional identification marks as specified in the **TDS.**
	38.3 Tenderers shall enclose the original of **Financial Offer** in one (1) envelope and all the copies of the **Financial Offer** in another envelope, duly marking the envelopes as "**ORIGINAL OF FINANCIAL OFFER**" & "**COPY OF FINANCIAL OFFER".** These sealed envelopes for the original and copies of the Financial Tender shall then be enclosed and sealed in one single envelope and clearly mark it "**ENVELOPE-02: FINANCIAL OFFER.**
	38.4 The inner and outer envelopes of Financial Offer shall:

		(a) be addressed to the Procuring Entity at the address as stated under ITT Sub Clause 39.1; (b) bear the name of the Tender and the Tender Number as stated under ITT Sub Clause 1.1; (c) bear the name and address of the Tenderer; **(d)** bear a statement "**DO NOT OPEN BEFORE THE TECHNICAL OFFER EVALUATION AND APPROVAL".** (e) bear any additional identification marks as specified in the **TDS.**
	38.5	**The Envelope-01** as stated in ITT Clause 38.1 and **Envelope-02** as in ITT Clause 38.3 shall then be enclosed and sealed in one single outer envelope which shall contain the information as stated under ITT Clause 38.2 (a) to (e) & ITT Clause 38.4 (a) to (e)
	38.6	Tenderers are solely and entirely responsible for pre-disclosure of Tender information if the envelope(s) are not properly sealed and marked.
	38.7	Tenders shall be delivered by hand or by mail, including courier services at the address(s) as stated under ITT Sub Clause 39.1.
	38.8	The Procuring Entity will, on request, provide the Tenderer with acknowledgement of receipt showing the date and time when it's Tender was received.
39. Deadline for Submission of tenders	39.1	Tenders shall be delivered to the Purchaser at the address specified in the **TDS** and no later than the date and time specified in the **TDS**.
	39.2	The Purchaser may, at its discretion on justifiably acceptable grounds duly recorded, extend the deadline for submission of Tender as stated under ITT Sub Clause 39.1, in which case all rights and obligations of the Purchaser and Tenderers previously subject to the deadline will thereafter be subject to the new deadline as extended.
	39.3	If submission of Tendersis allowed in more than one location, the date and time, for submission of Tenders for both the primary and the secondary place(s), shall be the "**same and not different**" as specified in the **TDS.**
	39.4	The Procuring Entity shall ensure that the Tenders received at the secondary place(s) are hand-delivered at the primary place as stated under ITT Sub Clause 39.1, within THREE (3) HOURS after the deadline for submission of Tenders at the secondary place (s), in case of MULTIPLE DROPPING as stated under ITT Sub Clause 39.3, as specified in the **TDS**.

40. Late tender	37.6	Any Tender received by the Purchaser after the deadline for submission of Tenders as stated under ITT Clause 39, shall be declared LATE, rejected, returned unopened to the Tenderer.
41. Modification, Substitution or Withdrawal of Tenders	41.1	Tenderers may modify, substitute or withdraw its Tender after it has been submitted by sending a written notice duly signed by the authorized signatory and properly sealed, and shall include a copy of the authorization; provided that such written notice including the **affidavit** is received by the Procuring Entity prior to the deadline for submission of Tenders as stated under ITT Clause 39
42. Tender Modification	42.1	Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit corresponding modification either to its original **Technical Offer** or **Financial Offer** or both, marked as **"MODIFICATION FOR TECHNICAL OFFER(MTO)" or "MODIFICATION FOR FINANCIAL OFFER (MFO)"**with two separate envelopes. The envelope/envelopes marked as MTO and/or MFO then be enclosed and sealed in one single outer envelope with a written notice duly as stated under ITT Sub Clause 41.1. The outer envelope shall contain the information as stated under ITT Sub Clause 38.2(a) to (d) and clearly marked as **"MODIFICATION (M)".**
43. Tender Substitution	43.1	Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit another **Technical Offer** or **Financial Offer** or both, marked as **"SUBSTITUTION FOR TECHNICAL OFFER (STO)" or "SUBSTITUTION FOR FINANCIAL OFFER (SFO)"**with two separate envelopes. The envelope/envelopes marked as STO and/or SFO then be enclosed and sealed in one single outer envelope with a written notice duly as stated under ITT Sub Clause 41.1. The outer envelope shall contain the information as stated under ITT Sub Clause 38.2(a) to (d) and clearly marked as **"SUBSTITUTION (S)".**
44. Withdrawal of Tender	44.1	The Tenderer shall be allowed to withdraw its Tender by a Letter of Withdrawal marked as "WITHDRAWAL" prior to the deadline for submission of Tenders as stated under ITT Clause 39.
F. Tender Opening and Evaluation		
45. Tender Opening	45.1	Only the **Technical Offer(Envelope-01**) shall be opened immediately after the deadline for submission of Tenders at the primary place as specified in the **TDS** but not later than **ONE HOUR,** after expiry of the submission deadline at the same primary place unless otherwise stated under ITT Sub Clause 39.2. But with in **THREE HOURS** after the dateline of submission of tender at primary place in case of multiple dropping. Tender opening shall not be delayed on the plea of absences of Tenderers or his or her representatives. Financial offer **(Envelope-02)** shall not open with Technical offer (**Envelope-01)** and shall be kept unopened at the Custody of the Head of the

	Procuring Entity or his Authorised Officer (AO). 45.2 Persons not associated with the Tender may not be allowed to attend the public opening of Technical Offers. 45.3 Tenderers' representatives shall be duly authorised by the Tenderer. Tenderers or their authorised representatives will be allowed to attend and witness the opening of **Technical Offers**, and will sign a register evidencing their attendance. Technical Offers Opening shall not be delayed on the plea of absence of Tenderers or his or her representatives. 45.4 The authenticity of withdrawal or substitution of, or modifications to original Tender, if any made by a Tenderer in specified manner, shall be examined and verified by the Tender Opening Committee (TOC) based on documents submitted as stated under ITT Sub Clause 41.1. Any envelope related to financial modification, substitute shall be recorded but not open with technical offer. 45.5 Verify (**M), (S), (W), (A), (O) by following step by steps** (a) **Step 1:** envelopes marked "**Withdrawal (W)"** shall be opened and "Withdrawal" notice read aloud & recorded in the opening sheet. After verify the withdrawal letter is genuine, corresponding tender shall not be opened, but returned unopened to the Tenderer by Procuring Entity (**PE**) at a late time. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice shall be as stated in 41.1& 44.1 and in such case the Tender shall be opened and recorded. (b) **Step 2:** the remaining Tenders will be sorted out and those marked **"SUBSTITUTION (S)"** or "**MODIFICATION (M)"** of Tender will be linked with their corresponding Original Tender. (c) **Step 3:** outer envelopes marked "**SUBSTITUTION (S)**" shall be opened. The inner envelopes containing the "Substitution of Technical Offer (**STO**)" and/or "Substitution of Financial Offer (**SFO**)" shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Tenderer unopened by the Procuring Entity at a later time immediately after opening of Technical Offers. Only the Substitution of Technical Offer, if any, shall be opened, read out, and recorded. Substitution of Financial Offer will remain unopened in accordance with ITT Sub Clause45.1. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at Technical Offer opening.

	(d) **Step 4:** outer envelopes marked "**MODIFICATION (M)**" shall be opened. No Technical Offer and/or Financial Offer shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Offers. Only the Technical Offers, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Financial Offers, both Original as well as Modification, will remain unopened in accordance with ITT Sub Clause 45.1 (e) **Step5:** if so specified in this Tender Document, the envelopes marked "Alternative of Technical Offer (ATO)" shall be opened and read aloud with the corresponding Technical Offer and recorded. 45.6 Ensuring that only the correct (**MTO), (STO), (ATO), (OTO)** envelopes are opened, details of each Technical Offer will be dealt with as follows: (a) the Chairperson of the **TOC** will read aloud each Technical Offer and record in the Technical Offer Opening Sheet (**TOOS):** (i) the name and address of the Tenderer; (ii) state if it is a withdrawn, modified, substituted or original Technical Offer; (iii) any alternatives; (iv) record the rejection of the Tender which submitted Technical Offer and Financial Offer together in one envelope. (v) the presence or absence of any requisite Tender Security; and (vi) such other details as the Procuring Entity, at its discretion, may consider appropriate. (b) Only Technical Offer and alternatives read aloud at the Technical Offer Opening will be considered in evaluation. (c) all pages of the original version of the Technical Offer, except for un-amended printed literature, will be initialled by members of the TOC**. Remember, No financial Offer shall be open with Technical Offer** 45.7 Upon completion of Technical Offer opening, all members of the **TOC** and the Tenderers or Tenderer's duly authorised representatives attending the Technical Offer opening shall sign by name, address, designation, the TOS, copies of which shall be issued to the Head of the Procuring Entity or an officer authorised by him or her and also to the members of the TOC and any authorised Consultants and, to the Tenderers immediately. 45.8 The omission of a Tenderer's signature on the record shall not invalidate the contents and effect of the record under ITT Sub Clause 45.7 45.9 No Tender i.e., Technical or Financial Offer shall be

	rejected at the Tender opening stage except the **LATE** Tenders as stated in the ITT Clause 40.
46. Evaluation of Tenders	46.1 Technical Offers shall be examined and evaluated only on the basis of the criteria specified in the Tender Document. 46.2 **Tender Evaluation Committee** (**TEC**) shall examine, evaluate and compare Tenders that are responsive to the requirements of Tender Documents in order to identify the successful Tenderer.
47. Evaluation Process	47.1 TEC may consider a Tender Offer as responsive in the Evaluation, only if it is submitted in compliance with the mandatory requirements set out in the Tender Document. The evaluation process should begin immediately after Technical Offer opening following Two steps: (a) Preliminary examination (b) Technical examination and responsiveness
48. Preliminary Examination	48.1 Compliance, adequacy and authenticity of the documentary evidences for meeting the qualification criterion specified in the corresponding section of the Tender document shall have to be preliminarily examined and verified. 48.2 The TEC shall firstly examine the Tenders to confirm that all documentation requested in ITT Clause 24 has been provided. Examination of the compliance, adequacy and authenticity of the documentary evidence may follow the order below: (a) verification of the completeness of the eligibility declaration in the Tender Submission Letter (Form PG5A-1), to determine the eligibility of the tenderer as stated under ITT Sub-Clause 24(h). Any alterations to its format, filling in all blank spaces with the information requested, failing which the tender may lead to rejection of the Tender; (b) verification of that the Tenderer is enrolled in the relevant professional or trade organisations as stated under ITT Clause 24(l); (c) verification of the eligibility in terms of legal capacity and fulfilment of taxation obligation by the tenderer in accordance as stated under ITT Sub-Clause 24(i) and 24(k); (d) verification of eligibility that the tenderer is not insolvent, in receivership, bankrupt, not in the process of bankruptcy, not temporarily barred as stated under ITT Sub-Clause 24(j); (e) verification of eligibility of Tenderer's country of origin as stated under ITT Sub-Clause 24(b); (f) verification of the written authorization confirming the signatory of the Tenderer to commit the Tender has been attached with Tender Submission Letter (Form PG5A-1) as stated under ITT Sub-Clause 24(g); in

	order to check the authenticity of Tender and Tenderer itself ; (g) verification of the Tender Security as stated under ITT Sub-Clause 24(d); and 48.3 The TEC shall confirm that the above documents and information have been provided in the Tender and the completeness of the documents and compliance of instructions given in corresponding ITT Clauses shall be verified, failing which the tender shall be considered rejection of that tender.
49. Technical Evaluation and Responsiveness	49.1 Only those Tenders surviving preliminary examination need to be examined in this phase. 49.2 Secondly, the TEC will examine the adequacy and authenticity of the documentary evidence which may follow the order below: (a) verification of the completeness of the country of origin declaration in the Price Schedule for Plant and Services (Form PG5A-3) as furnished in Section 5: Tender and Contract Forms to determine the eligibility of the Goods and Related Services as stated under ITT Sub Clause 24(m). (b) verification and examination of the documentary evidence and completed Technical Proposal (Form PG5A-4) as furnished in Section 5: Tender and Contract Forms to establish the conformity of the Goods and Related Services to the Tender Documents as stated under ITT Sub Clause 24(e) and 24(n). (c) verification and examination of the documentary evidence that the Tenderer's qualifications conform to the Tender Documents and the Tenderer meets each of the qualification criterion specified in Sub-Section C, Qualification Criteria as stated under ITT Sub Clause 24(o). (d) verification and examination of the documentary evidence that Tenderer has met all the requirements in regards under Section 6, Employer's Requirements, without any material deviation or reservation. (e) verification and examination of the documentary evidence and completed Specification Submission Sheet **(Form PG5A-4a**) to determine the conformity of the Goods and related services .
	49.3 TEC may consider a Tender as responsive in the evaluation, only if comply with the mandatory requirements as stated under Clause 49.2.
	49.4 The TEC's determination of a Tender's responsiveness is to be based on the documentary evidence as requested in Clause 49.2 without recourse to extrinsic evidence.

	49.5 Information contained in a Tender, that was not requested in the Tender Document shall not be considered in evaluation of the Tender.
	49.6 If a Tender is not responsive to the mandatory requirements set out in the Tender Document it shall be rejected by the TEC and shall not subsequently be made responsive by the Tenderer by correction of the material deviation, reservation.
	49.7 A material deviation or reservation is one- (a) which affects in any substantial way the scope, quality, or performance of the Goods and Related Services and Tenderer's qualifications mentioned in the Tender Document (b) which limits in any substantial way, inconsistent with the Tender Documents, the Purchaser's rights or the Tenderer's obligations under the Contract; or (c) whose rectification would anyway affect unfairly the competitive position of other Tenderers presenting responsive Tenders.
	49.8 During the evaluation of Tender, the following definitions apply: (a) Deviation" is a departure from the requirements specified in the Tender Document; (d) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Tender Document;
	49.9 A TEC may regard a Tender as responsive, even if it contains-minor or insignificant deviations, which do not meaningfully alter or depart from the technical specifications, characteristics and commercial terms and conditions or other requirements set out in the Tender Document; errors or oversights, which if corrected, would not alter the key aspects of the Tender.
50. Clarification on Technical Offer	50.1 TEC may ask Tenderers for clarification of their Technical Offers in order to facilitate the examination and evaluation of Technical Offers. The request for clarification by the TEC and the response from the Tenderer shall be in writing, and Technical Offers clarifications which may lead to a change in the substance of the Technical Offers or in any of the key elements of the Technical Offers as stated under ITT Sub Clause 49.2, will neither be sought nor be permitted. 50.2 Any request for clarifications by the TEC shall not be directed towards making an apparently non-responsive Tender responsive and reciprocally the response from the concerned Tenderer shall not be articulated towards any addition, alteration or modification to its Technical Offer.

	50.3 If a Tenderer does not provide clarifications of its Technical Offer by the date and time, its Tender shall not be considered in the evaluation
51. Restrictions on Disclosure of Information	51.1 Following the opening of Technical Offers until issuance of Notification of Award no Tenderer shall, unless requested to provide clarification to its Tender or unless necessary for submission of a complaint, communicate with the concerned Procuring Entity 51.2 Tenderers shall not seek to influence in anyway, the examination and evaluation of the Tenders 51.3 Any effort by a Tenderer to influence the Procuring Entity in its decision concerning the evaluation of Tenders, Contract awards may result in the non-responsiveness of its Tender as well as further action in accordance with Section 64 (5) of the Public Procurement Act, 2006. 51.4 All clarification requests shall remind Tenderers of the need for confidentiality and that any breach of confidentiality on the part of the Tenderer may result in their Tender being non-responsive.
52. Approval of Technical Offer	52.1 TEC shall prepare the Technical Offer Evaluation Report and shall directly submit the Evaluation Report to the Head of the Procuring Entity **(HOPE) or Authorized Officer for approval.**
53. Financial Offer Opening	53.1 After receiving approval of the Technical Offer Evaluation Report, Financial Offer **(Envelope-2)** of only the Responsive Tenderers who have been determined as qualified to the requirements of the Technical Offer, shall be opened publicly, The Date, time and place of Financial Offer Opening shall be communicated to the Responsive Tenderers in writing by issuing a Financial Offer Opening notice not less than **SEVEN DAYS** before the opening.
	53.2 Ensuring that only the correct **MFO, SFO, OFO** envelopes of the Responsive Tenderers shall be opened, in the presence of the Responsive Tenderer's representatives who choose to attend, on the date, time and at the place as notified by the Procuring Entity in accordance with ITT Clause 53.1. Details of each Financial Offer will be dealt with as follows: (a) the Chairperson of the Tender Evaluation Committee will read aloud each Financial Offer and record in the Financial Offer Opening Sheet (**FOOS**): (i) the name and address of the Tenderer; (ii) state if it is a modified, substituted or original Financial Offer; (iii) the Tender Price; (iv) the number of initialled corrections; (v) any discounts; and (vi) any other details as the Procuring Entity, at its discretion, may consider appropriate

	(b) only the discounts and alternatives read aloud and recorded at the Financial Offer Opening will be considered in Financial Offer Evaluation. No Tenders shall be rejected at the opening of the Financial Offer. (c) all pages of the original version of the Financial Offer, except for un-amended printed literature, will be initialled by members of the Tender Evaluation Committee. (d) The Procuring Entity shall, in writing, notify the Non-responsive Tenderers who have not been determined as qualified to the requirements of the Technical Offer and shall return their Financial Offers (Envelope-02) unopened after signing of the contract.
54. Clarification on Financial Offer	54.1 TEC may ask Tenderers for clarification of their Financial Offers, about the breakdowns of unit rates, in order to facilitate the examination and evaluation of Financial Offers. The request for clarification by the TEC and the response from the Tenderer shall be in writing.
	54.2 Changes in the Tender price shall not be sought or permitted, except to confirm the correction of arithmetical errors discovered by the TEC in the evaluation of the Tenders, as stated under ITT Sub Clause 55.1.
	54.3 If a Tenderer does not provide clarifications of its Financial Offer by the date and time, its Tender shall not be considered in the evaluation.
	54.4 Requests for clarifications on Financial Offers shall be duly signed only by the TEC Chairperson.
55. Correction of Arithmetical Errors	55.1 The TEC shall correct any arithmetic errors that are discovered during the examination of Tenders, and shall promptly notify the concerned Tenderer(s) of any such correction(s) pursuant to Rule 98(11) of the Public Procurement Rule, 2008. 55.2 Provided that the Tender is responsive, TEC shall correct arithmetical errors on the following basis: (a) If there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of the TEC there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted willgovern and the unit price will be corrected; (b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the sub-totals shall prevail and the total shall be corrected. 55.3 Any Tenderer that does not accept the correction of the Tender amount following correction of arithmetic errors as determined by the application of ITT Sub-Clause 55.2 shall be considered as non-responsive.

56. Conversion to Single Currency	56.1For evaluation and comparison purpose, TEC shall convert all Tender prices expressed in the amounts in various currencies into an amount in Bangladeshi Taka currency, using the **selling exchange rates** established by the Bangladesh Bank, on the date of **Tender opening**.
57. Financial Evaluation	57.1 Thirdly the TEC, pursuant to Rule 98 of the Public Procurement Rules, 2008 shall evaluate each Tender that has been determined, up to this stage of the evaluation, to be responsive to the mandatory requirements in the Tender Document.
	57.2 To evaluate a Tender in this stage , the Purchaser shall consider the following (a) Verification and examination of the Price Schedule for Plant and Services (Form PG5-3) as furnished by the Tenderer and checking the compliance with the instructions provided under ITT Clause 26; (b) Evaluation will be done for Items or lot by lot as stated under ITT Clause 26 and the Total Tender Price as quoted in accordance with Clause 26; (c) Adjustment for correction of arithmetical errors as stated under ITT Sub-Clause 55.2; (d) Adjustment for price modification offered as stated under ITT Clause 41; (e) Adjustment due to discount as stated under ITT Sub-Clauses 26.11 and 57.3; (f) Adjustment due to the application of economic factors of evaluation as stated under ITT Sub-Clause 57.5 if any; (g) Adjustment due to the assessment of the price of unpriced items as stated under ITT Clause 58 if any;
	57.3 If Tenders are invited for a single lot or for a number of lots as stated under ITT Sub-clauses 26.10, TEC shall evaluate only lots that have included at least the percentage of items per lot. The TEC shall evaluate and compare the Tenders taking into account: (a) Lowest evaluated tender for each lot ; (b) The price discount/reduction per lot; (c) Least cost combination for the Purchaser, considering discounts and the methodology for its application as stated under ITT Sub-clauses 26.10 and 26.11 offered by the Tenderer in its Tender. 57.4 Only those spare parts and tools which are specified as a item in the List of Goods and Related Services in Section 6, Employer's Requirement or adjustment as stated under ITT Sub-clause 54.5, shall be taken into account in the Tender evaluation. Supplier-recommended spare parts for a specified operating requirement as stated under ITT

		Sub-clause 28.2(b) shall not be considered in Tender evaluation.
	57.5	The Purchaser's evaluation of a tender may require the consideration of other factors, in addition to the Tender Price quoted as stated under ITT Clause 26. The effect of the factors selected, if any, shall be expressed in monetary terms to facilitate comparison of tenders. The factors, methodologies and criteria to be used shall be as specified in **TDS**. The applicable economic factors, for the purposes of evaluation of Tenders shall be: (a) Adjustment for Deviations in the Delivery and Completion Schedule. (b) Cost of major replacement components, mandatory spare parts, and service.
	57.6	Variations, deviations, and alternatives and other factors which are in excess of the requirements of the Tender Document or otherwise result in unsolicited benefits for the Purchaser will not be taken into account in Tender evaluation.
58. Price Comparison	58.1	The TEC shall compare all responsive Tenders to determine the lowest-evaluated Tender, as stated in ITT 57.2.
	58.2	In the extremely unlikely event that there is a tie for the lowest evaluated price, the Tenderer with the superior past performance with the Purchaser shall be selected, whereby factors such as delivery period, quality of Goods delivered, complaints history and performance indicators could be taken into consideration.
	58.3	In the event that there is a tie for the lowest price and none of the Tenderers has the record of past performance with the Purchaser, then the Tenderer shall be selected, subject to firm confirmation through the Post-qualification process described in ITT Clause 61, after consideration as to whether the quality of Goods that is considered more advantageous by the end-users.
	58.4	The successful Tenderer as stated under ITT Sub Clauses 58.1, 60.2 and 60.3 shall not be selected through lottery under any circumstances.
59. Post-qualification	59.1	After determining the lowest-evaluated responsive tender as sated under ITT Sub-Clause 58.1, the Purchaser's TEC pursuant to Rule 100 of the Public Procurement Rules, 2008, shall carry out the Post-Qualification of the Tenderer, using only the requirements specified in Sub-Section C, Qualification Criteria.

	59.2 The TEC shall contact the references given by Tenderers about their previous Supply experiences to verify, if necessary, statements made by them in their Tender and to obtain the most up-to-date information concerning the Tenderers.
	59.3 The TEC may visit the premises of the Tenderer as a part of the post-qualification process, if practical and appropriate, to verify information contained in its Tender. 59.4 The TEC shall determine to its satisfaction whether the Tenderer that is selected as having submitted the lowest evaluated responsive Tender is qualified to perform the Contract satisfactorily. 59.5 The objective of any visit under ITT Sub-Clause 59.3 shall be limited to a general and visual inspection of the Tenderer's facilities and its plant and equipment, and there shall be no discussion concerning the Tender or its evaluation with the Tenderer during such visit(s). 59.6 In the event that the Tenderer with lowest evaluated cost fails the post-qualification, the TEC shall make a similar determination for the Tenderer offering the next lowest evaluated cost and so on from the remaining responsive Tenders, provided that, (a) such action shall only be taken if the evaluated costs of the Tenders under consideration are acceptable to the Purchaser; (b) when the point is reached whereby the evaluated costs of the remaining responsive Tenders are significantly higher than that of the official estimate, or the market price, the Purchaser may take action pursuant to Rule 33 of the PPR 2008 and may proceed for re-Tendering, using a revised Tender Document designed to achieve a more successful result.
60. Negotiation	60.1 No negotiations shall be held during the financial offer evaluation or award, with the lowest or any other Tenderer. 60.1 The Procuring Entity through the TEC may, however, negotiate with the lowest evaluated Tenderer with the objective to reduce the Contract Price by reducing the scope of works or a reallocation of risks and responsibilities, only when it is found that the lowest evaluated Tender is significantly higher than the official estimated cost; the reasons for such higher price being duly investigated. 60.1 If the Procuring Entity decides to negotiate for reducing the scope of the requirements under ITT Sub Clause 60.2, it will be required to guarantee that the lowest Tenderer remains the lowest Tenderer even after the scope of work has been revised and shall further be ensured that the objective of the Procurement will not be seriously affected through this reduction.

	60.1 In the event that the Procuring Entity decides because of a high Tender price to reduce the scope of the requirements to meet the available budget, the Tenderer is not obliged to accept the award and shall not be penalised in any way for un-accepting the proposed award.
61. Rejection of All Tenders	61.1 The Purchaser may, in the circumstances as stated under ITT Sub-Clause 61.2 and pursuant to Rule 33 of the Public Procurement Rules 2008, reject all Tenders following recommendations from the Tender Evaluation Committee only after the approval of such recommendations by the Head of the Purchaser.rejected, if – 61.2 All Tenders can be rejected, if - (a) the price of the lowest evaluated Tender exceeds the official estimate, provided the estimate is realistic; or (b) there is evidence of lack of effective competition; such as non-participation by a number of potential Tenderers; or (c) the Tenderers are unable to propose completion of the delivery within the stipulated time in its offer, though the stipulated time is reasonable and realistic; or (d) all Tenders are non-responsive; or (e) evidence of professional misconduct, affecting seriously the Procurement process, is established pursuant to Rule 127 of the Public Procurement Rules, 2008. 61.3 Notwithstanding anything contained in ITT Sub-Clause 61.2 Tenders may not be rejected if the lowest evaluated price is in conformity with the market price. 61.4 A Purchaser may pursuant to Rule 35 of the Public Procurement Rules, 2008, on justifiable grounds, annul the Procurement proceedings prior to the deadline for the submission of Tenders. 61.5 All Tenders received by the Purchaser shall be returned unopened to the Tenderers in the event Procurement proceedings are annulled under ITT Sub-Clause 61.4.
62. Informing Reasons for Rejection	62.1 Notice of the rejection, pursuant to Rule 35 of the Public Procurement Rules, 2008, will be given promptly within **seven (7) days** of decision taken by the Purchaser to all Tenderers and, the Purchaser will, upon receipt of a written request, communicate to any Tenderer the reason(s) for its rejection but is not required to justify those reason(s).

G. Contract Award

63. Award Criteria	63.1 The Purchaser shall award the Contract to the Tenderer whose offer is responsive to the Tender Document and that has been determined to be the lowest evaluated Tender, provided further that the Tenderer is determined to be Post-Qualified as stated under ITT Clause 59. 63.2 A Tenderer shall not be required, as a condition for award of contract, to undertake obligations not stipulated in the Tender Document, to change its price, or otherwise to modify its Tender.
64. Notification of Award	64.1 Prior to the expiry of the Tender validity period and within **seven (7)** working days of receipt of the approval of the award by the Approving Authority, the Purchaser pursuant to Rule 102 of the Public procurement Rules, 2008, shall issue the Notification of Award (NOA) to the successful Tenderer.
	64.2 The Notification of Award, attaching the contract as per the sample (**Form PG5A-7)** to be signed, shall state: (a) the acceptance of the Tender by the Purchaser; (b) the price at which the contract is awarded; (c) the amount of the Performance Security and its format; (d) the date and time within which the Performance Security shall be submitted; and (e) the date and time within which the contract shall be signed.
	64.3 The Notification of Award shall be accepted in writing by the successful Tenderer within **seven (7)** working days from the date of issuance of **NOA.**
	64.4 Until a formal contract is signed, the Notification of Award shall constitute a Contract, which shall become binding upon the furnishing of a Performance Security and the signing of the Contract by both parties.
	64.5 The Notification of Award establishes a Contract between the Purchaser and the successful Tenderer and the existence of a Contract is confirmed through the signature of the Contract Document that includes all agreements between the Purchaser and the successful Tenderer.
65. Performance Security	65.1 The Performance Security shall be determined sufficient to protect the performance of the Contract pursuant to Rule 27 of the Public Procurement Rules, 2008.
	65.1 Performance Security shall be furnished by the successful Tenderer in the amount specified in the **TDS** and **denominated in the currencies** in which the Contract Price is payable pursuant to Rule 102 (8) of the Public Procurement Rules, 2008.

	65.1	The proceeds of the Performance Security shall be payable to the Purchaser unconditionally upon first written demand as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.
66. Form and Time Limit for furnishing of Performance security	66.1	The Performance Security shall be in the form of irrevocable Bank Guarantee in the format (Form PG5A-9) as stated under ITT Clause 65, shall be issued by an internationally reputable bank and it shall have correspondent bank located in Bangladesh, to make it enforceable pursuant to Rule 27(4) of the Public Procurement Rules, 2008..
	66.2	Within twenty-eight (28) days from issue of the Notification of Award, the successful Tenderer shall furnish the Performance Security for the due performance of the Contract in the amount specified under ITT Sub Clause 65.2.
67. Validity of Performance Security	67.1	The Performance Security shall be required to be valid until a date twenty-eight (28) days beyond the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations.
	67.1	If under any circumstances date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations is to be extended, the Performance Security shall correspondingly be extended for the extended period.
68. Authenticity of performance Security	69.1	The Purchaser shall verify the authenticity of the Performance Security submitted by the successful Tenderer by sending a written request to the branch of the bank issuing irrevocable Bank Guarantee in specified format.
	69.2	If the Performance Security submitted under ITT Sub Clause 65.2 is not found to be authentic, the Purchaser shall proceed to take measures against the Tenderer in accordance with Section 64 of the Act and pursuant to Rule 127 of the Public Procurement Rules, 2008.

69. Contract Signing	69.1	At the same time as the Purchaser issues the Notification of Award, the Purchaser shall send the draft Contract Agreement and all documents forming the Contract pursuant to Rule 102 of the Public Procurement Rule, 2008, to the successful Tenderer.
	69.2	Within twenty-eight (28) days of the issuance of Notification of Award, the successful Tenderer and the Purchaser shall sign the contract provided that the Performance Security submitted by the Tenderer is found to be genuine.
	69.3	If the successful Tenderer fails to provide the required Performance Security, as stated under ITT Clause 65 or to sign the Contract , as stated under ITT Sub-Clause 69.2, Purchaser shall proceed to award the Contract to the next lowest evaluated Tenderer, and so on, by order of ranking pursuant to Rule 102 of the Public Procurement Rules,2008.
70. Publication of Notification of Award of Contract	70.1	Notification of Awards for Contracts of Taka 10 (ten) million and above shall be notified by the Purchaser to the Central Procurement Technical Unit within 7(seven) days of issuance of the NOA for publication in their website, and that notice shall be kept posted for not less than a month pursuant to Rule 37 of the Public Procurement Rules, 2008.
	70.2	Notification of Award for Contracts below Taka 10(ten) million, shall be published by the Purchaser on its Notice Board and where applicable on the website of the Purchaser and that notice shall be kept posted for not less than a month pursuant to Rule 37 of the Public Procurement Rules, 2008..
71. Debriefing of Tenderers	72.1	Debriefing of Tenderers by Purchaser shall outline the relative status and weakness only of his or her Tender requesting to be informed of the grounds for not accepting the Tender submitted by him or her pursuant to Rule 37 of the Public Procurement Rule, 2008, without disclosing information about any other Tenderer.
	72.2	In the case of debriefing confidentiality of the evaluation process shall be maintained.
72. Right to Complains	72.1	Any Tenderer has the right to complain if it has suffered or likely to suffer loss or damage due to a failure of a duty imposed on the Purchaser to fulfil its obligations in accordance with Section 29 of the Public Procurement Act 2006 and pursuant to Part 12 of Chapter Three of the Public Procurement Rules, 2008.
	72.1	Circumstances in which a formal complaint may be lodged in sequence by a potential Tenderer against a Purchaser pursuant to Rule 56 of the Public Procurement Rules, 2008, and the complaints, if any, be also processed pursuant to Rule 57 of the Public Procurement Rules 2008.

72.1	The potential Tenderer shall submit his or her complaint in writing within seven (7) calendar days of becoming aware of the circumstances giving rise to the complaint.
72.1	In the first instance, the potential Tenderer shall submit his or her complaint to the Purchaser who issued the Tender Document.
72.1	The place and address for the first stage in the submission of complaints to the Administrative Authority is provided in the **TDS**.
72.1	The Tenderer may appeal to a Review Panel only if the Tenderer has exhausted all his or her options of complaints to the administrative authority as stated under ITT Sub-Clause 72.2.

Section - 2. Tender Data Sheet

ITT Clause	Amendments of, and Supplements to, Clauses in the Instruction to Tenderers
A. General	
ITT 1.1	The Purchaser is Bangladesh Power Development Board (BPDB) Authorized Representative: Secretary, Bangladesh Power Development Board, WAPDA Bhaban (1st Floor), Motijheel C/A, Dhaka -1000, Bangladesh. The Name of Tender is Construction of 50MWp (DC) Solar Photovoltaic Grid Connected Power Plant at Rangunia, Chattagram Bangladesh on Turn Key Basis.
ITT 1.2	The number, identification and name of lots comprising the Tender are: Single Lot Construction of 50MWp (DC) Solar Photovoltaic Grid Connected Power Plant at Rangunia, Chattagram, Bangladesh on Turn Key Basis.
ITT3.1	The source of public funds is Power Sector Development Fund of BPDB (formerly Energy Maintenance and Development Fund of BPDB).
ITT3.3	The name of the Development Partner is None
ITT5.1	Tenderers from the following countries are not eligible: Israel and countries having no diplomatic relation with the Government of the People's Republic of Bangladesh.
ITT 5.13	Tenderers shall have the following up to date valid License Registration /Certificate of Incorporation /Trade licence/Business License in its country of origin.
ITT6.1	Materials, Equipment and associated services from the following countries are not eligible: Israel and countries having no diplomatic relation with the Government of the People's Republic of Bangladesh.
ITT7.1	Each Tenderer before submitting his/her Tender will carefully examine the tender requirements and will visit the site at their own cost to determine the existing conditions, facilities and limitations. The Tenderer shall thoroughly inform himself/herself of all conditions and factors which would affect the prosecution and completion of the Work, including, but not be limited to, the exact condition of the proposed site, soil condition, water quality availability and cost of labour, applicable laws and regulations and facilities for transportation, handling and storage of materials and equipment and limitation of working days due to monsoon. Any neglect to delay or failure on the part of the tenderer to obtain reliable information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final acceptance of the work in case of award of the contract. It must be understood and agreed that such factors have been properly investigated and considered in the preparation of the Proposal submitted. No claims for financial and time adjustment to the Contract awarded for the Work under these Specifications and Documents will be permitted by the Board/Engineer which are based on the lack of such prior information or its effect on the cost of the work and its completion time.

B. Tender Document	
ITT8.2	The following are the offices of the Purchaser or authorised agents for the purpose of providing the Tender Document: Agent's Name: Directorate of Purchase Address: Bangladesh Power Development Board WAPDA Building (9th Floor) Motijheel C/A, Dhaka -1000, Bangladesh Telephone No.: +8802-9550532; Fax No.: +8802-7126151
ITT9.1	For **clarification of Tender Document purposes** only, the Procuring Entity's address is: Attention: Secretary, Address: Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh. Telephone: 880-2-9554209 Fax No.: 880-2-9564765 e-mail address: secretary@bpdb.gov.bd A prospective tenderer requiring any clarification of the tender document shall contact in writing at the procuring entity's address on or before **22 (twenty two) days** from the date of Tender Submission.
ITT10.1	A Pre- Tender meeting shall **not be held**
C. Qualification Criteria	
ITT 13.1	The maximum 3 (three) number of arbitration against the Tenderer over a period of 5 (five) years.
ITT14.1 (a)	The Tenderer shall have a minimum of 03 (three) years of overall experience in the role of contractor, subcontractor, or management contractor.
ITT 14.1(b)	Tenders will only be considered from individual firm or joint venture, consortium or association (JVCA) who are actually engaged and experienced in Design, Supply, Installation, Testing and Commissioning of Grid Tied Solar Power Plant project described herein. (i) The Tenderer and/or member(s) of JVCA shall successfully completed at least 02 (two) contracts of Design, Supply, Installation, Testing and Commissioning of Ground Mounted Grid Tied Solar Power Plant having minimum capacity of 20.0 MWp or higher each within last 10 (ten) calendar years from the date of Tender Notice. One of the 02 (two) contracts must be executed outside Tenderer's country. (ii) In support of experience as mentioned in Serial no. (i), Tenderer shall have to submit Satisfactory Performance Certificate (SPC) from the end user. The Satisfactory Performance Certificate (SPC) should be in end user's letterhead pad in English stating at least 02 (two) years of satisfactory operation from the date of commissioning of the said plant and shall contain end-user's full mailing address, e-mail address, website address, fax number and phone number for the convenience of authentication. **For non-compliance of above requirements, the Tender shall be considered non-responsive**
ITT 15.1(a)	The required average annual turnover shall be greater than **USD 50.00 (fifty) million** or equivalent within the last 5 (five) years (best three (3) years in the last five (5) years shall be considered).
ITT 15.1(b)	The minimum amount of liquid assets or working capital or credit facilities of the Tenderer shall be **USD 10.00 (ten)** million or equivalent.

ITT 16.1(a)

A Project Manager, Engineer, and other key staff shall have the following qualifications and experience:

SL	Position	Educational qualification	Professional Experience
1.	Project Manager	B. Sc engineer (Civil/Mechanical/ Electrical/Control or Automation)	Minimum 5 years work experience as PV Engineer
2.	Electrical/Power Engineer	B. Sc engineer/ Diploma in Electrical/Power Engineering	Minimum 3 years work experience in Electrical/Power Engineering
3.	Civil Engineer	B. Sc Engineer/ Diploma in Civil engineering	Minimum 3 years work experience in Civil Engineering
4.	Commissioning Expert	B. Sc engineer/ Diploma in Electrical/Power Engineering	Minimum 3 years work experience in Grid Tied Solar PV Power Plant Commissioning
5.	Expert in Quality, Health, Occupational Safety and Environment Management	B. Sc engineer/ Diploma in Civil Engineering	Minimum 2 years work experience in relevant Field

Note: Additional manpower like Electrical/Mechanical technician; Electrician; Foreman, Scaffolders; cleaners, Crane Operator, Machinist shall be deployed by the contractor as per requirement.

ITT 17.1

The Tenderer shall own or have proven access to hire or lease of the major equipment, in full working order as follows :
As required to perform the work as mentioned in Section-6, Employer's Requirements.

ITT 18.1

The value of non-judicial stamp for execution of the Joint Venture Agreement shall be Tk 300 only.

ITT 18.2

The **minimum qualification** requirements of Leading Partner, other Partner(s) and requirements by summation of a JV shall be as follows:

TDS Clauses References	Requirements by summation	Requirements for Leading Partner	Requirements for other Partner(s)
ITT-14.1(a)	Summation not applicable	Same as stated in TDS	Same as for Leading Partner
ITT-14.1(b)	100%	At least one Contract [as mentioned in TDS{ITT 14.1(b)}]	Not Mandatory
ITT-15.1(a)	100%	At least 40% of requirement	At least 25% of requirement
ITT-15.1(b)	100%	At least 40% of requirement	At least 25% of requirement
ITT-16.1(a)	100%	Not Mandatory	Not Mandatory
ITT-17.1	100%	Not Mandatory	Not Mandatory
JVCA Stake	100%	at least 40% stake and must be higher than the stake of other partner	at least 25% stake and must be lower than the stake of leading partner

D. Tender Preparation

ITT 19.2

The maximum of percentage [state percentage] of Goods allowed to be subcontracted: ***Not Allowed***

ITT 19.4

The Nominated Subcontractor(s) named [*insert name(s)*] shall execute the following specific components of the proposed Works: ***None***

ITT 20.1	Tenders are being invited for **Single Lot.**
ITT 24.2(r)	The Tenderer shall submit with its Tender the following additional documents; **01. Manufacturer Authorization Letter:** If Tenderer does not manufacture or produce the following Goods shall submit the Manufacturer's Authorization Letter (Form PG5A-5) from OEM furnished in Section 5: Tender and Contract Forms, to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply the Goods to Bangladesh. Authorization Letter from Dealer will be accepted if supported by Manufacturer's letter in this regard. Authorization Letter from Trading house will not be accepted if not supported by Manufacturer's Authorization Letter. Authorization Letter from Manufacturer's Sales office located in other country (not in the country of origin) may be allowed if supported by Manufacturer's letter in this regard. Scanning Paper, E-mail copy, Faxed copy will not be allowed. 1. Solar Photovoltaic Module 2. Grid Tied Inverter; 3. Power Transformer (LV/33kV) 2. **End User Certificates/Satisfactory Performance Certificate (SPC)** Satisfactory Performance Certificate (SPC) of the following offered equipment from the end user depicting that the equipment is operating satisfactorily for at least 2 (two) years: – Offered Solar Photovoltaic Module – Offered Grid Tied Inverter – Power Transformer (LV/33kV) The Satisfactory Performance Certificate (SPC) should be in end user's letterhead pad in English stating at least 02 (two) years of satisfactory operation from the date of commissioning of the said equipment and shall contain end-user's full mailing address, e-mail address, website address, fax number and phone number for the convenience of authentication; 3. Process Flow Diagram of the Solar Power Plant; 4. Data sheets of major items of the facilities viz, Solar PV Module, Grid Tied Inverter, Power Transformer; 5. List of codes and standards followed; 6. English version of original printed Catalogues, operation and maintenance manuals of Solar Power plant and/or equipment; 7. Guarantee/Warranty certificate from the tenderer of the offered System/Equipment/items/spares including turnkey work and its satisfactory performance during warranty period [24 (twenty four) months from the date of issuing **Operational Acceptance Certificate (OAC)**]; 8. Tenderer shall have to submit audited financial balance sheet for last 5 Years to demonstrate the current soundness of the tenderer's position and its prospective long-term profitability; 9. Certificate from the manufacturer or authorized entities of manufacturer confirming that offered items are new, unused, in good condition and will fit properly. 10. Supply record from the concerned manufacturer over the last three years. 11. Common approach or methodology for carrying out the work including detailed relevant information and work program. 12. Schedule of work in bar chart form as well as in critical path method. 13. List of special tools, equipment and instruments which they intend to bring to Bangladesh on re-exportable basis for completion of the work.

	14. Complete CV with detail experience of the key personnel, who will perform the work. 15. Maximum no. of days required to complete the work. 16. List of special equipment and tools, which will be handed over to BPDB after completion of work (If any). 17. Sealed & signed (on every pages) original Tender Document which was issued by BPDB and would be enclosed with the Tender Submission Letter (Copy of issued tender document will not be accepted) by a person duly authorised to sign on behalf of the Tenderer; 18. Tenderers are requested not to put any clause of their own in their submission which is not belongs to this tender document.
24.3(c)	The Tenderer shall submit with its financial offer the following additional documents: None
ITT 25.1	Alternatives *shall not be* permitted.
ITT 26.1	Tenderers shall quote for the entire Plant and Installation Services on a single responsibility basis
26.5(a)	*Place of Destination:* **Rangunia, Chattagram, Bangladesh**
26.5(d)	Local transportation to named place of final destination is: **Rangunia, Chattagram, Bangladesh**
ITT 26.7	The prices quoted by the Tenderer shall be fixed for the duration of the Contract.
ITT 27.4	Name of the foreign currency: US Dollar/ Freely convertible international currency and Bangladesh Taka. Tenderers shall quote a Firm Turnkey Contract Price for the work as described in **Section 6. Employer's Requirement** of this Tender document. If the Tenderer deemed necessary any additional expert service/equipment/materials/works out of the list of tender schedule, may quote as recommended expert service/equipment/materials/works. In that case, price of those additional expert service/equipment/materials/works will be loaded during evaluation. The total price shall be considered as the firm base price. Prices quoted shall be firm for a period Tender validity. Prices of all items shall be entered in the Price Schedule for Plant and Service (Form PG5A-3). During the course of work, the Contractor finds any additional supply/works require to be carried out, that additional work shall also be done by the Contractor including supply of necessary spares/materials/ consumables to complete the said additional work within the Contract price. No additional payment shall be allowed in this respect.
ITT 28.1 (b)	Spare parts are: **Required** Period of time the Equipment are expected to be functioning (for the purpose of spare parts): 2 (two) years
ITT 30.2	The Tender validity period shall be 240 days.
ITT 32.2	The amount of the Tender Security shall be **USD 1.0 (one) million or BDT 11.00 (eleven) crore** in favour of in the form of an irrevocable and unconditional Bank Guarantee issued by a scheduled bank of Bangladesh or by a foreign bank duly endorsed & authenticated by a scheduled bank of Bangladesh in favour of Secretary, Bangladesh Power Development Board, Dhaka.
ITT 37.1	The original & three copies of the Technical Proposal and the original & three copies of Financial Proposal shall be submitted within the due date and time as mentioned in the tender notice. Any technical proposal associated with financial proposal in the same envelopes will be rejected.

E. Submission of Tender	
ITT 38.2(e)	The inner and outer envelopes shall bear the following additional identification marks : 1. Tender Enquiry No. & Date, 2. Brief Description of work, 3. Date of Submission, 4. Name & Address of the Employer, 5. Name & Address of the Tenderer, 6. Seal & Signature of the Tenderer.
ITT 38.4(e)	The inner and outer envelopes shall bear the following additional identification marks : 1. Tender Enquiry No. & Date, 2. Brief Description of work, 3. Date of Submission, 4. Name & Address of the Employer, 5. Name & Address of the Tenderer, 6. Seal & Signature of the Tenderer.
ITT 39.1	For **Tender submission purposes** , the Purchaser's address is: Attention: Secretary, Address : Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh. The deadline for the submission of Tenders is: As specified in the Tender Notice or amendment of submission date & time (if any).
ITT 39.3	For **Tender submission purposes** only, the Procuring Entity's address is: Address **(PRIMARY PLACE):** Secretary, Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh. Address **(SECONDARY PLACES):** Submission of Tenders will not be allowed in more than one place.
ITT 39.4	The deadline for hand-delivering of the Tenders at the **PRIMARY PLACE** is: As specified in the Tender Notice or amendment of submission date & time (if any). Submission of Tenders will not be allowed at the **SECONDARY PLACES.**
F. Opening and Evaluation of Tenders	
ITT 45.1	The tender opening shall take place at (*always the **primary place***): Address: Secretary, Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh. Time & Date: As specified in the Tender Notice or amendment of opening date & time (if any).
ITT 57.5	The applicable economic factors, for the purposes of evaluation of Tenders shall be: ***Not Applicable***

G. Award of Contract	
ITT 65.2	The amount of Performance Security shall be 10 (ten) percent of the Contract Price. The Performance Security shall be in the form of irrevocable and unconditional Bank Guarantee on 300 BDT Non-judicial stamp issued by a scheduled bank of Bangladesh or by a foreign bank duly endorsed & authenticated (means Bank Guarantee shall be payable/ en-cashable from the authenticating Bank in Bangladesh) by a scheduled bank of Bangladesh, to make it enforceable pursuant to Rule 27(4) of the Public Procurement Rules, 2008.
ITT 72.5	The name and address of the office where complaints to the Purchaser are to be submitted is: Attention: Secretary, Address: Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh. Telephone: 880-2-9554209 Fax No.: 880-2-9564765 e-mail address: secretary@bpdb.gov.bd

Section 3. General Conditions of Contract

A. General

1. Definitions	1.1 In the Conditions of Contract, which include Particular Conditions and these General Conditions, the following words and expressions shall have the meaning hereby assigned to them. Boldface type is used to identify the defined terms: (a) **Approving Authority** means the authority which, in accordance with the Delegation of Financial powers, approves the award of Contract for the Procurement of Goods, Works and Services. (b) **Act means** The Public Procurement Act, 2006 (Act 24 of 2006). (c) **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 for the purpose of carrying out Guarantee Test(s). (d) **Competent Authority** means the authority that gives decision on specific issues as per delegation of administrative and/or financial powers. (e) **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 Pre Commissioning of the Facilities or such specific part thereof has been completed, and that the Facilities or specific part thereof are ready for Commissioning. (f) **Completion Certificate** means the Certificate issued by the Project Manager as evidence that the Contractor has executed the services in all respects as per design, drawing, specifications and Conditions of Contract. (g) **Completion Date** is the actual date of completion of the plant and services certified by the Project Manager, in accordance with GCC Clause 24. (h) **Contract Agreement** means the Agreement entered into between the Procuring Entity and the Contractor, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein to supply and install Plant & Equipment (i) **Contract Documents** means the documents listed in GCC Clause 6, including any amendments thereto. (j) **Contractor/supplier** means the Person under contract with the Procuring Entity for the supply and installation of Plant & Equipment under the Rules and the Act as stated in the **PCC**.

	(k) **Contractor's Representative** means any person nominated by the Contractor and approved by the Employer to perform the duties delegated by the Contractor. (l) **Contract Price** means the price payable to the Contractor as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, for the supply and installation of plant & equipment in accordance with the provisions of the Contract, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract. (m) **Cost** means all expenditures reasonably incurred or to be incurred by the Contractor, whether on or off the Site, including overhead ,profit, taxes, duties, fees, and such other similar levies (n) **Day** means calendar day unless otherwise specified as working days. (o) **Dayworks** means work carried out following the instructions of the Procuring Entity or the authorised Project Manager and is paid for on the basis of time spent by the Contractor's workers and equipment at the rates specified in the Schedules, in addition to payments for associated Materials and Plant. (p) **Defect** is any part of the Works not completed in accordance with the Contract. (q) **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 contract document. (r) **Defects Correction Certificate** is the certificate issued by the Project Manager upon correction of defects by the Contractor. (s) **Drawings** include calculations and other information provided in Section 7 or as approved by the Project Manager for the execution and completion of the Contract. (t) **Effective Date** means the date of fulfillment of all conditions of the Contract Agreement, from which the Time for Completion shall be counted. (u) **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. (v) **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. It also includes any ancillary building or infra-structure that needs to be constructed/built/erected to support the plant.

	(w) **Force Majeure** means an event or situation beyond the control of the Contractor that is not foreseeable, is unavoidable, and its origins not due to negligence or lack of care on the part of the Contractor; such events may include, but not be limited to, acts of the Government in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes or more as included in GCC Clause 52. (x) **Goods** mean the Contractor's Plant, Equipment, Materials or any of them as appropriate. (y) **GCC** means the General Conditions of Contract. (z) **Government** means the Government of the People's Republic of Bangladesh. (aa) **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 GCC Sub-Clause 25.2 (Guarantee Test) hereof. (bb) **Head of the Procuring Entity** means the Secretary of a Ministry or a Division, the Head of a Government Department or Directorate; or the Chief Executive, by whatever designation called, of a local Government agency, an autonomous or semi-autonomous body or a corporation, or a corporate body established under the Companies Act; (cc) **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, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc. as the case may require. (dd) **Intended Completion Date** is the date calculated from the Commencement Date as specified in the PC**C**, on which it is intended that the Contractor shall complete the Works and Physical services as specified in the Contract and may be revised only by the Project Manager by issuing an extension of time or an acceleration order. (ee) **Materials** means things of all kinds other than Plant intended to form or forming part of the Permanent Works, including the supply-only materials, if any, to be supplied by the Contractor under the Contract. (ff) **Month** means calendar month.

	(gg) **Original Contract Price** is the Contract Price stated in the Procuring Entity's Notification of Award (Form PG5A-7) and further clearly determined in the **PCC**. (hh) **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 contract (ii) **PCC** means the Particular Conditions of Contract. (jj) **Plant** means permanent plant, equipment, machinery, apparatus, materials, articles, ancillary buildings/structure 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), but does not include Contractor's Equipment. (kk) **Pre Commissioning** 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. (ll) **Procuring Entity/Employer/Purchaser** means, as the context so applies, an Entity having administrative and financial powers to undertake procurement of Plant and Physical services using public funds and is as named in the **PCC** who employs the Contractor to carry out the contractual obligations. (mm) **Project Manager** is the person named in the **PCC** or any other competent person appointed by the Procuring Entity and notified to the Contractor who is responsible for supervising the execution and completion of the plant and services and administering the Contract. (nn) **Schedules** means the document(s) entitled schedules, completed by the Contractor and submitted with the Tender Submission Letter, as included in the Contract. Such document may include the data, lists and schedules of rates and/or prices. (oo) **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 PC**C** as forming part of the Site (pp) **Site Investigation Reports** are those that were included in the Tender Document and are factual and interpretative reports about the surface and subsurface conditions at the Site. (qq) **Specification** means the Specification of the goods/works/related services included in the Contract and any modifications or additions to the specifications made or approved by the Project Manager in accordance with the Contract.

	(rr) **Start Date** is the date defined in the **PCC** and it is the last date when the Contractor shall commence execution of the goods/works/services under the Contract. (ss) **Subcontractor** means a person or corporate body, who has a contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site. (tt) **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, in accordance with the relevant provisions of the Contract. (uu) **Variation** means any change to the plant and services directly procured from the original Contractor to cover increases or decreases in quantities, including the introduction of new work items that are either due to change of plans, design or alignment to suit actual field conditions, within the general scope and physical boundaries of the contract. (vv) **Works** means all works associated with the construction, reconstruction, site preparation, demolition, repair, maintenance or renovation of railways, roads, highways, or a building, an infrastructure or structure or an installation or any construction work relating to excavation, installation of equipment and materials, decoration, as well as physical services ancillary to works as detailed in the **PCC**, if the value of those services does not exceed that of the Works themselves. (ww) Writing means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail.
2. Interpretation	2.1 In interpreting the GCC, singular also means plural, male also means female or neuter, and the other way around. Headings in the GCC shall not be deemed part thereof or be taken into consideration in the interpretation or construance of the Contract. Words have their normal meaning under the language of the Contract unless specifically defined.
	2.2 Entire Agreement. The Contract constitutes the entire agreement between the Employer and the Contractor and supersedes all communications, negotiations and agreements (whether written or verbal) of parties with respect thereto made prior to the date of Contract Agreement; except those stated under GCC Sub Clause 6.1(j).
	2.3 Non waiver. (a) Subject to GCC Sub Clause 2.3(b), no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either

	party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.
	(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.
	2.4. 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.
	2.5. Sectional completion If sectional completion is specified in the **PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).
3. Communications & Notices	3.1 Communications between Parties such as notice, request or consent required or permitted to be given or made by one party to the other pursuant to the Contract shall be in writing to the addresses specified in the **PCC.**
	3.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.
	3.3 A Party may change its address for notice hereunder by giving the other Party notice of such change to the address.
4. Governing Law	4.1 The Contract shall be governed by and interpreted in accordance with the laws of the People's Republic of Bangladesh.
5. Governing Language	5.1 The Contract shall be written in English. All correspondences and documents relating to the Contract may be written in English. Supporting documents and printed literature that are part of the Contract may be in another language, provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Contract, such translation shall govern.
	5.2 The Contractor shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.
6. Documents Forming the Contract and Priority of Documents	6.1 The following documents forming the Contract shall be interpreted in the following order of priority:

	(a) the signed Contract Agreement (**Form PG5A-8**); (b) the Notification of Award (**PG5A-7**); (c) the completed Tender and the **Appendix to the Tender**; (d) the Price Schedule for Plant and Services **(PG5A-3);** (e) the Particular Conditions of Contract; (f) the General Conditions of Contract; (g) the Technical Specifications; (h) Personnel Information; (i) Equipment Information; (j) the Drawings; and (k) Any other document listed in the PCC forming part of the Contract.
7. Contract Agreement	7.1 The parties shall enter into a Contract Agreement within twenty eight (28) days from the date of issuance of the Notification of Award (NOA). The costs of stamp duties and similar charges, if any, designated by the applicable law in connection with entry into the Contract Agreement, shall be borne by the Employer.
8. Assignment	8.1 Neither the Contractor nor the Employer shall assign, in whole or in part, its obligations under the Contract; except with the Employer's prior written approval.
9. Eligibility	9.1 The Contractor and its Subcontractor(s) shall have the nationality of a country other than that specified in the PCC.
	9.2 All materials, equipment, plant, and supplies used by the Contractor in both permanent and temporary works and services supplied under the Contract shall have their origin in the countries except any specified in the PCC.
10. Gratuities / Agency fees	10.1 No fees, gratuities, rebates, gifts, commissions or other payments, other than those included in the Contract, shall be given or received in connection with the procurement process or in the Contract execution.
11. Confidential Details	11.1 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 completion or termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor such documents, data, and other information it receives from the Employer to the extent required for the Subcontractor to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Contractor under GCC Clause 11.

	11.2 The Employer shall not use such documents, data, and other information received from the Contractor for any purposes unrelated to the Contract. Similarly, the Contractor shall not use such documents, data, and other information received from the Employer for any purpose other than the design, construction, or other work and services required for the performance of the Contract.
	11.3 The obligations of a party under GCC Sub Clauses 11.1 and 11.2 above, however, shall not apply to information that: the Employer or Contractor needs to share with institutions participating in the financing of the Contract; now or hereafter enters the public domain through no fault of that party; can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.
	11.4 The above provisions of GCC Clause 11 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 Works or any part thereof.
	11.5 The provisions of GCC Clause 11 shall survive completion or termination, for whatever reason.
12. Joint Venture (JV)	12.1 If the Contractor is a Joint Venture, Consortium, or Association (JVCA), (a) each partner of the JV shall be jointly and severally liable for all liabilities and ethical or legal obligations to the Employer for the performance of the Contract; (b) the JV partners shall nominate a representative who shall have the authority to conduct all business including the receipt of payments for and on behalf of all partners of the JV; (c) in the event of a dispute that results in legal action against all partners of the JV, if they are available and if only one partner is available, then that partner alone shall answer on behalf of all partners and, if the complaint lodged is proven, the penalty shall be applicable on that lone partner as whatever penalty all the partners would have received. (d) the JV shall notify the Employer of its composition and legal status which shall not be altered without the prior approval of the Employer. (e) alteration of partners shall only be allowed if any of the partners is found to be incompetent or has any serious difficulties which may impact the overall implementation of the goods/works/service, whereby the incoming partner shall require to possess qualifications equal to or higher than that of the outgoing partner. (f) if any of the partners of JV has been debarred from participating in any procurement activity due to corrupt, fraudulent, collusive or coercive practices, that JV partner shall be altered following provisions under GCC Sub Clause 12.1 (d) and (e), while in

	case the Leading Partner has been debarred due to the same reasons stated herein the Contract shall be terminated as stated under GCC Sub Clause 67.1(b).
13. Possession of the Site	13.1 The Employer shall give possession of the Site or part(s) of the Site, to the Contractor on the date(s) stated in the PCC. If possession of a part of the Site is not given by the date stated in the PCC, the Employer will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event.
14. Access to the Site	14.1 The Contractor shall allow the Engineer and any person authorised by the Engineer access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.
15. Safety, Security and Protection of the Environment	15.1 The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein:
	(a) take all reasonable steps to safeguard the health and safety of all workers working on the Site and other persons entitled to be on it, and to keep the Site in an orderly state; (b) provide and maintain at the Contractor's own cost all lights, guards, fencing, warning signs and watching for the protection of the Works or for the safety on-site; and (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.
16. Working Hours	16.1 The Contractor shall not perform any work on the Site on the weekly holidays, or during the night or outside the normal working hours, or on any religious or public holiday, without the prior written approval of the Project Manager.
17. Welfare of Laborers	17.1 The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's personnel relating to their employment, health, safety, welfare, immigration and shall allow them all their legal rights.
	17.2 The Contractor, in particular, shall provide proper accommodation to his or her labourers and arrange proper water supply, conservancy and sanitation arrangements at the site for all necessary hygienic requirements and for the prevention of epidemics in accordance with relevant regulations, rules and orders of the government.
	17.3 The Contractor, further in particular, shall pay reasonable wages to his or her labourers, and pay them in time. In the event of delay in payment the Employer may effect payments to the labourers and recover the cost from the Contractor.
	17.4 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 appropriate protective measures to prevent accidents that could result in injury.

		Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.
18. Child Labor	18.1	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 in compliance with the applicable laws and other relevant treaties ratified by the government.
19. Fossils& antiquities	19.1	All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.
	19.2	The Contractor shall, upon discovery of any such finding, promptly give notice to the Project Manager, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs cost from complying with the instructions, the Contractor shall give a further notice to the Project Manager and shall be entitled subject to Claims under GCC Clause 71
20. Corrupt, Fraudulent, Collusive or Coercive Practices	20.1	The Government requires that Employer, as well as the Contractor shall observe the highest standard of ethics during the implementation of procurement proceedings and the execution of the Contract.
	20.2	The Government requires that Employer, as well as the Contractor shall, during the Procurement proceedings and the execution of the Contract under public funds, ensure- (a) strict compliance with the provisions of Section 64 of the Public Procurement Act, 2006 (b) abiding by the code of ethics as mentioned in the Rule127 of the Public Procurement Rules, 2008; (c) that neither it, nor any other member of its staff, or any other agents or intermediaries working on its behalf engages in any such practice as detailed in GCC Sub Clause 20.2.
	20.3	For the purposes of GCC Sub Clause 20.2, the terms set forth below as follows (a) "**corrupt practice**" means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of a Employer or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by a Employer in connection with a Procurement proceeding or Contract execution; (b) **"fraudulent practice"** means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution;

	(c) **collusive practice**" means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Employer, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying a Employer the benefits of competitive price arising from genuine and open competition; or (d) "**Coercive practice**" means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of the Contract, and this will include creating obstructions in the normal submission process used for Tenders. 20.4 Should any corrupt, fraudulent, collusive or coercive practice of any kind come to the knowledge of the Employer, it will, in the first place, allow the Contractor to provide an explanation and shall, take actions only when a satisfactory explanation is not received. Such decision and the reasons thereof, shall be recorded in the record of the procurement proceedings and promptly communicated to the Contractor. Any communications between the Contractor and the Employer related to matters of alleged fraud or corruption shall be in writing. 20.5 If corrupt, fraudulent, collusive or coercive practices of any kind determined by the Employer against the Contractor alleged to have carried out such practices, the Employer will : (a) exclude the Contractor from further participation in the particular Procurement proceeding; or (b) declare, at its discretion, the Contractor to be ineligible to participate in further Procurement proceedings, either indefinitely or for a specific period of time. 20.6 20.6 The Contractor shall be aware of the provisions on corruption, fraudulence, collusion and coercion in Section 64 of the Public Procurement Act, 2006 and Rule 127 of the Public Procurement Rules, 2008.
21. License/ Use of Technical Information	21.1 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. 21.2 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.
B. Subject Matter of Contract	
22. Scope of Facilities	22.1 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, Pre Commissioning and delivery) of the Plant, and the installation, completion and commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Section, Employer's Requirements. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor, materials, equipment, spare parts 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.
	22.2 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.
	22.3 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 PCC** and the provisions, if any, **specified in the PCC.** 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.1 & 2 under form PG5A-3**, 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.
23. Time for Commencement	23.1 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 PCC** or within such extended time to which the Contractor shall be entitled under GCC Clause 65.1 hereof.

24. Time for Completion	24.1 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 PCC**or within such extended time to which the Contractor shall be entitled under GCC Clause 65.1 hereof.
25. Employer's Responsibilities	25.1 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 25.2 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. 25.3 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). 25.4 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 25.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all raw materials, utilities, lubricants, chemicals, catalysts, other materials and facilities; and shall perform all work and services of whatsoever nature, including those required by the Contractor to properly carry out Pre Commissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of the Appendix 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 the provisions of contract specified or as otherwise agreed upon by the Employer and the Contractor. 25.6 The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GCC Sub-Clause 39.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GCC Sub-Clause 40.2.

	25.7 All costs and expenses involved in the performance of the obligations under this GCC Clause 25 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 GCC Sub-Clause 40.2. 25.8 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
26. Contractor's Responsibilities	26.1 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.
	26.2 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 tender 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.
	26.3 The Contractor shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GCC Sub-Clause 25.3 hereof and that are necessary for the performance of the Contract.
27. Employer's and Contractor's Risks	27.1 The Employer carries the risks that the Contract states are Employer's risks and the Contractor carries the risks that the Contract states are Contractor's risks.
28. Employer's Risks	28.1 From the Start Date until the Defects Correction Certificate has been issued, the following are Employer's risks: (a) the risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to i. use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or ii. negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or Contracted to him except the Contractor.

	iii. the risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
	28.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is Employer's risk, except loss or damage due to: (a) a Defect which existed on the Completion Date; (b) an event occurring before the Completion Date, which was not itself Employer's risk; or (c) the activities of the Contractor on the Site after the Completion Date.
29. Contractor's Risks	29.1 From the Start Date until the Defects Correction Certificate has been issued the risks of personal injury, death, and loss of or damage to property including without limitation, the Works, Plant, Materials, and Equipment, which are not Employer's risks are Contractor's risks.
C. Execution of the Facilities	
30. Representatives	31.1 <u>Project Manager</u> 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. 30.2 <u>Contractor's Representative & Construction Manager</u>
	30.2.1 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 GCC Sub-Clause 30.2.1 shall apply thereto.
		30.2.2 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. The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC Sub-Clause 30.2.1.
		30.2.3 . The Contractor's Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager. Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Sub-Clause 30.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.
		30.2.4 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.
		30.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC Sub-Clause 37.4. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.
		30.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC Sub-Clause 30.2.5, the Contractor shall, where required, promptly appoint a replacement.

31. Work Program	31.1	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.
	31.2	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 Pre Commission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion, Commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in the Appendix 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 PCC pursuant to Sub-Clause 24.1 and any extension granted in accordance with GCC Clause 65.1, and shall submit all such revisions to the Project Manager.
	31.3	**Progress Report** The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Sub-Clause 31.2 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.
	31.4	**Progress of Performance** If at any time the Contractor's actual progress falls behind the program referred to in GCC Sub-Clause 31.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to

	attain Completion of the Facilities within the Time for Completion under GCC Sub-Clause 24.1, any extension thereof entitled under GCC Sub-Clause 65.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor. 31.5 **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.
32. Subcontractor	32.1 Subcontracting the whole of the Plant and Service by the Contractor shall not be permissible. The Contractor shall be responsible for the acts or defaults of any Subcontractor, his or her agents or employees, as if they were the acts or defaults of the Contractor.
	32.2 The Contractor shall not be required to obtain consent from the Project Manager or his representative, for suppliers solely of Materials or to a subcontract for which the Specialist Subcontractor(s) is already named in the Contract.
	32.3 The prior consent, in writing, of the Engineer shall however be obtained for other proposed Subcontractor(s).
33. Nominated Subcontractor	33.1 Nominated Subcontractor named in the Contract shall be entitled to execute the specific components of the Works stated in the **PCC.** 33.2 The Contractor shall not be under obligations to employ a Nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars while there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength, or does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, or does not accept to enter into a subcontract which specifies that, for the subcontracted work including design, if any, the Nominated Subcontractor shall undertake to the Contractor such obligations and liabilities as will enable the contractor to discharge his or her liabilities under the Contract.
34. Other Contractors	34.1 The Contractor shall cooperate and share the Site with other Contractors, public authorities, utilities, the Engineer and the Employer between the dates given in the Schedule of other Contractors. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of other Contractors, and shall notify the Contractor of any such modification.

35. Design and Engineering	35.1 **Specifications and Drawings** 35.1.1 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. 35.1.2 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. 35.2 **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 tender submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GCC Clause 64. 35.3. **Approval/Review of Technical Documents by Project Manager**
	35.3.1 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 GCC Sub-Clause 31.2 (Program of Performance). Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof. GCC Sub-Clauses 35.3.2 through 35.3.6 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only
	35.3.2 Within fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Sub-Clause 35.3.1, 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.
	35.3.3. 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.
	35.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Sub-Clause 35.3.2. 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.
	35.3.5 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.
	35.3.6 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manageran amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Sub-Clause 35.3. If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC Clause 64 shall apply to such request.
36. Procurement	36.1 **Plant** Subject to GCC Sub-Clause 60.2, the Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.
	36.2 **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: **36.2.1** The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the Parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to GCC Sub-Clause 31.2, unless otherwise mutually agreed. **36.2.2** Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this GCC Sub-Clause 36.2.2 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. **36.2.3** The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GCC Clause 42 or under any other provision of Contract.
	36.3 **Transportation** **36.3.1** 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. **36.3.2** 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. **36.3.3** 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. **36.3.4** 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.
	36.4 **Customs Clearance** The Contractor shall, at its own expense, handle all imported materials and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer's obligations under GCC Sub-Clause 60.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance that are not the fault of the Contractor, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to GCC Clause 65.
37. Installation	37.1 **Setting Out/Supervision** 37.1.1 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. 37.1.2 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.
	37.2 Labor: 37.2.1 Engagement of Staff and Labor (a) Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding and transport. (b) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills. (c) The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site into the country where the Site is located. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel. (d) The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such

personnel and recover the cost of doing so from the Contractor.

37.2.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer's Personnel.

37.2.3 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

37.3 **Contractor's Equipment**

37.3.1 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.

37.3.2 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.

37.3.3 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.

37.4 **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. 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. 37.5 **Site Clearance** 37.5.1 Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shallkeep theSite 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 350 **Opportunities for Other Contractors** 350.1 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. 350.2 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. 37.7 **Emergency Work** 37.7.1 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. 37.7.2 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. 37.8 **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.
38. Test & Inspection	38.1 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.
	38.2 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.
	38.3 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.
	38.4 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.
	38.5 38.5 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.
	38.6 If any Plant or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC Sub-Clause 38.3.
	38.7 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 72.2.

	38.8	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.
	38.9	The Contractor agrees that neither the execution of a test and/or inspection of Plant or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC Sub-Clause 38.4, shall release the Contractor from any other responsibilities under the Contract.
	38.10	39.10 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.
	38.11	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.
	38.12	If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Sub-Clause 38.10 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.
39. Completion of the Facilities	39.1	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.
	39.2	Within seven (7) days after receipt of the notice from the Contractor under GCC Sub-Clause 39.1, 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 Pre Commissioning 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 Pre Commissioning of the Facilities or any part thereof.

	39.3	As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters have been provided by the Employer in accordance with GCC Sub-Clause 39.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GCC Sub-Clause 40.5.
	39.4	As soon as all works in respect of Pre-commissioning are completed and, in the opinion of the Contractor, the Facilities or
	39.5	The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 39.4, either issue a Completion Certificate in the form specified in the Employer's Requirements (Forms and Procedures), stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's notice under GCC Sub-Clause 39.4, or notify the Contractor in writing of any defects and/or deficiencies. If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC Sub-Clause 39.4.
	39.6	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.
	39.7	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.
	39.8	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 GCC Sub-Clause 39.4 or within seven (7) days after receipt of the Contractor's repeated notice under GCC Sub-Clause 39.5, 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.
	39.9	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.
	39.10	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.

40. Commissioning and Operational Acceptance	40.1 **<u>Commissioning</u>** 40.1.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the Project Manager, pursuant to GCC Sub-Clause 39.5, or immediately after the date of the deemed Completion, under GCC Sub-Clause 39.6. 40.1.2 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. 40.1.3 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.
	40.2 **Guarantee Test** 40.2.1 Subject to GCC Sub-Clause 40.5, 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. 40.2.2 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 PCC** or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GCC Sub-Clauses 43.2 and 43.3 shall not apply. 40.3 **Operational Acceptance** 40.3.2 At any time after any of the events set out in GCC Sub-Clause 40.3.1 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. 40.3.3 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.

	40.3.4 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.
	40.4 **Partial Acceptance** 40.4.1 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. 40.4.2 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 40.5 **Delayed Pre-commissioning and/or Guarantee Test** 40.5.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 39.3, or with the Guarantee Test pursuant to Sub-Clause 40.2, 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 GCC Sub-Clause 39.6, and Operational Acceptance, pursuant to GCC Sub-Clause 40.3.4, and Contractor's obligations regarding Defect Liability Period, pursuant to GCC Sub-Clause 42.2, Functional Guarantee, pursuant to GCC Clause 43, and Care of Facilities, pursuant to GCC Clause 48, and GCC Clause 66.1, Suspension, shall not apply. In this case, the following provisions shall apply. 40.5.2 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to clauses 58 & 59, the Contractor shall be entitled to the following:

	(a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Sub-Clause 41.2; (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 40.5.3 below; (c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer; (d) the additional charges towards the care of the Facilities pursuant to GCC Sub-Clause 48.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause 40.5.4 below. The provision of GCC Sub-Clause 49.2 shall apply to the Facilities during the same period. 40.5.3 In the event that the period of suspension under above Sub-Clause 40.5.1 actually exceeds one hundred eighty (180) days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor. 40.5.4 When the Contractor is notified by the Project Manager that the plant is ready for Pre-commissioning, the Contractor shall proceed without delay in performing Pre-commissioning, in accordance with Clause 39.
D. Guarantees and Liabilities	
41. Completion Time Guarantee	41.1 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 PCC pursuant to GCC Sub-Clause 24.1, or within such extended time to which the Contractor shall be entitled under GCC Clause 65 hereof
	41.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC Clause 65, the Contractor shall pay to the Employer liquidated damages in the amount specified in the PCC as a percentage rate of the Contract Price or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as "Maximum" in the PCC as a percentage rate of the Contract Price. Once the "Maximum" is reached, the Employer may

		consider termination of the Contract, pursuant to GCC Sub-Clause 67.2.2. Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GCC Clause 65. The Contractor shall have no further liability whatsoever to the Employer in respect thereof. However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract. Save for liquidated damages payable under this GCC Sub-Clause 41.2, 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 GCC Sub-Clause 31.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer..
	41.3	If the Contractor attains Completion of the Facilities or any part thereof before the Time for Completion or any extension thereof under GCC Clause 65, the Employer shall pay to the Contractor a bonus in the amount **specified in the PCC.** The aggregate amount of such bonus shall in no event exceed the amount **specified as "Maximum" in the PCC.**
42. Defect Liability	42.1	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.
	42.2	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 PCC pursuant to GCC Sub-Clause 42.10. 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.

	42.3 The Contractor's obligations under this GCC Clause 42 shall not apply to: (a) any materials that are supplied by the Employer under GCC Sub-Clause 36.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein; (b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein; or (c) Any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC Sub-Clause 42.7.
	42.4 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.
	42.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC Clause 42. 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.
	42.6 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.
	42.7 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.
	42.8 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.
	42.9	Except as provided in GCC Clauses 42 and 49, 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.
	42.10	In addition, any such component of the Facilities, and during the period of time as may be **specified in the PCC,** shall be subject to an extended defect liability period. Such obligation of the Contractor shall be in addition to the defect liability period specified under GCC Sub-Clause 42.2.
43. Functional Guarantees	43.1	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.
	43.2	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 GCC Sub-Clause 64.2.2.
	43.3	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.
	43.4	The payment of liquidated damages under GCC Sub-Clause 43.3, 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 GCC Sub-Clause 43.3, 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.
44. Patent Indemnity	44.1 The Contractor shall, subject to the Employer's compliance with GCC Sub-Clause 44.2, 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. 44.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GCC 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. 44.3 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.

45. Limitation of Liability	45.1 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 PCC, 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..
E. Risk Distribution	
46. Transfer of Ownership	46.1 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.
	46.2 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.
	46.3 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.
	46.4 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.
	46.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant are incorporated.
47. Care of Facilities	47.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to GCC Clause 39 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC Clause 42. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Sub-Clauses 48.2.

	47.2	If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of
		(a) insofar as they relate to the country where the Site is located, nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under GCC Clause 34 hereof; or (b) any use or occupation by the Employer or any third Party other than a Subcontractor, authorized by the Employer of any part of the Facilities; or (c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein,
	47.3	the Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GCC Clause 64. If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GCC Clause 64, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GCC Sub-Clause 66.1 hereof.
	47.4	The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in GCC Sub-Clause 42.2 with respect to the Contractor's temporary facilities, and (ii) where such loss or damage arises by reason of any of the matters specified in GCC Sub-Clauses 47.2 (b) and (c).
48. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification	48.1	Subject to GCC Sub-Clause 48.3, 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.
	48.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Sub-Clause 48.1, 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.
	48.3 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.
	48.4 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under GCC Clause 49, provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.
	48.5 The Party entitled to the benefit of an indemnity under this GCC Clause 48 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.
49. Insurance	49.1 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) <u>Installation All Risks Insurance</u> Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with 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. 49.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 49.1, except for the Third Party Liability, Workers' Compensation and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 49.1 except for the Cargo Insurance during Transportation, 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. 49.3 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. 49.4 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. 49.5 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-insured under all such policies. All insurers' rights of subrogation against such

		co-insured 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 GCC Sub-Clause 49.5.
	49.6	If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Sub-Clause 49.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due to the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GCC 49.5, 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.
	49.7	Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies affected by it pursuant to this GCC Clause 49, 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.
50. Unforeseen Conditions	50.1	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 beforehand: (a the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen; (b) the additional work and/or Plant and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions; (c) the extent of the anticipated delay; and (d) the additional cost and expense that the Contractor is likely to incur.) On receiving any notice from the Contractor under this GCC Sub-Clause 50.1, 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.
	50.2	Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in GCC Sub-Clause 50.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.
	50.3	If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in GCC Sub-Clause 50.1, the Time for Completion shall be extended in accordance with GCC Clause 60.
51. Change in Laws and Regulation	51.1	Unless otherwise specified in the Contract, if after the Contract, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in Bangladesh (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Delivery Date and/or the Contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Supplier has thereby been affected in the performance of any of its obligations under the Contract.
52. Force Majeure	52.1	In this Clause, "Force Majeure" means an exceptional event or circumstance: (a) which is beyond a Party's control; (b) which such Party could not reasonably have provided against before entering into the Contract; (c) which, having arisen, such Party could not reasonably have avoided or overcome; and (d) which is not substantially attributable to the other Party.

	52.2	Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied: (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies; (ii) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war; (iii) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel; (iv) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and (v) natural catastrophes such as cyclone, hurricane, typhoon, tsunami, storm surge, floods, earthquake , landslides, fires, epidemics, quarantine restrictions, or volcanic activity; (vi) freight embargoes; (vii) acts of the Government in its sovereign capacity.
53. Notice of Force Majeure	53.1	If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure
	53.2	The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.
	53.3	Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.
54. Duty to Minimize Delay	54.1	Each Party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure.
	54.2	A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

55. Consequences of Force Majeure	55.1 The Contractor shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure: 55.2 The Employer may suspend the delivery or contract implementation, wholly or partly, by written order for a certain period of time, as it deems necessary due to force majeure as defined in the contract. 55.3 Delivery made either upon the lifting or the expiration of the suspension order. However, if the Employer terminates the contract as stated under GCC clause 66, resumption of delivery cannot be done. 55.4 The Employer determines the existence of a force majeure that will be the basis of the issuance of suspension of order.
F. Payment	
56. Contract Price	56.1 The Contract Price shall be paid as specified in the Contract Agreement Form **PG5A- 8.** 56.2 Unless an adjustment clause is **provided for in the PCC,** 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. 56.3 Subject to GCC Sub-Clauses 25.2, 26.1 and 50 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. 56.4 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the PCC. If so provided, the amounts as certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amount. The generic formula indicated below in the form as specified in the PCC applies: **P= A + B (Im/Io)** where: **P** is the adjustment factor **A** and **B** are Coefficients specified in the PCC, representing the nonadjustable and adjustable portions, respectively, of the Contract; and **Im** is the Index during the month the work has been executed and **Io** is the Index prevailing twenty eight (28) days prior to the deadline for submission of Tender. The Indexes to be used is as published by the Bangladesh Bureau of Statistics (BBS) on a monthly basis. In case not available, then other countries or authorities of the sources mentioned in **Appendix to the Tender** may be used. 56.5 If the value of the Index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment

		made in the next or in the final payment certificate. The Index value shall be deemed to take account of all changes in price due to fluctuations.
57. Terms of Payment	57.1	The Contract Price shall be paid as specified in 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.
	57.2	No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.
	57.3	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 Appendices 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.
	57.4	The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the Appendices 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 tender.
58. Advance Payment Security	58.1	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.
	58.2	The security shall be in the form provided in the tender 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.
59. Performance Security	59.1	The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a security for the due performance of the Contract in the amount **specified in the PCC.**
	59.2	The 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 form provided in Section 5, Tender and Contract Forms, corresponding to the type of bank guarantee stipulated by the Employer in the PCC, or in another form acceptable to the Employer.
	59.3	Unless otherwise specified in the PCC, 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 GCC Sub-Clause 42.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor, pursuant to GCC Sub-Clause 42.10, is liable for an extended defect liability obligation, the performance security shall be extended for the period specified in the PCC pursuant to GCC Sub-Clause 42.10 and up to the amount specified in the PCC.
	59.4 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.
60. Taxes and Duties	60.1 The Contractor shall be entirely responsible for all kinds of taxes, duties, fees, levies, and such other 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.
	60.2 Notwithstanding GCC Sub-Clause 60.1 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.
	60.3 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.
61. Payments to Nominated Subcontractor(s)	61.1 The Contractor shall pay to the Nominated Subcontractor(s) the amounts shown on the Nominated Subcontractor's invoices approved by the Contractor in accordance with the subcontract included under the Contract.
62. Price Adjustment	62.1 Where the Contract Period (excluding the Defects Liability Period) exceeds eighteen (18) months, it is normal procedure that prices payable to the Contractor shall be subject to adjustment during the performance of the Contract to reflect changes occurring in the cost of labour and material components. In such cases the tender

	documents shall include in the Appendix 2, a formula of such price adjustment. 62.2 Where Contracts are of a shorter duration than eighteen (18) months or in cases where there is to be no Price Adjustment, the following provision shall not be included. Instead, it shall be indicated under this Appendix 2 that the prices are to remain firm and fixed for the duration of the Contract. 62.3 If the value of the Index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next or in the final payment certificate. The Index value shall be deemed to take account of all changes in price due to fluctuations.
63. Liquidated Damages	63.1 The Contractor shall be liable to pay Liquidated Damages or in other words the Delay Damages to the Employer at the rate per day as specified in the PCC for each day of delay from the Intended Completion Date, for the uncompleted delivery of goods/works/services or for any part thereof. 63.2 The total amount of Liquidated Damages shall not exceed the amount defined in the PCC. 63.3 Once the cumulative amount of Liquidated Damages reaches ten (**10**) percent of the Contract price, the Employer may rescind the Contract, without prejudice to other courses of action and remedies open to it. 63.4 The amount of Liquidated Damages may be deducted from any money due or which may become due to the Contractor under the Contract and/or collect such amount of Liquidated Damages from the Retention Money (if any) or other securities posted by the Contractor whichever is convenient to the Employer. In an extreme situation that no such foregoing recourse is available, the contractor be asked to make good the damages from his own finances in writing failing which necessary action as per the provisions of this GCC or PCC be taken. 63.5 Payment of Liquidated Damages by the Contractor shall not relieve the Contractor from its obligations. 63.6 If the Intended Completion Date is extended after Liquidated Damages have been paid, the Engineer shall correct any overpayment of Liquidated Damages by the Contractor by adjusting the next payment certificate.
G. Change in Contract Elements	
64. Change in the Facilities	64.1 **<u>Introducing a Change</u>** 64.1.1 Subject to GCC Sub-Clauses 64.2.5 and 64.2.7, 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 64.1.2 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.
	64.1.3 Notwithstanding GCC Sub-Clauses 64.1.1 and 64.1.2, 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. 64.1.4 The procedure on how to proceed with and execute Changes is specified in GCC Sub-Clauses 64.2 and 64.3, and further details and forms are provided in the Employer's Requirements (Forms and Procedures). 64.2 **Changes Originating from Employer** 64.2.1 If the Employer proposes a Change pursuant to GCC Sub-Clause 64.1.1, 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) effect on any other provisions of the Contract. 64.2.2 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.

	64.2.3 Upon receipt of the Employer's instruction to proceed under GCC Sub-Clause 64.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC Sub-Clause 64.2.1.
	64.2.4 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
	.64.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GCC Clause 64 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.
	64.2.6 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 GCC Sub-Clause 64.2.2. 64.2.7 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.
	64.3 **Changes Originating from Contractor** 64.3.1 If the Contractor proposes a Change pursuant to GCC Sub-Clause 64.1.2, the Contractor shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in GCC Sub-Clause 64.2.1. Upon receipt of the Application for Change Proposal, the Parties shall follow the procedures outlined in GCC Sub-Clauses 64.2.6 and 64.3.2. 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.
65. Extension of Time for Completion	65.1 The Time(s) for Completion specified in the PCC pursuant to GCC 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 GCC Clause 64 (b) any occurrence of Force Majeure as provided in GCC Clause 52, unforeseen conditions as provided in GCC Clause 50, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Sub-Clause 47.2 (c) any suspension order given by the Employer under GCC Clause 41 hereof or reduction in the rate of progress pursuant to GCC Sub-Clause 66.2 or (d) any changes in laws and regulations as provided in GCC Clause 51 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.

	65.2 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. The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract. In all cases where the Contractor has given a notice of a claim for an extension of time under GCC 65.2, 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 GCC 65.1, the amount of such extra costs shall be added to the Contract Price.
66. Suspension	66.1 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 thereof. 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 GCC Clause 64, excluding the performance of the suspended obligations from the Contract. If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC Clause 64 or, where it affects the whole of the Facilities, as termination of the Contract under GCC Sub-Clause 66.1.

	66.2 **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 GCC Sub-Clause 57.3, 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 GCC Sub-Clause 25.2, 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. 66.3 If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this GCC Clause 66, then the Time for Completion shall be extended in accordance with GCC 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. 66.4 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.
H. Termination and Settlement of Disputes	
67. Termination	67.1 **<u>Termination for Default</u>**
	(a) The Employer or the Contractor, without prejudice to any other remedy for breach of Contract, by giving twenty eight (28) days written notice of default to the other party, may terminate the Contract in whole or in part if the other party causes a fundamental breach of Contract.
	(b) Fundamental breaches of the Contract shall include, but shall not be limited to, the following:

	(i) the Contractor stops work for twenty-eight (28) days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Engineer; (ii) the Engineer instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within twenty-eight (28) days; (iii) the Engineer gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer; (iv) the Engineer gives Notice that the failure to achieve the progress in accordance with the updated Programme of Works by the Contractor is a non-fulfilment of contractual obligations and the Contractor fails to restore it within a reasonable period of time instructed by the Engineer; (v) the Contractor does not maintain a Security, which is required; (vi) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of Liquidated Damages can be paid, as specified in GCC Sub Clause 41.2; (vii) the Contractor has subcontracted the whole of the Works or has assigned the Contract without the required agreement and without the approval of the Engineer; (viii) the Contractor, in the judgment of the Employer has engaged in practices, as defined in GCC Sub Clause 39, in competing for or in executing the Contract. **(c)** A payment certified by the Engineer is not paid by the Employer to the Contractor within twenty eight (28) days of the date of the Engineer's certificate.
	67.2 **Termination for Insolvency** The Employer and the Contractor may at any time terminate the Contract by giving twenty eight (28) days written notice to the other party if either of the party becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to any party, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the other party. 67.3 **Termination for Convenience** (a) The Employer, by giving twenty eight (28) days written notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Employer's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective. The termination shall take effect twenty eight (28) days

	after the later dates on which the Contractor receives this notice or the Employer returns the Performance Security. (b) The Employer shall not terminate the contract under GCC Sub Clause 67.1 (a) in order to execute the contract itself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor as stated under GCC Sub Clause 67.1(a). 67.4 In the event the Employer terminates the Contract in whole or in part, the Employer shall accept the portion of the Works that are complete and ready for handing over after the Contractor's receipt of notice of termination of the Contract. For the remaining portion of the Works, the Employer may elect: (a) to have any portion completed by the Contractor at the Contract terms and prices; and /or (b) to cancel the remainder and pay to the Contractor an agreed amount for partially completed Works and for materials and parts previously procured by the Contractor, or (c) except in the case of termination for convenience as stated under GCC Sub Clause 67, engage another Contractor to complete the Works, and in that case the Contractor shall be liable to the Employer for any cost that may be incurred in excess of the sum that would have been paid to the Contractor, if the work would have been executed and completed by him or her. 67.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as is reasonably possible
68. Payment upon Termination	68.1 If the Contract is terminated because of a fundamental breach of Contract under GCC Sub Clause 67.1 by the Contractor, the Project Manager shall issue a certificate for the value of the Works done and Plant and Materials ordered less advance payments received up to the date of the issue of the certificate and less the amount from percentage to apply to the contract value of the works not completed, as indicated in the PCC. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer. 68.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a payment certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's foreign personnel employed solely on the Works and recruited specifically for the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate. 68.3 If the Contract is terminated for reasons of Force Majeure, the The Project Manager shall determine the value of the work done and issue a Payment Certificate which shall include.

	(a) the amounts payable for any work carried out for which unit rates or prices are stated in the Contract; (b) the cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal; (c) other costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works; (d) the cost of removal of Temporary Works and Contractor's Equipment from the Site; and (e) the cost of repatriation of the Contractor's staff and labor employed wholly in connection with the Works at the date of termination.
69. Property	69.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default stated under GCC Sub Clause 67.1.
70. Frustration	70.1 If the Contract is frustrated by the occurrence of a situation of Force Majeure as defined in GCC Sub Clause 52, the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all works carried out before receiving it and for any work carried out afterwards to which a commitment was made.
I. Claims, Disputes and Arbitration	
71. Contractor's Claims	71.1 If the Contractor considers himself to be entitled to any extension of the Completion Time and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Employer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than twenty eight (28) days after the Contractor became aware, or should have become aware, of the event or circumstance. 71.2 If the Contractor fails to give notice of a claim within such period of twenty eight (28) days, the Intended Completion Date 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. 71.3 Within forty two (42) days after the Contractor became aware or should have become aware of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer 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, for settlement.

72. Settlement of Disputes	**Amicable settlement** 72.1 The Employer and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract. **Arbitration** 72.2 If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation as stated under GCC Clause 72.1, then either the Employer or the Contractor may give notice to the other party of its intention to commence arbitration in accordance with GCC Sub Clause 72.3, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. 72.3 Arbitration shall be commenced prior to or after execution of the Works under the Contract. Arbitration proceedings shall be conducted in accordance with the rules of procedure specified in the PCC. 72.4 Notwithstanding any reference to arbitration hereinabove the parties shall continue to perform their respective responsibilities under the Contract unless agreed otherwise and, the Employer shall pay any monies due to the Contractor.

Section 4. Particular Conditions of Contract

GCC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 1.1(j)	The Contractor is *[Name, address, and name of authorized representative]*
GCC 1.1(t)	The Effective Date upon which the period until the Time for Completion of the Facilities shall be counted from is the date when all of the following conditions have been fulfilled: (a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor; (b) The Contractor has submitted to the Employer the performance security and the advance payment guarantee, if any; (c) The Employer has paid the Contractor the advance payment, if applicable (d) L/C shall be opened in favor of the Contractor. Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.
GCC 1.1(ll)	The Employer is Bangladesh Power Development Board (BPDB) Name & Address of authorized representative: Secretary, Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh.
GCC 1.1(mm)	Project Manager will be treated as Project Director where required.
GCC 1.1(oo)	The Site is located at *Rangunia, Chattagram, Bangladesh.*and is defined in *Figure 6.2.1 & 6.2.2 in Section-6*
GCC 1.1(rr)	The Start Date shall be: Immediately after Contract Signing.
GCC 1.1(xx)	"Engineer or Consultant" shall mean Directorate of Renewable Energy and Research & Development, Bangladesh Power Development Board or Consulting firm for the time being or from time to time duly appointed by the Board and whose authority shall be notified in writing to the Contractor by the Board and who is acting on behalf of the Board as Engineer for the purpose of the Contract and includes such other person (if any) to whom the Engineer's authority may have been lawfully delegated pursuant to the Contract.
GCC 1.1(yy)	"Receiving cum Damage Report (RCDR)" shall mean the report prepared by the employer after visual inspection of plant after arrival at site. This inspection will be done within 21 (twenty-one) days from the date of notification by the contractor stating that plant arrived at site.
GCC 1.1(zz)	"Final Acceptance Certificate (FAC)" shall mean the official notification by the Board to the Contractor, issued at the end of the Defect Liability Period which indicates that the Contractor has completed his obligation under the Contract.
GCC 3.1	The Procuring Entity's address for the purpose of communications under this contract is : Secretary,

	Bangladesh Power Development Board. WAPDA Building, (1st floor) Motijheel Commercial Area, Dhaka-1000, Bangladesh.
	The Contractor's address for the purpose of communications under this contract is : Contact person: Address: Tel: Fax: e-mail address:
GCC 6.1 (k)	Other documents forming part of the Contract are; All correspondences between Procuring Entity and Contractor prior to signing of the Contract agreement.
GCC 9.2	Materials, Equipment Plants and supplies shall not have their origin in the following countries: Israel and countries having no diplomatic relation with the Government of the People's Republic of Bangladesh
GCC 13.1	Possession of the Site or part(s) of the Site, to the Contractor shall be given on the following date(s); Immediately After signing of Contract Agreement.
GCC 22.3	The Contractor agrees to supply spare parts for a period of: **Not Applicable**
GCC 23.1	The Contractor shall commence work on the Facilities from the Effective Date for determining Time for Completion as specified in the Contract Agreement.
GCC 24.1	The time for completion of the whole of the facilities within 360 days from the effective date as described in the contract agreement.
New Clause GCC 26.6	The Contractor shall be responsible for the continued operation of the Facilities up to issuance of Operational Acceptance Certificate. 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.
GCC 32.1	A Subcontractor that is a national of, or registered in, the following countries are not eligible: Israel and countries having no diplomatic relation with the Government of the People's Republic of Bangladesh
GCC 33.1	Nominated Subcontractor(s) named below; **None** shall be entitled to execute the following specific components of the Works **not applicable**
GCC 35.1.1	**Replaced by the following:** The Contractor shall be responsible for 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. All the basic & detail design and engineering shall have to be performed by a reputed & Proven DESIGN Institute or Firm. This DESIGN Institute or Firm must have a proven experience for the completion of basic & detail design and engineering of minimum 02 (two) Ground Mounted Grid Tied Solar Power Plant projects with having capacity of each Solar Park minimum 20.00 MWp during last 10 (ten) years. Such power plants should have been

	in continuous commercial operation for minimum two (2) years. The Contractor shall have to submit required document to prove the qualification and take approval from BPDB after signing of the contract and before engagement of DESIGN Institute or Firm. 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.
GCC 35.1.2	Deleted
GCC 38.1	**A. Pre-delivery inspection and/or Witnessing of manufacturing process and tests of the equipment/ materials and spares at manufacturers' works including transfer of technical know-how** The Employer and the Project Director or their designated representatives shall be entitled to attend the aforesaid test and/or inspection as stated in the Technical Specifications, and the Contractor shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses. The Contractor shall give a reasonable notice to the Project Manager 90 days or 3 months earlier whenever any such parts of the Facilities 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. The Contractor would not be relieved from its responsibility/ liability of making appropriate plant and material as per Specification despite inspection by the Employer/ Project Director or their designated employees. The Contractor shall at its own expense carry out all such tests and/or inspections at manufacturer's premises for (1) PV Module, (2) Grid Tied Inverter, (3) Transformer, (4) SCADA System, (5) Control & Protection System, (6) LV and 33 kV Switchgear, (7) As per requirement of BPDB for one other item. The Engineer and Board's authorized representative shall have the right to inspect and/or to test the Goods at Site and at manufacturer's premises to confirm their conformity to the Contract. The cost of performing any tests shall be borne by the Contractor. The payment for inspection and tests at the manufacturer's premises and training on tests including traveling expenses, daily pocket expenses (@ US$100 /person/ day) and lodging at actual for Seven (7) round trips (two Engineers/ round trip) and seven days/ Inspection (Except the travelling time). The cost of subsequent inspection(s) due to rejection/additional re-testing of Goods at the first inspection shall also be borne by the Contractor. ***<u>Third Party Inspection:</u>*** For any reason, if Purchaser's/ Employer's representative(s) cannot attend Inspection/ Test program described in PCC [GCC 38.1], a Third Party Inspection Company/Agency shall conduct/ witness above mentioned Inspections/Tests as per Contract and relevant standard at the Manufacturer's Premises with the concurrence of BPDB. The Third Party Inspector shall submit a comprehensive report to Purchaser with recommendation accompanied with photograph and video

clips with date and time of the Equipment/ Materials/ Goods inspected within 7 days after completion of respective inspection/Test. After approval of Third Party Inspection report by BPDB, shipping advice shall be issued to Supplier/ Contractor. No Equipment/ Materials/ Goods shall be shipped without shipping advice.

The inspections/ Tests shall be performed on as-needed basis as per schedule provided by the respective manufacturers.

Supplier/Contractor/ Manufacturer shall not claim any additional cost for Third Party Inspection.

The third party inspection company/agency must not be involved in design, procurement, fabrication, construction and installation under this Contract.

BPDB Shall choose/ propose any of the following companies/agencies as Third Party Inspector:

1. BUREAU VERITAS,
2. SGS,
3. Black and Veatch,
4. TUV SUD,
5. Lloyd Inspection Agency,
6. Mott MacDonald ,
7. Intertek group,

With the approval of BPDB, Contractor/Supplier shall engage Third Party Inspection company/ agency. BPDB reserves the right to revise above mentioned list.

Third party inspection is applicable for Equipment/ Materials/ Goods manufactured in outside Bangladesh.

B. Post Landing Inspection (PLI):

(a) Post Landing Inspection shall be done after arrival of the materials/ equipment/Spare parts at **Rangunia, Chattagram, Bangladesh**. The program of such Inspection shall be intimated to the representative of the Contractor by BPDB upon arrival of the materials/ equipment at above Power station store. "Receiving cum Inspection Report" will be prepared after successful Post Landing Inspection.

(b) The Purchaser has right to inspect, test and where necessary, reject the Goods arrival in the purchaser's store shall in no way be limited or waived by reason of the Goods having previously been tested and passed by the manufacturer/supplier. The contractor/ supplier will facilitate such Inspections/ Tests.

(c) Nothing in this clause shall in any way release the supplier from any warranty or other obligation under the provisions of the contract/purchase order.

C. Job Site Training (Training at Power Plant)

The BPDB shall make available, free of cost, to the Contractor the suitable number of staff member for the purpose on-the-job training at site during installation, testing, commissioning and initial operation of the plant for one (1) month. During warranty period, it shall be the responsibility of the Contractor to train them adequately and properly in a planned manner so that these member of the BPDB's staff could take over the responsibility of operation and maintenance of the plant and equipment independently at the time of handing over the plant and equipment before issuing FAC.

	D. Foreign Training: Foreign or overseas Training Venue will be at Manufacturer's Factory Premises. All living, accommodation, food, transport expenses of the trainees/officers during the period of training/study tour including airfares, incidental expenses, medical expenses, medical insurance etc. will be covered by the Contractor including pocket allowance of *@ USD/ EURO (for EU) 100.00* day/person. The total person-months for training will be limited to 15 (fifteen) Person-Months on PV Module, Inverter, Switchgear and Operation & Maintenance of power plant equipment, orientation & technology transfer at manufacturer's factory
GCC 38.2	Carry out such tests & Inspection at the place of manufacture: Contractor shall bear cost pertaining to third party inspection team/BPDB's representative(s) as per GCC 38.1. Manufacturer/ Supplier/ Contractor shall facilitate and provide full support for the Pre-Shipment Inspection/Witnessing of Factory Acceptance Test and transfer of technical know-how to BPDB representative(s). The Manufacturer/ Supplier/ Contractor shall not claim any additional cost in this regard. **Post Landing Inspection (PLI):** The Post landing Inspection/ any other tests of the materials/ equipment/Spare Parts shall be conducted by BPDB's Inspectors or its authorized representative in the presence of the representative of the Contractor. The contractor/ supplier will facilitate such Inspections /Tests.
GCC 39.2	2nd paragraph will be replaced by: 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 utilities required for Pre Commissioning of the Facilities or any part thereof.
GCC 39.10	will be replaced by: 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 under GCC Sub-clause 47.1, and shall thereafter take over the Facilities or the relevant part thereof.
GCC 40.1.2	Clause is replaced as follows: Before commissioning the Employer will provide operating and maintenance personnel under Contractor's supervision to get them (Employer's O&M personal) acquainted with and to witness the commissioning of the Plant & Equipment. All raw materials, chemicals, catalysts, facilities, services and other matters required for Commissioning shall be supplied by the Contractor.

GCC 40.2.2	The Guarantee Test of the Facilities shall be successfully completed immediately after the Completion of complete facility **Operational Acceptance Certificate (OAC)** may be issued subjected to GCC Sub-Clause 40.3.1 hereof. The work shall not be considered as complete provisionally until the Operational Acceptance Certificate (OAC) has been issued for the work by **the BOARD**. **The OAC will be issued only after the final inspection and performance test has been carried out by a team of representatives of the Contractor and witness and accepted by the OAC committee of BPDB formed by the competent authority and the work has been judged complete and in compliance with the Contract Documents.** The test shall be performed as specified in the applicable Technical Requirements. Necessary testing equipment will be supplied by the Contractor. The final inspection and the performance test of equipment and the subsequent issuance of the OAC shall not be construed as a release to the Contractor from any Contractual liability or responsibility, such release being subject only to the provisions of the Release of Liability clause PCC [New clause GCC 74]. BPDB may take over completed portions of the work, prior to completion of the Contract, by written notice to the Contractor. The Operational Acceptance Certificate shall not be unreasonably withheld nor shall BPDB delay the issuing of the OAC on account of minor omissions or defects, which do not affect the commercial operation without any serious risk to the plant, provided always that the Contractor undertakes to make good such omission and defects within a reasonable time. From the date of final inspection and test of completed works, at least three (3) week time should be taken for observation to the outcome of the work, after which Operational Acceptance Certificate should be issued for the work by **the BOARD** and delivered to the Contractor, provided that no omissions or defects are found which may affect the commercial operation of the plant. The final inspection and performance test will commence upon a written notice from the EPC Contractor stating that the Plant has successfully completed continuous initial commercial operation in accordance with the parameter stated in Reliability Run Test in Appendix 8. Functional Guarantees after installation work. The inspection, testing, commissioning and performance test shall be conducted in accordance with the **Section 6. Employer's Requirement, Specification Submission & Compliance Sheet (Form PG5A-4a) and relevant International Standard**.
GCC 40.3.1 **(Missing Clause)**	Add the Clause 40.3.1 **(Operational Acceptance)** as follows: Operational Acceptance shall occur in respect of Facilities when- a. the Guarantee Test has been successfully completed and the Functional Guarantee 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 or any other agreed upon period as specified in GCC Sub-Clause 40.2.2 or c. the Contractor has paid the liquidated damages specified in GCC Sub clause 43.3 for Functional Guarantee hereof; and d. any minor items mentioned in GCC Sub-Clause 39.9 hereof relevant to the Facilities or that part thereof have been completed; and successfully carry out the Technical Orientation and Quality Test Witness of Plant & Equipment and any part of the Facilities specified hereof;
GCC 41.3	No bonus will be given for earlier Completion of the Facilities or part thereof.

GCC 42.2	**The Defects liability / warranty shall cover the following :** The Contractor warrants that each item of equipment/ materials and work furnished under this Contract will be as specified and will be free from defects in design to the extent the Contractor is responsible for design, workmanship and material. The warranties contained in this Contract document are in lieu of any other warranties and are the only warranties made by Contractor with respect to the materials, equipment and work. If within the warranty period set forth below any part of the material or work fails to meet the warranty BPDB will notify the Contractor and the Contractor shall promptly correct any defect including non-conformance with specifications by adjustment, repair or replacement of any and all defective parts or materials. Unless otherwise specified the Defects liability period/warranty period hereunder shall begin from the date of issuance of Operational Acceptance Certificate (OAC) by BPDB and shall end after **24 (twenty four)** months of operation until final acceptance. The Contractor shall pay all costs for correction of defects including shop and field labour and supervision, transportation, parts, supplies, all tackles and special tools. The Contractor will be given an opportunity to check the existence of the defect and he shall promptly do the correction within reasonable time. This section states the limit of the Contractor's liability for defects for which he is responsible. When it is necessary to dismantle piping, ducts, machinery, equipment or other work furnished or performed by the Contractor in order to obtain access to the work, the cost of all such dismantling and re-assembling will be paid by the Contractor. The Contractor shall extend the provisions of this warranty to cover all repaired and replacement parts furnished under the Defects liability/ warranty provisions for a period of **24 (twenty four)** months of operation from the date of repair, replacement, commissioning thereof. If within **twenty (20)** days after BPDB gives the Contractor notice of a defect, the Contractor neglects to make or undertake with due diligence to make the necessary corrections, BPDB is hereby authorized to make the corrections himself or order the work to be done by a third party and cost of the corrections shall be paid by the Contractor. BPDB will be permitted to make repairs or replacements on equipment without affecting the warranty or without prior notice to the Contractor so long as the repairs or replacements involve the correct installation of spares. BPDB shall also be permitted to adjust or test equipment as outlined in instruction manuals provided by the manufacturer. In the case of an emergency where in the judgment of BPDB the delay resulting from giving formal notice would cause serious loss or damage which could be prevented by immediate action, defects may be corrected by BPDB or a third party chosen by BPDB without giving prior notice to the Contractor and cost of all corrections shall be paid by the Contractor. In the event, such action is taken by BPDB, the Contractor will be notified promptly and the Contractor shall assist wherever possible in making the necessary corrections. The Contractor shall extend the provisions of the Defects Liability Period to cover all repaired and replacement parts furnished under the Defects Liability Period.
GCC 42.10	The critical components covered under the extended defect liability are*[insert components*, the period shall be *[number of years, which shall not exceed five (5) years*]- **Not Applicable**

GCC 42.11 **(New Clause)**	**Final Acceptance Certificate (FAC)** After completion of the Defects Liability Period /Warranty period, Final Acceptance Certificate shall be issued as mentioned below: The work shall not be considered as completed until a Final Acceptance Certificate (FAC) is signed and issued by the BOARD on the basis of the successful report of FAC committee formed by the competent authority stating that all work has been finally completed to their satisfaction. The Final Acceptance Certificate (FAC) will be given latest twenty eight (28) days after the expiration of the Defects liability period or if different guarantee periods shall become applicable to different parts of the work, after the expiration of the latest of such periods and as soon as any and all work to be made good is completed to the satisfaction of the Consignee/ Project Manager and the competent Authority.
GCC 45.1 (b)	The multiplier of the Contract Price is: 1 (one)
GCC 56.2	The Contract Price shall be adjusted in accordance with the provisions of the Appendix to the Contract Agreement titled Adjustment Clause - *Not Applicable*
GCC 59.1	The amount of performance security, as a percentage of the Contract Price for the Facility shall be 10 (ten) percent of the contract price.
GCC 59.2	The performance security shall be provided in the currency or currencies of the Contract as stated under ITT Sub Clauses 27.4 at the percentage as Specified in GCC 59.1. The Performance Security shall be in the form of irrevocable and unconditional Bank Guarantee on 300 BDT Non-judicial stamp issued by a scheduled bank of Bangladesh or by a foreign bank duly endorsed & authenticated (means Bank Guarantee shall be payable/ en-cashable from the authenticating Bank in Bangladesh) by a scheduled bank of Bangladesh, to make it enforceable pursuant to Rule 27(4) of the Public Procurement Rules, 2008.
GCC 59.3	The performance security shall be valid until completion of Defects Liability Period plus 28 (twenty eight) days, provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC Sub-Clause 42.8 hereof, the Contractor shall issue an additional performance security in an amount proportionate to the Contract Price of that part.
GCC 60.1 & GCC 60.2 **Taxes and Duties** **(Replaced)**	**PAYMENT OF DUTIES, TAXES, VAT, FEES AND OTHER TAXES**: **<u>01. For Contractor's equipment, materials and services</u>** **<u>a) Income Tax and VAT at payment stage:</u>** i) The Contractor shall be entirely liable to pay Income Tax & VAT on Contract price for both foreign & local currency (Except CIP i.e. FOB, insurance, Freight up to place of destination) according to the Income Tax ordinance 1984 & VAT Act. 1991 at the prevailing rate (ten days before the date of tender submission) of the Govt. which shall be deducted at source at the time of payment of bills for onward deposition of the same into Govt. Treasury. In case of any change of tax & VAT rate on the date of payment that will be in account of employer ii) The Board shall pay all TAX & VAT on CIP portion at the payment stage (If applicable) as per Price Schedule No.-1.

b) Foreign country Taxes and Permits:

The Contractor shall pay all sales, income and other taxes and duties, tariffs and imports that can be lawfully assessed against the contractor by the Government or any lawful authority of any country other than the people's Republic of Bangladesh which has jurisdiction over the contractor in connection with this contract and shall pay for all licenses permits and inspection required for the work including the cost or securing all export licenses and permits for materials, equipment, supplies and personnel exported from that country to Bangladesh.

c) For Contractor's equipment, materials imported on re-exportable basis:

The Contractor shall be entirely responsible for all Bangladesh Custom and Import duties, VAT, taxes and all other levies imposed under applicable law of Bangladesh for Importation of Contractor's Construction equipment, tools and materials required for implementation of the contract in Bangladesh which shall be imported on the condition to be exported after completion of the work, if the same are not exempted from such taxes, VAT & levies. The Board shall assist to the contractor to obtain exemption from NBR [National Board of Revenue] for import of the contractor's equipment and materials on the basis of re-export.

02. IMPORT DUTY, VAT, TAXES, LEVIES AND OTHER TAXES FOR PERMANENT MATERIALS OF THE PROJECT

The Contractor shall obtain all import permits or licenses required for any part of the work within the terms stated in the program or if not so stated, in reasonable time having regard to the time for delivery of the work and the time for completion. The Board shall pay all Bangladesh customs and import duties, VAT, taxes and all other levies arising from the importation of all permanent materials and equipment (on CIP Value). The Board shall provide its extreme effort to pay such taxes in a timely manner to avoid any extra cost thereon. The contractor shall submit to the owner 5 (five) copies of non- negotiable shipping document ahead of shipment for arranging payment of such taxes and clearing the materials in time. The Board shall not bear any expenditure on account of import of cement, if any, by the Contractor. Normally, equipment and materials that will be incorporated in the permanent works shall be transported by vessel. If the Contractor decides to air freight any items, the excess freight beyond freight of vessel or excess inland transportation or any other additional cost on account of air freight shall be borne by the Contractor.

BPDB will not provide IMPORT DUTY, VAT, TAXES, LEVIES AND OTHER TAXES for import of Replacement materials of the project and the items without mentioning the name of materials in Price Schedule No.-1

03. CONTRACTOR'S RESPONSIBILITY TO GET ACQUAINTED WITH BANGLADESH LAWS, IMPORT POLICY, ETC.

The Contractor shall get himself acquainted with the relevant Bangladesh Laws as well as the Import Policy of the Government of People's Republic of Bangladesh remaining in force regarding import of banned items, if any, during the execution of the Contract. In case of import of any banned items and/or contraband item, the consequential effect shall rest with the Contractor. Similarly, the Contractor shall be responsible for any non-conformance of Bangladesh Laws either by his own employees or any of the employees of his Subcontractors during execution of the Contract.

GCC 63.1	**LD (Liquidated Damages) for the Delay of Turnkey Works** 0.1 % (Zero point one percent) of the Contract Price per day of delay for the whole work of Construction of 50MWp (DC) Solar Photovoltaic Grid Connected Power Plant, BPDB, Rangunia, Chattagram, Bangladesh on Turnkey Basis.
GCC 63.2	Total amount of liquidated damages shall not exceed ten percent (10%) of the final Contract price for the whole of the Turn Key Works.
GCC 68.1	The percentage to apply to the contract value of the works not completed, representing the Procuring Entity's additional cost for completing the uncompleted Works, is twenty (20%)percent.
GCC 72.3	(i) In the case of a dispute between the Employer and the foreign Contractor, Any dispute, controversy or claim arising out of or relating to this Contract, or breach, termination or invalidity thereof, shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules of 1976 as at present in force. (ii) In the case of a dispute between the Employer and the national Contractor, in particular, the arbitration shall be conducted in accordance with the Arbitration Act (Act No 1 of 2001) of Bangladesh as at present in force and in the place Dhaka, Bangladesh.
New Clause **GCC 74**	**Release of Liability** The acceptance by the Contractor of the last payment shall operate as, and shall be, a release to the BOARD and every officer, agent and employee thereof, from all claims and liability hereunder for anything done or furnished for or relating to the work, or for any act or neglect of the BOARD or of any person relating to or the affecting the work. The last payment by the BOARD to the Contractor shall constitute final acceptance of all work performed under this Contract and shall release the Contractor and his surety, from all Contractual liabilities and responsibilities to the BOARD except these liabilities assumed under the Warranty clause PCC [GCC 42.2] of these Special Conditions or arising out of hidden defects. In the event a suit were to be instituted in Bangladesh against the BOARD and the Contractor as defendants neither shall be released from his respective liabilities under this Contract.

Appendix to the Tender- Not Applicable

[In Tables below, the Procuring Entity shall indicate the source and base values with dates of Indexes, unless otherwise instructed to be quoted by the Tenderer, for the different Cost Components and mention its Weightings or Coefficients]

Table 1.1: Price Adjustment Data

[ITT Sub Clause 26.9: To be provided by the Procuring Entity]

Index Descriptions	Base Value	Sources of Index

Note:

1. **The sources of Indexes and its values with dates shall be Bangladesh Bureau of Statistics (BBS) unless otherwise mentioned by the Procuring Entity or instructed to be quoted by the Tenderer.**
2. **The Procuring Entity may require the Tenderer to justify its proposed Indexes, if quoted by the Tenderer.**
3. **The Base Value of the Indexes shall be those prevailing twenty eight (28) days prior to the deadline for submission of the Tenders.**

Table 1.2: Price Adjustment Data- Not Applicable

[GCC Sub Clause 56.4: To be provided by the Procuring Entity]

Item Group	Bill No. if applicable	Index Descriptions	Coefficients or Weightings for non-adjustable Cost Component	Coefficients or Weightings for adjustable Cost Components										Total
				a	b	c	d	e	f	g	h	i	j	
														1
														1
														1
														1
														1
														1

Note:

The Weightings or Coefficients of the Cost Components shall be mentioned by the Procuring Entity based on the proportion of components involved in the items caused to be impacted by rise and fall in its prices.

APPENDICES [This appendixes shall be the part of the contract]

Appendix 1 - Terms and Procedures of Payment
Appendix 2 - Price Adjustment
Appendix 3 - Insurance Requirements
Appendix 4 - Time Schedule
Appendix 5 - List of Major Items of Plant and services and List of Approved Subcontractors
Appendix 6 - Scope of Works and Supply by the Employer
Appendix 7 - List of Documents for Approval or Review
Appendix 8 - Functional Guarantees

Appendix 1. Terms and Procedures of Payment

In accordance with the provisions of GCC Clause 57 (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 Tenderer unless otherwise agreed between the parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

(A) Terms of Payment

Advance payment is not permitted.

Schedule No. 1 - Plant and Equipment Supplied from Abroad
In respect of plant and equipment supplied from abroad, the following payments shall be made:

In respect of plant and equipment supplied from abroad, the following payments shall be made:

Seventy percent (70%) of the total or pro rata CIP amount upon Incoterm "CIP," shall be paid out of the irrevocable Letter of Credit within 28 days upon presentation of invoice along with complete shipping documents. Payment advice shall be issued to the Bank by the concerned office of the BOARD upon receipt of the negotiable shipping documents duly verified by project office & certified by the Engineer and approved by the Project Director.

Twenty percent (20%) of the total or pro rata value of CIP amount upon Incoterm "CIP", after issuance of RCDR. The payment shall be paid within 28 days against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director.

Five percent (5%) of the total or pro rata value of CIP amount shall be paid only after successful ICO, Guarantee tests and after issuance of Operational Acceptance Certificate/ Provisional acceptance certificate (PAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of CIP amount shall be paid after issuance of Final Acceptance Certificate (FAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Schedule No. 2 - Plant and Equipment Supplied from within the Employer's Country- Not Applicable

Schedule No. 3 - Design Services
In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made:

Ninety percent (90%) of the total or pro rata value of design services amount upon acceptance of design services in accordance with GC Clause 35 within forty-five (45) days after receipt of invoice duly verified by project office & certified by the Engineer and approved by the Project Director.

Five percent (5%) of the total or pro rata value of total or pro rata value of design services amount shall be paid only after successful ICO, Guarantee tests and after issuance of Operational Acceptance Certificate/ Provisional acceptance certificate (PAC) against submission of invoices

duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of design services shall be paid after issuance of Final Acceptance Certificate (FAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Schedule No. 4 - Civil Works

In respect of civil works for both the foreign and local currency portions, the following payments shall be made:

Ninety percent (90%) of the total or pro rata value of measured value of work performed by the Contractor, against monthly invoice duly verified by project office & certified by the Engineer and approved by the Project Director.

Five percent (5%) of the total or pro rata value of Civil works part amount shall be paid only after successful ICO, Guarantee tests and after issuance of Operational Acceptance Certificate/ Provisional acceptance certificate (PAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of Civil works part amount shall be paid after issuance of Final Acceptance Certificate (FAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Schedule No. 5- Installation and other Services

In respect of Installation and other Services for both the foreign and local currency portions, the following payments shall be made:

Ninety percent (90%) of the total or pro rata value of measured value of work performed by the Contractor, against monthly invoice duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of Installation and Commissioning Services amount shall be paid only after successful ICO, Guarantee tests and after issuance of Operational Acceptance Certificate/ Provisional acceptance certificate (PAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation & other services amount shall be paid after issuance of Final Acceptance Certificate (FAC) against submission of invoices duly verified by project office & certified by the Engineer and approved by the Project Director within forty-five (45) days after receipt of invoice.

Note: No interest will be applicable for delayed payment.

(B) Payment Procedures

The procedures to be followed in applying for certification and making payments shall be as follows:

1 Local Currency [BDT]

Eligible claims for Local Currency [Bangladesh Taka] payment shall be made by the Employer through a bank of Bangladesh from the Project Budget allocated by the Government of the

People's Republic of Bangladesh. An account payee cheque will be issued in favor of the Contractor by the Employer.

2 Foreign Currency
The foreign exchange component of the Contract Price will be paid out of an irrevocable and unconditional Letter of Credit to be established in favour of the Contractor. All foreign currency payment shall be made upon issuance of Payment advice to the Bank by the concerned office of the BPDB/BOARD.

All Bank charges for opening, amendment, prolongation and payment out of the L/C within the territory of Bangladesh shall be paid by the BPDB/BOARD and outside the territory of Bangladesh shall be paid by the Contractor. But in case the amendment of the L/C is required due to the cause of the Contractor, the amendment charge shall be paid by the Contractor.

3 Invoices
The Contractor shall submit invoices (original) in triplicate to the Project Manager whenever an invoice is required to be submitted as per provision of this Contract. Invoices should be duly certified by Project manager.

C. DOCUMENTATION FOR PAYMENT
Claims for payment must be supported by the following documentation as specified hereinafter, Requests for reimbursement for the cost of equipment materials, freight, transportation and insurance shall be supported by the following documents (each copy to be certified by the Contractor or the Contractor's representative to be a true copy of the document of which it is a copy):

70% of the CIP cost of supply of materials and equipment shall be paid upon presentation of i) invoice in 3(three) originals, ii) packing list in 3(three) originals, iii) insurance certificate in 1(one) originals, iv) Bill of lading/ Airway Bill in 1(one) original and 3(three) copies marked Freight prepaid, v) Warranty certificate in 1(one) original, vi) manufacturer’s factory test certificate in 1(one original, vii) quality and quantity certificate of the materials & equipment shipped in 1(one) original, viii) factory test witnessing certificate where applicable in 1(one) original and ix) certificate of origin issued by the manufacturer of the materials shipped in 1(one) original.

Requests for mobilisation fund and progress payments for Schedule No. 3, Schedule No. 4 and Schedule No. 5 shall be supported by the following documents:

i. One copy or Photostat of the Contractor's invoice which shall identify the Contract and which shall show the total foreign currency value of the Contract, the total foreign currency amounts previously received and/or claimed as mobilisation fund or progress payments; the foreign currency amount being invoiced for payment; separate total values as of the date of this invoice of equipment and materials delivered (including shipping and related costs) and services performed; and separate total values since the date of the previous notice.

ii. One counterpart of a Work Progress Certificate signed by the Contractor and jointly countersigned by the Engineer and the Project Director.

iii. The Contractor shall submit all Work Progress Certificates to both the Engineer and the BOARD simultaneously by registered air mail. The Engineer and the Project Director will either countersign or reject a Work Progress Certificate within a maximum period of thirty (30) days from the date of receipt of such Certificate by him. If the Engineer and the Project Director or either shall fail either to countersign or to reject a Work progress Certificate within the said thirty (30) days period, the Contractor shall notify the BOARD by cable of the delay in the approval from the Site; and the BOARD will either countersign the Work Progress Certificate in question or assign his reasons for not doing so within a maximum period of sixty (60) days from the date of receipt of the Contractor's said cable notice to him.

iv. The Contractor shall furnish to the BOARD and the Engineer or either whenever called upon to do so any additional information or documents that may be required in connection with verification of progress claims and or any other payments made.

D. REPORTING, CLEARING AND SHIPPING DOCUMENTS
The Contractor shall provide all official forms and documentary information as shall be needed to satisfy the requirements of Bangladesh Customs and the Board.

D.01 REPORTING DOCUMENTS
The Contractor shall forward to the Project Director, Construction of 50 MWp (DC) Solar Photovoltaic Grid Connected Power Plant at Rangunia, Chattagram, Bangladesh Power Development Board, Bangladesh, the following documents:

a. Bill of Lading/ Air Way Bill	1 Copy
b. Shipping Specification	2 Copies
c. Quality Certificate	2 Copies
d. Packing Lists (One copy shall be placed inside the case, the other in a special packet in case No.1)	2 Copies
e. Insurance Certificate	2 Copies

D. 02 CLEARING DOCUMENTS
The Contractor shall forward to the Board through their bankers not later than seven (7) days from the date of sailing for the purpose of clearing the cargo at the Point of destination the following documents

a. Negotiable copy of Bill of Lading	1 Copy
b. Invoice with itemized	3 Copies
c. Shipping Specification	3 Copies
d. Copy of the Charter Party	1 Copy

(If chartering has been permitted by prior arrangement with the Board)

D. 03 SHIPPING DOCUMENTS
Simultaneously with the dispatch of the negotiable documents as listed in Sl. no. D.02 above the Contractor shall also send by Air Mail eleven (11) sets of nonnegotiable shipping documents for each shipment according to the following distribution list. Each set will comprise the following documents:

1. Bill of Lading/ Air Way Bill	1 Copy
2. Invoice	1 Copy
3. Shipping Specification	1 Copy

The invoices and shipping specifications shall bear the Insurance cover note number.

1.	Project Director. Construction of 50 MWp (DC) Solar Photovoltaic Grid Connected Power Plant at Rangunia, Chattagram Bangladesh	2 Copies
2.	The Engineer	1 Copy
3.	Director, Dte. of Purchase/ Finance Bangladesh Power Development Board	1 Copy

4. Director, Dte. of Clearance & Movement — 1 Copy
   Bangladesh Power Development Board
   Hossain Chamber, 105, Agrabad CA, Chattogram, Bangladesh

5 Deputy Director of Clearance & Movement — 1 Copy
   Bangladesh Power Development Board
   Chattogram, Bangladesh.
   (In case of shipment to Chattogram)

6. Deputy Director of Insurance — 1 Copy
   Bangladesh Power Development Board
   Biddut Bhavan, Dhaka-1000, Bangladesh.

After shipment equipment and materials, the Contractor shall notify by registered air mail, the Board at the addresses under 1 and 3 above not later than three (3) days after the sailing date of the vessel the following information:

1. The name of the vessel.
2. The sailing date of vessel.
3. Port of destination.
4. Description of the cargo (grouped).
5. Number of cases and/or weight of cargo.
6. Number of cases weighing above 20 tons and their individual weights.
7. Number of Bills of Lading.
8. Expected date of arrival at the port of destination.

The Contractor shall so arrange that the master of the vessel will inform Project Director, Construction of 50 MWp (DC) Solar Photovoltaic Grid Tied Power Plant at Rangunia, Chattagram Bangladesh of the date and time of arrival of the vessel at the port of destination seventy-two (72) hours in advance. No goods shall be shipped without prior consent of Project Director.

E. BOOKS AND RECORDS

The Contractor shall maintain books and records covering all transactions under this Contract. These books and records shall be available for inspection and audit by the Board for a period of three (3) years after termination as provided under the Contract.

F. PACKAGING

All equipment and materials shall be suitably coated wrapped, or covered and boxed or crated for export shipment and to prevent damage during handling and storage at the Site. Cardboard containers shall be enclosed in a solid wooden container.

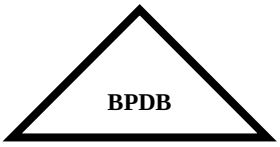
Equipment and process materials shall be packed and semi-kocked down, to the extent possible, to facilitate handling and storage and to protect bearings and other machine surfaces from oxidation. Each container, box, crate or bundle shall be reinforced with steel strapping in such a manner that breaking of one strap will not cause complete failure of the packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while awaiting erection at the Site.

Equipment and materials in wooden cases or crates shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable to tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventative compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper.

Crates and packing material used for shipping will become the property of the Board, but the Contractor will be allowed to use the same for the Work as needed, but the remaining material shall be turned over to the Board upon completion of the Project.

Packaging or shipping units shall be designed within the limitations of the unloading facilities of the receiving ports and the ship which will be used. Ships with special heavy capacity unloading rigging may be required for large units of equipment. It shall be the Contractor's responsibility to investigate these limitations

Each package or shipping unit shall be clearly marked or stenciled on at least two sides as follows:



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In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.

Each part of the equipment which is to be shipped as a separate piece or smaller parts packed within the same case shall be legibly marked to show the unit of which it is a part and matchmarked to show its relative position in the unit, to facilitate assembly in the field. Unit marks and matchmarks shall be made with steel stamps and with paint.

Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied together with the shipment of materials no single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained.
The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed.

Wherever necessary besides usual inscriptions the cases shall bear special indication such as "Top", "Do not turn over", "Care', "Keep dry", etc., as well as indication of the centre of gravity (with red vertical lines) and places for attaching slings (with chain marks).

Cases which cannot be marked as above shall have metal tags with the necessary markings on them. The metal tags shall be securely attached to the packages with strong steel binding wire.

Each piece, skid, case or package shipped separately shall be labelled or tagged properly.

Appendix 2. Price Adjustment -*Not Applicable*

Prices payable to the Contractor, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of labor and material components, in accordance with the following formula:

The Contract is subject to price adjustment applying the following formulae and the weightings or coefficients :

[*Price Adjustment Formulae to be applicable if stated under ITT Sub Clause 26.9 shall be specified here]*

Example:

P= A + a (Lm/Lo)+ b (BIm/BIo)+ c (CEm/CEo)+ d (RSm/RSo)+ e (STm/STo)+ f (BRm/BRo)+g (MIm/MIo) + h (FUm/FUo)+ etc

where;

L= Labor, BI=Bitumen, CE=Cement, RS=Reinforcing Steel, ST=Stone, BR=Bricks, MI=Miscellaneous, FU= Fuel]

Weighting or Coefficient A equals between 0.10 and 0.15 and, B (a+b+c+d+e+f+g+h+etc) equals between 0.90 and 0.85.

[insert figure] non-adjustable component (**coefficient A**)

[insert figure] adjustable component (**coefficient B**)

*[The sum of **A+B** shall equal **ONE** (1). It is usual to have value of **A** between 0.10 and 0.15 and that of **B** between 0.90 and 0.85. Breakdown of **B**shall be provided in **Appendix to the Tender.]***

[delete as appropriate]

The date of adjustment shall be the mid-point of the period of manufacture or installation of component or Plant.

The following conditions shall apply:

(a) No price increase will be allowed beyond the original delivery date unless covered by an extension of time awarded by the Employer under the terms of the Contract. No price increase will be allowed for periods of delay for which the Contractor is responsible. The Employer will, however, be entitled to any price decrease occurring during such periods of delay.

(c) No price adjustment shall be payable on the portion of the Contract price paid to the Contractor as an advance payment.

For complex plant supply and installation involving several sources of supply and/or a substantial amount of installation works, a family of formulas may be necessary, with provision for the usage of Contractor's equipment in the works formula.

Appendix 3. Insurance Requirements

Insurances To Be Taken Out By The Contractor

In accordance with the provisions of GCC Clause 49, 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.

The Contractor shall arrange the following insurance except "Workmen's compensation Insurance for the Contractor's expatriate personnel" from M/S Bangladesh SadharanBima Corporation in the joint name of the BOARD and Contractor and Policies to be taken in foreign currency and local currency wherever necessary and the payment of premium shall be made by the Contractor. The minimum insurance cover shall be 110% (Hundred Ten).

The Contractor/Supplier shall secure and maintain throughout the duration of the contract insurance of such types and in such amounts as may be necessary to protect himself and the interest of Purchaser against hazards of risk or loss at Supplier's cost. Failure of the Supplier to maintain such coverage shall not relieve him of any contractual responsibility or obligations for transportation and ocean cargo insurance from port of loading to port of unloading and from warehouse to warehouse in Bangladesh.

(a) Cargo Insurance

Covering loss or damage occurring, while in transit from the supplier's or manufacturer's works or stores until arrival at the Site, to the Facilities (including spare parts therefore) and to the construction equipment to be provided by the Contractor or its Subcontractors.

Amount [in currency(ies)]	**Deductible limits** [in currency(ies)]	**Parties insured** [names]	**From** [place]	**To** [place]
110%(Hundred Ten Percent) of Contract Price	--------	BPDB	Supplier's or manufacturer's Works or Stores	BPDB designated store at site in Bangladesh

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Amount	**Deductible limits**	**Parties insured**	**From**	**To**
[in currency(ies)]	**[in currency(ies)]**	**[names]**	**[place]**	**[place]**
110%(Hundred Ten Percent) of Contract Price	--------	BPDB	Project Site	BPDB designated store at site in Bangladesh i.e Project Site

Note: Insurance of equipment/Spare parts/materials/ Vehicles and other goods covering all risks including war, strike, riots, civil commotion from the port of shipment to the port of discharge transit after discharge to the Site, and ware-houses to warehouse anywhere in Bangladesh.

The Contractor shall promptly furnish one set of shipping documents, a copy of Bill of lading, invoice, packing list etc, of each consignment direct to the Deputy Director, Insurance. Finance Directorate, BPDB, Dhaka well in time of the shipment of goods indicating the contract number and name of the insurer. If they fail to comply with this instruction they will be held responsible to compensate the losses if any arising out of the non –compliance of this conditions.

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the defect liability period while the Contractor is on the Site for the purpose of performing its obligations during the defect liability period.

Amount	**Deductible limits**	**Parties insured**	**From**	**To**
[in currency(ies)]	**[in currency(ies)]**	**[names]**	**[place]**	**[place]**
110%(Hundred Ten Percent) of Contract Price		BPDB		

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities that have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

Amount **[in currency(ies)]**	**Deductible limits** **[in currency(ies)]**	**Parties insured** **[names]**	**From** **[place]**	**To** **[place]**
In accordance statutory requirement				

(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

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:

Amount [in currency(ies)]	**Deductible limits** [in currency(ies)]	**Parties insured** [names]	**From** [place]	**To** [place]
10%(Ten Percent) of Contract Price				

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 49.1, except for the Third Party Liability, Workers' Compensation and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause49.1, 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.

Insurances to be Taken Out By The Employer

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Details:

Amount [in currency(ies)]	**Deductible limits** [in currency(ies)]	**Parties insured** [names]	**From** [place]	**To** [place]
Nil	Nil	Nil	Nil	Nil

Appendix 4. Time Schedule

Time(s) for Completion as stated in the [PCC (GCC 24.1)].

Note: 1.which includes **(a)** complete procurement **(b)** mobilizing contractor's Required personnel to work site **(c)** preparing Inspection schedule in consultation with BPDB along with a manpower deployment chart **(d)** turnkey Works & **(e)** Assisting to prepare the plant & test and run the plant up to its designed capacity.

2.The Bidder shall be required to submit with its bid a detailed program, normally in the form of a bar chart & CPM, 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 or give its reasons for not adhering thereto. 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.

Appendix 5. List of Major Items of Plant and Services and List of Approved Subcontractors - *Not Applicable*

Prior to issuing the Tender Document, the Employer has established a list of major item of plant and services for which approval of the Employer is required. Prior to award of Contract, the details of approved subcontractor, including manufacturers shall be completed, indicating those subcontractors proposed by the Tenderer in the corresponding Attachment to its tenderthat are approved by the Employer for engagement by the Contractor during the performance of the Contract.

A list of major items of plant and services is provided below.

The following Subcontractors and/or manufacturers are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with GCC Sub-Clause 32.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Major Items of Plant and Services	Approved Subcontractors/Manufacturers	Nationality

Appendix 6. Scope of Works and Supply by the Employer

The following personnel, facilities, works and supplies shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor, in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Sub-Clause 31.2.

Unless otherwise indicated, all personnel, facilities, works and supplies will be provided free of charge to the Contractor.

Personnel	**Charge to Contractor (if any)**
None	Not Applicable

Facilities	**Charge to Contractor (if any)**
1. Land for Solar Power Plant	Free of Charge
2. Available site layout drawings. (if any).	Free of Charge
3. Construction Electricity & Water requirement for site work.	Applicable Electricity charge. Arrangement for construction electricity & water shall be done by the contractor.

Works	**Charge to Contractor (if any)**
None	Not Applicable

Supplies	**Charge to Contractor (if any)**
None	Not Applicable

Appendix 7. List of Documents for Approval or Review

Pursuant to GCC Sub-Clause 35.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager/Consignee in accordance with the requirements of GCC Sub-Clause 31.2 (Program of Performance), the following documents for

(A) Approval

1. Inspection and Test Programme;
2. Performance and Test Procedures;
3. Site layout drawings and arrangement drawings;
4. PV Module arrangement drawings;
5. Plant Performance Test Procedures and Records;
6. Detailed soil investigation program, soil test report;
7. Land development (earth filling program);
8. Lightning protection drawings;
9. All drawings and design (architectural, foundation and structure);
10. Assumptions, design data, codes and standard;
11. Design calculation;
12. Pile load test program, test results and modification of design (if any);
13. Test protocols for all equipment commissioning test;
14. Installation drawings;
15. As built drawings (if any).

(B) Review

1. None

Note:

Five (5) copies of each drawings and necessary data shall first be submitted to Engineer. Two copies of drawings and data shall be returned to the Contractor marked "APPROVED" "APPROVED AS NOTED", "RETURNED FOR CORRECTION" within 21 days after receipt from the Contractor. If drawings submitted for approval are not returned within 21 days after receipt by the Engineer**,** the Contractor shall notify Engineer of such fact, and if the drawings still have not been returned within 15 days after such notice the Contractor may proceed as if drawings have been returned approved. When the drawings and data are returned marked "APPROVED AS NOTED" or "RETURNED FOR CORRECTION" the corrections or changes shall be made and five (5) revised copies shall be submitted to Engineer. Two copies of the revised drawings and data will be returned to the Contractor by (15) days from the receipt of the same with due approval, if not anything otherwise specified.

The approval by the Engineer of drawing and data submitted by the Contractor will cover only general conformity to the plans and specifications and the external connections and dimensions which affect the plant arrangement. This approval of drawings returned marked "APPROVED" or "APPROVED AS NOTED" will not constitute a blanket approval of all dimensions, quantities and details of the materials, equipment, device or item shown and does not relieve the Contractor from any responsibility for errors or deviations from the Contract requirements.

All drawings and data after final procession by BPDB shall become a part of the Contract document and the work shown or described thereby shall be performed in conformity therewith unless otherwise required by BPDB

When the work is completed, two copies of all final approved drawings on AO Size Paper and 1 (One) soft copy shall be sent by the Contractor to the Consignee/ Project Manager.

Appendix 8. Functional Guarantees

1. General

This Appendix sets out

(a) the functional guarantees referred to in GCC Clause 43 (Functional Guarantees)
(b) the preconditions to the validity of the functional guarantees, either in production and/or consumption, set forth below
(c) the minimum level of the functional guarantees
(d) the formula for calculation of liquidated damages for failure to attain the functional guarantees.

2. Preconditions

The Contractor gives the functional guarantees (specified herein) for the facilities, subject to the following preconditions being fully satisfied:

As defined in sub-section 6.2.15 of Section 6. Employer's Requirement

3. Functional Guarantees

Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

As defined in sub-section 6.2.17 of Section 6. Employer's Requirement

4. Failure in Guarantees and Liquidated Damages

As defined in sub-section 6.2.15 of Section 6. Employer's Requirement

Section 5. Tender and Contract Forms

Form	Title
	Tender Forms
PG5A – 1a	Tender Submission Letter for Technical Proposal
PG5A – 1b	Tender Submission Letter for Financial (Price) Proposal
PG5A – 2a	Tenderer Information Sheet
PG5A – 2b	JVCA Partner Information
PG5A – 2c	Subcontractor Information
PG5A – 3	Price Schedule for Plant and Services
PG5A – 4	Technical Proposal
PG5A – 4a	Specification submission & compliance sheet.
PG5A– 5	Manufacturer's Authorisation Letter
PG5A – 6	Bank Guarantee for Tender Security
PG5A – 6a	**Letter of Commitment for Bank's undertaking for Line of Credit (Form PG5A-6a)**
	Contract Forms
PG5A – 7	Notification of Award
PG5A – 8	Contract Agreement
PG5A – 9	Bank Guarantee for Performance Security
PG5A– 10	Bank Guarantee for Advance Payment
PG5A– 11	Bank Guarantee for Retention Money Security (Form PG5A-11)

Forms PG5A-1a, PG5A-1b to PG5A-6, PG5A-6a comprises part of the Tender and should be completed as stated in ITT Clause 24.

Forms PG5A-7 to PG5A-11 and the appendices of the tender comprises part of the Contract as stated in GCC Clause 6.

Tender Submission Letter for Technical offer (Form PG5A-1a)

[This letter should be completed and signed by the Authorised Signatory preferably on the Letter-Head Pad of the Tenderer and be appended in the technical proposal envelope]

To: *[Contact Person]* *[Name of Procuring Entity]* *[Address of Procuring Entity]*	Date:
Invitation for Tender No:	*[indicate IFT No]*
Tender Package No:	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

We, the undersigned, offer to design, manufacture, test, deliver, install, pre-commission and commission in conformity with the Tender Document, the following Plant and Services, viz:

In signing this letter, and in submitting our Tender, we also confirm that:

(a) our Tender shall be valid for the period stated in the Tender Data Sheet (ITT Sub Clause 30.1) and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(b) a Tender Security is attached in the form of a *[state pay order, bank draft, bank guarantee]* in the amount stated in the Tender Data Sheet (ITT Sub Clause 32) and valid for a period of twenty eight (28) days beyond the Tender validity date;

(c) we have examined and have no reservations to the Tender Document, issued by you on *[insert date];* including Addendum to Tender Document No(s) [*state numbers*] , issued in accordance with the Instructions to Tenderers (ITT Clause 11). *[insert the number and issuing date of each addendum; or delete this sentence if no Addendum has been issued];*

(d) we, including as applicable, any JVCA partner or Subcontractor for any part of the contract resulting from this Tender process, have nationalities from eligible countries, in accordance with ITT Sub Clause 5.1;

(e) we are submitting this Tender as a sole Tenderer in accordance with ITT Sub Clause 38.3

or

we are submitting this Tender as the partners of a JVCA, comprising the following other partners in accordance with ITT Sub Clause 18.1*;*

	Name of Partner	Address of Partner
1		
2		
3		
4		

(f) *we are not a Government owned entity as defined in ITT Sub Clause 5.3 or*
we are a Government owned entity, and we meet the requirements of ITT Sub Clause 5.3;
(delete one of the above as appropriate)

(g) we, including as applicable any JVCA partner, declare that we are not associated, nor have been associated in the past, directly or indirectly, with a consultant or any other entity that has prepared the design, specifications and other documents in accordance with ITT Sub Clause 5.5;

(h) we, including as applicable any JVCA partner or Subcontractor for any part of the contract resulting from this Tender process, have not been declared ineligible by the Government of Bangladesh on charges of engaging in corrupt, fraudulent, collusive or coercive practices in accordance with ITT Sub Clause 5.6;

(i) furthermore, we are aware of ITT Clause 4 concerning such practices and pledge not to indulge in such practices in competing for or in executing the Contract;

(j) we intend to subcontract an activity or part of the Works, in accordance with ITT Sub Clause 19.1, to the following Subcontractor(s);

Activity or part of the Plant and Services	Name of Subcontractor with Address

(k) we, including as applicable any JVCA partner, confirm that we do not have a record of poor performance, such as abandoning the works, not properly completing contracts, inordinate delays, or financial failure as stated in ITT Clause 5.7, and that we do not have, or have had, any litigation against us, other than that stated in the Tenderer Information (**Form PG5A-2b**);

(l) we are not participating as Tenderers in more than one Tender in this Tendering process. We understand that your written Notification of Award shall constitute the acceptance of our Tender and shall become a binding Contract between us, until a formal Contract is prepared and executed;

(m) we, including as applicable any JVCA partner, confirm that we do not have a record of insolvency, receivership, bankrupt or being wound up, our business activities were not been suspended, and it was not been the subject of legal proceedings in accordance with ITT Sub Clause 5.8;

(n) we, including as applicable any JVCA partner, confirm that we have fulfilled our obligations to pay taxes and social security contributions applicable under the relevant national laws and regulations of Bangladesh in accordance with ITT Sub Clause 5.9;

(o) we understand that you reserve the right to reject all the Tenders or annul the Tender proceedings, without incurring any liability to Tenderers, in accordance with ITT Clause 59.

Signature:	*[insert signature of authorised representative of the Tenderer]*
Name:	*[insert full name of signatory with National ID Number, if applicable]*
In the capacity of:	*[insert capacity of signatory]*
Duly authorised to sign the Tender for and on behalf of the Tenderer	

*[If there is more than one (1) signatory, or in the case of a JVCA, add other boxes and sign accordingly].***Attachment 1**:

[ITT Sub Clause 38.3]

Written confirmation authorising the above signatory(ies) to commit the Tenderer

[and, if applicable]

Attachment 2:

[ITT Sub Clause 29.2(b)]

Copy of the JVCA Agreement / Letter of Intent to form JVCA with draft proposed Agreement

Tender Submission Letter for Financial offer
(Form PG5A-1b)

[This letter should be completed and signed by the Authorised Signatory preferably on the Letter-Head Pad of the Tenderand be appended in the financial proposal envelope]

To: Date:

[Contact Person]

[Name of Procuring Entity]

[Address of Procuring Entity]

Invitation for Tender No: *[indicate IFT No]*

Tender Package No: *[indicate Package No]*

This Package is divided into the following Number of Lots *[indicate number of Lot(s)]*

We, the undersigned, offer to design, manufacture, test, deliver, install, precommission and commission in conformity with the Tender Document, the following Plant and Services, viz:

In accordance with ITT Clauses 26 and 27, the following prices and discounts apply to our Tender:

The Tender Price is: (ITT Sub-Clause 26.1)	*[state amount in figures]* *and [state amount in words]*
Plant (including Mandatory Spare Parts) Supplied from abroad	*[state amount in figures]* *and [state amount in words]*
Plant (including Mandatory Spare Parts) supplied from within the Employer's Country	*Taka[state amount in figures]* *And Taka [state amount in words]*
Design Services	*[state amount in figures]* *and [state amount in words]*
Civil Works	*[state amount in figures]* *and [state amount in words]*
Installation and Other Services	*[state amount in figures]* *and [state amount in words]*
Recommended Spare parts Price (If economic Factor is applicable)	*[state amount in figures]* *and [state amount in words]*
The Unconditional discount is (ITT Sub-Clause 23.11)	*[state amount in figures]* *and [state amount in words]*
The methodology for Application of the discount is:	*[state the methodology]*

and we shall accordingly submit an Advance Payment Guarantee in the format shown in Form PG5A- 10.

In signing this letter, and in submitting our Tender, we also confirm that:

a) our Tender shall be valid for the period stated in the Tender Data Sheet (ITT Sub Clause 30.1) and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

b) a Tender Security is attached in the form of a [state pay order, bank draft, bank guarantee] in the amount stated in the Tender Data Sheet (ITT Sub Clause 32) and valid for a period of twenty eight (28) days beyond the Tender validity date;

c) if our Tender is accepted, we commit to furnishing a Performance Security within the time stated under ITT Sub Clause 65.1) and in the form specified in the Tender Data Sheet (ITT Sub Clause 66.1) valid for a period of twenty eight (28) days beyond the date of issue of the Completion Certificate of the Plants and Services;

d) we have examined and have no reservations to the Tender Document, issued by you on [insert date]; including Addendum to Tender Document No(s) [state numbers] , issued in accordance with the Instructions to Tenderers (ITT Clause 11). [insert the number and issuing date of each addendum; or delete this sentence if no Addendum has been issued];

e) we, including as applicable, any JVCA partner or Subcontractor for any part of the contract resulting from this Tender process, have nationalities from eligible countries, in accordance with ITT Sub Clause 5.1;

f) we are submitting this Tender as a sole Tenderer in accordance with ITT Sub Clause 38.3 or
we are submitting this Tender as the partners of a JVCA, comprising the following other partners in accordance with ITT Sub Clause 18.1*;*

	Name of Partner	Address of Partner
1		
2		
3		
4		

g) we are not a Government owned entity as defined in ITT Sub Clause 5.3 or

we are a Government owned entity, and we meet the requirements of ITT Sub Clause 5.3;

(delete one of the above as appropriate)

h) we, including as applicable any JVCA partner, declare that we are not associated, nor have been associated in the past, directly or indirectly, with a consultant or any other entity that has prepared the design, specifications and other documents in accordance with ITT Sub Clause 5.5;

i) we, including as applicable any JVCA partner or Subcontractor for any part of the contract resulting from this Tender process, have not been declared ineligible by the Government of Bangladesh on charges of engaging in corrupt, fraudulent, collusive or coercive practices in accordance with ITT Sub Clause 5.6;

j) furthermore, we are aware of ITT Clause 4 concerning such practices and pledge not to indulge in such practices in competing for or in executing the Contract;

k) we intend to subcontract an activity or part of the Works, in accordance with ITT Sub Clause 19.1, to the following Subcontractor(s);

Activity or part of the Plant and Services	Name of Subcontractor with Address

l) we, including as applicable any JVCA partner, confirm that we do not have a record of poor performance, such as abandoning the works, not properly completing contracts, inordinate delays, or financial failure as stated in ITT Clause 5.7, and that we do not have, or have had, any litigation against us, other than that stated in the Tenderer Information **(Form PG5A-2b);**

m) we are not participating as Tenderers in more than one Tender in this Tendering process. We understand that your written Notification of Award shall constitute the acceptance of our Tender and shall become a binding Contract between us, until a formal Contract is prepared and executed;

n) we, including as applicable any JVCA partner, confirm that we do not have a record of insolvency, receivership, bankrupt or being wound up, our business activities were not been suspended, and it was not been the subject of legal proceedings in accordance with ITT Sub Clause 5.8;

o) we, including as applicable any JVCA partner, confirm that we have fulfilled our obligations to pay taxes and social security contributions applicable under the relevant national laws and regulations of Bangladesh in accordance with ITT Sub Clause 5.9;

p) we understand that you reserve the right to reject all the Tenders or annul the Tender proceedings, without incurring any liability to Tenderers, in accordance with ITT Clause 61

Signature:	*[insert signature of authorised representative of the Tenderer]*
Name:	*[insert full name of signatory with National ID Number]*
In the capacity of:	*[insert capacity of signatory]*
Duly authorised to sign the Tender for and on behalf of the Tenderer	

*[If there is more than one (1) signatory, or in the case of a JVCA, add other boxes and sign accordingly].***Attachment 1**:
[ITT Sub Clause 38.3]
Written confirmation authorising the above signatory(ies) to commit the Tenderer

[and, if applicable]

Attachment 2:
[ITT Sub Clause 29.2(b)]
Copy of the JVCA Agreement / Letter of Intent to form JVCA with draft proposed Agreement

Tenderer Information (Form PG5A-2a)

[This Form should be completed only by the Tenderer, preferably on its Letter-Head Pad]

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No:	*[indicate Package No]*
This Package is divided into the following Number of Lots:	*[indicate number of Lot(s)]*

1.	Eligibility Information of the Tenderer [ITT –Clauses 5 & 29]				
1.1	Nationality of individual or country of registration				
1.2	Tenderer's legal title				
1.3	Tenderer's registered address				
1.4	Tenderer's legal status *[complete the relevant box]*				
	Proprietorship				
	Partnership				
	Limited Liability Concern				
	Government-owned Enterprise				
	Others [please describe, if applicable]				
1.5	Tenderer's year of registration				
1.6	Tenderer's authorised representative details				
	Name				
	National ID number				
	Address				
	Telephone / Fax numbers				
	e-mail address				
1.7	Litigation [ITT Cause 13]				
	If there is no history of litigation or no pending litigation then state opposite "None". If there is a history of litigation, or a number of awards, against the Tenderer provide details below				
	A. Arbitration Awards made against				
	ar	Matter in dispute	Value of Award	Value of Claim	

	B. **Arbitration Awards pending**			
	Year	Matter in dispute	Value of Claim	

1.8	Tenderer to attach photocopies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 29]
The following two information are applicable for National Tenderers		
1.9	Tenderer's Value Added Tax Registration (VAT) Number	
1.10	Tenderer's Tax Identification Number(TIN)	
[The foreign Tenderers, in accordance with ITT Sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		

2. Qualification Information of the Tenderer [ITT Clause 29]

2.1 General Experience in Plant and Services of Tenderer

	Start Month Year	End Month Year	Years	Contract No and Name of Contract Name and Address of Procuring Entity Brief description of Plant and Services	Role of Tenderer [Contractor/Subcontractor /Management Contractor]

2.2	Specific Experience in Key Activities			
	Contract No Name of Contract	[insert reference no] of [insert year] [insert name]		
	Role in Contract *[tick relevant box].*	Contractor	Subcontractor	Management Contractor
	\Award date Completion date Total Contract Value	[insert date] [insert date] [insert amount]		
	Procuring Entity's Name Address Tel / Fax e-mail Brief description with justifications of the similarity compared to the Procuring Entity's requirements	[state justification in support of its similarity compared to the proposed works]		

2.3	Average annual turnover [ITT Sub Clause15.1(a)] *[amount invoiced to Procuring Entity(s) for each year of works in progress or completed, using rate of exchange at the end of the period reported]*		
	Year	Amount & Currency	*amount in figures*
2.4	Financial Resources available to meet the cash flow [ITT Sub Clause 15.1(b)]		
	No	Source of Financing	Amount Available
	In order to confirm the above statements the Tenderer shall submit , as applicable, the documents mentioned in ITT Sub Clause 14.1(a), (b) and 15.1 (a), (b) & (c)		
2.5	Contact Details		
	Name, address, and other contact details of Tenderer Bankers and other Procuring Entity(s) that may provide references, if contacted by this Procuring Entity		
2.6	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Sub Clause 16.1]		
	Position Name Years of General Experience	Years of Specific Experience	
	[*Tenderer to complete details of as many personnel as are applicable.Each personnel listed above should complete the Personnel Information (Form PG5A-5*)]		
2.7	Major Equipment proposed to carry out the Contract [ITT Sub Clause 17.1]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, less or seller)

[Tenderer to list details of each item of major equipment, as applicable]			

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

JVCA Partner Information (Form PG5A-2b)

[This Form should be completed by each JVCA partner].

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

1.	Eligibility Information of the JVCA Partner [*ITT –Clauses 5 & 29]*			
1.1	Nationality of Individual or country of Registration			
1.2	JVCA Partner's legal title			
1.3	JVCA Partner's registered address			
1.4	JVCA Partner's legal status *[complete the relevant box]*			
	Proprietorship			
	Partnership			
	Limited Liability Concern			
	Government-owned Enterprise			
	Other (please describe, if applicable)			
1.5	JVCA Partner's year of registration			
1.6	JVCA Partner's authorised representative details			
	Name			
	National ID number			
	Address			
	Telephone / Fax numbers			
	e-mail address			
1.7	Litigation [ITT Sub Cause 13]			
	If there is no history of litigation or no pending litigation then state "None". If there is a history of litigation, or a number of awards, against the JVCA Partner provide details below:			
	A. Arbitration Awards made against			
	Year	Matter in dispute	Value of Award	Value of Claim
	B. Arbitration Awards pending			
	Year	Matter in dispute	Value of Claim	

1.8	JVCA Partner to attach copies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 29]	
The following two information are applicable for national JVCA Partners only			
1.9	JVCA Partner's Value Added Tax Registration (VAT) Number		
1.10	JVCA Partner's Tax Identification Number (TIN)		
[The foreign JVCA Partners, in accordance with ITT Sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]			

2. Key Activity(ies) for which it is intended to be joint ventured [ITT Sub Clause 18.2 & 18.3]		
	Elements of Activity	Brief description of Activity

3. Qualification Information of the JVCA Partner [ITT Clause 18]					
3.1	General Experience in Plant and Services of JVCA Partner				
	Start Month Year	End Month Year	Years	Contract No and & Name of Contract Name and Address of Procuring Entity Brief description of Works	Role of JVCA Partner [Contractor/Subcontractor/Management Contractor]

3.2	Specific Experience in Key Activities			
	Contract No Name of Contract	[insert reference no] of [insert year] [insert name]		
	Role in Contract [tick relevant box]	Contractor	Subcontractor	Management Contractor
	Award date Completion date Total Contract Amount	[insert date] [insert date] [insert amount]		
	Procuring Entity's Name Address Tel / Fax e-mail	[state justification in support of its similarity compared to the proposed plants and service] Brief description with justifications of the similarity compared to the Procuring Entity's requirements		

3.3	Average annual construction turnover [ITT Sub Clause 15.1 (a)] *[amount invoiced to Procuring Entity(s) for each year of work in progress or completed, using rate of exchange at the end of the period reported]*		
	Year	Amount & Currency	Amount in Figures
3.4	Financial Resources available to meet the cash flow [ITT Sub-Clause 15.1(b)]		
		Source of financing	Amount available
	In order to confirm the above statements the JVCA Partner shall submit , as applicable, the documents mentioned in ITT Sub Clause 14.1 (a) & (b)15.1 (a), (b), (c) & (d)		
3.5	Contact Details		
	Name, address, and contact details of Tenderer's Bankers and other Procuring Entity(s) that may provide references if contacted by this Procuring Entity		
3.6	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Sub Clause 16.1]		
	Position Name Years of General Experience	Years of Specific Experience	
	[Tenderer to complete details of as many personnel as are applicable. Each personnel listed above should complete the Personnel Information (Form PG5A-5)]		
3.7	Major items of Construction Equipment proposed for carrying out the works [ITT Sub-Clause 17.1]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, leaser or seller)
	[Tenderer to list details of each item of Major equipment, as applicable]		

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Subcontractor Information (Form PG5A-2c)- Not Applicable

[This Form should be completed by each Subcontractor, preferably on its Letter-Head Pad]

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

1. Eligibility Information of the Subcontractor [*ITT –Clauses 5 & 29]*		
1.1	Nationality of Individual or country of Registration	
1.2	Subcontractor's legal title	
1.3	Subcontractor's registered address	
1.4	Subcontractor's legal status *[complete the relevant box*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Other (please describe)	
.1.5	Subcontractor's year of registration	
1.6	Subcontractor's authorised representative details	
	Name	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Subcontractor to attach copies of the following original documents	All documents to the extent relevant to ITT Clause 5 and 29 in support of its qualifications
The following two information are applicable for national Subcontractors		
1.8	Subcontractor's Value Added Tax Registration (VAT) Number	
1.9	Subcontractor's Tax Identification Number(TIN)	
[The foreign Subcontractors , in accordance with ITT sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		
2. Key Activity(ies) for which it is intended to be Subcontracted [ITT Sub Clause 19.1]		

2.1	Elements of Activity	Brief description of Activity	
2.2	List of Similar Contracts in which the proposed Subcontractor had been engaged		
	Name of Contract and Year of Execution		
	Value of Contract		
	Name of Procuring Entity		
	Contact Person and contact details		
	Type of Assignment performed		
Name:	*[insert full name of signatory]*	*Signature with Date and Seal*	
In the capacity of:	*[insert designation of signatory]*	*[Sign]*	
Duly authorised to sign the Tender for and on behalf of the Tenderer			

Price Schedule for Plant and Service (Form PG5A-3)

(This form should be completed and submitted by the tenderer and appended in the financial proposal envelope)

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

General

1. The Price Schedules are divided into separate Schedules as follows:

   Schedule No. 1: Plant (including Mandatory Spare Parts) Supplied from Abroad

   Schedule No. 2: Plant (including Mandatory Spare Parts) Supplied from within the Employer's Country

   Schedule No. 3: Design Services

   Schedule No. 4: Civil Works

   Schedule No. 5: Installation and Other Services

   Schedule No. 6: Grand Summary

   Schedule No. 7: Recommended Spare Parts

2. The Schedules do not generally give a full description of the plant to be supplied and the services to be performed under each item. Tenderers shall be deemed to have read the Employer's Requirements and other sections of the Tender Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.

3. If tenderers are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITT 9.1 prior to submitting their tender.

Pricing

4. Prices shall be filled in indelible ink, and any alterations necessary due to errors, etc., shall be initialed by the Tenderer.

   As specified in the Tender Data Sheet and Special Conditions of Contract, prices shall be fixed and firm for the duration of the Contract, or prices shall be subject to adjustment in accordance with the corresponding Appendix (Price Adjustment) to the Contract Agreement.

5. Tender prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Tenderers in the Tender Document.

   For each item, tenderers shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules.

   Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section 6 (Employer's Requirements) or elsewhere in the Tender Document.

6. Payments will be made to the Contractor in the currency or currencies indicated under each respective item.

7. When requested by the Employer for the purposes of making payments or partial payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.

Schedules of Rates and Prices

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

Line Item No	Description of Item	Country Of Origin	Unit	Qty	Unit price, CIP [Rangunia 50MWp Solar Power plant] *[FC]*	CIP price per Line Item *[FC]*
1	**2**	**3**	**4**	**5**	**6**	**7=5×6**
(a) Plant's Equipment						
1.	Solar Photovoltaic Module (Mono/Poly Crystalline) Each Module Capacity: Minimum 550Wp, (Cumulative Capacity 50MWp)		lot	1		
2.	Solar PV Module Mounting Structure		lot	1		
3.	Grid Tied Inverter (Capacity: Minimum 100 kW each, Cumulative Capacity - Minimum 40.0MW)		lot	1		
4.	Transformer Station/Medium Voltage Power Platform (MVPP) Power Transformer, LV/33 kV, 3 phase, Multi-winding, Minimum 625 kVA, Low Voltage Panel & Accessories (LA, DOF cutout, Mounting Structures etc. complete in all respect)		lot	1		
5.	LV/MV Cable & Accessories		lot	1		
6.	Power Evacuation line (33 kV) including bay extension of Chandroghona 132/33 kV Sub-station		km	5		
7.	Switchgear & Protection System (LV and MV)		lot	1		
8.	SCADA system		lot	1		
9.	Metering System (110V, Three Phase, CT/PT metering)		lot	1		
10.	Weather Station (Pyranometer and Associated Equipment)		Nos	4		
11.	PV Module Washing System (Semi-Automatic)		Nos	2		
12.	Security & Surveillance Facilities		lot	1		
13.	Fire Detection and Fighting System		lot	1		
14.	Lighting and Illumination System		lot	1		
15.	DC, UPS & Auxiliary Power Supply		lot	1		

Line Item No	Description of Item	Country Of Origin	Unit	Qty	Unit price, CIP [Rangunia 50MWp Solar Power plant] *[FC]*	CIP price per Line Item *[FC]*
1	**2**	**3**	**4**	**5**	**6**	**7=5×6**
(b) Mandatory Spare Parts						
16.	PV Modules (1% of installed module)		lot	1		
17.	Inverter (7.5 % of installed unit)		lot	1		
18.	PV Module Cable Connector		lot	1		
19.	DC String Fuses		lot	1		
Total: 1 (Total Price excluding TAX & VAT) Column 7 to be carried forward to Column 3 and 4 of Schedule No. 6. Grand Summary						

Note: 1. The Employer may also use other INCOTERMs, if deemed necessary, In such case Form PG5A-6, will require to be customized by the Employer
2. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies.

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from within the Employer's Country- Not Applicable

1	2	3	4	5	6
Line Item No	Description of Item	Unit	Qty	Rate upto site in Bangladesh Taka	Total Amount upto site in Bangladesh Taka
(a) Plant's Equipment					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
(b) Mandatory Spare Parts					
13.					
14.					
15.					
16.					
TOTAL Column 6 to be carried forward to Schedule No. 6. Grand Summary					

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Schedule No. 3 - Design & Other Services

Item	Description of Item	Quantity	Unit Price		Total Price	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
(1)	(2)	(3)	(4)	(5)	(6) = (3 x 4)	(7) = (3 x 5)
1	Design of the complete PV plant systems and equipment required to provide the power generating Facility meeting Employer's specification requirements.	1 lot				
2	Design of the Substation, Switchyard complete with all necessary structure	1 lot				
3	Designing of 33kV Evacuation Line including bay extension of Chandroghona 132/33kV Substation	1 lot				
	Foreign Training (17 nos, 15 PM)					
4A	Training at manufacturers' factory	1 lot				
4B	Traveling charges,	1 lot				
4B	Living allowance	1 lot				
5	Transport/ Vehicles (Jeep-1 no (2700CC), Double Cabin Pick-up- 2 nos (2500CC), Motor Cycle -4 nos (125CC), Electric Vehicle-02 (Minimum Motor Power 100kW, Minimum Motor Torque-380Nm Battery-Lithium-ion Polymer, Minimum Battery Capacity-35kWh,)	1 lot				
6	Related Expense to Conduct/Witness the tests by Third Party Inspection/Agency/BPDB witness team as per GCC 38.1	1 lot				
Total: 3 (Total Price excluding TAX & VAT) Column 6 and 7 to be carried forward to Column 3 and 4 of Schedule No. 6. Grand Summary						
VAT & TAX (according to prevailing Rule)						
Total: 3 (Total Price excluding TAX & VAT) Column 6 and 7 to be carried forward to Column 5 and 6 of Schedule No. 6. Grand Summary						

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*

Duly authorised to sign the Tender for and on behalf of the Tenderer

Schedule No. 4 – Civil Works

Item	Description	Unit	Qty	Unit Price		Total Price	
				Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
01	All types of survey, soil tests, excavation and development (as per international standard and formation level fixation prior site visit performed by EPC contractor), other necessary tests as per Employer's requirements described in Bidding Document	Lot	01				
02	Construction of River bank and Dyke side protection	Lot	01				
03	Construction of Dyke		01				
04	Foundation of all equipment including Module Mounting Structure	Lot	01				
05	All necessary works including Site Boundary wall , gates	Lot	01				
06	Approach Road and Internal Road	Lot	01				
07	Drainage System within the power plant	Lot	01				
08	Water supply system including module washing arrangement	Lot	01				
09	Construction of Site Office/Administrative Building cum Control Room	Lot	01				
10	Watch Tower	Nos	06				
11	Any other works (if required)	Lot	01				
Total: 4 (Total Price excluding TAX & VAT) Column 6 and 7 to be carried forward to Column 3 and 4 of Schedule No. 6. Grand Summary							
VAT & TAX (according to prevailing Rule)							
Total: 4 (Total Price including TAX & VAT) Column 6 and 7 to be carried forward to Column 5 & 6 of Schedule No. 6. Grand Summary							

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Schedule No. 5- Installation and Other Services

Item	Description	Unit	Quantity	Unit Price		Total Price	
				Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
01	Installation, Testing & Commissioning of Rangunia 50MWp (DC) Grid Tied Solar Power Plant	Lot	01				
	Total: 5 (Total Price excluding TAX & VAT) **Column 6 and 7 to be carried forward to Column 3 and 4 of Schedule No. 6. Grand Summary**						
	VAT & TAX (according to prevailing Rule)						
	Total: 5 (Total Price including TAX & VAT) **Column 6 and 7 to be carried forward to Column 5 & 6 of Schedule No. 6. Grand Summary**						

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Schedule No. 6 - Grand Summary

Schedule No.	Title	Total Price excluding TAX & Vat		Total Price including TAX & Vat	
		Local Currency	Foreign Currency	Local Currency	Foreign Currency
1	2	3	4	5	6
1	Plant and Mandatory Spare Parts Supplied from Abroad				
2	Plant and Mandatory Spare Parts Supplied from Within the Employer's Country				
3	Design & Other Services				
4	Civil Works Parts				
5	Installation and Commissioning Services				
GRAND TOTAL including TAX & VAT (Tender Price) to be carried forward to Form PG5A-1b					

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies
2. Create additional columns for up to a maximum of 3 Foreign Currencies if so required.
3. Financial Evaluation will be done considering Total Price excluding Tax & VAT. However, Tax & VAT shall be included in the Final Contact Price as per clause: PCC [GCC 60.1 & 60.2]

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Schedule No. 7 - Recommended Spare Parts- Not Applicable

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
TOTAL						

Note: 1. ***Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies***

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

Technical Proposal (Form PG5A-4)

[The Revised Technical Proposal, if any, shall follow the same format and structure]

Site Organization

Method Statement

Mobilization Structure

Construction Structure

Plant

Safety Plan

Personnel

Equipment

Proposed subcontractors for Major Items of Plant and Services

Time Schedule

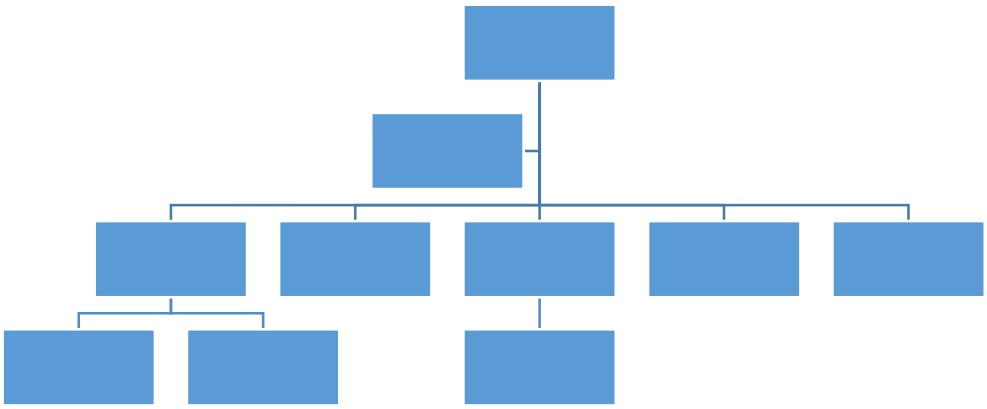
Site Organization

The Bidder shall present a detailed organization chart and list of key personnel showing the intended project organization in the Contractor's head office and at site resources to complete the Supply and Installation of Plant & Equipment.

As a minimum the following positions shall be shown

No.	Position	Total Work Experience [years]	Experience In Similar Work [years]
1.	Project Manager (PV engineer)	10	5
2.	Electrical/Power Engineer	8	3
3.	Civil Engineer	8	3
4.	Expert in Quality, Health, Occupational Safety and Environment Management	5	2

The organization chart shall be of the following principle form reflecting the Contractors way of project execution responsibilities and ways of communication:



Method Statement

[Insert technical proposal for Method Statement]

The Bidder shall submit a program of work giving a general description of the methods which the Contractor intends to adopt for the execution of each major stage of the Works such as e.g. for the design, procurement, manufacturing, shipping time incl. custom clearance, inland transport, civil works, mechanical works, commissioning, trial run, training, and final completion.

Technical Approach and Methodology. Explain your understanding of the objectives of the assignment, approach to services, methodology for carrying out the activities and obtaining the expected output, and the degree of detail of such output. Highlight the problems being addressed and their importance, and explain your technical approach addressing them. Also explain the methodologies you propose to adopt and highlight the compatibility of those methodologies with the proposed approach.

The program must detail the project step by step including milestones, describing how the contractor intends to perform the Works and site supervision showing the function of their key personnel and the involvement of the subcontractors, if any, also reflecting the anticipated timing of the Contractor's time schedule. The Bidder shall clearly show all major and important activities and number of staff involved e.g. number of teams/ personnel for foundation works and equipment intended to be deployed.

Mobilization Schedule

[insert technical proposal for Mobilization Schedule]

[This shall be included in the overall time schedule to be provided by the Tenderer as per "Time Schedule" in Section 5.Tendering Forms

Construction Schedule

[insert technical proposal for Construction Schedule]

Work Plan. Propose the main assignment activities, their content and duration, phasing and interrelations, milestones and delivery dates for the reports. The proposed work plan should be consistent with the technical approach and methodology, showing understanding of the TOR and ability to translate them into a feasible working plan. Include a list of the final documents, including reports, drawings, and tables to be delivered as final output. Construction schedule shall be consistent with mobilization schedule.

[This shall be included in the overall time schedule to be provided by the Tenderer as per "Time Schedule" in Section 5. Tendering Forms]

Plant

*[insert technical proposal for **Plant**]*

[The Tenderer shall provide the plant and equipment it intends to use in the construction process to demonstrate that it has the capability to complete the Supply and Installation of Plant & Equipment.]

Safety Plan

*[insert technical proposal for **Safety Plan**]*

[The Tenderer shall demonstrate that it has a comprehensive safety system that will be used during the construction and installation phase. This system shall meet all safety requirements in accordance with all relevant laws, rules and regulations.]

Personnel Information

[This Form should be completed for each person proposed by the Tenderer on Form PG5A-2a& PG5A-2b, where applicable]

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

A.	**Proposed Position** (tick the relevant box)		
B.	**Personal Data**		
Name			
Date of Birth			
Years overall experience			
Years of specific experience			
National ID Number			
Years of employment with the Tenderer			
B. Professional Qualifications: 1. 2.			
C.	**Present Employment** *[to be completed only if not employed by the Tenderer]*		
Name of Procuring Entity:			
Address of Procuring Entity:			
Present Job Title:			
Years with present Procuring Entity:			
Tel No:	Fax No:	e-mail address:	
Contact *[manager/personnel officer]:*			

D.	**Professional Experience**		
Summarise professional experience over the last twenty years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.			
	From	To	Company / Project / Position / Relevant technical and management experience.
1			
2			
3			

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Equipment Information

[The Tenderer shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in TDS . A Separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Tenderer]

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of Lot(s)]*

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured	

Omit the following information for equipment owned by the Tenderer.

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

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Proposed Subcontractors for Major Items of Plant and Installation Services- *Not Applicable*

A list of major items of Plant and Installation Services is provided below.

The following Subcontractors and/or manufacturers are proposed for carrying out the item of
the facilities indicated. Tenderers are free to propose more than one for each item

Major Items of Plant and Installation Services	**Proposed Subcontractors/Manufacturers**	**Nationality**

Form Functional Guarantee

The Tenderer shall copy in the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Employer in ITT 24(n) and in the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.

Invitation for Tender No:	*[indicate IFT No]*
Tender Package No	*[indicate Package No]*
This Package is divided into the following Number of Lots	*[indicate number of ot(s)]*

Required Functional Guarantee	**Value of Functional Guarantee of the Proposed Plant and Equipment**
1.	
2.	
3.	
4.	
5.	
6.	

Specifications Submission and Compliance Sheet (Form PG5A-4a)

Invitation for Tender No: Date:

Tender Package No: Package Description: *[enter description as specified in Section 6]*

Tender Lot No: Lot Description: *[enter description as specified in Section 6]*

Item No.	Name of Goods	Country of Origin [Tenderer shall fill up]	Make and Model [Tenderer shall fill up]	Full Technical Specifications and Standards [Tenderer shall fill up the Reference Appendices]
1	2	3	4	5
1	Solar Photovoltaic Module Manufacturer:Lungi/Jinko/Canadian/ Trina/JA/ Hanwha Q Cells			Appendix 1: Solar Photovoltaic Module
2	Grid Tied Inverter Manufacturer:SMA/Huawei/Sungrow/ Fronius/ABB/Solar Edge			Appendix 2: Grid Tied Inverter
3	Power Transformer			Appendix 3: Power Transformer
4	Vacuum Circuit Breaker			Appendix 4: Vacuum Circuit Breaker
5	Energy Meter			Appendix 5: Energy meter
6	Pyranometer and Data Logger Manufacturer: Kipp & Zonen/Hukseflux			Appendix 6: Pyranometer and Data Logger
7	33 kV Evacuation Line			Appendix 7: 33kV Evacuation Line
8	33kV Control Protection and Metering Panel			Appendix 8: 33kV Control Protection and Metering Panel

The Bidder is required to comply with the following technical characteristics guaranteed mandatory. In case of no compliance with these specifications, the Bid will be rejected.

Appendix 1: Solar Photovoltaic Module

Sl. No.	Description	Purchaser's Requirement	Manufacturer's Particulars
1	Description of the Item	Solar PV Module	
2	Name of the Manufacturer	To be mentioned	
3	Address of the Manufacturer	To be mentioned	
4	Standard	Design, manufacturing, performance & testing shall be in accordance to the IEC, BS, BDS or equivalent international standards.	

Sl. No.	Description	Purchaser's Requirement	Manufacturer's Particulars
5	Model number	To be mentioned	
6	Type of solar Cells	Mono/Poly Crystalline	
7	Rated Power /Maximum Power (Pmax)	Minimum 550 Wp at STC, (Standard Testing Conditions)	
8	Power Tolerance (STC)	0~+3%	
9	Voltage at Pmax (V mp)	To be mentioned	
10	Current at Pmax (I mp)	To be mentioned	
11	Open circuit voltage (V_{oc})	To be mentioned	
12	Temperature Co-efficient (Pmax)	Maximum -0.35%/ºC	
13	Temperature Co-efficient (Voc)	Maximum -0.28%/ºC	
14	Number of cells in series	Minimum 72 Nos.	
15	Module Efficiency	Minimum 20.00%	
16	Front Glass	3.2 mm, High Transmission, Anti-Reflection Coating, Tempered glass.	
17	Frame	35mm Anodized Aluminum Alloy	
18	Operating Temperature	-40ºC to +85ºC	
19	Static Load front and back (e.g. wind)	Minimum 2400 Pascal	
20	Junction Box	IP 68 rated	
21	Connector	MC4	
22	Cables Cross Section	Min 4.0 mm^2	
23	Cable Length	(-) 1200 mm and (+) 1200 mm	
24	Expected Life	25 years	
25	Maximum Annual Degradation over 25 years life of Module	0.55%	
26	Warranty	Minimum 20 years	
27	Certifications	UL, TUV , ISO or equivalent	
28	Weight and Dimension	To be mentioned	
29	Catalogue	To be submitted	

Appendix 2: Grid Tied Inverter

Sl. No.	Description	Purchaser's Requirement	Manufacturer's Particulars
1	Name of the Item	Grid Tied Inverter	
2	Name of the Manufacturer	To be mentioned	
3	Address of the Manufacturer	To be mentioned	
4	Standard	Design, manufacturing, performance & testing shall be in accordance to the IEC, BS, BDS or equivalent international standards.	
5	Certifications	To be mentioned	
6	Model number	To be mentioned	
INPUT			
7	Max start up Input Voltage	200V	
	Maximum input Voltage	To be mentioned	
	Minimum No of Independent MPP input	4 Nos	
OUTPUT			
8	Nominal AC Output Power	Minimum 100 kW	
	AC Frequency, adjustable	50 ± 5% Hz	
	Nominal AC Voltage Range	To be mentioned	
	AC Grid Connection	3 phase, 4 wire	
	Output Current	To be mentioned	
9	Idle power	To be mentioned	
10	Total Harmonic Distortion	< 3%	
11	Typical efficiency	Minimum 97%	
12	Power Factor	0.8 leading to 0.8 lagging	
13	Reverse Current Protection	To be incorporated	
14	DC Reverse Polarity Protection	To be incorporated	

15	Anti-Islanding Protection	To be incorporated	
16	Display monitor	To be provided	
17	Ground Fault Monitoring	To be incorporated	
18	Topology	Transformerless	
19	Weight and Dimension	To be mentioned	
20	Warranty	Minimum 5 years	
21	Catalogue	To be submitted	

Appendix 3: Power Transformer

Sl. No.	Description	Purchaser's Requirement	Manufacturer's Particulars
1	Description of the Item	Multi-winding Step Up Transformer	
2	Manufacturer's Name	To be mentioned	
3	Country of the Origin	To be mentioned	
4	Manufacturer's Type/ Model No.	To be mentioned	
5	Installation	Outdoor, Tropical, High Rainfall & Humidity	
6	Type	Core	
7	Coolant	Mineral oil	
8	Method of Cooling	ONAN	
9	kVA Rating	Minimum 625 KVA	
10	Number of Phases	3	
11	Rated frequency, Hz	50	
12	Rated primary voltage, V	To be mentioned	
13	Rated no load sec. Voltage, kV	33	
14	Vector group	As per system requirement	
15	Highest system voltage of :		
	a) Primary winding, V	To be mentioned	
	b) Secondary winding, kV	36	
16	Basic insulation level, KV	170 kV Peak (1.2/50 µs)	
17	Power frequency withstand voltage, kV		
	a) HT Side	36	
	b) LT Side	To be mentioned	
18	No-Load Loss (W)	To be mentioned	
19	Full Load Loss (W)	To be mentioned	
20	Percentage Impedence	To be mentioned	
21	Type of cooling	ONAN	
22	Catalogue	To be submitted	
H.T WINDING			
1	Nominal Rated voltage	33 KV	
2	Maximum system voltage	36 KV	
3	Basic insulation level (minimum)	75 KV	
4	Tap Changer	+2x2.5%, 0, -2x2.5% of rated kV & all fully rated capacity. Tap Changer shall be on load type	
5	Inter phase connection	Wye	
6	Bushings	Porcelain, outdoors type with arcing horns of standard gap, mounted on top of tank. Quantity-3 Nos.	
7	Power frequency withstand voltage for one minute	28 kV	

Sl. No.	Description	Purchaser's Requirement	Manufacturer's Particulars
L.T WINDING:			
1	Nominal Rated voltage	To be mentioned (in accordance with the inverter output voltage)	
2	Highest system voltage	To be mentioned	
3	Basic insulation level (minimum)	2.5 kV	
4	Inter phase connection	Delta	
5	Bushings	Porcelain, outdoors type with arcing horns of standard gap, mounted on top of tank. Quantity-3 Nos.	
6	Power frequency withstand voltage for one minute	2.5 kV	

Appendix 4: Vacuum Circuit Breaker

Sl. No.	Description	Employer's Requirement	Manufacturer's Particulars
Vacuum Circuit Breaker (630A)			
1	Description of the Item	Vacuum Circuit Breaker	
2	Country of Origin	To be mentioned	
3	Name and Address of the Manufacturer	To be mentioned	
4	Standard	As per Section 6	
5	Certifications	To be mentioned	
6	Model Number	To be mentioned	
7	Type	Porcelain Clad, Three Phase, Three Pole, Outdoor Type	
8	Mounting	On Supporting Structure	
9	Rated Frequency	50 Hz	
10	Rated Nominal Voltage	33 kV	
11	Maximum Rated Voltage	36 kV	
12	Rated Nominal Current	630 A	
13	Number of Breaks Per Phase	To be mentioned	
14	Interrupting Medium	Vacuum	
15	Insulation	SF6	
16	Manufacturer's Name and Country of Making of Vacuum Interrupter	To be mentioned	
17	Model Number of Vacuum Interrupter	To be mentioned	
18	Basic Insulation Level	170 kV peak (1.2/50 µs)	
19	Power Frequency Withstand Voltage	70 kV (For 1 Minute @ 50 Hz)	
20	**Rated Breaking Capacity:**		
	(i) Symmetrical, rms	25 kA	
	(ii) Asymmetrical, rms	31.25 kA (Including DC)	
21	Rated Short Circuit Making Current	62.5 kA (Peak)	
22	Rated Short Time Current Withstand Capability for 3 second	25 kA (For Panel) 25 kA (For Interrupter)	
23	Rate of Rise of Recovery Voltage	0.57 kV/µs	
24	Re-ignition and Re-strike free Operation	Shall Comply	
25	Rated Auxiliary AC Supply for Spring Charge Motor, Lamp & Heater	230 V AC	
26	Auxiliary AC Supply Voltage Limits for Proper Operation	+15% ~ -15% of the Rated Supply Voltage	
27	Frequency Limits for Proper Operation	+5% ~ -5% of the Rated Frequency	
28	Rated Auxiliary DC Supply for Control Circuit	110 V DC	
29	Auxiliary DC Supply Voltage Limits for Proper Operation	+20% ~ -30% of the Rated Supply Voltage	
30	Power Required for Trip/Closing Coil	< 300 W	
31	Number of Tripping Coil	2	

32	**Main Contact:**		
	(i) Type of contact	To be mentioned	
	(ii) Material of contact surfaces	To be mentioned	
	(iii) Contact resistance	< 40 μΩ	
33	**Operating Particulars :**		
	(i) Breaking Time	< 60 ms	
	(ii) Making Time	< 60 ms	
34	Method of Closing	To be mentioned	
35	Method of Tripping	To be mentioned	
36	Number of Close/ Trip Operation Possible on a Single Spring Charge	To be mentioned	
37	Method of Indicating VCB ON/ OFF	To be mentioned	
38	Pressure in Vacuum Tube	To be mentioned	
39	Pressure of Insulating Gas	To be mentioned	
40	Creepage Distance	900 mm (Minimum)	
41	**Guaranteed Number of Operation for Vacuum Interrupter:**		
	(i) At full rated interrupting current	≥ 100 Nos.	
	(ii) At 50% of rated interrupting current	≥ 100 Nos.	
	(iii) At 100% of full load current	20,000 Nos.	
42	Rated Operating Sequence	O-0.3sec-CO-3m-CO	
43	Circuit Breaker Sealing	Hermetically Sealed	
44	Electrical Endurance Capacity	E2 Class	
45	Operating Temperature	-40°C ~ 60°C	
46	Operating Humidity	0 ~ 100 % RH	
47	Design Lifetime	To be mentioned	
48	Weight and Dimension	To be mentioned	
49	Warranty	3 Years (Full Warranty)	
Vacuum Circuit Breaker (1250A)			
1	Description of the Item	Vacuum Circuit Breaker	
2	Country of Origin	To be mentioned	
3	Name and Address of the Manufacturer	To be mentioned	
4	Standard	As per Section 6	
5	Certifications	To be mentioned	
6	Model Number	To be mentioned	
7	Type	Porcelain Clad, Three Phase, Three Pole, Outdoor Type	
8	Mounting	On Supporting Structure	
9	Rated Frequency	50 Hz	
10	Rated Nominal Voltage	33 kV	
11	Maximum Rated Voltage	36 kV	
12	Rated Nominal Current	1250 A	
13	Number of Breaks Per Phase	To be mentioned	
14	Interrupting Medium	Vacuum	
15	Insulation	SF6	
16	Manufacturer's Name and Country of Making of Vacuum Interrupter	To be mentioned	
17	Model Number of Vacuum Interrupter	To be mentioned	
18	Basic Insulation Level	170 kV peak (1.2/50 μs)	
19	Power Frequency Withstand Voltage	70 kV (For 1 Minute @ 50 Hz)	
20	**Rated Breaking Capacity:**		
	(i) Symmetrical, rms	25 kA	
	(ii) Asymmetrical, rms	31.25 kA (Including DC)	
21	Rated Short Circuit Making Current	62.5 kA (Peak)	
22	Rated Short Time Current Withstand Capability for 3 second	25 kA (For Panel) 25 kA (For Interrupter)	
23	Rate of Rise of Recovery Voltage	0.57 kV/μs	
24	Re-ignition and Re-strike free Operation	Shall Comply	
25	Rated Auxiliary AC Supply for Spring Charge Motor, Lamp & Heater	230 V AC	
26	Auxiliary AC Supply Voltage Limits for Proper Operation	+15% ~ -15% of the Rated Supply Voltage	
27	Frequency Limits for Proper Operation	+5% ~ -5% of the Rated Frequency	

28	Rated Auxiliary DC Supply for Control Circuit	110 V DC	
29	Auxiliary DC Supply Voltage Limits for Proper Operation	+20% ~ -30% of the Rated Supply Voltage	
30	Power Required for Trip/Closing Coil	< 300 W	
31	Number of Tripping Coil	2	
32	**Main Contact:**		
	(i) Type of contact	To be mentioned	
	(ii) Material of contact surfaces	To be mentioned	
	(iii) Contact resistance	< 40 μΩ	
33	**Operating Particulars :**		
	(i) Breaking Time	< 60 ms	
	(ii) Making Time	< 60 ms	
34	Method of Closing	To be mentioned	
35	Method of Tripping	To be mentioned	
36	Number of Close/ Trip Operation Possible on a Single Spring Charge	To be mentioned	
37	Method of Indicating VCB ON/ OFF	To be mentioned	
38	Pressure in Vacuum Tube	To be mentioned	
39	Pressure of Insulating Gas	To be mentioned	
40	Creepage Distance	900 mm (Minimum)	
41	**Guaranteed Number of Operation for Vacuum Interrupter:**		
	(i) At full rated interrupting current	≥ 100 Nos.	
	(ii) At 50% of rated interrupting current	≥ 100 Nos.	
	(iii) At 100% of full load current	20,000 Nos.	
42	Rated Operating Sequence	O-0.3sec-CO-3m-CO	
43	Circuit Breaker Sealing	Hermetically Sealed	
44	Electrical Endurance Capacity	E2 Class	
45	Operating Temperature	-40°C ~ 60°C	
46	Operating Humidity	0 ~ 100 % RH	
47	Design Lifetime	To be mentioned	
48	Weight and Dimension	To be mentioned	
49	Warranty	3 Years (Full Warranty)	

Appendix 5: Energy meter

Sl. No.	Description		Required Specification	Manufacture's particulars
1	Reference Standard		Relevant ANSI / IEC Standard	
2	Manufacturer's name & address		Shall be mentioned	
3	Manufacturer's type & model		Shall be mentioned	
4	Construction/connection		3-Phase 4-wire solidly grounded neutral	
5	Installation		Indoor installation in A socket [for socket type]	
6	Number of element		3 (Three)	
7	Rated Voltage , Volt		110V	
8	Minimum Biasing Voltage , Volt		40V	
9	Variation of Frequency, %		± 2%	
10	Variation of Voltage, %		+ 10, -20%	
11	Accuracy class		0.2 (point two)	
12	Rated Current			
	i)	Nominal Current , A	= 5	
	ii)	Maximum Current , A	≥ 6	
13	Resister Type		LCD Display	
14	Number of Digits (Integer with Decimal), Nos.		5 with 1 (Programmable)	
15	Starting Current , ma		0.1% of Nominal Current	

16	Losses at Nominal Load , Watt		Shall be mentioned	
17	Meter Constant , Imp./		Shall be mentioned	
18	Integration Period		30 (Thirty) Minutes	
	Resetting Period		1 (one) month	
	Cumulative MD transfer		Built in	
	Cycle Timing Device		Built in	
19	Size of the Digit of Display, E x H in mm		4 x 8	
20	No. of Terminal , Nos.		10 (Ten) min	
21	Type of socket and country of origin		To be mentioned	
22	Battery Service life and shelf Life (minimum), Year		10 (ten) & 15 (fifteen)	
23	Year of manufacture		Shall be mentioned	
24	List of Recommended spare parts (if any) , any		Shall be mentioned	
25	Warranty , Year		3 (three)	
26	Meter Service Life (Min), Year		15 (fifteen)	
27	Weight of meter , Kg		Shall be mentioned	
28	Dimensions , mm x mm x mm		Shall be mentioned	
29	Outlines, Drawings & Leaflets		Shall be mentioned	
30	Performance Curve for Balanced & Unbalanced load		Shall be mentioned	
31	Meter sealing condition		Hermetically or Ultrasonic welded	
32	a) Country of Origin b) Place of Manufacture c) Place of Testing		Shall be mentioned	
33	Memory Storage		Shall be mentioned by putting Yes/ No.	
	i)	Equipment Identification Code		
	ii)	Security code		
	iii)	Access code		
	iv)	Number of Power Interruption with Date & Time		
	V	Latest Power Failure- Time & Date		
	Vi	Event logs		
	vii)	Cumulative kWh, kVarh (Q_1 + Q_4) Reading for previous two months		
	viii) Load profile with 30 min interval at least 90 days for:			
		KWh, kVarh (Q_1+Q_4)		
		Phase Voltage or Vh		
		Phase Amps or Ah		

Appendix 6: Pyranometer and Data Logger

SL No	Description	Purchaser's Requirement	Manufacturer's Particulars
Pyranometer			
01	Description of the Item	Pyranometer	
02	Name of the Manufacturer	To be mentioned	
03	Standard	Design, manufacturing, performance & testing shall be in accordance to the IEC or equivalent international standards.	
04	Model number	To be mentioned	
05	Spectral Range	285 to 2800 nm	
06	Sensitivity	7 to14 µV/W/m^2	
07	Response Time	< 5 s	

08	Zero Offset A	< 7 W/ m^2	
09	Zero Offset B	< 2 W/ m^2	
10	Direction Error (up to 80º with 1 Sun irradiance)	< 10 W/ m^2	
11	Operating Temperature Range	-40º C to +80º C	
12	Temperature Dependence of Sensitivity (-40º C to +80º C)	< 1%	
13	Maximum Solar Irradiance	4000 W/ m^2	
14	Field of View	180 º	
Data Logger			
01	Description of the Item	**Data Logger**	
02	Name of the Manufacturer		
03	Standard	Design, manufacturing, performance & testing shall be in accordance to the IEC or equivalent international standards.	
04	Model number	To be mentioned	
05	Local Communication	USB 2/ Optical Port	
06	Remote Access	RS232/485 modem interface port	
07	Display	Alphanumeric LCD	

Appendix 7: 33kV Evacuation Line

33kV Evacuation Line: ACSR Grosbeak

Sl. No.	Description	Purchaser's Requirement	Manufacturer's Particulars
ACSR Grosbeak			
1	Name of the Item	ACSR GROSBEAK	
2	Name of the Manufacturer	Shall be mentioned	
3	Address of the Manufacturer	Shall be mentioned	
4	Standard	Performance Design and Testing shall be in accordance to the BS, IEC, ASTM, BDS or equivalent International standards.	
5	Installation	Overhead	
6	Type	Stranded	
7	Material	Hard drawn Aluminium steel reinforced	
8	Overall diameter, mm	25.15	
9	Nominal cross sectional area of conductor, mm^2	374.70	
10	Number/diameter of Aluminium Strand, No./mm	26/3.97	
11	Nominal Aluminium cross sectional area, mm^2	321.68	
12	Number/diameter of Steel Strand, No./mm	7/3.09	
13	Nominal Steel cross sectional area, mm^2	53.02	
14	Weight of conductor, Kg/KM	1304	
15	Drum wound length, M	500	
16	Net weight, Kg	Shall be mentioned	
17	Gross weight, Kg	Shall be mentioned	
18	Maximum DC Resistance of Conductor at 20 °C, Ω/KM	0.0900	
19	Minimum breaking Load of Conductor, Kg	11400	

20	Maximum working tension of conductor, KN	Shall be mentioned	
21	Current rating at 35ºC rise over 40ºC ambient temperature (75ºC), Amps.	538 (min)	
22	Practical (final) modulus of elasticity, hbar	7700	
23	Co-efficient of linear expansion , /ºC	18.9×10^{-6}	
24	Aluminum to Steel Ratio	Shall be mentioned	
25	Lay length, mm	Shall be mentioned	
26	Lay direction	Right hand	
27	Lay ratio	10-14	
28	Treated Wooden Drum Standard	AWPA C_1 – 82, C_2 –83, C_{16} –82, P_5 –83.	
15 M 650 DAN SPC POLE			
01.	Name & Address of the Manufacturer	To be mentioned	
02.	Manufacturer's Code No.	To be mentioned	
03.	Type	SPC	
04.	Capacity	650 daN	
05.	Overall Length, m	15	
06.	Depth of Plantation (m)	2.5	
07.	Top Diameter of the Pole, mm	To be mentioned	
08.	Bottom Diameter of the Pole, mm	To be mentioned	
09.	Taper (mm/m)	To be mentioned	
10.	Hollow or solid	To be mentioned	
11.	No. and size of Pre-stressing wire (No/mm)	To be mentioned	
12.	F.O.S on Maximum design Load	≥ 2	
13.	Straightness ratio	To be mentioned	
14.	Weight of Pole (Kg)	To be mentioned	

Appendix 8: 33kV Control Protection and Metering Panel

Sl No	Description	Unit	Purchaser's Requirement	Manufacturer's Particulars
1.	Manufacturer's Name & Country of origin	-	To be mentioned	
2.	Manufacturer's Model no.	-	To be mentioned	
3.	System nominal voltage	kV	33	
4.	Maximum System Voltage	kV	36	
5.	Rated Frequency	Hz	50	
A. PROTECTION CONTROL & METERING (0.4/33 kV Transformer)				
6.	**Differential Relay**			
	Manufacturer's Name		ABB- (Sweden/ Switzerland/ Finland) / Siemens-(Germany)/ Alstom-(France/UK)/ Schneider-(France/UK) / NR, China/ SEL, USA	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Relay		Numerical programmable	
	Maximum through fault at which the protective equipment is stable with recommend settings:			
	a) Earth faults	rating % of CT rating	Shall be mentioned	
	b) Phase faults		Shall be mentioned	
	Maximum time delay between initiation of fault and energize of breaker trip circuit.	ms	Shall be mentioned	
	The Relay shall be IEC 61850 protocol type.		Yes	
7.	**Restricted Earth Fault Relay**			

	Manufacture's Name & Country of Origin		ABB- (Sweden/ Switzerland/ Finland) / Siemens-(Germany)/ Alstom-(France/UK)/ Schneider-(France/UK) / NR, China/ SEL, USA	
	Manufacture's Model no.		Shall be mentioned	
	Type of Relay		Numerical programmable	
	Range of current setting :	% of CT rating	Shall be mentioned	
	Earth fault element Range of timing settings at 10 time CT rating	Sec	Shall be mentioned	
	Burden of relay at 10 time CT rating	VA	Shall be mentioned	
	Percentage of current setting at which relay will reset.	%	Shall be mentioned	
	The Relay shall be IEC 61850 protocol type.		Yes	
8	**IDMT OVER CURRENT & EARTH FAULT RELAY**			
	Manufacture's Name Country of Origin		ABB- (Sweden/Switzerland/ Finland) / Siemens-(Germany)/ Alstom-(France/ UK)/ Schneider-(France/UK) / NR, China/ SEL, USA	
	Manufacture's Model no.		Shall be mentioned	
	Type of relay		Numerical programmable Multifunction	
	The Relay shall be IEC 61850 protocol type.		Yes	
	Range of current setting :			
	a) Phase element	% of CT rating	Shall be mentioned	
	b) Each fault element		Shall be mentioned	
	Range of timing settings at 10 time CT rating	Sec	Shall be mentioned	
	Burden of relay at 10 time CT rating	VA	Shall be mentioned	
	Percentage of current at which relay will reset	%	Shall be mentioned	
	Reset time after removal of 10 times CT rated current	Sec	Shall be mentioned	
9	**Separate Auxiliary Flag Relays for Transformer self-protection (OTA, OTT, WTA, WTT, BA, BT, OLTC Surge, PRD for main tank.**			
	Manufacture's Name		Shall be mentioned	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no		Shall be mentioned	
	Type of Relays		Shall be mentioned	
10	**Trip Circuit Supervision (TCS) Relay (Separate Relay for each trip coil)**			
	Manufacture's Name		Shall be mentioned	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Relay		Shall be mentioned	
11	**Trip Relay (Separate Relay)**			
	Manufacture's Name		Shall be mentioned	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Operating Time	ms	<10	
	Self-reset type for O/C, E/F protection		Yes	
	Hand & Electrical reset type for Differential, REF and Transformer Self-protection		Yes	
12	**Annunciator**			
	Manufacture's Name		Shall be mentioned	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Windows	nos.	24	

	Built in buzzer and buttons for accept, mute, test, reset, etc.		Yes	
13	**Control Switch**			
	Manufacture's Name & Country		Shall be mentioned	
	Manufacture's Model/Type No.		Shall be mentioned	
	Separate TNC/Discrepancy switch and Local Remote (L/R) selector switch		Yes	
14	**AVR Relay:** Transformer incomer PCM panel shall be equipped with AVR relay and control switch for RTCC operation along with necessary indication system (Tap position, oil temperature, winding temperature etc.).		Yes	
B. PROTECTION CONTROL & METERING (Evacuation Line)				
15	**IDMT OVER CURRENT & EARTH FAULT RELAY with Directional feature**			
	Manufacture's Name Country of Origin		ABB- (Sweden/Switzerland/ Finland)/Siemens-(Germany) / Alstom-(France/UK)/ Schneider-(France/UK) / NR, China/ SEL, USA	
	Manufacture's Model no.		Shall be mentioned	
	Type of relay		Numerical programmable Multifunction	
	Directional Feature can be activated/de-activated	Yes/No	Yes	
	The Relay shall be IEC 61850 protocol type.		Yes	
	Range of current setting :			
	a) Phase element	% of CT rating	Shall be mentioned	
	b) Each fault element		Shall be mentioned	
	Range of timing settings at 10 time CT rating	Sec	Shall be mentioned	
	Burden of relay at 10 time CT rating	VA	Shall be mentioned	
	Percentage of Current setting at which relay will reset	%	Shall be mentioned	
	Reset time after removal of 10 time CT rated current for: a) Phase element (100%) b) E/F element (40%)	 Sec Sec	Shall be mentioned	
16	**Trip Circuit Supervision (TCS) Relay (Separate Relay for each trip coil)**			
	Manufacture's Name		Shall be mentioned	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Relay		Shall be mentioned	
17	**Trip Relay (Separate Relay)**			
	Manufacture's Name		Shall be mentioned	
	Country of Origin		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Operating Time	ms	<10	
	Self-reset type for O/C, E/F protection		Yes	
18	**Annunciator**			
	Manufacture's Name & Country		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Windows	nos.	12	
	Built in buzzer and buttons for accept, mute, test, reset, etc.		Yes	
19	**Control Switch**			
	Manufacture's Name & Country		Shall be mentioned	
	Manufacture's Model/Type No.		Shall be mentioned	
	Separate TNC/Discrepancy switch and Local Remote (L/R) selector switch		Yes	
20	**METERING AND INSTRUMENTATION**			

20.1	KWH & kVARH Meter			
	Manufacture's Name & Country		Siemens(Germany/ Switzerland)/ AEG (Germany) / ABB (Switzerland)/ Toshiba (JAPAN) /Elster (USA /Romania), Landis+ Gyr (Switzer land/Greece)/ Honeywell (USA)/ CEWE (UK)	
	Manufacture's Model no.		Shall be mentioned	
	Type of Meter		Numerical programmable Multifunction	
	Class of Accuracy		0.2	
20.2	**VOLT METERS with Selector Switch**			
	Manufacturer's Name and Country		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Meter		Analogue, 90 degree scale range	
	Class of Accuracy		1.0	
20.3	**AMPERE METERS**			
	Manufacturer's Name and Country		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Meter		Analogue, 240 degree scale range	
	Class of Accuracy		1.0	
	Separate A-meter for each phase		Yes	
	Mega Watt (MW) Meter			
	Manufacturer's Name and Country		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Meter		Analogue, Import/Export	
	Class of Accuracy		1.0	
20.4	**Mega VAR (MVAR) Meter**			
	Manufacturer's Name and Country		Shall be mentioned	
	Manufacture's Model no.		Shall be mentioned	
	Type of Meter		Analogue, Import/Export	
	Class of Accuracy		1.0	
21	The PCM Panel Shall be complied all the technical specification mentioned in Section-6.		Yes	

Seal and Signature
of the manufacturer:

Seal and Signature
of the Bidder:

The Tenderer shall fill up all the Guaranteed Technical Particulars in accordance with the purchaser's requirements

Signature:	*[insert signature of authorised representative of the Tenderer]*
Name:	*[insert full name of signatory with National ID]*
In the capacity of:	*[insert designation of signatory]*
Duly authorised to sign the Tender for and on behalf of the Tenderer	

Manufacturer's Authorisation Letter (Form PG5A - 5)

[The Tenderer 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 and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The Tenderer shall include it in its tender, if so indicated in the ***TDS as stated under ITT Sub-Clause29.1(b)****]*

Invitation for Tender No:	Date:
Tender Package No:	
Tender Lot No:	
To: Name and address of Employer]	

WHEREAS

We *[insert complete name of Manufacturer],*

who are official manufacturers of*[insert type of goods manufactured],* having factories at *[insert full address of Manufacturer's factories]*, do hereby

authorize*[insert complete name of Tenderer]* to supply the following Plant and Equipment, manufactured by us *[insert name and or brief description of the Goods]*.

We hereby extend our full guarantee and warranty as stated under GCC Clause 42 of the General Conditions of Contract, with respect to the Goods offered by the above Tenderer.

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

Name: *[insert complete name(s) of authorized representative(s) of the Manufacturer]*
Address: *[insert full address including Fax and e-mail]*
Title: *[insert title]*

Date: *[insert date of signing]*

Bank Guarantee for Tender Security (Form PG5A– 6)

[this is the format for the Tender Security to be issued by a scheduled bank of Bangladesh as stated under ITT Clauses32 and 33]

Invitation for Tender No: Date:

Tender Package No:

Tender Lot No:
To:
[Name and address of Employer]

TENDER GUARANTEE No:

We have been informed that *[insert name of Tenderer]* (hereinafter called "the Tenderer") intends to submit to you its Tender dated *[insert date of Tender]* (hereinafter called "the Tender") for the supply and installation of *[description of plant and services]* under the above Invitation for Tenders (hereinafter called "the IFT").

Furthermore, we understand that, according to your conditions, Tenders must be supported by a Bank Guarantee for Tender Security.

At the request of the Tenderer, we *[insert name of bank]* hereby irrevocably and unconditionally undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk.*[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Tenderer is in breach of its obligation(s) under the Tender conditions, because the Tenderer:

a. has withdrawn its Tender after opening of Tenders but within the validity of the Tender Security ; or
b. refused to accept the Notification of Award (NOA) within the period as stated under Instructions to Tenderers (ITT) ; or
c. failed to furnish Performance Security within the period as stipulated in the NOA; or
d. refused to sign the Contract Agreement by the time specified in the NOA; or
e. did not accept the correction of the Tender price following the correction of the arithmetic errors in accordance with the ITT; or

This guarantee will expire:

(a) if the Tenderer is the successful Tenderer, upon our receipt of a copies of the contract signed by the Tenderer and the Performance Security issued to you in accordance with the ITT; or

(b) if the Tenderer is not the successful Tenderer, twenty eight (28) days after the expiration of the Tenderer's Tender validity period, being [*date of expiration of the Tender validity plus twenty eight(28) days]*

Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Letter of Commitment for Bank's undertaking for Line of Credit (Form PG5A-6a)

[This is the format for the Credit Line to be issued by any scheduled Bank of Bangladesh in accordance with ITT Clause 15.1(b)]

Invitation for Tender No: Date:

Tender Package No:

Lot No (*when applicable*)
To:

[*Name and address of the Procuring Entity*]

CREDIT COMMITTMENT No: [insert number]

We have been informed that *[name of Tenderer]* (hereinafter called "the Tenderer") intends to submit to you its Tender (hereinafter called "the Tender") for the execution of the Supply and Installation of Plant & Equipment of *[description of works]* under the above Invitation for Tenders (hereinafter called "the IFT").

Furthermore, we understand that, according to your conditions, the Tenderer's Financial Capacity i.e. Liquid Asset must be substantiated by a Letter of Commitment of Bank's Undertaking for Line of Credit.

At the request of, and arrangement with, the Tenderer, we *[name and address of the Bank]* do hereby agree and undertake that [*name and address of the Tenderer*] will be provided by us with a revolving line of credit, in case awarded the Contract, for execution of the Works viz. [*insert name of works*], for an amount not less than BDT [*in figure*](*in words*) for the sole purpose of the execution of the above Contract. This Revolving Line of Credit will be maintained by us until issuance of "**Taking-Over Certificate**" by the Procuring Entity.

In witness whereof, authorised representative of the Bank has hereunto signed and sealed this Letter of Commitment.

Signature Signature

Notification of Award (Form PG5A - 7)

Contract No: Date:
To:

[Name of Contractor]

This is to notify you that your Tender dated *[insert date]* for the supply and installation of plant and Services for *[name of contract]* for the Contract Price of *[state amount in figures and in words]* as corrected and modified in accordance with the Instructions to Tenderers, has been approved by *[name of Employer].*

You are thus requested to take following actions:

i. accept in writing the Notification of Award within seven (7) working days of its issuance pursuant to ITT Sub-Clause 64.1

ii. furnish a Performance Security in the specified format and in the amount of Tk.*[state amount in figures and words]* ,within Twenty-eight (28) days from issue of this Notification of Award but not later than *(specify date),* in accordance with ITT Clause 64.3

iii. sign the Contract within twenty eight (28) days of issuance of this Notification of Award but not later than *(specify date),* in accordance with ITT Clause 69.2

You may proceed with the execution of the supply of Plant and Services only upon completion of the above tasks. You may also please note that this Notification of Award shall constitute the formation of this Contract, which shall become binding upon you.

We attach the draft Contract and all other documents for your perusal and signature.

Signed

Duly authorized to sign for and on behalf of *[name of Employer]*

Date:

Contract Agreement (Form PG5A - 8)

THIS AGREEMENT made the *[day]* day of *[month][year]* between *[name and address of Employer]* (hereinafter called "the Employer") of the one part and *[name and address of* Contractor*]* (hereinafter called "the Contractor") of the other part:

WHEREAS the Employer invited Tenders for certain plant and services, viz, *[brief description of plant and services]* and has accepted a Tender by the Contractor for the supply of those plant and services in the sum of Taka *[Contract Price in figures and in words]* (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the General Conditions of Contract hereafter referred to.
2. The following documents forming the Contract shall be in the following order of precedence, namely :
    - (a) the signed Form of Contract Agreement;
    - (b) the Notification of Award
    - (c) The Tender and the appendices to the Tender
    - (d) Particular Conditions of Contract;
    - (e) General Conditions of Contract;
    - (f) Technical Specifications;
    - (g) Drawings;
    - (h) Price Schedules of Plant and Equipment and;
    - (i) other document including correspondences listed in the PCC forming part of the Contract

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to provide the plants and related services and to remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the provision of the plant and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

5. The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement. 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 in accordance with the laws of Bangladesh on the day, month and year first written above.

Signed by, for and on behalf of the Employer

For the Employer: **For the Contractor:**

Signature

Print Name

Title

In the presence
of Name
Address

Bank Guarantee for Performance Security (Form PG5A – 9)

*[This is the format for the Performance Security to be issued by **an internationally reputable bank and it shall have correspondent bank located in Bangladesh, to make it enforceable**in accordance with ITT Sub-Clause 67.1pursuant to Rule 27(4) of the Public Procurement Rules, 2008.]*

Contract No: Date:

To:

[Name and address of Employer]

PERFORMANCE GUARANTEE No: *[insert Performance Guarantee number]*

We have been informed that *[name of* Contractor*]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[reference number of Contract]* dated *[date of Contract]* (hereinafter called "the Contract") for the supply and installation of *[description of plant and services]* under the Contract.

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

At the request of the Contractor, we *[name of bank]* hereby irrevocably and unconditionally undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk.*[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Supplier is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

This guarantee is valid until *[date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

[Signatures of authorized representatives of the bank]

Signature Seal

Bank Guarantee for Advance Payment (Form PG5A – 10)- *Not Applicable*

[this is the format for the Advance Payment Security to be issued by ***an internationally reputable bank and it shall have correspondent bank located in Bangladesh, to make it enforceable*** *in accordance with GCC Clause 57.1]*

Contract No: Date:

To:

[Name and address of Employer]

ADVANCE PAYMENT GUARANTEE No.:

We have been informed that *[name of* Contractor*]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[reference number of Contract]* dated *[date of Contract]* (hereinafter called "the Contract") for the supply and installation of *[description of plant and services]* under the Contract.

Furthermore, we understand that, according to your Particular Conditions of Contract Clause 26.1, Advance Payment(s) on Contracts must be supported by a bank guarantee.

At the request of the Contractor, we *[name of bank]* hereby irrevocably unconditionally undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk.*[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

We further agree that no change, addition or other modification of the terms of the Contract to be performed, or of any of the Contract documents which may be made between the Employer and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee is valid until *[date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

[Signatures of authorized representatives of the bank]

Signature Seal

Bank Guarantee for Retention Money Security (Form PG5A-11)

[This is the format for the Retention Money Guarantee to be issued by any scheduled Bank of Bangladesh in accordance with GCC Clause 57]

Demand Guarantee

[Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: [insert Name and Address of the Procuring Entity]

Date: [insert date]

RETENTION MONEY GUARANTEE No.: [insert number]

We have been informed that [insert name of Contractor] (hereinafter called "the Contractor") has entered into Contract Number [insert reference number of the Contract] dated [insert date] with you, for the execution of [insert name of Contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of Tk. [insert the amount of the second half of the Retention Money] which becomes due after the Defects Liability Period has passed and certified in the form of Defects Correction Certificate, is to be made against a Retention Money Guarantee.

At the request of the Contractor, we [insert name of Bank] hereby irrevocably unconditionally undertake to pay you any sum or sums not exceeding in total an amount of Tk. [insert amount in figures] (Taka [insert amount in words]) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor failed to properly correct the defects duly notified in respect of the Supply and Installation of Plant & Equipment.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number[insert A/C no] at [name and address of Bank].

This guarantee is valid until [insert the date of validity of Guarantee that being twenty-eight (28) days beyond the Defects Liability Period]. Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Section 6. Employer's Requirements

Table of Contents

6.1 Scope of Supply of Plant and Installation Services by the Contractor

The project scope will include, but is not limited to, the following broad areas. More details are provided later in the sections below. This specification mostly defines the functional design and operational requirements. It also provides site specific data and defines the environmental constraints within which the plant must operate. The work stated in this specification shall cover design, engineering, manufacture, supply, testing, packing, forwarding, supply, transportation, unloading, storage, installation and commissioning, civil construction, evacuation line construction and development of a 50MWp (DC) Grid Tied Solar Power Plant at Chattagram District in Bangladesh on full turnkey basis.

The work shall be carried out in accordance with the conditions of this document, and shall include followings:

1. The design, manufacture and supply of the Grid Tied Solar Power Plant.
2. Performance testing of the complete system
3. Supply and installation of LV/33kV Power Transformer
4. Supply and installation of 33/0.4kV Auxiliary Transformer
5. Supply and construction of LV and 33 kV switchgear & protection
6. Construction of 33kV double circuit power evacuation facility including bay extension of Chandroghona 132/33kV Sub-station
7. Supply and Installation of SCADA system
8. Construction of Dyke and River Bank Protection
9. Construction of Jetty
10. Construction of Approach Road and Internal Road
11. Construction of Watch Tower
12. Survey, preparation of drawing, land development, landscaping of the proposed site.
13. Supply and construction of all civil and building works for the power plant.
14. Supply of Fire Protection and Fire Detection Facilities.
15. Supply of communication facilities etc.

The scope of supply, works and services shall cover, but not limited to the following:

1. The assessment of the Site
2. The development, detailed design, engineering (including equipment specifications), permitting, procurement, manufacturing, factory testing, transport to site, erection, construction, commissioning and performance testing of the PV plant and other new installations
3. Road works that in the view of the Bidder are necessary for the construction and operation of the PV plant the works and services related to preparation, civil, mechanical, electrical, I&C and communication works including all required equipment for the execution of these works and services providing security on site as per insurance requirements and the security technical specifications of the Employer and per all applicable codes and standards
4. The training of personnel according to Employer´s Requirements
5. Environmental protection complying with local standards.

The Bidder shall include in its scope all facilities and equipment necessary for the generation of power from the PV plant and all works and services including workshop and store equipment, special tools and handling equipment, spare parts, consumables, etc. necessary for complete, safe and reliable operation and preventive and corrective maintenance of the PV plant. Furthermore, the Bidder shall be responsible for the security at the site during the installation process.

The work shall be performed according to the Good Industry Practice which means, at a particular time, those practices, methods and acts as are in accordance with good standards of prudence applicable to the international electricity generation industry which would have been expected to accomplish the desired result at lowest reasonable cost consistent with reliability, safety and expedition. The scope includes also works not explicitly stated in the Employers Requirements or elsewhere in the Tender Documents but which are reasonably required for the installation and operation of the PV plant according to Good Engineering Practice.

Reputable manufacturers shall manufacture new equipment, which shall be subject to Employer's review and approval. No used, reconditioned or salvaged equipment or material will be allowed. All equipment used in connection with the Project shall be of proven design for the intended use of the equipment. As a general principle, the latest, commercially proven, most modern and up-to-date technologies will be selected and licensing terms agreed with the objective of maximizing value to the Employer.

The Plant shall be designed, manufactured, erected and configured in such a way that it will achieve high life expectancy, high availability and reliability with minimum power generation costs. All parts of the Plant shall be suitable in every respect for continuous operation at maximum efficiency as well as part loads and minimum load, under consideration of the climatic conditions peculiar to the site and environmental restrictions. Extreme weather conditions like cyclones are excluded from this requirement. But the Bidder must design the PV plant including all required structures and facilities in such a way that they withstand also extreme weather conditions according to the last version of the Bangladesh National Building Code (BNBC). Each PV Plant element or component shall be designed to withstand the design ambient conditions as stated under chapter 6.2.

All PV Plant equipment and systems shall be built according to internationally recognized standards and shall comply with all the applicable national codes and statutory requirements as stated under chapter 6.2.6

The Bidder shall apply a well-established component classification and identification system. The international SI system of units shall be used for design, drawings, diagrams, instruments, etc. The Plant shall be designed to achieve a high level of reliability through component redundancy, quality construction implementation, quality equipment selection, and maintainability and operability. The facility shall be designed for safe continuous operation including the capability for unforeseen shutdowns.

The Bidder shall provide first aid sets at all permanent working locations, like offices, storages and workbenches and gatehouse.

Engineering Design

The Bidder shall develop the PV plant´s basic and detail engineering design in compliance with this Specifications, BPDB´s review and approval and following best industry practices. The Bidder shall prepare the project´s documentation that shall include, among others, the engineering, preparation and delivery program of the engineering, guaranteed data, essential diagrams, general arrangements, design criteria and main equipment specifications.

The design of the equipment and systems of the Plant shall be based on achieving the performance guarantees as described in **Appendix 8. Functional Guarantees** and its corresponding test procedures **6.2.15** of this tender document. The Bidder shall apply for and be responsible for successfully passing all required approvals and certifications of the authorities, the government and the related authorized institutions and organizations.

Preparatory Works

Prior to the start of construction and installation, the preparatory works shall be performed in advance so that the erection of the PV plant and can be realized as planned. At his sole responsibility the Bidder shall conduct and review, but not limited, to the following preparatory works:

- collection of general meteorological data
- conduction of own geotechnical studies
- conduction of drainage studies including retention basins and discharge options
- conduction of backfill studies including compaction
- conduction of logistics and transportation studies for time of construction
- conduction of a cartographic surveys for the exact location of boundaries and the elevation in meters above sea level

- conduction of own study for flooding risk and the determination of possible effects of storm water due to hundred year floods including the determination of the respective catchment area
- demolition of existing structures in coordination with the Employer (if required)
- the Bidder is required to prepare the Environmental Management Plan
- the Bidder is required to prepare and follow up an Occupational Health and Safety Plan for construction and operation of the PV plant and related facilities
- obtaining all required permits such as building permit, etc. in the name of the Employer, furthermore all certificates and acceptances of the authorities and related organizations
- The Bidder is required to prepare Occupational Health and Safety Plans, one for the site and construction purpose, one for the operational purpose
- data collection regarding interface points
- due diligence of all applicable aspects
- site preparation including compaction of soil, filling of low areas with imported fill and grading of the entire area of the site to the required levels and slopes, as required, in accordance with the building plan
- provision of temporary laydown areas, warehouses, workshops, vehicles, equipment etc. all as necessary for the construction phase
- disposal of demolition materials according to local environmental guidelines
- provision of precast yard as necessary
- provision of temporary firefighting and alarm system
- provision of temporary site drainage, storm water and sanitary drainage all as necessary for the site
- disposal of sewage, as necessary
- provision of temporary water and power supply
- provision of temporary roads, as required
- provision of temporary site fencing including gates
- provision of first aid, site safety and security for the construction phase as per insurance requirements
- provision of temporary reinforced security rooms according to the authorities requirements
- provision of temporary spill containment pallets
- site services as required for the construction and commissioning of the Plant such as electricity supply, potable water, instrument and service air, fuel supply, telecommunication etc.
- provisions of at least three (3) webcam(s) for site and progress supervision from start of construction including GPRS communication system, wide angle, tilt and rotation capability, HD quality and remote control feature at light poles, as well as appropriate record and storage capabilities.

6.2 Specification

6.2.1 Introduction

The changing climate is one of the major challenges we face today. Rise in Global average temperatures, increase in sea levels and melting of glaciers and ice sheets have underlined the immediate need to address this issue. Natural climates induced by climate change will have significant impact on economy and development of the country. Essentially, we need to tackle the problem of increasing concentration of greenhouse gas (Carbon) emissions. To reduce carbon emission we need to promote clean and efficient technologies and harness renewable energy sources. In order to overcome the above difficulties, Bangladesh Power Development Board has taken initiative to set up a 50 MWp (DC) Grid Tied Solar Power Plant on full turnkey basis at Chattagram District in Bangladesh. BPDB will provide 149.259 Acres land for this project at Rangunia, Chattagram.

This will be a Grid Tied system which is a very useful system to generate power from solar energy. The power generated from the SPV Power Plant will be stepped up to the required voltage level and then the power will be evacuated at 33kV voltage level of Chandroghona 132/33kV Grid Sub-station. The Project will be implemented on turnkey basis.

Location of the Solar Power Plant

The plant will be set up 149.259 acres acquired land by BPDB at Rangunia, Chattagram District in Bangladesh located at 22°27'26.9"N and 92°03'10.8"E.

Figure: 6.2.1 General Location

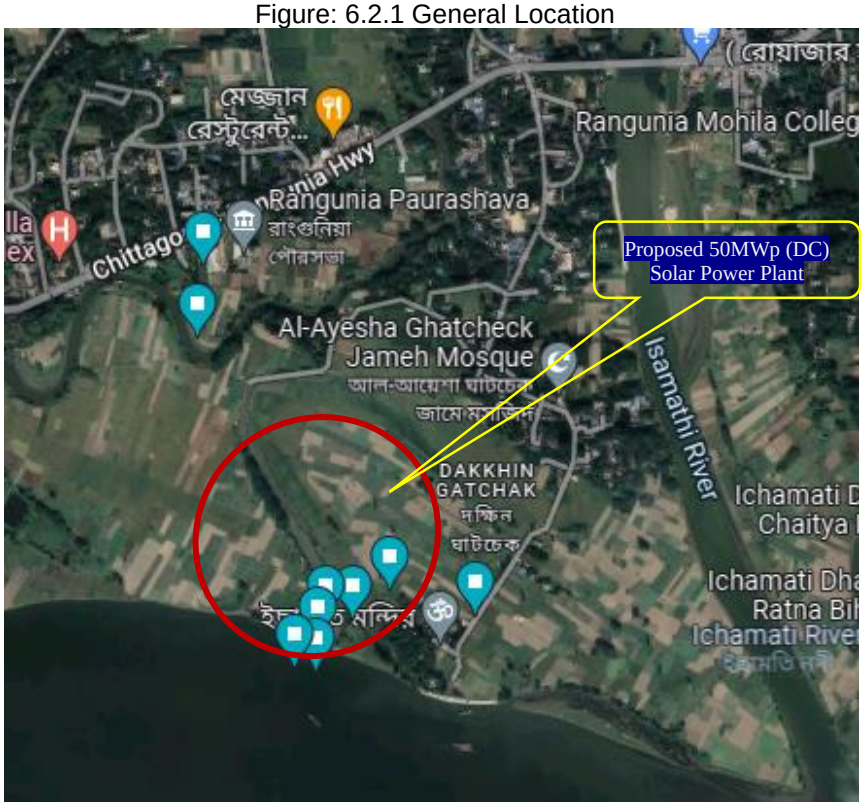


Figure: 6.2.2 Specific Location

Climate Data of the proposed Site

The following climate data of the location of the SPV Plant must be taken into account during plant design:

Climate Type	:	Hot, Wet and Humid Tropical Climate, Intense Sunshine, Heavy rain
Annual Average Temperature	:	26.27^0 C (Maximum)
Annual Average Temperature	:	12.67^0 C (Minimum)
Average Daily Temperature	:	25.32^0 C
Relative Humidity	:	75% - 90%
Average Annual Rain fall	:	2484 mm.
Maximum Wind Velocity	:	200 km/ hour
Altitude	:	12-18 meters above sea level.

6.2.2 PV plant design concept

The main characteristics of the sample PV plant are defined below:

- The installed nominal peak power of the PV Plant shall be equal or higher than 50 MWp (nameplate DC power).
- The PV power plant will consist of fixed mounted crystalline module technology and string inverters.
- The PV module mounting frames and structures will be built with fixed tilt angle set in 23º and South orientation. Modules mounting structures foundation should be RCC foundation columns made with cement concrete as per design based on site soil condition.
- A required no of LV/33 kV transformers will collect the energy produced by the solar array. The transformers will be interconnected through 33 kV underground network.
- A delivery station will connect the PV Plant to Chandroghona 132/33 kV Sub-Station.
- The water supply will comprise the construction of a pipeline network, storage and water distribution within the Plant for cleaning, cooling, cooking, and sanitary purpose.
- A fire protection system will cover the whole plant perimeter and main constructions.
- Security and surveillance system will include personnel access control, perimeter barrier protection, deterrent system, workstation and permanent alarm screening routine.
- I&C system covering: power circuits, meteorological stations, security and surveillance and energy metering.
- access road, internal and perimeter roads
- service building, gatehouse
- backfill, drainage, perimeter wall

6.2.3 Technical Specification

The Grid Tied Solar Photovoltaic power plant consists of mostly the followings equipment and accessories but not necessarily be limited to:

- Solar Photovoltaic (PV) Module
- Module Mounting Structure
- Grid Tied Inverter
- Junction Boxes
- Balance of Plants

6.2.3.1 Solar Photovoltaic (PV) Module

Solar PV module is the basic building block of the Solar PV power supply, which consists of a number encapsulated solar cells connected in series and hermetically sealed with a toughened low iron high transmission glass surface of thickness not less than 3mm to protect the cells from moisture, dust and

other adverse environmental conditions. These modules are connected in series and parallel to get the desired power and voltage.
The mechanical design and construction of Solar PV modules shall be inherently Robust and rigid under conditions of operation, adjustment, storage and transport.

1) Modules for Power Plant shall be of crystalline (Mono/Poly) silicon type.
2) SPV modules to be supplied should have minimum declared output of at least $550W_p$ capacity or higher rating under Standard Test Condition (STC).
3) The module efficiency shall be minimum 20.00% under Standard Test Condition (STC) and the module should have minimum fill factor of 0.70.
4) All the cells used in a module shall be identical, of regular shape and shall have the same rating with tolerance +/-5%.
5) The SPV Module must be provided with acceptable Test & Certified documents. The bidder shall specify the tests and limits specified there under.
6) The minimum stipulated life of the SPV Module shall be 25 years. Each solar PV module shall be warranted by the manufacturer for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. If the module(s) fail(s) to exhibit such power output in prescribed life span, the contractor shall provide additional PV module(s) to compensate the loss of power output.
7) All materials used shall have a proven history of reliability and stable operation in external applications. It shall perform satisfactorily in relative humidity up to 100% with temperatures between -10º C and +85º C and should have the lowest temperature loss coefficient and supporting structure shall withstand winds up to 200 Km/h on the surface of the panel. Each and every SPV module shall be checked for conformity with relevant standard and no negative tolerance shall be accepted.
8) The bidder shall provide the solar PV module electrical characteristics including current-voltage (I-V) performance curves and temperature coefficients of power.
9) Maximum, minimum and nominal voltage to be specified by the manufacturer at 25º C, but in no case it shall be less than the value specified in electrical requirements.
10) Voltage de-rating shall not be less than -0.29% per ºC above 25º C cell temperature.
11) The following information must be mentioned in PV Module:
    a) Name of the manufacturer of PV module.
    b) Name of the manufacturer of Solar Cells.
    c) Month & Year of manufacture (separately for solar cells and module).
    d) Country of origin (separately for solar cells and module).
    e) I-V curve for the module.
    f) Wattage, Im, Vm and Fill Factor for the module.
    g) Unique serial No and Model No of the module.
    h) Date and year of obtaining IEC PV module qualification certificate.
    i) Name of the test lab issuing IEC certificate.
    j) Other relevant information on traceability of solar cells and modules as per ISO 9000.
12) The PV modules used must comply with latest edition of the following IEC Module Qualification Test or equivalent BS, IEEE & BDS or equivalent International standards:

The PV modules used must comply with latest edition of the following IEC Module Qualification Test or equivalent BS, IEEE & BDS or equivalent International standards:

Component	Standard Description	Standard Reference	Application
PV Modules	Crystalline Silicon Terrestrial PV Modules- Design Qualification and Type Approval	IEC 61215	Type Test
	Solar PV Module Safety Qualification. Part 2: Requirements for Testing	IEC 61730 Part 1 & 2	Type Test
	Salt Mist Corrosion Testing of PV Modules	IEC 61701	Type Test

	Procedures of Temperature and Irradiance Corrections to Measure I-V Characteristics of Crystalline Silicon PV Devices.	IEC 60891	Field Test
	Crystalline Silicon Terrestrial PV Array-On Site Measurement of I-V Characteristics	IEC 60829	Field Test
	UV Test for PV Modules	IEC 61345	Type Test

6.2.3.2 Module Mounting Structure

In order to get an optimized design for the PV Plant, the Bidder may choose any type of mounting structures and final arrangement on the Site in consultation with the employer. The scope of the PV module fixed mounting system shall comprise the following:

(a) The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly.
(b) The PV module mounting frames and structures will be built with fixed tilt angle set in 23º and South orientation. The frames and leg assembles of the array structures shall be made MS hot dip galvanized as per ASTM A123. Minimum thickness of galvanization should be at least 120 microns. All nuts & bolts, Fasteners shall be made of high quality stainless steel of SS3 04 grade and shall be protected against adverse climatic conditions. The minimum clearance between the lower edge of the modules and the developed ground level shall be 1000 mm and conform to standards.
(c) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels, at the same time it will withstand storm condition with wind speed up to maximum 200 km/h or of wind speed applicable for the zone.
(d) The structures design shall be appropriate to allow easy replacement of any module, working space for carrying out module cleaning, repairs, replacement, etc and shall be in line with site requirement. The design of structures should be such that the shade of one structure shall not obstruct the others. The minimum spacing between structures shall be properly maintained and optimized.
(e) The structures shall be designed with factor of safety of 1.5 or higher as per relevant standards. The array structures shall be grounded properly using Earth Pit.
(f) The bidder is advised to submit his offer for fixed tracking system of module mounting structures along with guaranteed energy output from the solar system.
(g) The tilt angle for the mounting structure shall be calculated as per the site latitude.
Depending on the actual site location modules alignment and tilt angle shall have to be calculated to provide the maximum annual energy output.

6.2.3.3 Grid Tied Inverter

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage and frequency levels before synchronizing with the grid system. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. The inverters shall be designed to be able to transmit the maximum output of the solar PV generator at all possible ambient temperatures and local conditions (e.g. soil, dust atmosphere). The inverters shall be selected to be for grid tied applications, outdoor string type, three phase configuration (separate PE and N conductors) and operate at 50 Hz grid frequency.

Main features of Inverter

(a) Total harmonic distortion less than 3%
(b) Efficiency higher than 97%
(c) Reactive and active power control with power factor of 0.8 leading and lagging
(d) Frequency-dependent active power limitation and grid management service
(e) Minimum frequency operation range 47 Hz - 53Hz
(f) Minimum Nominal AC power 100 kW
(g) Protections shall follow the grid operation set points and conditions

(h) Corrosion prevention due to marine, salty and tropical environment
(i) Degree of Protection: IP 65, outdoor type.
(j) Minimum 4 (four) nos of MPPT for each Inverter

Selected inverters should have been installed in at least two other PV plants with similar capacity in similar climatic conditions in the last two years. The Bidders shall submit references.

Certificates
The inverters should be TÜV-tested for the required Certificates, CE-marked and in compliance with the applicable standards also most comply with the IEC 61000-6-2:2005; IEC 61000-6-4:2006; UL 1741 and IEEE 1547.

Warranty
Product warranty for inverters should be at least 5 years. In addition it should be possible to buy an extended warranty up to 20 years.

6.2.3.4 Junction Boxes

a. The junction boxes shall be dust, vermin, humidity, termites and waterproof and made of metal or thermoplastic. The junction boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables and alternatively the modules may be provided with connector cables.

b. The junction boxes shall have suitable protections to protect against
- Surge protection such as MOV devices
- Short-circuit
- Reverse Blocking Diodes of max DC blocking voltage of 1000 V

c. The junction Boxes shall have suitable arrangement for the following
- Combine groups of modules into independent charging sub-arrays that will be wired into the controller.
- Arrangement for disconnection for each of the groups
- Provide a test point for each sub-group for quick fault location.

6.2.3.8 Balance of Plants

The bidders shall include all required balance of system components in their bids. This includes all indicators, data loggers & software, displays, disconnectors, wiring, fittings and cable connectors, hardware etc. needed to install the solar photovoltaic system. A complete list of components to be supplied shall be included with the bid.

- Transformer Station/Medium Voltage Power Platform
- Power Evacuation Line
- LV/MV Cable & Accessories
- SCADA
- Switchgear and Protection System
- Energy Meter
- Weather Station
- Lighting and Illumination System
- Fire Detection and Fighting System
- PV Module Washing System
- Security and Surveillance Facilities
- Civil and Building Works

6.2.3.8.1 Medium Voltage Power Platform

Medium Voltage Power Platform having several units of low voltage panel and one LV/33kV Transformer. Each of the Medium Voltage Power Platform shall be equipped with adequate Surge Protection Device.

6.2.3.8.1.1 Low Voltage Panel

Low voltage panel shall be installed at Medium Voltage Power Platform (MVPP) unit. The capacity of each LV panel shall be as per design requirement and shall have following feature but not limited to:

a) Air Circuit Breaker;
b) Earth Fault and Over Current Protection (IDMT)
c) Digital Panel Meter (DPM)

6.2.3.8.1.2 Power Transformer

The transformers shall be designed and tested in accordance with IEC 76

(A) Power Transformer
Three phase, oil immersed, self-air cooled (ONAN) and suitable for stepping up the inverter output voltage to 33 kV with on load tap changer having uniform insulation.

The maximum continuous rating of the each transformers shall meet the design of each Medium Voltage Power Platform (MVPP) of the plant which shall be used to step-up the inverter output voltage of the solar park. In each MVPP, several no of string inverter shall be used and the output of those inverter shall be stepped-up by Power Transformer. Total capacity of the all Power Transformer shall not exceed 120% (one hundred and twenty) of the Guaranteed Net Output of the Plant.

(B) Auxiliary Transformer/Station Transformer
Three phase, oil immersed type, self-air-cooled (ONAN) for stepping down the voltage from 33 kV to 415 V with off load tap changer. The capacity of Auxiliary transformer shall enable to supply power to station control room, common station load and residential use.

1. General
All transformers shall have the following characteristics:

(i) Efficiency
The transformers shall be of highest efficiency that the Contractor can attain.

(ii) Temperature Rise
The temperature rise of the windings shall not exceed 55^0C when measured by the resistance method, after circulating the rated current at rated frequency in the windings under test. The temperature rise of top insulation oil shall not exceed 55 ^{0}C when measured by a thermometer in an oil filled thermometer pocket on the cover or in the outlet pipe to the cooler, and the method of the test of temperature rise will be decided in accordance with IEC 76-2.

(iii) Dielectric Test Voltage
The transformers shall withstand the following test voltages in accordance with IEC 76-3.

a.	33 kV circuit	
-	Lightning impulse withstand test voltage (1.2/ 50 micro sec)	: 170 kV (peak)
-	Power frequency test voltage	: 70 kV for one minute
b.	415 V circuit	
-	Lightning impulse withstands test voltage (1.2 / 50 micro sec)	: Not applicable
-	Power frequency test voltage	: 4.0 kV for one minute

(iv) No Load Excitation Current
The no load excitation current under the rated voltage and frequency shall be as small as possible. The transformers shall be designed and constructed to withstand for three seconds without damage the thermal and dynamic effects of external short circuits under the most severe conditions.

(v) Tolerances
The tolerances on the guarantee values shall be in accordance with IEC 76-1.

(vi) Noise
Vibration and noise levels of transformers shall be in accordance with the best commercial practice.

(vii) 33 kV Switchgear Equipment Panel

(a) Power Transformer Panel
All front panels of the above shall be equipped with control and metering facilities, and all rear panels shall be equipped with protection relays. The relays to be provided under this Project shall be suitable for proper coordination with the existing relays of the System.

(1) Front Panel
The front panel shall be equipped with the following items of controls and instruments, but not be limited to:

- 33 kV circuit breaker control switch.
- 33 kV disconnecting switch control switch
- Ammeter selector switch
- Ammeter (33 kV side) (0-600 A), Voltmeter & pf meter
- Mimic bus
- Annunciators (minimum 15 windows)

(2) Rear Panel
The rear panel shall be equipped with the following items of protection, but not be limited to:

- Overall differential relay
- Power transformer primary over-current relay
- Power transformer neutral over-current relay
- One necessary auxiliary relays, test terminal blocks, lockout relays, etc. shall also be provided

Panel Construction
All panels except local control box shall be constructed using steel plate not less than 3.2 mm thick.

(1) Vertical Panel of Front Face
The panel shall be fitted with indicating instruments, annunciator lamps, operating indicators, watt-hour meter and recorders (for generator's output, voltage and frequency) etc. necessary for operation.

(2) Slant Panel
This panel shall be fitted with control switch, indicating lamps and mimic bus, etc., necessary for operation.

(3) Vertical Panel of Rear Face
This panel shall be fitted with protection relays, etc.

(4) Panel Interior Space

Sliding type doors shall be furnished on the both sides of panel for access to pace shall be provided in the middle of front and rear faces of the panel to enable a man to pass through it. Chequered plate shall be furnished at the bottom of the panel.

(5) Type of Indicating Meters
110 mm square with about 240^0 C of seal angle, flush mounting type with 1.5 class accuracy, or other approved type by the BPDB

(6) Testing Power source
As a result power source for protective relay, meters, etc., one set of 50 A moulded case circuit breakers of 3 phase 415 V and DC 125 V shall be provided.

(7) Test Blocks
Test blocks for P.T. and C.T. circuits shall be provided on the panel as required. The test block shall be of the back- connected plug or stud type with removal covers. All test blocks shall be provided with suitable circuit identification and shall be arranged to isolate completely the instrument from the instrument transformers and other external circuits so that no other device will be affected, and means shall be provided for testing either from an external source of energy or from the instrument transformers.

The test blocks shall be arranged so that the current transformer secondary circuits cannot be open circuited if any position while the test plugs are in place, being inserted, or being removed. Three test plugs for each type of block furnished shall be furnished.

(8) Control Switch
The handles of control switches for circuit breakers, disconnecting switches and auxiliary equipment shall be of the stick type, the handles of the control switches for adjustment shall be of the oval type, and the handles of the selector switches shall be of the flower type. Every switch shall have engraved identification number on the knob in white.

(9) Internal wiring

a) Wire
The internal wiring shall be made with PVC wire of 2.5 sq. mm copper stranded or larger, and solder- less terminals shall be used for connection.

The secondary circuit of C.T. and P.T. shall be wired with PVC wire 4.0 sq. mm (minimum) copper stranded.

b) Color Coding

The color-coding shall be made as follows:

- Secondary circuit of potential transformer : Red
- Secondary circuit of current transformer : Black
- DC control circuit : Blue
- AC control circuit : Yellow
- Main circuit : Yellow
- Earthing circuit : Green

c) Terminal blocks
Terminal blocks to be connected with internal wiring and external wirings shall have the cover (s) and identification numbers.

(10) Others
The secondary circuit of P.T. for metering shall be provided with fuse.
Earth the C.T. and P.T. secondary circuits shall only be grounded inside the panel and appropriate Testing facility shall be provided.

A handset of flush type for paging system shall be installed on the slant part of remote unit panel.

A battery quartz clock and system clock shall be mounted on the upper part of the unit step up transformer control panel.

Switches such as circuit breaker controlling switch, annunciator test switch, emergency stop switch, etc., which may be unwillingly operated by accident due to mechanical or human contact, shall be protected by transparent plastic switch cover.

2. Requirement for Characteristics and Construction

2.1 Power Transformers

2.1.1 Requirement for Characteristics

Type and Ratio
The transformer shall be of three phase, oil immersed, self-air cooled (ONAN), outdoor use type. Ratio of delta star connection shall be LV to 33 kV on full load condition.

The connection of the three phase bank shall be arranged in vector symbol DYn1 according to IEC 74-4 and neutral of star connected high tension winding shall be solidly grounded.

The on load tap changer shall be provided on the high tension winding, and their ratio shall be as follows:

33 kV (±1.25% x 5)

Output and Required Numbers
The maximum continuous rating of the each transformer shall meet the design of each Medium Voltage Power Platform (MVPP) of the plant which shall be used to primarily to step-up the inverter output voltage of the solar park as shown in the attached single line diagram. At each MVPP, several inverter shall be connected to Low Voltage Panel and the output of those inverter shall be stepped-up by Power Transformer.

Impedence Voltage
Impedance voltage (+Ve seq) shall be within the range of 15% to 18% on the self-air cooled rating on the rated tapping (LV/33 kV) and shall be guaranteed by the Contractor.

Winding and Insulation
The full installation shall be applied on both 33 kV (phase & neutral) and LV windings and neutral point of 33 kV windings shall be solidly grounded. The winding conductors shall be of high conductivity copper.

The insulation shall be designed not merely by normal voltage per turn, but also by variation of line voltage and the operating conditions including impulse surge caused by lightning strokes on the transmission line and switching surges.

On Load Tap Changer
The on load tap changer shall be provided on neutral side of 33 kV winding and shall be designed to meet the requirement of IEC 76. Provisions shall be made for padlocking in any tap position.

Cable Box/Isolated & Insulated Phase Bus Duct
The cable box shall be provided on each transformer so as to cover the LV terminals and LV power cables down to ground surface. Proper cable supports and cleats shall also be provided.

Phase & Neutral Circuit Current Transformer
Current transformer shall be provided on the high tension neutral circuit for Restricted Earth Fault & Stand by Earth Fault relays and ratio should match with phases (LV & HV) Differential protection circuit. If necessary Inter-posing current transformers may be used.

1) Use : Protection

2) Ratings
- Primary current : 50 - 100 A (depends on rating of

Transformer)

- Rated secondary current : 1 A
- Accuracy class : 5 P20
- Rated burden : 15 VA

3) Requirements for characteristics and Construction

The current transformer shall be designed to meet the requirements of latest IEC

2.1.2 Requirement for Construction
(1) Tank and Interior Structure

a. The power transformer shall be of such structure to permit installation at the Site to be simple.

b. The sealed joint part of the tank shall be designed to prevent oil and gas leakage and shall be water light even after long term use, and careful attention shall be paid to fastening methods of packing of bushing, bursting tube, cooling radiator, connecting pipes and other accessories.

c. Looseness of core, yoke, coil and other parts shall not happen during transportation and long term use.

d. The transformer shall be provided with a bursting tube to discharge the pressure in case of abnormal rise of the inner pressure. The tube shall be equipped with alarm contact. The tube shall be extended up to tile oil pit which will be constructed around the transformer.

e. All generated gas and oil flow under fault conditions shall be concentrated to the Buchholz or similar type relay so as to ensure the relay action.

f. The transformer shall be provided with skid type base.

g. Winding of coils shall be designed so as to make the initial potential distribution caused by impulsive travelling waves as uniform as possible, to avoid potential oscillation and to withstand abnormal voltage due to switching.

h. The ground terminals of the transformer shall be copper faced steel ground pad, and shall be welded on the tank wall near the base. The ground terminal shall be of the bolt fastened type, suitable for 100-200 sq. mm hard or annealed copper stranded conductors.

i). In designing the transformers, the Contractor shall refer to the general arrangement of the transformer and shall consider the location of the lightning arrester.

Assembling work at the Site such as staking of core and insertion of coil shall not be allowed.

(2) Bushing and Connection
33 KV line and neutral bushings of the Power transformer shall be porcelain clad, and shall be of the highest quality. The glazing colour shall be of brown.

The lighting impulse (1.2/ 50 micro see.) insulation level of bushings shall be as follows:

- 33 kV line bushings : 170 kV_{peak}
- 33 kV line neutral bushing : 170 kV_{peak}
- 0.4 kV bushings : 10 kV_{peak}

(3) Oil Preservation System
Oil immersed transformers shall be provided with an oil preservation system in which the insulating oil shall be isolated from atmospheric air. The oil preservation system shall be of the diaphragm seal or air seal cell type conservator with silica-gel breather. Oil level gauge with low level alarm contact shall be mounted on the conservator.

(4) Cooling system

Cooling radiators shall be of robust and simple construction. Complicated shapes shall not be acceptable, and horizontal stiffeners on tanks should be avoided. The bearing surface of the tank to which bushings are clamped shall be substantially flat. The cooling capacity shall be sufficient to operate the transformer under the rated power.

(5) Temperature Detector
One (1) temperature detector shall be installed at the point where the highest temperature is anticipated.

(6) Protective Device
The following protection system shall be provided:

- Buchholz relay and Pressure Relieve Device (PRD) similar type for alarm and trip

- High temperature alarm and trip (winding and oil)

A Buchholz relay or oil pressure relay shall be fitted on between the conservator and the tank. A dial type thermometer with hand resetting maximum indicator shall be provided. A Pressure Relief Device (PRD) with operation indicator shall be provided.

The gas relay should be provided with double float (one operated by volume of gas flow and other operated by mass gas flow). It should have following provision:

a) Gas release valve
b) Mechanical test button
c) Provision for testing both the floats by injecting air from outside
d) Drain cock

Transport graduated window
The relay should be mounted at such a place that can be visible from the ground without climbing on the transformer

(7) Wiring
All wiring mounted on the transformer shall be drawn through conduit pipes or adequate protective tubes to the control cabinet which shall be properly located on the transformer.

The wiring shall be connected at the terminal blocks terminating the outgoing control cable. The flexible tube of the vapor tension thermometer shall be covered by a protective tube.

(8) Insulating oil
The insulating oil shall have sufficient insulation strength, and shall be excellent in heat conductivity, low in viscosity and pour point, and high in flash point. The oil shall not cause any corrosion to insulating materials and structured materials of electrical equipment and shall be chemically stable for long years of use.
Delivery shall be made to Site partly contained in the transformers and partly in steel drums, according to the method of packing employed. An excess of 10% of the quantity of oil required for filling transformers shall also be supplied and its cost shall be included in the price of each transformer.

(9) Skid Base
The transformer shall be provided with a skid base with four (4) steel wheels and necessary jacks for setting and appropriate devices for locking in position of its foundation.

2.2 Auxiliary Transformer/Station Transformer

2.2.1 Requirement for Characteristics

Type and Ratio

The transformers shall be of three (3) phase, oil immersed, self-air cooled (ONAN) type. Nominal no load ratio of delta star connection shall be 33 KV to 0.4 KV.

The connection shall be arrangement in vector symbol Ynd11 according to IEC 76-4 and neutral of star connected low tension winding shall be earthed solidly.

The off load tap changer shall be provided on the high tension winding, and their ratio shall be as follows:

+1x2.5%, 0, -3x2.5% of rated kV & at fully rated capacity.

Output
Auxiliary transformer shall enable to supply 120% of required power of station control room and common station load.

Impedence Voltage
The impedance voltage shall not less than 5 %, but not more than 7.5 % on the rated tapping (33 kV/0.4kV) and shall be guaranteed by the Contractor.

Winding and Insulation
The requirements shall be in accordance with section 2.1.1.

Off Load Tap Changer
The off load tap changer shall be provided on 33 kV winding and shall be designed to meet the requirements of IEC 76. The tap changer shall be of three phase resistor equipment with rotary diverter switch, and shall be designed to provide 16 tapping steps, i.e. 17 positions as follows.

Central tap	: 33 kV
Step voltage	: 2.50%
Upper side	: 1 tap (+2.5%)
Middle	: 1 tap (0%)
Lower side	: 3 taps (-2.5%)

All the mechanical operating parts of the gear shall be self-lubricated with transformer oil, no special lubrication being necessary. The tap changer compartment oil shall be isolated from main transformer tank oil, and the compartment shall be provided with proper protection facilities and accessories.

Cable Box
The cable boxes shall be provided on both high tension and low tension terminals to terminate high and low voltage power cables. Proper cable supports and cable cleats shall also be provided. Non segregated bus duct between low tension terminals of auxiliary transformer and power centre terminals instead of cables may be acceptable.

Accessories
The following accessories shall be furnished for each transformer:

a. Name plate
b. Valves for oil filtering and sampling
c. Air vent valve
d. Manhole and hand-hole including blind covers
e. Ladder fixed to the transformer tank for inspection of the upper part of the transformer.
f. Hanging hook
g. Grounding terminals
h. Anchor device
i. Oil preservation system including oil conservator
j. Oil level gauge
   Dial type thermometer with hand resetting maximum indicator
l. Breather with silica-gel

m. Other necessary accessories
n. Rail track in the transformer yard.

6.2.3.8.2 Power Evacuation

The contractor shall construct the 33 kV power evacuation line including 2 (two) bay at Chandroghona 132/33 kV sub-station to evacuate the power produced in the solar park which shall comply with the relevant IEC standard and the 33 kV line shall be constructed as directed by the BPDB. The 33kV Evacuation line shall be of ACSR Grosbeak type. The distance of the transmission line from the vicinity of the project area is approximately 5 kilometer. The generated power evacuation shall be done through a double circuit 33 kV transmission line.

The Contractor shall carry out detailed survey, route plan, route marking, profiling and tower spotting in a professional manner following international and national standards and guidance principle of the Grid Operator. The detailed survey for Transmission Line Routes shall be carried out using DGPS or using ALTM (Airborne Laser Terrain Modelling) techniques of equal or better accuracy for the detailed survey. The length of a span shall consider extension / truncation, loading, road crossing, river crossing, power line crossing, and telecommunication line crossing, etc.

Technical Specification of ACSR Grosbeak

STANDARDS:
The conductor as specified in this Section shall conform to the latest edition of the following standards for operation in overhead lines in air under local ambient conditions. Design, Manufacture, Testing and Performance of the conductor shall be in accordance with the ASTM B 232 & BDS-1037 or equivalent International standards.

SPECIFICATIONS:
This conductor shall be designed as per above standards for operation in overhead lines in air under local ambient conditions.

The maximum acceptable length of conductor in a drum shall be as stated below and shall be supplied on standard non-returnable treated wooden drum, each drum having stenciled on each side, drum number, code name of conductor, drum wound length together with gross and net weight, the manufacturer name, the purchaser's name and contract number with date. The cover of the drum should be of same treated wood.

Drum wound length of each drum may vary up to ± 5% of the total drum length as tolerance. However, the sum of total drum length shall be as per ordered quantity. Only one short length of conductor on a drum is considered for acceptance, if necessary. For the other requirements, the given data shall be considered as minimum and maximum where necessary. No negative tolerances for the diameter and thickness are acceptable.

ACSR GROSBEAK	
Code name	ACSR GROSBEAK
Installation	Overhead
Type	Stranded
Material	Hard drawn Aluminum steel reinforced
Overall diameter of the conductor	25.15 mm
Nominal cross sectional area of the conductor	374.70 sq. mm
Number/diameter of Aluminum Strand	26/3.97 mm
Nominal Aluminum cross sectional area	321.68 sq. mm
Number/diameter of Steel Strand	7/3.09 mm
Nominal Steel cross sectional area	53.02 sq. mm
Weight of conductor	1304 Kg/KM
Drum wound length	800 M
Maximum DC Resistance of Conductor at 20 °C	0.0900 Ω/Km

Minimum breaking Load of Conductor	11400 Kg
Lay ratio	10-14
Lay direction	Right hand

FEATURES AND ACCESSORIES:

Conductors shall be delivered on standard non-returnable strong wooden drum. The central hole of the drum shall be reinforced to fit on axle size 95 mm diameter. The interior of the conductor drum shall be lined with bituminous paper to prevent the conductor from being in contact with timber or Aluminium water proof paper and felt lining shall overlap at seams by at least 20 mm and the seams shall be sealed.

Drum shall be adequately protected by securely fastening substantial wooden battens around the periphery. These battens shall be secured by means of hoop metal bindings. Conductor drum shall be treated in an approved manner to resist termite and fungus attacks and shall be suitable for outside storage for a minimum period of 3 years in an equatorial climate with out undue deterioration.

There shall be only one length of conductor on a drum.

Treated wooden drum standard: AWPA C_1 – 82, C_2 –83, C_{16} –82, P_5 –83.

Technical Specification of Guy Wire/Earth Wire

STANDARDS:

The wire as specified in this Section shall be conforming to the latest edition of the following standards for operation in overhead lines or in stay in air under local ambient conditions. Design, Manufacture, Testing and Performance of the Guy/Earth Wire shall be in accordance with the BS-183, Grade 1150, ASTM B498-74, Class-A or equivalent International standards.

SPECIFICATIONS:

This wire shall be designed as per above standards for operation in overhead lines in air under local ambient conditions.

The maximum acceptable length of wire in a drum shall be as stated below and shall be supplied on standard non-returnable treated wooden drum, each drum having stenciled on each side, drum number, code name of conductor, drum wound length together with gross and net weight, the manufacturer name, the purchaser's name and contract number with date. The cover of the drum should be of same treated wood.

Drum wound length of each drum may vary up to ± 5% of the total drum length as tolerance. However, the sum of total drum length shall be as per ordered quantity. Only one short length of wire on a drum is considered for acceptance, if necessary. For the other requirements, the given data shall be considered as minimum and maximum where necessary. No negative tolerance for the diameter is acceptable.

Guy Wire	
Code name	Guy Wire/Earth Wire
Installation	Overhead/Stay
Type	Stranded, Solid and Bare
Material	High Strength Steel
Overall diameter	9.5 mm
Number/diameter of each strand	7/3.15 mm
Nominal cross sectional area	54.53 sq. mm
Weight of wire	430 Kg/Km
Drum wound length	1500 M
Ultimate Tensile Strength	62.75 KN
Galvanisation	As per ASTM B498-74, Class-A
Lay ratio	13-18
Lay direction	Right hand

Technical Specification of Pole

SPECIFICATION FOR SPUN PRESTRESSED CONCRETE (SPC) POLES

The design working loads for the poles are specified in later part. The Contractor is responsible for calculations necessary to establish the cross-sectional dimensions of the poles and the required reinforcing so that the poles can resist the specified working loading in accordance with various requirements set out in this specification. The person responsible for such calculations shall be experienced in the structural use of concrete in general and in the design of pre-stressed concrete poles in particular.

Standards

The poles specified herein shall conform to the latest version of the appropriate recognized international standards. But the poles will be tested as per BS Standards (latest version). In particular :

BS 8110 :1985	-	Structural use of concrete, Parts 1 and 2
BS 4449 concrete	-	Specification for hot rolled steel bars for the reinforcement of
BS 1881	-	Methods of Testing Concrete.
BS 812	-	Testing of Aggregates.
ASTM C39 specimens.	-	Test Method for Compressive Strength of Cylindrical Concrete
BS 12	-	Specification for Ordinary and Rapid Hardening Portland Cement.
BS 5075	-	Specification for Concrete Admixtures.
BS 5896 : 1980- concrete.		Specification for High Tensile Steel wire and strand for Pre-stressing of
BS 5750 : 1979 -		Quality System.

Technical Specification of Pole Fittings

The equipment specified herein shall conform to the latest version of the appropriate recognized international standards. In particulars

BS 729 : 1971	Hot dip galvanized coating on iron and steel articles or equivalent.
BS 4190 : 1967	Isometric Hexagonal Bolts, Screws and Nuts.
BS 4360	Specification for weld able Structural Steel
BS 4870	Specification for approval testing of welding procedures.
BS 5757	Quality Assurance.

If the Bidder offers other equivalent standards full details including copies in English Language of such standards shall be submitted with the offer.

Specification of Pole Fittings

This specification includes the design, manufacture and testing of SPC/Steel Pole fittings.

Definitions:

i)	Failure	:	Inability of the pole fittings when under test to support further load or when deformation or buckling of the pole renders it unserviceable.
ii)	Longitudinal direction	:	The horizontal direction parallel to the run of the direction of the conductors.
iii)	Transverse direction	:	The horizontal direction at right angles to the run of direction of the conductors.
iv)	Ultimate Tensile Strength	:	The strength at which the pole fittings will not accept any further applied force or when deformation or buckling or the pole renders at unserviceable.

Technical Specification of 33 KV Post Insulator

STANDARDS:

These 33 kV Post Insulator with specified in this Section shall conform to the latest edition of the following standards for operation in overhead lines in air under local ambient conditions. Design, Manufacture, Testing and Performance shall be in accordance with latest revisions of BS, IEC standards as listed below or other equivalent internationally acceptable standards:

BS-137	:	Method of test & requirements.
BS-916	:	Bolts, Screws & Nuts.
BS-3288	:	Performance & general requirements and Dimensions.
IEC-383	:	Insulator Tests.
IEC-575	:	Insulator Tests
IEC-437	:	Radio Interference Tests.

SPECIFICATIONS:

These 33kV Post Insulators shall be designed as per above standards for operation in overhead lines in air under local ambient conditions.

1.1	Installation	Overhead line, steel cross-arm mounting.
1.2	Nominal System Voltage, kV	(line to line).
1.3	Type of System	Three phases, 50 Hz, Three Wire, effectively earthed.
1.4	Highest System Voltage, kV	36.
1.5	Atmospheric Condition	Moderately polluted.
1.6	Altitude, meter	0-300 above sea level.
1.7	Maximum Ambient Temperature	40ºC
1.8	Insulator Material	The Insulator shall be made of good commercial grade wet process porcelain. The porcelain shall be sound, thoroughly vitrified and free from defects and blemishes which might adversely affect the life of the Insulator. The exposed parts of the porcelain shall be smoothly glazed and shall be brown in color unless otherwise specified.
1.9	Type of Insulator	Post,
1.10	Insulator Head & Neck	The Insulator Shall have head and neck suitable for fastening the tie wire or preformed fittings. Conductor sizes up to 170 mm^2 ACSR including line guards.

1.11	Markings	Each Insulator shall be marked with the name of Trade Mark of the manufacturer, the type of Insulator and the year of manufacture. These markings shall be legible and indelible.
1.12	Creepage Distance minimum, mm	699
2.0	**WITHSTAND VOLTAGE, MINIMUM**	
2.1	Power Frequency, dry (one minute), kV	115
2.2	Power Frequency, wet (one minute), kV	90
2.3	Impulse 1.2x50 micro-sec wave, kV	200
3.0	**FLASHOVER VOLTAGE, MINIMUM**	
3.1	Power Frequency, dry, kV	130
3.2	Power Frequency, wet, kV	95
3.3	50% Impulse 1.2x50 micro-sec wave, positive, kV	215
3.4	50% Impulse 1.2x50 micro-sec wave, negative, kV	290
4.0	**POWER FREQUENCY PUNCTURE VOLTAGE MINIMUM, kV**	210
5.0	**RADIO-INFLUENCE VOLTAGE DATA**	
5.1	Power Frequency Test Voltage RMS to Ground, kV	30
5.2	Maximum RIV at 1000 KC Micro-volt	200
6.0	**MECHANICAL FAILING LOAD, MINIMUM, kN**	10.7

Technical Specification of 33 KV Disc Insulator with fittings

STANDARDS:

These 33 kV Disc Insulator with Fittings specified in this Section shall conform to the latest edition of the following standards for operation in overhead lines in air under local ambient conditions. Design, Manufacture, Testing and Performance shall be in accordance with latest revisions of BS, IEC standards as listed below or other equivalent Internationally acceptable Standards:

IEC-120	:	Ball & Socket Coupling.
IEC-305	:	Characteristics of String Insulator Unit.
IEC-383	:	Insulator Tests.
IEC-437	:	Radio Interference Tests.
IEC-506	:	Switching Impulse Tests.
IEC-575	:	Thermal Mechanical Performance Tests.
BS-137	:	Method of test & requirements.
BS-916	:	Bolts, Screws & Nuts.

SPECIFICATIONS:

Specification of Disc Insulator:
These 33 kV Disc Insulators shall be designed as per following standards for operation in overhead lines in air under local ambient conditions.

1.	Installation	Overhead line for suspension or termination.
2.	Nominal System Voltage, kV	33 (line to line).
3.	Type of System	Three phase, 50 Hz, Three Wire, Effectively earthed.
4.	Highest System Voltage, kV	36 (three phase).
5.	Atmospheric Condition	Moderately polluted.
6.	Altitude, meter	0-300 above sea level.
7.	Maximum Ambient Temperature, ºC	45.
8.	Insulator Material	The Insulator shall be made of good commercial grade wet process porcelain. The porcelain shall be sound, thoroughly vitrified and free from defects and blemishes that might adversely affect the life of the Insulator. The exposed parts of the porcelain shall be smoothly glazed and shall be brown in color unless otherwise specified.
9.	Type of Insulator	Ball & Socket type Disc, security clip made of Stainless Steel or Phosphor Bronze.
10.	Markings	Each Insulator shall be marked with the name of Trade Mark of the manufacturer, the type of Insulator and the year of manufacture. These markings shall be legible and indelible.
11.	Maximum Nominal Diameter of Insulator, mm	255
12.	Nominal Spacing, mm	146
13.	Minimum Nominal Creepage Distance, mm	292
14.	Coupling Size, mm	16
15.	**WITHSTAND VOLTAGE, MINIMUM**	
15.1	Power Frequency, dry (one minute), kV	70
15.2	Power Frequency, wet (one minute), kV	40
15.3	Impulse 1.2x50 micro-sec wave, kV	110
16.	**FLASHOVER VOLTAGE, MINIMUM**	
16.1	Power Frequency, dry, kV	78
16.2	Power Frequency, wet, kV	45
16.3	50% Impulse 1.2x50 micro-sec wave, positive, kV	120

16.4	50% Impulse 1.2x50 micro-sec wave, negative, kV	125
17.	**POWER FREQUENCY PUNCTURE VOLTAGE MINIMUM, kV**	110
18.	**RADIO-INFLUENCE VOLTAGE DATA MINIMUM:**	
18.1	Power Frequency Test Voltage, RMS to Ground, kV	10
18.2	Maximum RIV at 1000 KC Micro-volt	50
19.	**MECHANICAL FAILING LOAD MINIMUM, kN**	70

Specification of 33 kV Strain Insulator String Set:

33 KV Strain Insulator String Set consisting of the following component parts for each set:

1.	Anchor Shackle	Made of forged steel galvanized complete with cotter bolt and Pin, UTS-6800 Kg, Galvanization as per BS-729 part 1 or ASTM A-153.
2.	Ball Eye	Oval eye type, made of forged steel galvanized, UTS-6800 Kg, Galvanization as per BS- 729 part 1 or ASTM A-153.
3.	Socket Eye	Made of malleable iron galvanized complete with cotter bolt and Pin, UTS-6800 Kg, Galvanization as per BS- 729 part 1 or ASTM A-153.
4.	Strain Clamp	Bolted type, Made of malleable iron galvanized or Alluminium Alloy, suitable for accommodating ACSR Grosbeak/Merlin of overall diameter 25.15/17.36 mm, complete with bolts, nuts, washers, Alluminium Alloy liner etc., UTS-6800 Kg, Galvanization as per BS- 729 part 1 or ASTM A-153 in case of malleable iron or other ferrous metal.
5.	Disc Insulator	3 (Three) Nos. are required for each set.

6.2.3.8.3 LV/MV Cable & Accessories

6.2.3.8.3.1 LV Cable & Accessories

LV AC power and control cables for the interconnection of the inverter and the LV/33 kV transformer, shall be provided with all accessories including the installations of the cable terminations into the related transformer and inverter and the required cable supporting systems including LV AC cable size calculation according to the IEC 60364-5-52.

Cables of appropriate size to be used in the system shall have the following characteristics:

- Will meet IEC, BS or equivalent International Standards
- Temp. Range -10°C to +80°C.
- Voltage rating 660/1000V
- Voltage losses to be less than 3%.
- Excellent resistance to heat, cold, water, oil, abrasion and UV radiation
- Flexible insulated wiring

Main features of Features

a. All cables shall be PVC insulated with appropriate grade conforming to IEC or equivalent international standard.
b. The wiring for module inter-connection shall have hard PVC conduit of approved make. All Tees, Bends etc shall be approved make. Before procurement, testing and approval for materials should be obtained from CERS, BPDB/BRTC or BUET/BSTI.
c. Cables in the array yard shall be laid direct in ground at a depth of 500 mm in the excavated trenches along the approved route and covered with sand cushion. A continuous single brick protective layer of first class brick shall be placed over the entire length of the underground cable before refilling the trench with loose soil. Alternatively, 6″ wide continuous layer of 1 1/2″ thick concrete cable markers may also be provided as protective cable cover. The cables shall be laid inside class-B. GI pipes of suitable size under road crossings, drains, sewerage lines, entry of exit points of the buildings or where there are chances of mechanical damage only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted.
d. Cables inside the control room shall be laid in suitable cable trays of approved type.
e. All wires used on the LT side shall conform to IS and should be appropriate voltage grade. Only Copper conductor wires of reputed make shall be used.
f. 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. The panel's bottoms should be properly sealed to prevent entry of snakes / lizard etc. inside the panel.
g. All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.
h. The terminal end of cables and wires are to be fitted with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.
i. As-built wiring diagrams shall be provided by the Tenderer.

6.2.3.8.3.2 MV Cable & Accessories (33 kV Underground Cable Power Cable)

(1) The cable shall be stranded annealed copper conductor.

The construction of the conductor shall be the compacted circular single core type. The size of the conductor shall be capable to carry the rated capacity of each MVPP and at specified site conditions without exceeding its maximum temperature i.e. 900 C. The minimum size of 33 KV cable shall not be less than 50 sq. mm. The copper conductor shall comply with latest IEC Standard.

(2) Insulation
The insulation material shall be extruded cross linked polyethylene of low dielectric loss, high dielectric strength, low thermal resistivity and long term stability. It shall be free from contamination by oil, chemical and moisture. The extrusion process shall ensure that the insulation is homogenous and The single core 33 kV XLPE Copper conductor power cable and other necessary items for the completion of the cable system.

The power cable and accessories shall be designed and constructed in accordance with the requirements of latest IEC Standard. High Voltage Cross linked Polyethylene Insulated cable" and the most up-to-date experience for a system of this voltage level and shall incorporate the latest improvements of design and manufacture for the type of cables and accessories required.
Free from voids and impurities. The process shall be dry method. The average thickness of insulation measured at section shall not be less than the value specified in the standard.

(3) Terminations
The end terminating materials shall be supplied for the termination of 33KV cables.

The 33 kV Bus shall have the capability to carry the total load to the secondary side of the relevant primary step-up transformer.

(4) Laying
Under-Ground Cable from 33 KV side of Primary step-up Transformers to 33 kV Bus and also re-routing from 33 kV bus to Secondary Step-Up Transformer by XLPE cable shall be provided with RCC slab on three sides.

6.2.3.8.4 SCADA

The scope of supply shall include - but not be limited to - the following systems and components:

- Primary sensors, transmitters, actuators
- PV Plant Control and Monitoring System (DCS – Digital Control System)/Supervisory Control and Data Acquisition (SCADA) for the PV Plant, including all necessary software licenses.
- Remote- PV Control System as Electrical Control and Monitoring System or as SCS independently working system, which is connected via serial interface with SCADA (if applicable)
- SCADA Human Machine Interface (HMI) with at least two (2) operator stations, one (1) on them combined operator/ engineering station (each with two (2) LED screens, at least 21 inch) to supervise all systems from the PV Control Room in Service Building;
- RAID Station (Redundant Arrays of Inexpensive Disks) for Long Term Data Server
- Routers
- copper/FO- Converters and Switches
- PV Plant monitoring and control system and PV Plant performance calculation
- Meteorological stations (one)
- CCTV - Details can be found in Section 6.2.5
- Connection of SCADA with Fire Alarm system
- Remote signal exchange and related works including RTU for signal exchange with BPDB and NLDC. All necessary interconnection & Integration shall be done by the tenderer as per existing guideline of PGCB.
- Communication for monitoring and control with BPDB and NLDC. All necessary interconnection & Integration shall be done by the tenderer as per existing guideline of PGCB.
- Training for all I&C systems and equipment shall be provided to the Employer's management, operation and maintenance staff. The training shall cover hardware and software of all control systems like all SCADA components, PV Plant control and monitoring systems, meteorological stations, etc.
- Assistance and close cooperation for end-to-end test for data and signal transferred from PV Plant to BPDB/NLDC, which shall include data point tests, data communication and exchange tests
- Bidder shall consider in its scope at least the following:

    - providing commissioning documentation
    - providing all as built drawings including set points, interfaces, etc.
    - Complete hardware and software documentation (including licenses and certificates).

All systems shall require minimum maintenance, and shall have comprehensive self-checking and self-diagnostic capabilities including self-test failure alarms etc. Mode of signal transmission shall be serial using standard protocols matching with DCS/SCADA, e.g. MODBUS, PROFIBUS, Foundation Fieldbus, etc.

PC Data logger software shall enable automatic long-term storage of measured data from PV plant. It shall allow visualization, monitoring, commissioning & service of the installation. Reliable sensors for Solar Radiation, Temperature & other Electrical Parameters are to be supplied with the Data Logger Unit. The data acquisition system shall perform the following operations:

(A) Measurement and continuous recording of

1) Ambient Air Temperature near Array Yard
2) Control Room Temperature
3) Module Back Surface Temperature
4) Wind Speed at the level of Array Plant
5) Solar Radiation incidental to Array Plant
6) Inverter Output
7) System Frequency
8) DC Bus output
9) Energy Delivered in kWh.

(B) All data shall be recorded chronologically date wise. The data file should be latest version and compatible. The data logger shall have internal reliable battery backup to record all sorts of data simultaneously round the clock. All data shall be stored in a common work sheet chronologically. All instantaneous data shall be shown in the Computer Screen.

(C) Unit wise & integrated Data logging.

(D) Dedicated Prefabs / Ethernet for networking.

(E) Remote control via Telephone Modem or mini web server.

6.2.3.8.5 Switchgear and Protection System

The Solar PV System and the associated Power evacuation system shall be protected as per relevant International Standards (IS). Detailed design calculations shall be provided on fault power calculations and the philosophy of protective relaying with respect to short circuit kVA calculations.

6.2.3.8.5.1 33kV Switchgear and Equipment

2.3.11.1 General
Power generated in PV module shall be primarily delivered to 33kV Switching sub-station through LV/33kV, 3 winding Power transformer. Insulated (XLPE), sheathed and armored Cable shall be used for connection between AC output of the transformer of the Medium Voltage Power Platform (MVPP) and 33kV Bus of 33kV sub-station. The scope of supply of 33kV Switchgear and equipment shall include, but is not `limited, to the following main elements:

(1) 33 kV circuit breaker
(2) 33 kV Current Transformers
(3) 33 kV Voltage Transformers
(4) 33 kV Lightning Arresters
(5) 33 kV Isolator with Earthing Blade
(6) 33 kV XLPE (Single-Core) cable including Two end termination and one spare core (3+1) with necessary hardware from 33 kV MVPP to 33kV Switching Sub-Station

The design of 33 kV Switchgear and Equipment shall be as follows:

System Voltage
The system shall be as follows:
- Nominal system voltage : 33 kV
- Highest system voltage : 36 kV

Insulation level
The insulation level of the switchgear, equipment shall be as follows:

- Lighting impulse withstand test Voltage (1.2 / 50 micro sec) : 170 kV (Peak)
- Power frequency insulation level (for 1 mm.) : 70 kV

Outdoor Conductor
Insulated (XLPE), sheathed and armored (Cu Cable) shall be used for connection between AC output of the Transformer of the Medium Voltage Power Platform and 33kV Bus of 33kV sub-station.

Design Conditions
Switchgear equipment shall be designed to avoid local corona formation and discharge likely to cause radio interface, and to endure short circuit current without thermal and mechanical failure for 1 (one) second. All cubicles and enclosures shall be vermin proof, dust resistance and weatherproof.

(1) 33 kV Circuit Breakers (630 A)

Type
Three (3) pole, porcelain type, high speed, indoor, trip free in any position, motor operated or hydraulic & spring operated SF_6 gas puffer, single flow type complete with hydraulic pump, tank, piping, conduit, wiring, and all other necessary accessories.

Use
For paralleling, control and protection

Ratings

a. Rated voltage	: 33 kV
b. Rated insulation level	
- Lighting impulse withstands test voltage (1.2/50 micro sec)	: 170 kV (peak)
- Power frequency withstand voltage (for 1 mm)	: 170 kV :
c. Rated frequency	: 50Hz
d. Rated nominal current	: 630A
e. Rated short circuit breaking current	: 25 kA [rms, 3 sec]
d. Rated transient recovery voltage for terminal faults and rated characteristics for short line faults shall be in accordance with IEC 56	
g. Rated short circuit making current	: 65 kA
h. Rated operating time	: Less than 40 msec
i. Rated operating sequence (<2.5 cycles)	: O-0.3sec-CO-3min- CO

Control System
The rated supply voltages of closing and opening devices shall be 110/115 VDC, and the operation of circuit breaker shall be performed safely under the following conditions:

For tripping operation (-30% to +10%) : 77 to 121 VDC

For closing operation (-15% to +10%) : 94 to 121 VDC

The rated hydraulic pressure shall be recommended by the Contractor.

Requirements for Design and Construction

i. The circuit breakers shall have automatic trip free mechanism.
ii. Time difference between contacts of three (3) poles shall not be more than 0.006 sec.
iii. In case of phase open trouble, all phases of the circuit breaker shall be opened by a protection circuit.
iv. The arcing contact shall be of an arc proof metal and the main contact shall be covered with silver electroplated. Five (5) pairs of “a-b“ spare contacts shall be equipped with the auxiliary switches.
v. The tripping current of the trip coil shall not be more than 2 A per phase.
vi. The porcelain insulator or bushings shall have sufficient strength to withstand stressed due to breaker operation. The glazing colour shall be of brown. The creepage distance shall not be less than 25 mm / kV of phase to phase voltage.
vii. Integrating time register for hydraulic pump shall be driven by a self starting synchronous motor through mechanical gears to record operating hours of hydraulic pump and shall be able to perform four operations without AC power.

viii. Gas circuit breaker shall be provided with gas density detector responding to gas density and pressure. This gas density detector shall have two (2) different functions according to the gas

condition: The first step gives alarm and the second step locks the operating mechanism. Operating mechanism which employs compressed air or hydraulic for driving the circuit breaker shall be provided with pressure detector which have two (2) different functions according to compressed air or hydraulic condition: The first step gives alarm and the 2nd step locks the operating mechanism.

ix. The weather and dust proof type control box shall be furnished with the circuit breakers. The control box shall be equipped with all necessary parts to operate the circuit breaker, such as control solenoids, operating switch of remote and local control, auxiliary switch, terminal blocks, protective devices, indicating lamp sockets, and other accessories. An anti-condensation electric heater with thermostatic switch shall be provided inside the control box.

x. The circuit breakers shall be provided with an emergency push button switch with cover to prevent inadvertent switching.

xi. The circuit breakers shall be provided with an electrical anti pumping relay.

xii. The supporting structure shall be free from mechanical vibration and loosening under long term use.

xiii. The circuit breakers shall be designed to facilitate inspection, especially for those parts which need inspection frequently.

xiv. The circuit breakers shall be filled with sufficient SF_6 gas.

xv. SF_6 gas leak detector shall be furnished.

xvi. The circuit breakers shall be driven by hydraulic and spring latch. Hydraulic supplying system shall be furnished with the circuit breakers, and shall be installed in weather dust proof type housing. The operating mechanism shall be designed to meet the requirements of IEC 56

xvii. Temperature limitation shall be in accordance with IEC 56.

xviii. The Contractor shall furnish all control cables, pipes or ducts and fittings between each phase and control box.

xix. The indicating lamp signals which display “on (red) “and " off green)" of the main contacts shall be furnished on the each control box of circuit breaker.

Dielectric Test Voltage

a. Power frequency withstand voltage : 70 kV for one minute

b. Lighting impulse withstand voltage : 170 kV_{peak}
Full wave (1.2 / 50 micro sec)

c. Test voltage on control circuit : 2.0 kV for one min

Tools and Accessories

The following tools and accessories shall be supplied for each circuit breaker

a. Name plate
b. Position indicating lamps (red and green) or flags
c. Operation counter
d. Grounding terminals
e. Gas and hydraulic pressure gauge
f. Safety valves, if any
g. Pressure drop protecting device
h. Manual operation device.
i. Auxiliary switch
j. Control box with locking device
k. Steel supporting structure with anchor bolts and nuts
l. Operating mechanism.
m. Special tools for checking and testing
n. Power outlet, single phase, 33 V, 10 A in control box
0. Conduit pipes
p. Communication facilities between switchgear and control room
q. Other necessary accessories, if any

33 kV Circuit Breakers (1250 A)

Type
Three (3) pole, porcelain type, high speed, indoor, trip free in any position, motor operated or hydraulic & spring operated SF_6 gas puffer, single flow type complete with hydraulic pump, tank, piping, conduit, wiring, and all other necessary accessories.

Use
For paralleling, control and protection

Ratings

a. Rated voltage	: 33 kV
b. Rated insulation level	
- Lighting impulse withstands test voltage (1.2/50 micro sec)	: 170 kV (peak)
- Power frequency withstand voltage (for 1 mm)	: 170 kV :
c. Rated frequency	: 50Hz
d. Rated nominal current	: 1250A
e. Rated short circuit breaking current	: 31.5 kA [rms, 3 sec]
d. Rated transient recovery voltage for terminal faults and rated characteristics for short line faults shall be in accordance with IEC 56	
g. Rated short circuit making current	: 80 kA
h. Rated operating time	: Less than 40 msec
i. Rated operating sequence (<2.5 cycles)	: O-0.3sec-CO-3min- CO

Control System
The rated supply voltages of closing and opening devices shall be 110/115 VDC, and the operation of circuit breaker shall be performed safely under the following conditions:

For tripping operation (-30% to +10%) : 77 to 121 VDC

For closing operation (-15% to +10%) : 94 to 121 VDC

The rated hydraulic pressure shall be recommended by the Contractor.

Requirements for Design and Construction

i. The circuit breakers shall have automatic trip free mechanism.
ii. Time difference between contacts of three (3) poles shall not be more than 0.006 sec.
iii. In case of phase open trouble, all phases of the circuit breaker shall be opened by a protection circuit.
iv. The arcing contact shall be of an arc proof metal and the main contact shall be covered with silver electroplated. Five (5) pairs of “a-b“ spare contacts shall be equipped with the auxiliary switches.
v. The tripping current of the trip coil shall not be more than 2 A per phase.
vi. The porcelain insulator or bushings shall have sufficient strength to withstand stressed due to breaker operation. The glazing colour shall be of brown. The creepage distance shall not be less than 25 mm / kV of phase to phase voltage.
vii. Integrating time register for hydraulic pump shall be driven by a self starting synchronous motor through mechanical gears to record operating hours of hydraulic pump and shall be able to perform four operations without AC power.

viii. Gas circuit breaker shall be provided with gas density detector responding to gas density and pressure. This gas density detector shall have two (2) different functions according to the gas condition: The first step gives alarm and the second step locks the operating mechanism. Operating mechanism which employs compressed air or hydraulic for driving the circuit breaker

shall be provided with pressure detector which have two (2) different functions according to compressed air or hydraulic condition: The first step gives alarm and the 2nd step locks the operating mechanism.

ix. The weather and dust proof type control box shall be furnished with the circuit breakers. The control box shall be equipped with all necessary parts to operate the circuit breaker, such as control solenoids, operating switch of remote and local control, auxiliary switch, terminal blocks, protective devices, indicating lamp sockets, and other accessories. An anti-condensation electric heater with thermostatic switch shall be provided inside the control box.

x. The circuit breakers shall be provided with an emergency push button switch with cover to prevent inadvertent switching.

xi. The circuit breakers shall be provided with an electrical anti pumping relay.

xii. The supporting structure shall be free from mechanical vibration and loosening under long term use.

xiii. The circuit breakers shall be designed to facilitate inspection, especially for those parts which need inspection frequently.

xiv. The circuit breakers shall be filled with sufficient SF_6 gas.

xv. SF_6 gas leak detector shall be furnished.

xvi. The circuit breakers shall be driven by hydraulic and spring latch. Hydraulic supplying system shall be furnished with the circuit breakers, and shall be installed in weather dust proof type housing. The operating mechanism shall be designed to meet the requirements of IEC 56

xvii. Temperature limitation shall be in accordance with IEC 56.

xviii. The Contractor shall furnish all control cables, pipes or ducts and fittings between each phase and control box.

xix. The indicating lamp signals which display “on (red) “and " off green)" of the main contacts shall be furnished on the each control box of circuit breaker.

Dielectric Test Voltage

a. Power frequency withstand voltage : 70 kV for one minute

b. Lighting impulse withstand voltage : 170 kV_{peak}
Full wave (1.2 / 50 micro sec)

c. Test voltage on control circuit : 2.0 kV for one min

Tools and Accessories

The following tools and accessories shall be supplied for each circuit breaker

a. Name plate
b. Position indicating lamps (red and green) or flags
c. Operation counter
d. Grounding terminals
e. Gas and hydraulic pressure gauge
f. Safety valves, if any
g. Pressure drop protecting device
h. Manual operation device.
i. Auxiliary switch
j. Control box with locking device
k. Steel supporting structure with anchor bolts and nuts
l. Operating mechanism.
m. Special tools for checking and testing
n. Power outlet, single phase, 33 V, 10 A in control box
0. Conduit pipes
p. Communication facilities between switchgear and control room
q. Other necessary accessories, if any

(2) 33 kV Voltage Transformer

Type
Outdoor, single phase, oil immersed with level indicator or gauge, N_2 gas sealed Electromagnetic type voltage transformer.

Use
For metering and protection

Ratings

a. Rated voltages
- Primary : 33/√3 kV
- Secondary : 110/√3 V
- Tertiary : 110/ 3 V

b. Rated insulation level

- Lighting impulse withstand voltage Full wave (1.2 / 50 micro sec) : 170 kV_{peak}
- Power frequency withstand voltage for one minute : 70 kV

c. Rated frequency : 50 Hz

d. Rated burden
- Secondary : 50VA
- Tertiary : 50 VA

e. Accuracy class : 1.0 (secondary)
: 3 P (tertiary)

Requirements for Design and Construction

i. The voltage transformers shall be have hermetically sealed and accessories shall be of weatherproof type. The glazing color shall be of brown.

ii. Creepage distance of bushing shall not be less than 25 mm / kV of phase to phase voltage.

iii. A protection device shall be provided against short circuit of the secondary circuits of the voltage transformers.

iv. Unless otherwise specified, the characteristic and others shall comply with the requirements of IEC 186.

Dielectric Test Voltages

a. Power frequency withstand voltage : 70 kV for one minute on primary windings

2.0 kV for one minute on secondary windings

b. Lighting impulse withstand voltage Full wave (1.2 / 50 micro Sec) : 170 kV_{PEAK}

Accessories
The following accessories shall be provided for each voltage transformer.

a. Nameplates
b. Grounding terminals
c. Lifting lugs

d. Steel supporting structure with anchor bolts and nuts
e. Junction boxes
f. Conduit pipes
g. Other necessary accessories, if any

(3) 33 kV Current Transformers

Type
Outdoor, single phase, oil immersed with level indicator or gauge, N_2 gas sealed porcelain clad type, quadruplicate cores.

Use
For metering and protection

Ratings

a. Rated current
- Primary : 50-100 A [to be at actual requirement]
- Secondary : 5-5-5-5 A

b. Rated insulation level : 170 kV_{PEAK}
-Lighting impulse withstand voltage
Full wave (1.2 / 50 micro sec)

-Power frequency withstands voltage : 70 kV for one min.

c. Rated frequency : 50 Hz

d. Rated burden : 15 VA for protection and
: 15 VA for measuring.

e. Rated continuous thermal current : 120%

f. Short time current ratings

-Thermal rating (rms for one sec) :40 kA
-Dynamic rating (peak) :2.5 times the thermal ratings

g. Accuracy classes
-For metering : 0.2, n‹5
-For protection : 5P20

Requirements for Design and Construction

i. The current transformer shall be of oil immersed hermetically sealed structure type.

ii. Internal conductor shall be adequately reinforced taking into account over current intensity.

iii. The junction box with terminals shall be provided for the secondary circuit connections.

iv. Each current transformer shall be equipped with terminal block of short circuiting type.

v. Creepage distance of bushing shall not less than 25 mm/kV of phase to phase voltage. The glazing color shall be of brown.

vi. Unless otherwise specified, the characteristics and others shall comply with IEC185

Dielectric Test Voltages

a. Power frequency withstand voltage on primary windings : 70 kV for one minute

b. Lighting impulse withstand voltage Full wave (1.2/ 50 micro sec) : 170 kV_{PEAK}

c. Power frequency withstand voltage : 2.0 kV for one minute on secondary windings

Accessories

The following accessories shall be provided for each current transformer.

a. Nameplates
b. Grounding terminals
c. Lifting lugs
d. Steel supporting structure with anchor bolts and nuts
e. Junction boxes
f. Conduit pipes
g. Other necessary accessories, if any

(4) 33 kV Lightning Arresters

Type

Outdoor, single phase, self standing, Metal-Oxide type with surge operating counter.

Use

For protection of 33 kV outdoor switchyard equipment and transformer windings

Electric system to be protected

Three (3) phase, three (3) wire, neutral point solidly grounded system.

Ratings and Performances

a. Rated voltage	: 33 kV
b. Rated frequency	: 50 Hz
c. Nominal discharge current	: 10 kA
d. Type of duty	: Heavy, Long duration Discharge
e. Pressure relief class	: C
f. Lighting impulse insulation level (1.2 / 50 micro sec)	: 170 kV_{peak}
g. Maximum residual voltage	: 110 kV
h. Power frequency spark-over voltage	: 70 kV po (rms)

Operating duty

The arrester shall successfully interrupt the dynamic current repeatedly conducted by impulse wave.

Requirements for Design and Construction

i. The series gaps shall be so designed that for practical purposes the various characteristics will not alter under the change of weather conditions

ii. The various parts of the lightning arrester shall be of complete moisture proof construction so that the characteristics shall not be impaired under long term use. Sealed parts shall be so designed to prevent to ingress of moisture or water under long term use.

iii. The operation counter shall be equipped on the lightning arrester in each phase and consist of a sure current recording and measuring device, such as a magnetic link surge crest ammeter, and counter for the number of discharges of the lightning arrester. It shall be located at the position convenient for inspection.

iv. Creepage distance of bushing shall not be less than 25 mm/ kV of phase to phase voltage. The glazing colour shall be of brown.

v. Unless otherwise specified, tile characteristics and others shall comply with IEC 99-1

Dielectric Test Voltage

a. Power frequency withstand voltage : 70 kV for one

b. Lighting impulse withstands voltage : 170 kV (peak)
(1.2 / 50 micro sec)

Accessories

The following accessories shall be provided for each lightning arrester.

a. Nameplates
b. grounding conductor to grounding terminal
c. Operating counter
d. Grounding terminal
e. Steel supporting structure with anchor bolts and nuts
f. Other necessary accessories, if any

(5) 33 kV Isolator with Earthing Blade

1.	Installation	Outdoor
2.	Type	Air
3.	Construction	Open
4.	Operation	Gang
5.	Operating Mechanism	Manual
6.	Mounting Position	Vertical on supporting structure.
7.	Number of Pole	3 (Three)
8.	Frequency	50 Hz
9.	System Nominal Voltage	33 KV
10.	System Maximum Voltage	36 KV
11.	Basic Insulation Level	170 KV
12.	Rated continuous Current	1250A
13.	Rated Short Time Withstand Current	31.5 KA (3 Sec.)
14.	Rated 1 minute power frequency withstand voltage, kV (rms)	70KV
15.	Standard	Design, Manufacture, Testing, Installation and Performance shall be in accordance to the latest editions of the relevant IEC standards.

A. FEATURES

- Single-Break Pattern [Vertical break or Horizontal break (centre break)], OFF load type.
- Channel type mounting base insulator, blast.
- Coupling tubes for gang operation and adjustable operating rod with insulating link and intermediate guide for operating rod.
- Auxiliary switch, operated by the phase coupling tube, to control circuits for operating indicators, alarms, electrical inter-locking with the respective breaker to ensure that the isolator can only be operated when the breaker is in “OFF’ position etc. with at least 10% spare contacts.
- Terminal connectors shall be suitable for ACSR Merlin/ Grosbeak/ HAWK conductor as required.
- Earthing steel pads with provision for earth lead.
- Glands for multi-core control cables.
- Provision for pad locking in “ON” & “OFF” position.
- Provision of key interlocking.

- Galvanized Nuts, bolts & all accessories for mounting on structures.
- Interlocking magnet for electrical interlocking.
- All ferrous parts shall be hot dipped galvanized after completion of machining. Galvanizing shall be in accordance with BS-729 and ASTM A90.
- All control devices shall be suitable for operation on 110 V DC supplies from Sub-station.
- Operating mechanism shall be fully tropicalized and housed in waterproof housing.
- Complete supporting steel structure.
- Isolating devices shall be accordance with IEC-60129. They shall be complete with supporting steel work and installed to maintenance of any section of the sub-station plant when the remainder is alive and shall be so located that the minimum safety clearances are always maintained.
- The air gap between terminals of the same pole with the isolator open shall be of a length to withstand a minimum impulse voltage wave of 115. Percent of the specified impulse insulation rating to earth
- Isolating switches shall be designed for life operation and isolators shall be hands operated. Where used for feeders they shall be capable of switching transformer-magnetizing currents. Main contacts shall be of the high-pressure line type and acing contacts.
- All feeder isolators shall be fitted with approved three phase link earthing devices, mechanically, coupled or interlocked with the main isolator so that the earthing device and main isolator con not be closed at the same time.
- Isolator operating mechanism shall be of robust construction, carefully fitted to ensure free action and shall be un-effected by the climatic conditions at site. Mechanism shall be as simple as possible and comprise a minimum of bearing and wearing parts. Approved grease lubricating devices shall be fitted to all principal bearings. The mechanism shall be housed in weatherproof enclosure complete with auxiliary switches, terminal blocks and cable gland plates. All steel and malleable iron parts including the support steelwork shall be galvanized as per BS-729 and ASTM A90.

B. Blades:
All metal parts shall be of non rusting and non corroding material. All current carrying parts shall be made from high conductivity electrolytic copper. Bolts, screws and pins shall be provided with lock washers. Keys or equivalent locking facilities if provided on current carrying parts, shall be made of copper alloy. The bolts or pins used in current carrying parts shall be made of non corroding material. All ferrous castings except current carrying parts shall be made of malleable cast iron or cast steel. No grey iron shall be used in the manufacture of any part of the isolator. The live parts shall be designed to eliminate sharp joints, edges and other corona producing surfaces, where this is impracticable adequate corona shield shall be provided. Isolators and earthing switches including their operating parts shall be such that they cannot be dislodged from their open or closed positions by short circuit forces, gravity, wind pressure, vibrations, shocks, or accidental touching of the connecting rods of the operating mechanism. The switch shall be designed such that no lubrication of any part is required except at very infrequent intervals i.e. after every 1000 operations or after 5 years whichever is earlier.

C. Base :
Each isolator shall be provided with a complete galvanised steel base provided with holes and designed for mounting on a supporting structure.

D. Supporting Structure
All isolators and earthing switches shall be rigidly mounted in an upright position on their own supporting structures. Details of the supporting structures shall be furnished by the successful tenderer. The isolators should have requisite fixing details ready for mounting them on switch structures.

6.2.3.8.5.2 Protection and Relaying System:

The Solar PV System and the associated Power evacuation system shall be protected as per relevant International Standards (IS). Over Current relays, Reverse Power Relays, Differential Protection Relays and Earth fault relays have to be provided. Detailed design calculations shall be provided on fault power calculations and the philosophy of protective relaying with respect to short circuit KVA calculations.

33kV Protection, Control, Metering and Relay Panel for Power Transformer, each Panel comprising:

1.	Indicating analogue Ampere meter flush mounting with dual scales options, 0-300/600A for connecting to current transformer ratio 50-100 [to be at actual requirement]/5-5A for LV/33 kV Power Transformer.
2.	Indicating analogue voltmeter with six position selector switch flush mounting with scales 0-40 KV for connection to potential transformer ratio (33/√3)/ (0.11/√3)/(0.11/√3) KV, (50 Hz).
3.	a) Numerical Programmable Multifunctional type MFM Meter It shall be capable of measuring and displaying MW, MVAR, PF, V, I, f, ø etc. distinguishing import and export operation.
	b) 3 phase, 4 wire, 3 element solid state, indoor type, multi tariff programmable KWh meter of class of accuracy 0.2 with the features for measuring the parameters viz. phase voltages, phase currents, system frequency, per phase & total KW with demand, KVAR, Power factor etc.
4.	Numerical programmable type Three Phase combined IDMT Over Current relay and Earth fault protection relay of 5 Amps, 50 Hz, 110V dc, 3 second operating time ratings having 3 (Three) over current units and one earth fault with current setting range of the O/C & E/F relay shall be from **$0.1*I_n$ to $40*I_n$** (where I_n is relay nominal current) for both overcurrent and earth fault element. All O/C & E/F relays shall have both IDMT & DT (51) and Instantaneous (50) function along with IEC NI, VI, EI, LTI etc. curve setting capability. The relays are housed in a horizontal, flush mounting draw-out case (tropicalized) with self-reset trip relay (relaying 02 nos. NO contacts as spares) (Not to be included in Differential Relay).
5.	Numerical programmable type Differential relay with REF inbuilt feature for LV/33 kV Power Transformer. The relay(s) are housed in a horizontal, flush mounting draw-out case (tropicalized) with hand-reset trip relay (having 02 nos. NO contacts as spares).
6.	Master Trip relays
7.	Separate Auxiliary Flag Relays for Device/Self Protection of Power Transformer to be provided. The following Auxiliary Flag Relays shall be available - **OTA, OTT, WTA, WTT, BA, BT, OLTC Surge, PRD for main tank**, etc.
8.	OLTC Tap position indicator & Lower/Raise push-button switchs with blinking feature along with AVR relay etc.
9.	All necessary switches (Local and remote selector switch, TNC switch, etc.), CT, PT test terminal blocks, signaling set lamps, master trip relay, trip circuit supervision relay for each trip circuit coil, PT supervision relay, auxiliary relay, MCB, fuse and provision for lighting etc. terminal blocks, mimic diagram with circuit breaker control indicating switches and isolating position indicating switches, indicating lamps shall be provided to indicate "Spring Charge"/ readiness for closing and healthy trip circuit indicating readiness for tripping. The mimic and positions of circuit breaker control cum position indicating switch and isolator position indicating switch arrangement in the panel. Mimic diagram shall contain LED based Semaphore Indicator for Isolator/Breaker/Earth switch position. The Annunciator shall have 24 windows and have built in buzzer and AC/DC fail relay.
10.	70 W, 240 V AC, Single Phase heater with thermostat and a visible light indicator which indicate the ''ON''- ''OFF'' position of the heater

33 KV PROTECTION, CONTROL, METERING AND RELAY PANEL FOR EVACUATION, each comprising:

1.	Indicating analogue Ampere meter flush mounting with dual scales option (0-400A/800A) for connecting to the current transformer ratio 50-100[to be at actual requirement]/5-5A for Evacuation Line.
2.	Indicating analogue voltmeter with six position selector switch flush mounting with scales 0-40 KV for connection to potential transformer ratio (33/√3)/ (0.11/√3)/(0.11/√3) KV, (50 Hz).
3.	a) Numerical Programmable Multifunctional type MFM Meter It shall be capable of measuring and displaying MW, MVAR, PF, V, I, f, ø etc. distinguishing import and export operation.

	b) 3 phase, 4 wire, 3 element solid state, indoor type, multi tariff programmable KWh meter of class of accuracy 0.2 with the features for measuring the parameters viz. phase voltages, phase currents, system frequency, per phase & total KW with demand, KVAR, Power factor etc.
4.	Numerical programmable type Three Phase combined IDMT Over Current relay and Earth fault protection relay, with directional feature of 5 Amps, 50 Hz, 110V dc, 3 second operating time ratings having 03 (Three) over current units and 01(one) earth fault with current setting of 50 to 200% and one earth fault unit with current setting range of the O/C & E/F relay shall be from **$0.1*I_n$ to $40*I_n$** (where I_n is relay nominal current) for both overcurrent and earth fault element. All O/C & E/F relays shall have both IDMT & DT (51) and Instantaneous (50) function along with IEC NI, VI, EI, LTI etc. curve setting capability. Along with O/C and E/F relay the 33 evacuation line shall have Directional Overcurrent Relay and Neutral Directional Overcurrent Relay The relays are housed in a horizontal, flush mounting draw-out case (tropicalized) with self-reset trip relay (relaying 02 nos. NO contacts as spares).
5.	All necessary switches (Local and remote selector switch, TNC switch, etc.), CT, PT test terminal blocks, signaling set lamps, master trip relay, trip circuit supervision relay for each trip coil, PT supervision relay, auxiliary relay, MCB, fuse and provision for lighting etc. terminal blocks, mimic diagram with circuit breaker control indicating switches and isolating position indicating switches, indicating lamps shall be provided to indicate "Spring Charge"/ readiness for closing and healthy trip circuit indicating readiness for tripping. The mimic and positions of circuit breaker control cum position indicating switch and isolator position indicating switch arrangement in the panel. Mimic diagram shall contain LED based Semaphore Indicator for Isolator/Breaker/Earth switch position. The Annunciator shall have 12 windows and have built in buzzer and AC/DC fail relay.
6.	70 W, 240 V AC, Single Phase heater with thermostat and a visible light indicator which indicate the "ON"- "OFF" position of the heater

6.2.3.8.5.3 Lightning & Over Voltage Protection:

a. The SPV Power plant should be provided with Lightning and over voltage protection connected to proper Earth mats. The 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.
b. The Lightning conductors shall be made as per applicable International Standards in order to protect the entire Array Yard Lightning stroke.
c. The lightning conductor shall be earthed through flats and connected to the Earth mats as per applicable International 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, watering pipe using Charcoal or Coke and Salt as per required provisions of IEC or equivalent international standard.
d. The bidder shall ensure adequate lightning protection to provide an acceptable degree of protection as per IEC or equivalent international standard for the array yard. If necessary more number of Lightning conductors may be provided. Theoretical design calculations and detailed explanations shall be provided.
e. The Control Room building is to be protected from lightning stroke with Lightning conductor as per requirements of IEC or equivalent international standard.
f. All Building Earth conductor shall be inter connected through the concept of Earth Mats for interconnection with separate earth pits.

6.2.3.8.5.4 DC, UPS & Auxiliary Power Supply

The Bidder shall supply, all requested auxiliaries (but not limited to), such as:

- UPS Battery Emergency Power Supply (DC and Safe AC)
- internal/external lighting and emergency lighting systems in Control building
- air conditioning in Control building
- power supply of CCTV
- fire alarm system

The Bidder shall submit the proposed auxiliary supply system with his Proposal.

Power supply systems may be categorized into essential and non-essential groups. Essential supplies should be continuously available without any interruption, whereas non-essential ones may be allowed to be subject to interruptions.

Low-voltage AC and DC systems shall be designed in accordance with the IEC 60364.

DC and Safe AC

The uninterruptable power supply system (UPS) shall serve the costumers which have to remain in operation in the event of the network failure i.e. emergency lighting, measuring, control room, CCTV, fire alarm system etc.

Some equipment (e.g. MV switchgear circuit breaker heaters) may require the provision of changeover power supplies.

The 100% load of 230/400 V AC (Safe AC), 110 V DC and 24 V DC are to be defined by the Contractor providing classification of consumers and their required backup time values.

The UPS system shall consist of:

- rectifier/battery/inverter set
- static switch by-pass and maintenance by-pass set
- three phase AC distribution board.

The DC system shall consist of:

- AC/DC rectifier
- batteries
- DC distribution board.

The rectifiers and inverters shall be arranged in sheet steel cubicles, which shall be matched to the distribution cubicles in respect of height and other dimensions.

The rectifiers and inverters shall be designed for operation with natural cooling. If forced air-cooling is required, then 2 x 100% air fans with monitoring and local and remote alarm signals must be provided.

The DC distribution is to be fed by 1x100% batteries and rectifier.

The digital control system (DCS) shall be supplied from a 24 V DC system. Redundant 24 V DC distribution system shall be provided.

The cubicles of 24 V DC consumers shall be supplied by redundant feeders. Redundant Safe AC system shall be provided.

230 V Safe AC system comprises one inverter with static bypass switch unit and a safe busbar. The inverter shall be supplied from sections of the 110 V DC main distribution. The static bypass switch shall be supplied from the 0.4 kV essential switchgear.

The 230 V Safe AC system supplies the equipment requiring uninterrupted supply (UPS) e.g. measuring, control system etc.

The 110/24 V DC/DC converters serve as supply for I&C cabinets and other consumers requiring 24 V DC supply. Each DC/DC converter is supplied via coupling diodes from both sections of the110 V DC main distribution.

The outgoing circuits in the safe DC and AC main distribution shall be equipped with monitored fuse- and load-break switches, fuses and contactors, mini-circuit breakers, etc.

The individual cubicles shall be bulk headed against one another by sheet metal walls or equivalent material.

The DC UPS shall be located inside an air conditioned room, the rectifier / charger and distribution board shall be rated for continuous operation at 40° C. Sizing of battery shall be based on a minimum of -3° C and maximum of 55° C ambient. The temperature derating factor and ageing factor of the battery shall be based on the above temperatures.

Battery

For the DC system, the Bidder shall supply Lead Acid type batteries designed according to Standard EUROBAT 15 with a life expectancy of 20 years or more.

The batteries shall be sized such that with each (1x100%) battery supplies the total load and shall be able to cover 100% load for 3 hours.

Sizing of batteries shall be based on worst case scenarios that might cause a total loss of AC services (i.e. total blackout, fault on a major bus in the installation, etc.). As a minimum, the DC batteries shall have enough capacity to trip breakers and switches at the beginning of the discharge period, to supply power to the continuous DC load and to close the elements of the installation that will restore AC services.

If applied, battery banks with exposed live parts shall be kept in a room or cubicle accessible only to authorized personnel.

Battery rooms or cubicles shall be dry and adequately ventilated to limit hydrogen accumulation. Allowable hydrogen levels and recommended number of air changes shall conform to national regulations.

Batteries shall be installed on insulated subframes with the necessary consoles and fixed material. At least 1.0 m access space shall be provided at the front and sides of the battery rack.

Internal/external lighting and emergency lighting system

The installation method differs between internal lighting (offices, rooms for similar purposes, technical rooms) and exterior lighting.

All lighting fittings and all equipment comprising the lighting sub-distribution units shall meet the operational requirements in full at an ambient temperature of 40°C and for a relative humidity of up to 100%.

The lights must be connected in a 3-phase circuit, so that in an event of failure of the phase only each third lamp will go out. The cable cross section shall be calculated according to the IEC 60364-5-52.

Location of the lighting and small power equipment shall be reviewed before installation so that satisfactory co-ordination with walkways, streets, fences, gates, crossings, entries, PV panel support structures, cable ways and other installations can be assured.

The lighting systems are to be classified as follows:

- Normal lighting fed from normal supply: shall provide desired and required illumination levels in the various indoor and outdoor areas and roads
- Emergency lighting fed from safe AC supply (UPS): In case of failure of normal lighting, emergency lighting shall provide sufficient illumination to allow safe movement of personnel.

In coordination with the design of the alarm and CCTV systems outdoor lighting as a minimum shall be provided for perimeter of the plant and at the entrances of all buildings on site including the transformer stations.

Indoor lighting can be operated manually and/or using automatic motion detecting devices where suitable.

In control room, switchgear rooms flush-mounted fluorescent tube fittings are to be provided. The lightning fittings are to be designed with required louvers for mounting in the suspended mineral fiber acoustic tiles.

In battery room explosion-proof lighting fitting (EExd II CT2) are to be provided.

Outdoor lighting at the entrances of buildings and where suitable shall be operated automatically (motion detection) and also shall permit remote control from the main control room and shall be included in the concept for intrusion alarm. The perimeter lighting shall be operated centrally and also included in the security concept for the plant.

The lighting shall be designed so that the lighting illumination density listed in DIN EN 12464-2 will be achieved. In that respect an aging factor of 20 % is to be taken into account so that new lighting densities must be achieved as a minimum in the acceptance measurement.

Fire alarm system and fire fighting

The detectors shall be stable against environmental influences (ambient temperature, humidity etc.) and shall be so positioned as to avoid the possibility of spurious operations due to air current from pressurization, ventilation or air-conditioning grills.

A manually operated alarm system shall be provided in each building with an alarm initiating point at each room exit. This system shall be fully integrated with the automatic fire detection and alarm system.

Alarms shall be signaled locally (audible and visible) and in the plant control room and should also permit remote connection.

All MVAC systems must be shut down in case of fire to prevent spread of fire.

Suitable firefighting equipment shall be provided in the control buildings, transformer stations, and transformers compounds as required.

- The design and installation of the fire protection and alarm systems shall be in accordance with Section 6.2.4;
- The design and installation of the fire protection and alarming systems shall be in accordance with highest international recognized standard, preferably the relevant NFPA-Codes and international standards

The fire detection and alarm shall be DC operated by UPS

All fire equipment & system installed outdoor must be IP65.

6.2.3.8.6 Energy Meter

The metering system shall be capable of obtaining and interpreting readings and performing the adjustments, if required, to comply with the pertinent information concerning Plant performance required. The system shall be part of the Plant's control and measurement installations, provided it complies with the criteria specified below.

Accuracy
Maximum Allowable Errors

Measured Parameter	**Maximum Error**
Ambient Temperature	$\pm 1^0$C
Ambient Relative Humidity	$\pm$ 3%

Water Temperature (when applicable)	± 1^0C
Net Electricity (kWh) meters	± 0.2%
Capacity (kW) meters	± 0.1%
Time Reference	0.01 seconds per week-maximum

Technical Specifications of Programmable Tariff Meter

- Technical Specifications of Programmable Tariff Meter shall be compatible with BPDB automated meter reading system.
- Standard Metering Protocol for Remote Interface. 4G GPRS (able to support 3G and EDGE) communication module with necessary accessories. Ethernet port along with RS232/485 port for communication
- Meter must support DLMS protocol.
- Optical head and software to Upload and Download of billing and analytical meter data. Software password protection facility is a must for meter programming or for Meter configuration which will be assigned and preserved by BPDB.The meter must be capable to display & record meter ID, Program, Total kWh, kVarh, kVAh, kW, kVar, kVA, PF, per phase (voltage, current, phase angle), load profile at 30 min intervals with minimum 16 channel storage data for minimum 120 days, Event log, power failure etc. Meter shall be installed at plant's side

6.2.3.8.7 Weather Station

There shall be a weather station which will measure the ambient temperature, PV panel temperature, solar radiation, wind speed with direction etc. and send the data to the data logger through RS-485 communication link. The data logger will also collect power/energy related data from digital energy meters through RS-485 link and will provide the data to the computer. There must be a monitoring and display system comprising of computer, monitor and appropriate software to gather all the data from data logger, process the data and display the data in the monitor's window as well as store data.

The Solar Power plant shall be designed with 4 (four) Nos Weather Monitoring system, which comprises of: -

1. Global Horizontal Irradiance (GHI) Pyranometer
2. Global Inclined Irradiance (GII) Pyranometer
3. Module Temp. Sensor
4. Ambient Air Temperature cum Relative Humidity Sensor
5. Control Room Temperature Sensor
6. Wind velocity Sensor

The exact location of the anemometer will follow the recommendations from the supplier of the mounting system.

· Wind direction sensor.

· Dust fall verification for determination of soiling losses by means of two inclined reference cells on the planes of array (POA). The first reference cell shall be cleaned on a weekly basis and the second one shall be cleaned together with all the modules of the PV Plant.

6.2.3.8.8 Lighting and Illumination

The following lighting and small power arrangements shall be provided as a minimum by the Contractor.

No	Location	Illumination Level (Lux)	Type of Fitting
a.	**PV Plant Area**		
	PV Plant Area	20	LED Flood light
	Road or path	10	LED street light
b	**33 KV Switchyard**		
	Around Switchgear	20	LED Flood light
	Roadways	10	LED street light

No	Location	Illumination Level (Lux)	Type of Fitting
c	**Control Room cum Office Building**		
	Control room	500	LED Lighting system
	Electrical room and cable room	50	LED Lighting system
	Office	500	LED Lighting system
	Toilet, corridor, etc.	50	LED Lighting system

Emergency Lighting
The Contractor shall design DC emergency lighting and power supply system for the power station, and illumination level of DC emergency lighting shall be as follows.

The lighting shall consist of 125 V DC operated incandescent luminaries.

Location		Illumination Level (Lux)
Control room and inside of control package	:	15
Inside of other package	:	1
The other area surrounding the plant	:	0.5

Additional emergency lighting arrangement, independent emergency light units operated from built in charger and batteries charged by 230 V AC shall also be provided strategically. Total ten units shall be included in the Tender.

6.2.3.8.9 PV Module Washing System
The PV Module washing system is used to improve peak output performance of their Solar Power Plants by washing photovoltaic arrays. Solar panel washing is achieved with a combination of water and gentle foam-brush friction. A sophisticated brush with ultrasonic sensors shall be used to adjust the brush to maintain feather light pressure on the PV panels during cleaning and to avoid damage in case of rough terrain. Solar panel washing shall have a combination of water and gentle foam-brush friction system.

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- Double joystick operator servo-controls (left-travel, right-boom and brush control)
- Three element telescoping boom. Washing capacity up to 20' height/length
- Brush length up to 12'
- Full hydrostatic machine with load sensing hydraulic distributor for better boom control
- Water pressure spray bar to 580psi (40bar)
- Water tank capacity 650 gallon (2400l)
- Swivel seat and boom, able to wash right or left. Machine able to wash in fwd/rev

6.2.3.8.10 Fire Detection & Fighting Facilities

General:

The Contractor shall design, manufacture, delivery to the Site, install, test and commission the firefighting system to protect the Solar PV Plant and all associated equipment and Outdoor yard. Fire detection and Alarm system for office building and control & equipment room shall be provided. In particular, the following shall be included:

- Dry Chemical Powder Fire Extinguishers.
- Water Hydrant System including electric motor, water reservoir, hydrant stands, hoses etc.
- Sand Buckets
- Fire Detection and Alarm system

Design Requirements:
All fire protection installations shall comply with the requirements of the codes of practice of the National Fire Protection Association, Boston, Massachusetts, U.S.A as appropriate for the respective systems, subject to the approval of the Engineer. The codes and practice of the Japanese Fire Protection may also be considered.

Dry Chemical Powder Fire Extinguishers:

The Dry Chemical Powder Fire Extinguisher shall be Upright type of capacity 8 Kg conformed to NFPA Codes and Standard. The fire extinguisher shall be suitable for fighting fire of oils, solvents, gases, paints, varnishes, electrical wiring, live machinery fires, all flammable liquid & gas.

The following portable fire fighting equipment or equivalent shall be provided:

(1) Eight 8 kg Dry chemical extinguishers

Hydrant System:

Fire hydrant of water type shall be provided in the power plant. Hydrants shall be installed at required places around PV Plant. Each hydrant stand shall be fitted with an isolating valve and approved type of instantaneous hose complying 30-m hose with combined jet/water-fog nozzle shall be provided in the cabinet adjacent to each hydrant.

Sand Buckets:
The bucket should be wall mounted made from at least 24 SWG sheet with bracket fixing on wall conforming to NFPA Codes and Standard**.**

Fire Detection and Alarm system:
Fire detection shall be by means of ultra violet flame detectors with a backup system utilising rate-of-rise temperature detectors. The use of smoke detectors shall be subject to specific approval by the Engineer as regards their type and location.

6.2.3.8.11 Security and Surveillance Facilities

General:

The Contractor shall design, manufacture, delivery to the site and install Communication and Security System which shall be comprised of but not limited to the following:

- Closed Circuit Television (CCTV) System (IP based) for the plant security;
- One IP telephone set (Cisco) with accessories.

Closed Circuit Television (CCTV) System:

Security and surveillance of different operating areas in the plant as an aid to operators, IP based CCTV system shall have to be provided. Adequate number of dome type cameras with facilities like Zoom, pan, tilt etc. would be provided at various operating areas.

The camera shall have a resolution of at least 1280 horizontal lines. The camera pictures shall be displayed at the Administrative Building (Manager), Central Control Room (CCR) and Security Supervisor room where the camera view or combination of views, selected by an operator shall be displayed on colour LCD video monitors. A digital video recording system shall also be provided to allow a permanent record to be made from all or selected channels. The system shall store the CCTV data for at least 1 (one) month.

The complete system, as specified including, but not limited to the following:-

- High resolution colour cameras including lenses, mountings and housings.
- Camera for CCTV have capabilities to cover capturing outdoor video ranging minimum 30 meter.
- Colour Monitors
- Pan/tilt units for moveable cameras
- Video matrix switcher and control system
- Hard Disk / DVD recorder
- Video multiplexers
- Video transmission system including cabling, launch, line, equalizing, repeating amplifiers, etc.

These specific areas as listed below shall be considered as minimum requirements. As minimum, the following areas of the plant shall be covered by video surveillance (CCTV).

- Control Room (4 Unit)
- Building gate entrance area. (2 Unit)
- Security gate(2 Unit)
- Sub-station (2 Units)
- Solar PV Array area (Minimum 50 Units)

IP telephone System

IP phone uses voice over IP technologies for placing and transmitting telephone calls over an IP network, such as the Internet, instead of the traditional public switched telephone network (PSTN). The telephone set shall be installed at the Central Control Room (CCR).

6.2.6 Civil and Building Works

General:

The General Conditions, Tender Drawings, relevant Specifications of materials and workmanship described elsewhere in this Documents, Schedule of Rates shall be read in conjunction with this Specification. On the other hand, Local Code of Practice shall be followed where not mentioned.

The civil works shall include collection of site data, detailed design, production of working drawings, provision of labour, supply of construction plant and materials, construction and rectification of defects during the Warranty Period of the Works. Moreover, during design, construction and operation phases, all works and activities of this project should be followed by health, safety and environmental practice according to international standards and guidelines.

Topographical Survey:

The Contractor shall carry out surveys as necessary for the proper design and execution of the Works. The results of such additional surveys together with the survey drawings shall be submitted to the employer for approval. Based on the survey work, a general layout drawing with clear demarcation showing Boundary Pillars, location of Control Room, Array Yard, Approach Road and General Drainage etc. has to be prepared.

Soil Test:

To ascertain Soil Parameters of the proposed site for construction of Control Room & Office building & Array Yard, the Contractor shall carry out Sub Soil Investigation through certified soil consultant. These reports shall be furnished to employer. The scope of sub soil investigation covers: execution of complete soil exploration including boring, drilling, collection of undisturbed soil sample wherever 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 sub soil condition and submission of detail reports with recommendation regarding suitable type of foundation for each bore hole along with recommendation for soil improvement wherever necessary.

The minimum diameter of the borehole shall be 100 mm and boring shall be carried out in accordance with the provisions of BS 5930. All boreholes shall be at least 20 meter deep for normal soil conditions. The depth of boreholes at river crossings and special locations shall be at least 40m. if a strata is encountered where the standard penetration test records N values higher than 50, the borehole shall be advanced by coring at least 3 m further in normal locations and at least 7 m further for the case of river crossing locations with prior approval of the Employer. When the boreholes are to be terminated in soil strata, an additional standard penetration test shall be carried out at the termination depth. No extra payment shall be made for carrying out standard penetration tests. Water table in the bore hole shall be carefully recorded and reported following BS 5930. On completion of the drilling, the Contractor shall backfill all boreholes as directed by the Employer.

Planning and Designing:

a. The Bidder has to plan and design the Plant Array Yard, Control Room & office building as per international standard. The bidder has to develop general layout drawing of Plant Array Yard, Transformer, Double pole Structure, Control Room, Internal Road & Drainage (ensuring no water logging in the Power Plant Compound) along with Sanitary plumbing layout etc. All Design & drawings has to be developed based on specification given in the tender, soil report and relevant international standard unless otherwise specified. All details related to internal electrification, water supply and sewerage system should be clearly shown in the drawings. The work also includes landscaping of the entire Plant Array Yard & Control room area. The employer reserves the right to modify the landscaping design at any stage as per local site conditions/requirements.
b. Design should be developed considering optimal usage of space, material and labour without compromising the effect of shadow, cooling, ventilation, accessibility etc. The design of Control Room Building shall also incorporate the outlet openings for ventilation ducting from “Inverter”.
c. The bidder shall submit preliminary drawing for approval & based on any modification or recommendation, if any. The Contractor shall submit five sets of final drawings for formal approval to proceed with construction work.
d. The building shall be with concrete construction in compliance with Bangladesh National Building Code (BNBC) and relevant international standards.
e. The design of landscaping, Sign boards, Building services i.e Ventilation, Lighting, Air condition and Electrical allied installations shall be adhered to BNBC.

Site Development:

Landscaping work of the entire area of the plant premises shall have to be done as per drawing developed by the Contractor and as per approval. All proper attention must be given to the drainage and water runoff.

The scope includes the followings:

- Site grading, leveling, drilling exploratory bore holes and consolidation of the area pertaining to the installation of SPV modules of solar plant.
- Embedment of structures suitable for mounting PV modules on ground.
- Laying of earthing equipments / structures and connecting to the main ground mat as per the statutory requirements.
- Cutting of cable trenches wherever necessary.
- Providing foundation for structures etc.

River Bank Protection
The site is prone to erosion at the river side. Thus river banks protection becomes of importance. Concrete blocks will be used to prevent river bank from erosion. The river bank protection will be done by concrete block of 300mmx300mmx300mm and side Protection can be done by concrete block of 300mmx300mmx150mm upto 1500m along the shore.

Land development & Drainage

Since the highest flood level is 6m above MSL, the land development shall be made keeping in consideration of highest flood level. It is proposed that 3m wide dyke along the periphery of the site will be constructed to the elevation of 6.5m above MSL. The dyke height above ground elevation will vary from 4m to the river side (south) down to 2.5m to the leeward. The remaining area within the dyke may be developed by earth feeling to make uniform elevation of 5m above MSL along east west line y=2484300 with uniform slope southward till an elevation of 4m above MSL along east-west line y=2483500 to allow natural drainage. Provision of adequate number of low lift pumps with adequate capacities shall be kept for normal draining and draining for unusual precipitations.

Approach Road and Internal Roads/Pathways

All roads shall be designed and constructed to allow smooth on-site transportation and delivery of all project components to installation location and heavy equipment to their respective work locations. At all cable crossings, Hume pipes of appropriate sizes shall be embedded within the road. However, the Contractor shall architect the internal roads and pathways in most endeavor way for easy operation and maintenance and safety measures.

Main approach and internal roads shall be designed for a life of fifty (50) years. Roads shall be constructed with required cutting of soil, grading to the given slopes, backfilling and due compaction. The minimum width of main approach and internal roads shall be 5 and 3 meters respectively, excluding roadsides. The main approach will be on the entrance of project site to Jetty.

All internal roads (except the perimeter road on the dike) shall be at least 0.5m high from FGL to allow their uninterrupted use during rain or flood conditions. There will not be any dead-ends and access will always be possible through an alternative path. All internal and main roads shall have sufficient culverts to drain out the rain water of the project area through the drains or canals to the pumping outlet of the project area. Maximum longitudinal slope of the road shall be less than 5%.

All buildings and housings for inverters, transformers and electrical switchgear shall be connected by main and/or internal roads.

An appropriate drainage system shall be in place to protect the roads from erosion.

Jetty
Jetty to be provided with minimum capacity of 50 tons for off- loading cargoes.

Module Structure Foundations

a. Modules structures foundation should be RCC foundation columns made with cement concrete as per design based on site soil condition. The minimum clearance between lower edge of the PV and Ground Level shall be 1000 mm. While making foundations designs due consideration will be given to weight of module assembly, maximum wind speed as per specification. Seismic factors for the site to be considered while making the design of the foundation. The design of array structure shall be based on soil test report of the site and shall be approved by employer.
b. Foundation drawings & designs shall be submitted to employer for approval before starting the work. Foundation digging of Module Mounting Structure shall commence only after the proper leveling of the site.

Water & Arrangement for Modules Washing:

Water distribution System within the Plant area for cleaning the modules:

Bore wells and Water source should be arranged by the Tenderer. The Tenderer should make necessary arrangements of booster pump and laying of network of GI pipe in each row of SPV Panels. Opening from the GI pipe with manual isolating valves should be provided at regular interval in each row of SPV panels. GI pipes and Mild Steel pipes conforming to relevant international standard shall be used for all water supply and plumbing works. The Syntax or equivalent make PVC storage water storage tank shall be provided over the roof of the control room with adequate capacity and all fittings including float valve, stop cock etc.

Control Room & Office Building of the Solar Plant:

The control room and office buildings shall have to be designed based on topological survey report & soil testing report, relevant BDS code, Bangladesh National Building Code (BNBC), unless otherwise mentioned in the general scope of work & technical specification in consultation with Project Director. All kind of Construction work the tenderer shall follow the appropriate international standards.

- Control Room of innovative and appropriate design with at least **500 square meter (or suitable higher size required)** for accommodating the inverters, control panels, etc and additional room/cabin/space for accommodating operating personnel, storage of spares, etc with a height of 5 meter shall be constructed. The bidder has to submit the proposed drawing of control room building along with the bid to the employer for approval.

- Control Room building shall be equipped with Toilets, Washbasin, and Overhead tank for water storage with proper fresh water and sewage arrangement and septic tank has to be provided. Relevant standards have to be maintained for construction. The bidder has to submit the proposed drawing of control room building along with the bid to the owner for approval. The building shall be designed to meet national building code requirement. The control Room shall be provided with suitable smoke detectors and the entrance of the control room shall have ramp arrangement for the entry of goods and the necessary cable to be brought through cable tray arrangements. All the cable trays shall be provided with shock proof rubber mats.

Civil Design consideration

Since land is alluvial and soil quality is poor, pile foundation is proposed for water tank, sub-station and control buildings. Foundation for Medium Voltage Power platform (MVVP) and solar panel proposed to be at 1.5m depth. However, land filling and compaction can increase the soil bearing capacity. Thus the miscellaneous foundation (MVVP), solar panels etc may not require any additional consideration. However, the top elevation of switchyard will be 300mm above ground level and MVPP foundation will be 150mm above ground level to avoid inundation due to unusual precipitation. The control room building plinth level will be 600mm above ground level.

RCC Work:

All RCC works shall be M 20 grade concrete design mix as per BDS or equivalent international standard and the materials used viz. Cement reinforcement, steel etc. shall be as per relevant BDS or equivalent international standards. In addition, international Codes of Practice for Bending and Fixing of Bars for concrete Reinforcement must be complied. Reinforcement shall be high strength TMT Fe 415 or Fe 500 conforming to suitable standard. Cement grade OPC 43 grade shall have to be considered.

Masonry Work:
All brick works shall be using at least II class bricks of approved quality as per relevant standard. The cement mortar for brick masonry shall be in the ratio 1 cement and 5 sand by weight. The cement mortar shall be machine mixed. Bricks required for masonry work shall be thoroughly soaked in clean water tank for approximately two hours. Brick shall be laid in English bond style. Green masonry work

shall be protected from rain. Masonry work shall be kept moist on all the faces for a period of seven days.

Doors & Windows:

Doors, windows and ventilators of air-conditioned areas, entrance lobby of all buildings (where ever provided), and all windows and ventilators of main plant and service building shall have, electro color dyed (anodized with 15 micron coating thickness) aluminum framework with glazing. All other buildings doors, windows and ventilators (unless otherwise specified) shall be of steel. The doors frames shall be fabricated from 1.6 mm thick MS sheets and shall meet the general requirements of relevant standard. Steel windows and ventilators shall be as per standard. All windows and ventilators on ground floor of all buildings shall be provided with suitable grill. Minimum size of door provided shall be 2.1 m high and 1.2 m wide. The structural steel shall conform to relevant international standard. The fixtures, fastenings and door latch are to be made with same materials. Each window unit shall have a solid bronze polished, cam locking handle and strike. Fixing of metallic doors and windows shall be done in accordance to relevant Standards. Doors and windows on external walls of the buildings shall be provided with RCC sunshade over the openings with 300 mm projection on either side of the openings. Projection of sunshade from the wall shall be minimum 450 mm over window openings and 750 mm over door openings except for main entrance door to the control room where the projection shall be 1500mm.

Glazing:

All accessible ventilators and windows of all buildings shall be provided with min. 4mm thick float glass, plain or tinted for preventing solar radiations, unless otherwise specified. For single glazed aluminum partitions and doors, float glass of 8mm or 10 mm thickness shall be used. All glazing work shall conform to relevant International Standards. The glass should be free from distortion and thermal stress.

Plastering:

All external surfaces shall have 20 mm cement plaster in two coats, under layer 16 mm thick cement plaster 1:4 and finished with a top layer 4 mm thick cement plaster 1:3 with water proofing compound. White cement primer shall be used as per manufacturer's recommendation. At least one coat of plaster shall be applied to interior walls by hand or mechanically, to a total thickness of 12 mm using 1:4, 1 cement and 4 sand. Plastering shall comply with relevant Standards. Oil bound washable distemper on smooth surface applied with 2 mm thick Plaster of Paris putty for control room. Plaster of Paris (Gypsum Anhydrous) conforming to proper standard shall be used for plaster of Paris punning.

Flooring:

The Cement shall be ordinary Portland cement conformed to relevant International Standards. Base concrete for flooring with a bed of 100 mm thick in CC 1:4:8 using graded concrete of 40mm nominal size HBG metal. For pantry slab and control room floor mirror polished (6 layers of polish) Granite stone (slab) of minimum thickness of 18 mm shall be used.

Foundations:

CC (1:4:8) using graded aggregate of 40mm nominal size HBG metal shall be laid as leveling course under footings. The CC work shall be executed as per the latest codes and standards. Major portion of the site is filled up area which contains majority of boulders with soil muck. Necessary foundation treatment like sand sluice treatment shall be taken and all foundations of structures shall be suitably designed considering the condition of present site strata.

Roofing:

Roof of the C.R. Building shall consist of Cast-in-situ RCC slab treated with a water proofing system which shall be an integral cement based treatment conforming to CPWD specification. The roof of the building shall be water proof with tar felt 5 layer over screeding. The roof shall be designed for minimum superimposed load to 150 kg/m2. For efficient disposal of rainwater, the run off gradient for the roof shall not be less than 1:100 and the roof shall be provided with RCC water gutter, wherever required.

Gutter shall be made water tight using suitable watertight treatment. This gradient can be provided either in structure or subsequently by screed concrete 1:2:4 (using 12.5 mm coarse aggregate) and/or cement mortar (1:4). However, minimum 25 mm thick cement mortar (1:4) shall be provided on top to achieve smooth surface.

Paintings of Walls & Ceilings:

The paint shall be anti-fungal quality of reputed brand suitable for masonry surfaces for high rainfall zone. All painting on masonry or concrete surface shall preferably be applied by roller. If applied by brush then same shall be finished off with roller. For painting on concrete, masonry and plastered surface suitable standard shall be followed. All paints shall be of approved make including chemical resistant paint. Minimum 2 finishing coats of paint shall be applied over a coat of primer.

For painting on steel work and ferrous metals relevant Standards shall be followed. The type of surface preparation, thickness and type of primer, intermediate and finishing paint shall be according to the painting system adopted. The cement paint of suitable standard shall be of approved brand and manufacturer. Ceiling of all rooms except Battery room shall be white washed. The ceiling of Battery room (if provided) shall be acid resistant paint.

Plinth Protection:

Plinth protection shall be provided around all the buildings with Brickbats and PCC 1:2:4 & smoothly finish of top surface.

Plumbing & Sanitary:

The whole of the plumbing works in the buildings shall be provided in accordance with the relevant bylaws and to the complete satisfaction of the Engineer. Pipes shall be connected to each point where water is required, with a minimum head of 2 metres at all outlets.

All cast iron pipe works and fittings as are necessary for the complete installation of the sanitary system shall be supplied and installed in accordance with the requirement of the local authorities and other standards approved by the Engineer.

Stairs:

Bidder shall have to provide service ladder made up steel to access the roof for maintenance of communication equipment and water tank.

False Ceiling:

The control room shall be provided with false ceiling of 15 mm thick mineral fiber board, in tile form of size 600mm x 600mm, along with galvanized light gauge rolled form supporting system in double web construction pre painted with steel capping, of approved shade and color, to give grid of maximum size of 1200x600 mm as per manufacturers details including supporting grid system, expansion fasteners for suspension arrangement from RCC, providing openings for AC ducts (if required), return air grills (if required), light fixtures etc.

Site Boundary Wall
The site boundary wall shall be installed around the power station as directed by the Engineer. The site boundary wall shall be of brick wall with RCC frame in accordance with KPI Standard and 2.40 m high and 0.25 m thickness.

Watch Tower
There will be 6 (six) watch towers at the remote boundary of the power plant site. The location will be agreed upon with the Employer's Engineer.

Office Furniture:

Adequate and appropriate ergonomically designed furniture of approved make for the control room shall be included in the offer. The furniture should be chosen in such a way that it matches with the décor of the control room. Furniture shall be of reputed approved manufacturer.

Others:

Any Civil work which is not mentioned or included here but necessary for the plant shall be borne by bidder.

6.2.7 Supply of International Codes and Standards:

The Tenderer shall supply copy of all relevant international standards (ISO, IEC, ASTM, IEEE, ASME, NFPA etc.).

- ISO for Testing and Commissioning
- IEC/IEEE for Electrical Equipment

6.2.8 Technical documents and information

Documentation to be submitted with Bid
The Bidder must complete all forms given in **Section 5 - Tender and Contract Forms** and the Tables and Forms in **Section 6 – Employer Requirements** of the bidding document for the Plant. Some of them shall be submitted electronically as Excel-file. Technical data sheets should be supplemented by additional descriptions, explanations, drawings and all other information necessary for a clear understanding of the Tender to enable the Employer to undertake the necessary assessment, evaluation and verification of the technical and performance features of the Tender.

In any case deviations are discouraged and Employer reserves the right to reject any Tender as non-compliant in his sole discretion.

Documentation to be submitted after Award of Contract
The following describes the minimum scope of information, documents, drawings, etc. to be submitted by the successful Bidder to the Employer after award of contract during the design and engineering phase and during site construction of the Plant. The Employer reserves the right to request from the successful Bidder such additional information, drawings, documents, etc. as may be reasonably required for proper understanding and definition of the design and engineering of the project.

The successful Bidder shall provide softcopies and four (4) hard copies of all drawings and documentation to be submitted by him. For the as-built documentation a well-organized electronic file including an Excel based table of contents, two (2) copies (plus electronic copy) shall be provided. All information with respect to connection points and interfaces between the Plant and the Chandroghona 132/33 kV Sub-station, and any other interface as well as for the entire Plant itself shall be included. The number of copies or the final content may be amended as may otherwise be required by the provisions of the EPC Contract or as may otherwise be reasonably required by the Employer.

Monthly status reports shall be provided by no later than ten (10) days after the last day of each month. Any revision of the project implementation schedule shall not be delivered later than seven (10) days after such revision.

Documentation to be submitted during Detail Design
The following documents shall be submitted as a minimum by the successful Bidder to the Employer within a maximum of two (2) months after the date of contract award:

- Drawings, technical information and documentation required for BPDB to obtaining permitting, certifying and/or licensing of the Plant
- general arrangement and layout drawings

- project documents (data sheets, specifications, drawings) for major systems and components including system description of the main systems
- underground / aboveground ducts and cable arrangement drawings (civil and electrical)
- operation philosophy
- maintenance philosophy
- emergency response plan
- Health, Safety and Environmental (HSE) Plan
- cable size calculation according the IEC 60502-2 and IEC 60364-5-52
- soil resistivity measurement
- step and touch voltage calculation
- risk assessment for lightning according to the IEC 62305-2
- interface concept (concept and settings of protection equipment at the interface)
- detailed layout drawings including detailed roads design, slope, structure levels and level of terrain, arrangement of PV structures and foundations, water supply and drainage concept, and cable routing
- detailed drawings (architectural, formwork, reinforcement and steel structure drawings, work shop drawings) as a minimum for:
  - PV structures including foundations
  - service building
  - gatehouse
  - structures for surveillance and lighting equipment
  - cable channel and ducts
  - drainage channels and ducts
  - any other needed structure or baseplate
- Structural analyses as a minimum for:
  - PV structures including foundations
  - service building
  - gatehouse including foundations
  - any other needed structure or baseplate
- The structural analysis shall include as a minimum the following information and specifications:
  - information of Codes and Standards
  - information of chosen design method and factors of safety
  - detailed description of structural model (dimensions, materials, definitions of connections and bearings)
  - specification of materials
  - definition of loads and load combinations
  - structural analysis including detailed report of the results (stress resultants, utilization, deflections, bearing loads)
- Reports of the following site investigations:
  - land survey of the total site and corridor for access road
  - soil investigation report including geotechnical recommendations for foundations and chemical soil analysis
  - local pile tests for PV-structures foundations if micro pile foundations are planned:
    - the pile tests shall be carried out in a professional manner and regarding the results of the soil investigation and structural analysis
    - the tests shall be carried out in a sufficient number and test setup, the chosen pile specifications and dimensions shall meet the given requirements according structural analysis
    - the tests shall be supervised by an expert and summarized in a report
- For quality assurance and control, the following shall be delivered:
  - specification and data sheets of all used electrical and mechanical components
  - delivery notes of all used construction materials and components with detailed information and product specifications
  - specification of chosen corrosion protection.

The following documents shall be delivered by the successful Bidder to the Employer by the dates set forth in the following or, if not specified, as and when each such document is obtained by the successful Bidder, as the case may be:

- copies of all applications submitted by the Successful Bidder to the relevant governmental instrumentalities for the governmental authorization or otherwise required under applicable legal requirements, to commence the construction of the Plant, together with copies of all supporting documentation submitted therewith within two (2) months after award of contract.
- review report of the Environmental & Social Impact Assessment and the stipulations thereof regarding procedures and test specifications related to all environmental investigations, surveys and monitoring undertakings, as well as relevant test results promptly after their completion.

Documentation to be submitted prior to Site Construction
All documents and permits required for site construction shall be submitted prior to site construction.

Documentation to be submitted during Site Construction
The following documents shall be submitted during site construction:

- It is to be noted that for all major works not only in the site, but also for those works, which are located within BPDB areas or related to facilities of such entities a method statement for the proposed works is to be included in the permit to work application along with the approved design review documentation at and specifics of the construction works and any associated risk evaluation for the relevant owner.
- BPDB will coordinate all temporary building permits or the no-objection certificates, as applicable, issued by the various departments or other relevant Governmental Authority to the Bidder in accordance with applicable Law, and all related permits, consents and approvals related to the construction of Project.
- The Contractor shall submit to the Employer drawings, diagrams, graphs, curves, calculations, schedules for information, review or approval as described in the EPC Contract. The quality of all documents submitted shall conform to acceptable international practice.
- The Bidder shall provide the calibration certificates of all calibrated equipment to the Employer.
- Monthly progress brief reports - by no later than one (1) week after the last day of each month including S-curves showing the work progress. The minimum information shall be:
  - Engineering activities
  - Component and material purchase and receipt status
  - Construction activities
  - HSE
    - Trainings executed
    - Incidents
    - Accidents
  - Personal on site
    - Number of staff
    - Number of local staff
  - 4-week look ahead schedule
  - Recommendations for improvement
  - Project graphs
    - Layout drawings which shall show the work status

S-curves which shall show on a monthly base the status of the works (planned and actual as well as cumulated) for the PV Plant e.g. land preparation, security systems, piling, mounting structure, PV module installation, LV electrical works, MV electrical works, installation of transformer stations, building erection and interface works.

Documentation to be retained at Site
Additional to the submission of the documentation as mentioned above the final documentation (including electronic files) has to be retained on site as listed in the following chapter. The final documentation should be stored in a safe and lockable compartment.

Final Documentation
The Contractor shall deliver to the Employer the final documentation, both in digital and hard copies (2x). The final documentation for the PV Plant shall be prepared in accordance with the IEC 62446 standard "Minimum requirements for documenting, commissioning and inspecting grid connected PV systems"

The final documentation for the Plant shall comprise at least the following:

- the above mentioned documents listed in section 6.2.7 as appropriate
- all As-built drawings
- O&M Manual with safety guidelines
- site safety procedures
- HSE procedure and plan
- key list and site access contacts
- components data sheets
- installation and O&M manuals from component manufacturers
- studies and tests (Pull out / extraction test, geological / geotechnical analysis, static calculation)
- mechanical completion documents including but not limited to:
  - Data sheets and manuals of all components and equipment
  - Serial numbers of inverters, transformers, counters, sensors, etc.
  - Module flash list (Excel files) with serial number and electrical values, and the exact location of the module within the PV plant
  - Calibration protocols
- warranties of component suppliers, e.g.
  - Modules
  - Mounting structure
  - Galvanization and durability guarantee of fixed structure foundation
  - Junction box
  - Inverters
  - Transformers
  - LV and MV cables
- factory acceptance test reports
- acceptance test and protocols including but not limited to the definitions in section 6.2.15
- acceptance protocols between Contractor and Subcontractors
- initial inventory list
- training program
- commissioning protocols
- legal documents including but not limited to:
  - connection related documents, as far as relating to the Bidder's responsibility.

Permitting and authorization related documents, so far as relating to the Bidder's responsibility.

6.2.9 Implementation Schedules

After Bids close that will be evaluated and followed by contract negotiations with the lowest ranked compliant Bidder. The estimated timeline for the above activities is shown in Table 26;

Table: Estimated Timeline for Bid Documents

Activity	Duration	Estimated Date
Release of Bid Documents		.....02/2023
Pre Bid Meeting		.....02/2023
Bid Period	240 days	

Bid Evaluation	120 days	
Evaluation Report send to Ministry	7 days	
Notice of Award	15 days	
Contract Negotiations	14 days	
Contract Award	14 days	
EPC Contract Execution	360 days	

The EPC contract duration shall be not more than **360 days** for the Construction of 50MWp (DC) Solar Photovoltaic Grid Connected Solar Power Plant at Rangunia, Chattagram Bangladesh.

6.2.10 Progress Reports

Progress Measurement

The Contractor shall, for the duration of the Contract Period, develop and maintain systems and procedures for the measurement of progress against the Contractor's Programme and Document Schedule.

Progress achieved shall be measured concurrently at all Work locations. Unless otherwise stipulated in the Contract the measurement cut-off date shall be the last Friday of each calendar month.
Progress measurement at the Site shall be carried out on a weekly basis.
Prior to the formal issue of progress statistics to the Employer, the Contractor shall establish within its own organization the accuracy of the monthly measure.
Detailed risk analysis shall be carried out on the programme and submitted to the Employer on a monthly basis.

Progress Reporting

The Contractor shall submit to the Employer a detailed progress report for each month up to the cutoff date. The monthly report shall contain, but not be limited to, the following:

- Listing of activities more than two weeks late
- Listing of all items on the critical path and next sub critical path
- Explanations for late activities which are having, or are likely to have, impact on the project schedule
- Details of measures proposed to bring late activities back on schedule
- Outstanding interface data and measures proposed to expedite the issue of critical interface data
- Confirmation of the achievement of near term milestones
- Confirmation of the achievement of the completion date
- Detailed risk analysis of the programme.

In addition to the activities referred to above the monthly progress report shall also include, but not be limited to, the following:

- Covering letter and executive summary
- Details of any accident or injuries during the reporting period and overall accident, safety and injury statistics for the construction phase, in the reporting period and to date. Management report on, and status of compliance with, the Health and Safety Plan
- Management report on, and status of compliance with, the Environmental Management Plan
- Details of any industrial relations issues
- Details of any complaints or comments made by external bodies or individuals
- Problem areas (and details of measures being taken to resolve problems)
- A statement of the number of site personnel engaged in the work during the reporting period and, where relevant, details of erection equipment in use or held in readiness
- Document Index marked up to show document status
- Purchasing schedule marked up to show status of procurement activities
- Copies of those inspection and test reports which identify any deviations from the quality standards in the Contract and a statement of corrective actions
- A Schedule of all other inspections and tests performed

- Copies of quality assurance audit reports which identify the need of corrective actions and evidence of the implementation of corrective actions
- Progress on compilation of manuals
- Colour photographs showing the progress of construction

The Project Master Schedule shall be marked up, on a monthly basis, by the Contractor to indicate the progress achieved against each activity and submitted as part of the monthly progress report which shall be issued to the Employer within 10 working days after the cut-off date (one week prior to the monthly progress meeting).

The progress curves developed from the Project Master Schedule shall include planned and actual progress status. The progress curves shall be produced using the manhour content of the network activities factored to achieve a percentage weighting for each activity. The weightings, once agreed, shall not be varied during the course of the Project unless otherwise agreed by the Employer.

The progress report, six copies of which shall be provided, shall address each of the following project phases, as appropriate:

- Engineering
- Procurement
- Expediting
- Inspection
- Manufacturer and fabrication
- Construction and erection
- Testing and pre-commissioning
- Commissioning
- Reliability testing, performance testing and taking over.

6.2.11 Photographs

Twelve color photographs showing progress on site shall be provided with each monthly report. Each photograph shall not be less than 240 mm by 180 mm and shall carry description, serial number and dates.
Soft copies in jpg format of all photographs shall be handed over to the Employer at the completion of the Contract at which time the Contractor shall also hand over three sets of photographs in separate albums.
In addition to still photographs, the Contractor shall provide four digital videos taken at key dates during the construction programme. Two copies of each video file on a DVD shall be provided to the Employer.

6.2.12 Data for Asset Management System

The Employer is purchasing an asset management system under another contract. In addition to the above documentation, the Contractor shall provide on DVDs (four sets), electronic versions/copies of the following key plant reference documents:

- Plant Equipment List
- Equipment Name Plate Data
- Plant Spare Parts and Inventory List
- Equipment Operations Manuals
- Equipment Maintenance Manuals and Bill of Materials
- Plant System Design and As-Built Drawings (AutoCAD)
- Plant System Design Specifications

6.2.13 Training

General:

The Bidder is required to demonstrate the implementation of a Training Program for the personnel of the Employer during construction and operation phase. BPDB will select several employees for the PV power plant. The training has to be carried out prior to COD as well as during the 2-year Warranty Period and cover all aspects of O&M.

The Contractor shall submit, within four months of the Contract Effective date, a detailed training plan including scope and timing for review by the Employer. The Contractor shall submit, two months prior to the start of each classroom lesson, a Course Description and Lesson Plan for review by the Employer. The training program shall be coordinated with pre-commissioning and commissioning so that the operation and maintenance staff use and consolidate their training by assisting the Contractor in the pre-commissioning and commissioning phases under the direction of the Contractor. The Contractor shall provide all the materials, training aids, venue and all facilities required for the training.

The Contractor must indicate in technical offer the practical arrangements he is offering for ensuring the training, as well as the methodology used. The Contractor will provide all maintenance and operation manual, drawings related to all the equipment to each trainee on the first day of his arrival at the Contractor's Works.

Program Goals and Objectives:

The training program covers both training and qualification. The goal of the training and qualification program is to ensure that the PV Plant's personnel acquire and maintain the combination of knowledge and demonstrated skills to fulfill their responsibilities. Likewise, Employer will acquire the knowledge required to fulfill his responsibilities as Plant's owner during operation. This will reasonably assure that the PV Plant is operated safely and efficiently, while also ensuring the long-term economic success of the Plant. The objectives required to attain the training program goals are as follows:

- All designated personnel will participate in training to satisfy local law, permits, regulations, and any other training as assigned.
- All designated personnel will participate in PV Plant familiarization training.
- After training each employee will qualify by formal written program for the position for which each holds; and
- Employees will be required to re-qualify for his or her position regularly to ensure maintenance of proficiency and knowledge of the PV Plant.

Staff responsibilities and training organization:

- All employees are responsible to participate in both formal and self-paced training to achieve and maintain qualification for their assigned position. Maintaining an assigned level of qualification is a condition of continued employment.
- The PV plant manager has the overall responsibility for ensuring that the PV plant personnel are adequately trained and fully qualified to perform their assigned duties.
- The training supervisor is responsible for the day-to-day administration of the training and qualification plan. The training supervisor will work closely with all department managers to ensure effective program development.
- The training will be held in English language. Documents and certificates will be in English only.

Scope of Training:

The training and qualification program shall include a review of the PV plant system. It shall also cover health and safety, and other general matters. The training shall comprise but not be limited to the following:

- ✓ PV Technologies and its applications
- ✓ Principle of operation of PV systems
- ✓ Design and planning of PV power projects
- ✓ Operation, maintenance and troubleshooting of PV power plant:
  - Operation of PV plant
  - Monitoring and access to the monitoring system of PV plant
  - Grid integration of renewable energy systems
  - Fault detection, and troubleshooting
  - Preventive and corrective maintenance
- ✓ Norms and standards used in PV power plant
- ✓ Testing of PV systems
- ✓ Health, Safety, and Environment (HSE)
- ✓ PV Project Management

Program Description:

The training and qualification plan shall be self-paced and self-taught. It shall be based on foreign training and on-the-job-training, supplemented by classroom instruction and/or computer-assisted training for required topics, lab works, field visit etc.

Foreign Training:

Foreign or overseas Training Venue will be at Manufacturer's Factory Premises. All living, accommodation, food, transport expenses of the trainees/officers during the period of training/study tour including airfares, incidental expenses, medical expenses, medical insurance etc. will be covered by the Contractor including pocket allowance of *@ USD/ EURO (for EU) 100.00* day/person. The total person-months for training will be limited to 15 (fifteen) Person-Months on PV Module, Inverter, Switchgear and Operation & Maintenance of power plant equipment, orientation & technology transfer at manufacturer's factory in the following manner:

Job Site Training:

The BPDB shall make available, free of cost, to the Contractor the suitable number of staff member for the purpose on-the-job training at site during installation, testing, commissioning and initial operation of the plant for one (1) month. During warranty period, it shall be the responsibility of the Contractor to train them adequately and properly in a planned manner so that these member of the BPDB's staff could take over the responsibility of operation and maintenance of the plant and equipment independently at the time of handing over the plant and equipment before issuing FAC. The personnel to receive on the job training is detailed below:

Sl. No.	Position	Persons
1	Executive Engineer	2
2	Sub-divisional/ Assistant Engineer	6
3	Sub-assistant Engineer	4
	Total	**12**

6.2.14 Approval of Drawings and Specifications and Tests Witness

A. Approval of Drawings and Specifications:

SHOP DRAWINGS

Engineering data covering the manufacture of all equipment and fabricated materials specified hereunder shall be submitted to the Board/Engineer for approval. These data shall include drawings and descriptive material in sufficient detail to show the type, size, arrangement, operation of component, materials, devices, the external connections, anchorage's, supports required and any dimensions necessary for installation and co-ordination with related equipment. No work shall be performed until the drawings and data have been approved.

WORKING DRAWINGS

The Contract drawings shall show the arrangement, layout, existing equipment, method of control and the design of the, completion of power plant addition as specified herein.

(1) The title of the drawing, the signature of the Contractor's responsible engineer, the date prepared shall appear in the bottom right hand corner of the drawing. The size of drawings shall be as follows:

AO 841 mm x 1,188 mm

Al 594 mm x 840 mm

A2 420 mm x 594 mm

A3 297 mm x 420 mm

A4 210 mm x 297 mm

(2) The Contractor shall submit for approval checked arrangement and detailed drawings of all parts, schematic and wiring diagrams and description of equipment to demonstrate that the equipment to be furnished will conform to the requirements and intent of the Specifications.

The arrangement drawings shall show overall dimensions, clearance heights for the equipment, weight, description and location of all accessories.

Schematic diagrams shall indicate the operation and function of all electrical equipment, accompanied, where necessary, with explanatory notes.

(3) The Contractor shall submit installation drawings for approval including embedded Piping. piping details, support for pipings, conduits and fittings, cable laying, cable rack fixing and other detailed drawings for installation work.

(4)The following types of drawings shall be submitted for approval immediately on completion of design:

a. The drawings showing the arrangement of necessary devices specified in the Technical Requirements
b. Sequence and internal connection diagram
c. Drawings of installation equipment and measuring instruments to be supplied by the Contractor

(5) The Contractor shall in addition to the documents specified in the Contract, furnish without delay the documents, drawing and other information, which though not specified in the Contract, may be required by the Board or the Engineer from time to time during the period of execution of the Contract.

(6) Unless otherwise specially provided, any and all expense required to submit the documents, drawing and other information in compliance with the Contract shall be borne by the Contractor.

(7) Prior to fabrication of the equipment, the Contractor shall submit approval drawings to the Engineer for approval. Should the Engineer direct modifications to be made in order to satisfy the requirements of the Specifications, the Contractor shall submit modified approval drawings. Alterations in the Contract Price shall not be made by reason of the modifications in the approval drawings. In the event the Contractor proceeds with fabrication without approval of drawings, he shall make the necessary changes at his own expense. Approval of drawings shall in no way relieve the Contractor of his obligation to satisfy the requirements of the Specifications or the responsibility of making corrections in his drawings.

All approved drawings shall have a column provided for inscription of modifications in the contents. Drawings shall clearly indicate modified parts by arrows or other means.

(8) After approval, the drawings shall be kept up to date reflecting any changes made, and upon completion. "**As built**" drawings shall be delivered to the Board. The Board's approval shall be obtained for all Contractors' drawings including any changes made.

FOUNDATION DESIGN

The Contractor shall be responsible for the proper design of the equipment foundations to withstand the dynamic load and static load of major equipments and solar module etc. Location and arrangement of steel reinforcement, concrete keyways and detailed drawings showing additional concrete required shall be prepared by the Contractor.

B. TESTS WITNESS:

Tests shall be performed in accordance with the relevant IEC/BS/BDS standards or equivalent and shall be complied with offered Guaranteed Technical Particulars and specifications of the Contract.

Tests of the following items but not least:

Test of PV module:

i. Short Circuit current Test
ii. Open circuit voltage test etc. as per standard.
iii. Maximum Power Point Voltage
iv. Maximum Power Point Current
v. Open Circuit Voltage Test
vi. Short Circuit Current Test
vii. Fill Factor Check
viii. Module Temperature Co-efficient Test

Test of Grid Tied Inverter:

i. Operation test ,
ii. Test for pure sine wave out put
iii. Total Harmonic Distortion (THD)
iv. Synchronization Operation Test
v. Operating Voltage Range Test (AC & DC)
vi. MPPT Functionality Test
vii. Short Circuit Current capability Test
viii. Protection Function Test (DC Reverse Polarity Protection/ DC Isolation Monitoring/ Ground Fault Protection/ Short Circuit Protection/ Over Voltage Protection/Over Current Protection/ Residual Current Protection/ Over Temperature Protection/ Anti Islanding Protection etc.)
ix. Power Factor Test
x. Total Harmonic Distortion Test
xi. DC Injection Test
xii. Standby & Full Load Power Consumption Test
xiii. Anti-Islanding Protection Check
xiv. Inverter Efficiency Test

Test of Power Transformer

i. Measurement of turn ratio test.
ii. Vector group test.
iii. Measurement of Winding resistance.
iv. Measurement of Insulation resistance.
v. Measurement of No-load loss & no-load current.
vi. Measurement of Impedance voltage & load loss.
vii. a) Separate Source Voltage Withstand Test
b) Induced Over Voltage Withstand Test.
viii. Transformer Oil test.
ix. Temperature Rise test.
x. Transformer tank sheet thickness (top bottom & side).
xi. All bolts & nuts connected with transformer tank, conservator, radiator etc shall be electroplated.
xii. Dimension of bolted type bimetallic connector for H.T. and L.T. bushing.
xiii. Dimension of tanks.
xiv. Dimension of core dia & height.
xv. Dimension of coil, inner dia & outer dia (HT & LT) etc.

xvi. Size of Copper Conductor for HT and LT Windings.

Test of Vacuum Circuit Breaker

i. Lightning Impulse Voltage withstand tests
ii. Power Frequency withstand tests
iii. Temperature Rise tests
iv. Measurement of Resistance of the main circuit.
v. Short-time withstand current and peak withstand current tests.
vi. Mechanical Endurance tests
vii. Short Circuit performance tests
viii. Out-of-phase making & breaking tests
ix. IP55 tests.

Test of SCADA System

i. As per GTP and Specification of Section 6

Test of Control Protection and Metering Panel

i. As per GTP and Specification of Section 6

Test of LV and 33 kV Switchgear

i. As per GTP and Specification of Section 6

The manufacturer shall have the testing facilities at manufacturer's premises in accordance with the relevant IEC/BS/BDS or equivalent Standards. All cost of testing including carrying, loading, un-loading etc. will be borne by the supplier. If the sample(s) fails to confirm the specification, the full consignment will be rejected.

6.2.15 Commissioning and Acceptance Testing

BPDB shall have the right to have their representatives present during all inspections and tests. The presence of BPDB's representatives during any inspection or test (or waiver by BPDB of their right to witness any inspection or test) shall in no way relieve the Bidder of its responsibility for supplying the equipment in accordance with the scheduled dates. The Contractor shall be responsible for providing all supplies required for carrying out such tests, except for supplies required to be provided for such tests by BPDB. BPDB shall have the right to have their representatives present during all inspections and tests. The presence of the BPDB's representatives during any inspection or test (or waiver by BPDB of their right to witness any inspection or test) shall in no way relieve the Contractor of his responsibility to supply the equipment in accordance with the scheduled dates.

This section describes the relevant DC and AC test procedures and the sequence of tasks for Commissioning, Operational Acceptance Test, Annual Performance Review, and Final Acceptance Test of the PV Plant ("the Plant"). The Contractor shall be responsible for providing all supplies required for carrying out such tests, except for supplies required to be provided for such tests by the Employer.

All measurement uncertainties due to, for example, equipment inaccuracies etc. shall not be taken into account separately as they are already considered in the thresholds of provided formulas or guarantees. The results of all tests shall be certified by the manufacturer, Contractor, independent agency or the Engineer as appropriate.

6.2.15.1 Test procedures

The Contractor's technical personnel, with the assistance and supervision of equipment manufacturer(s), will be responsible for complete Commissioning of the PV Plant.

The Commissioning of the PV Plant includes the following procedures:

1. Hot and Cold Commissioning testing outlined in Contractor procedures;
2. Tests and inspections required by codes, national standards, and equipment manufacturers;

All measurements and testing procedures, such as string testing and I-V curve measurement results, will be provided completely in electronic form and as a hard copy. Documentation from all procedures of Commissioning and testing tasks, measurements, and results will be submitted to the Engineer.

The overall testing program for the PV Plant shall consist of the following:

- Commissioning, including the Connection Infrastructure
- Operational Acceptance Test

6.2.15.2 Cold Commissioning

The verification of the Commissioning tests will be based at least on the latest published testing procedure IEC 62446: Grid-connected photovoltaic systems – Minimum requirements for system documentation, Commissioning tests, and inspection, for all electrical Commissioning. The verifications shall include, but not be limited to, the following equipment to be tested:

- PV modules;
- PV modules support structure;
- Support structure foundations;
- String cabling;
- LV DC cabling between combiner boxes and inverters;
- Combiner boxes;
- Inverters;
- LV AC cabling between inverters and transformers;
- Transformers;
- transformation, protection, distribution centers, and MV lines piping (where applicable), cable trays, inspection chambers, wiring, etc. both for DC and AC power, data transmission, and all other required transmission lines, including junction boxes, fuses, and all other required electrical equipment;
- External interconnection cabinets;
- Internal connections and Connection Infrastructure with external facilities in accordance with the relevant IEC and national norms as described in Sections 6 of the tender Documents;
- Meteorological stations and monitoring system
- Low-voltage installation, civil works, and medium-voltage installation
- Security system
- all measurements as defined and described in IEC 62446
- all necessary tests at the MV interface in coordination with BPDB

The Cold Commissioning tests shall include the measurement of 100% of the open circuit voltage (Voc) and the short circuit current (Isc) of the PV module strings. The minimum irradiance on the plane of array for the Voc and Isc measurements is 600 W/m^2 . At least 10 % of the strings of the PV Plant shall be measured with the presence of the Engineer. The selection of strings shall be agreed between the Contractor and the Engineer on a case-by-case basis, taking into account the fact that the sample shall be representative of all the sections of the PV Plant. The adequacy of the measurement devices proposed by the Contractor in terms of measurement uncertainty, calibration, etc. will be assessed and must be confirmed by the Engineer prior to the start of the tests. A report with the measurement results of 100% of the strings will be presented by the Contractor in digital form as an Excel file.

The conditions for the measurements are as follows:

The V_{oc} test will be considered as passed if all the $V_{oc,string}$ on the tested strings satisfy the following condition:

$$0.05 \times V_{theo} \leq V_{oc,string} \leq 1.05 \times V_{theo}$$

Where V_{theo} is the theoretical open circuit voltage for the strings and calculated as follows:

$$V_{theo} = n \times V_{oc} \times [1+(T_{mod} - T_{STC}) \times c_{i,abs}]$$

Whereby:

n is the number of PV modules of the tested string [-].
V_{oc} is the open circuit voltage of the PV module as of the PV module manufacturer data sheet [V].
T_{mod} is the temperature recorded on a PV module representing the tested string [°C], measured with a precision better than 1%.
T_{STC} is the temperature under standard test conditions and equal to 25°C.
$c_{t,abs}$ is the absolute value of the power temperature coefficient as of the PV module manufacturer data sheet [V/°C].

The I_{sc} test will be considered as passed if all the $I_{sc,string}$ on the tested strings satisfy the following condition:

$$0.00 \times I_{theo} \leq I_{sc,string}$$

Where I_{theo} is the theoretical short circuit current for the strings calculated as follows:

$$I_{theo} = I_{sc} \times H_{POA} / H_{STC}$$

Where
I_{sc} is the short circuit current of the module as of the PV module manufacturer data sheet.
H_{POA} is the instantaneous irradiation on the plane of array of the tested PV module string [W/m2], measured with a pyranometer with 2% measurement uncertainty.
H_{STC} is the irradiance under standard test conditions and is equal to 1,000 W/m2.

Any possible anomalies shall be checked immediately by the Contractor as they could result from, for example, faulty connections or damage in the junction boxes or diodes. The faulty connection must be identified and repaired or substituted. Once the repair has been completed, the short circuit test will be repeated.

6.2.15.3 Hot Commissioning

Once the PV Plant is energized (this may require a dump load during testing), the Contractor shall demonstrate that the overall system and equipment operates in accordance with the following:

1. Equipment manufacturer specifications
2. Specifications of the Contract
3. National Grid Code and other relevant national and international norms and standards.

For hot Commissioning testing, the following supplies and equipment will be commissioned / tested:

- DC operating current tests
- Inverters
- Combiner boxes
- Low-voltage boards
- Internal connections and interconnections with external facilities, whether mechanical or electrical
- Monitoring system and/or control instruments and devices
- Telecommunication system for remote access
- Meteorological stations and monitoring system
- Safety devices
- Medium-voltage switchgears and cubicles
- Transformers
- Security system
- Grounding and lightning protection system
- MV interface, including, but not limited to:
- MV equipment.

Thermo graphic analyses will also be performed with IR camera for all PV modules and electrical connections in order to detect possible hot spots.

Likewise, it will be verified that any equipment and material that may compromise the proper and safe operation of the PV Plant has been removed.

6.2.15.4 Completion of Commissioning

After successful Commissioning for the PV Plant, the Contractor will deliver all results and documentation to the Employer and the Employer's Engineer. The Completion Certificate will be issued by the Employer's Engineer once the successful completion of commissioning has been verified.

6.2.15.5 Operational acceptance testing

6.2.15.5.1 Purpose

The Operational Acceptance Test of the Plant shall be for the purpose of (i) demonstrating the achievement of guaranteed values, (ii) demonstrating the reliable and safe operation of the equipment, systems, and facilities, and (iii) being a condition precedent to the achievement of the Operational Acceptance of the Plant.

After successful completion of the items described in section 6.2.15.5.4, the Contractor shall be allowed to prepare the facilities for the Operational Acceptance Test.

The Operational Acceptance Test shall be carried out for the entire Plant, including related equipment and systems and by taking into account the conditions as specified in Section 6 of the Tender Documents.

The Contractor shall notify the Employer that the Plant is ready for the Operational Acceptance Test and that the instrumentation for the test is installed, commissioned, and checked. The supporting documentation, including instrumentation, calibration, and commissioning certificates, shall be provided to the Employer's Engineer together with the notification. Should all documentation be acceptable, within five (5) days thereafter the Operational Acceptance Test shall be started, when the weather conditions allow the test to be started, that is, when no Adverse Weather Conditions prevail.

The Operational Acceptance Test shall be carried out by the Contractor under the supervision of the Employer's Engineer, involving representatives from the Employer.

The Operational Acceptance Test shall be evaluated by the Contractor and the results of the Operational Acceptance Test shall be reviewed by the Employer's Engineer.

When the Operational Acceptance Test is passed successfully (as specified in chapters 6.2.15.5.2, 6.2.15.5.3 and 6.2.15.5.4 the Operational Acceptance Certificate will be issued to the Contractor by the Employer.

If the Operational Acceptance Test is not passed successfully, the Contractor has the obligation for remediation and to repeat the Operational Acceptance Test within a maximum period of three (3) months. Until successfully passing the Operational Acceptance Test, delay damages apply up to the maximum amount of delay damages according to GCC Sub-Clause 63.1 of the Contract. In the event that the maximum amount of delay damages is reached without successfully passing the Operational Acceptance Test, the Employer has the right to terminate the Contract in accordance with the provisions of Clause 67 of the Contract.

6.2.15.5.2 Operational acceptance test procedure

The Contractor shall submit to the Employer a detailed test procedure for the Operational Acceptance Test in writing two (2) months prior to the proposed commencement of the Operational Acceptance Test in accordance with the provisions of section 6.2.15. The procedure must be approved by the Employer's Engineer.

The test procedures shall include:

- Operational Acceptance Test detailed procedure
- description of instrumentation to be used, including accuracy

- method of data recording
- forms of test records and of test report.

The Operational Acceptance Test shall be performed for the entire PV Plant, evacuation infrastructure and grid connection.

6.2.15.5.3 Instrumentation

The instrumentation for the Operational Acceptance Test for the PV Plant will consist of at least two (2) meteorological stations, each consisting of:

- one (1) calibrated pyranometer to measure the global inclined irradiance on the plane of the array (POA) with a target measurement uncertainty of 2% and secondary standard according to ISO 9060 classification [W/m2].
- one (1) calibrated pyranometer to measure the global horizontal irradiance (GHI) with a target measurement uncertainty of 2% and secondary standard according to ISO 9060 classification [W/m2].
- a shielded, ventilated thermocouple to measure ambient temperature with a measurement accuracy of ± 1 °C
- a resistance thermometer (e.g. Pt100, Pt1000) or equivalent to measure the temperature of modules (on the back of the PV modules) with a measurement accuracy of ± 1 °C
- an anemometer mounted on a mast to measure the wind speed at the Site. The exact location and height of the mast will follow the recommendations from the structure supplier (if applicable).

For the data collection and evaluation of the meteorological data from the stations:

- Data will be collected by station, loggers, and instruments with a scan rate of one minute.
- All collected data will be averaged into 15-minute records.
- The records will be used for Operational Acceptance Testing and for the Annual Performance Review

The values of the pyranometers of different meteorological stations shall be averaged arithmetically. In case that the daily sum of the irradiation is more than 3% deviating between both pyranometers, the day shall be excluded and the test for that day repeated.

All pyranometers have to be cleaned on a daily basis.

The following energy meters (calibrated and approved according to national standard) are required:

- meter at the PV Plant Delivery Station (MV side)

6.2.15.5.4 Requirements for starting the Operational Acceptance testing

The following requirements must be fulfilled prior to the start of the Operational Acceptance Test:

- The Completion Certificate has been issued, which relates to the successful execution of Commissioning as described in section 6.2.15.4
- The Peak Power Certificate has been issued, which relates to the verification of the Installed Capacity of the PV Plant in accordance with section 6.2.15.5.8.
- Upon issuance of the Completion Certificate, the Operational Acceptance Test must be started within a maximum of twenty (20) days if not otherwise agreed between Contractor and Employer.
- The Operational Acceptance Test Procedure as described in section 6.2.15.1 has been published and agreed by the Contractor, the Employer and the Employer's Engineer.
- Instrumentation for the tests as described in section 6.2.15.3 has been installed, commissioned, and calibrated, and data is available in the monitoring system.

6.2.15.5.5 Irradiance and Availability Criteria for the Operational Acceptance Test

The test will be carried out for at least 6 days (the Operational Acceptance Testing Period) with the following criteria:

- at least five (5) days with irradiance measured on the plane of the array greater than 600 W/m² for 3 contiguous hours
- for at least five (5) days, the daily total irradiation on the plane of the array exceeds 4.5 kWh/m². For the avoidance of doubt, these days may be the same as those in the first condition (600 W/m² for 3 continuous hours)
- In the event that the five days are not reached with the required irradiation levels, the Operational Acceptance Testing Period will be extended until the irradiation criteria are achieved.
- Availability of the PV Plant and the grid shall be 100%. In the event of unavailability, the Operational Acceptance Testing Period will be extended accordingly by the relevant number of days.

6.2.15.5.6 Operational Acceptance Guarantee

During the Operational Acceptance Test, the Contractor shall demonstrate that the PV Plant, including related equipment and systems, achieves the Weather Adjusted Yield guaranteed in the relevant schedules of Section 6 of the Bid Documents for the month under consideration.

6.2.15.5.7 Evaluation methodology of the Operational Acceptance Test

In order to take into account the actual ambient conditions at the Site during the Operational Acceptance Test, the expected Yield (Y_{adj}) will be determined by running the PVsyst simulation - which has been contractually fixed - with the actual weather data during the test. For the determination of the Y_{adj}, the following method shall be applied:

- The irradiation in the plane of array (POA) will be averaged over all the existing meteorological stations of the PV Plant and formatted to hourly values. The same applies for the values of the module temperature.
- The simulation model for PVsyst (which has been contractually fixed) will be rerun with the irradiation and temperature logged during the testing period. In addition to that the results of the flash list values of the manufacturer will be taken into account for mismatch losses and the Counter Flash Tests for the adjustment of the module quality losses.
- The weather adjusted yield Y_{adj} (in kWh) will be determined for the entire testing period. This value represents the yield that the PV Plant should have achieved during the test.
- The weather adjusted yield Y_{adj} will then be compared with the yield at the relevant energy meter (Y_{meter}), taking into account the guarantee level (GL) of the weather adjusted yield as contractually agreed.

6.2.15.5.8 Definition of the Yield at the Operational Acceptance Test

Especially for PV systems the verification of Operational Acceptance provides benefits when being assessed on the basis of a weather adjusted yield. The theoretically achievable yield of the PV Plant will be calculated with the simulation software based on the ambient conditions prevailing during the testing period. The actually achieved yield can be easily verified as it is recorded as the produced electricity at the relevant energy meter at the point of grid connection.

A shortfall of produced electricity can therefore be detected by a simple comparison after a rerun of the simulation (keeping the same configurations as in the original simulation prior to award of contract except the adjustments for mismatch and module quality losses in accordance with the values of the manufacturer flash list and the results of the Counter Flash Tests). All kinds of losses and the individual performance of all components implemented are reflected in the actual electricity production measured at the energy meter.

If the Installed Capacity will be higher than the Nominal Peak Power, this will be reflected by means of adjusting the module quality losses of the original parameter setting of the PVsyst simulation.

The Yield at Operational Acceptance is defined as:

$$\boldsymbol{Y_{OAC}} = GL_{OAC} \times Y_{adj}$$

whereby:

- Y_{adj} = weather adjusted yield based on a rerun of the PVsyst simulation with actually measured ambient conditions
- GL_{OAC} = guarantee level provided by the Contractor (minimum value of 95%) [%]
- Y_{OAC} = relevant yield at Operational Acceptance

6.2.15.5.9 Operational Acceptance Test Calculation

The Operational Acceptance Test will be considered successful if, for the Operational Acceptance Testing Period, the following is fulfilled:

$$Y_{meter} \geq Y_{OAC}$$

with:

$$\boldsymbol{Y_{meter}} = \sum_{t=1}^{n} Y_t \left(G_{POA,t}\right)$$

whereby:

- Y_t = electricity generation at the relevant meter [kWh] within interval t (for valid intervals complying with the section 6.2.15.3)
- $G_{POA,t}$= total global solar irradiation on the plane of array [kWh/m²] within interval t
- t = interval of 1 hour
- n = last interval of 1 hour at the end of the testing period
- Y_{meter} = yield at the relevant energy meter [kWh] within Operational Acceptance Testing Period
- Y_{PAC} = yield at Operational Acceptance to be compared with the relevant energy meter

The guarantee level GL_{PAC} is applied in order to consider measurement uncertainties during the relatively short time of the Operational Acceptance Testing Period. At the same time this parameter shows the confidence of the Contractor in the well performance of the PV Plant and the suitability of their provided simulation results.

Plant Rejection will apply if the Y_{meter} of the Operational Acceptance Test is below the Minimum Acceptance Criteria as specified in Appendix 8 of Section 9 of the Tender Documents (90% of Yadj).

Should the achieved yield Y_{meter} be between the Minimum Acceptance Criteria and $\boldsymbol{Y_{PAC}} = GL_{PAC} \times Y_{adj}$ as specified in Appendix 12 of Section 9 of the Tender Documents, the Contractor shall be obliged to re-perform the Operational Acceptance Testing. Should the Contractor be unable to reach the guarantee level GL_{PAC} of Y_{adj} within three (3) months, the Employer shall be given the right to terminate the Contract in accordance with the provisions of Clause 42 of the Contract.

6.2.15.5.10 Requirements for the Issuance of the Operational Acceptance Certificate

The Operational Acceptance Certificate will be issued by the Employer once the following items are fulfilled:

- The Cold and Hot Commissioning Tests for the PV Plant have been successfully executed as described in section 6.2.15.2 and section 6.2.15.3.
- The Operational Acceptance Test for the PV Plant is successfully passed as described in section 6.2.15.9

- The punch list has been prepared and delivered by the Contractor and the Employer's Engineer has approved the punch list items and determined the value thereof, which must be remedied within one month from the issuance of the Operational Acceptance Certificate. The value of the punch list items shall not exceed 3% of the Contract Price.
- The Final Documentation has been delivered by Contractor.
- The O&M Manual has been delivered by the Contractor.
- Liquidated Damages have been paid if applicable.
- The Initial Inventory has been delivered to the Site.

6.2.15.6 Annual Performance Review

6.2.15.6.1 Purpose

The Annual Performance Review of the PV Plant shall be for the purpose of (i) demonstrating the achievement of the Annual PR Guarantee during the Defects Notification Period of the PV Plant, and (ii) reliable, stable, and safe operation of the PV Plant. The Annual Performance Review will be performed for the first and second year of plant operation from the issuance of the Operational Acceptance Certificate.

When the Annual Performance Review is passed successfully (as specified in section 6.2.15.6.4 the Annual Performance Review Certificate will be issued to the Contractor by the Employer.

If the Annual Performance Review is not passed successfully (as specified in section 6.2.15.6.4 non-performance damages must be paid according to 6.2.15.6.6.

6.2.15.6.2 Requirements for the Annual Performance Review

The following requirements must be fulfilled prior to the start of the Annual Performance Review:

- The Operational Acceptance Test has been successful and the Operational Acceptance Certificate has been issued.
- For the first Annual Performance Review, the issuing of the Operational Acceptance Certificate is one (1) year previously.
- No punch list items are pending.

6.2.15.6.3 Annual Performance Review Calculation

The Annual Performance Review comprises the verification of the performance of the PV Plant on a yearly basis. For the comparison of the measured PR and the guaranteed PR, a temperature correction approach must be followed. The $PR_{measured}$ will be corrected with the actual ambient temperature, which may deviate from the assumptions of a typical meteorological year as the basis of the PVsyst simulations (reference values). The correction for the Annual Performance Review takes the annual values into account (both measured and reference). No further reduction with respect to the Annual Degradation δ must be made as the measured electricity generation already accounts for module degradation. The Annual PR Corrected for the first year is consequently defined as:

$$PR^{A}_{corrected} = PR^{A}_{measured} \times \left[1 - \left(T_{amb,measured} - T_{amb,ref} \right) \times c_t \right] .$$

whereby:

- $T_{amb,\ measured}$ = average ambient temperature measured [°C]
- $T_{amb,\ ref}$ = average ambient temperature from the typical meteorological year [°C]
- c_t = negatively defined power temperature coefficient as of the module manufacturer data sheet [-x%/°C].

6.2.15.6.4 Compare Annual $PR_{corrected}$ with Annual $PR_{Guarantee}$

The Annual Performance Review will be considered successful if, for the relevant year of consideration, the following is fulfilled:

$$PR^{A}_{corrected} \geq PR^{A}_{Guarantee}$$

for each year of the Defects Notification Period.

6.2.15.6.5 Requirements for the Issuance of the Annual Performance Review Certificate

The Annual Performance Review Certificate will be issued once:

- The requirements as described in section 6.2.15.6.2 are fulfilled.
- The Annual Performance Review is considered successful as described in section 6.2.15.6.4

6.2.15.6.6 Liquidated Damages

The Contractor shall pay non-performance damages to the Employer if the Performance Ratio measured during the Annual Performance Review is less than the Annual PR Guarantee without further consideration of measurement uncertainties:

Damages shall be paid if: $PR^{A}_{corrected} \leq PR^{A}_{Guarantee}$

For each percentage that the Annual PR Corrected (PR corrected) is below the Annual PR Guarantee (PR Guarantee), an amount equal to 0.5% of the EPC price shall be payable by the Contractor to the Employer.

It is intended that, under no circumstances, will the correction mechanism lead to a payment from the Employer to the Contractor.
The non-performance damages are payable in the proportions of currencies in which the Contract Price is payable.

The maximum amount of non-performance damages for the Annual PR Guarantee shall be five percent (5%) of the Contract Price.

6.2.15.7 Final Acceptance Test

6.2.15.7.1 Purpose
The Final Acceptance Test of the PV Plant shall be for the purpose of (i) demonstrating achievement of the PR Guarantee for the last year of the Defects Notification Period of the PV Plant, and (ii) reliable, stable, and safe operation of the PV Plant.

When the Final Acceptance Test is passed successfully (as specified in section 6.2.15.7.4) the Final Acceptance Certificate will be issued to the Contractor by the Employer.

If the Final Acceptance Test is not passed successfully (as specified in section 6.2.15.7.4) non-performance damages related to future losses must be paid according to 6.2.15.6.6.

6.2.15.7.2 Requirements for the Final Acceptance Test

- The Annual Performance Review has been successful for the first year of the Defects Liability Period or relevant liquidated damages have been paid according to section 6.2.15.6.6.
- The issuing of the Operational Acceptance Certificate is two (2) years previously.
- The Initial Inventory has been replenished as per Sub-Section 6.2.16 **of Section 6**.

Thermo graphic analyses have been performed with IR camera for all PV modules and electrical connections in order to detect possible hot spots. PV modules with temperature anomalies have been

replaced and electrical connections with temperature anomalies have been renewed, at the Contractor's sole expense.

6.2.15.7.3 Final Acceptance Test Calculation

The Final Acceptance Test Calculation is equal to section 6.2.15.6.3.

6.2.15.7.4 Compare Final $PR_{corrected}$ with Final $PR_{Guarantee}$

Final Acceptance for the second year of the Defects Liability Period will be deemed achieved if:

$$PR^{F}_{corrected} \geq PR^{F}_{guarantee}$$

6.2.15.7.5 Requirements for the Issuance of the Final Acceptance Certificate Final

The Final Acceptance Certificate will be issued once:

- The requirements as described in section 6.2.15.7.2 are fulfilled.
- The Final Acceptance Test is considered successful as described in section 6.2.15.7.4.

6.2.15.50 Liquidated Damages

The calculation of Liquidated Damages at Final Acceptance is equal to section 6.2.15.6.6.

6.2.16 Initial Inventory

The Bidder shall be responsible for initial supplies of mechanical, electrical and I&C equipment as well as store and office equipment not specifically mentioned below, but necessary for the reliable operation and maintenance of the Plant, such as:

- consumables for commissioning, testing and during the Defects Notification Period of the PV Plant
- spare parts for at least the Defects Notification Period of the Plant
- special tools and equipment for maintenance.

6.2.16.1 Spare parts and consumables

The Bidder shall provide all spares necessary for discharging his responsibilities in carrying out the work, including commissioning and testing and during the warranty period. The Bidder shall ensure that he has prompt access to the spares to avoid delay to completion, commissioning or loss of generation.

All spare parts shall be directly interchangeable with the corresponding parts installed in the Plant and shall meet the requirements of the specifications of the Plant.

Spare parts comprise all disciplines of civil, mechanical, electrical and I&C works and shall be in compliance with Table 0-1 below:

Spare part	Amount
PV modules	1 % of installed modules
PV module cable connectors	10
DC string fuses	10
Inverters	7.5% of installed units

Table 0-1: Initial Inventory of Spare Parts

Any spare parts used during the Defects Notification Period shall be promptly replaced by the Bidder. Spares shall be warranted during the Defects Notification Period for the original Plant.

6.2.16.2 Special tools and equipment for maintenance

All the special tools and other equipment that are necessary for the overhaul, maintenance and adjustment of the whole Plant facilities and equipment shall be included in the Bidder's scope of supply. The Bidder shall provide two (2) sets of special tools. Corresponding toolboxes and tool cabinets shall also be provided by the Bidder.

All needed machinery, electrical and other equipment as well as vehicles needed for regular services and maintenance of the Plant shall be provided by the Bidder.

6.2.17 Performance Guarantee

The bidder is required to propose a PV Plant with a capacity ≥ 50 MWp and performance ratio **(PR) ≥ 80%** at the time of commissioning regardless the month the Plant is commissioned. This is a Technical Mandatory Requirement subject of rejection if not compliant.

The PV plant capacity in MWp and performance ratio of the completed Facility will be measured in quantitative terms as specified in Sub-section 6.2.15 to verify the compliance with the Plant capacity and PR requirements specified.

The Bidder shall provide the guaranteed values of the Plant operation as part of his Tender, by filling out the performance guarantee form listed below, see Table 6.1

For the simulation of the expected yield of the PV plant, which is the basis for the guaranteed performance. The Bidder is required to perform the yield estimation by using PVsyst software only.

Guaranteed Performance Ratio [PR]:

Month	Year 0*	Year 1**	Year 2***
	PR %	PR %	PR %
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Mean PR			

Table 6.1: Guaranteed PR

* at Operational acceptance [OAC]
** 12 months thereafter
*** at final acceptance [FAC]

Future performance of PV plant. The Bidder is also required to make yield estimations over a 20-year period considering PV module degradation according to Table 6.2 below:

Year	Annual Degradation of PV modules [%]	Estimated energy production kWh
1*		
2		
3		
4		
5		
6		
7		
8		
9		
10		

11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Table 6.2 : Future performance of PV plant

* 12 months after PAC

The Bidder is encouraged to define a certain soiling limit, based on his experience and verified with the dust fall equipment as determined in section **6.2.3.8.4** at which cleaning of all PV modules of the PV Plant will be performed. A suggested value for the soiling limit is 3%. The expected average soiling losses should consequently be in the range of 2%, which can then be used as an input variable to the yield simulation.

6.3 Form of Completion Certificate

Contract No: Date:
To:

[Name of Contractor]

Pursuant to GCC Clause 39 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated *[insert date]*, for the supply and installation of plant and Services for *[name of contract],* 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,

for and on behalf of the Employer

[***Signature***]

[***Title of the Project Manager***]

6.4 Form of Operational Acceptance Certificate

Contract No: Date:
To:

[Name of Contractor]

Pursuant to GCC Clause 40.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated *[insert date]*, for the supply and installation of plant and Services for *[name of contract],* 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,

for and on behalf of the Employer

[***Signature***]

[***Title of the Project Manager***]

6.5 Form of Change Order Procedure and Forms

Contract No: Date:
To:

[Name of Contractor]

CONTENTS

ANNEXES

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 GCC Clause 64 (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 GCC Clause64 shall be serially numbered CR-X-nnn.

(2) Estimate for Change Proposal as referred to in GCC Clause 64 shall be serially numbered CN-X-nnn.

(3) Acceptance of Estimate as referred to in GCC Clause 64 shall be serially numbered CA-X-nnn.

(4) Change Proposal as referred to in GCC Clause 64 shall be serially numbered CP-X-nnn.

(5) Change Order as referred to in GCC Clause 64 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: Date:

Attention:

Contract Name:
Contract Number:

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. _____[16]:

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:

   Drawing No./Document No. Description

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.

   (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.

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

Annex 2. Estimate for Change Proposal

(Contractor's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

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 GCC Sub-Clause64.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Sub-Clause64.2.2, 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: _____[17]

   (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)

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

[17] Costs shall be in the currencies of the Contract.

Annex 3. Acceptance of Estimate

(Employer's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

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 GCC Clause64 of the General Conditions.

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

Annex 4. Change Proposal

(Contractor's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

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:[18]

(Amount)

   (a) Direct material

   (b) Major construction equipment

   (c) Direct field labor (Total _____hrs)

   (d) Subcontracts

   (e) Indirect material and labor

   (f) Site supervision

   (g) Head office technical staff salaries

[18] Costs shall be in the currencies of the Contract.

Process engineer	_____hrs @ _____ rate/hr
Project engineer	_____hrs @ _____ rate/hr
Equipment engineer	_____hrs @ _____ rate/hr
Procurement	_____hrs @ _____ rate/hr
Draftsperson	_____hrs @ _____ rate/hr
Total	_____hrs

(h) Extraordinary costs (computer, travel, etc.)

(i) Fee for general administration, _____ % of Items

(j) Taxes and customs duties

Total lump sum cost of Change Proposal
(Sum of items (a) to (j))

Cost to prepare Estimate for Change Proposal
(Amount payable if Change is not accepted)

9. Additional time for Completion required due to Change Proposal

10. Effect on the Functional Guarantees

11. Effect on the other terms and conditions of the Contract

12. Validity of this Proposal: within *[Number]* days after receipt of this Proposal by the Employer

13. Other terms and conditions of this Change Proposal:

(a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within _____ 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]

Signature:	*[insert signature of authorised representative of the Contractor]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Contractor:	*[insert name of the Contractor]*

[2] Specify where necessary.

Annex 5. Change Order

(Employer's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

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 GCC Clause64 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: _____

   Foreign currency portion _____ plus Local currency portion _____

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: Date:

Attention:

Contract Name:
Contract Number:

We instruct you to carry out the work in the Change Order detailed below in accordance with GCC Clause64 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:

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

Annex 7. Application for Change Proposal

(Contractor's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

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:

Signature:	*[insert signature of authorised representative of the Contractor]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Contractor:	*[insert name of the Contractor]*

Signature Seal

6.6 Supplementary Information

[The Tenderer shell furnish additional description/information covering all activities, if any]

Section 7. Drawings