

ISO 9001, ISO 14001 &
ISO 45001 Certified

Bangladesh Rural Electrification Board

**OFFICE OF THE SUPERINTENDING ENGINEER (GRID &
SUBSTATION), BREB, DHAKA**

Tender Document (STD)

For Supply & Installation of Plant & Equipment (National)

TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.

Invitation for Tender No: 27.12.0000.173.31.417.26.76, Date- 20-01-2026

Tender Package No: SE(G&SS)-11/0.4KV-SS-Padma Bridge-BBA

Issued to: M/S.....

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Section-I: Instructions to Tenderers

A. General

1. Scope of Tender	1.1	The Procuring Entity, as indicated in the Tender Data Sheet (TDS) issues this Tender Document for the supply and installation of plant and equipment incidental thereto as specified in the TDS and as detailed in Section 6: Schedule of Requirements . The name of the Tender and the number and identification of its constituent lot(s) are stated in the TDS .
	1.2	The successful Tenderer shall be required to execute the Plant and Equipment as specified in the General Conditions of Contract and Particular Conditions of Contract.
2. Interpretation	2.1	<ul style="list-style-type: none"> (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; (c) “day” means calendar days unless otherwise specified as working days; (d) “Person” means and includes an individual, body of individuals, sole proprietorship, partnership, company, association or cooperative society, NGO that wishes to participate in Procurement proceedings; (e) “Tenderer” means a Person who submits a Tender; (f) “Tender Document” means the Document provided by a Procuring Entity to a Tenderer as a basis for preparation of the Tender; and (g) “Tender” depending on the context, means a Tender submitted by a Tenderer for delivery of Goods to a Procuring Entity in response to an Invitation for Tender. (h) “BPPA” means the Bangladesh Public Procurement Authority formed under the Bangladesh Public Procurement Authority Act, 2023.
3. Source of Funds	3.1	The Procuring Entity has been allocated public funds 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 monetary resources appropriated to the Procuring Entity under Government budget, or financing, grants and credits placed at the disposal of the Procuring Entity through the Government by the development partners or foreign states or organisations and also includes any fund of a government, semi-government or a statutory body established by law.
	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 or foreign state or Organisation in accordance with the applicable Financing/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 Practices	4.1	The Government, and the Development Partner, if applicable, requires that the Procuring Entity as well as the Tenderers and Contractors (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	<p>For the purposes of ITT Sub Clause 4.3, the terms set forth below as follows:</p> <ul style="list-style-type: none"> (a) “Corrupt practice” means offering or promising to offer, directly or indirectly, any bribe, employment, valuable item or service, or financial benefit to any officer or employee of the Procuring Entity or of any other public or private authority, with the intent to influence any act, decision, or procedure of the Procuring Entity in the course of the procurement process or contract execution, or the acceptance or solicitation of such by any officer or employee of the Procuring Entity. It shall also include any involvement of the Procuring Entity or any of its employees in corrupt, fraudulent, collusive, coercive, or obstructive practices as mentioned in this Rule; (b) “Fraudulent practice” means any act of providing false statements, dishonestly concealing information, or omitting or misrepresenting or distorting facts by any person to influence a decision in the procurement process or contract execution; (c) “Collusive practice” means a scheme or arrangement between two (2) or more Persons, knowingly or unknowingly involving the Procuring Entity or any of its employees, 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” means deliberately destroying, falsifying, altering, or concealing evidence related to a procurement-related investigation, or providing false statements to an investigator so as to impede the investigation of allegations of corrupt, fraudulent, collusive, coercive, or obstructive practices; or intimidating, harassing, or threatening an investigator so as to discourage the disclosure of information or prevent

		<p>the investigator from carrying out their duties, or directly or indirectly obstructing any action undertaken by the Bangladesh Public Procurement Authority (BPPA) in discharging its responsibilities assigned under the Bangladesh Public Procurement Authority Act, 2023.</p>
4.3		<p>Should any corrupt, fraudulent, collusive, coercive or obstructive practice of any kind be 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 2006 and Public Procurement Rules, 2025 and Guidelines of the Development Partners as stated in the ITT sub-clause 3.3.</p>
4.4		<p>If corrupt, fraudulent, collusive, coercive or obstructive practices of any kind is determined by the Procuring Entity against any Tenderer or Contractors (including sub-contractors, agents, personnel, consultants, and service providers) in competing for, or in executing, a contract under public fund:</p> <ul style="list-style-type: none"> (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 (debarment) in any Public Procurement proceedings for a specific period of time; (d) Procuring Entity shall suspend the concerned Tenderer from participating in any other procurement proceedings within the PE organization for the period of finalizing the debarment process; (e) 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 (f) Development Partner shall cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Procuring Entity or of a beneficiary of the financing 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.
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	4.5	Tenderer shall be aware of the provisions on corruption, fraudulence, collusion, coercion and obstruction of the Public Procurement Act, 2006, the Public Procurement Rules, 2025 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, the BPPA 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, the BPPA 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 (not barred by Public Procurement Act or any other law(s) to sign the contract) to enter into the Contract under the Applicable law.
	5.3	Tenderers shall be enrolled in the relevant professional or trade organisations registered in its own country.
	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, if any, 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 Partners 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 due to suspension or debarment for corrupt, fraudulent, collusive, coercive or obstructive practices as stated under ITT Sub Clause 4.4.

5.8	Tenderers are not currently restrained due to suspension or debarred from participating in Public Procurement on grounds of fundamental breach of contract 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	<p>A Tenderer shall not have a conflict of interest. Any Tenderer found to have a conflict of interest shall be disqualified. A Tenderer may be considered to have a conflict of interest for the purpose of this Tendering process, if the Tenderer:</p> <ul style="list-style-type: none"> a) directly or indirectly controls, is controlled by or is under common control with another Tenderer; or b) receives or has received any direct or indirect subsidy from another Tenderer; or c) has the same legal representative as another Tenderer; or d) has a relationship with another Tenderer, directly or through common third parties, that puts it in a position to influence the Tender of another Tenderer, or influence the decisions of the procuring entity regarding this tendering process; or e) any of its partners participated as a consultant in the preparation of the design or technical specifications of the Goods that are the subject of the Tender.
5.14	A Tenderer shall provide its/their Beneficial Ownership related information, as the specified in Form PG5A-2 , if it/they will be awarded the contract and declare their consent on publishing that information publicly following the signing of contract.
5.15	A tenderer has not been under restriction imposed by any Development Partner operating in Bangladesh on grounds related to their procurement affairs.

6. Eligible Plants and Services	6.1	All plants and services to be supplied under the Contract are from eligible sources, 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	<p>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.</p> <p>For the purposes of this Clause, “origin” means the country 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 or country where the goods have been mined, grown, cultivated, produced, manufactured or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components or the place from which the related services are supplied.</p>
	6.3	The origin of plant and equipment and associated services 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 Procuring Entity 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 Procuring Entity 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 Tenderer’s own expense.

B. Tender Document

8. Tender Document: General	8.1	<p>The Sections comprising the Tender Document are listed below, and should be read in conjunction with any Addendum issued under ITT Clause 11.</p> <ul style="list-style-type: none"> • 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 Procuring Entity's Requirements • Section 7 Drawings
	8.2	<p>The Procuring Entity is not responsible for the completeness of the Tender Document and their addenda, if these were not purchased directly from the Procuring Entity, or through its agent as specified in the TDS.</p>
	8.3	<p>Tenderers are expected to examine all instructions, forms, terms, and specifications in the Tender Document as well as in addendum to Tender, if any.</p>
9. Clarification of Tender Document	9.1	<p>A prospective Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address and within time as specified in the TDS.</p>
	9.2	<p>The Procuring Entity is not obliged to answer any clarification request received after that date as stated under ITT Sub Clause 9.1.</p>
	9.3	<p>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.</p>
	9.4	<p>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.</p>
	9.5	<p>Should the Procuring Entity deem it necessary to amend the Tender Document as a result of a clarification, it will do so following the procedure under ITT Clause 11.</p>
10. Pre-Tender Meeting	10.1	<p>To clarify issues and to answer questions on any matter arising in the Tender Document, the Procuring Entity 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 and invited to attend the meeting, if it is held.</p>
	10.2	<p>Tenderers are requested to submit any questions in writing so as to reach the Procuring Entity not later than one day prior to the date of the meeting.</p>

	10.3	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 five (5) working days after holding the meeting to all those who purchased the Tender document and to even those who did not attend the meeting. Any revision to the Tender Document listed in ITT Sub Clause 8.1 that may become necessary as a result of the pre-Tender meeting will be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to 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 Procuring Entity, on its own initiative or in response to an inquiry 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.
	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 must be circulated by 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 Procuring Entity shall also ensure posting of the relevant addenda with the reference number and date on their websites including notice boards, where the Procuring Entity had originally posted the IFTs.
	11.4	The Tenderer shall acknowledge receipt of an addendum.
	11.5	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.
	11.6	To give a prospective Tenderer reasonable time in which to take an addendum into account in preparing its Tender, the Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders, pursuant to ITT Sub Clause 41.2.
	11.7	If an addendum is issued when time remaining is less than one-third of the time allowed for the preparation of Tenders, the Procuring Entity at its discretion 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. In any case, the minimum time for such extension shall not be less than three (3) working days.

C. Qualification Criteria

12. General Criteria	12.1	Tenderers 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, which entails setting pass/fail criteria, which if not met by the Tenderers, will result in consideration of its Tender as non-responsive.
	12.2	In addition to meeting the eligibility criteria, as stated in ITT Clause 5, Tenderers must satisfy the other criteria stated in ITT Clauses 13 to 18 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 Tenderers shall demonstrate having resources and experience sufficient to meet the aggregate of the qualifying criteria for the individual contracts. The requirement of general experience as stated under ITT Sub Clause 13.1(a) and specific experience, unless otherwise of different nature, as stated under ITT Sub Clause 13.1(b) shall not be separately applicable for each individual lot.
13. Experience Criteria	13.1	Tenderers shall have the following minimum level of supply experience to qualify for the supplying of Goods under the Contract: <ul style="list-style-type: none"> (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, each with a minimum value, over the period, as specified in TDS.
14. Financial Criteria	14.1	Tenderers shall have the following minimum level of financial capacity to qualify for the supply, execution and performance of plant and services under the Contract: <ul style="list-style-type: none"> (a) satisfactory resolution of all claims under litigation cases and shall not have serious negative impact on the financial capacity of the Tenderers. All pending litigation shall be treated as resolved against the Tenderers; (b) availability of minimum financial resources in any form or combination of forms of liquid assets or credit line(s) or working capital, net of other

		<p>contractual commitments of the amount as specified in the TDS; and</p> <p>(c) 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.</p>
15. Personnel Capacity	15.1	<p>The Tenderer shall have the following minimum level of personnel capacity to qualify for the performance of the plant and services under the Contract.</p> <p>A Project Manager, Engineers, and other key staff with qualifications and experience as specified in the TDS;</p>
16. Equipment Capacity	16.1	<p>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.</p>
17. Joint Venture (JV)	17.1	<p>Tenderers may participate in the procurement proceedings forming a Joint Venture(JV) by an agreement, without alterations, in the format as specified in the Format PG5A-2b, executed case by case on a non-judicial stamp of value as specified in the 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 legally authorised partners of the intended JV and authenticated by a Notary Public, with the declaration that the partners will execute the JV agreement in the event the Tenderer is successful.</p>
	17.2	<p>The figures for each of the partners of a JV shall be added together to determine the Tenderer's compliance with the minimum qualifying criteria; however, for a JV under ITT Sub Clause 17.1, with number of partners as specified in the TDS to qualify, Lead partner and other partners must meet the criteria as specified in the TDS. Failure to comply with these requirements will result in non-responsiveness of the JV Tender.</p>
	17.3	<p>Each partner of the JV 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.</p>
	17.4	<p>JV shall nominate the Lead Partner as Representative or Partner-in-charge being entrusted with the Contract administration and management at Site who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the Tendering process and, in the event the JV is awarded the Contract, during contract execution including the receipt of payments for and on behalf of the JV.</p>
	17.5	<p>The business share of the Lead Partner shall be the highest among all the partners. Other partner(s) shall have at least 25% of business share each.</p>

18. Subcontractor (s)	18.1	Tenderers may intend to subcontract an activity or 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 maximum allowable limit for subcontracting of Plant and Services specified in the TDS , in which case such item(s) and the proposed Subcontractor shall be clearly identified in the Form PG5A-2c .
	18.2	The Procuring Entity 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 Tenderers to propose an acceptable substitute.
	18.3	A Subcontractor may participate in more than one Tender, but only in that capacity.
	18.4	The Procuring Entity may also select in advance Nominated Subcontractor(s) to execute certain specific components of the Works and if so, those will be specified in the TDS .
	18.5	If a contractor wishes to subcontract an activity or part of the works according to the provision of ITT Clause 18.1 after entering into the contract, it can only be done after approval of Head of the Procuring Entity (HOPE) or an officer authorized by him or her (AO).
	18.6	Any unauthorised subcontracting after entering into the contract shall be considered as fundamental breach of contract.

D. Tender Preparation

19. Only one Tender	19.1	If a Tender for Plants and Services is invited for a number of lots on a "lot-by-lot" basis, each such lot shall constitute a Tender. Tenderers shall submit only one (1) Tender for each lot, either individually or as a JVCA. Tenderer who submits or participates in more than one (1) Tender in one (1) lot of the package will cause all the Tenders of that particular Tenderer to be rejected.
20. Cost of Tendering	20.1	Tenderers shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.
21. Issuance and Sale of Tender Document	21.1	The Procuring Entity shall make Tender Documents available immediately to the potential Tenderers, requesting and willing to purchase at the corresponding price by the date the advertisement has been published in the newspaper.
	21.2	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 Procuring Entity.
	21.3	There shall not be any pre-conditions whatsoever, for sale of Tender Documents and the sale of such Document shall be permitted up to the day prior to the day of deadline for the submission of Tender.

22. Language of Tender	22.1	<p>Tenders shall be written in the English language. Correspondences and documents relating to the Tender may be written in English or <i>Bangla</i>. 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 <i>Bangla</i> language, in which case, for purposes of interpretation of the Tender, such translation shall govern.</p>
	22.2	<p>Tenderers shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.</p>
23. Contents of Tender	23.1	<p>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 Sub Clause 23.2 and other called the Financial Offer containing the documents listed in 23.3, both envelopes enclosed together in an outer Single envelope.</p>
	23.2	<p>The Technical Offer (Envelope-01) prepared by the Tenderers will comprise the following:</p>
		<ul style="list-style-type: none"> (a) the Tender Submission Letters (Form PG5A-1a), as stated under ITT Sub Clause 24.1; (b) the Tenderer Information as stated under ITT Clauses 5, 28 and 31 (Form PG5A-2a); (c) the Tender Security as stated under ITT Clauses 34, 35 and 36. (d) the alternatives, if permissible, as stated under ITT Clause 25; (e) the written confirmation authorizing the signatory of the Tender including National ID to commit the Tenderer if applicable, as stated under ITT Sub Clause 39.4; (f) the Valid Trade license; (g) The Tenderer shall submit with its Tender the following documents as a proof of fulfilling taxation obligations in accordance with ITT Sub Clause 5.5; <ul style="list-style-type: none"> i. TIN certificate; ii. Acknowledgement slip issued by the competent income tax authority as a proof of submission of income tax return for the Assessment Year as mentioned in the TDS; and iii. Value Added Tax registration certificate/ Business Identification Number. (h) the Technical Proposal describing work plan & method, personnel, equipment and schedules as stated under ITT Clause 30; (i) documentary evidence as stated under ITT Clause 28 and 31 establishing the Tenderer's eligibility and the minimum qualifications of the Tenderers required to be met for due performance of the Works under the Contract; (j) 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

		<p>Contract with the Procuring Entity as stated under ITT clause 5;</p> <p>(k) 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;</p> <p>(l) 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;</p> <p>(m) 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;</p> <p>(n) Documentary evidence as stated under ITT Clauses 29, that the Goods and Related Services conform to the Tender Documents;</p> <p>(o) Documentary evidence as stated under ITT Clause 31 that the Tenderer's qualifications conform to the Tender Documents;</p> <p>(p) document establishing legal and financial autonomy and compliance with commercial law, as stated under ITT Sub Clause 5.10 in case of government owned entity;</p> <p>(q) In addition to the requirements stated under ITT Sub Clause 18.1, Tenders submitted by a JVCA or proposing a Subcontractor shall include.</p> <ol style="list-style-type: none"> 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 17.1; or a Letter of Intent along with the proposed agreement duly signed by all partners of the intended JV with the declaration that it will execute the Joint Venture agreement in the event the Tenderer is successful; the JV Partner Information (Form PG5A-2b); the Subcontractor Information (Form PG5A-2c). <p>(r) the completed Specifications Submission and Compliance Sheet (Form PG5A-5) as stated under ITT clause 29.1;</p> <p>(s) Any other document as specified in the TDS.</p>
23.3		<p>The Financial Offer (Financial Envelope-02) prepared by the Tenderers will comprise the following:</p> <p>(a) the Financial Offer Submission Letter (Form PG5A-1b), as stated under ITT Sub Clause 23.3;</p> <p>(b) the completed Price Schedule for Plant and Services for each lot in accordance with ITT Clauses 24, 26 and 27;</p> <p>(c) the written confirmation authorizing the signatory of the Tender to commit the Tenderer, as stated under ITT Sub Clause 39.4;</p>

		(d) any other document as specified in the TDS.
24. Tender Submission Letter and Price Schedule	24.1	Tenderers shall submit the Technical Offer Submission Letter (Form PG5A-1a), which shall be completed without any alterations to its format, filling in all blank spaces with the information requested, failing which the Tender may be rejected as being incomplete.
	24.2	Tenderers shall submit the Financial Offer submission letter (Form PG5A-1b) along with priced Schedule using the form(s) furnished in Section 5: Form PG5A-3 (Price Schedule)
	24.3	If in preparing its Tender, the Tenderer has made errors in the unit rate or the total price, and wishes to correct such errors prior to submission of its Tender, it may do so, but shall ensure that each correction is initialled by the authorised person of the Tenderer.
25. Alternatives	25.1	Unless otherwise specified in the TDS , Technical alternatives shall not be considered.
	25.2	When specified in ITT clause 25.1 , Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the TDS .
	25.3	Only the technical alternatives, if any, of the lowest evaluated Tenderer conforming to the basic technical requirements will be considered by the Procuring Entity.
26. Tender Prices, Discounts and Price Adjustment	26.1	The prices and discounts quoted by the Tenderers in the Tender Submission Letter (Form PG5A-1a and PG5A-1b) and Price Schedule (Form PG5A-3) shall conform to the requirements specified below.
	26.2	Tenderers shall fill in unit rates for all items of the Goods both in figures and in words as described in the Price Schedule, excluding any discount offered.
	26.3	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.
	26.4	Tenderers are required to quote the price for the commercial, contractual and technical obligations outlined in the tender document.
	26.5	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.
	26.6	Depending on the scope of the Contract, the Price Schedules may comprise up to the seven (7) schedules listed below. Separate numbered Schedules included in Section 5, Tender Forms, from those

		<p>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 6), giving the total tender price(s) to be entered in the Letter of Tender.</p> <p>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 and other Services Schedule No. 6 Grand Summary (Schedule Nos. 1 to 4) Schedule No. 7 Recommended Spare Parts</p> <p>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.</p>
	26.7	<p>In the Schedules, tenderers shall give the required details and a breakdown of their prices as follows:</p> <p>(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.</p> <p>(b) Plant manufactured within the Purchaser's country (Schedule No. 2):</p> <ul style="list-style-type: none"> (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 Procuring Entity's country on the plant if the contract is awarded to the Tenderer, and (iii) The total price for the item. <p>(c) Design Services (Schedule No. 3).</p> <p>(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</p>

		<p>Procuring Entity's country as of twenty-eight (28) days prior to the deadline for submission of tenders.</p> <p>(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</p>
26.8		The current edition of INCOTERMS, published by the International Chamber of Commerce shall govern.
26.9		The prices shall be either fixed or adjustable as specified in the TDS .
26.10		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.
26.11		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.
26.12		If so, indicated in ITT 19.1, 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.
26.13		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.
26.14		All items or lots in Section 6: Schedule of Requirements must be listed and priced separately on the Price Schedule following the Form PG5A-3 .
26.15		The price to be quoted in Tender Submission Letter (Form PG5A-1a and PG5A-1b) shall be the total price of the Tender, excluding any discounts offered.
26.16		Tenderers shall quote any unconditional discounts and the methodology for application of that discount in the Tender Submission Letter as stated under ITT Sub Clause 24.1.
26.17		Tenderers wishing to offer any unconditional discount for the award of more than one lot shall specify the discount applicable to each lot, or alternatively, to any combination of lots within the package in their Tender. Discounts will be submitted as stated under ITT Sub Clause 26.12, provided the Tenders for all lots are submitted and opened together.

	26.18	All applicable taxes, custom duties, VAT and other levies payable by the Contractor under the Contract, or for any other causes, as of the date twenty-eight (28) days prior to the deadline for submission of Tenders, shall be included in the unit rates and the total Tender price submitted by the Tenderers.
	26.19	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 Procuring Entity shall provide the indexes and weightings or coefficients in Appendix to the Tender for the price adjustment formulae specified in the PCC.
	26.20	The Procuring Entity may require the Tenderer to justify its proposed indexes, if any of those as stated under ITT Sub Clause 26.11, are instructed to be quoted by the Tenderer in Appendix to the Tender .
	26.21	The price adjustment stated under ITT Sub Clause 26.9 and 26.11 shall be dealt with in accordance with the provisions in Section 12 and 22 of the Public Procurement Act, 2006 and Rule 4 and 51 of the Public Procurement Rules, 2025.
27. Tender Currency	27.1	For expenditures that will be incurred in Bangladesh, the Tenderer shall quote the prices in Bangladeshi Taka (BDT).
	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 Eligibility of the Tenderer	28.1	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: <ul style="list-style-type: none"> (a) complete the eligibility declarations in the Tender Submission Letter (Form PG5A-1a and PG5A-1b); (b) complete the Tenderer Information (Form PG5A-2a); (c) complete Subcontractor Information (Form PG5A-2c), if it intends to engage any Subcontractor(s).
	28.2	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 28.1, it shall: <ul style="list-style-type: none"> (a) provide for each JV partner, completed JV Partner Information (Form PG5A-2b); (b) provide the JV agreement as per Format PG5A-2b or Letter of Intent along with the proposed agreement of the intended JV as stated under ITT Sub Clause 17.1.
	29.1	Tenderers shall complete the country of origin declarations in the Price Schedule Forms and, submit documentary evidence to establish the

29. Documents Establishing the Eligibility and Conformity of Plant and Services		origin of all Goods to be supplied under the Contract as stated under ITT Clause 6.
	29.2	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 (which may be in the form of literature, specifications and brochures, drawings or data) that the Goods and Related Services conform to the technical specifications and standards specified in Section 7, Technical Specifications .
	29.3	<p>Documentary evidence of conformity of the Goods to the Tender Documents may be in the form of literature, drawings, and data, and shall consist of:</p> <ul style="list-style-type: none"> (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 Procuring Entity's Technical Specifications demonstrating substantial responsiveness of the plant and services to those specifications. Tenderers shall note that standards for workmanship, materials and equipment designated by the Procuring Entity 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 Procuring Entity's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Specification.
30. Documents Establishing Technical Proposal	30.1	Tenderers shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule, risks involved and measures there against and any other information as stipulated in TDS, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work requirements and the completion time.
31. Documents Establishing the Tenderer's Qualification	31.1	<p>Tenderers shall complete and submit the Tenderer Information (Form PG5A-2a) and shall include documentary evidence, as applicable to satisfy the following:</p> <ul style="list-style-type: none"> a) general experience in the supply of Goods as stated under ITT Sub Clause 13.1(a), substantiated by the year of Tenderer's registration/constitution/licensing in its country of origin; b) specific experience of satisfactory completion of supply of Goods under public or private sector of similar nature and size as stated under ITT Sub Clause 13.1(b), substantiated

		<p>by Completion Certificate (s) issued or duly certified, by the relevant Procuring Entity(s);</p> <p>c)</p> <p>d) adequacy of minimum liquid asset substantiated by bank statement having previous date's closing balance with three (3) months transaction details; or (ii) updated balance statement on previously approved credit line; or (iii) unconditional specific credit commitment letter issued in the format as specified in Form PG5A-8 without alteration from any scheduled bank of Bangladesh, and issued not earlier than twenty-eight (28) days prior to the day of the initial (if applicable) deadline for submission of Tenders for this Contract as stated under ITT Sub Clause 14.1(b) or (iv) working capital substantiated by audited financial statements mentioned in (h) below.;</p> <p>e) if required in the TDS, a Tenderer that does not manufacture or produce the Goods shall submit the Manufacturer's Authorization Letter (Form PG5A-6);</p> <p>f) authority to seek references from the Tenderer's Bankers or any other sources in its letter-head pad;</p> <p>g) reports on the financial standing of the Tenderers, such as profit and loss statements and audited balance sheet for the previous years as specified in the TDS, substantiated by Audit Reports;</p> <p>h) information regarding technical and administrative personnel along with their qualification and experience proposed for the Contract as stated under ITT Clause 15; and</p> <p>i) major items of construction equipment proposed to carry out the Contract as stated under ITT Clause 16, substantiated by statement(s) of the entity(s) participating in the Tender in its letter-head pad declaring source of its availability and documents related to ownership or hiring or leasing.</p>
32. Validity Period of Tender	32.1	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 <u>Tender and issuance of the Notification of Award (NOA)</u> .
	32.2	Tenders shall remain valid for the period as specified in the TDS after the date of Tender submission deadline. A Tender valid for a period shorter than that specified will be considered, non- responsive.
33. Extension of Tender Validity	33.1	In exceptional circumstances, prior to the expiration of the Tender Validity period, the Procuring Entity may solicit all the Tenderers' consent to an extension of the period of validity of their Tenders, subject to a maximum of two times; provided that those Tenderers have passed the preliminary examination as stated under ITT Sub Clauses 46.2.

and Tender Security	33.2	The request for extension of Tender Validity period shall state the new date of the validity of the Tender.
	33.3	The request and the responses shall be made in writing. Validity of the Tender Security provided under ITT Clause 34 shall also be suitably extended for twenty-eight (28) days beyond the new date for the expiry of the Tender Validity. If a Tenderer does not respond or refuses the request it shall not forfeit its Tender Security, but its Tender shall no longer be considered in the evaluation proceedings. A Tenderer agreeing to the request will not be required or permitted to modify its Tender.
34. Tender Security	34.1	Tenderers shall furnish as part of its Technical offer (envelope-1) Tender, in favour of the Procuring Entity or as otherwise directed on account of the Tenderer, a Tender Security in original form (not copy) and in the amount, as specified in the TDS .
	34.2	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 JV or any of the partners of that JV or in the names of all future partners as named in the Letter of Intent of the JV, a Tender Security in original form and in the amount as stated under ITT Sub Clause 34.1.
	34.3	In case of substitution of the Tender as stated under ITT Clause 43.3 a new Tender Security shall be required in the substituted Tender.
35. Form of Tender Security	35.1	<p>The Tender Security shall:</p> <ul style="list-style-type: none"> (a) at the Tenderer's option, be either; <ul style="list-style-type: none"> i. in the form of a Bank Draft or Pay Order, or ii. in the form of an irrevocable unconditional Bank Guarantee issued by any scheduled Bank of Bangladesh, in the format (Form PG5A-7) without any alteration, 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-7) furnished in Section 5: Tender and Contract Forms; (c) be payable promptly upon written demand by the Procuring Entity in the case of the conditions as stated under ITT Sub Clause 38.1 being invoked; and (d) 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 as stated under ITT Sub Clause 38.1.
36 Authenticity of Tender Security	36.1	The authenticity of the Tender Security submitted by a Tenderer may be examined and verified by the Procuring Entity at its discretion in writing from the Bank issuing the security, prior to finalization of the Evaluation Report.
	36.2	If a Tender Security is found to be not-authentic, the Procuring Entity may proceed to take measures against that Tenderer as stated under ITT Sub Clause 4.4.

	36.3	A Tender not accompanied by a valid Tender Security will be considered non-responsive.
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37. Return of Tender Security	37.1	No Tender Security shall be returned to the Tenderers before Approval of Evaluation Report.
	37.2	Non-responsive Tenderer's Tender Security will be returned after approval of Evaluation Report but within twenty-eight (28) days of the expiry of the Tender Validity period as stated under ITT Sub Clauses 32.1. The Tender Security of the responsive Tenderers except the 1 st , 2 nd , and 3 rd lowest responsive Tenderers may be returned, in the same manner, upon written request from them to the Procuring Entity.
	37.3	The Tender Security of the 1 st , 2 nd , and 3 rd lowest responsive Tenderers (as the case may be) will be returned upon the successful Tenderer's furnishing of the performance security and signing of the Contract Agreement, if not otherwise subject to ITT Clause 38.1.
38. Forfeiture of Tender Security	38.1	<p>The Tender Security may be forfeited, if a Tenderer:</p> <ul style="list-style-type: none"> (a) withdraws its Tender after opening of Tenders but within the validity of the Tender as stated under ITT Clause 32 and 33; or (b) does not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT Clause 53; or (c) fails to furnish Performance Security or tenderer's submitted Performance Security has been found unauthentic as stated under ITT Sub Clauses 66.1 and 66.2; or (d) refuses or fails to sign the Contract as stated under ITT Sub Clause 71.2. (e) involves in any corrupt, fraudulent, collusive, coercive or obstructive practice of any kind as defined in ITT Clause 4.
39. Format and Signing of Tender	39.1	Tenderers shall prepare one (1) original of the documents comprising the Technical Offer as described in ITT Clause 23.2 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.
	39.2	Tenderers shall prepare one (1) original of the documents comprising the Financial Offer as described in ITT Clause 23.3 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.
	39.3	Alternatives, if permitted as stated under ITT Clause 22, shall be clearly marked "Alternative".

	39.4	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. The original and each copy of the Tender 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 document shall be attached to the Tender Submission Letter (Form PG5A-1c). 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.
	39.5	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

40. Sealing, Marking and Submission of Tender	40.1	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 ". Tenderers shall enclose the original in one (1) envelope and all the copies of the Tender, including the alternatives, if permitted under ITT Clause 25, in another envelope, duly marking the envelopes as " ORIGINAL (O) " " ALTERNATIVE (A) " (if permitted) and " COPY ." These sealed envelopes will then be enclosed and sealed in one (1) single outer envelope.
	40.2	The inner and outer envelopes of Technical Offer shall: <ul style="list-style-type: none"> (a) be addressed to the Procuring Entity at the address as stated under ITT Sub Clause 41.1; (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 44.1; (e) bear any additional identification marks as specified in the TDS.

	40.3	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 ".
	40.4	<p>The inner and outer envelopes of Financial Offer shall:</p> <ul style="list-style-type: none"> (a) be addressed to the Procuring Entity at the address as stated under ITT Sub Clause 41.1; (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.
	40.5	The Envelope-01 as stated in ITT Clause 40.1 and Envelope-02 as in ITT Clause 40.3 shall then be enclosed and sealed in one single outer envelope which shall contain the information as stated under ITT Clause 40.2 (a) to (e) & ITT Clause 40.4 (a) to (e).
	40.6	Tenderers are solely and entirely responsible for pre-disclosure of Tender information if the envelope(s) are not properly sealed and marked.
	40.7	Tenders shall be delivered by hand or by mail, including courier services at the address(s) as stated under ITT Sub Clause 41.1.

	40.8	The Procuring Entity will, on request, provide the Tenderer with acknowledgement of receipt showing the date and time when it's Tender was received.
41. Deadline for Submission of Tender	41.1	Tenders shall be delivered to the Procuring Entity at the address specified in the TDS and not later than the date and time specified in the TDS .
	41.2	The Procuring Entity may, at its discretion, extend the deadline for submission of Tender as stated under ITT Sub Clause 41.1, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline will thereafter be subject to the new deadline as extended.
	41.3	Tenders shall be received at only one place as specified under ITT Sub Clause 41.1.

42. Late Tender	42.1	Any Tender received by the Procuring Entity after the deadline for submission of Tenders as stated under ITT Sub Clause 41.1 shall be declared LATE and returned unopened to the Tenderer.
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43. Modification, Substitution or Withdrawal of Tender	43.1	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 41.
	43.2	Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit corresponding modification to its original Tender marked as " MODIFICATION (M) ".
	43.3	Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit another Tender marked as " SUBSTITUTION (S) ".
	43.4	Tenderers shall be allowed to withdraw its Tender by a Letter of Withdrawal marked as " WITHDRAWAL(W) ".

F. Tender Opening and Evaluation

44. Tender Opening	44.1	Only the Technical Offer (Envelope-1) 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 , Tenders shall be opened immediately after the deadline for submission of Tenders at the place as specified in the TDS but not later than ONE HOUR after expiry of the submission deadline. Financial offer (Envelop-02) shall not be opened with technical offer (Envelop-1) and shall be kept unopened at the Custody of the Head of the Procuring Entity or his Authorised Officer (AO).
	44.2	Persons not associated with the Tender may not be allowed to attend the public opening of Tenders.
	44.3	Tenderers' representatives shall be duly authorised by the Tenderer. Tenderers or their authorised representatives will be allowed to attend and witness the opening of Tenders, and will sign a register evidencing their attendance.
	44.4	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 43.1.
	44.5	Verify (M), (S), (W), (A), (O) by following step by steps

	<p>(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 43.4 and in such case the Tender shall be opened and recorded.</p> <p>(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.</p> <p>(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 Clause 45.1. 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.</p> <p>(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</p> <p>(e) Step 5: 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.</p>
44.6	<p>Ensuring that only the correct (MTO), (STO), (ATO), (OTO) envelopes are opened, details of each Technical Offer will be dealt with as follows:</p> <p>(a) the Chairperson of the TOC will read aloud each Technical Offer and record in the Technical Offer Opening Sheet (TOOS):</p>

		<ul style="list-style-type: none"> (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. <p>(b) Only Technical Offer and alternatives read aloud at the Technical Offer Opening will be considered in evaluation.</p> <p>(a) 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 opened with the Technical Offer.</p>
	44.7	Upon completion of Tender opening, all members of the TOC and the Tenderers or Tenderer's duly authorised representatives attending the Tender 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 Representatives and, to the Tenderers immediately.
	44.8	The omission of a Tenderer's signature on the record shall not invalidate the contents and effect of the record under ITT Sub Clause 44.7.
	44.9	No Tender i.e., Technical or Financial Offer will be rejected at the Tender opening stage except the LATE Tenders as stated in the ITT Clause 42.
45. Evaluation of Tenders	45.1	Technical Offers shall be examined and evaluated only on the basis of the criteria specified in the Tender Document.
	45.2	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.
	45.3	<p>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:</p> <ul style="list-style-type: none"> (a) Preliminary examination (b) Technical examination and responsiveness

46. Preliminary Examination	46.1	TEC shall examine the Tenders to confirm that all documentations as stated under ITT Clause 23 have been provided, to determine the completeness of each document submitted.
	46.2	<p>TEC shall confirm that the following documents and information have been provided in the Tender. If any of these documents or information is missing, the Tender shall be considered rejected.</p> <ul style="list-style-type: none"> (a) All Forms, as applicable, duly filled-in and signed, as in Tender Forms (Section 5); (b) Priced Schedule; (c) Written confirmation authorizing the signatory of the Tender to commit the Tenderer; and (d) Valid Tender Security.
47. Technical Responsiveness and Technical Evaluation	47.1	Only those Tenders surviving preliminary examination need to be examined in this phase.
	47.2	<p>Secondly, the TEC will examine the adequacy and authenticity of the documentary evidence which may follow the order below:</p> <ul style="list-style-type: none"> (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 23.2(n). (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 23.2 (d) and 23.2(o). (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 23.2(p). (d) verification and examination of the documentary evidence that Tenderer has met all the requirements in regards under Section 6, Procuring Entity's Requirements, without any material deviation or reservation. (e) verification and examination of the documentary evidence and completed Specification Submission Sheet (Form PG5A-5) to determine the conformity of the Goods and related services.
	47.3	TEC may consider a Tender as responsive in the evaluation, only if comply with the mandatory requirements as stated under Clause 47.2.

	47.4	The TEC's determination of a Tender's responsiveness is to be based on the documentary evidence as requested in Clause 47.2 without recourse to extrinsic evidence.
	47.5	Information contained in a Tender, that was not requested in the Tender Document shall not be considered in evaluation of the Tender.
	47.6	<p>A responsive Tender is one that conforms in all respects to the requirements of the Tender Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:</p> <ul style="list-style-type: none"> (a) affects in any substantial way the scope, quality, or supply of goods specified in the Contract; or (b) limits in any substantial way, or is inconsistent with the Tender Documents, the Procuring Entity's rights or the Tenderer's obligations under the Contract; or (c) if rectified would unfairly affect the competitive position of other Tenderers presenting responsive Tenders. <p>During the evaluation of Tenders, the following definitions shall apply:</p> <p>"Deviation" is a departure from the requirements specified in the Tender Document;</p> <p>"Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Tender Document; and</p> <p>"Omission" is the failure to submit part or all of the information or documentation required in the Tender Document.</p>
	47.7	If a Tender is not responsive to the mandatory requirements set out in the Tender Document, shall not subsequently be made responsive by the Tenderer by correction of the material deviation, reservation, or omission.
	47.8	There shall be no requirement as to the minimum number of responsive Tenders.
	47.9	Provided that a Tender is responsive, TEC may request that the Tenderer submit the necessary information or documentation, within a reasonable period of time to rectify nonmaterial nonconformities or omissions in the Tender related to documentation requirements. Such omission shall not be related to any aspect of the rates of the Tender reflected in the Priced Schedule or any mandatory criteria. Failure of the Tenderer to comply with the request may result in the consideration of its Tender as non-responsive.
	47.10	TEC may regard a Tender as responsive even if it contains:

		<p>(a) minor or insignificant deviations which do not meaningfully alter or depart from the technical specifications, characteristics and commercial terms and, conditions or other mandatory requirements set out in the Tender Document; or</p> <p>(b) errors or oversights, that if corrected, would not alter the key aspects of the Tender.</p>
48. Clarification on Tender	48.1	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 47.2, will neither be sought nor be permitted.
	48.2	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 Tender.
	48.3	The Tenderer shall be provided a reasonable timeline, but not less than three (3) working days, to respond against a clarification request. 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.
49. Restrictions on Disclosure of Information	49.1	Following the opening of Tenders 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.
	49.2	Tenderers shall not seek to influence in anyway, the examination and evaluation of the Tenders.
	49.3	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.
	49.4	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.

50. Approval of Technical Evaluation Report	50.1	TEC shall prepare the Technical Evaluation Report and shall directly submit the Evaluation Report to the Head of the Procuring Entity (HOPE) or Authorized Officer for approval.
51. Financial Offer Opening	51.1	<p>After getting approval of the Technical Offer Evaluation Report, Financial Offer (Envelope-02) 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.</p>

52. Clarification on Financial Offer	52.1	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.
	52.2	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.
	52.3	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.
	52.4	Requests for clarifications on Financial Offers shall be duly signed only by the TEC Chairperson.
53. Correction of Arithmetical Errors	53.1	<p>Provided that the Tender is responsive, the TEC shall correct arithmetical errors on the following basis:</p> <ul style="list-style-type: none"> (a) if there is a discrepancy between the unit price and the line item total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the line item total price 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 will govern and the unit price will be corrected; and (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
	53.2	TEC shall correct the arithmetic errors and shall promptly notify the concerned Tenderer(s). If the Tenderer does not accept the correction of arithmetic errors, its Tender shall be rejected.

54. Conversion to Single Currency	54.1	<p>For 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.</p>
55. Financial Evaluation	55.1	<p>TEC will evaluate each Financial Offer that has been opened duly.</p>
	55.2	<p>To evaluate a Tender, the TEC will consider the following:</p> <ul style="list-style-type: none"> (a) the Tender price for Item(s) or Lot (b) adjustments for correction of arithmetical errors, as stated under ITT Sub Clause 53.1; (c) Adjustment in order to take into consideration the unconditional discounts and methodology for application of the discount offered for being awarded more than one lot, as stated under ITT Sub Clauses 23.10 and 23.11, if any.
	55.3	<p>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:</p> <ul style="list-style-type: none"> (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 26.16 and 26.17 offered by the Tenderer in its Tender.
	55.4	<p>Only those spare parts and tools which are specified as a item in the List of Goods and Related Services in Section 6, Procuring Entity's Requirement or adjustment as stated under ITT Sub-clause 55.6, shall be taken into account in the Tender evaluation. Supplier-recommended spare parts for a specified operating requirement as stated under ITT Sub-clause 29.3(b) shall not be considered in Tender evaluation.</p>
	55.5	<p>Variations, deviations, alternatives and other factors which are in excess of the requirements of the Tender Document or otherwise result in unsolicited benefits for the Procuring Entity will not be considered in Tender evaluation.</p>
	55.6	<p>The Procuring Entity'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:</p> <ul style="list-style-type: none"> (a) adjustment for deviations in the Delivery and Completion Schedule;

		(b) cost of major replacement components, mandatory spare parts and service.
	55.7	TEC may recommend to increase the amount of the Performance Security above the amounts as stated under ITT Sub Clause 66.1 but not exceeding twenty-five (25) percent of the Contract Price, if in the opinion of the TEC, it is found that the item prices are unbalanced.
56. Identifying Significantly Low-priced Tenders (SLT)	56.1	Prices of all technically responsive Tenderers shall be checked to identify Significantly Low-priced Tender through a specified manner mentioned in the following Sub Clauses.
	56.2	<p>During the evaluation of tenders, the proposed prices of all technically responsive tenderers (at least two tenders) shall be used to determine a Weighted Average, considering:</p> <ul style="list-style-type: none"> i. the official cost estimate, ii. the prices obtained from the recent Price Index in public procurement processes following ITT Sub Clause 56.4 and iii. the tenderers' quoted prices. <p>The weights shall be as follows:</p> <ul style="list-style-type: none"> • official cost estimate = 0.20 • Prices obtained from the recent Price Index = 0.30 • Prices quoted by all responsive tenderers = 0.50 <p>The formula shall be:</p> $\bar{x} = 0.5 * \frac{1}{n} \sum_{i=1}^n x_i + 0.2 * x_{OCE} + 0.3 * x_{NPPI}$ <p>Thereafter, the Weighted Standard Deviation (sd) of the quoted prices of all responsive tenders shall be determined using the following formula:</p> $sd = \sqrt{\frac{(x_i - \bar{x})^2}{n}}$ <p>Where:</p> <ul style="list-style-type: none"> • x_i = Quoted prices of tenderers • \bar{x} = Weighted Average • n = Number of responsive tenderers.
	56.3	Finally, the lower limit of acceptable prices shall be $[x^- (x \bar{-}) - sd]$. Any tender quoted below this limit shall be considered as a significantly low-priced tender and shall be treated as financially non-responsive and rejected.

	56.4	For determining the recent National Public Procurement Price Index, a national average percentage deviation for Goods procurement category shall be calculated from the e-GP system over a period of 28 days-consisting of the day of tender opening and the preceding 27 days.
	56.5	<p>To determine the NPPI, in all procurement processes (except for cases under the Limited Tendering Method in National procurement) where a Notice of Award has been issued during 28-days period, the percentage deviation between the officially estimated price and the awarded tender price shall be calculated, and the national average of such deviations shall be determined.</p> <p>X_{NPPI} shall be determined through multiplication between officially estimated price and NPPI derived from the e-GP system.</p>
	56.6	In the case of only one technically responsive tender, the above methodology shall not be applied; instead, the lowest evaluated price obtained shall be directly compared with the official cost estimate. If the deviation of the evaluated price of the responsive tender from the official estimate exceeds twenty percent (20%), such tender shall be deemed non-responsive. If the deviation of the evaluated price from the official cost estimate is twenty percent (20%) or less, the said tenderer may be recommended for issuance of the Notification of Award subject to successful Post-Qualification verification under ITT Sub Clause 59.

57. Price Comparison	57.1	The lowest-priced Tender among the technically and financially responsive Tenders through ITT Clause 52 shall be determined as the Lowest Evaluated Responsive Tender and shall be recommended for issuance of the Notification of Award subject to successful Post-Qualification verification under ITT Sub Clause 59.
	57.2	In the extremely unlikely event that there is a tie for the lowest evaluated price, the Tender Evaluation Committee shall initially examine the possible presence of collusive practices, and if such practices are found, further actions shall be taken in accordance with Rule 149 of the PPR 2025.
	57.3	Where there is a tie in the lowest evaluated bid but no case of the collusive practice is identified, the Tenderer with the superior past performance with the Procuring Entity shall be selected, whereby factors such as delivery period, quality of Goods delivered, complaints history and performance indicators could be taken into consideration.

	57.4	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 Procuring Entity as stated under ITT Sub Clause 57.3, then the Tenderer shall be selected, subject to firm confirmation through the Post-qualification process, after consideration as to whether the quality of Goods that is considered more advantageous by the end-users.
	57.5	The successful Tenderer shall not be selected through lottery under any circumstances.
58. Negotiations	58.1	No negotiations shall be held during the financial offer evaluation or award, with the lowest or any other Tenderer.
	58.2	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.
	58.3	If the Procuring Entity decides to negotiate for reducing the scope of the requirements under ITT Sub Clause 58.2, 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.
	58.4	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.
59. Post-qualification	59.1	The determination on Post-qualification shall be based upon an examination and verification of the documentary evidence of the Tenderer's eligibility and qualifications submitted by the Tenderer, pursuant to ITT Clauses 28, 30 and 31, clarifications as stated under ITT Clause 48 and the qualification criteria indicated in ITT Clauses 12 to 18. Factors not included therein shall not be used in the evaluation of the Tenderer's qualification.
	59.2	An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in non-responsiveness of the Tenderer's Tender, in which event the Procuring Entity shall proceed to the next lowest evaluated Tender to make a similar determination of that Tenderer's capabilities to perform the Contract satisfactorily, if awarded.
	59.3	TEC may verify information contained in the Tender by visiting the premises of the Tenderer as a part of the post qualification process, if practical and appropriate.

	59.4	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).
60. Procuring Entity's Right to Accept any or to Reject Any or All Tenders	60.1	The Procuring Entity reserves the right to accept any Tender or to reject any or all the Tenders any time prior to contract award and, to annul the Procurement proceedings with prior approval of the Head of the Procuring Entity, any time prior to contract award following specified procedures, without thereby incurring any liability to Tenderers, or any obligations to inform the Tenderers of the grounds for the Procuring Entity's action.
61. Rejection of All Tenders	61.1	The Procuring Entity may, in the circumstances as stated under ITT Sub Clause 61.2 reject all Tenders following recommendations from the TEC only after the approval of such recommendations by the Head of the Procuring Entity.
	61.2	<p>All Tenders can be rejected, if -</p> <ul style="list-style-type: none"> (a) the price of the lowest evaluated Tender exceeds the official estimated cost, 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 contract within the stipulated time in its Tender, though the stipulated time is reasonable and realistic; or (d) all Tenders are non-responsive; or (e) If, in the tendering process or in the tender documents, any defect, deviation, or inconsistency is observed, which appears to hinder the objective of public procurement should the procurement process be continued; or (f) evidence of professional misconduct, affecting seriously the Procurement process, is established pursuant to Rule 149 of the Public Procurement Rules, 2025.
	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.
62. Informing Reasons for Rejection	62.1	Notice of the rejection will be given promptly within three (3) working days of decision taken by the Head of the Procuring Entity to all Tenderers and, the Procuring Entity 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 Procuring Entity shall award the Contract to the Tenderer whose Tender is responsive to all the requirements of 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 in accordance with ITT Clause 59.
	63.2	Tenderer will not be required, as a condition for award, to undertake responsibilities not stipulated in the Tender Documents, 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 three (3) working days of receipt of the approval of the award by the Approving Authority, the Procuring Entity shall issue the Notification of Award (NOA) to the successful Tenderer.
	64.2	The NOA , (Form PG5A-9) attaching the Contract Agreement as per the sample (Form PG5A-10) to be signed, shall state: <ul style="list-style-type: none"> (a) the acceptance of the Tender by the Procuring Entity; (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 furnished; and (e) the date and time within which the Contract shall be signed.
	64.3	In the event, the Tenders were invited for one (1) or more items on an “item-by-item” basis, contract(s) will comprise the corresponding item(s) awarded to the successful Tenderer(s) and, Contract(s) will be signed per each of the successful Tenderer(s) covering the corresponding item(s).
	64.4	In the event, the Tenders were invited for a single lot, contract will comprise the corresponding items in the lot awarded to the successful Tenderer and, Contract will be signed with the successful Tenderer of the lot, covering the item(s).
	64.5	In the event, the Tenders were invited for a number of lots on a “lot-by-lot” basis, contracts will comprise the corresponding items in a lot awarded to the successful Tenderer(s) and, Contract(s) will be signed per each of the successful Tenderer(s) per lot, covering the corresponding item(s).

65. Reporting on Contract Awarding	65.1	Immediately, but no later than 24 hours, after issuing the Notification of Award, the Procuring Entity shall, for the information of other tenderers and procurement-related stakeholders, publish the contract award details Format PG5A-B on the his/her notice board or on its own website, as well as on the BPPA website. Such information shall remain displayed on the notice board or retained on the website for at least twenty-eight (28) days.
66. Performance Security	66.1	Performance Security shall be provided by the successful Tenderer in BDT currency and within the timeline as mentioned in the TDS .
	66.2	The proceeds of the Performance Security shall be payable to the Procuring Entity unconditionally upon first written demand as compensation for Contractor's failure to complete its obligations under the Contract.
	66.3	In the event a Government owned enterprise as stated under ITT Sub Clause 5.10 is the successful Tenderer, there shall be Security Deposit as specified in the TDS , in lieu of the Performance Security, as stated under ITT Sub Clause 66.1
67. Form and Time Limit for Furnishing of Performance Security	67.1	Performance Security, as stated under ITT Clause 66, may be in the form of a Bank Draft, or a Pay Order or an irrevocable unconditional Bank Guarantee in the format (Form PG5A-11), without any alteration, issued by any Scheduled Bank of Bangladesh acceptable to the Procuring Entity.
	67.2	Within the timeline mentioned in the TDS from the issuance of the NOA but not later than the date specified therein, the successful Tenderer shall furnish the Performance Security for the due performance of the Contract in the amount as stated under ITT Sub Clauses 66.1 or 66.2.
68. Validity of Performance Security	68.1	Performance Security shall be required to be valid until a date twenty-eight (28) days beyond the Intended Completion Date as specified in Tender Document.
69. Authenticity of Performance Security	69.1	The Procuring Entity 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 the Pay Order or Bank Draft or irrevocable unconditional Bank Guarantee in specified format.
	69.2	In case of Performance Security being found unauthentic, measures shall be taken following ITT Sub Clause 4.4.
70. Retention Money and Contractual Security	70.1	Upon the completion of delivery of Goods and subsequent acceptance by the TEAC, the Procuring Entity shall deduct from the payment certificate, a retention amount at the percentage rate as mentioned in TDS .
	70.2	The Performance Security mentioned in ITT Sub Clause 66.1 and the money to be retained as per ITT Sub Clause 70.1 will together be considered as the Contractual Security.
	70.3	The Contractual Security against the contract shall not go beyond the amount mentioned in the TDS unless it is recommended by the TEC to extend as mentioned in ITT Sub Clause 70.4.
	70.4	The Procuring Entity shall increase the amount of the Contractual Security on the recommendation of TEC above the amounts as per Rule 36(2) of the PPR 2025.

71. Contract Signing	71.1	At the same time as the Procuring Entity issues the NOA, the Procuring Entity will send the draft Contract Agreement and all documents forming the Contract to the successful Tenderer.
	71.2	Within the timeline mentioned in the TDS from the issuance of the NOA but not later than the date specified therein, the successful Tenderer and the Procuring Entity shall sign the contract.
	71.3	Failure of the successful Tenderer to submit the Performance Security, as stated under ITT Sub Clause 66.1, or to sign the Contract, as stated under ITT Sub Clauses 71.1 and 71.2, shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the next lowest evaluated responsive Tenderer, who is determined by the TEC to be qualified to perform the Contract satisfactorily.
72. Notification of Contract Signing	72.1	Immediately, but no later than three (3) days after the signing of contract, the Procuring Entity shall publish the contract-related information, in the format prescribed in Format PG5A-C on the his/her notice board or on its own website. The Procuring Entity shall also publish, on the BPPA website or web portal, the contract-related information together with details of the beneficial ownership of the successful Tenderer. This information shall be kept posted in the notice board or websites for at least thirty (30) days.
73. Debriefing of Tenderers	73.1	Debriefing of Tenderers by the Procuring Entity 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, without disclosing information about any other Tenderer.
	73.2	In the case of debriefing, confidentiality of the evaluation process shall be maintained.
74. Adjudicator	74.1	The Procuring Entity proposes the person named in the TDS to be appointed as Adjudicator under the Contract, at an indicative hourly fee and for those reimbursable expenses as specified in the TDS .
75. Right to Complain and appeal	75.1	Tenderer has the right to complain and appeal in accordance with the Sections 29 and 30 of Public Procurement Act 2006 and the Rule 72 of Public Procurement Rules, 2025. The Procuring Entity shall cause to dispose of the complaint and appeal in accordance with the provisions of Section 30 of Public Procurement Act 2006 and Rules 72-77 of Public Procurement Rules, 2025.

Section 2. Tender Data Sheet

Instructions for completing the Tender Data Sheet are provided, as needed, in the notes in italics and underlined mentioned for the relevant ITT clauses.

ITT Clause	Amendments of, and Supplements to, Clauses in the Instruction to Tenderers
A. General	
ITT 1.1	<p>The Procuring Entity is Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + 8802- 8900757 E-mail: segridssreb@gmail.com</p> <p>The Name of the Tender is: TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.</p> <p>Tender Ref: 27.12.0000.173.31.417.26.76, Date- 20-01-2026</p>
ITT 1.1	<p>The number, identification and name of lots comprising the Tender are:</p> <p>The Name of the Tender is: TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.</p> <p>Tender Ref: 27.12.0000.173.31.417.26.76, Date- 20-01-2026</p> <p>Package No: SE(G&SS)-11/0.4KV-SS-Padma Bridge-BBA</p>
ITT 3.1	The source of public fund is Munshiganj PBS Own Fund.
ITT 3.3	The name of the Development Partner is Not Applicable .
ITT 5.1	<p>Tenderers from the following countries are not eligible:</p> <p>All countries except Bangladesh.</p>
ITT 6.1	<p>Materials, Equipment and associated services from the following counties are not eligible:</p> <p>Israel</p>
B. Tender Document	
ITT 8.2	<p>The following are authorised agents/offices of the Procuring Entity for the purpose of issuing the Tender Document:</p> <p><u>Agent's/office Name:</u></p> <p>Office of the Superintending Engineer (Grid & Sub-Station)</p>

	<p>Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + <u>8802</u>- 8900757 E-mail: <u>segridssbreb@gmail.com</u></p>
ITT 9.1	<p>For clarification of Tender Document purposes only, the Procuring Entity's address is:</p> <p>Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + <u>8802</u>- 8900757 E-mail: <u>segridssbreb@gmail.com</u></p> <p>and contact Procuring Entity within Date: 29-01-2026, Time: 10.30AM</p>
ITT 10.1	<p>The Pre- Tender meeting shall be held at</p> <p>Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + <u>8802</u>- 8900757 E-mail: <u>segridssbreb@gmail.com</u></p> <p>Time: 11.00AM Date: 29-01-2026</p>

C. Qualification Criteria

ITT 13.1(a)	The minimum of years of general experience of the Tenderer in the role of contractor, subcontractor, or management contractor shall be 05 (Five) years.
ITT 13.1(b)	<p>The minimum specific experience required as a Contractor or Subcontractor or Management Contractor is as follows:</p> <p>1. At least 01 (one) no. of contract for construction of 11/0.415kV, 33/11kV or Higher voltage level Substations or 132/33kV grid Sub-station or 33kV or 132kV Bay Breaker Extension work or 33 kV and above voltage level switching station on turnkey basis. The contract having capacity regarding engineering, supply, construction, installation, testing and commissioning of indoor 11/0.415kV, 33/11kV substation or 132/33kV grid substation or 132/33kV Bay Breaker Extension or 33 kV and above voltage level switching station on turnkey basis each with a minimum value of BDT 850.00 Lac Taka within the last 05 years; years counting backward from the date of publication of IFT in the newspaper.</p> <p>2. In support of experience as mentioned is Serial no. 1 Tenderer shall submit Satisfactory Performance Certificate(s) from the end user's letter head pad. The Certificate(s) shall mention the name & commissioning date of Sub-station, capacity & voltage level which were designed, supplied constructed, tested and commissioned by Tenderer (lead partner in case</p>

	<p>of JV submission) and shall contain end-user's full mailing address, e-mail address, website address, fax number and phone number for the convenience of authentication.</p> <p>3. For JV Experience, monetary value of specific experience shall be determined as per ratio of partnership share for evaluation. (Relevant documents have to be submitted for proof).</p>																								
ITT 14.1 (a)	The maximum Three (03) number of arbitration against the Tenderer over a period of the last Five (05) years.																								
ITT 14.1(b)	The minimum amount of financial resources as liquid asset or working capital or credit line(s) or specific credit commitment or in any combination of them, of the Tenderers shall be BDT 600 Lac .																								
ITT 14.1(c)	The required average annual turnover shall be greater than BDT 1800 Lac over the last three (03) years within the last five (05) years.																								
ITT 15.1	<p>A Project Manager, Engineer, and other key staff shall have the following qualifications and experience:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Position</th> <th>Total Works Experience (Years)</th> <th>Experience in similar works (Years)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Project Manager (B.Sc.Engineer) Civil / Electrical)- (1 nos.)</td> <td>10 Years</td> <td>05 Years.</td> </tr> <tr> <td>2.</td> <td>Testing/Commissioning Engineer (B.Sc.Engineer-Electrical)- (1 nos)</td> <td>5 Years.</td> <td>03 Years.</td> </tr> <tr> <td>3.</td> <td>Site Engineer (B.Sc./ Diploma Engr.) (Electrical / Mechanical)- (2/2 nos)</td> <td>5/10 Years.</td> <td>03 Years.</td> </tr> <tr> <td>4.</td> <td>Site Engineer (B.Sc./Diploma Engr.) (Civil)- 2 (Two) nos.</td> <td>5/10 Years.</td> <td>03 Years.</td> </tr> <tr> <td>5.</td> <td>Site Supervisor, Foreman, Lineman for line construction/augmentation works (4 nos)</td> <td>05 Years</td> <td>03 Years.</td> </tr> </tbody> </table>	No	Position	Total Works Experience (Years)	Experience in similar works (Years)	1.	Project Manager (B.Sc.Engineer) Civil / Electrical)- (1 nos.)	10 Years	05 Years.	2.	Testing/Commissioning Engineer (B.Sc.Engineer-Electrical)- (1 nos)	5 Years.	03 Years.	3.	Site Engineer (B.Sc./ Diploma Engr.) (Electrical / Mechanical)- (2/2 nos)	5/10 Years.	03 Years.	4.	Site Engineer (B.Sc./Diploma Engr.) (Civil)- 2 (Two) nos.	5/10 Years.	03 Years.	5.	Site Supervisor, Foreman, Lineman for line construction/augmentation works (4 nos)	05 Years	03 Years.
No	Position	Total Works Experience (Years)	Experience in similar works (Years)																						
1.	Project Manager (B.Sc.Engineer) Civil / Electrical)- (1 nos.)	10 Years	05 Years.																						
2.	Testing/Commissioning Engineer (B.Sc.Engineer-Electrical)- (1 nos)	5 Years.	03 Years.																						
3.	Site Engineer (B.Sc./ Diploma Engr.) (Electrical / Mechanical)- (2/2 nos)	5/10 Years.	03 Years.																						
4.	Site Engineer (B.Sc./Diploma Engr.) (Civil)- 2 (Two) nos.	5/10 Years.	03 Years.																						
5.	Site Supervisor, Foreman, Lineman for line construction/augmentation works (4 nos)	05 Years	03 Years.																						
ITT 16.1	<p>The Tenderer shall own or have proven access to hire or lease of the major equipment, in full working order as follows:</p> <p>The tenderer shall submit list of tools & equipment owned by them or have to submit evidence that they own or letter of authorization that they are assured to hire the required equipment, so that they could engage the equipment from the day of starting of the work to ensure the completion of the Project within the specified completion time with the technical proposal.</p>																								

ITT 17.1	The value of non-judicial stamp for execution of the Joint Venture Agreement shall be Tk 300 only.			
	Maximum number of partners in the JV shall be 3 (Three) .			
ITT 17.2	Maximum number of partners in the JV shall be 3 (Three) .			
	The minimum qualification requirements of Leading Partner, other Partner(s) and requirements by summation of a JV shall be as follows:			
	ITT Clauses References	Requirements by summation	Requirements for Leading Partner	Requirements for other Partner(s)
	ITT-13.1(a)	Summation not applicable	Same as stated in TDS	Same as for Leading Partner
	ITT-13.1(b)	100% (summation of different contracts)	At least one Contract	Minimum requirement not applicable
	ITT-14.1(b)	100%	40%	25%
	ITT-14.1(c)	100%	40%	25%
	ITT-15.1	100%	Minimum requirement not applicable	Minimum requirement not applicable
	ITT-16.1	100%	Minimum requirement not applicable	Minimum requirement not applicable
	ITT-17.5	100%	Maximum among the Partners	Minimum 25%
D. Preparation of Tender				
ITT 18.1	The maximum of percentage [state percentage] of Goods allowed to be subcontracted: Not Applicable .			
ITT 18.4	The Nominated Subcontractor(s) named [insert name(s)] shall execute the following specific components of the proposed Works: None			
ITT 19.1	Tenders are being invited for Single Lot .			
ITT 23.2(f)	Tenderers shall have the following up to date valid License: ABC License .			
ITT 23.2(s)	The Tenderer shall submit with its technical offer the following additional documents:			

	<p>The Tenderer shall submit the following additional documents furnished below with its Technical Proposal:</p> <ol style="list-style-type: none"> 1. Tenderers shall furnish copies of ISO 9001/9002 or equivalent certificates of proposed manufacturers for individual equipment, evidence from users satisfactory service mentioned above. 2. The tenderer shall submit satisfactory type test reports for the following equipments: Power Transformer, 11kV Switchgear Panel, 11kV Underground cable. 3. The Tender/manufacturer shall submit with its Tender the following additional documents: All necessary papers, test report, samples, catalogue etc as described in the technical specification of the Tender document. 4. i) The tender shall submit along with offer all type test reports of equipments as mentioned in clause no.2 and the specification enclosed in the tender document from internationally recognized independent testing laboratory such as KEMA HOLLAND, CESI-ITALY, Under writers Laboratory (UL), U.S.A. CPRI- INDIA or equivalent laboratory for the equipments to be offered. ii) For Power Transformers, type test reports for higher voltage and higher size transformers will be accepted. Transformer loss quoted by the bidder in the GTP will be used for loss evaluation. iii) Routine tests will be done for all equipments before delivery at manufacturers premises or BREB workshop. Charges and fees will be applicable while conducting tests at BREB Workshop. 5. i. Technical specification and brochures of equipment/plant to be incorporated in the works ii. Letter of authorization to the effect that the Tenderer is authorized to submit Tender on behalf of the respective manufacturers and the Tenderer has the authority to supply equipment to the Employer from the proposed manufacturers for Power Transformer, LT Switchgear, 11kV Switchgear Panel, 415V Underground Cable, 11kV Underground cable, Termination kits, Fuel Save Controller and Protective Relays. iii. Supply records of the manufacturer of Power Transformer, LT Switchgear, 11kV Switchgear Panel, 415V Underground Cable, 11kV Underground cable, Termination kits, Fuel Save Controller and Protective Relays. 6. Performance certificates of the above equipment 7. Tender Capacity and Bank solvency certificate from their banker showing capability of handling the projects. 8. Table of contents with page no. 9. Tender purchased receipt/Document. 10. Power of attorney in favour of the tender signatory. 11. A written confirmation of Authorization to sign on behalf of the tenderer. 12. Statement of works in hand to be completed next 01(one) year including its value of uncompleted portion. 13. The required reports on the financial standing, such as profit and loss statements and audited balance sheet shall be for the past 05 (five) years. <p>(B) The required Technical Proposal shall include the following additional information :</p> <ol style="list-style-type: none"> I. Work plan II. Statement of working method III. Technical specification and brochures of machineries plant to be incorporated in the works. IV. Methodology of foundation, erection and stringing. V. Time Schedule in bar chart. VI. Organogram of the required man power for implementing of this project. VII. Letter of authorization to the effect that the Tendered is authorized to submit the Tender on behalf of the respective manufacturer and that the Tenderer has the authority to supply such equipment to the Procuring Entity from the proposed manufacturers for the construction of the mentioned works. VIII. Personnel required for the work. IX. Equipment's required for the work.
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ITT 23.2(g) ii.	Income Tax Assessment Year shall be 2023-24;
ITT 23.3(d)	The Tenderer shall submit with its financial offer the following additional documents: None.
ITT 25.1	Alternatives will not be permitted.
ITT 26.3	Tenderers shall quote for the entire Plant and Installation Services on a single responsibility basis
26.7(a)	Place of Destination: Service area-1 (Mawa, Munshiganj), Service Area-2 (Zajira, Shariatpur) and Service area-3 (Shibchar, Madaripur) of Bangladesh Bridge Authority.
26.7(d)	Local transportation to named place of final destination is: Service area-1 (Mawa, Munshiganj), Service Area-2 (Zajira, Shariatpur) and Service area-3 (Shibchar, Madaripur) of Bangladesh Bridge Authority.
ITT 26.9	The prices quoted by the Tenderer shall be fixed for the duration of the Contract.
ITT 27.4	Name of the foreign currency: Not Applicable.
ITT 29.3 (b)	Spare parts are: Not Required.
ITT 31.1(d)	The required information regarding claims under litigation shall be current or during the last Five (05) years.
ITT 31.1(e)	Manufacturer's Authorization is required as stated in ITT 23.2 (s).
ITT 31.1(g)	The required reports on the financial standing, such as profit and loss statements and audited balance sheet shall be for the past Five (05) years.
ITT 32.2	The Tender Validity period shall be 120 days.
ITT 34.1	The amount of the Tender Security shall be BDT 35 Lac in favour of Superintending Engineer (Grid & Sub-Station)
ITT 39.1	In addition to the original of the Tender, 01(One) copy and 01 (One) Electronic shall be submitted.

E. Submission of Tender

ITT 40.2 (e)	<p>The inner and outer envelopes shall bear the following additional identification marks:</p> <p>(a) Be addressed to the Procuring Entity at the following address:</p> <p style="padding-left: 40px;">Attention: Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, Address: Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + 8802- 8900757 E-mail: segridssbreb@gmail.com</p> <p>(b) bear the following identification:</p> <p>Tender for TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV</p>
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	<p>SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.</p> <p>Tender Ref :27.12.0000.173.31.417.26.76 Date : 20-01-2026</p> <p>DO NOT OPEN BEFORE 12:30 noon Bangladesh Standard Time on 17-02-2026</p>
ITT 40.4(e)	<p>The inner and outer envelopes shall bear the following additional identification marks:</p> <p>(a) Be addressed to the Procuring Entity at the following address:</p> <p>Attention: Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, Address: Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + 8802- 8900757 E-mail: segridssbreb@gmail.com</p> <p>(b) bear the following identification:</p> <p>Tender for TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.</p> <p>Tender Ref : 27.12.0000.173.31.417.26.76 Date : 20-01-2026.</p> <p>DO NOT OPEN BEFORE THE TECHNICAL OFFER EVALUATION AND APPROVAL.</p>
ITT 41.1	<p>For Tender submission purposes, the Procuring Entity's address is:</p> <p>Attention: Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board</p> <p>Address: Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + 8802- 8900757 E-mail: segridssbreb@gmail.com</p> <p>The deadline for submission of Tenders is:</p> <p>Time & Date: 17-02-2026 up to 12:00 Noon (BST)</p>
F. Opening and Evaluation of Tenders	
ITT 44.1	<p>The Tender opening shall take place at:</p> <p>Address: Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh.</p>

	<p>Tel: + 8802- 8900757 E-mail: segridssbreb@gmail.com</p> <p>Time & Date: 17-02-2026 (BST) On 12:30 Noon (BST)</p>
ITT 55.6	The applicable economic factors, for the purposes of evaluation of Tenders shall be: Not Applicable.
G. Award of Contract	
ITT 66.1	<p>The amount of Performance Security shall be ten (10) percent of the Contract Price.</p> <p>The successful Tenderer shall furnish the Performance Security for the due performance of the Contract within [mention number of working days as per Rule 123(7) of the PPR 2025: 7/10/14] working days of issuance of the Notification of Award (NoA).</p> <p><i>[<input type="checkbox"/> Within seven (7) working days, where the estimated cost does not exceed BDT 50 million (Taka five crore);</i></p> <p><i>[<input type="checkbox"/> Within ten (10) working days, where the estimated cost exceeds BDT 50 million (Taka five crore) but does not exceed BDT 250 million (Taka twenty-five crore);</i></p> <p><i>[<input type="checkbox"/> Within fourteen (14) working days, where the estimated cost exceeds BDT 250 million (Taka twenty-five crore).]</i></p>
ITT 66.3	The Security Deposit shall be deducted @ ten (10) percent from the successful Tenderer's (any government enterprise) payable invoices during Contract implementation, if awarded the Contract.
ITT 70.1	The Procuring Entity shall deduct from the payment certificate, a retention amount at the percentage rate of ten (10) percent from the payment certificate as Retention Money.
ITT 70.3	The Contractual Security against the contract shall not go beyond ten (10) percent of the contract price.
ITT 71.2	<p>The successful Tenderer shall sign the contract with the Procuring Entity within [mention number of days as per Rule 123(9) of the PPR 2025: 14/21/28] days of issuance of the Notification of Award (NoA).</p> <p><i>[<input type="checkbox"/> Within fourteen (14) days, where the estimated cost does not exceed BDT 50 million (Taka five crore);</i></p> <p><i>[<input type="checkbox"/> Within twenty-one (21) days, where the estimated cost exceeds BDT 50 million (Taka five crore) but does not exceed BDT 250 million (Taka twenty-five crore);</i></p> <p><i>[<input type="checkbox"/> Within twenty-eight (28) days, where the estimated cost exceeds BDT 250 million (Taka twenty-five crore).]</i></p>
ITT 74.1	<p>The Adjudicator will be appointed as per situation arise in future.</p> <p>The Hourly fee will be 10000 Tk.</p> <p>BREB will appoint the Adjudicator.</p>

Section-III: General Conditions of Contract

A. General

1. Definitions	1.1	<p>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:</p> <ul style="list-style-type: none">(a) Act means The Public Procurement Act, 2006 (Act 24 of 2006).(b) Adjudicator is the expert appointed jointly by the Procuring Entity and the Contractor to resolve disputes in the first instance, as provided for in GCC Sub Clause 82.2.(c) 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(d) Completion Schedule means the fulfilment of the Related Services by the Contractor in accordance with the terms and conditions set forth in the Contract;(e) 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.(f) Intended Completion Date is the date calculated from the Commencement Date as specified in the PCC, 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.(g) Effective Date means the date of fulfilment of all conditions of the Contract Agreement, from which the Time for Completion shall be counted.(h) 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.(i) 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.
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		<p>(bb) GCC means the General Conditions of Contract.</p> <p>(cc) Government means the Government of the People's Republic of Bangladesh.</p> <p>(dd) Goods means raw materials, products and equipment and objects in solid, liquid or gaseous form, electricity, and related Services if the value of such Services does not exceed that of the Goods themselves. It also means mean the Contractor's Plant, Equipment, Materials or any of them as appropriate;</p> <p>(ee) 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.</p> <p>(ff) 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;</p> <p>(gg) 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.</p> <p>(hh) 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.</p> <p>(ii) 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.</p> <p>(jj) 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</p> <p>(kk) "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,</p>
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		<p>or as applicable, Divisional Commissioner, Deputy Commissioner, District Judge; or 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;</p> <p>(ii) Procuring Entity/Procuring Entity/Purchaser means an Entity having administrative and financial powers to undertake Procurement of Goods, Works or Services using public funds, as specified in the PCC;</p> <p>(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</p> <p>(nn) PCC means the Particular Conditions of Contract;</p> <p>(oo) 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 ;</p> <p>(pp)</p> <p>(qq) 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.</p> <p>(rr) Contractor's Representative means any person nominated by the Contractor and approved by the Procuring Entity to perform the duties delegated by the Contractor.</p> <p>(ss) 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 ;</p> <p>(tt) Site means the point(s) of delivery named in the PCC.</p> <p>(uu) Writing means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail.</p>
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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 construction of the Contract. Words have their normal meaning under the language of the Contract unless specifically defined.
	2.2	<p>Entire Agreement:</p> <p>The Contract constitutes the entire agreement between the Procuring Entity 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 7.1(k).</p>
	2.3	<p>Amendment:</p> <p>No amendment or other variation of the Contract shall be valid unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorised representative of each party thereto.</p>
	2.4	<p>Non-waiver:</p> <p>(a) Subject to GCC Sub Clause 2.4(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.</p> <p>(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.</p>
	2.5	<p>Severability:</p> <p>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.</p>
	2.6	<p>Sectional completion:</p> <p>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).</p>
3. Communications & Notices	3.1	Communications between Parties (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.
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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 or <i>Bangla</i> . 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. Corrupt, Fraudulent, Collusive, Coercive or Obstructive Practices	6.1	The Government, and the Development Partner, if applicable, requires that the Procuring Entity as well as the Tenderers and Contractors (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.
	6.2	<p>For the purpose of GCC Sub Clause 6.2 the terms set forth below as follows-</p> <p>(a) “Corrupt practice” means offering or promising to offer, directly or indirectly, any bribe, employment, valuable item or service, or financial benefit to any officer or employee of the Procuring Entity or of any other public or private authority, with the intent to influence any act, decision, or procedure of the Procuring Entity in the course of the procurement process or contract execution, or the acceptance or solicitation of such by any officer or employee of the Procuring Entity. It shall also include any involvement of the Procuring Entity or any of its employees in corrupt, fraudulent, collusive, coercive, or obstructive practices as mentioned in this Rule;</p> <p>(b) “Fraudulent practice” means any act of providing false statements, dishonestly concealing information, or omitting or misrepresenting or distorting facts by any person to influence a decision in the procurement process or contract execution;</p> <p>(c) “Collusive practice” means a scheme or arrangement between two (2) or more Persons, knowingly or unknowingly involving the</p>

		<p>Procuring Entity or any of its employees, 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;</p>
		<p>(d) “Coercive practice” means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in a Procurement proceeding or the execution of a Contract, and this will include creating obstructions in the normal submission process used for Tenders</p> <p>(e) “Obstructive practice” means deliberately destroying, falsifying, altering, or concealing evidence related to a procurement-related investigation, or providing false statements to an investigator so as to impede the investigation of allegations of corrupt, fraudulent, collusive, coercive, or obstructive practices; or intimidating, harassing, or threatening an investigator so as to discourage the disclosure of information or prevent the investigator from carrying out their duties, or directly or indirectly obstructing any action undertaken by the Bangladesh Public Procurement Authority (BPPA) in discharging its responsibilities assigned under the Bangladesh Public Procurement Authority Act, 2023.</p>
	6.3	<p>Should any corrupt, fraudulent, collusive, coercive or obstructive practice of any kind, in competing for or in executing the Contract, is determined by the Procuring Entity, then the Procuring Entity may, upon giving 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract and the provisions of Clause 73 shall apply as if such expulsion had been made under Sub-Clause 73.1 (Termination for Default).</p>
	6.4	<p>If corrupt, fraudulent, collusive, coercive or obstructive practice of any kind, determined by the Procuring Entity or the Development Partner (if applicable) against the Contractor alleged to have carried out such practices, the Procuring Entity and/or the Development Partner shall;</p> <p>(a) exclude the Contractor from further participation in the particular Procurement proceeding; or</p>

		<p>(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.</p>
	6.5	<p>The Contractor shall be aware of the provisions on corruption, fraudulence, collusion, coercion and of the Public Procurement Act, 2006, the Public Procurement Rules, 2025 and in case of Development Partner financed contract, the Procurement Guidelines of the Development Partner.</p>
	6.6	<p>The Contractor (including its manufacturers, sub-contractors, agents, personnel, consultants and service providers) shall permit the Government and/or the Development Partner to inspect the Contractor's accounts and records and other documents relating to the submission of Tender and contract performance, and to have them audited by auditors appointed by the Government and/or the Development Partner, if so required.</p>
7. Documents Forming the Contract and Priority of Documents	7.1	<p>The following documents forming the Contract shall be in the following order of precedence, namely:</p> <ul style="list-style-type: none"> (a) The signed Contract Agreement; (b) The Notification of Award; (c) The Completed Tender and the Appendix to the Tender; (d) Particular Conditions of Contract; (e) General Conditions of Contract; (f) Technical Specifications; (g) Personnel Information; (h) Equipment Information; (i) Drawings; (j) Priced Schedule for Plant and Services (PG5A-3) and Schedule of Requirements and; (k) Other Documents including correspondences listed in the PCC forming part of the Contract.
8. Assignment	8.1	<p>The Contractor shall not assign his rights or obligations under the Contract, in whole or in part, except with the Procuring Entity's prior written consent.</p>
9. Eligibility	9.1	<p>The Supplier/Contractor and its Subcontractor(s) shall have the nationality of a country other than that specified in the PCC.</p>
	9.2	<p>All Goods and related services to be supplied under the Contract shall have their origin in the countries except any specified in the PCC.</p>

10. Gratuities / Agency fees	10.1	No fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the Tender or in the Contract, have been given or received in connection with the procurement process or in the Contract execution.
11. Confidential Details	11.1	The Procuring Entity 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 Procuring Entity 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 Procuring Entity 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 Procuring Entity 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 Procuring Entity 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	Any document, other than this Contract itself, enumerated in GCC Clause 12.1 shall remain the property of the Procuring Entity and shall be returned (all copies) to the Procuring Entity on completion of the Contractor's performance under this Contract if so required by the Procuring Entity.
	11.6	The provisions of GCC Clause 11 shall survive completion or termination, for whatever reason

12. Trademark, Patent and Intellectual Property Rights	12.1	The Procuring Entity should not be liable for any infringement of intellectual property rights arising from use of the goods procured. In case there are third-party claims of such infringement of patent, trademark, or industrial design rights, the Contractor must indemnify and hold the Procuring Entity free and harmless against such claims and shall not be in contravention of Trademark Act, 2009 and Patent and Design Act, 1911.
13. Copyright	13.1	The copyright in all drawings, documents, and other materials containing data and information furnished to the Procuring Entity by the Contractor herein shall remain vested in the Contractor, or, if they are furnished to the Procuring Entity 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.
14. License/ Use of Technical Information	14.1	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 Procuring Entity 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 Procuring Entity 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 Procuring Entity 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 Procuring Entity.
15. Joint Venture (JV)	15.1	<p>If the Contractor is a JV,</p> <ul style="list-style-type: none"> (a) each partner of the JV shall be jointly and severally liable for all liabilities and ethical or legal obligations to the Procuring Entity for performance of the Contract; (b) the JV partners shall nominate the Leading Partner as Representative or Partner-in-charge being entrusted with the Contract administration and management at Site 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) If there is a dispute that results in legal action being taken in court then action will be taken 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 partner alone as whatever penalty all the partners would have received; provided that if the other partners of the JV subsequently become available before the legal action has been completed, the Procuring Entity shall have the right to take action against those other partners of that JV as well.

		<p>(d) the composition or constitution and legal status of the JV shall not be altered without the prior approval of the Procuring Entity;</p> <p>(e) alteration of partners, except the Leading partner, shall only be allowed if any of them is found to be incompetent or has any serious difficulties which may impact the overall implementation of the Works, whereby the incoming partner shall require to possess qualifications higher than that of the outgoing partner;</p> <p>(f) The business share of the Leading Partner shall be the highest among all the partners. Other partner(s) shall have at least 25% of business share each.</p>
16. Nominated Subcontractor	16.1	Nominated Subcontractor named in the Contract shall be entitled to execute the specific components of the Works stated in the PCC .
	16.2	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.
17. Other Contractors	17.1	The Contractor shall cooperate and share the Site with other Contractors, public authorities, utilities, the Engineer and the Procuring Entity 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 Procuring Entity may modify the Schedule of other Contractors, and shall notify the Contractor of any such modification.
18. Possession of the Site	18.1	The Procuring Entity 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 Procuring Entity will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event.
19. Access to the Site	19.1	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.

20. Safety, Security and Protection of the Environment	20.1	<p>The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein:</p> <ul style="list-style-type: none"> (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.
21. Working Hours	21.1	<p>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.</p>
22. Welfare of Laborers	22.1	<p>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.</p>
	22.2	<p>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.</p>
	22.3	<p>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 Procuring Entity may effect payments to the labourers and recover the cost from the Contractor.</p>
	22.4	<p>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.</p>
23. Subcontractor	23.1	<p>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.</p>

	23.2	Any subcontracting arrangements made during contract implementation and not disclosed at the time of the Tendering shall not be allowed.
	23.3	Subcontracting of any portion of the works shall not relieve the Contractor from any liability or obligations that may arise from its performance.
	23.4	Contractor shall retain full responsibility for the contract and cannot pass any contractual obligations to the Subcontractor and under no circumstances assignment of the contract to the Subcontractor be allowed.
	23.5	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.
	23.6	The prior consent, in writing, of the Engineer shall however be obtained for other proposed Subcontractor(s).
	23.7	Subcontractors shall comply with the provisions of GCC Clause 6 and 11.
24. Dayworks	24.1	If applicable, the Dayworks rates in the Contractor's Tender shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
	24.2	All works to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be certified and signed by the Project Manager within seven (7) days of the works being done.
	24.3	The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.
25. Child Labor	25.1	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.
26. Fossils& antiquities	26.1	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 Procuring Entity. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.
	26.2	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 81.
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B. Subject Matter of Contract

27. Scope of Facilities	27.1	Unless otherwise expressly limited in the Procuring Entity'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, Procuring Entity'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 Procuring Entity, as set forth in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Procuring Entity
	27.2	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
	27.3	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 Procuring Entity 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.
28. Time for Commencement	28.1	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 70.2 hereof
29. Time for Completion	29.1	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 70.2 hereof.

30. Procuring Entity's Responsibilities	30.1	Whenever the performance of the obligations in this Contract requires that the Contractor obtain permits, approvals and other license from local public authorities, the Procuring Entity may, if so needed by the Contractor, make its best effort to assist the Contractor in complying with such requirements in a timely and expeditious manner. However, the Contractor shall bear the costs of such permits and/or licenses.
	30.2	The Procuring Entity 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 Procuring Entity. The Procuring Entity shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.
	30.3	The Procuring Entity 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 Procuring Entity to obtain in the Procuring Entity's name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Procuring Entity of their respective obligations under the Contract, and (c) are specified in the Appendix (Scope of Works and Supply by the Procuring Entity).
	30.4	If requested by the Contractor, the Procuring Entity shall use its best endeavours 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
	30.5	Unless otherwise specified in the Contract or agreed upon by the Procuring Entity and the Contractor, the Procuring Entity 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 Procuring Entity, 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 Procuring Entity and the Contractor.
	30.6	The Procuring Entity shall be responsible for the continued operation of the Facilities after Completion, in accordance with GCC Sub-Clause 42.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GCC Sub-Clause 43.2.

	30.7	All costs and expenses involved in the performance of the obligations under this GCC Clause 30 shall be the responsibility of the Procuring Entity, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GCC Sub-Clause 43.2.
	30.8	In the event that the Procuring Entity 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
31. Contractor's Responsibilities	31.1	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.
	31.2	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 Procuring Entity, 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
	31.3	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 Procuring Entity under GCC Sub-Clause 30.3 hereof and that are necessary for the performance of the Contract.
32. Procuring Entity's and Contractor's Risk	32.1	The Procuring Entity carries the risks that the Contract states are Procuring Entity's risks and the Contractor carries the risks that the Contract states are Contractor's risks
33. Procuring Entity's Risks	33.1	From the Start Date until the Defects Correction Certificate has been issued, the following are Procuring Entity's risks: <ul style="list-style-type: none"> (g) the risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to <ul style="list-style-type: none"> 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 Procuring Entity or by any person

		<p>employed by or Contracted to him except the Contractor.</p> <p>iii. the risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Procuring Entity or in the Procuring Entity's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.</p>
	33.2	<p>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 Procuring Entity's risk, except loss or damage due to:</p> <ul style="list-style-type: none"> (a) a Defect which existed on the Completion Date; (b) an event occurring before the Completion Date, which was not itself Procuring Entity's risk; or (c) the activities of the Contractor on the Site after the Completion Date.
34. Contractor's Risks	34.1	<p>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 Procuring Entity's risks are Contractor's risks.</p>
C. Execution of the Facilities		
35. Representatives: Project Manager	35.1	<p>If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Procuring Entity shall appoint and notify the Contractor in writing of the name of the Project Manager. The Procuring Entity 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 Procuring Entity 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.</p>
	35.2	<p>All notices, instructions, information and other communications given by the Contractor to the Procuring Entity under the Contract shall be given to the Project Manager, except as herein otherwise provided.</p>

36. Representatives: Contractor's Representative & Construction Manager	36.1	<p>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 Procuring Entity in writing to approve the person so appointed. If the Procuring Entity makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Procuring Entity 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 39.2.1 shall apply thereto.</p>
	36.2	<p>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.</p> <p>The Contractor shall not revoke the appointment of the Contractor's Representative without the Procuring Entity's prior written consent, which shall not be unreasonably withheld. If the Procuring Entity consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC Sub-Clause 39.2.1.</p>
	36.3	<p>The Contractor's Representative may, subject to the approval of the Procuring Entity 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 Procuring Entity 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 39.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.</p>
	36.4	<p>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.</p>

	36.5	The Procuring Entity 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 Procuring Entity, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC Sub-Clause 40.4. The Procuring Entity shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.
	36.6	If any representative or person employed by the Contractor is removed in accordance with GCC Sub-Clause 36.5, the Contractor shall, where required, promptly appoint a replacement.
37. Work Program	37.1	<p><u>Contractor's Organization</u></p> <p>The Contractor shall supply to the Procuring Entity 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 Procuring Entity and the Project Manager in writing of any revision or alteration of such an organization chart.</p>
	37.2	<p><u>Program of Performance</u></p> <p>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 Procuring Entity 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 29.1 and any extension granted in accordance with GCC Clause 70.2, and shall submit all such revisions to the Project Manager.</p>
	37.3	<p><u>Progress Report</u></p> <p>The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Sub-Clause 31.2</p>

		<p>above, and supply a progress report to the Project Manager every month.</p> <p>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.</p>
	37.4	<p><u>Progress of Performance</u></p> <p>If at any time the Contractor's actual progress falls behind the program referred to in GCC Sub-Clause 37.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Procuring Entity 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 29.1, any extension thereof entitled under GCC Sub-Clause 70.1, or any extended period as may otherwise be agreed upon between the Procuring Entity and the Contractor.</p>
	37.5	<p><u>Procedures</u></p> <p>The Contract shall be executed in accordance with the Contract Documents including the procedures given in the Forms and Procedures of the Procuring Entity'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.</p>
38. Design and Engineering	38.1	<p><u>Specifications and Drawings</u></p> <p>(a) 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 Procuring Entity.</p> <p>(b) 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 Procuring Entity, by giving a notice of such disclaimer to the Project Manager.</p>

	<p>38.2 <u>Codes and Standards</u></p> <p>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 Procuring Entity and shall be treated in accordance with GCC Clause 69.</p>
	<p><u>Approval/Review of Technical Documents by Project Manager</u></p> <p>38.3.1 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 37.2 (Program of Performance).</p> <p>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.</p> <p>GCC Sub-Clauses 38.3.2 through 38.3.6 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only</p> <p>38.3.2 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 38.3.1, 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.</p>
	<p>38.3.3. 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.</p> <p>38.3.4 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 38.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s),</p>

		<p>whereupon the document shall be deemed to have been approved.</p> <p>38.3.5 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.</p> <p>38.3.6 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Sub-Clause 38.3. If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC Clause 70 shall apply to such request.</p>
39. Procurement	39.1	<p><u>Plant</u></p> <p>Subject to GCC Sub-Clause 65.2, the Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.</p>
	39.2	<p><u>Procuring Entity-Supplied Plant</u></p> <p>If the Appendix to the Contract Agreement titled Scope of Works and Supply by the Procuring Entity, provides that the Procuring Entity shall furnish any specific items to the Contractor, the following provisions shall apply:</p> <ul style="list-style-type: none"> i. The Procuring Entity 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 37.2, unless otherwise mutually agreed. ii. 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 Procuring Entity shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Procuring Entity, remedy such shortage, defect or default at the Procuring Entity'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 39.2.ii. 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. iii. The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Procuring Entity 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 45 or under any other provision of Contract.
39.3	<u>Transportation</u>	<p>i. 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.</p> <p>ii. 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.</p> <p>iii. Upon dispatch of each shipment of materials and the Contractor's Equipment, the Contractor shall notify the Procuring Entity 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 Procuring Entity with relevant shipping documents to be agreed upon between the Parties.</p> <p>iv. 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 Procuring Entity 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 Procuring Entity 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.</p>
39.4	<u>Customs Clearance</u>	<p>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 Procuring Entity's obligations under GCC Sub-Clause 65.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Procuring Entity, the Procuring Entity 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 70.</p>

40. Installation	40.1	<p><u>Setting Out/Supervision</u></p> <p>i. 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 Procuring Entity.</p> <p>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 Procuring Entity, the expense of rectifying the same shall be borne by the Procuring Entity.</p> <p>ii. 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.</p>
	40.2	<p>Labor:</p> <p>40.2.1 Engagement of Staff and Labor</p> <p>(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.</p> <p>(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.</p> <p>(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 Procuring Entity 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.</p>

	<p>(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 Procuring Entity may provide the same to such personnel and recover the cost of doing so from the Contractor.</p> <p>40.2.2 Persons in the Service of Procuring Entity</p> <p>The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Procuring Entity's Personnel.</p> <p>40.2.3 Facilities for Staff and Labor</p> <p>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 Procuring Entity's Personnel as stated in the Specification.</p> <p>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.</p>
40.3	<p><u>Contractor's Equipment</u></p> <p>40.3.1 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.</p> <p>40.3.2 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.</p> <p>40.3.3 The Procuring Entity 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</p>

		use in the execution of the Contract that is no longer required for the execution of the Contract.
40.4		<p><u>Site Regulations and Safety</u></p> <p>The Procuring Entity 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 Procuring Entity, with a copy to the Project Manager, proposed Site regulations for the Procuring Entity's approval, which approval shall not be unreasonably withheld.</p> <p>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 Procuring Entity in connection therewith shall be paid by the Contractor to the Procuring Entity. Otherwise, the cost of such remedial work shall be borne by the Procuring Entity.</p>
40.5		<p><u>Site Clearance</u></p> <p>Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.</p>
40.6		<p><u>Opportunities for Other Contractors</u></p> <p>40.6.1 The Contractor shall, upon written request from the Procuring Entity or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Procuring Entity on or near the Site.</p> <p>40.6.2 If the Contractor, upon written request from the Procuring Entity 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 whatever nature for such other contractors, the Procuring Entity 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.</p>
40.7		<p><u>Emergency Work</u></p> <p>40.7.1 If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective</p>

		<p>or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.</p> <p>If the Contractor is unable or unwilling to do such work immediately, the Procuring Entity may do or cause such work to be done as the Procuring Entity may determine is necessary in order to prevent damage to the Facilities. In such event the Procuring Entity 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 Procuring Entity is work that the Contractor was liable to do at its own expense under the Contract.</p> <p>40.7.2 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.</p>
	40.8	<p><u>Watching and Lighting</u></p> <p>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.</p>
41. Test & Inspection	41.1	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.
	41.2	The Procuring Entity and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Procuring Entity shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.
	41.3	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 Procuring Entity and the Project Manager or their designated representatives to attend the test and/or inspection.
	41.4	The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection. If the Procuring Entity 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.
41.5		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.
41.6		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 41.3.
41.7		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 82.3.
41.8		The Contractor shall afford the Procuring Entity and the Project Manager, at the Procuring Entity'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.
41.9		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 Procuring Entity or the Project Manager, nor the issue of any test certificate pursuant to GCC Sub-Clause 41.4, shall release the Contractor from any other responsibilities under the Contract.
41.10		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.

	41.11	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.
	41.12	If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Sub-Clause 41.10 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 Procuring Entity, 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.
42. Completion of the Facilities	42.1	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 Procuring Entity's Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Procuring Entity in writing.
	42.2	Within seven (7) days after receipt of the notice from the Contractor under GCC Sub-Clause 42.1, the Procuring Entity shall supply the operating and maintenance personnel specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Procuring Entity 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 Procuring Entity, the Procuring Entity 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.
	42.3	As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Procuring Entity and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters have been provided by the Procuring Entity in accordance with GCC Sub-Clause 42.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GCC Sub-Clause 43.5.
	42.4	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 Procuring Entity'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, 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.

	42.5	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.
	42.6	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.
	42.7	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 or within seven (7) days after receipt of the Contractor's repeated notice under GCC Sub-Clause 42.4, or if the Procuring Entity 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 Procuring Entity's use of the Facilities, as the case may be.
	42.8	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 Procuring Entity will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.
	42.9	Upon Completion, the Procuring Entity 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.
43. Commissioning and Operational Acceptance	43.1	<p><u>Commissioning</u></p> <p>43.1.1 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 42.4, or immediately after the date of the deemed Completion, under GCC Sub-Clause 42.5.</p> <p>43.1.2 The Procuring Entity shall supply the operating and maintenance personnel and all raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Commissioning.</p> <p>43.1.3 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 Procuring Entity.</p>
	43.2	Guarantee Test

		<p>43.2.1 Subject to GCC Sub-Clause 43.5, 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 Procuring Entity 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.</p> <p>43.2.2 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 Procuring Entity and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GCC Sub-Clauses 46.2 and 46.3 shall not apply.</p>
43.3		<p>Operational Acceptance</p> <p>43.3.1 The Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Procuring Entity'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.</p> <p>43.3.2 The Project Manager shall, after consultation with the Procuring Entity, and within seven (7) days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate.</p> <p>43.3.3 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.</p>
43.4		<p>Partial Acceptance</p> <p>43.4.1 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.</p>

		43.4 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.
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	43.5	<p><u>Delayed Pre-commissioning and/or Guarantee Test</u></p> <p>43.5.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 42.3, or with the Guarantee Test pursuant to Sub-Clause 43.2, for reasons attributable to the Procuring Entity 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 42.6, and Operational Acceptance, pursuant to GCC Sub-Clause 43.3.3, and Contractor's obligations regarding Defect Liability Period, pursuant to GCC Sub-Clause 45.2, Functional Guarantee, pursuant to GCC Clause 46, and Care of Facilities, pursuant to GCC Clause 50, and GCC Clause 71.1, Suspension, shall not apply. In this case, the following provisions shall apply.</p> <p>43.5.2 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to clauses 62, 63 & 64, the Contractor shall be entitled to the following:</p> <ul style="list-style-type: none"> (a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Sub-Clause 44.2; (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 Procuring Entity, 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 43.5.3 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 Procuring Entity; (d) the additional charges towards the care of the Facilities pursuant to GCC Sub-Clause 50.1 shall be reimbursed to the Contractor
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		<p>by the Procuring Entity for the period between the notification mentioned above and the notification mentioned in Sub-Clause 43.5.4 below. The provision of GCC Sub-Clause 49.2 shall apply to the Facilities during the same period.</p> <p>43.5.3 In the event that the period of suspension under above Sub-Clause 43.5.1 actually exceeds one hundred eighty (180) days, the Procuring Entity and Contractor shall mutually agree to any additional compensation payable to the Contractor.</p> <p>43.5.4 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 42.</p>
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D. Guarantees and Liabilities		
44. Completion Time Guarantee	44.1	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 29.1, or within such extended time to which the Contractor shall be entitled under GCC Clause 70 hereof
	44.2	<p>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 70, the Contractor shall pay to the Procuring Entity 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 Procuring Entity may consider termination of the Contract, pursuant to GCC Sub-Clause 73.1.</p> <p>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 70. The Contractor shall have no further liability whatsoever to the Procuring Entity in respect thereof.</p> <p>However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.</p> <p>Save for liquidated damages payable under this GCC Sub-Clause 44.2, 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 37.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Procuring Entity.</p>
	44.3	If the Contractor attains Completion of the Facilities or any part thereof before the Time for Completion or any extension thereof under GCC Clause 70, the Procuring Entity 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.
45. Defect Liability	45.1	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.
	45.2	<p>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 45.10.</p> <p>If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the</p>

		<p>Plant supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Procuring Entity regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good as the Contractor shall determine at its discretion, such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:</p> <ul style="list-style-type: none"> (a) improper operation or maintenance of the Facilities by the Procuring Entity; (b) operation of the Facilities outside specifications provided in the Contract; or (c) Normal wear and tear.
45.3		<p>The Contractor's obligations under this GCC Clause 45 shall not apply to:</p> <ul style="list-style-type: none"> (a) any materials that are supplied by the Procuring Entity under GCC Sub-Clause 39.2, 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 Procuring Entity 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 Procuring Entity, except for the work executed by the Procuring Entity under GCC Sub-Clause 45.7.
45.4		<p>The Procuring Entity 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 Procuring Entity shall afford all reasonable opportunity for the Contractor to inspect any such defect.</p>
45.5		<p>The Procuring Entity 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 45.</p> <p>The Contractor may, with the consent of the Procuring Entity, 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.</p>
45.6		<p>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 Procuring Entity 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</p>

		<p>remedial work, whereupon the Contractor shall carry out such tests.</p> <p>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 Procuring Entity and the Contractor.</p>
	45.7	<p>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 Procuring Entity may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Procuring Entity in connection therewith shall be paid to the Procuring Entity by the Contractor or may be deducted by the Procuring Entity from any monies due the Contractor or claimed under the Performance Security.</p>
	45.8	<p>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 Procuring Entity because of any of the aforesaid reasons.</p>
	45.9	<p>Except as provided in GCC Clauses 45 and 52, 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.</p>
	45.10	<p>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 45.2.</p>
46. Functional Guarantees	46.1	<p>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.</p>
	46.2	<p>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 Procuring Entity upon completion of the necessary changes, modifications and/or additions, and shall</p>

		request the Procuring Entity 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 Procuring Entity may consider termination of the Contract, pursuant to GCC Sub-Clause 69.2.2.
46.3		<p>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</p> <ul style="list-style-type: none"> (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 Procuring Entity to repeat the Guarantee Test or (b) pay liquidated damages to the Procuring Entity 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.
46.4		The payment of liquidated damages under GCC Sub-Clause 46.3, 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 46.3, and the Contractor shall have no further liability whatsoever to the Procuring Entity 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.
47. Patent Indemnity	47.1	<p>The Contractor shall, subject to the Procuring Entity's compliance with GCC Sub-Clause 47.2, indemnify and hold harmless the Procuring Entity 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 Procuring Entity 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:</p> <ul style="list-style-type: none"> (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. <p>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</p>

		any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.
47.2		<p>If any proceedings are brought or any claim is made against the Procuring Entity arising out of the matters referred to in GCC Sub-Clause 34.1, the Procuring Entity shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Procuring Entity's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.</p> <p>If the Contractor fails to notify the Procuring Entity within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Procuring Entity shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Procuring Entity within the twenty-eight (28) day period, the Procuring Entity shall make no admission that may be prejudicial to the defense of any such proceedings or claim.</p> <p>The Procuring Entity 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.</p>
47.3		<p>The Procuring Entity 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 Procuring Entity.</p>
48. Limitation of Liability	48.1	<p>Except in cases of criminal negligence or willful misconduct,</p> <ul style="list-style-type: none"> (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 Procuring Entity, 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 Procuring Entity with respect to patent infringement..
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E. Risk Distribution

49. Transfer of Ownership	49.1	Ownership of the Plant (including spare parts) to be imported into the country where the Site is located shall be transferred to the Procuring Entity upon loading on to the mode of transport to be used to convey the Plant from the country of origin to that country.
	49.2	Ownership of the Plant (including spare parts) procured in the country where the Site is located shall be transferred to the Procuring Entity when the Plant are brought on to the Site.
	49.3	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.
	49.4	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 Procuring Entity and the Contractor agree that the Plant in question are no longer required for the Facilities.
	49.5	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 50 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant are incorporated.
50. Care of Facilities	50.1	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 42 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 45. 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 50.2.

	50.2	<p>If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of</p> <ul style="list-style-type: none"> (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 17 hereof; or (b) any use or occupation by the Procuring Entity or any third Party other than a Subcontractor, authorized by the Procuring Entity 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 Procuring Entity, or any such matter for which the Contractor has disclaimed responsibility herein,
	50.3	<p>the Procuring Entity 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 Procuring Entity 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 Procuring Entity in accordance with GCC Clause 64. If the Procuring Entity does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Procuring Entity shall either request a change in accordance with GCC Clause 69, 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 Procuring Entity shall terminate the Contract pursuant to GCC Sub-Clause 71.1 hereof.</p>
	50.4	<p>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 45.2 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 50.2 (b) and (c).</p>
51. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification	51.1	<p>Subject to GCC Sub-Clause 51.3, the Contractor shall indemnify and hold harmless the Procuring Entity 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</p>

		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 Procuring Entity, its contractors, employees, officers or agents.
	51.2	If any proceedings are brought or any claim is made against the Procuring Entity that might subject the Contractor to liability under GCC Sub-Clause 51.1, the Procuring Entity shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Procuring Entity's, name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.
	51.3	If the Contractor fails to notify the Procuring Entity within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Procuring Entity shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Procuring Entity within the twenty-eight (28) day period, the Procuring Entity shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Procuring Entity 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.
	51.4	The Procuring Entity 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 Procuring Entity, 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 52, provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.
	51.5	The Party entitled to the benefit of an indemnity under this GCC Clause 51 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.
52. Insurance	52.1	To the extent specified in the Appendix and in PCC 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 Procuring Entity, who should not unreasonably withhold such approval. (a) <u>Cargo Insurance During Transport</u> Covering loss or damage occurring while in transit from the Contractor's or Subcontractor's works or

	<p>stores until arrival at the Site, to the Plant (including spare parts therefor) and to the Contractor's Equipment.</p> <p>(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.</p> <p>(c) <u>Third Party Liability Insurance</u> Covering bodily injury or death suffered by third Parties including the Procuring Entity's personnel, and loss of or damage to property occurring in connection with the supply and installation of the Facilities.</p> <p>(d) <u>Automobile Liability Insurance</u> 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.</p> <p>(e) <u>Workers' Compensation</u> In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.</p> <p>(f) <u>Procuring Entity's Liability</u> In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.</p> <p>(g) <u>Other Insurances</u> 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.</p>
52.2	<p>The Procuring Entity shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 52.1, except for the Third Party Liability, Workers' Compensation and Procuring Entity'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 52.1 except for the Cargo Insurance during Transportation, Workers' Compensation and Procuring Entity's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the</p>

		performance of the Contract shall be waived under such policies.
52.3		The Contractor shall, in accordance with the provisions of the Appendix to the Contract Agreement titled Insurance Requirements, deliver to the Procuring Entity 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 Procuring Entity by insurers prior to cancellation or material modification of a policy.
52.4		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.
52.5		The Procuring Entity 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 Procuring Entity 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 Procuring Entity shall provide copies of the policies taken out by the Procuring Entity under this GCC Sub-Clause 52.5.
52.6		If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Sub-Clause 51.1, the Procuring Entity 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 Procuring Entity shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Procuring Entity 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 Procuring Entity 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 Procuring Entity. 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 Procuring Entity, and the Contractor shall have full recourse against the Procuring Entity for any and all liabilities of the Procuring Entity herein.

	52.7	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 52, and all monies payable by any insurers shall be paid to the Contractor. The Procuring Entity shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Procuring Entity'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 Procuring Entity. With respect to insurance claims in which the Contractor's interest is involved, the Procuring Entity shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.
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53. Limitation of Liability	53.1	<p>Except in cases of criminal negligence or wilful misconduct,</p> <ul style="list-style-type: none"> (a) the Contractor shall not be liable to the Procuring Entity, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Procuring Entity; and (b) the aggregate liability of the Contractor to the Procuring Entity, whether under the Contract, in tort or otherwise, shall not exceed 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 Procuring Entity with respect to patent infringement.
54. Unforeseen Conditions	54.1	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 Procuring Entity, 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

		<p>shall promptly, and before performing additional work or using additional Plant or Contractor's Equipment, notify the Project Manager in writing beforehand:</p> <ul style="list-style-type: none"> (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.) <p>On receiving any notice from the Contractor under this GCC Sub-Clause 54.1, the Project Manager shall promptly consult with the Procuring Entity 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 Procuring Entity, of the actions to be taken.</p>
	54.2	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 54.1 shall be paid by the Procuring Entity to the Contractor as an addition to the Contract Price.
	54.3	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 54.1, the Time for Completion shall be extended in accordance with GCC Clause 65.
55. Adjustment for Changes in Legislation	55.1	Unless otherwise specified in the Contract, if after the Contract, any law, regulation, ordinance, order or by law 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 Contractor has thereby been affected in the performance of any of its obligations under the Contract.
56. Force Majeure	56.1	<p>Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below:</p> <ul style="list-style-type: none"> (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies;

		<ul style="list-style-type: none"> (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.
	56.2	The Head of Procuring Entity decides the existence of a Force Majeure that will be the basis of the issuance of order for suspension of Supply as stated under GCC Sub Clause 59.2.
57. Notice of Force Majeure	57.1	If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice within fourteen (14) days after the party became aware, 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.
	57.2	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.
58. Duty to Minimise Delay	58.1	Each Party shall at all times use all reasonable endeavours to minimise any delay in the performance of the Contract as a result of Force Majeure.
	58.2	A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.
59. Consequences of Force Majeure	59.1	The Contractor shall not be liable for forfeiture of its 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
	59.2	The Procuring Entity 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.
59.3		Delivery shall be made either upon the lifting or the expiration of the suspension order. However, if the Procuring Entity terminates the contract as stated under GCC Clause 59, resumption of delivery cannot be done.
59.4		After receiving notice under GCC Sub Clause 57.1, the Procuring Entity shall proceed to determine these matters under the provisions of the Contract.

F. Payment

60. Contract Price	60.1	The Contract Price shall be paid as specified in the Contract Agreement Form PG5A- 8.
	60.2	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.
	60.3	Subject to GCC Sub-Clauses 30.2, 31.1 and 54 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.
	60.4	<p>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> <p>P = A + B (Im/Io)</p> <p>where:</p> <p>P is the adjustment factor</p> <p>A and B are Coefficients specified in the PCC, representing the nonadjustable and adjustable portions, respectively, of the Contract; and</p> <p>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.</p> <p>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.</p>
	60.5	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.
61. Terms of Payment	61.1	The Contract Price, including any Advance Payments specified in PCC, if applicable, shall be paid in the manner as specified in the PCC 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.
	61.2	No payment made by the Procuring Entity herein shall be deemed to constitute acceptance by the Procuring Entity of the Facilities or any part(s) thereof.
	61.3	Payments shall be made promptly by the Procuring Entity after submission of an invoice or request for payment by the Contractor, and after the Procuring Entity has accepted it.
	61.4	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.
	61.5	In the event that the Procuring Entity fails to pay the Contractor any payment by its respective due date or within the period as stated under GCC Sub Clause 61.3, the Procuring Entity shall pay to the Contractor interest on the amount of such delayed payment at the rate specified in the PCC, for the period of delay until payment has been made in full.
	61.6	If an amount certified is increased in a subsequent certificate as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
62. Advance Payment Security	62.1	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.
	62.2	The security shall be in the form provided in the tender documents or in another form acceptable to the Procuring Entity. 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 Procuring Entity. The security shall be returned to the Contractor immediately after its expiration.

63. Performance Security	63.1	The Procuring Entity shall notify the Contractor of any claim made against the Bank issuing the Performance Security. in the amount specified in the PCC .
	63.2	The Procuring Entity may claim against the security if any of the following events occurs for fourteen (14) days or more. <ul style="list-style-type: none"> i. The Contractor is in breach of the Contract and the Procuring Entity has duly notified him or her; and ii. The Contractor has not paid an amount due to the Procuring Entity and the Procuring Entity has duly notified him or her.
	63.3	In the event as stated under GCC Sub Clause 63.2, the Contractor is liable to pay compensation under the Contract amounting to the full value of the Performance Security or more, the Procuring Entity may call the full amount of the security.
	63.4	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 45.8 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 45.10, 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 45.10 and up to the amount specified in the PCC.
	63.5	If there is no reason to call the security, the security shall be discharged by the Procuring Entity and returned to the Contractor not later than seven (7) days following the date of making the final payment to the Contractor under the Contract and subject to the issuance of the Acceptance Certificate by the Procuring Entity.
	64.1	The Procuring Entity shall retain an amount from the payable amount due to the Contractor at the percentage specified in the PCC until successful expiration of the Defect Liability period.
64. Retention Money	64.2	The total amount retained under GCC Sub Clause 64.1 shall be kept to meet any claims during the Defect Liability Period and shall be returned after the successful expiration of Defects Liability Period and the Project Manager has certified in the form of Defects Corrections Certificate .

65. Taxes and Duties	65.1	The Contractor shall be entirely responsible for all kinds of taxes, customs duties, VAT, 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.
	65.2	Notwithstanding GCC Sub-Clause 65.1 above, the Procuring Entity shall bear and promptly pay <ul style="list-style-type: none"> (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.
	65.3	In the event that the rate of any direct or indirect tax (including, but not limited to, income tax, VAT, customs duties, etc.) is altered by virtue of any law, regulation, order, or other legal instrument, the Contract Price shall, subject to the approval of the Head of the Procuring Entity, be adjusted (either upward or downward) so as to ensure that the net amount payable to the Contractor remains unaffected by such legal changes.
66. Payments to Nominated Subcontractor(s)	66.1	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.
67. Price Adjustment	67.1	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.
	67.2	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.
	67.3	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.
68. Liquidated Damages	68.1	Except as provided under GCC Sub Clause 56, if the Contractor fails to complete the Plant and Equipment Works within the Intended Completion Date or extended Intended Completion Date of the contract or Intended Sectional Completion Date or extended sectional completion date of any section under the contract, the Procuring Entity shall, as

		Liquidated Damages, deduct from the Contract Price, a sum at the percent-rate per day of delay as specified in the PCC , of the contract value of the uncompleted works or part thereof completed after the Intended Completion Date or extended Intended Completion Date, as applicable. The total amount of Liquidated Damages or Delay Damages shall not exceed the amount specified in the PCC . The Procuring Entity may deduct Liquidated Damages from payments due to the Contractor. Payment of Liquidated damages shall not affect the Contractor's liabilities.
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G. Change in Contract Elements

69. Change in the Facilities	69.1	<p><u>Introducing a Change</u></p> <p>69.1.1 Subject to GCC Sub-Clauses 69.2.5 and 69.2.7, the Procuring Entity 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</p> <p>69.1.2 The Contractor may from time to time during its performance of the Contract propose to the Procuring Entity 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 Procuring Entity may at its discretion approve or reject any Change proposed by the Contractor, provided that the Procuring Entity shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.</p> <p>69.1.3 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.</p> <p>69.1.4 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 Procuring Entity's Requirements (Forms and Procedures)</p>
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	69.2	<p><u>Changes Originating from Procuring Entity</u></p> <p>69.2.1 If the Procuring Entity proposes a Change pursuant to GCC Sub-Clause 69.1.1, 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:</p> <ul style="list-style-type: none"> (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. <p>69.2.2 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.</p> <p>Upon receipt of the Contractor's Estimate for Change Proposal, the Procuring Entity shall do one of the following:</p> <ul style="list-style-type: none"> (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 Procuring Entity does not intend to proceed with the Change. <p>69.2.3 Upon receipt of the Procuring Entity's instruction to proceed under GCC Sub-Clause 69.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC Sub-Clause 69.2.1.</p> <p>69.2.4 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</p> <p>69.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other</p>
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		<p>Change Orders that have already become binding upon the Contractor under this GCC Clause 69 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 Procuring Entity accepts the Contractor's objection, the Procuring Entity shall withdraw the proposed Change and shall notify the Contractor in writing thereof.</p> <p>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.</p> <p>69.2.6 Upon receipt of the Change Proposal, the Procuring Entity and the Contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the Procuring Entity shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.</p> <p>If the Procuring Entity 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.</p> <p>If the Procuring Entity 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 69.2.2.</p> <p>69.2.7 If the Procuring Entity 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 Procuring Entity 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</p>
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		on the outstanding issues under the Change Proposal.
	69.3	<p>Changes Originating from Contractor</p> <p>69.3.1 If the Contractor proposes a Change pursuant to GCC Sub-Clause 69.1.2, 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 69.2.1.</p> <p>Upon receipt of the Application for Change Proposal, the Parties shall follow the procedures outlined in GCC Sub-Clauses 69.2.6 and</p> <p>69.3.2. However, should the Procuring Entity choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.</p>
70. Extension of Delivery and Completion Schedule	70.1	The Contractor must deliver the Plant and the services procured within the period prescribed by the Procuring Entity, as specified in the TDS .
	70.2	<p>The Time(s) for Completion specified in the PCC pursuant to GCC Sub-Clause 29.1 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:</p> <ul style="list-style-type: none"> (a) any Change in the Facilities as provided in GCC Clause 69 (b) any occurrence of Force Majeure as provided in GCC Clause 56, unforeseen conditions as provided in GCC Clause 54, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Sub-Clause 50.2 (c) any suspension order given by the Procuring Entity under GCC Clause 44 hereof or reduction in the rate of progress pursuant to GCC Sub-Clause 71.2 or (d) any changes in laws and regulations as provided in GCC Clause 55 or (e) any default or breach of the Contract by the Procuring Entity, Appendix to the Contract Agreement titled, or any activity, act or omission of the Procuring Entity, or the Project Manager, or any other contractors employed by the Procuring Entity, 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

		<p>been entitled to an extension of time under this sub-clause, or</p> <p>(g) delays attributable to the Procuring Entity or caused by customs, or</p> <p>(h) any other matter specifically mentioned in the Contract</p> <p>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.</p>
70.3		<p>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 Procuring Entity 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.</p>
70.4		<p>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.</p>
70.5		<p>Within twenty-one (21) days of receipt of the Contractor's notice, the Procuring Entity shall evaluate the situation and may grant time extensions, if based on justifiable grounds, without liquidated damages.</p>
70.6		<p>The Procuring may extend up to thirty percent (30%) of the original contract time. above 30% of the original contract time as mentioned in GCC Sub Clause 70.1.</p>
70.7		<p>In the case an extension of the original delivery schedule required under GCC Sub Clause 70.1 is or will be more than thirty (30) percent but not beyond one hundred (100) percent additional to the original Contract time, approval of the Head of the Procuring Entity or an officer authorized by him or her for the same shall be required.</p>

	70.8	In exceptional cases, where an extension of the original contract time required under GCC Sub Clause 70.1 is or will be more than one hundred (100) percent of the original Contract time, approval of the Secretary of the concerned ministry or division for the same shall be required.
	70.9	Except in case of Force Majeure, as provided under GCC Clause 56, a delay by the Contractor in the performance of its delivery and completion obligations shall render the Contractor liable to the imposition of Liquidated Damages pursuant to GCC Clause 68, unless an extension of the Delivery and Completion Schedule is agreed upon, pursuant to GCC Clause 70.
71. Suspension	71.1	<p>The Procuring Entity 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.</p> <p>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 Procuring Entity 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 69, excluding the performance of the suspended obligations from the Contract.</p> <p>If the Procuring Entity 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 69 or, where it affects the whole of the Facilities</p>
	71.2	<p>If</p> <p>(a) the Procuring Entity 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 Procuring</p>

		<p>Entity that requires payment of such sum, with interest thereon as stipulated in GCC Sub-Clause 61.6, requires approval of such invoice or supporting documents, or specifies the breach and requires the Procuring Entity to remedy the same, as the case may be. If the Procuring Entity 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 the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Procuring Entity, including but not limited to the Procuring Entity's failure to provide possession of or access to the Site or other areas in accordance with GCC Sub-Clause 30.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,</p> <p>then the Contractor may by fourteen (14) days' notice to the Procuring Entity suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.</p>
	71.3	If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this GCC Clause 71, then the Time for Completion shall be extended in accordance with GCC Sub-Clause 43.1, 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 Procuring Entity 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.
	71.4	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 Procuring Entity.

H. Termination and Settlement of Disputes

72. Notice to Correct	72.1	<p>If the Contractor fails to carry out any obligation under the Contract the Project Manager may, by giving a Notice to the Contractor, require the Contractor to make good the failure and to remedy it within a specified time ('Notice to Correct' in these Conditions).</p> <p>The Notice to Correct shall:</p> <p style="padding-left: 20px;">(a) describe the Contractor's failure to comply with any contractual obligations;</p>
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		<p>(b) state the Sub-Clause and/or provisions of the Contract under which the Contractor has the obligation; and</p> <p>specify the time within which the Contractor shall remedy the failure, which shall be reasonable, taking due regard of the nature of the failure and the work and/or other action required to remedy it.</p>
	72.2	<p>After receiving a Notice to correct the Contractor shall immediately respond but not later than 5 (five) days by giving a reply to the Project Manager describing the measures the Contractor will take to remedy the failure, and stating the date on which such measures will be commenced in order to comply with the time specified in the notice to correct. The time specified in the notice to correct shall not imply any extension of the Time for Completion.</p>
73. Termination for Default	73.1	<p>The Procuring Entity or the Contractor, without prejudice to any other remedy for breach of Contract, by giving fourteen (14) working-days written Notice of Termination mentioning the clause of breach to the other party, may terminate the Contract in whole or in part if the other party causes a fundamental breach of Contract. Fundamental breaches of the Contract shall include, but shall not be limited to, the following:</p> <ul style="list-style-type: none"> i. the Contractor stops work for twenty-eight (28) days when no stoppage of work is shown on the current Programme or the Contractor stops works repeatedly without any valid ground and the stoppage has not been authorized by the Project Manager; ii. the Contractor fails to commence the work within the Start date; iii. the Contractor does not maintain a Security, which is required; iv. the Contractor fails to comply with instructions of the Notice to Correct as specified in GCC Clause 72; v. the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within eighty-four (84) days; vi. the Procuring Entity fails to handover the full works-site or a substantial portion of the works-site to the Contractor within eighty-four (84) days of contract signing; vii. the Project Manager 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 Project Manager; viii. 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 68;

		<p>ix. the Contractor has subcontracted the Works exceeding the percentage as mentioned in GCC Sub Clause 23.1 or any subcontractor has been engaged during contract implementation without the prior approval of the Head of Procuring Entity or Authorized Officer as specified in GCC Sub Clause 23.6.</p> <p>x. the Contractor, in the judgment of the Procuring Entity has engaged in corrupt or fraudulent or collusive or coercive or obstructive practices, in case development partner, as defined in GCC Clause 6, in competing for or in executing the Contract.</p> <p>xi. A payment certified by the Project Manager is not paid by the Procuring Entity to the Contractor within eighty-four (84) days of the date of the Project Manager's certificate.</p>
	73.2	If any of the events pointed out under GCC Sub Clause 72.1 or any such event that is not listed in that clause but can be deemed as a fundamental breach of a contract happens, the affected party shall notify (first notice-Notice of Default) the defaulted party of such event and its intention to terminate the contract making reference(s) to the relevant GCC Clauses and ask the defaulted party the reason why the affected party will not terminate the contract with a 21-day timeline from the issuance of the first notice to provide any clarification.
	73.3	If the Procuring Entity receives a reasonable clarification on the breaching event from the Contractor or the Contractor attempts and accomplishes any remedial action to mitigate the breach event, the Procuring Entity may affirm the contract without limiting its right to terminate the contract for any other fundamental breach by the Contractor.
	73.4	If the Procuring Entity does not receive any response or receive an unacceptable clarification on the breach event, it may terminate the contract mentioning an immediate effective date through a final notice.
	73.5	The final notice (Notice of Termination) will be issued by the Procuring Entity getting approval from the Head of the Procuring Entity and the Contractor shall not perform any activity after issuance of that notice.
	73.6	The Head of the Procuring Entity may create a Contract Termination Review Committee (CTRC) to assist him in the discharge of this function. All decisions recommended by the CTRC shall be subject to the approval of the Head of the Procuring Entity.
	73.7	In the event the Procuring Entity terminates the Contract in whole or in part, as stated under GCC Clause 73.1, the Procuring Entity may procure, upon such terms and in such

		manner as it deems appropriate, Plant similar to those not completed or not performed, and the Contractor shall be liable to the Procuring Entity for any additional costs as mentioned in the PCC for such similar Goods. However, the Contractor shall continue performance of the Contract to the extent not terminated.
74. Termination for Insolvency	74.1	
75. Termination for Convenience	75.1	
	75.2	<ul style="list-style-type: none"> (a) to have any portion delivered and/or performed and paid at the contract terms and prices; and/or (b) to cancel the remainder and pay to the Contractor an agreed amount for partially completed and/or performed goods and for materials and parts previously procured by the Contractor
	75.3	
76. Payment upon Termination	76.1	If the Contract is terminated because of a fundamental breach of Contract under GCC Sub Clause 73.1 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 Procuring Entity exceeds any payment due to the Contractor, the difference shall be a debt payable to the Procuring Entity.
	76.2	If the Contract is terminated for the Procuring Entity's convenience or because of a fundamental breach of Contract by the Procuring Entity, 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.
	76.3	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.

		<ul style="list-style-type: none"> (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 Procuring Entity when paid for by the Procuring Entity, and the Contractor shall place the same at the Procuring Entity'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 labour employed wholly in connection with the Works at the date of termination.
77. Property	77.1	All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Procuring Entity if the Contract is terminated because of the Contractor's default stated under GCC Sub Clause 73.1.
78. Frustration	78.1	If the Contract is frustrated by the occurrence of a situation of Force Majeure as defined in GCC Sub Clause 56, 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.
79. Amendment to Contract	79.1	The amendment to Contract shall generally include equitable adjustments in original Contract price, Delivery and Completion Schedule and, any other changes acceptable under the conditions of the Contract.
	79.2	The Procuring Entity shall amend the Contract, incorporating the changes approved in accordance with the Delegation of Financial Power or sub-delegation thereof and, introduced to the original terms and conditions of the Contract.
80. Compensation Events	80.1	<p>The following shall be Compensation Events:</p> <ul style="list-style-type: none"> (a) The Procuring Entity does not give access to or possession of the Site or part of the Site by the Site Possession Date stated in the GCC Sub Clause 18.1;

		<ul style="list-style-type: none"> (b) The Procuring Entity modifies the Schedule of other Contractors in a way that affects the works of the Contractor under the Contract; (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time; (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects; (e) The Project Manager unreasonably does not approve a subcontract to be let, if applicable; (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Notification of Award from the information issued to Tenderers (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site; Other Contractors, public authorities, utilities, or the Procuring Entity do not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor; (g) The advance payment is delayed; (h) The effects on the Contractor of any of the Procuring Entity's Risks; (i) The Project Manager unreasonably delays issuing a Completion Certificate; (j) A situation of Force Majeure has occurred, as defined in GCC Clause 56; and (k) Other Compensation Events described in the Contract or determined by the Project Manager in the PCC shall apply.
	80.2	If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended, only on justifiably acceptable grounds duly recorded.
	80.3	As soon as the Contractor has provided information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost, the Project Manager shall assess it, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager will assume that the

		Contractor will react competently and promptly to the event.
	80.4	The Contractor shall not be entitled to compensation to the extent that the Procuring Entity's interests are adversely affected by the Contractor not having given early warning or not having cooperated with the Project Manager.
81. Contractor's Claims	81.1	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 Procuring Entity, 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
	81.2	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 Procuring Entity shall be discharged from all liability in connection with the claim.
	81.3	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.
82. Settlement of Disputes	82.1	<p><u>Amicable Settlement:</u></p> <p>The Procuring Entity and the Contractor shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or its interpretation.</p>
	82.2	<p><u>Adjudication</u></p> <p>(a) If the Contractor /Procuring Entity believe that amicable settlement of dispute is not possible between the two parties, the dispute shall be referred to the Adjudicator within fourteen (14) days of first written correspondence on the matter of disagreement;</p> <p>(b) The Adjudicator named in the PCC is jointly appointed by the parties. In case of disagreement between the parties, the Appointing Authority designated in the PCC</p>

		<p>shall appoint the Adjudicator within fourteen (14) days of receipt of a request from either party;</p> <p>(c) The Adjudicator shall give its decision in writing to both parties within twenty-eight (28) days of a dispute being referred to it;</p> <p>(d) The Contractor shall make all payments (fees and reimbursable expenses) to the Adjudicator, and the Procuring Entity shall reimburse half of these fees through the regular progress payments;</p> <p>(e) Should the Adjudicator resign or die, or should the Procuring Entity and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract; a new Adjudicator will be jointly appointed by the Procuring Entity and the Contractor. In case of disagreement between the Procuring Entity and the Contractor the Adjudicator shall be designated by the Appointing Authority designated in the PCC at the request of either party, within fourteen (14) days of receipt of a request from either Party</p>
82.3		<p><u>Arbitration</u></p> <p>(a) If the Parties are unable to reach a settlement under GCC Clause 82.1 or 82.2 within twenty-eight (28) days of the first written correspondence on the matter of disagreement or within twenty-eight (28) days of the date of decision made by the Adjudicator as per GCC Sub Clause 82.2(c), then either Party may give notice to the other party of its intention to commence arbitration in accordance with GCC Sub Clause 82.3(b);</p> <p>(b) 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 shown in the PCC</p>

Section 4. Particular Conditions of Contract

Instructions for completing the Particular Conditions of Contract are provided, as needed, in the notes in italics mentioned for the relevant GCC clauses.

GCC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 1.1(l)	The Procuring Entity is Office of the Superintending Engineer (Grid & Sub-Station), Bangladesh Rural Electrification Board, Dhaka.
GCC 1.1(mm)	<p>The Project Manager is: Executive Engineer, System Operation and Distribution, Munshiganj, BREB.</p> <p>The project management shall be done under Superintending Engineer, Dhaka (South) Zone, BREB, Dhaka. Executive Engineer, System Operation and Distribution, Munshiganj, BREB shall act as Project Manager and shall be responsible for supervising the execution and completion of the works and physical services and administering the Contract under Superintending Engineer, Dhaka (South) Zone, BREB, Dhaka.</p>
GCC 1.1(tt)	The site(s) is/are is located at: Service area-1 (Mawa, Munshiganj), Service Area-2 (Zajira, Shariatpur) and Service area-3 (Shibchar, Madaripur) of Bangladesh Bridge Authority
GCC 3.1	<p>For notices, the Procuring Entity's contact details shall be:</p> <p>(i) Office of the Superintending Engineer (Grid & Sub-Station) Bangladesh Rural Electrification Board, 3rd Floor, Executive Building, Nikunja-2, Khilkhet, City: Dhaka-1229, Country: Bangladesh. Tel: + 8802 - 8900757 E-mail: segridssbreb@gmail.com</p> <p>(ii) Superintending Engineer, Dhaka (South) Zone, Dhaka, BREB.</p> <p>(iii) Executive Engineer, System Operation and Distribution, Munshiganj, BREB.</p> <p>For notices, the Contractor's contact details shall be:</p> <p>Attention: Address: Telephone: Facsimile number: Electronic mail address:</p>
GCC 7.1(k)	The following documents shall also be part of the Contract: None
GCC 9.1	The Contractor or the Subcontractor that is a national of, or registered in, the following countries are not eligible: Israel
GCC 9.2	Materials, Equipment and associated services from the following counties are not eligible: Israel

GCC 16.1	Nominated Subcontractor(s) named below: None
GCC 18.1	Possession of the Site or part(s) of the Site, to the Contractor shall be given on the following date(s); Within 7 (Seven) days from the date of contract signing.
GCC 27.3	The Contractor agrees to supply spare parts for a period of five years .
GCC 28.1	The Contractor shall commence work on the Facilities within 7 (Seven) days from the Effective Date for determining Time for Completion as specified in the Contract Agreement.
GCC 29.1	The time for completion of the whole of the facilities within 180 Days from the effective date as described in the contract agreement.
GCC 43.2.2	The Guarantee Test of the Facilities shall be successfully completed within 15 Days from the date of Completion.
GCC 44.3	No bonus will be given for earlier Completion of the Facilities or part thereof.
GCC 45.3	The amount to be withheld for late submission of an updated Programme is $\frac{\text{USD/GBP/EU R/JPY/BDT}}{\text{delete not appropriate}} \frac{[insert amount]}{\text{Bangladesh Taka}} \frac{\text{delete if not appropriate}}{[insert amount]}$
GCC 45.10	The critical components covered under the extended defect liability are: Power Transformers for a total of 3 (Three) Years .
48.1 (b)	The multiplier of the Contract Price is: Not Applicable .
GCC 52.1	<p>The insurance cover shall be:</p> <p>(a) The minimum cover for the Works and of Plant and Materials is 110%.</p> <p>(b) The maximum deductible for insurance of the Works and of Plant and Materials is 3% of the sum insured.</p> <p>(c) The minimum cover for loss or damage to Equipment is 110%.</p> <p>(d) The maximum deductible for insurance of Equipment is 3% of the sum insured.</p> <p>(e) The minimum cover for other property is 10%.</p> <p>(f) The maximum deductible for insurance of other property is 3% of the sum insured.</p> <p>(g) The minimum cover for personal injury or death: (i) for the Contractor's employees is as per the law and common practice in Bangladesh. (ii) and for third parties is as per the law and common practice in Bangladesh.</p>
GCC 60.2	The Contract Price shall not be adjusted.
GCC 60.4	The Contract is not subject to price adjustment.
GCC 61.1	The original Contract price is: <i>[insert the amount in the NOA]</i>

GCC 61.1	The Advance Payment shall be Tk <i>insert amount</i> and shall be paid to the Contractor not later than <i>insert date</i> . Not Applicable.
GCC 61.5	The rate of interest shall be the prevailing rate of interest for commercial borrowing established in the country. None
GCC 63.1	The amount of performance security, as a percentage of the Contract Price for the Facility or for the part of the Facility for which a separate Time for Completion is provided, shall be 10% of the Contract Price .
GCC 63.4	The performance security shall not be reduced before the date of the Operational Acceptance.
GCC 63.4	The performance security shall be reduced to ten percent (10%) of the value of the component covered by the extended defect liability to cover the Contractor's extended defect liability in accordance with the provision in the PCC, pursuant to GCC Sub-Clause 42.10.
GCC 64.1	The portion of payments to be retained is five (5) percent of the contract price. In case of front loading or unbalanced price loading, PE may extend this proportion up to twenty (20) percent of the contract price. In such cases, money retained for meeting any claims during Defect Liability Period shall be half of the total money retained but not less than five (5) percent of the contract price.
GCC 68	The amount of Liquidated Damages is 0.075 of ONE (1) percent of the contract value of the uncompleted works or any part thereof completed after expiry of the Intended Completion Date or extended Intended Completion Date, as applicable, per day of delay. The maximum amount of Liquidated Damages for the uncompleted Works or any part thereof is 10% (ten) percent of the final Contract Price of the whole of the Works.
GCC 82.2(b)&(e)	The Adjudicator jointly appointed by the Parties is: The Adjudicator will be appointed as per situation arise in future. The Hourly fee will be 10000 Tk. BREB will appoint the Adjudicator. In case of disagreement between the parties, the Appointing Authority for the Adjudicator is the President of the Institution of Engineers, Bangladesh (IEB).

GCC 82.3	<p>In the case of a dispute between the Procuring Entity and the foreign Contractor, <i>[insert any of the following options]</i></p> <p>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.</p> <p>OR</p> <p>All disputes arising in connection with the present Contract shall be finally settled under the Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more arbitrators in accordance with the said rules.</p> <p>Not Applicable.</p>
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Appendix to the Tender

[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: 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

[GCC Sub Clause 67: 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 [These 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 Procuring Entity
- Appendix 7 - List of Documents for Approval or Review
- Appendix 8 - Functional Guarantees

Appendix 1. Terms and Procedures of Payment

(A) Terms of Payment

Schedule No. 1 - Plant and Mandatory Spare Parts

In respect of plant and equipment supplied from within the Procuring Entity's country, the following payments shall be made:

Eighty percent (75%) of the total or pro rata EXW amount upon Incoterm "Ex-Works," upon delivery to the carrier within forty-five (45) days after receipt of invoice.

Five percent (15%) of the total or pro rata CIP/EXW amount upon Incoterm "Ex-Works", upon place/install in accordance with the design layout (i.e., Relevant civil works & others must be completed as required for placing the equipments as per design layout) within 45 days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount after commissioning, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 2 - Installation and other Services

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

Eighty percent (80%) of the measured value of work performed by the Contractor, as identified in the said Program of Performance, during the preceding month, as evidenced by the Procuring Entity's authorization of the Contractor's application, will be made monthly within forty-five (45) days after receipt of invoice.

Five percent (15%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Procuring Entity's authorization of the Contractor's monthly applications, upon commissioning, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Procuring Entity's authorization of the Contractor's monthly applications, upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

(B) Payment Procedures

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

1. All costs in connection with invoice and document within Bangladesh/Procuring Entity's country shall borne by the Procuring Entity and outside of the Bangladesh/Procuring Entity's country shall be borne by the Contractor but tenderer shall be paid as per quoted price by the Procuring Entity.
2. Amount of contract Price will be paid by the Procuring Entity's designated Bank.
3. The retention money shall be deducted @ ten (10) percent from the successful Tenderer's payable invoices during contract implementation.

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:

$P = A + a (Lm/Lo) + b (BIm/Blo) + c (CEm/CEO) + d (RSm/RSO) + e (STM/STO) + f (BRm/BRo) + g (MIm/Mlo) + h (FUm/FUo) + \text{etc}$

where;

$L = \text{Labor}, B = \text{Bitumen}, C = \text{Cement}, R = \text{Reinforcing Steel}, S = \text{Stone}, B = \text{Bricks}, M = \text{Miscellaneous}, F = \text{Fuel}$]

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 Procuring Entity under the terms of the Contract. No price increase will be allowed for periods of delay for which the Contractor is responsible. The Procuring Entity 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 52, 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 Procuring Entity, such approval not to be unreasonably withheld.

All insurances are to be taken from **Sadharan Bima Corporation**.

(a) Cargo Insurance

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

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
110% of the contract price	-	Bangladesh Rural Electrification Board	Supplier's or manufacturer's works or stores	Site

(b) Installation All Risks Insurance

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

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]
110% of the contract price	-	Bangladesh Rural Electrification Board	Supplier's or manufacturer's works or stores	Site

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Procuring Entity's personnel) and loss of or damage to property (including the Procuring Entity's property and any parts of the Facilities that have been accepted by the Procuring Entity) 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]
For the contractor employees is as per law and common practice in Bangladesh				

(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) Procuring Entity'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]
Nil	Nil	Nil	Nil	Nil

The Procuring Entity shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 52.1, except for the Third-Party Liability, Workers' Compensation and Procuring Entity'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 52.1, except for the Cargo, Workers' Compensation and Procuring Entity'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 Procuring Entity

If the Procuring Entity is proposing to take out any or all of the above insurances itself, or any other insurances in respect of the Facilities, either in its own name or in the joint names of itself and the Contractor, it shall give details below prior to issuing the tender documents. Under the terms of the Contract, the Contractor and the Contractor's Subcontractors shall be named as co-insured under all such policies.

The Procuring Entity 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

The time for completion of whole facilities shall be as specified in the PCC against sub-clause GCC-29.1.

Appendix 5. List of Major Items of Plant and Services and List of Approved Subcontractors

Appendix 6. Scope of Works and Supply by the Procuring Entity

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

All personnel, facilities, works and supplies will be provided by the Procuring Entity 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 37.2.

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

Personnel	Charge to Contractor (if any)
Procuring Entity's personnel will be engaged to supervise and certify the works and tests. Name of the personnel will be informed later on.	No Charge to the contractor

Facilities	Charge to Contractor (if any)
Power shutdown as required and approved by the Procuring Entity for the execution of works	No charge to contractor/not payable
Information/Data on incoming source of electric power	No charge to contractor/not payable
Assistance in availing of other utility services.	Charge to contractor if applicable.
The Procuring Entity will not provide any storage facility to the contractor. Contractor shall be responsible to provide storage facility In the event of any such requirement and subject to availability, the Procuring Entity may extend the facility to use such storage facility by the contractor on rental charge/cost basis normal terms and conditions.	The amount determined by the Procuring Entity to be paid by the contractor.

Works	Charge to Contractor (if any)
Procuring Entity will not do any works. Contractor shall responsible to execution the contract. If contractor do not reinstate the Procuring Entity's existing facilities (Civil fencing and other ancillaries) Procuring Entity will complete it.	Will be deducted from contractor's payment.

Supplies	Charge to Contractor (if any)
<p>The Procuring Entity will not generally supply any machinery/equipment and materials to the contractor. The contractor shall be responsible to supply any machinery and materials for the contract. In the event of any such requirement and subject to availability, the Procuring Entity may extend the facilities to use such machinery and materials by the contractor on rental charge/cost under normal terms and conditions</p>	<p>The amount determined by the Procuring Entity to be paid by the contractor.</p>

Appendix 7. List of Documents for Approval or Review

Pursuant to GCC Sub-Clause 38.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GCC Sub-Clause 37.2 (Program of Performance), the following documents for

(A) Approval

- (1) Project implementation schedule, Project organogram, Detail drawing schedule.
- (2) Technical particular & Guarantees and Drawing, catalogue and operational manuals, from manufacturer for each type of Equipment, Insulator, Conductor, Earth wire and Hard ware fittings.
- (3) Protection and metering scheme.
- (4) Steel structures.
- (5) Overhead earth screen.
- (6) Plan drawing and Design of all Civil structures.
- (7) All civil and foundation works
- (8) Routine and factory acceptance test plan of each Equipment, Conductor, Insulator, Earth wire, Hardware fittings and Steel structures.
- (9) Pre-commissioning and commissioning Test Plan.
- (10) Any other relevant design-drawing & documents as per the Contract Documents to the complete respective works.

(B) Review

Any documents listed above are to be reviewed if required to complete the works.

Appendix 8. Functional Guarantees

1. General

This Appendix sets out

- (a) the functional guarantees referred to in GCC Clause 46 (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: *[List any conditions for the carrying out of the Guarantee Test referred to in GCC Sub-Clause 43.2]*

3. Functional Guarantees

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

- 3.1 Production Capacity** Satisfactory completes all commissioning tests, Procuring Entity's requirements. All equipment shall be proven to function as required in the individual specifications provided.
- 3.2 Raw Materials and Utilities Consumption** Satisfactory completes all commissioning tests, Procuring Entity's requirements. All equipment shall be proven to function as required in the individual specifications provided.

4. Failure in Guarantees and Liquidated Damages

4.1 Failure to Attain Guaranteed Production Capacity

If the production capacity of the facilities attained in the guarantee test, pursuant to GCC Sub-Clause 43.2, is less than the guaranteed figure specified in para. 3.1 above, but the actual production capacity attained in the guarantee test is not less than the minimum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Procuring Entity in lieu of making changes, modifications and/or additions to the Facilities, pursuant to GCC Sub-Clause 46.3, then the Contractor shall pay liquidated damages at the rate of *[amount in the contract currency]* for every complete one percent (1%) of the deficiency in the production capacity of the Facilities, or at a proportionately reduced rate for any deficiency, or part thereof, of less than a complete one percent (1%).

4.2 Raw Materials and Utilities Consumption in Excess of Guaranteed Level

[To be specified in the appropriate wording for the type of facilities if there are consumption guarantees]

If the actual measured figure of specified raw materials and utilities consumed per unit (or their average total cost of consumption) exceeds the guaranteed figure specified in para. 3.2 above (or their specified average total cost of consumption), but the actual consumption attained in the guarantee test, pursuant to GCC Sub-Clause 43.2, is not more than the maximum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Procuring Entity in lieu of making changes, modifications and/or additions to the Facilities pursuant to GCC Sub-Clause 46.3, then the Contractor shall pay liquidated damages at the rate of *[amount in the contract currency]* for every complete one percent (1%) of the excess consumption of the Facilities, or part thereof, of less than a complete one percent (1%).

[The rate of liquidated damages specified in paras. 4.1 and 4.2 above shall be at least equivalent to the rate specified in Section 3 (General Conditions of Contract) for the comparison of functional guarantees provided by the Tenderers]

4.3 Minimum Levels

Notwithstanding the provisions of this paragraph, if as a result of the guarantee test(s), the following minimum levels of performance guarantees (and consumption guarantees) are not attained by the Contractor, the Contractor shall at its own cost make good any deficiencies until the Facilities reach any of such minimum performance levels, pursuant to GCC Sub-Clause 46.2:

- (a) production capacity of the Facilities attained in the guarantee test: ninety-five percent (95%) of the guaranteed production capacity

and/or

- (b) average total cost of consumption of all the raw materials and utilities of the Facilities: one hundred and five percent (105%) of the guaranteed figures.

4.4 Limitation of Liability

Subject to para. 4.3 above, the Contractor's aggregate liability to pay liquidated damages for failure to attain the functional guarantees shall not exceed *[the percentage specified shall not exceed ten percent (10%)]*. percent (. . . %) of the Contract price

Section 5. Tender and Contract Forms

Form	Title
Tender Forms	
PG5A-1a	Tender Submission Letter for Technical Offer
PG5A-1b	Tender Submission Letter for Financial Offer
PG5A-1c	Letter of Authorization
PG5A-2a	Tenderer Information
PG5A-2b	JV Partner Information (<i>if applicable</i>)
PG5A-2c	Subcontractor Information (<i>if applicable</i>)
PG5A-3	Price Schedule for Plant and Services
PG5A-4	Technical Proposal
PG5A-5	Specifications Submission and Compliance Sheet
PG5A-6	Manufacturer's Authorisation Letter
PG5A-7	Bank Guarantee for Tender Security (<i>when this option is chosen</i>)
PG5A-8	Bank's Letter of Commitment for Line of Credit (<i>when this option is chosen</i>)
Contract Forms	
PG5A-9	Notification of Award
PG5A-10	Contract Agreement
PG5A-11	Bank Guarantee for Performance Security (<i>when this option is chosen</i>)
PG5A-12	Bank Guarantee for Advance Payment (<i>if applicable</i>)
PG5A-13	Bank Guarantee for Retention Money Security (<i>when this option is chosen</i>)
PG5A-14	Contract Amendment

Forms PG5A-1 to PG5A-8 are the contents of the Tender Forms and should be completed as stated in ITT Clauses 23.

Forms PG5A-9 to PG5A-14 are the contents of the Contract Forms as stated in GCC Clause 7.

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

[This format shall be completed and signed by the Tenderer or his/her Authorised Signatory, without alterations, on the Letter-head pad of the Tenderer]

To: <i>[Contact Person]</i> <i>[Name of the Procuring Entity]</i> <i>[Address of the Procuring Entity]</i>	Date:
Invitation for Tender No:	<i>IFT No.</i> _____
Tender Package No:	<i>Package No.</i> _____
Lot No: (when applicable)	<i>Lot No.</i> _____

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 32.1) 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 34.1) 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 JV 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 19.1
or
we are submitting this Tender as the partners of a JV, comprising the following other partners in accordance with ITT Clause 17;

	Name of Partner	Location & District of Partner
1		
2		
3		
4		

(f) *we are not a Government owned entity as defined in ITT Sub Clause 5.10 or*
we are a Government owned entity, and we meet the requirements of ITT Sub Clause 5.10;

(g) we, including as applicable any JV 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 5.6;

(h) we, including as applicable any JV 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, coercive or obstructive practices in accordance with ITT Sub Clause 5.7;

(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 Clause 18.1 to the following Subcontractor(s);

Activity or part of the Plant and services	Name of Subcontractor with Location and District

(k) we, including as applicable any JV partner, confirm that we are not currently suspended or debarred in connection with ITT Clause 5.8,

(l) we are not participating as Tenderer 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 JV 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 5.9;

(n) we, including as applicable any JV 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 5.5;

(o) we understand that you reserve the right to reject all the Tenders or annul the Tender proceedings, without incurring any liability to Tenderer, in accordance with ITT Clause 60.

Signature:	<i>[insert signature of authorised representative of the Tenderer]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
In the capacity of:	<i>[insert capacity of signatory]</i>

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 JV, add other boxes and sign accordingly].

Attachment 1:

[ITT Sub Clause 39.4]

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

[and, if applicable]

Attachment 2:

[ITT Sub Clause 28.2(b)]

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

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

[This format shall be completed and signed by the Tenderer or his/her Authorised Signatory, without alterations, on the Letter-head pad of the Tenderer]

<p>To:</p> <p><i>[Contact Person]</i></p> <p><i>[Name of the Procuring Entity]</i></p> <p><i>[Address of the Procuring Entity]</i></p>	<p>Date:</p>
<p>Invitation for Tender No.:</p>	<p><i>IFT No.</i> _____</p>
<p>Tender Package No.:</p>	<p><i>Package No.</i> _____</p>
<p>Lot No: (<i>when applicable</i>)</p>	<p><i>Lot No.</i> _____</p>

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 accordance with ITT Clause 26 and 27, the following price applies to our Tender:

The Tender price is: (ITT Sub Clause 26.4 and 27)	Amount _____ [in figures] Amount _____ [in words]
Plant (including Mandatory Spare Parts) Supplied from abroad	Amount _____ [in figures] Amount _____ [in words]
Plant (including Mandatory Spare Parts) supplied from within the Procuring Entity's Country	Tk. _____ [in figures] Taka _____ [in words]
Design Services	Amount _____ [in figures] Amount _____ [in words]
Installation and Other Services	Amount _____ [in figures] Amount _____ [in words]
Recommended Spare parts Price (If economic Factor is applicable)	Amount _____ [in figures] Amount _____ [in words]

The advance payment (when applicable) is: <i>[insert the amount based on percentage of the Tender Price]</i> (GCC Sub Clause 61.1)	Taka _____ <i>[in words]</i> Taka _____ <i>[in words]</i>
and we shall accordingly submit an Advance Payment Guarantee in the format shown in Form PW3A-11 .	
In accordance with ITT Clause 28, the following discounts shall apply to our Tender:	
The unconditional discount proposed in this package/Lot/other lot(s) of the Tender is:	In Percentage (%).-----
The discount shall be equally applicable on all the items of Schedule of requirements within each lot after arithmetical correction.	

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 32.1) 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 34.1) 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 67.2 in the amount stated in the Tender Data Sheet (ITT Sub Clause 66.1) 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 Works;
- (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 JV 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 19.1
or
we are submitting this Tender as the partners of a JV, comprising the following other partners in accordance with ITT Clause 17;

	Name of Partner	Location & District of Partner
1		
2		
3		
4		

(g) *we are not a Government owned entity as defined in ITT Sub Clause 5.10 or we are a Government owned entity, and we meet the requirements of ITT Sub Clause 5.10;*

(h) we, including as applicable any JV 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 5.6;

(i) we, including as applicable any JV 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, coercive or obstructive practices in accordance with ITT Sub Clause 5.7;

(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 Clause 18.1 to the following Subcontractor(s);

Activity or part of the Plant and Services	Name of Subcontractor with Location and District

(l) we, including as applicable any JV partner, confirm that we are not currently suspended or debarred in connection with ITT Clause 5.8;

(m) we are not participating as Tenderer 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 JV 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 5.9;

(o) we, including as applicable any JV 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 5.5;

(p) we understand that you reserve the right to reject all the Tenders or annul the Tender proceedings, without incurring any liability to Tenderer, in accordance with ITT Clause 60.

Signature:	<i>[insert signature of authorised representative of the Tenderer]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
In the capacity of:	<i>[insert capacity of signatory]</i>
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 JV, add other boxes and sign accordingly].

Attachment 1:

[ITT Sub Clause 39.4]

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

[and, if applicable]

Attachment 2:

[ITT Sub Clause 28.2(b)]

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

Letter of Authorization (Form PG5A-1A)

[This is the format for the Letter of Authorization submitted by the tenderer in accordance with ITT Clause 39.4]

Invitation for Tender No:

Date:

Tender Package No:

Lot No (*when applicable*)

To:

[Name and address of the Procuring Entity]

I/We, the undersigned, as the Sole Proprietor/Authorized Partner/Partner-in-Charge/Managing Director/Chairman/Chief Executive Officer of the firm titled *[Insert Name and Address of the firm]*, do hereby authorize *[Insert name, designation, address and NID of the person being authorized]* to sign all the documents related with the tender on behalf of the firm. His/her specimen signatures are given below:

1.....
(signature)

2.....
(signature)

3.....
(signature)

Date:

(Signature)

Name, designation, address and NID

Note:

1. Relevant documentary evidence of authorizing capacity of the signatory of this authorization letter shall be attached.

Tenderer Information (Form PG5A-2)

[This format shall be completed and signed by the Tenderer or his/her Authorised Signatory, without alterations, on the Letter-head pad of the Tenderer]

Invitation for Tender No:

[IFT No]

Tender Package No:

[Package No]

Lot No (*when applicable*)

[Lot No]

1. Eligibility Information of the Tenderer [ITT -Clauses 5 & 28]		
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 <i>[complete the relevant box]</i>	
	Proprietorship (Please mention name and NID of the proprietor)	
Partnership (Please mention name and NID of the partners)		
Limited Liability Concern (Please mention name and NID of CEO or MD and the Directors (members of Board of Directors) and/ or Shareholders (at least 10% shares) of the 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 Sub Cause 14.1(a)]	

	<p>A. No pending litigation <input checked="" type="checkbox"/> [if no pending litigation put Tick Mark in Box]</p> <p>B. Pending litigation</p>			
	Month h/ Year	Matter in dispute	Value of Pending Claim in Taka	
1.8	Tenderer to attach photocopies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 28]		
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 31]				
2.1	General Experience in the Supply of Goods [State years of experience]			
2.2	Specific Experience of satisfactory completion of supply of similar Goods			
Contract No		[insert reference no] of [insert year]		
Name of Contract		[insert name]		
Role in Contract <i>[tick relevant box]</i>		Prime Contractor	Subcontractor	Management Contractor
Award date		[insert date]		
Completion date		[insert date]		
Total Contract Value		[insert amount]		
Procuring Entity's Name Address Tel <u>e-mail</u> 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 supply]		

2.3	Supply and/or production capacity of Goods are:		
	Year	Quantity	Type of Goods

2.4	Liquid assets available [ITT Sub Clause 14.1(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 31.1(d)			
2.5	Contact Details [ITT Sub Clause 31.1 (f)] Name, address, and other contact details of Tenderer Bankers and other Procuring Entity(s) that may provide references, if contacted by this Procuring Entity		

JV Partner Information (Form PG5A-2b)

[This Form should be completed and signed by each JV partner without alterations, preferably on its Letter-Head Pad]

I

Invitation for Tender No:

[IFT No]

Tender Package No:

Package No]

Lot No. (*when applicable*)

[Lot No)]

1. Eligibility Information of the JV Partner [ITT -Clauses 5 & 28]		
1.1	Nationality of individual or country of registration	
1.2	JV Partner's legal title	
1.3	JV Partner's registered address	
1.4	JV Partner's legal status <i>[complete the relevant box]</i>	
	Proprietorship (Please mention name and NID of the proprietor)	
	Partnership (Please mention name and NID of the partners)	
	Limited Liability Concern (Please mention name and NID of CEO or MD and the Directors (members of Board of Directors) and/ or Shareholders (at least 10% shares) of the concern)	
	Government-owned Enterprise	
1.5	JV Partner's year of registration	
1.6	JV Partner's authorised representative details	
	Name	
	National ID number	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Litigation [ITT Cause 13]	

	<p>A. No pending litigation <input checked="" type="checkbox"/> [if no pending litigation put Tick Mark in Box]</p> <p>B. Pending litigation</p>			
	Year	Matter in dispute	Value of Pending Claim in Taka	Value of Pending Claim as Percentage of Net Worth
1.8	JV Partner 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 JV Partners only				
1.9	JV Partner's Value Added Tax Registration (VAT) Number			
1.10	JV Partner's Tax Identification Number (TIN)			
[The foreign JV 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, if it can be specified [ITT Sub Clause 17.2]				
	Elements of Activity	Brief description of Activity		
3. Qualification Information of the JV Partners [ITT Clause 31]				
3.1	General Experience in Construction Works of JV Partners [State years of experience]			
3.2	Specific Experience in Construction Works of JV Partners Completed Contracts of similar nature, complexity and methods/construction technology			
Contract No		[insert reference no] of [insert year]		
Name of Contract		[insert name]		
Role in Contract <i>[tick relevant box]</i>		Prime Contractor	Subcontractor	Management Contractor
Award date Completion date Total Contract Value		[insert date] [insert date] [insert amount]		
Procuring Entity's Name Address Tel / Fax <u>e-mail</u>				
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]
--	--	---

3.3 Average Annual Construction Turnover

[Select one option from below and delete the italics]

[Option 1: Based on Profit and Loss Account or Audit Report duly conducted by Registered Chartered Accountancy Firm, Exchange Rate shall be rate at the end of the period reported by the concerned central bank of the country]

Period or Year	Amount and Currency	Amount in Equivalent BDT.
1	2	3

Option 2: Based on total certified payments received for contracts in progress or completed under public sector for a period as stated under ITT Sub Clause 14.1(b) [applicable for local tenderer]

Sl.	Period or Year	Tender ID or Ref. No.	Received Date	Amount	Business Share	Turnover
1	2	3	4	5	6	7
					Total	
					AACT	

3.4	Liquid assets available to meet the construction cash flow [ITT Sub Clause 14.1(b)]		
	No	Source of Financing	Amount Available
In order to confirm the above statements, the JV Partners shall submit, as applicable, the documents mentioned in ITT Sub Clause 31.1(d)			
3.5	Contact Details [ITT Sub Clause 31.1 (f)]		
	Name, address, and other contact details of JV Partner'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 31.1(h)]		
	Name	Position	Years of General Experience Years of Specific Experience

<i>[JV Partners to complete details of as many personnel as are applicable. Each personnel listed above should complete the Personnel Information (Form PG5A-2b)]</i>				
3.7	Major Construction Equipment proposed to carry out the Contract [ITT Sub Clause 31.1(i)]			
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, lessor or seller)	
<i>[Tenderer to list details of each item of major construction equipment, as applicable]</i>				

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

Subcontractor Information Form (Form PG5A-2c)

[This Form should be completed and signed by each Subcontractor, without alterations, preferably on its Letter-Head Pad]

Invitation for Tender No:

[IFT No]

Tender Package No

[Package No]

Lot No. (when applicable)

[Lot No]

1. Eligibility Information of the Subcontractor [ITT -Clauses 5 & 28]		
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 <i>[complete the relevant box]</i>	
1.4	Proprietorship (Please mention name and NID of the proprietor)	
1.4	Partnership (Please mention name and NID of the partners)	
1.4	Limited Liability Concern (Please mention name and NID of CEO or MD and the Directors (members of Board of Directors) and/ or Shareholders (at least 10% shares) of the concern)	
1.4	Government-owned Enterprise	
1.5	Subcontractor's year of registration	
1.6	Subcontractor's authorised representative details	
1.6	Name	
1.6	Address	
1.6	Telephone numbers	
1.6	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 28 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 18.1]		
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 Work performed	

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:	<i>[indicate IFT No]</i>
Tender Package No	<i>[indicate Package No]</i>
This Package is divided into the following Number of Lots	<i>[indicate number of Lot(s)]</i>

General

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

Schedule No. 1: Plant and Mandatory Spare Parts.

Schedule No. 2: Installation and Other Services.

Schedule No. 3: Grand Summary.

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 Procuring Entity'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 (Procuring Entity'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 Procuring Entity for the purposes of making payments or partial payments, valuing variations or evaluating claims, or for such other purposes as the Procuring Entity may reasonably require, the Contractor shall provide the Procuring Entity with a breakdown of any composite or lump sum items included in the Schedules.

TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.

Package No: SE(G&SS)-11/0.4KV-SS-Padma Bridge-BBA

Schedule No.1: Plant and Mandatory Spare Parts

Sl No.	Description	Unit	Qty	Unit price (in BDT)	Total Price (in BDT)
Service Area-1					
1	Supply of 11/0.415 KV, 3150 kVA, Dry Type Power Transformer with Off Load Tap Changer, 11kV Surge arrestors and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos	1		
2	Supply of 1900 kVAR Automatic PFI Plant (12 stage) for 3150kVA transformer and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Set	1		
3	Supply of 415V Main LT Switchgear (5000 Amps, ACB) for 415V Incoming-Feeder with 5500A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection and ATS Panel for 1500kVA generator as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1		
4	Supply of 415V LT Switchgear (3000 Amps, ACB) for 1900 kVAR PFI Plant with 4000A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1		
5	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	m	150		
6	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) Termination Kits for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	Lot	1		
7	Supply of 11KV indoor CT (300:5-5A) and related accessories in control room building for 11kV Switchgear where Core-1(CL-0.2, 20VA) dedicated for Metering panel & core-2 (20VA, 5P20) dedicated for protection as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity. (1 set= 3 nos)	Set	1		
8	Supply of TP MCCB and DB Box for the following houses with appropriate size bus				

Sl No.	Description	Unit	Qty	Unit price (in BDT)	Total Price (in BDT)
a	Museum- 200A, 36kA	Set	1		
b	Engineers Mess-1- 600A, 36kA	Set	1		
c	Engineers Mess-2- 500A, 36kA	Set	1		
d	Indoor Sports- 100A, 36kA	Set	1		
e	Dormitory- 400A, 36kA	Set	1		
f	3 Bed House SDB- 600A	Set	5		
g	3 Bed House MDB- 100A, 36kA	Set	24		
9	Supply of TP MCCB for the following LT Panels with appropriate size bus inside the substation.				
a	BBA Office- 250A, 36kA	Set	1		
b	Museum- 200A, 36kA	Set	1		
c	Engineers Mess-1- 600A, 36kA	Set	1		
d	Engineers Mess-2- 500A, 36kA	Set	1		
e	Dormitory- 400A, 36kA	Set	1		
f	3 Bed House SDB- 600A	Set	5		
g	3 Bed House MDB- 100A, 36kA	Set	24		
10	Supply of following sizes of 415V XLPE Cu Armour Cable for connection between House/Office/Other Buildings DB Box to MDB/LT Panel as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.				
a	4 core 10mm ²	m	4000		
b	4 core 50mm ²	m	2300		
c	Single core 120mm ²	m	3408		
11	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos.	4		
12	Supply of Fuel save controller for synchronization with generator as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Set	1		
Service Area-2					
13	Supply of 11/0.415 KV, 2000 kVA, Dry Type Power Transformer with OLTC, 11kV Surge arrestors and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos	1		
14	Supply of 1200 kVAR Automatic PFI Plant (12 stages) for 2000kVA Transformer and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Set	1		

Sl No.	Description	Unit	Qty	Unit price (in BDT)	Total Price (in BDT)
15	Supply of 415V Main LT Switchgear (3000 Amps, ACB) for 2000kVA Transformer Feeder with 4000A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection and ATS Panel for 1250kVA Generator as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1		
16	Supply of 415V LT Switchgear (2000 Amps, ACB) for 1200 kVAR PFI Plant with 2500A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1		
17	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	m	200		
18	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) Termination Kits for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	Lot	1		
19	Supply of 11KV indoor Switchgear VCB (630 Amps, 31.5kA, 3s) for 11KV Incoming-Feeder from source line with inbuilt CT (600-300:5-5A) where Core-1 (CL-0.2, 20VA) dedicated for Metering, Core- 2 (20VA, CL-5P20) dedicated for protection including Digital Master Relay, Trip relay, Directional relay, 2 nos Trip circuit supervision Relay, Energy meter (Accuracy-0.2s) with Export and Import and 03 Nos digital Ammeter & volt meter, KW meter, KVAR meter, Power factor meter etc. with in-built 11 KV 1000 Amps copper bus-bar where closing and tripping coil must be operated by in built 110 Volt DC . in control room building inbuilt 11KV PT (11000/√3:110/√3:110/√3) as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	set	1		

Sl No.	Description	Unit	Qty	Unit price (in BDT)	Total Price (in BDT)
20	Supply of 11KV indoor Switchgear/ VCB (630 Amps, 31.5kA,3s) for 2000kVA transformer with inbuilt CT (600-300:5-5A) in control room building where Core-1(CL-0.2, 20VA) dedicated for Metering panel & core-2 (20VA, 5P20) dedicated for protection including digital master relay, trip relay, Directional relay, 2 nos trip ckt supervision relay, energy meter (Accuracy-0.2s) with export & import and 3 nos digital ammeter & volt meter, KW meter, KVAR meter, PF meter, etc. with inbuilt 11KV 1000A copper Bus bar where closing and tripping coil must be operated by in built 110 Volt DC as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1		
21	Supply 11KV, 3c×185 mm ² Power Cable for 11KV Outgoing Feeders from 11KV Switchgear/ VCB to Over-Head Line as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	m	200		
22	Supply 11KV, 3c×185 mm ² Power Cable Termination Kits for 11KV Outgoing Feeders from 11KV Switchgear/ VCB to Over-Head Line as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Lot	1		
23	Supply of TP MCCB and DB Box for the following houses with appropriate size bus				
a	Motel Mess- 800A, 50kA	Set	1		
b	Reception- 800A, 50kA	Set	1		
c	Supervision Office- 600A, 36kA	Set	1		
24	Supply of TP MCCB for the following LT Panels with appropriate size bus inside the substation.				
a	Motel Mess- 800A	Set	1		
b	Reception- 800A	Set	1		
25	Supply of following sizes of 415V XLPE Cu Armour Cable for connection between House/Office/Other Buildings DB Box to MDB/LT Panel as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.				
a	4 core 10mm ²	m	2500		
b	4 core 25mm ²	m	1000		
c	Single core 185mm ²	m	1000		
d	Single core 240mm ²	m	590		
26	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos.	4		

Sl No.	Description	Unit	Qty	Unit price (in BDT)	Total Price (in BDT)
27	Supply of Fuel save controller for synchronization with generator as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Lot	1		
	Service Area-3				
28	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) for connection between 11/0.4 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	m	150		
29	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) Termination Kits for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	Lot	1		
30	Supply of TP MCCB and DB Box for the following houses with appropriate size bus				
a	Engineering Mess- 600A, 36kA	Set	1		
b	Dormitory- 400A, 36kA	Set	1		
c	Indoor Sports- 100A, 36kA	Set	1		
d	3-Bed House-100A, 16kA	Set	6		
31	Supply of TP MCCB for the following LT Panels with appropriate size bus inside the substation.				
a	Engineering Mess- 600A, 36kA	Set	1		
b	Dormitory- 400A, 36kA	Set	1		
c	3-Bed House-100A, 16kA	Set	6		
32	Supply of following sizes of 415V XLPE Cu Armour Cable for connection between House/Office/Other Buildings DB Box to MDB/LT Panel as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.				
a	4 core 10mm ²	m	500		
b	4 core 25mm ²	m	750		
c	Single core 185mm ²	m	700		
33	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos.	4		
34	Supply of Fuel save controller for synchronization with generator as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Lot	1		
	Sub-Total of Schedule-1=				

In word:

Note: 1. All Costs of Equipment shall include Design, Manufacture, and Transportation to site including Insurance, VAT & all other Taxes (as applicable in the Procuring Entity's Country).
2. All Costs of Works shall include Cost of Works including Insurance, VAT income Tax & all other Taxes (as applicable in the Procuring Entity's Country).
3. All costs shall include the items / components as detailed in the document.

Seal and signature of Tenderer

TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.

Package No: SE(G&SS)-11/0.4KV-SS-Padma Bridge-BBA

Schedule No. 2- Installation and Other Services

Sl No.	Description	Unit	Qty	Unit price (in BDT)	Total Price (in BDT)
1	Testing & Commissioning of Substation	Lot	1		
2	All installation including a) substation earthing, b) lighting (as required), c) all electrical equipments, d) replacement of existing House DB's (where necessary), MCCB's with New units as mentioned in schedule-1, e) replacement of existing MCCB's installed in LT Panels inside the substation with MCCB's mentioned in schedule-1, f) steel structure (as required), g) cable laying (including HDD boring with PN-10 HDPE pipe where necessary), h) cable termination and other as required, i) removal of existing 1500kVA transformer, 2500A LT Switchgear, 900kVA PFI Plant from Service area-1 and carry & install the equipment in Service area-3 substation, j) replacement of existing CT of 11kV switchgear in Service area-1 with newly supplied CT's as mentioned in schedule-1	Lot	1		
3	Supply materials and Construction of Foundation of all Equipments and gantry Structure as per approved design & drawing and direction of Engineer-in-charge.	Lot	1		
Sub-Total of Schedule-2=					

Note: 1. All Costs of Equipment shall include Design, Manufacture, and Transportation to site including Insurance, VAT & all other Taxes (as applicable in the Procuring Entity's Country).

2. All Costs of Works shall include Cost of Works including Insurance, VAT income Tax & all other Taxes (as applicable in the Procuring Entity's Country).

3. All costs shall include the items / components as detailed in the document.

Seal and signature of Tenderer

TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.

Package No: SE(G&SS)-11/0.4KV-SS-Padma Bridge-BBA

Schedule No. 3- Grand Summary

Sl No.	Description	Total Price (in BDT)
1	Sub-Total of Schedule No. 1- Plant and Mandatory Spare Parts	
2	Sub-Total of Schedule No. 2- Installation and other services	
Grand Total=		

In word:

Note: 1. All Costs of Equipment shall include Design, Manufacture, and Transportation to site including Insurance, VAT & all other Taxes (as applicable in the Procuring Entity's Country).
 2. All Costs of Works shall include Cost of Works including Insurance, VAT income Tax & all other Taxes (as applicable in the Procuring Entity's Country).
 3. All costs shall include the items / components as detailed in the document.

Seal and signature of Tenderer

Name:	<i>[insert full name of signatory]</i>	<i>Signature with Date and Seal</i>
In the capacity of:	<i>[insert designation of signatory]</i>	<i>[Sign]</i>
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

[insert technical proposal for site organization]

[The Tenderer shall include in the tender an appropriate organization chart. This shall include head office as well as site components and clearly demonstrate that the Tenderer possesses the staff and organizational resources to complete the Supply and Installation of Plant & Equipment.]

Method Statement

[insert technical proposal for Method Statement]

[The Tenderer shall furnish an overall description covering all activities and processes from inception to site works and commissioning.

In particular methods of minimizing the impact on the environment in accordance with the relevant laws and regulations during the construction phase shall be described.]

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]

[This shall be included in the overall time schedule to be provided by the Tenderer as per "Time Schedule" in Section5. 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:	[IFT No]
Tender Package No	[Package No]
Lot No. (when applicable)	[Lot No]

A. Proposed Position (tick the relevant box)			
<input type="checkbox"/> Construction Project Manager		<input type="checkbox"/> Prime Candidate	<input type="checkbox"/> Alternative Candidate
<input type="checkbox"/> Key Personnel		<input type="checkbox"/> Prime Candidate	<input type="checkbox"/> Alternative Candidate
B. Personal Data			
Name			
Date of Birth			
Years overall experience			
National ID Number			
Years of employment with the Tenderer			
Professional Qualifications:			
1.			
C. Present Employment [to be completed only if not employed by the Tenderer]			
Name of Procuring Entity (working under):			
Address of Procuring Entity (working under):			
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 past 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			

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:	<i>[indicate IFT No]</i>
Tender Package No	<i>[indicate Package No]</i>
This Package is divided into the following Number of Lots	<i>[indicate number of Lot(s)]</i>

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 <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the 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:	<i>[insert full name of signatory]</i>	<i>Signature with Date and Seal</i>
In the capacity of:	<i>[insert designation of signatory]</i>	<i>[Sign]</i>
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Proposed Subcontractors for Major Items of Plant and Installation Services

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 Procuring Entity 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:	<i>[indicate IFT No]</i>
Tender Package No	<i>[indicate Package No]</i>
This Package is divided into the following Number of Lots	<i>[indicate number of lot(s)]</i>

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-5)

Invitation for Tender No:

Tender Package No:

Date:

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 or Related Service	Country of Origin	Make and Model (when applicable)	Full Technical Specifications and Standards
1	2	3	4	5
	FOR GOODS			Note 1
	FOR RELATED SERVICES			

[The Tenderer should complete all the columns as required]

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

Manufacturer's Authorisation Letter (Form PG5A - 6)

[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 Clause 31.1 (e)]

Invitation for Tender No:	Date:
Tender Package No:	
Tender Lot No (<i>when applicable</i>):	
To: [Name and address of Procuring Entity]	

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 45 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-7)

[This is the format for the Tender Security to be issued by any scheduled Bank of Bangladesh without alteration, in accordance with ITT Clause 34 & 35]

Invitation for Tender No:

Date:

Tender Package No:

Lot No (*when applicable*)

To:

[Name and address of the Procuring Entity]

TENDER GUARANTEE No: [insert number]

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

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

At the request of the Tenderer, 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 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. failed to furnish Performance Security within the period stipulated in the NOA; or
- c. refused to sign the Contract Agreement by the time specified in the NOA; or
- d. did not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT.
- e. involves in any corrupt, fraudulent, collusive, coercive or obstructive practice of any kind as defined in ITT Clause 4.

This guarantee will expire

- (a) if the Tenderer is the successful Tenderer, upon our receipt of a copy of the Contract Agreement signed by the Tenderer or a copy of 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.

Signature

Signature

Letter of Commitment for Bank's Undertaking for Line of Credit (Form PG5A-8)

[This is the format for the Credit Line to be issued by any scheduled Bank of Bangladesh, without alterations, in accordance with ITT Clause 31.1(d).]

Invitation for Tender No: Date:

Tender Package No:

Lot No (*when applicable*)

To:

[Name and address of the Procuring Entity]

CREDIT COMMITMENT 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 of *[description of Goods]* 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 the delivery of Goods viz. *[insert name of Goods]*, 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 "Acceptance 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-9)

Reference No:

Date:

To:

[Name of the successful tenderer]

This is to notify you that your Tender dated [insert date] for the supply of the Goods for [name of Contract] for the Contract Price of BDT [state amount in figures and in words] as evaluated in accordance with the Instructions to Tenderers, has been approved by the competent authority. You are, thus, requested to take following actions:

- i. furnish a Performance Security in the specified format and in the amount of Tk [state amount in figures and words], within [mention number of days as per Rule 123(7)] working days of issuance of this letter but no later than [specify the date of the last working day of the allowed time] in accordance with ITT Clause No 66;
- ii. sign the Contract within [mention number of days as per Rule 123(11)] days of issuance of this letter but no later than [specify the date of the last working day of the allowed time] in accordance with ITT Clause 71.

You may proceed with the supply of the Goods 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 or behalf of
[name of Procuring Entity]
Date:

Contract Agreement (Form PG5A-10)

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

WHEREAS the Procuring Entity invited Tenders for certain goods and related services, viz, *[brief description of goods]* and has accepted a Tender by the Contractor for the execution of those Goods 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 documents forming the Contract shall be interpreted in the following order of priority:
 - (a) the signed Contract Agreement
 - (b) the Notification of Award
 - (c) the completed Tender and the Appendix to the Tender
 - (d) the Particular Conditions of Contract
 - (e) the General Conditions of Contract
 - (f) the Technical Specifications
 - (g) the General Specifications
 - (h) the Drawings
 - (i) the Priced Schedules of Plant and Equipment
 - (j) any other document including correspondence listed in the PCC forming part of the Contract.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Procuring Entity 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 Procuring Entity 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 parties hereto have caused this Agreement to be executed in accordance with the laws of Bangladesh on the day, month and year first written above.

For the Procuring Entity For the Contractor

Signature

Name

National ID No.

Title

In the presence of Name

Address

Bank Guarantee for Performance Security (Form PG5A-11)

[This is the format for the Performance Security to be issued by any scheduled Bank of Bangladesh, without alteration, in accordance with ITT Clause 66]

Contract No: [insert reference number]

Date: [insert date]

To:

[insert Name and address of Procuring Entity]

PERFORMANCE GUARANTEE No: [insert number]

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of Goods *[description of Goods]* under the Contract.

Furthermore, we understand that, according to your conditions, the Contract must be supported by a Bank Guarantee for Performance Security.

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.

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.

Signature

Signature

Bank Guarantee for Advance Payment (Form PG5A-12)

[This is the format for the Advance Payment Guarantee to be issued by any scheduled Bank of Bangladesh, without alteration, in accordance with GCC Clause 61.1]

Contract No: [insert reference number]

Date: [insert date]

To:

[insert Name and address of the Procuring Entity]

ADVANCE PAYMENT GUARANTEE No: [insert number]

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of Goods *[description of Goods]* under the Contract.

Furthermore, we understand that, according to your Conditions of Contract under GCC Clause 61.1, the Advance Payment on Contract must be supported by a Bank Guarantee.

At the request of the Contractor, we *[insert 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 Procuring Entity 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 *[insert 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.

Signature

Signature

Bank Guarantee for Retention Money Security (Form PG5A-13)

[This is the format for the Retention Money Guarantee to be issued by any scheduled Bank of Bangladesh in accordance with GCC Clause 64]

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.

Contract Amendment (Form PG5A-14)

[Insert Full Contact Details of the Procuring Entity]

CONTRACT AMENDMENT

Contract No.	
Amendment No.	
Approval Reference No.	

Contract No. [insert number/year] by and between the [insert Procuring Entity's name] and [insert Contractor's legal title] for the contract named [insert name of the Goods] is amended as follows:

1. GCC Clause [insert clause no], is hereby revised as _____

2. GCC Clause [insert clause no], is hereby revised as _____

and so on.

The effective date of this Amendment is [insert effective date] or upon execution whichever is later.

ALL OTHER TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT SHALL REMAIN IN FULL FORCE AND EFFECT

THIS AMENDMENT, consisting of [insert number] page(s) and [insert number] attachment(s), is executed by the persons signing below who warrant that they have the authority to execute this Amendment under the original Contract.

IN WITNESS WHEREOF, the Procuring Entity and the Contractor have signed this Amendment.

[Contractor's Authorized Signatory]

Signature

Title

[Procuring Entity's Authorized Signatory]

Signature

Title

Date

Section 6. Procuring Entity's Requirements

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

1.0 PROCURING ENTITY'S REQUIREMENTS

The works in this bidding document covers the upgradation, design, supply, construction, installation and commissioning of 11/0.415 kV substation works at Padma bridge site office-1, 2 & 3 for rooftop solar integration under Bangladesh Bridge Authority situated in Mawa, Zajira and Shibchar respectively, under the jurisdiction of the BREB/PBS, on turnkey basis. A list of the sites is given in Table 01 below and site plans are provided in “Drawings” section of this document.

The scope of work includes design, manufacture, quality assurance, inspection & testing, packing for export, insurance & shipment to site, civil works, complete construction & installation jointing, terminating, bonding, earthing, painting, setting to work, site testing & commissioning all the equipment necessary for operation of the sub-station.

The detail requirements are listed in the technical particulars and guaranteed schedules in the technical specification. The Contractor shall remedy all defects during the defect notification period of the equipment as per the contract.

The scope also includes imparting technical training for BREB/PBS/BBA Personnel on operation, maintenance, protection & control of 11/0.415 kV substation.

The Contractor shall be responsible for providing equipment, which shall meet in all respects the performance specifications and will have satisfactory durability for the prevailing site conditions. The Contractor is responsible for ensuring that all and any items of work (materials and labor) required for the safe efficient and satisfactory completion and functioning of the works in accordance with the specification, are included in the bid price whether they be individually described in the specification or not.

The site plans are included in the drawings and the locations are identified by pegs in the ground. Each bidder shall visit each site during the bidding period.

The Bidders shall inspect each new site to identify the location, orientation, actual space available, extent of earth works involved, construction of control building and its ancillary facilities and sub-soil investigation and soil testing reports available (which will be supplied from PMU office) including recommendations, to determine the actual scope of work. Modifications to the lay-out provided in the drawing, may be necessary based on the Contractor's detailed design and the actual available size of the land at the site.

The detailed design arrangement of the equipment shall be the responsibility of the Contractor subject to the approval of the concern committee of BREB with the recommendation of Project Manager. The Contractor shall submit all drawings, manuals, designs and calculations for review prior to commencing manufacturing and/or installation works. Typical existing designs are included in Drawings section of this document, for information only.

Transportation requirements, storage, suitable construction tools, necessary equipment and all required materials for installation and connections as well as testing and commissioning are included in the scope of work.

1.1 New 11/0.415kV Substation Upgradation – Electrical

The key requirements for the works are presented hereunder; any other works required but not included below but required to complete the 11/0.415 kV Substation Upgradation and put it into operation is to be treated as forming a part of this contract.

1.1.1 The new 11/0.415 kV Substation Upgradation shall have the following features:

Bangladesh Bridge Authority (BBA) has three service areas in a) Mawa, Munshiganj, b) Zajira, Shariatpur and c) Shibchar, Madaripur. Each of these service areas has one 11/0.415kV substation. The capacity of these substations are 1500 kVA, 1250 kVA and 500 kVA respectively. There are three generators installed in three service area substations. The capacity of the generator are 1500kVA, 1250kVA and 500kVA respectively. BBA is installing a total of 6.03 MW rooftop solar over the buildings situated inside the service areas. Solar will be installed over the following buildings:

Service Area-1:

- a) BBA Office
- b) Museum
- c) Engineering Mess-1
- d) Engineering Mess-2
- e) Indoor Sports
- f) Dormitory
- g) 3-Bed Houses-24 nos

Service Area-2

- a) 3-Bed Houses-30 nos
- b) Motel Mess
- c) Reception
- d) Supervision office

Service Area-3

- a) Engineering Mess
- b) Dormitory
- c) Office
- d) Lab
- e) Indoor Sports
- f) Cottage- 6 nos

The existing substations need to be upgraded to integrate the solar power with grid. All equipments will be indoor. The main work will consist the following:

- Upgradation of Service area-1 substation from 1500 kVA to 3150 kVA.
- Supply and installation of a new 11/0.415 kV 3150 kVA Power transformer, related LT switchgear, PFI Plant, ATS Panel, Fuel save controller, 415V Power cable and related accessories at Service area-1 substation;
- Dismantling of existing 11/0.415kV 1500kVA Power transformer, related LT switchgear, PFI Plant and related accessories and carrying those equipment to Service area-3. Those equipments will be installed in service area-3 substation. Existing 11/0.415kV 500kVA Power transformer, related LT switchgear, PFI Plant and related accessories will be dismantled and carried to BBA store;
- Supply and installation of a new 11/0.415 kV 2000 kVA Power transformer, related 11kV switchgear, LT switchgear, PFI Plant, ATS Panel, Fuel save controller, 11kV & 415V Power cable and related accessories at Service area-2 substation. One 11kV Panel will be used for 2000kVA transformer incomer and the other 11kV Panel will be used for substation incomer;
- Supply of 415V Power cable, Fuel save controller and related accessories at service area-3

substation;

- Replacement of existing 11kV indoor CT inside 11kV Panel with new 300:5-5 CT at Service area-1;
- Replacement of existing house/office/building MCCB's with appropriate size bus in LT panels at substations as per price schedule;
- Replacement of existing house/office/building MCCB's and DB Box (where necessary) with appropriate size bus in MDB/SDB as per price schedule;
- Supply and laying of 415V XLPE Armoured underground cables from existing house/office/building MDB/SDB to substation LT panels;
- Related civil works including HDD boring (where necessary) for cable laying and equipment installation;
- Supply and installation of air condition system in substations;
- Supply of Fuel save controllers for synchronization between generator and solar system;
- All relevant civil works, foundations, earth grid and structural works as detailed in this specification and shown on the drawings.
- The main earth grid including bonding of bays and all steel work / gantries (50 grade steel) shall be installed for the final configuration;
- As built drawing to be prepared and submitted to the following offices

Office of the Superintending Engineer (Grid & Substation)-1 copy

Munshiganj PBS- 1 copy

Shariatpur PBS- 1 copy

Madaripur PBS- 1 copy (1 copy to be kept in the substation and 1 copy to be kept in PBS)

Xen, SPD, Dhaka-1 copy

Xen (SOD), Munshiganj-1 copy

BBA Office- 3 copies

The quantities of each item will be as indicated in the bill of quantities and the drawings.

The conceptual single line diagrams, plans and elevations are provided in Section 7 – Drawings.

1.1.3 Cables within sub-station

Multi-core cabling between equipment within the substation i.e. LVAC, DC, etc. shall be provided and installed by the contractor as required under this Contract.

1.1.4 11/0.415kV Substation Upgradation – Civil works

The Contractor shall be responsible for the construction of the equipment foundation and its facilities earthworks associated with each new bays. This shall include but not be limited to the following:

- Site topographical surveys and sub-soil investigations report including recommendation;
- Testing of water and materials used in construction works;
- New trench for control cable, power cable;
- Foundation works for power transformer, 11kV & LT Panels;
- Earthworks, and landscaping as per approved drawings;
- Any required piling work. Preliminary soil test reports will be provided by the Procuring Entity, However final soil test reports and designs will be contractor's responsibility;
- Structure and foundations for line landing gantries, plant and equipment;
- Any required temporary works;
- Master plan/site layout plan as per respective site condition;
- Architectural plan, section, all side elevation and also 3-D perspective;
- Preparation of As-built documentation;
- Any other works required but not included in the above to complete the substation and put it into operation.

All the civil works will be done as per approved drawing & design prepared by the contractor and approved by the Procuring Entity.

TURNKEY CONTRACT FOR DESIGN, SUPPLY, CONSTRUCTION, UPGRADATION, INSTALLATION, TESTING & COMMISSIONING OF 11/0.4kV SUB-STATION WORKS AT PADMA BRIDGE SITE OFFICE-1, 2 & 3 FOR ROOFTOP SOLAR INTEGRATION UNDER BANGLADESH BRIDGE AUTHORITY.

Package No: SE(G&SS)-11/0.4KV-SS-Padma Bridge-BBA

Schedule No.1: Plant and Mandatory Spare Parts

Sl No.	Description	Unit	Qty
	Service Area-1		
1	Supply of 11/0.415 KV, 3150 kVA, Dry Type Power Transformer with Off Load Tap Changer, 11kV Surge arrestors and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos	1
2	Supply of 1900 kVAR Automatic PFI Plant (12 stage) for 3150kVA transformer and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Set	1
3	Supply of 415V Main LT Switchgear (5000 Amps, ACB) for 415V Incoming-Feeder with 5500A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection and ATS Panel for 1500kVA generator as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1
4	Supply of 415V LT Switchgear (3000 Amps, ACB) for 1900 kVAR PFI Plant with 4000A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1
5	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	m	150
6	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) Termination Kits for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	Lot	1
7	Supply of 11KV indoor CT (300:5-5A) and related accessories in control room building for 11kV Switchgear where Core-1(CL-0.2, 20VA) dedicated for Metering panel & core-2 (20VA, 5P20) dedicated for protection as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity. (1 set= 3 nos)	Set	1
8	Supply of TP MCCB and DB Box for the following houses with appropriate size bus		
a	Museum- 200A, 36kA	Set	1
b	Engineers Mess-1- 600A, 36kA	Set	1
c	Engineers Mess-2- 500A, 36kA	Set	1
d	Indoor Sports- 100A, 36kA	Set	1
e	Dormitory- 400A, 36kA	Set	1
f	3 Bed House SDB- 600A	Set	5
g	3 Bed House MDB- 100A, 36kA	Set	24
9	Supply of TP MCCB for the following LT Panels with appropriate size bus inside the substation.		
a	BBA Office- 250A, 36kA	Set	1
b	Museum- 200A, 36kA	Set	1
c	Engineers Mess-1- 600A, 36kA	Set	1
d	Engineers Mess-2- 500A, 36kA	Set	1
e	Dormitory- 400A, 36kA	Set	1
f	3 Bed House SDB- 600A	Set	5
g	3 Bed House MDB- 100A, 36kA	Set	24

Sl No.	Description	Unit	Qty
10	Supply of following sizes of 415V XLPE Cu Armour Cable for connection between House/Office/Other Buildings DB Box to MDB/LT Panel as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.		
a	4 core 10mm ²	m	4000
b	4 core 50mm ²	m	2300
c	Single core 120mm ²	m	3408
11	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos.	4
12	Supply of Fuel save controller for synchronization with generator as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Set	1
Service Area-2			
13	Supply of 11/0.415 KV, 2000 kVA, Dry Type Power Transformer with OLTC, 11kV Surge arrestors and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos	1
14	Supply of 1200 kVAR Automatic PFI Plant (12 stages) for 2000kVA Transformer and all necessary accessories as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Set	1
15	Supply of 415V Main LT Switchgear (3000 Amps, ACB) for 2000kVA Transformer Feeder with 4000A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection and ATS Panel for 1250kVA Generator as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1
16	Supply of 415V LT Switchgear (2000 Amps, ACB) for 1200 kVAR PFI Plant with 2500A Copper bus having adjustable overcurrent, magnetic short circuit & earth fault protection as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1
17	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	m	200
18	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) Termination Kits for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	Lot	1
19	Supply of 11KV indoor Switchgear VCB (630 Amps, 31.5kA, 3s) for 11KV Incoming-Feeder from source line with inbuilt CT (600-300:5-5A) where Core-1 (CL-0.2, 20VA) dedicated for Metering, Core- 2 (20VA, CL-5P20) dedicated for protection including Digital Master Relay, Trip relay, Directional relay, 2 nos Trip circuit supervision Relay, Energy meter (Accuracy-0.2s) with Export and Import and 03 Nos digital Ammeter & volt meter, KW meter, KVAR meter, Power factor meter etc. with in-built 11 KV 1000 Amps copper bus-bar where closing and tripping coil must be operated by in built 110 Volt DC . in control room building inbuilt 11KV PT (11000/√3:110/√3:110/√3) as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	set	1
20	Supply of 11KV indoor Switchgear/ VCB (630 Amps, 31.5kA,3s) for 2000kVA transformer with inbuilt CT (600-300:5-5A) in control room building where Core-1(CL-0.2, 20VA) dedicated for Metering panel & core-2 (20VA, 5P20) dedicated for protection including digital master relay, trip relay, Directional relay, 2 nos trip ckt supervision relay, energy meter (Accuracy-0.2s) with export & import and 3 nos digital ammeter & volt meter, KW meter, KVAR meter, PF meter, etc. with inbuilt 11KV 1000A copper Bus bar where closing and tripping coil must be operated by in built 110 Volt DC as per approved design & drawing and instructions Engineer-in-charge /Procuring Entity.	Set	1
21	Supply 11KV, 3c×185 mm ² Power Cable for 11KV Outgoing Feeders from 11KV Switchgear/ VCB to Over-Head Line as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	m	200

Sl No.	Description	Unit	Qty
22	Supply 11KV, 3c×185 mm ² Power Cable Termination Kits for 11KV Outgoing Feeders from 11KV Switchgear/ VCB to Over-Head Line as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Lot	1
23	Supply of TP MCCB and DB Box for the following houses with appropriate size bus		
a	Motel Mess- 800A, 50kA	Set	1
b	Reception- 800A, 50kA	Set	1
c	Supervision Office- 600A, 36kA	Set	1
24	Supply of TP MCCB for the following LT Panels with appropriate size bus inside the substation.		
a	Motel Mess- 800A	Set	1
b	Reception- 800A	Set	1
25	Supply of following sizes of 415V XLPE Cu Armour Cable for connection between House/Office/Other Buildings DB Box to MDB/LT Panel as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.		
a	4 core 10mm ²	m	2500
b	4 core 25mm ²	m	1000
c	Single core 185mm ²	m	1000
d	Single core 240mm ²	m	590
26	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos.	4
27	Supply of Fuel save controller for synchronization with generator as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Lot	1
Service Area-3			
28	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) for connection between 11/0.4 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	m	150
29	Supply of 415V, 1c×500 mm ² armor power cable (XLPE, Copper Cable) Termination Kits for connection between 11/0.415 KV Power Transformer to 415V LT Switchgear as per approved design & drawing and instruction of Engineer in charge /Procuring Entity.	Lot	1
30	Supply of TP MCCB and DB Box for the following houses with appropriate size bus		
a	Engineering Mess- 600A, 36kA	Set	1
b	Dormitory- 400A, 36kA	Set	1
c	Indoor Sports- 100A, 36kA	Set	1
d	3-Bed House-100A, 16kA	Set	6
31	Supply of TP MCCB for the following LT Panels with appropriate size bus inside the substation.		
a	Engineering Mess- 600A, 36kA	Set	1
b	Dormitory- 400A, 36kA	Set	1
c	3-Bed House-100A, 16kA	Set	6
32	Supply of following sizes of 415V XLPE Cu Armour Cable for connection between House/Office/Other Buildings DB Box to MDB/LT Panel as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.		
a	4 core 10mm ²	m	500
b	4 core 25mm ²	m	750
c	Single core 185mm ²	m	700

Sl No.	Description	Unit	Qty
33	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Nos.	4
34	Supply of Fuel save controller for synchronization with generator as per approved design & drawing and instruction of Engineer-in-charge /Procuring Entity.	Lot	1

Schedule No. 2- Installation and Other Services

Sl No.	Description	Unit	Qty
1	Testing & Commissioning of Substation	Lot	1
2	All installation including a) substation earthing, b) lighting (as required), c) all electrical equipments, d) replacement of existing House DB's (where necessary), MCCB's with New units as mentioned in schedule-1, e) replacement of existing MCCB's installed in LT Panels inside the substation with MCCB's mentioned in schedule-1, f) steel structure (as required), g) cable laying (including HDD boring with PN-10 HDPE pipe where necessary), h) cable termination and other as required, i) removal of existing 1500kVA transformer, 2500A LT Switchgear, 900kVA PFI Plant from Service area-1 and carry & install the equipment in Service area-3 substation, j) replacement of existing CT of 11kV switchgear in Service area-1 with newly supplied CT's as mentioned in schedule-1	Lot	1
3	Supply materials and Construction of Foundation of all Equipments and gantry Structure as per approved design & drawing and direction of Engineer-in-charge.	Lot	1

Schedule No. 3- Grand Summary

Sl No.	Description
1	Sub-Total of Schedule No. 1- Plant and Mandatory Spare Parts
2	Sub-Total of Schedule No. 2- Installation and other services

6.2 Technical Specification

The Plant & Equipment's of 11/0.415 kV substation upgradation works in Site Area-1, 2 & 3 of Bangladesh Bridge Authority at Munshiganj, Shariatpur & Madaripur District of Turn-key works shall comply with following Technical Specifications:

GENERAL SPECIFICATION OF SUB-STATION EQUIPMENT

The specification for the parts of this contract mentioned below cover design, manufacture, assembly and testing at the contractor's workshop as well as the supply, delivery, installation, testing and commissioning of the sub-station equipment at site.

CLIMATIC CONDITIONS

The climate is tropical and has marked Monsoon character with seasonal changes from humid, warm, rainy season, summers to cool and dry winters. Maximum temperature occurs during the period from April to May reaching approximately 43 °C (110 °F) with a relative air humidity of 60% to 70%.

The annual mean temperature is approximately 29 °C (84 °F). During the rainy monsoon month from June to September, the average relative air humidity is 80% and reaches extreme values up to saturation point during longer periods, the annual rainfall, most of which occurs from June to September is 2000mm to 2500mm.

OPERATING CONDITIONS

The sub-station equipment will be connected to the 11KV, 3-phase, 50 Hz Feeder of REB.

STANDARDS

All equipment and materials must be in conformity with the most recent relevant Bangladeshi laws, standard rules and regulation. Particular attention is to be paid to the Electrical Act 2018 and Electricity Rules 2020. All equipment and materials to be supplied, which required any form of approval by the BANGLADESH Government or REB or equivalent must satisfactorily pass all inspection and tests procedures imposed by them.

Otherwise, all the equipment and materials must be in conformity with the most recent international rules, regulation, standards and recommendation: **IEC**

STANDARD DATA

The following standard values for high and low voltage are standard in BANGLADESH. Distribution bus high voltage: 11KV, maximum system voltage 12 KV.

Low voltage: 415/240V local voltage

400/230-opening voltage

457V-Maximum permissible voltage REB

FREQUENCY

The standard power frequency in BANGLADESH will be: 50Hz.

DESIGN & CONSTRUCTION REQUIREMENTS

All equipment are to be in accordance with the latest recognized rules of workmanship and modern engineering practice.

All parts of the equipment must be suitable in every respect for continuous operation at maximum output under the climatic conditions as specified above.

MARKING OF TERMINALS

The terminals shall be marked in accordance with BS, IEC, VDE or equivalent standards.

PAINTING

Protective painting shall be done in accordance with general practice and recognized methods, the paint manufacturer's instruction and according to the present addition of DIN 55 928, CORROSION PROTECTION OF STEEL STRUCTURE' such as to meet the tropical condition at site.

EARTHING OF EQUIPMENT

Each electrical equipment must be provided with an earthing screw of sufficient diameter or an earthing plate.

INSULATION CO-ORDINATION

The insulation level for load break switch, lightning arrestor and transformer are stipulated below, taking into account the maximum service voltage and the rated voltage according to IEC standard, with appropriate impose withstand test voltage and power frequency withstand test voltage values.

The insulation levels for equipment are as follows:

According to IEC rated service voltage: 11 KV

Maximum service voltage shall be considered: 12 KV

The respective test voltage shall be

Impulse withstand test voltage (BIL): 75 KV

Power frequency withstand test voltage: 28 KV

For the lightning arrestor, the IEC standard voltage of 9KV is to be selected.

TECHNICAL REQUIREMENTS

The equipment specified in the following items shall withstand the impulse levels and test voltages specified by the recommendations of IEC, as stipulated before. They must be capable of carrying the short time current for three seconds and must withstand the short circuit (peak value) current.

The rupturing capacity of the circuit breakers is indicated in the respective items. The switchgear must be designed accordingly in order to withstand the mechanical short circuit stresses.

They must contain all technical particulars which are mentioned in the schedule of technical data.

The owner reserves the right to have routine tests carried out on each type of equipment at the manufacturer's workshop in the presence of his representative.

THREE PHASE POWER TRANSFORMER

The transformer shall comply with IEC726, VDE 0532 etc, and the general specifications will be as follows:

Dry type power transformer:

- a) Rated capacity: 3150, 2000 KVA
- b) Rated frequency: 50 Hz
- c) Rated primary voltage: 11 KV
- d) Rated secondary voltage: 0.415KV
- e) Tap changing (off load): \pm 5%
- f) Phase connection: Dyn11.
- g) LV neutral: Brought out
- h) BIL level (HT side): 75KV (HT. side)
- i) Maximum system voltage: 12KV (HT. side), 0.5 KV (L.T. side)
- j) Cooling: AN

The tenderer shall furnish following data at 75 °C.

- a) Iron loss at rated voltage and frequency
- b) Copper loss (including supplementary eddy current loss) at continuous rated current (50 c/s) and for winding at 40 °C ambient temperature with the tap changer in middle position.
- c) Impedance voltage with tap changer at middle position.
- d) Voltage drop referred to rated voltage at rated load with tap changer in middle position and at unity p.f.
- e) Permissible maximum symmetric three phase short circuit current referred to rated current.
- f) Rated no load current (RMS value referred to rated current).
- g) Type of windings with conductor materials.
- h) Class of insulation material.
- i) Voltage regulation.
- j) Temperature rise after continuous rated load at 40°C ambient temperature.
- k) one minute double power frequency induced tests voltage applied to:

HV line terminal

LV line terminal

LV Neutral.

- 1) Impulse test voltage 1.2/50 micro second full wave positive and negative polarity applied to:

HV line terminal

LV line terminal

LV Neutral

Weight of: Iron core

The transformer shall be designed and manufactured in accordance with the requirement of B.S. 171: 1970

LOW TENSION SWITCHGEAR

The low tension switchgear shall be pre-wired, free standing and type conforming to IEC 439-1.

SWITCHGEAR DESIGN

The switchgear shall be pre-fabricated, complete and ready for erection on the site.

The switchgear shall be totally enclosed. All line parts shall be adequately and efficiently protected against accidental touching.

The switchgear cubicles shall conform to relevant provisions of BS / IEC and shall be adequate in all respect to accommodate the cables, switchgears, meters, cable terminations and inter connection as indicated in the schedule/specification / drawings and be with provided lockable doors. All apparatus and other components

shall be easily accessible from the front as required for inspection, replacement and repair. The switch gear shall be of tropical design.

The switchgear shall conform to the specifications

Operating voltage: 0.415 KV, 3-phase at 50 Hz.

Number of bus bar: 5 (L1, L2, L3, N & E)

Bus bar materials: Copper

All parts of the switchgear including apparatus shall be designed to withstand without being damaged, the mechanical and thermal, strain of this current or, where protected by circuit breaker, the interrupting current of the circuit breaker.

Outgoing cables shall be arranged in separate spacious cable spaces.

Protective screens shall, as far as possible, be arranged between main bus bars and cable space.

Terminals for power cables shall be protected against accidental touching.

Interior control wiring shall be accommodated in plastic conduits.

Wiring inside the cubicles shall be made with minimum 0.75mm² area and with tinned copper conductors.

The Switchgear shall be suitable for bus bar entry from the top, if required as per schedule.

APPARATUS

The switchgear shall be of modular type design. The apparatus of each functional group shall be assembled on a common base.

Coils for contractors must be of open type to be repairable.

CUBICLE CONSTRUCTION

The distribution sections shall be of car case construction and the car case shall be augmented with various cladding plates as required.

The top plate, bottom plate and side plates shall be polled for easy removal.

Creep age and clearance paths shall conform to VDE 0110 insulation group C or UL508 cable 18.1 and BS 162 table 4.

The electrical equipment inside the panel shall be finger proof. The cubical shall be dust vermin proof.

CABLE ENTRIES AND TERMINATIONS

The distribution board shall be so designed that the cable are fed in and connected in the base. The bottom plate shall be split and removable type to facilitate cable entry having cable grommet.

All cable socket for incoming and outgoing cable are to be provided.

CURRENT TRANSFORMERS

All current transformers shall comply with IEC 185 /BS 3938 and shall be of suitable class, rating and accuracy depending on the duty.

INDICATING LAMPS

Panels shall have indicating lamps as specified in design drawing.

AIR-CIRCUIT BREAKERS/ MCCB

The air-circuit breakers / MCCBs shall comply with IEC 947, 157 BS 4752.

The breaker shall have spring assisted manual closing mechanism with, breaker closing speed independent of operator. There shall be breaker close, open position indicator. Manual tripping shall be by push button and it shall not be possible to trip the breaker by means of the closing mechanism. Over load release shall trip the breaker by means of the closing mechanism. Over load release shall trip the breaker on over current or short circuit. The time lag for these released and the current setting shall be adjustable. All the ACB, MCCB, MCB's shall have the following attributes:

Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU/Australia

CIRCUIT BREAKERS

The MCB/MCCB's shall be quick-make, quick-break, trip free, indicating type and shall have inverse time limit characteristics with adjustable overload, adjustable short circuit (the maximum adjustable limit should be as per schedule) and instantaneous magnetic trip elements functioning on overloads above the normal operating range. All circuit breakers shall be in accordance with schedule. All lugs must be of the solder less above the normal operating range. The MCB must comply with IEC 157-1, IEC 898 rated voltage 240/415V, A.C. 50 Hz. Interrupting capacities minimum 6 kA, current limiting class 3, finger proof, protection through thermal and magnetic trip sections respectively, temperature rating 40°C preferably tropicalized (moisture fungus corrosion treated), with contacts of silver alloy, terminal capability as per requirement. The MCCB must comply with IEC 947, 157-1 having rated voltage 600V A.C. 50 Hz with thermal overload and instantaneous magnetic tripping action, temperature rating 40 °C preferably tropicalized (moisture-fungus- corrosion treated), terminal capability as per requirement.

AUTOMATIC REACTIVE POWER CONTROL EQUIPMENT WITH CAPACITOR BANK

The power factor improvement plant shall be sheet steel clad dust and vermin proof free standing, floor mounting indoor type. The centrally controlled automatic PFI Plant will be of compact design and will be suitable for operation in 12 steps in the system for automatic control of the reactive power. The PFI plant shall be consisting of required capacity kVAR, 415V, 50 Hz, self-healing non-PCB, capacitor bank with disconnecting switch with fuses of proper rating, discharge resistors required nos. suitably rated air-breaker contactors and associated control unit. The contactors shall have special non-welding contacts which can control inrush current of up to 180 times the rated current. When the contactors drop out, the resistors shall switch on the capacitor by means of two break contact. The control unit shall be an integral part of the PFI Plant and will be comprised of CT of adequate rating, automatic power factor correction relay, indicating lamp ON/OFF switches, switching step indicator etc. PFI panel shall be of a type conforming to IEC 439-1 from manufacturer having ISO 9001. The automatic control must be non-responsive in a certain range to element hunting.

INSTALLATION

HT SWITCHGEAR & METERING PANEL

All standard checks of the equipment before installation shall be done by the contractor and unit shall be installed and tested as per direction of the manufacturer and the project manager. Required finishing work shall be done by the contractor and hooking up the unit with the system shall also be within this contract. Consumable materials required for complete installation of the equipment including cables compound, boxes etc. shall be supplied by the contractor. After complete installation, the unit shall be tested by the contractor up the satisfaction of the Engineer-in-charge.

All accessories shall be installed as per direction of the Manufacturer and the project manager. If the equipment is damaged during handling and installation, the Contractor must repair the damage or replace the damaged parts at his own cost.

TRANSFORMER

The Transformer equipment should be checked before installation by the contractor and installed and tested as per direction of the project manager.

Required finishing work shall be done by the Contractor and hooking up the transformer with the system shall also be within this contract. Consumable materials required for complete installation including cable compound boxes etc. shall be supplied by the contractor and the rate quoted shall be inclusive of all incidental expenses. Care should be taken during carrying the transformer and its related parts. If there is any damage during handling and installation the Contractor will be liable to replace the damaged parts at his own expenses. After complete installation the transformer must be tested and commissioning as per direction of the project manager.

LT SWITCHGEAR

All LT switchgear equipment must be installed on proper foundation. All consumables required for the complete work shall be supplied by the contractor. The work shall be complete with all internal electrical connections. After complete installation of the panel, the contractor should test the complete LT switchgear equipment as per manufacturer specification and direction for full satisfaction of the project manager.

CAPACITOR

The item includes supervision of installation of capacitor on prepared foundation. The foundation is to be prepared by contractor as per direction of the project manager. All consumables required to install the equipment shall be supplied by the contractor. After completion of the installation, the contractor should test the equipment in presence of the project manager to his satisfaction.

EARTHING SYSTEM

The work under this item shall consist of supply and installation of earth electrode with copper lead, earthing inspection pit and connecting to the specified terminal according to the drawing, specification. The whole electrical system including light, fan, regulator sockets sub-station and metal parts incorporated with building electrification shall be earthed.

The earth resistance of the electrodes system shall be to the satisfaction of the local supply authority and shall not exceed **0.5 ohms**.

BANGLADESH RURAL ELECTRIFICATION BOARD (BREB)
PEOPLE'S REPUBLIC OF BANGLADESH
STANDARD FOR SUB-STATION
THREE PHASE POWER TRANSFORMERS:
3150 kVA, 2000 kVA

PART-1: GENERAL

1. SCOPE

The transformers shall be suitable for continuous operation on a three-phase 50 Hz high voltage transmission system as specified in the Schedule of Requirements.

The transformers shall be of the three phase dry type and designed with particular attention to the suppression of harmonic especially the third and fifth harmonics and to minimize the detrimental effects resulting there from. All transformers shall be suitable for indoor installation on concrete bases and shall be designed to operate satisfactorily in parallel with each other. The transformer shall conform in all respects to highest standards of engineering, design, workmanship, this specification and the latest revisions of relevant standards at the time of

The cooling for the transformers shall be AN as specified.

2. REFERENCES

2.1 British Standards

BS 61	Specification for threads for light gauge copper tubes and fittings
BS 3600	Specification for dimensions and masses per unit length of welded and seamless steel pipes and tubes for pressure purposes
BS 4504	Circular flanges for pipes, valves and fittings (PN designated)
BS 6121	Mechanical cable glands
BS 6346	Specification for PVC insulated cables for electricity supply
BS 6435	Specification for unfilled enclosures for the dry termination of HV cables for transformers and reactors
BS 7354	Code of practice for design of HV open terminal stations
BS 7613	Specification for hot rolled quenched and tempered weldable plates

2.2 BS European Standards

BS EN 10029 Specification for tolerances on dimensions, shape and mass for hot rolled steel plates 3mm thick and above

2.3 IEC Standards

IEC 76	Power transformers
IEC 137	Insulated bushings for ac voltages above 1000V
IEC 186	Voltage transformers
IEC 214	On load tap changers
IEC 228	Conductors of insulated cables
IEC 233	Tests on hollow insulators for use in electrical equipment
IEC 529	Degrees of protection provided by enclosures
IEC 551	Determination of transformer and reactor sound levels

3. CLIMATE DATA

Main climate data that must be taken into account for the goods will be the followings:

Climate : Tropical, intense sunshine, heavy rain

Maximum Temperature : 45°C

Minimum Temperature : 03°C

Average daily Temperature : 35°C

Average isokeraunic level : 80 days/ year

Relative humidity : 50-100%

Average annual rain fall : 3454mm

Maximum wind velocity : 200 km/hour

Altitude : 300 meters above Sea level

Atmospherically, Mechanical and Chemical impurities: Moderately polluted

The information is given solely as a guide for Tender and no responsibility for its, Accuracy will be accepted not will any claim based on the above be entertained.

Transformer supplied under this contract will be installed in tropical locations that can be considered hostile to its proper operation. Particular problems that shall receive special consideration relate to operation in a humid environment and presence of insects and vermin.

4. SYSTEM CONDITIONS

The equipment shall be suitable for installation in supply systems of the following characteristics:

•Frequency : 50Hz

• Nominal system voltages : 33kV

11kV

400/230V

- Maximum system voltages : 33kV System 36kV
11kV System 12kV
LV System 450V
- Minimum LV voltage : 360V
- Nominal short circuit levels : 33kV System 31.5 kA
11kV System 31.5 kA
- Insulation levels:
1.2/50 ms impulse withstand
(positive and negative polarity): 33kV System 170kV
11kV System 75kV
- Power frequency one minute withstand (wet and dry) : 33kV System 70 kV
11kV System 28 kV
LV System 2.5 kV
- Neutral earthing arrangements : 33kV System solidly earthed
11kV System solidly earthed
LV System solidly earthed

5. INSPECTION AND TESTING

During pre-delivery/ pre-shipment inspection; BREB's inspection team will witness the following test of total quantity ready for delivery during factory test in manufacturer's factory premises:

1. Measurement of turn ration test;
2. Vector group test (check of phase displacement)
3. Measurement of winding resistance;
4. Measurement of no load loss & no-load current;
5. Measurement of impedance voltage & load loss;
6. Dielectric withstands test;
7. Temperature rise test.
8. Impulse test.

Besides BREB's inspection team will perform some physical test during factory test:

1. Transformer tank sheet thickness (top bottom & side);
2. Hot dip galvanization test as per standard BS-729 of all bolts & nuts connected with transformer tank, conservator, radiator etc;
3. Dimension of bolted type bimetallic connector for H.T. and L.T. bushing;
4. Dimension of tanks;
5. Checking of creep age distance of HT/LT bushings.
6. Others visible parts as per approval drawing.

As and when the Purchaser is satisfied that any materials/equipment shall have passed the relevant tests, the Purchaser shall notify the contractor in writing to that effect.

Should any inspected/tested goods fail to conform to the specification, the Purchaser shall have the right to reject any of the items or complete batch if necessary. In that case the Supplier shall replace the goods make good them without any financial involvement to the Purchaser. The inspection and testing shall be carried out again and all cost thereof shall be borne by the Supplier.

Nothing in this clause shall in any way release the supplier from any warranty or other obligations under the contract.

5.1 Type Tests:

The following shall be regarded as type tests. Supplier shall submit all Type test reports from internationally recognized independent testing laboratory or BUET/KUET/RUET/ CUET laboratory along with bid proposal.

5.1.1 Type Tests (for Transformer):

- (a) Test of temperature rise.
- (b) Dielectric test: (Induced over voltage test, Lightning Impulse voltage withstand test, Power frequency voltage withstand test)

Temperature Rise, and Dielectric test (Induced over voltage test, Lightning Impulse voltage withstand test, Power frequency voltage withstand test) on one Transformer of each type and size (i.e. same KVA, KV, AMPS, Frequency, Impedance, Weight of the Core etc. with tolerance $\pm 5\%$) of Transformer. These all type tests shall be done on same Transformer.

5.1.2 HT Bushing type test:

- Dry or wet power-frequency voltage withstand test;
- Dry lightning impulse voltage withstand test;
- Temperature rise test ;
- Verification of thermal short-time current withstand;
- Cantilever load withstand test;
- Verification of dimensions.

5.2 Special Tests:

- a) Noise level measurement, in accordance with IEC Publication 551 using a precision sound level meter conforming to IEC Publication 651. In addition the test shall be repeated with narrow band filters for the harmonic frequencies from 100Hz. up to 350 Hz.
- b) Magnetic balance test.
- c) Harmonics measurement test.

5.2. Routine Tests

The following shall be regarded as routine tests and shall be carried out on each transformer

- (a) Measurement of winding resistance at principal tap and two extreme taps.
- (b) Voltage-ratio measurement and check of vector group.

- (c) Measurement of the impedance voltage at principal tap and two extreme taps.
- (d) Measurement of the load loss.
- (e) Measurement of no-load loss and no-load current, including measurement of harmonics.
- (f) Applied voltage test to all auxiliary circuits.
- (g) Tests on on-load tap-changer (fully assembled on transformer).
- (h) Induced over-voltage withstand test. The voltage applied shall be the relevant power frequency voltage specified in the clause on Insulation Levels.
- (i) Separate source voltage withstand test. The applied voltage shall be the relevant power frequency voltage specified in the clause on Insulation Levels.
- (j) Polarization index test (1 minute and 10 minute). Index shall be not less than 1.3.
- (i) Dielectric withstands test;

5.3. Routine Test Sequence

The sequence of tests shall be:

- (a) Winding resistance measurement, voltage ratio measurement and vector group check
- (b) Separate source voltage withstand test, induced over-voltage withstand test, **impulse test**.
- (c) Impedance voltage and loss measurements.
- (d) Tap changer test.
- (e) Tests on auxiliary circuits.

The Supplier will be held responsible for any discrepancy or defect discovered during these tests and shall rectify immediately on receipt of notification at no cost to the Purchaser. The Supplier may at his own discretion witness site testing of transformers.

6. PACKING AND SHIPPING

6.1. Packing

The equipment and any supporting structures are to be transported adequately sealed against water ingress. All accessories and spares shall be packed and securely clamped against movement in robust, wooden, non-returnable packing cases to ensure safe transit in rough terrain, cross country road conditions and in heavy rains from the manufacturer's works to the work sites.

- individual serial number;
- purchaser's name;
- contract number;
- destination;
- a colour coded marking to indicate destination;
- supplier's name;
- name and address of supplier;
- description and numbers of contents;
- manufacturer's name
- country of origin;
- case measurements;
- gross and net weights in kilograms; and
- all necessary slinging and stacking instructions.

Each crate or container shall be marked clearly on the outside of the case to show TOP and BOTTOM positions with appropriate signs to indicate where the mass is bearing and the correct positions for slings. All component parts which are separately transported shall have permanent identification marks to facilitate correct matching and assembly at site. Welded parts shall be marked before welding. Six copies of each packing list shall be sent to the Purchaser prior to dispatching the equipment.

6.2. Shipping

The Supplier shall be responsible for the shipping of all plant and equipment supplied from abroad to the ports of entry and for the transport of all goods to the various specified destinations including customs clearance, off-loading, warehousing and insurance.

The Supplier shall inform himself fully as to all relevant transport facilities and requirements and loading gauges and ensure that the equipment as packed for transport shall conform to these limitations. The Supplier shall also be responsible for verifying the access facilities specified.

The Supplier shall be responsible for the transportation of all loads associated with the contract works and shall take all reasonable steps to prevent any highways or bridges from being damaged by his traffic and shall select routes, choose and use vehicles and restrict and distribute loads so that the risk of damage shall be avoided. The Supplier shall immediately report to the Purchaser any claims made against the Supplier arising out of alleged damage to a highway or bridge.

All transport accessories, such as riding lugs, jacking pads or blanking off plates shall become the property of the Purchaser. All items of equipment shall be securely clamped against movement to ensure safe transit from the manufacturer's facilities to the specified destinations.

The Supplier shall advise the storage requirements for any plant and equipment that may be delivered to the Purchaser's stores. The Supplier shall be required to accept responsibility for the advice given in so far as these arrangements may have a bearing on the behavior of the equipment in subsequent service.

6.3. Hazardous substances

The Supplier shall submit safety data sheets for all hazardous substances used with the equipment. The Supplier shall give an assurance that there are no other substances classified as hazardous in the equipment supplied. No oil shall be supplied or used at any stage of manufacture or test without a certificate acceptable to the Purchaser that it has a PCB content zero. The Supplier shall accept responsibility for the disposal of such hazardous substances, should any be found.

The Supplier shall also be responsible for any injuries resulting from hazardous substances due to non-compliance with these requirements.

7. SUBMITTALS

7.1. Submittals required with the bid

The following shall be required with each copy of the bid :

- completed technical data schedule;
- descriptive literature giving full technical details with calculation of heat dissipation, no-load loss with considering flux density of equipment offered;

- outline dimension drawing for each major component, general arrangement drawing showing component layout and general schematic diagrams;
- type test certificates, where available, and sample routine test reports;
- list of recommended spare parts and consumable items for five years of operation with prices and spare parts catalogue with price list for future requirements.

7.2. Submittals required after contract award

7.2.1. Program

Five copies of the program for production and testing.

7.2.2. Technical Particulars

Within 30 days of contract award five bound folders with records of the technical particulars relating to the equipment. Each folder shall contain the following information:

- general description of the equipment and all components, including brochures;
- technical data schedule, with approved revisions;
- calculations to substantiate choice of electrical, structural, mechanical component size/ratings;
- detailed dimension drawing for all components, general arrangement drawing showing detailed component layout and detailed schematic and wiring drawings for all components;
- detailed loading drawing to enable the Purchaser to design and construct foundations for the transformer;
- detailed installation and commissioning instructions; at the final hold point for Purchaser approval prior to delivery of the equipment the following shall be submitted;
- inspection and test reports carried out in the manufacturer's works;
- operation and maintenance instructions as well as trouble shooting char

7.2.3. Operation and Maintenance instructions

The copy of installation and commissioning instructions and of the operation and maintenance instructions and troubleshooting charts shall be supplied with each transformer.

7.3. Drawings

Within 30 days of contract commencement the Supplier shall submit, for approval by the Purchaser, a schedule of the drawings to be produced detailing which are to be submitted for "Approval" and which are to be submitted "For Information Only". The schedule shall also provide a program of drawing submission, for approval by the Purchaser that ensures that all drawings and calculations are submitted within the period specified above. All detail drawings submitted for approval shall be to scale not less than 1:20. All important dimensions shall be given and the material of which each part is to be constructed shall be indicated on the drawings. All documents and drawings shall be submitted in accordance with the provisions of this specification and shall become the property of the Purchaser. All drawings and calculations, submitted to the Purchaser, shall be on international standard size paper, either A0, A1, A2, A3 or A4. All such drawings and calculations shall be provided with a contract title block, which shall include the name of the Purchaser and Consultants and shall be assigned a unique project drawing number; the contract title block and project numbering system shall be agreed with the Purchaser. Script sizes and thickness of scripts and lines be selected so that if reduced by two stages the alphanumeric characters and lines are still perfectly legible so as to facilitate microfilming. For presentation of design drawings and circuit documents IEC Publication 617 or equivalent standards for graphical symbols are to be followed.

8. SHIPMENT AND DRYING OUT

8.1 Shipment

Each transformer, when prepared for shipment, shall be fitted with a shock indicator or recorder which shall remain in situ until the transformer is delivered to Site. In the event that the transformer is found to have been subjected to excessive shock in transit, such examination as is necessary shall be made in the presence of the Engineer.

8.2 Drying Out

All transformers shall be dried out by an approved method at the manufacturer's works and so arranged that they might be put into service without further drying out on Site.

Clear instructions shall be included in the Maintenance Instructions regarding any special precautionary measures (e.g. strutting of tap changer barriers or tank cover) which must be taken before the specified vacuum treatment can be carried out. Any special equipment necessary to enable the transformer to withstand the treatment shall be provided with each transformer.

9. APPROVAL PROCEDURE

The Supplier shall submit all drawings, documents and type test reports for approval in sufficient time to permit modifications to be made if such are deemed necessary and resubmit them for approval without delaying the initial deliveries or completion of the contract work. The Purchaser's representative shall endeavor to return them within a period of four weeks from the date of receipt. Three copies of all drawings shall be submitted for approval and three copies for any subsequent revision. The Purchaser reserves the right to request any further additional information that may be considered necessary in order to fully review the drawings. If the Purchaser is satisfied with the drawing, one copy will be turned to the Supplier marked with "Approved" stamp. If the Purchaser is not totally satisfied with the drawing, then "Approved Subject to Comment" status will be given to it and a comment sheet will be sent to the Supplier. If the drawing submitted does not comply with the requirements of the specification then it will be given "Not Approved" status and a comment sheet will be sent to the Supplier. In both these cases the Supplier will have to modify the drawing, update the revision column and resubmit for final Approval. Following approval, twenty copies of the final drawings will be required by the Purchaser within the time allocated for design and drawing approval.

Any drawing or document submitted for information only should be indicated as such by the Supplier. Drawings and documents submitted for information only will not be returned to the Supplier unless the Purchaser considers that such drawing needs to be approved, in which case they will be returned suitably stamped with comments.

The Supplier shall be responsible for any discrepancies or errors in or omissions from the drawings, whether such drawings have been approved or not by the Purchaser. Approval given by the Purchaser to any drawing shall not relieve the Supplier from his liability to complete contract works in accordance with this specification and the condition of contract nor exonerate him from any of his guarantees.

If the Supplier needs approval of any drawing within a period of less than four weeks in order to avoid delay in the completion of supply, he shall advise the Purchaser when submitting the drawings and provide an explanation of the document's late submission. The Purchaser will endeavor to comply with the Contractors timescale, but this cannot be guaranteed.

10. SURFACE TREATMENT

A full description of the corrosion prevention system proposed by the Bidder shall be given in the Schedule and this is subject to acceptance by the Purchaser. This description shall include details of surface preparation, rust inhibition, paint thickness, treatment of fasteners.

All machining, drilling, welding, engraving, scribing or other manufacturing activities which would damage the final surface treatment shall be completed before the specified surface treatment is carried out. Any subsequent damage occurring to the surface treatment up to the final delivery and offloading shall be made good by the Supplier.

10.1. Painting

All paints shall be applied on clean, dry surfaces under suitable atmospheric and other conditions in accordance with the paint manufacturer's instructions. All paints used shall be compatible with each other and capable of being used as a system. The system shall be capable of performance for five years in the environment specified without any need for maintenance. No consecutive coats of paint shall be of the same shade. The minimum standards acceptable are:

- Cleaning by shot blasting to Grade Sa 2.5 of ISO 8501-1.
- All sheet steelwork shall be degreased, pickled and phosphate in accordance with IS 6005 - "Code of Practice for phosphate of iron and steel."
- All rough surfaces of coatings shall be filled with an approved two pack filler and rubbed down to a smooth finish.
- Interior surfaces of mechanism chambers, boxes and kiosks, after preparation, cleaning and priming shall be painted with one coat of zinc chromate primer, one coat of phenolic based undercoating, followed by one coat of phenolic based finishing paint to white colour followed by a final coat of anti-condensation white paint of a type and make to the approval of the Purchaser. A minimum overall paint film thickness of 150 microns shall be maintained throughout.
- Exterior steel work and metalwork, after preparation and priming shall be painted with one coat of zinc chromate primer, one coat of phenolic based under coating and two coats of micaceous iron oxide paint, then painted with a final coat of phenolic based hard gloss finishing paint of the Light Grey Shade No 631 of IS 5, to provide an overall minimum paint thickness of 200 microns.

10.2. Galvanizing

All galvanizing shall be carried out by the hot dip process, in accordance with Specification ISO 1460 or IS 2629. However, high tensile steel nuts, bolts and spring washers shall be electro galvanized to service condition 4. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating.

Before pickling, all welding, drilling, cutting, grinding etc. must be completed and all grease, paint, varnish, oil, welding slag etc. completely removed. All protuberances which would affect the life of galvanizing shall also be removed.

The weight of zinc deposited shall be in accordance with that stated in standard BS 729 and shall be not less than 0.61 kg/sq. mtr with minimum thickness of 86 microns for items of thickness more than 5 mm, 0.46 kg/ sq. mtr. (64 microns) for items of thickness between 2 mm & 5 mm and 0.33 kg/ sq. mtr (47 microns) for items less than 2 mm thick. Parts shall not be galvanized if their shapes are such that the pickling solution cannot be removed with certainty or if galvanizing would be unsatisfactory or if their mechanical strength would be reduced. In the event of damage to the galvanizing the method used for repair shall be subject to the approval of the Purchaser or that of his representative. Repair of galvanizing on site will generally not be permitted.

The threads of all galvanized bolts and screwed rods shall be cleared of splitter by spinning or brushing. A die shall not be used for cleaning the threads unless specifically approved by the Purchaser. All nuts and bolts shall be hot dip galvanized. Partial immersion of the work shall not be permitted and the galvanizing tank must therefore be sufficiently large to permit galvanizing to be carried out by one immersion.

After galvanizing no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. To avoid the formation of white rust, galvanized material shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization.

PART-2: TECHNICAL

11. TYPE OF TRANSFORMER

The transformers shall be three phase, dry type, **11/0.415 KV**, 50 Hz with off-load tap-changer for 3150 & 2000 kVA Transformer.

The transformers shall be naturally cooled type AN.

12. RATED CAPACITY

The MVA ratings shall be based on AN. Each transformer shall be capable of supplying its rated power continuously at all tap positions with rated voltage on the low voltage winding. The transformers shall also be capable of delivering rated current at an applied voltage equal to 105% of the rated voltage.

Each transformer shall be capable of supplying its rated power continuously under ambient temperature conditions. The indicative ambient temperature conditions are as follows:

Maximum ambient temperature	45°C
Maximum daily average ambient temperature	35°C
Maximum yearly weighted average ambient temperature	32°C

13. VOLTAGE RATIO

Each transformer shall be supplied with an off load tap changer (as specified) connected to the high voltage winding. The tap changer shall have 5 tap positions and shall be so arranged as to give variations of transformation ratio in equal steps of 2.5% per step. The total range of the tap changer shall be from +5 percent to -5.0 percent. Tap 3 shall be the principal tap and the transformation ratio at tap 3 shall be 11.00 KV to 0.415 KV.

The no-load voltage ratios shall be as follows:

Tap No.	High Voltage	Low Voltage
1	11.55 kV	0.415kV
3	11.00kV	0.415kV
5	10.45kV	0.415kV

14. WINDING CONNECTIONS AND VECTOR GROUP

The transformers shall be connected in accordance with IEC Publication 76 as follows:

HV Winding : Delta connected.

LV Winding : Star connected.

Vector Group : Dyn 11

15. INSULATION LEVELS

The transformers shall be designed and tested to the following insulation levels:

Line Terminals	Power Frequency Voltage (rms.)	Lightning Impulse Voltage (peak)
11kV	28 kV	75 kV (1.2/50 μ sec.)
0.415kV	2.5 kV	8 kV (1.2/50 μ sec.)

The windings shall be uniformly insulated and the low voltage neutral point shall be insulated for full voltage.

16. IMPEDANCE VOLTAGE

The impedance on the principal tap shall be as follows:

3150 kVA	7.0%
2000 kVA	6.0%

The impedance voltage refers to the principal tapping. Tolerance of $\pm 10\%$ is allowed on this percentage impedance.

Transformers of each rating shall have corresponding impedance per tap characteristics such that transformers of the same rating can be operated in parallel.

17. SHORT CIRCUIT PERFORMANCE

The transformer shall be capable of withstanding the thermal and dynamic effects of short circuits, as specified in IEC 76-5 'Ability to withstand short circuits'.

Each transformer shall be capable of withstanding for 2 seconds a bolted metallic short circuit on the terminals of either winding with rated voltage on the other winding and the tap-changer in any position.

Short circuit tests shall have been carried out on the particular design of transformer offered, the test results shall be supplied with the bid.

18. REGULATION

The regulation of each transformer from no-load to continuous rated output at 1.0 power factor and at 0.85 lagging power factor shall be as guaranteed in the Technical Data Schedules.

19. FLUX DENSITY

Each transformer shall be capable of operating continuously with rated current and with system maximum voltage applied to the low voltage winding at a frequency of 96 per cent of rated frequency without exceeding the temperature rise specified in Clause 12.

The limit of flux density at normal voltage and frequency shall be subject to the requirements for losses, harmonics and noise suppression but in any event shall not exceed 1.6 Tesla.

The transformer core shall not be saturated at maximum system voltage i.e. 12 kV.

20. HARMONIC CURRENTS

The transformers shall be designed with particular attention to the suppression of harmonic voltages, especially the 3rd, 5th and 7th harmonics, so as to eliminate wave form distortion and the possibility of high frequency disturbances, induction effect or of circulating current between neutral points at different transformer stations.

21. PARTIAL DISCHARGE

Each transformer shall be partial discharge free up to 120% of rated voltage as the voltage is reduced from 150% of rated voltage i.e. there shall be no significant rise above background level.

22. COOLING AND TEMPERATURE CONTROL

A similar dial thermometer shall be provided in the control box to indicate winding temperature. This thermometer shall have two sets of adjustable contacts one connected to give an alarm and the other to trip associated circuit breakers and a maximum temperature pointer which shall be re-settable by hand. The temperature control box shall be weatherproofed to IP55 of IEC 529 or IS 2147 equivalent.

23. TANK AND ACCESSORIES

23.1 General

The transformer tank shall be skid mounted type. The tank and cover including the stiffeners shall be designed in such a manner as to leave no external pockets in which water can lodge, or internal pockets where gas/air can collect. The tank and cover shall be of structural quality, weld-able high tensile steel with a minimum thickness of 3mm. All welding shall be stress relieved. The requirement of post weld heat treatment of tank/ stress relieving shall be based on recommendation of BS-5500.

23.2 Surface Treatment

The transformer tank and accessories shall be adequately protected against corrosion.

23.3 Earthing Terminals

Earthing terminals shall be provided on the transformer close to each of the four corners of the tank to facilitate easy earthing of the transformer on site.

24. TERMINAL BUSHING AND CONNECTIONS

24.1 General

Transformers are to be provided with outdoor type bushing insulators and cable box on the LV side. HV and LV bushings shall be from Europe, USA or Japan origin.

All bushings shall comply with IEC 60137 and the minimum creepage distance for outdoor bushings shall not be less than 25mm per kV of rated voltage between phases. Outdoor bushing insulators shall be provided with adjustable arcing horns and for rated voltages of 12 kV and lower these shall be of the duplex gap type.

Bushings shall be of sealed construction suitable for service under the very humid conditions at site and, addition, for the very rapid cooling of equipment exposed to direct sunlight when this is followed by sudden heavy rainstorms

Typical sections of bushing insulators showing the internal construction, method of securing the top cap and methods of sealing shall be included in the Tender.

Completely immersed bushings and lower voltage outdoor immersed bushings may be of other type of construction, subject to the approval of the Engineer but bushings of resin bonded paper construction are not permitted. The 12 kV bushings shall be porcelain (solid or condenser type). On all condenser bushings a tapping shall be brought out to a separate terminal for testing purposes on Site.

Special precautions shall be taken to exclude moisture from any paper insulation during manufacture, assembly, transport and erection. Terminal arrangement of LV cable box position & neutral bushing position shall be as per approved drawings.

24.2 Porcelain

Hollow porcelain shall meet the test requirements of IEC 60233 and shall be sound, free from defects and thoroughly vitrified. Designs based on jointed porcelains will not be acceptable. The glaze must not be depended upon for insulation. The glaze shall be smooth, hard, of a uniform shade of brown and shall cover completely all exposed parts of the insulator. Outdoor insulators and fittings shall be unaffected by atmospheric conditions producing weathering, acids, alkalis, dust and rapid changes in temperature that may be experienced under working conditions.

The porcelain must not engage directly with hard metal and, where necessary, gaskets shall be interposed between the porcelain and the fittings. All porcelain clamping surfaces in contact with gaskets shall be accurately ground and free from glaze.

All fixing material used shall be of suitable quality and properly applied and must not enter into chemical action with the metal parts or cause fracture by expansion in service. Cement thickness are to as small and even as possible and proper care is to be taken to centre and locate the individual parts correctly during cementing.

All porcelain insulators shall be designed to facilitate cleaning.

24.3 Marking

Each porcelain insulator shall have marked upon it the manufacturer's name or identification mark and year of manufacture. These marks shall be clearly legible after assemble of fittings and shall be imprinted before firing, not impressed.

When a batch of insulators bearing a certain identification mark has been rejected, no further insulators bearing this mark shall be submitted and the Contractor shall satisfy the Engineer that adequate steps will be taken to mark or segregate the insulators constituting the rejected batch in such a way that there can be no possibility of the insulators being re-submitted for the test or supplied for the use of the Employer.

Each complete bushing shall be marked with the manufacturer's name or identification mark, year of manufacture, serial number, electrical and mechanical characteristics in accordance with IEC 60137.

24.4 Mounting of Bushings

Bushing insulators shall be mounted on the tank in a manner such that the external connections can be taken away clear of all obstacles. Neutral bushings shall be mounted in a position from which connection can be taken to a neutral current transformer mounted on a bracket secured to the transformer tank. The current transformer will be supplied by the switchgear manufacturer but provision shall be made on the tank for mounting to the Engineer's requirements.

The clearances from phase to earth must not be less than those stated in the Technical Requirements and Guarantee Schedule.

A flexible pull-through lead suitably suited to the end of the winding aluminum shall be provided for the bushings and is to be continuous to the connector which is housed in the helmet of the bushings.

Clamps and fittings made of steel or malleable iron shall be galvanized and all bolt threads are to be greased before erection.

24.5 Tests

Routine, sample and type tests of Bushing shall be carried out in accordance with the specified standards. Type tests shall also be carried out unless approved type test evidence is submitted. These tests shall include temperature cycle and porosity tests.

The following standards shall apply:-

- IEC 60233(BS 4963) for hollow porcelains.
- IEC 60137 for bushings.
- IEC 60148 and 60273 (BS 3297) for high voltage post insulators.
- IEC 60383 and 60305 (BS 137 Part 1 and Part 2) for cap and pin string insulators.

25. CORE AND WINDINGS

25.1 General

The winding shall be of high-conductivity aluminum and transposed winding conductors shall be employed where applicable. Maximum current density for HV and LV windings should not exceed 2.5 A/mm².

The Windings shall have uniform insulation as defined in IEC 76. All neutral points shall be grounded.

The windings shall be located in a manner which will ensure that they remain electro-magnetically balanced and that their magnetic centers remain coincident under all conditions of operation.

The windings shall also be thoroughly dried and shrunk by the application of axial pressure for such length of time as will ensure that further shrinkage will not occur in service.

The windings and leads of all transformers shall be braced to withstand the shocks which may occur through rough handling and vibration during transport, switching and other transient service conditions including external short circuit

25.2 Core

The core shall be constructed from high grade, non-ageing, cold rolled grain oriented silicon steel laminations or superior material. The core and winding shall be capable of withstanding shocks during transport, installation and service. Provision shall be made to prevent movement of the core and windings relative to the tank during these conditions and also during short circuits.

The design shall avoid the presence of pockets which would prevent the complete emptying of the tank through the drain valve.

25.3 Windings

The winding conductor shall be of aluminum, free from burs and splinter. Paper shall be used for conductor insulation. The insulation shall be free from insulating compounds which are liable to soften, ooze out, shrink or collapse.

The stacks of windings are to receive adequate shrinkage treatment.

The windings and connections are to be braced to withstand shocks during transport, switching, short circuit or other transient conditions. The manufacturer must provide the thermal damage curve or thermal damage description of the transformer winding or the transformer as per relevant IEC standard.

The winding shall be of electrolytic aluminum, free from burs and splinter. Paper shall be used for conductor insulation.

26. INTERNAL EARTHING

26.1 General

All metal parts of the transformer, with the exception of the individual core laminations, core bolts and associated individual clamping plates, shall be maintained fixed potential.

26.2 Earthing of Core clamping Structure

The top main core clamping structure shall be connected to the tank body by a copper strap. The bottom main core clamping structure shall be earthed by one or more of the following methods:

- a) by connection through vertical tie rods to the top structure;

- b) by direct metal- to- metal contact with the tank base maintained by the weight of the core and windings;
- c) by connection to the top structure on the same side of the core as the main earth connection to the tank.

26.3 Earthing of Magnetic Circuits

The magnetic circuit shall be earthed to the clamping structure at one point only through a removable link placed in an accessible position just beneath an inspection opening in the tank cover and which, by disconnection, will enable the insulation between the core and clamping plates, etc., to be tested at voltages up to 2 kV. The link shall have no detachable components and the connection to the link shall be on the same side of the core as the main earth connection. These requirements are compulsory.

All insulating barriers within magnetic circuits shall be bridged by means of aluminum or tinned copper strips, so inserted as to maintain electrical continuity.

26.4 Earthing of Coil Clamping Rings

Where coil clamping rings are of metal at earth potential, each ring shall be connected to the adjacent core clamping structure on the same side of the transformer as the main earth connection.

26.5 Size of Earthing connections

Main earthing connections shall have a cross-sectional area of not less than 80 sq.mm but connections inserted between laminations may have cross-sectional areas reduced to 20 sq.mm when in close thermal contact with the core.

27. TANKS AND ANCILLARY EQUIPMENT

27.1 Transformer Tanks

Each transformer shall be enclosed in a suitably stiffened weld-able high tensile steel tank such that the transformer can be lifted and transported without permanent deformation. The construction shall employ weld-able structural high tensile steel of an approved grade to BS 7613 and BS EN10029. The final coat colour of Transformers shall be to Munsell notation N5Y-7/I.

Lifting lugs shall be provided, suitable for the weight of the transformer, including core and windings, fittings. Each tank shall be provided with at least four jacking lugs, and where required, with lugs suitably positioned for transport on a beam transporter. Haulage lugs should also be provided to enable a cable to be used safely for haulage in any direction.

The transformer tank shall be capable of withstanding vacuum up to 500mm of mercury without deflection exceeding the value stated in the Schedule of Requirements.

Where the design of the tank is such that the bottom plates will be in direct contact with the surface of the foundations. The base of each tank shall be so designed that it is possible to move the complete transformer unit in any direction without injury when using rollers, plates, or rails

All joints, other than those which may have to be broken, shall be welded.

Each tank cover shall be of adequate strength, must not distort when lifted and shall be provided with suitable flanges having sufficient and properly spaced bolts. Inspection openings shall be provided to give access to the internal connections of bushings, winding connections and earthing links. Each opening shall be correctly located and must be of ample size for the purpose for which it is intended. All inspection covers shall be provided with lifting handles.

It must be possible to remove any bushing without removing the tank cover.

A ladder shall be provided on one side of the tank as a means for inspection and access to the top of the transformer. The lower section of the ladder shall be equipped with a barrier complete with provision for locking with a padlock.

27.2 Earthing Terminals

Two substantial steel flag type terminals having two 14mm diameter holes on 55mm centers shall be located one on either side and near to the bottom of the transformer to facilitate connection to the local earthing system.

27.3 Rating, Diagram and Valve Plates

The following plates, or an approved combined plate, shall be fixed to each transformer tank at an average height of 1500mm above the ground level:-

- a) A rating plate bearing the data specified in IEC 76 Part 1. This plate shall also include the short-circuit current rating and time-factor for each winding.
- b) A Diagram plate showing in an approved manner the internal connections and the voltage vector relationship of the several windings, in accordance with IEC 76 Part1 with the transformer voltage ratio for each tap and, in addition a plan view of the transformer giving the correct physical relationship of the terminals.
- c) A plate showing the location and function of all valves and air release cocks or plugs. This plate shall also if necessary warn operators to refer to the Maintenance Instructions before applying vacuum.

Plates are to be of stainless steel or other approved material capable of withstanding the rigorous of continuous outdoor service at site.

28. CABLE TERMINATIONS AND GLANDS

28.1 Cable Boxes

The transformers shall be provided with cable boxes with all necessary fittings and attachments **as** per approval of Drawings (submitted by the bidder) by the proper authority of BREB. Cable boxes shall be of adequate proportions and designed in accordance with BS 6435 in such the manner that they can be opened for inspection without disturbing the gland plate or incoming cable(s).Cable boxes shall be designed for ease of access for jointing and connecting the cable. They shall be constructed to minimize the danger of fragmentation; cast iron boxes shall not be used. The cable box shall be of such a design as to prevent ingress of moisture. Where blind tapped holes have to be provided, studs shall be used and not bolts or set screws.

All gaskets, unless otherwise approved, shall be in one continuous piece without joints. Gaskets shall not be compressed before use. Provision shall be made for earthing the body of each cable box. Removable blank gland plates and suitable type and size of cable glands shall be supplied and fitted for termination of the cables.

Dehydrating breather and draining holes protected by 1 mm aperture mesh shall be incorporated at the base of the box to avoid moisture condensation within cable box and ensure drainage of condensation respectively. Cable boxes shall be provided with suitable means for clamping the armor wires of the cables.

Gland plates for single core cable shall be made from non-ferrous metal. The contractor shall guarantee (test certificate shall be supplied to prove) that the air clearances and the creep age path on the bushing connecting to the associated switchgear or transformers shall be such that the completed installation shall withstand in air the impulse and power frequency voltages appropriate to the plant. The cable box clearances would meet the requirements for BS 6435 for partially insulated cable boxes. An earthing terminal shall be provided in each sealing end chamber to which the connections from the transformer winding can be earthed during cable testing. Cable boxes shall be provided on 33kV/11kV sides suitable for air insulations terminations of XLPE Copper Conductor cables of minimum sizes as mentioned below:

29. TEMPERATURE AND ALARM DEVICES

29.1 Temperature Indicating Devices and Alarms

The devices shall have a dial type indicator and, in addition, a pointer to register the highest temperature reached. The Temperature indicating device shall be from MR Germany or equivalent European class.

To simulate indication of the hottest spot temperature of the winding the device shall comprise a current transformer associated with one phase only and a heating device designed to operate continuously at 130 percent of transformer CMR current and for 30 minutes at 150 percent of CMR current.

The winding temperature indicators (WTI) shall be housed in the marshalling cubicle.

All contacts shall be adjustable to a scale and must be accessible on removal of the relay cover. Alarm and trip circuit contacts shall be suitable for making or breaking 150 VA between the limits of 30 volts and 250 volts AC or DC and of making 500 VA between the limits of 110 and 250V DC. Cooler motor control contacts shall be suitable for operating the cooler contractors direct or, if necessary, through an interposing relay.

The temperature indicators in the marshalling kiosk shall be so designed that it is possible to move the pointers by hand for the purpose of checking the operation of the contacts and associated equipment. The working parts of the instrument shall be made visible by the provision of cut-away dials and glass-fronted covers and all setting and error adjustment devices shall be easily accessible.

Connections shall be brought from the device to terminal boards placed inside the marshalling cubicle.

Terminals, links and a 63mm moving iron ammeter shall be provided in the marshalling kiosk for each WTI for:

- a) Checking the output of the current transformer.
- b) Testing the current transformer and thermal image characteristics.

30. SURGE ARRESTERS (Station Class):

Required numbers of 11 KV Station Class Surge Arresters shall be provided along with each transformer. The transformers will have mounting facilities for required 11 KV surge arresters.

Surge arresters shall be of the type employing non-linear metal oxide resistors without spark gaps. The contractor shall demonstrate by calculations that the surge arresters will adequately protect the switchgear arrangement.

Surge arresters shall be housed in porcelain insulators designed to withstand extremes of the environment described. The insulation shall have a minimum creepage distance of 25mm/kV rated system phase to phase

voltage. Porcelain shall comply with IEC 60233. The method of sealing against the ingress of moisture shall be of a type well proven in service and the manufacturing procedures shall include an effective leak test which can be demonstrated to the inspecting engineer if required. The MCOV of the arresters are given below. MCOV exceeding the given range will not be acceptable.

Arrester according to Voltage class	MCOV range (KV)
10 KV	8kV- 10kV

The internal components of arresters shall be arranged to minimize radial voltage stresses, internal corona and to ensure minimal capacitive coupling with any conducting layer of pollutant on the outside of the porcelain housing.

Good electrical contact shall be maintained between resistor blocks taking account of any thermal expansion and contraction of the block or mechanical shock during transport and erection, by installing a well proven clamping system.

Metal oxide arresters installed outdoors shall be able to dissipate, when new, twice the energy generated in the resistor blocks when energized at their maximum continuous operating voltage immediately having been subjected to the discharge duties specified in IEC 60099-4 and assuming that the porcelain housing and the surrounding air is at least 5 degree centigrade higher than the maximum ambient air temperature specified.

All surge arresters shall be fitted with a pressure relief diaphragm which shall prevent explosive shattering of the porcelain housing in the event of an arrester failure and the arrester shall have been tested according to the high and low current tests specified in IEC 60099-1. Arresters shall be supplied complete for installation in an outdoor switchyard, including insulating bases and surge counters, one per phase, and, if applicable, grading rings. The material used for terminals shall be compatible with that of the conductors to which they are to be connected.

Each arrester shall be identified by a rating plate in accordance with the requirements of IEC 60099-4. In addition an identification mark shall be permanently inscribed on each separately housed unit of a multi-unit arrester so that units can be replaced in the correct position in the event of them being dismantled.

Surge counters shall have an internal assembly which is matched to the line discharge capability of the arrester and shall include a leakage current meter with a bi-linear scale for ease of reading. Auxiliary contacts are to be provided to signal remote indication of counter 10.5.

Surge arrester shall have suitable earth terminal to connect surge counter with insulated cable.

31.1 Tests

Routine tests and type tests shall be carried out to the specified standards. Bidder shall submit type and routine tests reports of surge arresters along with bid proposal. Type tests shall be from internationally accredited independent laboratory.

The following routine tests shall be carried out on all arrester units in accordance with clause 8.1 of IEC 60099-4.

- Measurement of reference voltage
- Residual voltage test
- Partial discharge test
- Housing leakage test
- Current distribution test for multi-column arrester

32. LOSSES AND EVALUTION OF LOSSES

Guaranteed values for component losses of the total loss which shall be as low as is consistent with transport restrictions, reliability and economic use of materials, shall be as stated in the Schedule of Particulars and Guarantees.

For purpose of arriving at comparable prices the iron, copper shall be capitalized on formula given below:

$$A = B + 6384 C + 1915 D$$

Where A = Evaluated present worth value in US Dollars

B = Total bid CIF quoted price in US Dollars

C = Guaranteed Iron Loss in kW

D = ONAN Guaranteed Copper Loss at 75°C

The acceptance of transformers yielding component losses higher than the guaranteed values shall be governed by- IEC 76 part 1. For actual tested losses higher than guaranteed figures but within acceptable tolerance limits, the bidder will be penalized as follows:

- USD 6.384 per watt of increased amount of No-load Loss
- USD 1.915 per watt of increased amount of Load Loss

32.1 Losses:

The maximum acceptable losses at 120 deg. C and at rated voltage, full site rated load and principal tap shall be as stipulated in the following table. Tenderers quoting for transformers with losses exceeding the following figures shall not be evaluated.

Transformer Rating	Losses in kW	
	No Load Loss (Iron Loss)	Load Loss (Copper Loss)
3150 kVA	≤5	≤32
2000 kVA	≤3.5	≤20

32.2 Rejection.

The purchaser may reject any transformer, if during evaluation and testing the following is found:

- Load and/or no-load losses exceed the guaranteed value by 15% .
- Total losses exceed the guaranteed values by 10% .
- Impedance differs from the values as specified in clause 16.
- Transformer fails any test.

The Supplier shall supply the replacement transformer and clause 5 shall apply for acceptance of the same.

33. FOR 3150, 2000 kVA 11/0.4 KV DRY TYPE (AN) TRANSFORMER

- 3150, 2000 kVA AN indoor mounting, 3-phase, 50 Hz, Dyn11, uniform insulation, 11 KV +2×2.5% and -2×2.5% (HV taps on-load operating), dry type, equipped with BCT. The supply of transformer will also include suitable size of MS rail for placing of transformer on foundation.
- Normal System Voltage between Phases KV 11 0.415
- System Frequency Hz 50 50

Rated Voltage between Phase	KV	12	0.450
Lightning Impulse withstand	KV	75	8
50 Hz withstand, 1 minute	KV	28	2.5

- c) The three H.T bushing shall be porcelain type being brown glazed.
- d) The three L.T bushings, one for each phase and one bushing for the neutral may be of capacitor type or porcelain type with outside glazed of brown porcelain.
- e) The winding shall be of Aluminum, free from burs and splinter. Paper shall be used for conductor insulation. The manufacturer must provide the thermal damage curve or thermal damage description of the transformer winding or the transformer as per relevant IEC standard.
- f) The transformer tank shall be of welded construction, fabricated from high tensile steel plate and shall be designed to withstand 500 mm of mercury.
- g) Besides the main components of the transformer the other features and accessories to be associated which are as follows:
 - i) Name plate with complete diagrams and main specifications.
 - ii) Ladder to climb up to top with barrier at the bottom.
 - iii) Thermometer for sensing winding temperature and display.
 - iv) There shall be four wheels (flanged type) suitable for mounting on rails and to carry the transformer as a whole.
 - v) The transformer shall have at least two grounding terminals on its body.

All ferrous parts of the transformer shall be galvanized or painted with appropriate paints of MUNSELL NO-5y 7/1 transformer with maximum shipping height (not exceeding 11 feet) will be preferred.

34. WARRANTY

The bidder shall warrant that the transformers furnished have conformed to this specification. The warranty shall state that if, within three (3) years from the date of commissioning, a transformer is found to have defects in workmanship or material or fails in service, the Contractor shall repair or replace such defective parts (and other parts damaged as a result) within 15 days with free of charge

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
For 3150 kVA 11/0.415 KV, 50 Hz TRANSFORMERS

(To be filled up by the supplier with appropriate data, otherwise the Tender will be rejected)

Description	Unit	REB Requirement	Tenderers Guaranteed Values
11/0.415 KV TRANSFORMERS			
1. Manufacturer's Name		To be mentioned	
2. Manufacturer's Address		To be mentioned	
3. Applied Standard		To be mentioned	
4. Type		Indoor	
5. Rated Power	kVA	AN, 3150	
6. Number of Phase		Three Phase	
7. Rated Voltage, Phase to Phase			
High Voltage winding	kV	11	
Low Voltage winding	kV	0.415	
8. Rated frequency	Hz	50	
9. Rated insulation level			
(a) Impulse withstand, full wave			
High voltage winding	kV	75	
Low voltage winding	kV	8	
Neutral side		Full insulation	
(b) AC withstand voltage			
High voltage winding	kV	28	
Low voltage winding	kV	2.5	
10. Vector Diagram (IEC 76-4)		Dyn11	
11. Type of Cooling		AN	
12. Off load Tap- changer			
Type			
Rated tap	kV	11	
Tap range	%	+ 5 to -5	
Capacity	Amps	Required	
Numbers of tap	Taps	5 Nos	
Location of tap		Primary side	
Rated short time current	kA	To be mentioned	
Duration of one step change	sec	To be mentioned	
Motor rating	kW	To be mentioned	
13. Impedance voltage at 120°C and at nominal ratio and 100% rated power	%	7.0% (with $\pm 10\%$ tolerance)	
14. Transformer core			
Type of core flux density			
At nominal voltage	Tesla	≤ 1.6	
15. Transformer bushings			
(a) H.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
(b) L.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
(c) Neutral Bushing			

Description	Unit	REB Requirement	Tenderers Guaranteed Values
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
16. Sound level	dB	To be mentioned	
17. WTI Protection		To be provided	
18. Core Loss at rated frequency and rated voltage at nominal tap.	kW	To be mentioned	
19. Copper Loss at full load, at rated frequency			
(a) At Maximum Tap	kW	To be mentioned	
(b) At Nominal Tap	kW	To be mentioned	
(c) At Minimum Tap	kW	To be mentioned	
20. Exciting Current at nominal tap and rated voltage	A	To be mentioned	
21. Dimensions and Weight			
Maximum size for transport			
L x W x H	mm	To be mentioned	
Heaviest weight for transport	Kg	To be mentioned	
Overall height	mm	To be mentioned	
Weight of core	Kg	To be mentioned	
Total weight	Kg	To be mentioned	
Float Type		Solid Body	
Petcock is provided for testing by injecting air		Yes	
22. Efficiency at 75° C at unity power factor:	%	To be mentioned	
23. Transformer tank	Shall be provided	Shall be high tensile steel plate	
24. Winding shall be of aluminum.	Shall be provided	Shall be aluminum	

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
For 2000 kVA 11/0.415 KV, 50 Hz TRANSFORMERS**

(To be filled up by the supplier with appropriate data, otherwise the Tender will be rejected)

Description	Unit	REB Requirement	Tenderers Guaranteed Values
11/0.415 KV TRANSFORMERS			
1. Manufacturer's Name		To be mentioned	
2. Manufacturer's Address		To be mentioned	
3. Applied Standard		To be mentioned	
4. Type		Indoor	
5. Rated Power	kVA	AN, 2000	
6. Number of Phase		Three Phase	
7. Rated Voltage, Phase to Phase			
High Voltage winding	kV	11	
Low Voltage winding	kV	0.415	
8. Rated frequency	Hz	50	
9. Rated insulation level			
(a) Impulse withstand, full wave			
High voltage winding	kV	75	
Low voltage winding	kV	8	
Neutral side		Full insulation	
(b) AC withstand voltage			
High voltage winding	kV	28	
Low voltage winding	kV	2.5	
10. Vector Diagram (IEC 76-4)		Dyn11	
11. Type of Cooling		AN	
12. Off load Tap- changer			
Type			
Rated tap	kV	11	
Tap range	%	+ 5 to -5	
Capacity	Amps	Required	
Numbers of tap	Taps	5 Nos	
Location of tap		Primary side	
Rated short time current	kA	To be mentioned	
Duration of one step change	sec	To be mentioned	
Motor rating	kW	To be mentioned	
13. Impedance voltage at 120°C and at nominal ratio and 100% rated power	%	6.0% (with $\pm 10\%$ tolerance)	
14. Transformer core			
Type of core flux density			
At nominal voltage	Tesla	≤ 1.6	
15. Transformer bushings			
(a) H.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
(b) L.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
(c) Neutral Bushing			

Description	Unit	REB Requirement	Tenderers Guaranteed Values
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
16. Sound level	dB	To be mentioned	
17. WTI Protection		To be provided	
18. Core Loss at rated frequency and rated voltage at nominal tap.	kW	To be mentioned	
19. Copper Loss at full load, at rated frequency			
(a) At Maximum Tap	kW	To be mentioned	
(b) At Nominal Tap	kW	To be mentioned	
(c) At Minimum Tap	kW	To be mentioned	
20. Exciting Current at nominal tap and rated voltage	A	To be mentioned	
21. Dimensions and Weight			
Maximum size for transport			
L x W x H	mm	To be mentioned	
Heaviest weight for transport	Kg	To be mentioned	
Overall height	mm	To be mentioned	
Weight of core	Kg	To be mentioned	
Total weight	Kg	To be mentioned	
Float Type		Solid Body	
Petcock is provided for testing by injecting air		Yes	
22. Efficiency at 75° C at unity power factor:	%	To be mentioned	
23. Transformer tank	Shall be provided	Shall be high tensile steel plate	
24. Winding shall be of aluminum.	Shall be provided	Shall be aluminum	

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 3150kVA transformer	A	5000	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	75	
7	Rated short-circuit making current	KA	187	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz, 1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be mentioned	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/N o	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	5500	
22	Standard		To be mentioned	
23	Manufacturer's name & Address		To be mentioned	
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/ EU/Australia	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
26	Indication Meter			
A	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
B	Model No.		To be mentioned	
C	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
D	Type of meter		Digital	
E	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUET or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 1900kVR PFI Plant	A	3200	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	75	
7	Rated short-circuit making current	KA	187	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz,1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be mentioned	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	4000	
22	Standard		To be mentioned	
23	Manufacturer's name & Address		To be mentioned	
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
26	Indication Meter			
a	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
b	Model No.		To be mentioned	
c	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
d	Type of meter		Digital	
e	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUET or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 2000 kVA transformer	A	3200	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	65	
7	Rated short-circuit making current	KA	165	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz, 1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be mentioned	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	4000	
22	Standard		To be mentioned	
23	Manufacturer's name & Address		To be mentioned	
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
26	Indication Meter			
a	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
b	Model No.		To be mentioned	
c	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
d	Type of meter		Digital	
e	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUET or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./ Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 1200kVR PFI Plant	A	2000	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	65	
7	Rated short-circuit making current	KA	165	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz, 1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be provided	
14	Is the circuit breaker trip free with anti- pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	2500	
22	Standard		To be mentioned	
23	Manufacturer's name & Address		To be mentioned	
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/ EU/Australia	
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/ EU/Australia	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
26	Indication Meter			
A	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
B	Model No.		To be mentioned	
C	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
D	Type of meter		Digital	
E	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUE T or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

PUBLICATION NO: 1002-1999
BANGLADESH RURAL ELECTRIFICATION BOARD (BREB)
TECHNICAL SPECIFICATION FOR 11 KV INDOOR TYPE VACUUM
CIRCUIT BREAKER/SWITCHGEAR

1. 11 KV Indoor Switchgear

1.1 General

The 11 kV switchgear shall consist of a single bus-bar, metal clad, indoor type, floor mounted, single tier integrated unit, incorporating enclosures for the circuit breaker units, bus-bars, current transformers and auxiliary wiring.

Each 11 kV CB shall be provided with a combined relay & control panel forming an integral part of the circuit breaker equipment. All in door 11 kV feeders/ bus CTs and bus PTs shall be dry/ cast resin type.

The panels shall be equipped with the necessary protection control devices, indicating instruments and alarming devices, MCBs, etc. All the relays should be 61850 protocol type for automation network of the 11/0.415 kV Sub-station.

The switchgear shall be of robust construction designed for maximum reliability of service in the tropical climate specified.

Cable boxes shall be supplied complete with glands and terminal lugs.

1.2 Clearances

Maximum insulator lengths and clearances in air shall be not less than those specified for 11 kV switchgear having 75 KVp Basic Impulse Level.

1.3 Current Ratings

All parts of the switchgear, including current transformers, shall be capable of withstanding, without thermal or mechanical damage, the instantaneous peak and the three second short time current corresponding to the rated making and breaking capacity of the circuit breakers.

All normal current specified are the minimum continuous values required under the service conditions appertaining to Bangladesh.

1.4 Circuit Breaker making and Breaking capacities

Each circuit breaker shall be capable of making and breaking short circuit faults in accordance with the requirements of IEC 56 - Circuit Breaker, at 3 phase symmetrical circuit ratings at 11 kV service voltages as stated in the schedules.

1.5 Circuit Breakers

1.5.1 Type

The 11 kV circuit breakers shall be vacuum type in accordance with IEC 56 as appropriate.

All types shall incorporate horizontal isolation facilities and be mounted on horizontal draw-out type.

1.5.2 Interchangeability of Circuit Breakers

Circuit breaker of the same type and current rating shall be interchangeable, both electrically and mechanically, but it must be impossible to interchange equipment of different current ratings.

1.5.3 Circuit Breaker Operation Mechanism

Circuit breaker closing mechanisms shall be 230-volt a.c motor wound preferably spring operated type such that the closing speed is independent of the operator.

11kV switchgear tripping shall be effected by means of 02 nos. of 110 volt dc shunt trip coil.

Each equipment shall be provided with a visual, mechanized, indicating device, which shall be positively driven in both directions to show whether the circuit breaker is "Open" or "Closed". It shall be operative when the circuit breaker is in the "Service" and "Test" locations. Lamp indication in place of a mechanical indicator will not be accepted. Operation counters shall be provided on each mechanism.

Means shall be provided for coupling the secondary circuits on the fixed portion to those on the movable portion when the circuit breaker is isolated in order to permit closing, tripping and interlock circuits to be checked for operation test purposes.

Means shall be provided for local manual mechanical tripping of circuit breakers, preferably by push buttons, shrouded to prevent inadvertent operation.

Locking facilities shall be provided so that with the circuit breaker in any location it can be prevented from being closed when it is open and from being mechanical tripped when it is closed. This requirement shall be met by the fitting of a single padlock and shall not entail the fitting of any loose components prior to the insertion of the padlock.

It shall not be possible, without the use of tools, to gain access to the tripping toggle or any part of the mechanism which would permit defeat of the locking of the mechanical tripping feature.

It shall not be possible to render the electrical tripping feature inoperative by any mechanical locking device.

1.5.4 Circuit Breaker Isolating Features

Irrespective of the operating type of unit the following shall apply.

Each circuit breaker shall be connected to the bus bars and feeder circuit through plug and socket type isolating devices. The devices shall be of the "Off Load Type" but shall be suitable for operation whilst the bus bars and/or feeder circuits are alive.

Isolating devices shall be interlocked with their respective circuit breakers to prevent their making or breaking load, but arrangements whereby attempted isolation of a closed circuit breaker trips the circuit breaker are not permitted.

The main circuit isolating devices and also all secondary circuit isolating contacts shall be of the self-aligning type, mounted in accessible positions to permit maintenance.

The number of auxiliary circuit isolating switches shall be sufficient to meet the facilities.

1.5.5 Interlocks

All mechanical interlocks shall be of the preventive type and shall be arranged to prevent mal operation as close as possible to the point at which mechanical force is applied, in order to prevent defeat of the interlocks by distortion of linkages Electrical interlocks shall also function so as to prevent the closing of the circuit breaker.

Clearly labeled mechanical interlocks shall be provided which are designed to prevent:

- a) A closed circuit breaker from being withdrawn or inserted into the isolating contacts.
- b) Tripping by attempted isolation.
- c) The closing of a circuit breaker except when correctly located in Service or Test positions.
- d) A circuit breaker from being plugged into the isolation contacts if the tank is not in position
- e) A circuit breaker being closed in the service position when the secondary circuits between the fixed and moving portions are not completed.

In addition electrical interlocks may be utilized to ensure safe operation of the plant; i.e. on 11 kV transformer incoming circuits the circuit earth position shall not be operative unless the 33 kV circuit is de-energized and isolated etc.

1.5.6 Safety Shutter Devices

A set metal shutters shall be provided to cover each 3 phase group of stationary isolating contacts.

The shutters shall open automatically by a positive drive initiated by the movement of the circuit breaker. The closing operation shall also be automatic by positive drive

When padlocked closed, the shutters shall completely shroud the stationary contacts and it shall not be possible to force the shutters or part of the shutters to gain access to the stationary contacts.

To facilitate testing, means other than locking shall be provided for securing the shutters in the open position. However, such means shall be automatically cancelled when the automatic operation of the shutters restored upon reconnection of the circuit breaker.

Bus-bar shutters shall be painted signal red, colour 537 in BS 381 C, and shall be clearly and indelibly labeled "BUSBARS" in large white letter in English. The Contractor may offer works which comply with different standards or codes only if, and when requested by the Project Manager Circuit shutters shall be painted yellow, colour 355 in BS 381 C, but shall not be lettered, except that on incoming feeders the circuit shutters shall be clearly and indelibly labeled "DANGER LIVE CABLES" in large red letters.

Voltage transformer spout shutters shall be painted yellow, colour 355 in BS 381 C. Durable phase colour identification shall be provided in a prominent position. Provision or access shall be made for lubricating the mechanical linkages.

All shutters shall be effectively earthed

Shutters shall not operate towards the fixed isolating contacts.

1.5.7 Bus-bars and Connections

The equipment shall be of single bus-bar type. Bus-bars and connection shall comply with applicable clauses of IEC 298 and shall be fully insulated.

The equipment shall be of single bus-bar type. The bus-bar assemblies shall be of a type which shall not rely only on air for insulation purpose.

Any earthed screen applied to the exterior of the insulation shall be securely earthed in each bus-bar compartments.

The insulation of the bus-bars and their connections shall be capable of withstanding, without damage, the thermal and mechanical effect of a through fault current equivalent to the short-time rating of the switchgear.

Access to bus-bars and the connections directly thereto shall be gained only by the removal of covers secured by bolts or screws. Such covers shall be marked clearly and indelibly "BUSBARS"

Bus-bars shall be extensible at both ends; such extension shall entail the minimum possible disturbance to the bus-bar chambers. Compound filled bus-bar chambers are not acceptable.

1.5.8 Earthing of Metal Parts of Switchgear

All metal parts, other than those forming part of an electrical circuit, shall be connected to a hard-drawn, high conductivity, copper earth conductor on each unit, of adequate sectional area.

The frame of draw-out circuit breakers shall be connected to the earth bar through a substantial plug type contact and the plug shall be long enough to allow the bus-bar and feeder shutters to close before breaking contact.

Interlocking (both mechanical & electrical) must be provided to avoid accidental earthing circuit breaker in "service position".

1.5.9 Earthing of Insulations

Earthing of the switchgear and ancillary panels and auxiliary equipment shall be carried out in accordance with IEEE Standard 80 & 142 where applicable.

1.5.10 Insulators

Porcelain insulators shall be best quality electrical porcelain. The clamping surfaces of all porcelain insulators shall be accurately ground and shall be free of glaze.

Insulators of moulded or resin bonded material shall have a durable, non-hygroscopic surface finish having a high anti-tracking index.

1.5.11 Auxiliary switch

Each circuit breaker shall be provided with adequate no. auxiliary switches to interrupt the supply to the closing mechanism and to complete the trip circuit, when the circuit breaker is in the "Closed" position and to cover all the necessary indication, interlocking and control facilities with spare contacts.

Each circuit breaker shall be provided with clean auxiliary contacts for the purpose of providing remote switch and alarm indication at the remote grid supervisory centre. In addition each circuit breaker shall be provided with the necessary 50 volt dc interposing relays required to achieve remote control of the circuit breaker via a future remote grid supervisory system. All auxiliary switches shall be wired down whether in use or not to the appropriate marshaling kiosk.

1.5.12 Special Tools

One complete set, of all special tools that are necessary for the overhauling maintenance and adjustment of the whole equipment shall be provided with each switchboard. The tools provided shall be in a new condition and shall not be used for the erection of the equipment on Site.

1.5.13 Indoor Breaker Specification

The 11 kV switchgear unit indoor vacuum CB will be draw out type along with CT, 11 kV bus, 11 kV PT (3 x single phase unit – draw out type). The C.B shall have spring operating mechanism suitable for charging by motor (A.C 230 V, 1 phase) with provision of hand charging. Sufficient auxiliary contacts shall be provided for position indication, interlocks and other purposes. Two sets of independently operative trip coils shall be there. Provision for signaling of low gas pressure and ultimate lock out for very low pressure shall be provided. Anti-pumping features should be introduced with the Breaker. All the current carrying parts should be copper.

Technical Particulars of 11 kV Circuit Breakers:

Phase	3-phase
Service (Rated) Voltage	11 KV
Maximum system Voltage	12 KV
Continuous rating current of Bus-bar	1000 Amps.
Continuous rating current	630 A

Basic Impulse Level (BIL)

Power frequency withstand voltage	75 kV, 28 kV.
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Bus Shall be 3 phase, 50Hz, 1000A, air insulated capable of withstanding **31.5** KA for 3 sec

Vacuum Interrupter

The vacuum interrupter, consisting of fixed contact and moving contact, shall be interchangeable among the same type interrupter. Short circuit capacity of vacuum bottle should be 31.5 KA and design life should be 100 nos. Operation at rated short circuit level. The operation of the interrupter will be 30000 nos. at rated current.

Vacuum Bottle shall be from Siemens/ABB or/ALSTOM and of reputed indigenous make. Offered bottle shall be identical with Type tested one. Brochures/leaflet on technical data sheet for vacuum bottle shall be enclosed with technical bid.

1.5.14 Current Transformers (CTs).

The current transformer rated current ratio shall match the connected load circuit and secondary circuit requirements.

Current transformers shall be capable of withstanding without damage the full load, peak and rated short time currents of their associated equipment.

Where space within a current transformer chamber permits dedicated current transformers shall be used for protection, instrumentation and metering. All the indoor 11 kV CTs shall be dry/ cast resin type.

Current transformers used for energizing indicating instruments and metering shall be of Class 0.2 accuracy in accordance with IEC 185 Current transformers for protective and protective/indication purposes shall be designed to suit the particular requirements of the associated protection, which in general shall be in accordance with the recommendations given in BS 3938 or approved equivalent.

Class 5P current transformers shall be used for inverse time over-current and/or earth fault protection. The rated accuracy limit current shall be equivalent to the maximum symmetrical three phase fault current or earth fault current of the protected circuit or equivalent to the switchgear breaking capacity unless otherwise approved by the Project Manager.

The current transformers shall be capable of meeting the 5P error classification at rated accuracy limit current over the full range of relay settings, unless otherwise approved by the Project Manager.

Current transformers used for indication/metering purposes shall be designed to saturate at a value of primary current sufficiently low to protect the secondary circuit from damage at all possible values of primary fault current up to the associated primary short time thermal rating.

Current transformers for combined purposes (e.g. protection relays and indicating meters) shall have a dual Class 5P/Class 0.2 performance, and the secondary circuit shall have an approved means (saturating reactor or saturating interposing C.T.) of protecting the meters and reducing their burden under system fault conditions.

The rated volt-amp output of each current transformer shall not be less than 110% of the connected burden as installed in service, the burden of cable connections being taken into account.

The secondary windings of each set of current transformers shall be earthed at one point only via an accessible bolted disconnecting link, preferably located within the relay cubicle.

Where double-ratio secondary windings are specified provided a label shall be provided at the secondary terminals of the current transformer indicating clearly the connections required for either tap. The connections and the ratio in use shall be indicated on all connection diagrams.

Design magnetization curves and dc resistance values shall be submitted before manufacture for each current transformer used for protective purposes and shall be subsequently verified by works routine tests and also by site commissioning tests.

Where current transformers have to operate or be mounted on apparatus provided under other contracts, the Contractor shall be responsible for ensuring design and installation compatibility with other Contractors and for keeping the Project Manager informed.

Metal clad switchgear current transformers shall be located on the non-bus-bar side of the circuit breaker except where current transformers are provided on both sides of the circuit breaker for protection zone overlap. The primary conductors shall be accessible for primary current injection treating on site.

1.5.15 Voltage Transformers (VTs)

Voltage transformers shall comply with the requirements of IEC 186 with amendments and supplements and shall be of:-

- Class 3P accuracy for protection/indicating instruments
- Class 0.2 accuracy for tariff metering or acceptance efficiency testing.

The VA output shall be 50% in excess of the design requirements except for tariff metering voltage transformers which shall be at least 10% in excess of the design requirements.

For tariff metering voltage transformers the Contractor shall check the total installed secondary burden and if necessary shall install dummy burdens to achieve the calibrated accuracy.

Voltage transformer secondary circuit shall be earthed at one point only and metal cases shall be separately earthed. The transformers core, where accessible, shall also be separately earthed. All the indoor 11 kV VTs shall be dry/ cast resin type.

All voltage transformers in the system at a given voltage level shall be earthed in the same manner.

Where it is required to earth the primary neutral of a metal clad three- phase voltage transformer, the neutral earthing connection shall be insulated and brought out separately from the tan earthing connection. Means shall be provided to maintain the tank earthing connection while the voltage transformer is being withdrawn.

Where three single-phase voltage transformers are supplied for protection purposes, star connected secondary windings shall have the star point formed by insulated connections and shall be earthed at a common point.

Where necessary for earth fault protection, voltage transformers shall be of five- limbed core construction.

Where possible primary windings shall be connected through fuses with current limiting features.

Secondary MCB's shall be provided as close as possible to each voltage transformer and labeled to show their function and phase colour. The secondary circuits shall be monitored individually to detect and alarm individual fuse failure or MCB trip and to block protection operation if required.

Voltage transformers shall be designed that saturation of their cores does not occur when 1.732 times normal voltage is applied to each winding.

Magnetization curves shall be submitted for approval for each type of voltage transformer.

The standard secondary voltage between phases shall be 110 volts unless special circumstances dictate otherwise, and are approved by the Project Manager.

Secondary circuits from different voltage transformers, or separate windings of the same transformer, shall not be connected in parallel.

Voltage transformers shall be connected on the non-bus-bar side of circuit breakers unless otherwise approved by the Project Manager.

1.6 TEST CERTIFICATE OF 11 KV INDOOR TYPE CIRCUIT BREAKER.

Instructions to Bidders: Bidders shall submit with their offer the test certificates along with the test results of 11 KV Panel board including Circuit Breaker for the following tests carried out in accordance with IEC-56 and other international standard or latest revision thereof from an internationally recognized independent and reputable testing authority like KEMA-Holland/CESI Italy/UL-USA etc.

A. Type Tests:

For Breaker:

- a) Short time withstand and peak withstand current test
- b) Lightning impulse voltage withstand test
- c) Temperature rise Test
- d) Mechanical Endurance Test
- e) Measurement of the resistance of the main circuit
- f) Short circuit current making and breaking tests

For CT

- a) Lightning impulse voltage (Chopped impulse and full impulse);
- b) Power frequency wet withstand voltage;
- c) Temperature rise;
- d) Short circuit withstand capability test;
- e) Current error and phase displacement
- f) Switching impulse.

For PT:

- a) Lightning impulse voltage test;
- b) High voltage power frequency wet withstand voltage; c) Temperature rise test;
- d) Short circuit withstand capability test;
- e) Switching impulse;
- f) Determinations of error;

For Control Panel & Relays:

Required tests as per relevant IEC 62271-111 Standard.

B. Routine test**For Breaker:**

- a) Dielectric test on main, auxiliary and control circuit b)
- Measurement of the resistance of the main circuit c)
- Tightness test
- d) Mechanical operation tests
- e) Design and visual checks

For CT:

- a) Verification of terminal marking and polarity;
- b) Power frequency dry withstand test on both windings;
- c) Power frequency dry withstand test between sections;
- d) Over voltage inter-turn test;
- e) Turn ratio;
- f) Instrument security factor test;
- g) Determinations of error;
- h) Secondary winding resistance and Accuracy test; i)
- Current error and phase displacement;
- j) Knee point voltage and magnetizing current test; k)
- Insulation Resistance Test;

For PT:

- a) Verification of terminal marking and polarity;
- b) Power frequency dry withstand tests on both winding;
- c) Power frequency withstand tests between sections;
- d) Determination of limits of voltage errors and phase displacement;
- e) Partial discharge measurement;
- f) Insulating Resistance measurement;

Note: The test certificate for 3 phases, 50 Hz, 11 KV circuit breaker of rated current offered for the type (Manufacturer's designed type) shall be submitted. However, the test certificates for circuit breakers of the offered manufacturer's designated type and voltage class as per requirement of the bidding document but having higher rated current shall also be accepted. All the aforesaid tests shall be carried out in one random selected circuit breaker. Parts of the tests carried out on different circuit breakers shall not be accepted. The bid will be considered non responsive in absence of test certificates and the supply records.

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE**FOR 11 KV SWITCHGEAR AND CONTROL EQUIPMENT**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
 Failure to provide all of the information requested may lead to the rejection of the bid.

INCOMING SWITCHGEAR UNIT:

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Manufacturer's Name & Address		To be mentioned	
Vacuum bottle manufacturer		Siemens /ABB or / ALSTOM	
Applied standard			
Rated nominal voltage	kV	11	
Rated voltage	kV	12	
Rated current for bus	A	1000	
Rated short time current	kA	31.5	
Short time current rated duration	Sec.	3	
Circuit Breaker:			
Type		VCB	
Rated Voltage	kV	12	
Rated current	A	630A	
Rated short Ckt. Breaking current, 3 sec	kA	31.5	
Rated short Ckt. Making current	kA	80	
Rated breaking time	Cycle	3	
Opening time	Sec.		
Closing time	Sec.		
Rated operating sequence		0-0.3 sec-co 3 min-co	
Control Voltage	V	DC 110	
Motor voltage for spring charge	V	AC 180~240	
No. of Trip coil	No.	02	
Current Transformer:			
Rated Voltage	kV	12	
Accuracy class, Metering		0.2	
Accuracy class, Protection		5P20	
Rated Current ratio	A	600-300:5-5-5	
Burden	VA	20	
Rated frequency	Hz	50	
Insulation level:			
AC withstand voltage 1 min. dry	kV	28	
Impulse withstand, full wave	kV	75	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Degree of Protection:			
Enclosure		IP3X	
HV Compartment		IP65	
LV Compartment		IP40	
Earthing Switch:			
Type			
Short time current, 3 Secs.	kA		
Bus bar:			
Material	Copper		
Cross Section	mm ²		
Dimension and Weight			
Height	mm		
Width	mm		
Depth	mm		
Weight including Circuit Breaker	Kg.		
LINE FEEDER SWITCHGEAR UNITS:			
Manufacturer's Name & Address			
Applied standard			
Rated nominal voltage	kV	11	
rated voltage	kV	12	
Rated current for bus	A	1000	
Rated short time current	kA	31.5	
Short time current rated duration	Sec.	3	
Circuit Breaker:			
Type		VCB	
Rated Voltage	kV	12	
Rated current	A	630	
Rated short Ckt. Breaking current, 3sec	kA	31.5	
Rated short Ckt. Making current	kA	80	
Rated breaking time	Cycle	3	
Opening time	Sec.		
Closing time	Sec.		
Rated operating sequence		0-0.3 sec-CO- 3 min-CO	
Control Voltage	V	DC 110	
Motor voltage for spring charge	V	AC 180~240	
No. of Trip coil	No.	02	
Current Transformer:			
Rated Voltage	kV	12	
Accuracy class, Metering		0.2	
Accuracy class, Protection		5P20	
Rated Current ratio	A	600-300: 5-5	
Rated short time current, 3 Sec	kA	31.5	
Burden	VA	20	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Knee point voltage for protection (at both ratio)		Sufficient to meet 5P20 at rated burden and measured CT secondary resistance	
Rated frequency	Hz	50	
Insulation level:			
AC withstand voltage 1 min. dry	kV	28	
Impulse withstand, full wave	kV	75	
Degree of Protection:			
Enclosure		IP3X	
HV Compartment		IP65	
LV Compartment		IP40	
Earthing Switch:			
Type		Earthing Truck	
Short time current, 3 Secs.	kA		
Bus bar:			
Material			
Cross Section	mm ²		
Dimension and Weight			
Height	mm		
Width	mm		
Depth	mm		
Weight including Circuit Breaker	Kg.		
VOLTAGE TRANSFORMER SWITCHGEAR UNITS			
Type			
Bus bar			
Material		Copper	
Cross Section	mm ²		
Rated nominal voltage	kV	11	
rated voltage	kV	12	
Rated current for bus	A	1000	
Rated short time current	kA	31.5	
Short time current rated duration	Sec.	3	
Number of phase			
Rated primary voltage	kV	11/ $\sqrt{3}$	
Rated secondary voltage	V	110/ $\sqrt{3}$	
Rated tertiary voltage	V	110/ $\sqrt{3}$	
Rated burden, Secondary	VA	50	
Rated burden, Tertiary	VA	30	
Accuracy class for Metering		0.2	
Accuracy class for Protection		3P	
Power Fuse:			
Rated voltage	kV	12	
Rated current	A	10	
Rated short Ckt. Breaking current	kA	31.5	
Dimension and Weight			
Height	mm		

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Width	mm		
Depth	mm		
Wt. including voltage transformer	Kg.		
Degree of Protection:			
Enclosure		IP3X	
HV Compartment		IP65	
LV Compartment		IP40	
Insulation level:	kV		
All Current carrying path of the breaker should be copper			
11KV CONTROL AND ENERGY METERING PANEL PROTECTION			
Manufacturer's name & Country		Siemens, Germany / ABB, (Sweden/Finland) / GE, (USA/UK)	
Model Number		To be mentioned	
Type of relay		Numerical Programmable	
Range setting			
a) Phase element of current	% of CT rating	5% to 2500%	
b) Earth fault element of current		1% to 1000%	
c) Range of time setting (IDMT)		2.5% to 1000%	
Ranges of timing at DMT	Sec.	0-100 (with 1ms interval)	
Shall have event record option		Yes	
Burden of relay at 10 time CT rating	VA	To be mentioned	
Percentage of current setting at which relay will reset	%	To be mentioned	
Reset time after removal of 10 time CT rated current for			
a) Phase element (100%)	Sec.	To be mentioned	
b) E/F element (40%)	Sec.	To be mentioned	
The relays should be 61850 protocol type			
KWh Meter			
Manufacturer's name & Country		Siemens (Germany/Switzerland)/ Alstom(UK)/ ABB (Sweden)/ AEG(Germany)/ Schlumberger (USA)/ Landis Gyr (Switzerland/Greece)/ CEWE (UK/Italy)	
Model Number		To be mentioned	
Number of KWh Meters		1	
Type of the meter		Numerical Programmable, Multifunction with accuracy Class 0.2s, Load profile, instrumentation profile for minimum 6 months with a interval of 30 min, software for	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
		protection and optical probe for data download as per IEC with provision of communication port automatic meter reading (AMR)	
Class of accuracy		0.2s	
Indication meter (Volt, Ampere, kW, KVAR, Power Factor, Frequency)			
Manufacturer's name & Country		Siemens (Germany/Hungary/Switzerland)/ Alstom (UK)/ ABB (Switzerland/Romania/Finland)/ AEG (Germany)/ Schlumberger (USA)	
Model Number		To be mentioned	
Number of Meters		3 nos Ammeter, 1 Nos Voltmeter	
Multifunction Meter		01Nos. multifunction meter containing (1 Nos KW Meter, 1 Nos KVAR meter, 1 Nos Pf meter, 1 Nos frequency meter)	
Type of the meter		Digital	
Class of accuracy		0.5	

SUBSTATION EARTHING SYSTEM

1. GENERAL

Circuit breakers, power transformers, voltage transformers, auxiliary transformers, earthing switches and other electrical apparatus shall each be connected to the main earth bus by means of a separate subsidiary connection. Gradient control mats shall be installed adjacent to each circuit breaker and disconnect switch mechanism box. Each mat shall be connected directly to the earth grid and the equipment.

Isolating supports, bus bar supports and cable sheaths may be earthed in groups by a separate branch connection from each item of equipment in the group the branch connections being connected by a single subsidiary connection to the main earth. Isolating and earth switch mechanism boxes shall be earthed by a connection separate from that effecting the earthing of the associated switch.

The main members of the steel structures shall be earthed by continuous copper connections bonded to the steelwork and these connections shall be connected separately at each column to the main or subsidiary earth. There shall be 2 connections to each structure and 1 to each piece of high voltage apparatus.

Connections to apparatus and structures shall be made clear of ground level, preferably to a vertical face and protected against electrolytic corrosion.

Current transformer and voltage transformer secondary circuits shall be complete and shall be earthed at one point only (at the control building) through links situated in an accessible position. Each separate circuit shall be earthed through a separate link, suitably labelled. The links shall be of the bolted type, having necessary provision for attaching test leads.

The earth system shall be designed so as to include all overhead line terminal Poles, by bonding the overhead earth wire to the earth grid by means of a link which shall be capable of being removed for testing purposes.

The terminal pole shall also be included within the boundary of the earth grid by extending the grid if necessary.

Structures and masts for lighting and security surveillance equipment shall also be within the perimeter of the earth grid. No fixed low voltage equipment, with the exception of a warning or alarm button and intruder alarms, which shall be of the double insulation type, shall be erected outside the perimeter of the earth grid.

All control and relay panels shall have a continuous earth bus run of sectional area approved by the Project Manager along the bottom of the panels, each end being connected to the main earthing system. Metal cases of instruments and metal bases of relays on the panels shall be connected to this bar by conductors of sectional area approved by the Project Manager.

Loops shall be provided on the earthing system in positions approved by the Project Manager, for the attachment of portable earth connectors during maintenance. These will normally be in the earth bar run between the equipment and the base of the structure. They shall be formed separately from the bar and soldered or thermo-welded thereto. Where necessary, rods shall be provided at the tops of bushings or insulators for the attachment of portable earth clips.

Earthing for any high frequency coupling equipment , if applicable, and surge diverters shall be via a copper rod driven directly into the ground at a position immediately adjacent to the equipment being earthed in addition to the normal earth connection.

2. EARTHING SYSTEM DESIGN

The earthing system shall be designed to meet the requirements of this specification and shall be in accordance with "The Guide for Safety in Alternating Current Substation Grounding" as published by the Institute of Electrical and Electronic Engineers Incorporated, Publication IEEE 80 and 142. The Contractor shall present calculations to show the earthing system meets these requirements and can be shown to be safe in terms of touch, step and transferred potentials. The earth resistance should be kept below or equal to 0.2Ω .

Electrical measurements of the subsoil at various depths, up to 20 metres shall be made at the site of the substation in order to determine the layered effects of the ground from which the effective ground resistivity and hence the expected resistance of the proposed earth grid system may be predicted.

Soil composition may be highly corrosive and special consideration shall be given to this problem. The earth grid shall be effectively protected against corrosion. Cathodic protection, if considered, may adversely affect other equipment and shall be subject to approval by the Project Manager.

In actual design, the earthing system shall take the form of a combination of grids of buried conductors and earth rods driven vertically into the ground. Within the grid, conductors shall be laid in parallel lines at reasonably uniform spacing. They shall be located along rows of structures or equipment to facilitate the making of earth connections, where practical.

The main earth and each subsidiary earth shall have a sectional area, as required for 31.5 kA for 3 sec, in any case not less than 120 mm^2 in any part of its length. Each branch connection shall have a sectional area of not less than 70 mm^2 .

Connections to the grid of all non-current carrying metallic parts, which might become energized by chance, such as metal structures, building earth, equipment, earth rods, water pipes, etc. shall not be less than 70 mm^2 and shall be of adequate size, current-carrying capacity and mechanical ruggedness.

The spacing between conductors forming the mesh system shall be such as to limit the grid potential rise to a value that limits the touch voltage to a value not greater than the maximum tolerable touch potential assuming a fault clearance time equal to that of the main protection equipment being provided.

Each group of earth conductor shall be connected to the main earth grid through connections having a sectional area of not less than 120 mm^2 which shall be protected from corrosion.

The grid shall be subdivided into a number of sections, interconnected with test links. These links shall be accessible from above-ground.

Areas of the grid, where high concentrations of fault currents can appear, as at neutral earthing connections, shall have reinforced conductor sizes where necessary, to handle adequately the highest fault current and its duration.

In case the equipment is widely spaced in the station, individual local grids may be established at the various equipment locations and the local grids shall be interconnected and connected to the

overall earth grid. Interconnecting conductors shall not be less than the size of the conductor for main grid.

Metal parts of all equipment, other than those forming part of an electrical circuit shall be connected directly to the main earth system via a single conductor. The arrangement of the mesh earth system shall be such as to minimize the length of these single connections.

Earth bars installed directly into the ground should normally be laid bare and the trench back-filled with fine topsoil. Where the soil is of a corrosive nature, precautions must be taken to protect the earth bar.

All trenches shall be backfilled in compacted 100 mm layers. All stones and other sharp objects shall be removed from the backfill by a suitable sieve.

Copper to copper joints on strip conductor shall be brazed, using zinc-free brazing material with a melting point of not less than 600°C, or by approved exothermic welding. All exposed joints shall be at a minimum height of 150 mm above floor or ground level. Earth conductor joints that are required to be broken for testing or maintenance shall have mating surfaces tinned.

After installation of the earth system the Contractor shall measure the resistance of the substation. The method used shall preferably be the "fall of potential" method, requiring the availability of a local low voltage supply but other methods using an earth resistance megger will be acceptable in the event of a local supply being unavailable.

In the case of surge (lightning) arrestors a local earth connection shall be made by driving electrodes into the earth near the arrestors and the lightning arrester earth conductor shall be connected to both the rod and to the common earthing grid of the station. The connection from arrester to earth shall be as short and as straight as possible. The conductor shall not be less than 120 mm².

The measured earth resistance shall not exceed 0.5 ohm. A value higher than 0.5 ohm shall be subject to the approval of the Project Manager. The resistance shall be measured with all transmission line earth wires connected to the earthing grid.

In the event of the substation resistance obtained with the foregoing installation being of a magnitude unacceptable to the Project Manager, then where practicable, the ground area enclosed by the earth system shall be increased by installing directly in the ground an additional copper conductor in the form of a ring around the site, or by additional conductors within the site. Alternatively earth conductors can be directly buried radially outside the substation perimeter fence. The use of earth plates as current carrying electrodes is not acceptable. Any additional conductors shall be as directed by the Project Manager.

From the point of view of the possible damage to apparatus, the earthing system shall be such as to limit voltage appearing between the substation equipment and the main body of earth, so that insulation breakdown or burning does not occur on apparatus. For the same reason, voltage rise between earthed points in the substation shall be kept to a minimum. In addition, the effectiveness of any surge protection devices shall be fully realized by providing an adequate earth path. In this case, the earthing system shall not only be of low resistance, but of as low reactance as practicable.

N.B: For the earthing system design copper conductor shall be considered instead of copper earth electrode.

3. STEP AND TOUCH VOLTAGE

The earthing systems shall be so designed as to keep the "step" and "touch" potentials within acceptable limits, thereby ensuring safety to the personnel. The aim shall be to ensure that under either normal or abnormal conditions no dangerous voltages can appear on the equipment or accessories to which a person has legitimate access.

The step and touch potential voltages obtained inside the site and at selected locations around the fence/gate shall also be measured by a suitable method acceptable to the Project Manager. Appropriate measures shall be taken to rectify the causes of any deviations from allowable values.

4. FENCE AND PERIMETER EARTHING

The fence surrounding the substation shall be earthed to its own earth grid and the fence earth grid shall be connected to the main station earth grid at frequent intervals as approved by the Project Manager.

A continuous conductor shall be laid outside the periphery of the substation site at a distance of 1.0 metre from the boundary fence and at a depth of 0.6 metres below the surface. This shall be welded to earth rods installed at adequate intervals and at points adjacent to each corner and immediately below any overhead line entering or leaving the site. The location of the mesh conductors shall be such as to enable all items of equipment to be connected to the earth system via the shortest possible route. All corner fence posts and posts adjacent to earth rods shall be effectively connected to the earth conductor.

Gateposts forming part of the substation fence shall be bonded together with below ground connections and the gates themselves shall be electrically bonded to the posts.

The alternative approach of independently earthing the fence and placing it outside the earth grid area shall only be adopted if the above mentioned procedures prove insufficient or impracticable. The Contractor shall provide calculations to show that this approach produces safe touch voltages at the fence and shall ensure that the fence is isolated from all other buried metalwork.

5. TESTS

All relevant type and routine tests shall be carried out.

Complete charge and discharge tests on each of the combined batteries and chargers shall be conducted and results recorded so as to permit verification of the ampere-hour capacity of the battery. During these tests the Project Manager shall select at random reference cells and the voltage curves thereof shall be checked when the battery is discharged over three and ten hour periods. The alarm levels and the automatic voltage control feature of the charger shall be demonstrated over the specified load range.

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE

For Air Conditioning System

(To be filled up by the tenderer with appropriate data, otherwise the Tender will be rejected) Failure to provide all of the information requested may lead to the rejection of the tender.

DESCRIPTION	BREB REQUIREMENT	MANUFACTURER'S GUARANTEED DATA
BRAND	Internationally Reputed (To be mentioned by the supplier)	OUTDOOR UNIT / CONDENSING UNIT
COMPANY	Internationally Reputed (To be mentioned by the supplier)	
MODEL	To be mentioned by the Supplier	
COUNTRY OF ORIGIN	Japan/Malaysia/South Korea/Taiwan/Thailand/USA/EU Countries	
COUNTRY OF ASSEMBLE	Japan/Malaysia/South Korea/Taiwan/Thailand/USA/EU Countries	
COOLING CAPACITY	28000-30000 BTU/HR	
TYPE	Compact weather proof outdoor type condensing unit	
COMPRESSOR	Hermetically sealed reciprocating/ Rotary compressor	
REFRIGERANT	Internationally accepted & recommended and most commonly used gas (CFC free)	
BLOWER MOTOR	Well balanced type direct driven centrifugal type blower fan	
POWER SUPPLY	200-250 V, single phase, 50 Hz. AC supply	
Inverter Type	Non-Inverter	
CONDENSING PIPE/COIL	Made of copper	
ENERGY EFFICIENCY RATIO (EER)	Minimum 9.23 (BTU/HR)/Watt.	
COEFFICIENT OF PERFORMANCE (COP)	Minimum 2.70 (W/W)	
OTHERS FEATURES	(a) Well balanced in all respect having interlock with the fan coil unit. (b) Compressor duly equipped with vibration isolator, thermostatic & overload controls, magnetic contactors and all other standard accessories complete.	

DESCRIPTION		BREB REQUIREMENT	MANUFACTURER'S GUARANTEED DATA
INDOOR UNIT/ FAN COIL UNIT		<p>(c) Refrigerant copper pipe [From outdoor to indoor unit] with thermal insulation, refrigerant charging arrangement etc. [Minimum length 10 meters].</p> <p>(d) Required size PVC insulated & sheathed, cable with ECC through water grade PVC pipe from outdoor to indoor unit.</p> <p>(e) Sound level: maximum 65 dB(A) at 1 meter.</p>	
	FEATURES	<p>(a) Direct expansion system fan coil unit with well-balanced direct driven centrifugal type fan.</p> <p>(b) Fancy & adjustable air circulating louver grill, removable & washable type filter.</p> <p>(c) Condensing water drain out PVC flexible pipe with necessary insulation.</p> <p>(d) Thermostatic switch and remote-control switch.</p> <p>(e) Sound level: maximum 44 dB(A) at 1 meter.</p>	
	STANDARD	Major component — shall be manufactured as per relevant international standard & code.	
	Mount Type	Wall Mounted.	
	WARRANTY	Compressor: 2 Year (Minimum); Service with spares: 2 Year (Minimum)	
SUPPORTING DOCUMENTS		<p>Must be supported by printed catalogue/manual.</p> <p>Authenticity document (Letter from the parent/authorized company or Verifiable QR/BAR Code and Others) must be supplied with product.</p> <p>If any confusion arises in validation, supplier must clarify any misconception/confusion.</p>	

PUBLICATION 262-1988
BANGLADESH RURAL ELECTRIFICATION BOARD (BREB)
PEOPLES REPUBLIC OF BANGLADESH
STANDARD FOR
15 KV UNDERGROUND POWER CABLE

1. GENERAL

This standard establishes the physical and electrical requirements for 15 KV, 3-Core, copper conductor, cross-linked polyethylene insulated power cable shall comply with IEC-60502. The cable shall be suitable in all respect for use in 11 KV system, 50 hertz, underground distribution system.

2. CLIMATE CONDITIONS

The cable subject to this specification shall be used to convey power from a 11kV overhead line via fresh or tidal submarine route to another overhead line under the following conditions:

- Altitude above sea level up to 1000 meters
- Maximum outdoor temperature: 45°C
- Minimum outdoor temperature: 0°C
- Maximum daily average temperature: 35°C
- Relative Humidity: up to 100%
- Water conditions: high turbidity, heavy scouring by sandy bed load, brackish water conditions, up to 30m depth of installation
- Frequency: 50 Hz.
- System type: 11kV Unigrounded three phase (neutral earthed at the substation)
- Installation: Three core copper conductors in a single cable.
- Average isokeraunic: 80 days/year
- Earthing and bonding: Sheaths and armour bonded and earthed at both ends.

3. REFERENCE DATA:

REB 15 KV, 3- core underground cable shall be comprised of the following:

3.1 CONDUCTOR.

The conductor shall be uncoated, class B stranded, circular and compacted copper wire in accordance with IEC-228 or ASTM B3. The copper conducted cables shall be constructed with three cores in size of as per **table-2** or specified in material schedule. The cores in any one cable shall be of equal cross-sectional areas.

3.2 CONDUCTOR SCREEN

The conductor screen shall comprise of a layer of extruded semi-conducting polyethylene compound, compatible in all respects with the conductor and insulation material. Conductor screen shall be bonded to the insulation such a way that no voids or discontinuities are present. The bond shall be adequate to withstand normal electrical and mechanical stresses in service without degradation or separation.

Lapped semi-conducting tape shall not be used for conductor screens.

3.3 INSULATION

The insulation shall be cross-linked polyethylene (XLPE). The cable insulation shall be extruded in one operation with conductor & insulation screens. The highest possible purity of insulation material is required. The Bidder shall demonstrate that adequate precautions are taken to remove contaminants and to eliminate the introduction of particles of contaminant during material handling or the extrusion process.

The insulation material shall consist of cross-linked polyethylene tightly extruded over the conductor screen. A cross-linking process using steam curing will not be permitted. Dry process using the Catenary Continuous Vulcanization or the Vertical Continuous Vulcanization insulation shall be offered, without which the tender will not be considered.

3.4 INSULATION THICKNESS

The minimum thickness of insulation shall be (4.50 mm) for 15 KV underground cable. The thickness at any point may, be less than the specified value, provided the difference does not exceed 10 percent plus 0.1 mm.

The thickness of the semi conducting screens on the conductors and over the insulation shall not be included in the measurement of insulation thickness.

3.5 INSULATION SCREEN

The insulation screen shall comprise of a non-metallic semi-conducting polyethylene part in combination with a metallic part by triple tandem process.

The non-metallic semi-conducting part shall be applied directly upon the insulation of each core and shall comprise of a layer of extruded semi-conducting polyethylene compound.

The conductor screen, Insulation and semi-conducting part of Insulation screen layer shall be applied to the conductor in common extrusion process with dry curing system.

The metallic part shall be stranded copper applied directly over the semi-conducting part.

3.6 Metallic Shield

A minimum 0.2mm thick copper tape or copper wire applied over the outer screen of the each core. Shield shall provide the circuit neutral and withstand a fault current as per table-2 with initial sheath temperature of 90 degree C, and final sheath temperature of 250 degree C for each core.

3.7 INNER SHEATH

The cable shall be sheathed overall with a PVC inner sheath. The inner sheath shall be of smooth and uniform composition and free of holes, Cracks and blisters and imperfection.

As a protection against termite attack, the inner covering shall contain termite repellent substance of Pb nephtanate.

The inner sheath shall be of adequate strength and thickness to withstand the test voltages and mechanical tests and shall be suitable for the ambient conditions at site.

The inner sheath material shall be capable of withstanding without damage or deformation the highest temperature achieved with the cable at its rated current and at the site ambient conditions.

3.8 Jacket

The cable shall be jacketed overall with a medium density polyethylene (MDPE) outer jacket. The outer jacket shall be of smooth and uniform composition and free of holes, cracks blisters and imperfection. The jacket shall fully embed & encapsulate the armour wires.

The external jacket shall be loaded with 2.5% carbon black for UV resistance.

The outer jacket shall be of adequate strength and thickness to withstand the test voltages and mechanical tests and shall be suitable for the ambient conditions at site.

The outer jacket material shall be capable of withstanding without damage or deformation the highest temperature achieved with the cable at its rated current and at the site ambient conditions.

3.9 ARMOUR

The armour shall consist of a single layer of Aluminum Alloy Wire. The armour shall cover the whole diameter of the cable.

The wire joints are brazed or welded and any wire shall be not less than 1 mm from nearest joints in any other armour wire in the complete cable.

3.10 MANUFACTURER'S IDENTIFICATION.

The manufacturer's identification shall be printed with white colour on the identifying tape. It shall show the rated voltage, conductor size, year of manufacturing and name of the manufacturer at an interval of not more than 1000 mm throughout the length of the cable.

The designation of voltage and cable marking shall also be embossed on the outer MDPE covering.

The gap between the end of one set of embossed characters and the beginning of the next shall be not greater than 150 mm throughout the length of cable with character approximately 10 mm high. Each conductor shall be coded for phase identification.

Name of the purchaser shall be embossed in the title- "BANGLADESH RURAL ELECTRIFICATION BOARD" at every 1000 mm gap.

3.11 CONTINUOUS CURRENT RATING:

The continuous rating of the cables that the bidder proposes to supply shall be calculated by means of the procedure described in IEC publication 287 based on the site ambient conditions including solar radiation, with the installation parameters as specified.

The maximum conductor temperature shall not exceed 90⁰ C when carrying the rated current under the most onerous site conditions.

The bidder shall base his ratings on the site ambient conditions, with the methods of installation and bonding as specified. Due account shall be taken of the heating due to other cables or other sources of heat where these can be identified. The bidder shall state all the parameters including any assumptions that he has made in the calculation of continuous current ratings.

Temperature ratings the cable are given below:

Normal operation	:90°C
Emergency overload	:130°C
Short circuit	:250°C

3.12 SHORT CIRCUIT RATING:

All cables shall be capable of withstanding without damage or permanent distortion the specified maximum short circuit currents for the specified times as under: -

The temperature of the conductors during the passage of the specified maximum fault current for the specified time of one second shall not exceed 250° C for XLPE cables.

The cable design including the design of external Clamps or other restraining devices shall be adequate to contain the mechanical forces arising from two or three phase short circuit currents and longitudinal forces whether arising from magnetic effects or from thermal expansion of conductors.

The cable is suitable in all respect for use on an 11 KV system with a nominal 3-phase fault level described in table-2.

The cable metallic screen sheath and armor shall be capable of passing the specified maximum earth fault current for the specified time of one second without damage, permanent distortion or deterioration in the cable where the cable must have the short circuit capability of it's metallic screen as per table-2.

4.0 TESTS:

4.1 GENERAL

The following tests shall be carried out to demonstrate the integrity of the cable.

The frequency of the alternating current supply is between 48 Hz and 62 Hz.

4.2 TESTS AT MANUFACTURER'S WORKS

Tests shall be carried out in accordance with the relevant IEC publication and the following type tests and routine tests shall be carried out at the Manufacturer's works.

a) TYPE TESTS

Type test for 15 KV cables shall be carried out in accordance with the IEC publication 60502 for suitable length of cable.

i) ELECTRICAL TESTS

1. Partial Discharge test (s).
2. Bending test.
3. Heat cycle test.
4. Impulse Voltage withstand test
5. High voltage Alternating current test

II) NON-ELECTRICAL TEST

1. Measurement of Insulation thickness
2. Measurement of thickness of non-metallic sheath.
3. Determination of mechanical properties of insulation and sheaths before and after aging.
4. Ageing test on pieces of complete cables.
5. Pressure test at high temperature on insulation & sheaths.
6. Hot set test.
7. Water absorption test on insulations.
8. Shrinkage test on XLPE insulation.
9. Electrical test after installation.
10. Water penetration test.

b) ROUTINE TESTS:

The manufacturer shall carry out routine tests on all finished cables to demonstrate their individual integrity as per IEC pub. 60502 .

1. Measurement of Electrical Resistance of conductors.
2. High voltage test
3. Partial discharge test

4.3 SPECIAL TEST

Additional samples of cable shall be selected for special tests. The number and frequency of special tests shall be in accordance with the procedures specified in IEC publication 60502.

The cable shall be subjected to the following special tests.

1. Conductor examination
2. Check of dimensions
3. Electrical test for cables
4. Hot set test.

5. PACKING

Cable shall be shipped on standard non-returnable steel drum, each drum having stenciled on its side ; Size, Type, and length of cable, gross & net weight and contract number. The complete cable drum shall be covered by steel sheet to protect from external thrust and the kits are to be export-packed and properly protected for shipment, rough transportation and storage.

The maximum length of cable on a drum shall be **as per table-2** with a variation of + / - 10 %(ten percent) and it shall be only one length of conductor on a reel.

Each kits cartoon shall be sealed in water proof polyethylene bag having a silicagel packet placed inside the unit and then packed in polystyrene foam gasket closed by self-adhesive tape. Size of the items shall be marked by label on the foam for easy identification. Maximum 10 (ten) sets kits are allowed to pack into separate wooden packing box lined with heavy gauge polyethylene.

6. DOCUMENTATION

The following test reports and the attached data schedule filled in completely shall be included with offer, without which the offer shall not be considered for evaluation.

- a) All Routine Test, Type Test and Special Test reports as per clause 4.2a, 4.2b, 4.3 of the specification and ISO-9001 Certificate of the identical offer type 15KV cables from an internationally recognized independent laboratory.
- b) Printed catalogue/Leaflet for the offered type of cables.

7. DRAWINGS & APPROVAL PROCEDURE

- a) Within 30 days of contract commencement the Supplier shall submit, for approval by the Purchaser, a schedule of the drawings to be produced detailing which are to be submitted for "Approval" and which are to be submitted "For Information Only". The schedule shall also provide a program of drawing submission, for approval by the Purchaser that ensures that all drawings and calculations are submitted within the period specified above.
- b) The Supplier shall submit all drawings, documents and type test reports for approval in sufficient time to permit modifications to be made if such are deemed necessary and resubmit them for approval without delaying the initial deliveries or completion of the contract work. If the Purchaser is satisfied with the drawing, one copy will be turned to the Supplier marked with "Approved" stamp. If the Purchaser is partially satisfied with the drawing, then Approved Subject to Comment" status will be given to it and a comment sheet will be sent to the Supplier. If the drawing submitted does not comply with the requirements of the specification then it will be given "Not Approved" status and a comment sheet will be sent to the Supplier. In both these cases the Supplier will have to modify the drawing, update the revision column and resubmit for final Approval.

Table-2

Item No.	Conductor		XLPE Insulation Thickness (mm)	Max ^m D. C Resistance of Conductor at 20°C (Ω/km)	Short Circuit Withstand Capacity For 1 Second(min)		Stand. Packing Length (m) (will be finalize during drawing approval)
	Nominal Cross Sectional Area (mm ²)	Minimum number of wires in the conductor			Phase conduct or (KA)	Metallic Screen for (KA)	
F-1	95	15	4.50	0.193	12.5	3	375-800
F-2	120	18	4.50	0.153	17	4	350-800
F-3	150	18	4.50	0.124	20	5	300-800
F-4	185	30	4.50	0.0991	25	6	300-800

7. **GENERAL REQUIREMENT OF 11 KV XLPE UNDERGROUND CABLE**

SL. No.	Particulars	BREB Required
1.	INSTALLATION	Direct burial
2.	TYPE	XLPE insulated, 3-core, armoured, under ground cable.
3.	VOLTAGE:	
	a. Voltage between phases	11 KV
	b. Maximum system voltage	15 KV
	c. Rated voltage of cable U_0/U	8.7/15 KV
4.	CORES:	
	Number of cores	Three core, stranded copper, round concentric.
5.	CONDUCTOR:	
	a. Material	copper
	b. Design (stranded sectional etc.)	round, compacted
	c. Strand	As per table-2
	d. Cross sectional area of each conductor core	As per table-2 or specified in material schedule
	e. Maximum DC resistance of conductor at $20^0 C$	As per table-2
6.	CONDUCTOR SCREEN:	
	a. Material	Extruded Semi-conducting PE
7.	INSULATION:	
	a. Thickness (Nom)	4.50 mm
	b. Type of curing	Dry curing
8.	INSULATION SHIELD	Extruded Semi-conducting PE
9.	METAL SHIELD	Copper wire
10.	INNET SHEATH	Polyvinyl Chloride (PVC)
11.	ARMOUR	Aluminum Alloy Wire.
12.	OUTER SHEATH	Medium Density Polyethylene (MDPE)
13.	Short Circuit Withstand Capability	As per table-2
14.	STANDARDS	Design, Manufacture, Testing & Performance shall be in accordance to latest revision of IEC-60502-2 or Equivalent International standard.

8. TECHNICAL SPECIFICATION OF JOINTING KITS FOR 11 KV XLPE, 3-CORE, COPPER CABLE

8.1. TERMINATION KITS (OUTDOOR)

Sl. No.	Name of Item	Termination jointing kits for 15 KV XLPE cable 3-core, (Outdoor)
1.	Application	For 11 KV, 3- core, XLPE, copper conductor armored cable
2.	Installation	Outdoor, mounted on Poles/Structure
3.	Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
4.	Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
5.	System	11 KV, effectively grounded system
6.	Cable Conductor	185 mm ² copper conductor
7.	Kit content	<p><i>Heat shrinkable high voltage insulating and non-tracking tubing</i></p> <p>Heat shrinkable stress control tubing</p> <p>Stress relieving mastic strip</p> <p>Truck resistant sealant tape</p> <p>Heat shrinkable track resistant rain skirt</p> <p>Support Insulator</p> <p>Cable preparation kit</p> <p>Solderless earth connection kit</p> <p>Compression lugs</p> <p>Support Insulators Tee brackets</p> <p>Installation Instructions</p>

8.2 TERMINATION KITS (INDOOR)

Sl. No.	Name of Item	Termination jointing kits for 15 KV XLPE cable 3-core (Indoor)
1.	Application	For 11 KV, 3- core, XLPE, copper conductor armored cable
2.	Installation	For indoor switchgear terminations
3.	Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
4.	Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
5.	System	11 KV, effectively grounded system
6.	Cable Conductor	185 mm ² copper conductor
7.	Kit content	<p><i>Heat shrinkable high voltage insulating and non-tracking tubing</i></p> <p>Heat shrinkable stress control tubing</p> <p>Stress relieving mastic strip</p> <p>Truck resistant sealant tape</p> <p>Heat shrinkable track resistant rain skirt</p> <p>Cable preparation kit</p> <p>Solderless earth connection kit</p> <p>Compression lugs</p> <p>Installation Instructions</p>

8.3 STRAIGHT THROUGH JOINT BOX

Sl. No.	Name of Item	Straight through joint box for 15 KV XLPE cable, 3-core copper conductor.
1.	Application	For 11 KV, 3- core, XLPE, copper conductor armored cable
2.	Installation	For underground horizontal mounting
3.	Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
4.	Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU/Australia
5.	System	11 KV, effectively grounded system

6.	Cable Conductor	185 mm ² copper conductor
7.	Construction	The joint shall be proof against ingress of moisture and water.
8.	Kit content	Compression ferrules Valid filling tape Heat shrinkable stress control tubing Truck resistant sealant tape Heat shrinkable high voltage insulating tape Heat shrinkable black/red dual wall Estomeric tube Roll spring Heat shrinkable outer jacket tube Heat shrinkable truck resistant rain skirt. Cable preparation kit Solder less earth connection kit Misc. other material Installation instructions

Note: The size & quantity of the termination kits and straight through joint splices shall be as per material & price schedule.

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE

For 415V 1-CORE X 500mm² U/G XLPE COPPER CABLE

(To be filled up by the tenderer with appropriate data, otherwise the Tender will be rejected) Failure to provide all of the information requested may lead to the rejection of the tender.

SI. No.	Description	Unit	REB Specification	Guaranteed Specification
A. General Parameter				
1	Name of the Manufacture and Country of Origin	-	To be mentioned	
2	Reference Standard	-	IEC 60228, IEC 60502-1	
3	Rated Voltage: $U_0/U (U_m)$	V	415	
4	No. of Cores & Conductor Cross-Sectional Area	No.xm ²	1C×500 mm ²	
5	Type / Model of the Cable	-	To be mentioned	
B. Construction Parameter				
1	CONDUCTOR:	-	Plain Annealed Stranded Copper, Class 2	
	i. Conductor Material	No./m	To be mentioned	
	ii. Number of Wire and Each Wire Diameter	m		
	iii. Shape of Conductor	-	Circular Compacted	
2	iv. Approx. Conductor Diameter	mm	To be mentioned	
	INSULATION:	-	Extruded Cross-Linked Polyethylene (XLPE)	
	i. Insulation Material	mm	To be mentioned	
	ii. Nominal Thickness of Insulation	mm	To be mentioned	
3	iii. Approx. Radius over Insulation	-		
	iv. Core Identification Color	-	Natural	
	INNER SHEATH / INNER COVERING:	-	Extruded Polyvinyl Chloride (PVC), ST ₂	
	i. Inner Sheath / Inner Covering Material	mm	To be mentioned	
4	ii. Nominal Thickness of Inner Sheath	mm	To be mentioned	
	iii. Approx. Diameter over Inner Sheath	-		
	iv. Color of Inner Sheath / Inner Covering	-	Black	
	ARMOURING:	-	Round Aluminium Wire Armour	
5	i. Armour Material	No./m	To be mentioned	
	ii. Number and Each Armour Wire Diameter	m		
	iii. Approx. Diameter over Armouring	-	To be mentioned	
6	BINDER / WRAPPED:	-	Non-Hygroscopic Polypropylene Tape	
	i. Binder / Wrapped Material	Mm	To be mentioned	
C. COMPLETE CABLES DETAILS:	ii. Approx. Thickness of Binder / Wrapped Tape	-		
	OUTER SHEATH / JACKET:	-	Extruded FRLS-PVC, ST ₂	
	i. Outer Sheath / Jacket Material	mm	To be mentioned	
D. ELECTRICAL PARAMETER:	ii. Nominal Thickness of Outer Sheath	-		
	iii. Color of Outer Sheath / Jacket	-	Black	
1	Approx. Overall Diameter of Cable	mm	To be mentioned	
2	Approx. Weight of Complete Cable	kg/km	To be mentioned	
1	Max. DC Resistance of Conductor at	Ω/km	0.0366	

Sl. No.	Description	Unit	REB Specification	Guaranteed Specification
	20°C			
6	CONTINUOUS CURRENT RATING: i. Direct Buried in Ground at 30°C ii. In Air at 35°C	Amp s Amp s	800 1030	
7	MAXIMUM CONDUCTOR TEMPERATURE: i. Condition: Normal Operation ii. Condition: Short-Circuit	°C °C	90 250	
8	Short-Circuit Withstand Capacity of Conductor	kA	71 (for 1 second duration)	
9	Minimum Insulation Resistance at 27°C	MΩ-km	To be mentioned	
10	Minimum Bending Radius for Fixed Installation	mm	To be mentioned	
11	Applied High Voltage Withstand Test	kV	To be mentioned	
E. OTHER PARAMETER:				
	i. Standard Drum Length	Meter	Should be in Single Length as per Capacity	
	ii. Drum Type and Drum Size (Flange x Width)	-	Wooden Drum, Drum Size: Depends on Customer	
	iii. Gross Weight of Complete Drum Length ($\pm 5\%$)	kg	---	
	iv. EMBOSSSED every 1 meter length	-	Rated voltage, conductor size, manufacturer's name, year of manufacture, purchaser's name RURAL ELECTRIFICATION BOARD.	

TESTING AND COMMISSIONING

3.0 Testing and Commissioning

The Contractor shall include comprehensive Inspection and Test Plans in its Quality Plan. Factory testing shall include all type tests and routine tests set out in the relevant IEC standards and in the Particular Technical Requirements.

If satisfactory type tests have been carried out on identical equipment the Contractor shall submit copies of the test certificates to the Employer. The Employer may waive the requirement for any of the type tests if it approves these test certificates.

The Employer will witness all factory inspections and testing. The Contractor shall notify the Employer of its intention to conduct factory inspection and testing for each lot of equipment at least one month in advance, and shall not perform such testing unless the Employer witnesses the test or a waiver has been provided by the Employer.

The notification shall include full details of the equipment, manufacturers and proposed tests, including:

Contract identification

Full details of equipment to be tested

Manufacturer's name, address and contact information

Contractor or manufacturer's staff responsible for the testing

Location and date of tests

Schedule of tests to be performed and standard to be applied
List of relevant drawings and documents

In the following sections, various relevant standards and tests are listed. These are not intended to be exhaustive. If other standards and/or tests are relevant, they shall also apply.

3.1 Motors

One motor of each type and rating shall be type tested and all motors shall be routine tested in accordance with the tests specified in IEC 60034, NEMA MG 1, IEEE 112, 114, 115 and 85.

3.2 Relays

3.2.1 Type Tests

Type test results shall be submitted for approval for each type and rating of relay.

Type tests may be waived at the Project Manager's discretion if adequate type tests have already been performed and copies of the type test reports are supplied.

3.2.2 Routine Tests

All relays and associated equipment shall be routine tested as required by the standards to prove the quality and accuracy. Routine tests shall be in accordance with relevant IEC recommendations and BS 142.

All relays shall be subjected to the appropriate routine tests as listed below, the individual tests being as detailed in IEC 60255 or as otherwise agreed with the Project Manager.

- Accuracy of calibrated pick-up and drop-off levels over the effective range of settings □ Insulation tests
- Accuracy of timing elements
- Correct operation of flag (or other) indicators
- Mechanical requirements, integrity/safety of draw-out units, check of contact pressure and alignment.

3.3 Instrument Transformers

All required tests shall be carried out as per relevant IEC standards.

3.4 Electrical Instruments and Meters

One instrument and meter of each type and rating shall be subjected to the test as specified in IEC 60051.

3.5 AC Switchboards/ Contacts/L.V Equipment

Routine tests shall include general inspection and electrical operation tests.

3.6 PVC Cable

Each size and rating of PVC cable shall be subjected to type tests as specified in BS 6346. Routine tests are detailed in this document.

3.7 Metal Clad Switchgear

One circuit breaker, disconnector, earthing device and other switchgear equipment of each rating and type shall be subjected to the type tests laid down in IEC 60056, ANSI C37, IEC 62271-100 and other relevant IEC standards. In cases where documentary evidence is produced that a circuit breaker of exactly similar design has been type tested by an approved and independent testing station, the type test requirement may be waived.

The circuit breakers of each type shall be either fully assembled at the manufacturer's works and subjected to operation tests and power frequency tests or, where not assembled at works, separate power frequency voltage tests shall be performed on all major insulation components.

Routine tests in accordance with IEC 60056, IEC 62271-100 or ANSI C37 shall be carried out on all circuit breakers. These shall include operation tests, millivolt drop tests and power frequency voltage tests. Routine tests in accordance with the relevant IEC standards, including operation tests and power frequency voltage tests, shall be carried out on all switchgear.

3.8 Disconnectors and Earth Switches

Tests shall be carried out as required according to the following standards:

- Type and routine tests to IEC 60129 (BS 5253).
- Type and routine tests to IEC 60265 for switch disconnection. □ Routine high voltage and mechanical test of insulators.

- Sample and type tests of insulators

3.9 Bushings and Insulators

Routine, sample and type tests shall be carried out in accordance with the specified standards. Type tests shall also be carried out unless approved type test evidence is submitted. These tests shall include temperature cycle and porosity tests.

The following standards shall apply:-

- IEC 60233 (BS 4963) for hollow porcelains.
- IEC 60137 for bushings.
- IEC 60148 and 60273 (BS 3297) for high voltage post insulators.
- IEC 60383 and 60305 (BS 137 Part 1 and Part 2) for cap and pin string insulators.

3.10 Current and Voltage Transformers

Type and routine tests shall be carried out according to IEC 60185 (BS 3938), IEC 60186 (BS 3941), IEC 60044-1 and IEC 60044-2.

3.11 Structures of Electrical Equipment

Sample tests on the assembly and galvanizing of the structures shall be carried out. A mechanical type test with the structure loaded with working load multiplied by the appropriate factor of safety shall be carried out.

3.12 Surge Arresters

Routine tests and type tests shall be carried out to the specified standards.

The following routine tests shall be carried out on all arrester units in accordance with clause 8.1 of IEC 60099-4.

- Measurement of reference voltage
- Residual voltage test
- Partial discharge test
- Housing leakage test
- Current distribution test for multi-column arrester

3.13 Metal Clad Switchgear Busbars

Routine tests including millivolt drop tests shall be carried out in accordance with the specified standard. Type tests shall also be carried out on each busbar design unless approved type test evidence is submitted.

3.14 Instruments

Calibration tests shall be carried out on all important pressure gauges and other instruments as required by the relevant standards. Site tests shall also be carried out to prove compliance.

3.15 Power Transformers

Testing shall include all routine electrical, mechanical and hydraulic tests in accordance with the relevant IEC or British Standard, except where departures there from and modifications thereto are embodied in this specification. For plant not covered by any IEC or British Standard or specifically mentioned in this specification, such tests as are relevant shall be agreed with the Project Manager.

Should the plant, or any portion thereof, fail under test to give the required performance, further tests which are considered necessary by the Project Manager shall be carried out by the Contractor and the whole costs of the repeated tests borne by the Contractor. This also applies to tests carried out at the Sub-contractors' works.

After satisfactory completion of the witnessed tests at the works, the Plant shall be submitted for the Project Manager's approval during dismantling preparatory to shipment. No item of Plant is to be despatched to site until the Project Manager has given his approval in writing.

Routine Tests

All transformers shall be subject to the routine tests and routine test sequence (mentioned in Section VI Part 2 Electrical Transformer Specification (Clause 5)) in accordance with IEC 60076 and the requirements of this Specification.

The test shall be in accordance with IEC 60076, Part 2, and shall be carried out on one transformer of each size and type. Temperature-rise tests shall be conducted on the tapping corresponding to the maximum losses.

All relevant type tests shall be carried out or documentary evidence of tests on similar designs presented.

Temperature Rise Test:

This shall be carried out in accordance with IEC 60076 Part 2.

Noise Level Tests:

A noise level test according to IEC 60075 shall be carried out on one transformer of each type specified under items 1 and 2 in accordance with IEC 60551.

Special Tests

As mentioned in Section VI Part 2 Electrical Transformer Specification (Clause 5).

Voltage Control Equipment

The following tests shall be carried out:

Routine Tests

Each finished tap changer shall be subjected to the routine tests specified in IEC 60214.

Type Tests

Type tests shall be carried out entirely in accordance with IEC 60214 except that evidence of the service duty type test shall be in excess of 100,000 operations.

Magnetic Circuit

The following tests shall be carried out:

Routine Tests

Each core completely assembled shall be tested for one minute at 2,000V AC between core bolts, side plates, structural steelwork and core at the core and coil stage. After the transformer is tanked and completely assembled, a further test shall be applied between the core and the earthed structural steelwork to prove that the core is earthed through the removable link, at one point only.

Outdoor Bushing Assemblies with Porcelain Insulators

The following tests shall be carried out:

Hollow insulators tested in accordance with IEC 60233.

Complete bushings tested in accordance with IEC 60137.

All relevant type and routine tests shall be carried out.

Galvanizing

Routine Tests shall be carried out to the requirements of BS 443 or BS 729 whichever is applicable

3.16 Prior to Shipment

After the satisfactory completion of all tests at the factory, the plant shall be submitted for the Project Manager's approval during dismantling preparatory to shipping. No item of plant shall be despatched to site until the Project Manager has given approval in writing.

3.17 Inspection and Testing During Site Erection and Commissioning

General

The Contractor shall be responsible for the inspection and testing during site erection, to ensure correct erection and compliance with the specification. Tests carried out during testing and commissioning shall include those tests listed in this section but shall not be limited to them.

During the course of erection, the Contractor shall provide access as required by the Project Manager for inspecting the progress of the works and checking its accuracy to any extent that may be required.

The Contractor shall provide, at its own cost, all labor, materials, stores, and apparatus as may be required and as may be reasonable demanded to carry out all tests during erection, whether or not the tests are specifically referred to in this specification. All power supplies (including 50Hz AC) shall be provided by the Contractor.

A full site test program shall be submitted for approval. This shall include a brief description of all tests and testing procedures and shall be provided before tests commence and the method of testing, unless otherwise specified, shall be agreed with the Project Manager.

The Contractor shall provide experienced test personnel and testing shall be carried out during normal working hours as far as is practicable. Tests which involve existing apparatus and outages may be carried out outside normal working hours. The Contractor shall give sufficient notice to allow for the necessary outage arrangements to be made in conformity with the testing program.

The Contractor shall record the results of the tests clearly, on an approved form and with clear reference to the equipment and items to which they refer, so that the record can be used as the basis for maintenance

test during the working life of the equipment. The required number of site test result records shall be provided by the Contractor to the Project Manager as soon as possible after completion of the tests.

No tests as agreed under the program of tests shall be waived except upon the instruction or agreement of the Project Manager in writing.

The Contractor's test equipment shall be of satisfactory quality and condition and, where necessary, shall be appropriately calibrated by an approved authority at the Contractor's expense. Details of the test equipment and instruments used shall be noted in the test sheets in cases where the instrument or equipment characteristics can have a bearing on the test results.

The testing requirements detailed under this specification may be subject to some variation upon the instruction or agreement of the Project Manager where necessitated by change conditions at site of by differing design, manufacture, or construction techniques.

The Contractor shall be responsible for the safe and efficient setting to work of the whole of the plant and equipment. The methods adopted shall be in accordance with any safety and permit regulations in force by the Employer on the site.

Mechanical Equipment

The extent of testing during erection shall include, but not be limited to, the following.

- Checking the accuracy and alignment of plant erected. The accuracy shall comply with the relevant standards, the specification or the plant manufacturer's requirements as may be applicable or where no requirements exist, to a standard to be agreed between the Project Manager and the Contractor.
- Checking the alignment of rotating equipment to the manufacturer's requirements.
- Non-destructive testing of site welds as required by the relevant standard and as detailed in this specification.

3.18 Commissioning Tests

At least two months before commencing the commissioning of any plant or equipment, the Contractor shall submit for approval fully comprehensive schedules of pre-commissioning checks as applicable to each item of the plant and equipment provided. These schedules shall then be used during pre-commissioning as a guide to the methods to be followed and to record the actual activities carried out with the appropriate date, together with details of all work yet to be completed, variations and modifications to design conditions.

In addition the Contractor is to submit with the schedules to the Project Manager proforma test sheets (to be used by the Contractor during testing and commissioning) for all tests he proposes to carry out and those required by the Project Manager.

Each activity on the schedules, when completed to the satisfaction of the Project Manager, shall be signed and dated by the Contractor. The schedules shall be countersigned by the Project Manager as necessary. If during the performance of the pre-commissioning checks the Project Manager considers that additional tests are necessary to prove the system or plant the Contractor shall perform such additional tests to the Project Manager's satisfaction.

Each activity on the commissioning procedure schedules when completed to the satisfaction of the Project Manager, shall be signed and dated by the Contractor and shall be countersigned by the Project Manager as necessary.

The commissioning procedures shall ensure that the commissioning of any section of the Works does not interrupt the normal commercial operation of any previously commissioned section(s).

At least 14 days prior to commencing commissioning checks, the Contractor is to agree with the Project Manager, the method and sequence of performing the commissioning tests. Following agreement the Contractor shall submit a detailed program indicating the testing sequence to permit advance notice to be given to the Employer in order that the Employer's representatives may also witness testing.

For the purposes of this Contract, the provisions of this section will apply to plant supplied from nominated sub-contractors.

Contractor's Site Supervisory Staff

During the commissioning and subsequent testing of any item of plant the Contractor shall provide the services of any special supervisory staff necessary for the purpose of ensuring proper commissioning and the satisfactory completion of all tests. The cost of any such specialized services is deemed to be part of the bid price for erection of plant.

Commissioning of Modified Circuits

Where the scope of works has included the diversion, relocation or variation of any existing circuit the Contractor is deemed to have included for all pre-commissioning checks on existing equipment. Where this work includes overhead line or cable circuits the Contractor is responsible for carrying out full pre-commissioning and on-load checks at the remote end of the circuit including the injection testing and re-setting of relays if required.

All and any such work associated with the re-commissioning of existing equipment is deemed to be included in the contract price.

Test Equipment

The Contractor is responsible for providing all equipment, power, etc. necessary to carry out all tests on site. Following award of contract, at the appropriate time, the successful Contractor shall submit a detailed schedule of the test equipment etc., he intends to provide for carrying out this portion of the works. Should the Project Manager require additional or alternative test equipment to be provided to enable full site testing to be performed in accordance with the requirements of the specification, the Contractor shall supply such equipment at no extra cost.

Owner Participation

The Contractor shall plan for Employer staff participation either continuously or on a regularly recurring basis in the commissioning work with the primary intent of:

- a) Staff becoming familiar with the operating and maintenance aspects of the new equipment.
- b) Staff maintaining a continuing assessment of the precautions required in, or possible consequences of, initial energization of equipment.

These two objectives must be allowed for in the preparation of schedules.

6.3 Form of Completion Certificate

Contract No:

To:

Date:

[Name of Contractor]

Pursuant to GCC Clause 42 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Procuring Entity 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 Procuring Entity 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 Procuring Entity

[*Signature*]

[*Title of the Project Manager*]

6.4 Form of Operational Acceptance Certificate

Contract No:

To:

Date:

[Name of Contractor]

Pursuant to GCC Clause 43.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Procuring Entity 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 Procuring Entity

[*Signature*]

[*Title of the Project Manager*]

6.5 Form of Change Order Procedure and Forms

Contract No:

To:

Date:

[Name of Contractor]

CONTENTS

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

ANNEXES

- Annex 1 Request for Change Proposal
- Annex 2 Estimate for Change Proposal
- Annex 3 Acceptance of Estimate
- Annex 4 Change Proposal
- Annex 5 Change Order
- Annex 6 Pending Agreement Change Order
- Annex 7 Application for Change Proposal

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 69 (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 Procuring Entity.

3. References for Changes

- (1) Request for Change as referred to in GCC Clause 69 shall be serially numbered CR-X-nnn.
- (2) Estimate for Change Proposal as referred to in GCC Clause 69 shall be serially numbered CN-X-nnn.
- (3) Acceptance of Estimate as referred to in GCC Clause 69 shall be serially numbered CA-X-nnn.
- (4) Change Proposal as referred to in GCC Clause 69 shall be serially numbered CP-X-nnn.
- (5) Change Order as referred to in GCC Clause 69 shall be serially numbered CO-X-nnn.

Note: (a) Requests for Change issued from the Procuring Entity's Home Office and the Site representatives of the Procuring Entity 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

(Procuring Entity'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: Procuring Entity: _____
Contractor (by Application for Change Proposal No. ____¹): _____
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:

<u>Drawing No./Document No.</u>	<u>Description</u>
---------------------------------	--------------------
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:	<i>[insert signature of authorised representative of the Procuring Entity]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
Title of the Signatory:	<i>[insert title of the Signatory]</i>
Name of the Procuring Entity:	<i>[insert name of the Procuring Entity]</i>

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-Clause 69.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Sub-Clause 69.2.2, 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: _____²

(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:	<i>[insert signature of authorised representative of the Procuring Entity]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
Title of the Signatory:	<i>[insert title of the Signatory]</i>
Name of the Procuring Entity:	<i>[insert name of the Procuring Entity]</i>

² Costs shall be in the currencies of the Contract.

Annex 3. Acceptance of Estimate

(Procuring Entity'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 Clause 69 of the General Conditions.

Signature:	<i>[insert signature of authorised representative of the Procuring Entity]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
Title of the Signatory:	<i>[insert title of the Signatory]</i>
Name of the Procuring Entity:	<i>[insert name of the Procuring Entity]</i>

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: Procuring Entity: /_____
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:

<u>Drawing/Document No.</u>	<u>Description</u>
-----------------------------	--------------------

8. Estimate of increase/decrease to the Contract Price resulting from Change Proposal:³

(Amount)

- (a) Direct material
- (b) Major construction equipment
- (c) Direct field labor (Total _____ hrs)
- (d) Subcontracts
- (e) Indirect material and labor
- (f) Site supervision

³ Costs shall be in the currencies of the Contract.

(g) Head office technical staff salaries

Process engineer	_____ hrs @ _____ rate/hr
Project engineer	_____ hrs @ _____ rate/hr
Equipment engineer	_____ hrs @ _____ rate/hr
Procurement	_____ hrs @ _____ rate/hr
Draftsperson	_____ hrs @ _____ rate/hr
Total	_____ hrs

(h) Extraordinary costs (computer, travel, etc.)

(i) Fee for general administration, _____ % of Items

(j) Taxes and customs duties

Total lump sum cost of Change Proposal

(Sum of items (a) to (j))

Cost to prepare Estimate for Change Proposal

(Amount payable if Change is not accepted)

9. Additional time for Completion required due to Change Proposal
10. Effect on the Functional Guarantees
11. Effect on the other terms and conditions of the Contract
12. Validity of this Proposal: within *[Number]* days after receipt of this Proposal by the Procuring Entity
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:	<i>[insert signature of authorised representative of the Contractor]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
Title of the Signatory:	<i>[insert title of the Signatory]</i>
Name of the Contractor:	<i>[insert name of the Contractor]</i>

² Specify where necessary.

Annex 5. Change Order

(Procuring Entity'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 Clause 69 of the General Conditions.

1. Title of Change: _____
2. Change Request No./Rev.: _____
3. Change Order No./Rev.: _____
4. Originator of Change: Procuring Entity: _____
Contractor: _____
5. Authorized Price: _____

Ref. No.: _____ Date: _____
Foreign currency portion _____ plus Local currency portion _____

Authorized by: _____ Date: _____
(Procuring Entity)

Accepted by: _____ Date: _____
(Contractor)

Annex 6. Pending Agreement Change Order

(Procuring Entity'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. Procuring Entity'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:

<u>Drawing/Document No.</u>	<u>Description</u>
-----------------------------	--------------------

7. Adjustment of Time for Completion:
8. Other change in the Contract terms:
9. Other terms and conditions:

Signature:	<i>[insert signature of authorised representative of the Procuring Entity]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
Title of the Signatory:	<i>[insert title of the Signatory]</i>
Name of the Procuring Entity:	<i>[insert name of the Procuring Entity]</i>

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:	<i>[insert signature of authorised representative of the Contractor]</i>
Name:	<i>[insert full name of signatory with National ID Number]</i>
Title of the Signatory:	<i>[insert title of the Signatory]</i>
Name of the Contractor:	<i>[insert name of the Contractor]</i>

Signature

Seal

6.6 Supplementary Information

GUARANTEED TECHNICAL PARTICULARS

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE

For 3150 kVA 11/0.415 KV, 50 Hz TRANSFORMERS

(To be filled up by the supplier with appropriate data, otherwise the Tender will be rejected)

Description	Unit	REB Requirement	Tenderers Guaranteed Values
11/0.415 KV TRANSFORMERS			
1. Manufacturer's Name		To be mentioned	
2. Manufacturer's Address		To be mentioned	
3. Applied Standard		To be mentioned	
4. Type		Indoor	
5. Rated Power	KVA	AN, 3150	
6. Number of Phase		Three Phase	
7. Rated Voltage, Phase to Phase			
High Voltage winding	KV	11	
Low Voltage winding	KV	0.415	
8. Rated frequency	Hz	50	
9. Rated insulation level			
(a) Impulse withstand, full wave			
High voltage winding	KV	75	
Low voltage winding	KV	8	
Neutral side		Full insulation	
(b) AC withstand voltage			
High voltage winding	KV	28	
Low voltage winding	KV	2.5	
10. Vector Diagram (IEC 76-4)		Dyn11	
11. Type of Cooling		AN	
12. Off load Tap- changer			
Type			
Rated tap	KV	11	
Tap range	%	+ 5 to -5	
Capacity	Amps	Required	
Numbers of tap	Taps	5 Nos	
Location of tap		Primary side	
Rated short time current	kA	To be mentioned	
Duration of one step change	sec	To be mentioned	
Motor rating	kW	To be mentioned	
13. Impedance voltage at 75°C and at nominal ratio and 100% rated power	%	7.0% (with $\pm 10\%$ tolerance)	
14. Transformer core			
Type of core flux density			
At nominal voltage	Tesla	≤ 1.6	
15. Transformer bushings			
(a) H.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	

Description	Unit	REB Requirement	Tenderers Guaranteed Values
(b) L.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
(c) Neutral Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
16. Sound level	dB	To be mentioned	
17. WTI Protection		To be provided	
18. Core Loss at rated frequency and rated voltage at nominal tap.	kW	To be mentioned	
19. Copper Loss at full load, at rated frequency			
(a) At Maximum Tap	kW	To be mentioned	
(b) At Nominal Tap	kW	To be mentioned	
(c) At Minimum Tap	kW	To be mentioned	
20. Exciting Current at nominal tap and rated voltage	A	To be mentioned	
21. Dimensions and Weight			
Maximum size for transport			
L x W x H	mm	To be mentioned	
Heaviest weight for transport	Kg	To be mentioned	
Overall height	mm	To be mentioned	
Weight of core	Kg	To be mentioned	
Total weight	Kg	To be mentioned	
Float Type		Solid Body	
Petcock is provided for testing by injecting air		Yes	
22. Efficiency at 75° C at unity power factor:	%	To be mentioned	
23. Transformer tank	Shall be provided	Shall be high tensile steel plate	
24. Winding shall be of aluminum.	Shall be provided	Shall be aluminum	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
For 2000 kVA 11/0.415 KV, 50 Hz TRANSFORMERS

(To be filled up by the supplier with appropriate data, otherwise the Tender will be rejected)

Description	Unit	REB Requirement	Tenderers Guaranteed Values
11/0.415 KV TRANSFORMERS			
1. Manufacturer's Name		To be mentioned	
2. Manufacturer's Address		To be mentioned	
3. Applied Standard		To be mentioned	
4. Type		Indoor	
5. Rated Power	KVA	AN, 2000	
6. Number of Phase		Three Phase	
7. Rated Voltage, Phase to Phase			
High Voltage winding	KV	11	
Low Voltage winding	KV	0.415	
8. Rated frequency	Hz	50	
9. Rated insulation level			
(a) Impulse withstand, full wave			
High voltage winding	KV	75	
Low voltage winding	KV	8	
Neutral side		Full insulation	
(b) AC withstand voltage			
High voltage winding	KV	28	
Low voltage winding	KV	2.5	
10. Vector Diagram (IEC 76-4)		Dyn11	
11. Type of Cooling		AN	
12. Off load Tap- changer			
Type			
Rated tap	KV	11	
Tap range	%	+ 5 to -5	
Capacity	Amps	Required	
Numbers of tap	Taps	5 Nos	
Location of tap		Primary side	
Rated short time current	kA	To be mentioned	
Duration of one step change	sec	To be mentioned	
Motor rating	kW	To be mentioned	
13. Impedance voltage at 75°C and at nominal ratio and 100% rated power	%	6.0% (with $\pm 10\%$ tolerance)	
14. Transformer core			
Type of core flux density			
At nominal voltage	Tesla	≤ 1.6	
15. Transformer bushings			
(a) H.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	

Description	Unit	REB Requirement	Tenderers Guaranteed Values
(b) L.V. Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
(c) Neutral Bushing			
Voltage class		To be mentioned	
Cantilever strength		To be mentioned	
16. Sound level	dB	To be mentioned	
17. WTI Protection		To be provided	
18. Core Loss at rated frequency and rated voltage at nominal tap.	kW	To be mentioned	
19. Copper Loss at full load, at rated frequency			
(a) At Maximum Tap	kW	To be mentioned	
(b) At Nominal Tap	kW	To be mentioned	
(c) At Minimum Tap	kW	To be mentioned	
20. Exciting Current at nominal tap and rated voltage	A	To be mentioned	
21. Dimensions and Weight			
Maximum size for transport			
L x W x H	mm	To be mentioned	
Heaviest weight for transport	Kg	To be mentioned	
Overall height	mm	To be mentioned	
Weight of core	Kg	To be mentioned	
Total weight	Kg	To be mentioned	
Float Type		Solid Body	
Petcock is provided for testing by injecting air		Yes	
22. Efficiency at 75° C at unity power factor:	%	To be mentioned	
23. Transformer tank	Shall be provided	Shall be high tensile steel plate	
24. Winding shall be of aluminum.	Shall be provided	Shall be aluminum	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 3150kVA transformer	A	5000	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	75	
7	Rated short-circuit making current	KA	187	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz,1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be mentioned	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	5500	
22	Standard		To be mentioned	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
23	Manufacturer's name & Address		To be mentioned	
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
26	Indication Meter			
A	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
B	Model No.		To be mentioned	
C	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
D	Type of meter		Digital	
E	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUE T or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 1900kVR PFI Plant	A	3200	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	75	
7	Rated short-circuit making current	KA	187	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz,1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be mentioned	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	4000	
22	Standard		To be mentioned	
23	Manufacturer's name & Address		To be mentioned	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
26	Indication Meter			
a	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
b	Model No.		To be mentioned	
c	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
d	Type of meter		Digital	
e	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUE T or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

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Seal and Signature of the Manufacturer

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 2000 kVA transformer	A	3200	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	65	
7	Rated short-circuit making current	KA	165	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz, 1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be mentioned	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	4000	
22	Standard		To be mentioned	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
23	Manufacturer's name & Address		To be mentioned	
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
26	Indication Meter			
a	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
b	Model No.		To be mentioned	
c	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
d	Type of meter		Digital	
e	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUE T or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./ Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR 415V LT SWITCHGEAR (ACB)**

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
1	Rated voltage	KV	415	
2	Rated frequency	Hz	50	
3	Rated normal current for 1200kVR PFI Plant	A	2000	
4	Interrupting medium		Air	
5	Number of phases		3	
6	Rated short-circuit breaking current	KA	65	
7	Rated short-circuit making current	KA	165	
8	First pole to clear factor		To be mentioned	
9	Rated duration of short circuit	Sec	3	
10	Impulse withstand on 1.2/50 μ s wave	KV	8	
11	Power frequency test voltage (dry) at 50Hz,1 min	KV	2.5	
12	Circuit breaker operating mechanism type		Gang operated spring charged stored energy.	
13	Operating particulars			
	a) Breaking time	ms	To be provided	
14	Is the circuit breaker trip free with anti-pumping feature?	Yes/No	Yes	
15	Spring charging motor voltage	VAC	415/230	
16	Degree of protection		IP 54	
17	Installation		Indoor	
18	Length of stroke	mm	To be mentioned	
19	All current carrying parts of ACB shall be made of		Copper	
20	Busbar		TPNE	
21	Busbar Rating	A	2500	
22	Standard		To be mentioned	
23	Manufacturer's name & Address		To be mentioned	

Sl. No.	Description	Unit	REB Requirements	Bidders Guaranteed Values
24	Country of origin of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
25	Place of Manufacture of ACB		USA/UK/Germany/Switzerland/France/Japan/EU/Australia	
26	Indication Meter			
A	Manufacturer's name & Country of Multifunction meter		Siemens (Germany/Hungary/ Switzerland)/ Alstom (UK)/ABB (Switzerland/ Romania/ Finland)/ AEG (Germany)/ CEWE (UK/ Italy)/ Schlumberger (USA)	
B	Model No.		To be mentioned	
C	Additional meters		3 nos Ammeter, 1 nos voltmeter,	
D	Type of meter		Digital	
E	Accuracy		0.5	
27	Type Test Reports from BUET/KUET/RUET/CUE T or any independent laboratory		a) Short time withstand and peak withstand current test b) Lightning impulse voltage withstand test c) Temperature rise Test d) Mechanical Endurance Test e) Measurement of the resistance of the main circuit f) Tightness tests.	
28	Routing Test		a) Dielectric test on main, auxiliary and control circuit b) Measurement of the resistance of the main circuit c) Tightness test d) Mechanical operation tests e) Design and visual checks	
29	Name Plate		i. Rated voltage/ Maximum voltage ii. Rated insulation level iii. Type /Model No./Sl. No./Year of manufacture. iv. Rated current v. Rated frequency. vi. Rated short Circuit Breaking Current. vii. Rated transient recovery voltage for terminal fault. viii. Rated short circuit making current. ix. Rated short time current. x. Applicable standard.	

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TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE

FOR 11 KV SWITCHGEAR AND CONTROL EQUIPMENT

(To be filled up by the bidder with appropriate data, otherwise the Bid will be rejected)
Failure to provide all of the information requested may lead to the rejection of the bid.

INCOMING SWITCHGEAR UNIT:

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Manufacturer's Name & Address		To be mentioned	
Vacuum bottle manufacturer		Siemens /ABB or / ALSTOM	
Applied standard			
Rated nominal voltage	kV	11	
Rated voltage	kV	12	
Rated current for bus	A	1000	
Rated short time current	kA	31.5	
Short time current rated duration	Sec.	3	

Circuit Breaker:

Type		VCB	
Rated Voltage	kV	12	
Rated current	A	630A	
Rated short Ckt. Breaking current, 3 sec	kA	31.5	
Rated short Ckt. Making current	kA	80	
Rated breaking time	Cycle	3	
Opening time	Sec.		
Closing time	Sec.		
Rated operating sequence		0-0.3 sec-co 3 min-co	
Control Voltage	V	DC 110	
Motor voltage for spring charge	V	AC 180~240	
No. of Trip coil	No.	02	

Current Transformer:

Rated Voltage	kV	12	
Accuracy class, Metering		0.2	
Accuracy class, Protection		5P20	
Rated Current ratio	A	600-300:5-5-5	
Burden	VA	20	
Rated frequency	Hz	50	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Insulation level:			
AC withstand voltage 1 min. dry	kV	28	
Impulse withstand, full wave	kV	75	
Degree of Protection:			
Enclosure		IP3X	
HV Compartment		IP65	
LV Compartment		IP40	
Earthing Switch:			
Type			
Short time current, 3 Secs.	kA		
Bus bar:			
Material	Copper		
Cross Section	mm2		
Dimension and Weight			
Height	mm		
Width	mm		
Depth	mm		
Weight including Circuit Breaker	Kg.		
LINE FEEDER SWITCHGEAR UNITS:			
Manufacturer's Name & Address			
Applied standard			
Rated nominal voltage	kV	11	
rated voltage	kV	12	
Rated current for bus	A	1000	
Rated short time current	kA	31.5	
Short time current rated duration	Sec.	3	
Circuit Breaker:			
Type		VCB	
Rated Voltage	kV	12	
Rated current	A	630	
Rated short Ckt. Breaking current, 3sec	kA	31.5	
Rated short Ckt. Making current	kA	80	
Rated breaking time	Cycle	3	
Opening time	Sec.		
Closing time	Sec.		
Rated operating sequence		0-0.3 sec-CO- 3 min-CO	
Control Voltage	V	DC 110	
Motor voltage for spring charge	V	AC 180~240	
No. of Trip coil	No.	02	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Current Transformer:			
Rated Voltage	kV	12	
Accuracy class, Metering		0.2	
Accuracy class, Protection		5P20	
Rated Current ratio	A	600-300: 5-5	
Rated short time current, 3 Sec	kA	31.5	
Burden	VA	20	
Knee point voltage for protection (at both ratio)		Sufficient to meet 5P20 at rated burden and measured CT secondary resistance	
Rated frequency	Hz	50	
Insulation level:			
AC withstand voltage 1 min. dry	kV	28	
Impulse withstand, full wave	kV	75	
Degree of Protection:			
Enclosure		IP3X	
HV Compartment		IP65	
LV Compartment		IP40	
Earthing Switch:			
Type		Earthing Truck	
Short time current, 3 Secs.	kA		
Bus bar:			
Material			
Cross Section	mm ²		
Dimension and Weight			
Height	mm		
Width	mm		
Depth	mm		
Weight including Circuit Breaker	Kg.		
VOLTAGE TRANSFORMER SWITCHGEAR UNITS			
Type			
Bus bar			
Material		Copper	
Cross Section	mm ²		
Rated nominal voltage	kV	11	
rated voltage	kV	12	
Rated current for bus	A	1000	
Rated short time current	kA	31.5	
Short time current rated duration	Sec.	3	
Number of phase			
Rated primary voltage	kV	11/ $\sqrt{3}$	
Rated secondary voltage	V	110/ $\sqrt{3}$	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
Rated tertiary voltage	V	110/ $\sqrt{3}$	
Rated burden, Secondary	VA	50	
Rated burden, Tertiary	VA	30	
Accuracy class for Metering		0.2	
Accuracy class for Protection		3P	
Power Fuse:			
Rated voltage	kV	12	
Rated current	A	10	
Rated short Ckt. Breaking current	kA	31.5	
Dimension and Weight			
Height	mm		
Width	mm		
Depth	mm		
Wt. including voltage transformer	Kg.		
Degree of Protection:			
Enclosure		IP3X	
HV Compartment		IP65	
LV Compartment		IP40	
Insulation level:	kV		
All Current carrying path of the breaker should be copper			
11KV CONTROL AND ENERGY METERING PANEL			
PROTECTION			
Manufacturer's name & Country		Siemens, Germany / ABB, (Sweden/Finland) / GE, (USA/UK)	
Model Number		To be mentioned	
Type of relay		Numerical Programmable	
Range setting			
a) Phase element of current	% of CT rating	5% to 2500%	
b) Earth fault element of current		1% to 1000%	
c) Range of time setting (IDMT)		2.5% to 1000%	
Ranges of timing at DMT	Sec.	0-100 (with 1ms interval)	
Shall have event record option		Yes	
Burden of relay at 10 time CT rating	VA	To be mentioned	
Percentage of current setting at which relay will reset	%	To be mentioned	
Reset time after removal of 10 time CT rated current for			
a) Phase element (100%)	Sec.	To be mentioned	
b) E/F element (40%)	Sec.	To be mentioned	

Description	Unit	BREB/PBS Requirement	Tenderer's Guaranteed Values
The relays should be 61850 protocol type			
KWh Meter			
Manufacturer's name & Country		Siemens (Germany/Switzerland)/ Alstom(UK)/ ABB (Sweden)/ AEG(Germany)/ Schlumberger (USA)/ Landis Gyr (Switzerland/Greece)/ CEWE (UK/Italy)	
Model Number		To be mentioned	
Number of KWh Meters		1	
Type of the meter		Numerical Programmable, Multifunction with accuracy Class 0.2s, Load profile, instrumentation profile for minimum 6 months with a interval of 30 min, software for protection and optical probe for data download as per IEC with provision of communication port automatic meter reading (AMR)	
Class of accuracy		0.2s	
Indication meter (Volt, Ampere, kW, KVAR, Power Factor, Frequency)			
Manufacturer's name & Country		Siemens (Germany/Hungary/Switzerland)/ Alstom (UK)/ ABB (Switzerland/Romania/Finland)/ AEG (Germany)/ Schlumberger (USA)	
Model Number		To be mentioned	
Number of Meters		3 nos Ammeter, 1 Nos Voltmeter	
Multifunction Meter		01Nos. multifunction meter containing (1 Nos KW Meter, 1 Nos KVAR meter, 1 Nos Pf meter, 1 Nos frequency meter)	
Type of the meter		Digital	
Class of accuracy		0.5	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE

For Air Conditioning System

(To be filled up by the tenderer with appropriate data, otherwise the Tender will be rejected)
Failure to provide all of the information requested may lead to the rejection of the tender.

DESCRIPTION	BREB REQUIREMENT	MANUFACTURER'S GUARANTEED DATA
BRAND	Internationally Reputed (To be mentioned by the supplier)	
COMPANY	Internationally Reputed (To be mentioned by the supplier)	
MODEL	To be mentioned by the Supplier	
COUNTRY OF ORIGIN	Japan/Malaysia/South Korea/Taiwan/Thailand/USA/EU Countries	
COUNTRY OF ASSEMBLE	Japan/Malaysia/South Korea/Taiwan/Thailand/USA/EU Countries	
COOLING CAPACITY	28000-30000 BTU/HR	
OUTDOOR UNIT / CONDENSING UNIT	TYPE	Compact weather proof outdoor type condensing unit
	COMPRESSOR	Hermetically sealed reciprocating/ Rotary compressor
	REFRIGERANT	Internationally accepted & recommended and most commonly used gas (CFC free)
	BLOWER MOTOR	Well balanced type direct driven centrifugal type blower fan
	POWER SUPPLY	200-250 V, single phase, 50 Hz. AC supply
	Inverter Type	Non-Inverter
	CONDENSING PIPE/COIL	Made of copper
	ENERGY EFFICIENCY RATIO (EER)	Minimum 9.23 (BTU/HR)/Watt.
	COEFFICIENT OF PERFORMANCE (COP)	Minimum 2.70 (W/W)
	OTHERS FEATURES	(a) Well balanced in all respect having interlock with the fan coil unit. (b) Compressor duly equipped with vibration isolator, thermostatic & overload controls, magnetic contactors and all other standard accessories complete. (c) Refrigerant copper pipe [From outdoor to indoor unit] with thermal insulation, refrigerant charging arrangement etc. [Minimum length 10 meters].

DESCRIPTION		BREB REQUIREMENT	MANUFACTURER'S GUARANTEED DATA
		<p>(d) Required size PVC insulated & sheathed, cable with ECC through water grade PVC pipe from outdoor to indoor unit.</p> <p>(e) Sound level: maximum 65 dB(A) at 1 meter.</p>	
INDOOR UNIT/ FAN COIL UNIT	FEATURES	<p>(a) Direct expansion system fan coil unit with well-balanced direct driven centrifugal type fan.</p> <p>(b) Fancy & adjustable air circulating louver grill, removable & washable type filter.</p> <p>(c) Condensing water drain out PVC flexible pipe with necessary insulation.</p> <p>(d) Thermostatic switch and remote-control switch.</p> <p>(e) Sound level: maximum 44 dB(A) at 1 meter.</p>	
	STANDARD	Major component — shall be manufactured as per relevant international standard & code.	
	Mount Type	Wall Mounted.	
	WARRANTY	Compressor: 2 Year (Minimum); Service with spares: 2 Year (Minimum)	
	SUPPORTING DOCUMENTS	Must be supported by printed catalogue/manual. Authenticity document (Letter from the parent/authorized company or Verifiable QR/BAR Code and Others) must be supplied with product. If any confusion arises in validation, supplier must clarify any misconception/confusion.	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

**TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE
FOR JOINING KITS FOR 11 KV XLPE, 3-CORE, 185 MM² COPPER CABLE**

(To be filled up by the tenderer with appropriate data, otherwise the Tender will be rejected)
Failure to provide all of the information requested may lead to the rejection of the tender.

SL. No.	Particulars	BREB Required	Guaranteed Particulars
1.	Name & address of the Manufacturer	Required	
2.	Type/Model of the offered Cable	Required	
3.	INSTALLATION	Direct burial	
	TYPE	XLPE insulated, 3-core, armoured, underground cable.	
4.	VOLTAGE:		
	a. Voltage between phases	11 KV	
	b. Maximum system voltage	15 KV	
	c. Rated voltage of cable U ₀ /U	8.7/15 KV	
5.	CORES:		
	Number of cores	Three core, stranded copper, round concentric.	
6.	CONDUCTOR:		
	a. Material	copper	
	b. Design (stranded sectional etc.)	round, compacted	
	c. Strand	30 nos	
	d. Cross sectional area of each conductor core	185 mm ²	
	e. Maximum DC resistance of conductor at 20° C	0.0991 Ω/km	
7.	CONDUCTOR SCREEN:		
	a. Material	Extruded Semi-conducting PE	
8.	INSULATION:		
	a. Thickness (Nom)	4.50 mm	
9.	b. Type of curing	Dry curing	
10.	INSULATION SHIELD	Extruded Semi-conducting PE	
11.	METAL SHIELD	Copper wire	
12.	INNET SHEATH	Polyvinyl Chloride (PVC)	
13.	ARMOUR	Aluminum Alloy Wire.	
14.	OUTER SHEATH	Medium Density Polyethylene (MDPE)	
15.	Short Circuit Withstand Capability	As per table-2	
16.	STANDARDS	Design, Manufacture, Testing & Performance shall be in accordance to latest revision of IEC-60502-2 or Equivalent International standard.	

**Seal and Signature of the Bidder
Manufacturer**

Seal and Signature of the

TERMINATION KITS (OUTDOOR)

SL. No.	Particulars	BREB Required	Guaranteed Particulars
	Termination jointing kits for 15 KV XLPE cable 3-core, (Outdoor)		
1.	Name and address of the manufacturer	Required	
2.	Type/model of the kits	Required	
3.	Application	For 11 KV, 3- core, XLPE, copper conductor armored cable	
4.	Installation	Outdoor, mounted on Poles/Structure	
5.	Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU /Australia	
6.	Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU /Australia	
7.	System	11 KV, effectively grounded system	
8.	Cable Conductor	185 mm ² copper conductor	
9.	Kit content	Heat shrinkable high voltage insulating and non-tracking tubing Heat shrinkable stress control tubing Stress relieving mastic strip Truck resistant sealant tape Heat shrinkable track resistant rain skirt Support Insulator Cable preparation kit Solderless earth connection kit Compression lugs Support Insulators Tee brackets Installation Instructions	

**Seal and Signature of the Bidder
Manufacturer**

Seal and Signature of the

TERMINATION KITS (INDOOR)

SL. No.	Particulars	BREB Required	Guaranteed Particulars
	Termination jointing kits for 15 KV XLPE cable 3-core (Indoor)		
1.	Name and address of the manufacturer	Required	
2.	Type/model of the kits	Required	
3.	Application	For 11 KV, 3- core, XLPE, copper conductor armored cable	
4.	Installation	For indoor switchgear terminations	
5.	Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU /Australia	
6.	Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU /Australia	
7.	System	11 KV, effectively grounded system	
8.	Cable Conductor	185 mm ² copper conductor	
9.	Kit content	Heat shrinkable high voltage insulating and non-tracking tubing Heat shrinkable stress control tubing Stress relieving mastic strip Truck resistant sealant tape Heat shrinkable track resistant rain skirt Cable preparation kit Solderless earth connection kit Compression lugs Installation Instructions	

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STRAIGHT THROUGH JOINT BOX

SL. No.	Particulars	BREB Required	Guaranteed Particulars
	Straight through joint box for 15 KV XLPE cable, 3-core copper conductor		
1.	Name and address of the manufacturer	Required	
2.	Type/model of the kits	Required	
3.	Application	For 11 KV, 3- core, XLPE, copper conductor armored cable	
4	Installation	For underground horizontal mounting	
5.	Country of origin	USA/UK/Germany/Switzerland/France/Japan/EU /Australia	
6.	Place of Manufacture	USA/UK/Germany/Switzerland/France/Japan/EU /Australia	
7.	System	11 KV, effectively grounded system	
8.	Cable Conductor	185 mm ² copper conductor	
9.	Construction	The joint shall be proof against ingress of moisture and water.	
10.	Kit content	Compression ferrules Valid filling tape Heat shrinkable stress control tubing Truck resistant sealant tape Heat shrinkable high voltage insulating tape Heat shrinkable black/red dual wall Estomeric tube Roll spring Heat shrinkable outer jacket tube Heat shrinkable truck resistant rain skirt. Cable preparation kit Solder less earth connection kit Misc. other material Installation instructions	

Seal and Signature of the Bidder

Seal and Signature of the Manufacturer

TECHNICAL REQUIREMENT AND GUARANTEE SCHEDULE

For 415V 1-CORE X 500mm² U/G XLPE COPPER CABLE

(To be filled up by the tenderer with appropriate data, otherwise the Tender will be rejected)
Failure to provide all of the information requested may lead to the rejection of the tender.

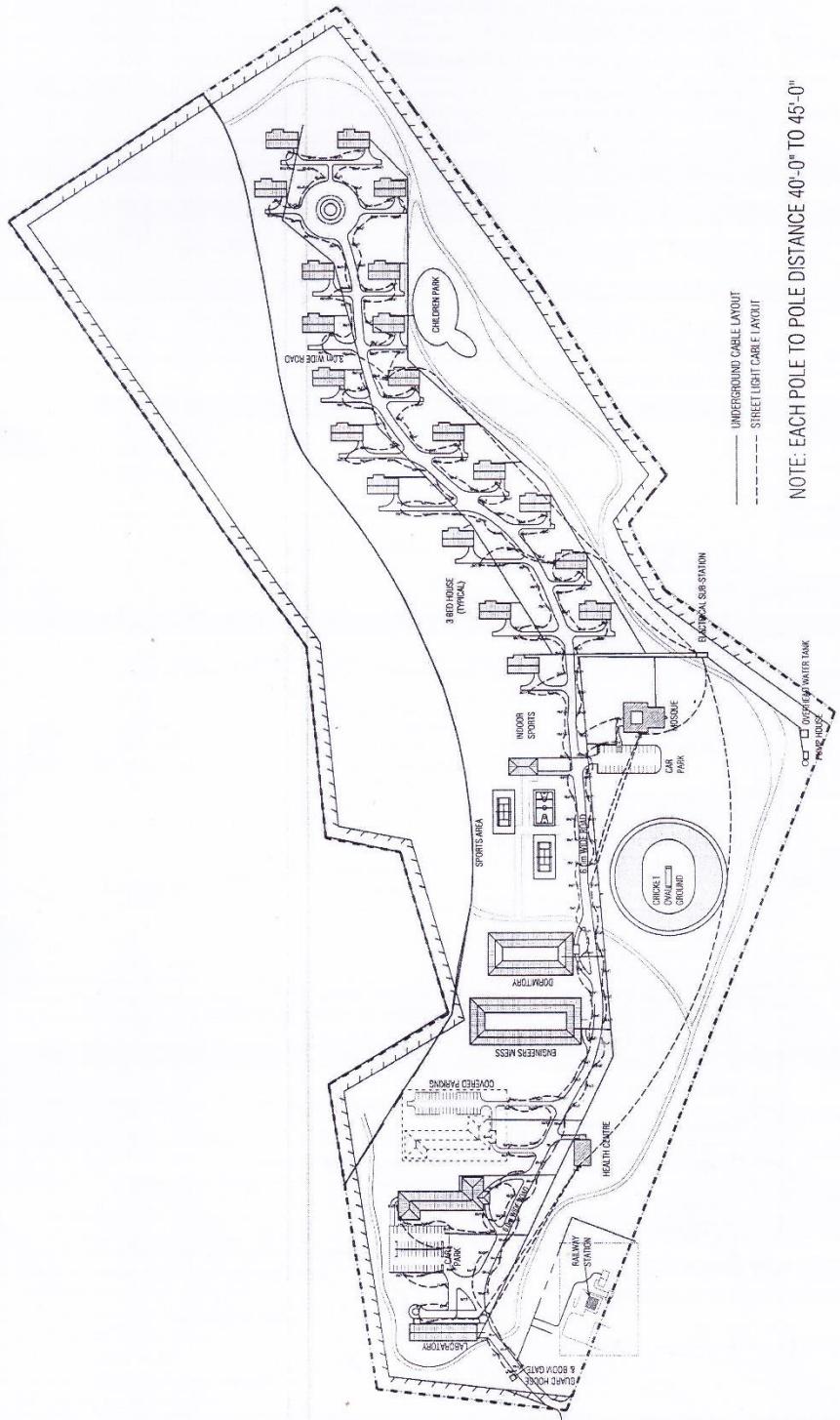
Sl. No.	Description	Unit	REB Specification	Guaranteed Specification
A. General Parameter				
1	Name of the Manufacture and Country of Origin	-	To be mentioned	
2	Reference Standard	-	IEC 60228, IEC 60502-1	
3	Rated Voltage: U ₀ /U (U _m)	V	415	
4	No. of Cores & Conductor Cross-Sectional Area	No.xm ²	1C×500 mm ²	
5	Type / Model of the Cable	-	To be mentioned	
B. Construction Parameter				
1	CONDUCTOR: v. Conductor Material vi. Number of Wire and Each Wire Diameter vii. Shape of Conductor viii. Approx. Conductor Diameter	-	Plain Annealed Stranded Copper, Class 2	
		No./m ^m	To be mentioned	
		-	Circular Compacted	
		mm	To be mentioned	
2	INSULATION: v. Insulation Material vi. Nominal Thickness of Insulation vii. Approx. Radius over Insulation viii. Core Identification Color	-	Extruded Cross-Linked Polyethylene (XLPE)	
		mm	To be mentioned	
		mm	To be mentioned	
		-	Natural	
3	INNER SHEATH / INNER COVERING: v. Inner Sheath / Inner Covering Material vi. Nominal Thickness of Inner Sheath vii. Approx. Diameter over Inner Sheath viii. Color of Inner Sheath / Inner Covering	-	Extruded Polyvinyl Chloride (PVC), ST ₂	
		mm	To be mentioned	
		mm	To be mentioned	
		-	Black	
4	ARMOURING: iv. Armour Material v. Number and Each Armour Wire Diameter vi. Approx. Diameter over Armouring	-	Round Aluminium Wire Armour	
		No./m ^m	To be mentioned	
		-	To be mentioned	
5	BINDER / WRAPPED: iii. Binder / Wrapped Material iv. Approx. Thickness of Binder / Wrapped Tape	-	Non-Hygroscopic Polypropylene Tape	
		Mm	To be mentioned	
6	OUTER SHEATH / JACKET: iv. Outer Sheath / Jacket Material v. Nominal Thickness of Outer Sheath vi. Color of Outer Sheath / Jacket	-	Extruded FRLS-PVC, ST ₂	
		mm	To be mentioned	
		-	Black	
C. COMPLETE CABLES DETAILS:				

Sl. No.	Description	Unit	REB Specification	Guaranteed Specification
1	Approx. Overall Diameter of Cable	mm	To be mentioned	
2	Approx. Weight of Complete Cable	kg/km	To be mentioned	
D. ELECTRICAL PARAMETER:				
1	Max. DC Resistance of Conductor at 20°C	Ω/km	0.0366	
6	CONTINUOUS CURRENT RATING: iii. Direct Buried in Ground at 30°C iv. In Air at 35°C	Amp s Amp s	800 1030	
7	MAXIMUM CONDUCTOR TEMPERATURE: iii. Condition: Normal Operation iv. Condition: Short-Circuit	°C °C	90 250	
8	Short-Circuit Withstand Capacity of Conductor	kA	71 (for 1 second duration)	
9	Minimum Insulation Resistance at 27°C	MΩ-km	To be mentioned	
10	Minimum Bending Radius for Fixed Installation	mm	To be mentioned	
11	Applied High Voltage Withstand Test	kV	To be mentioned	
E. OTHER PARAMETER:				
	i. Standard Drum Length	Meter	Should be in Single Length as per Capacity	
	ii. Drum Type and Drum Size (Flange x Width)	-	Wooden Drum, Drum Size: Depends on Customer	
	iii. Gross Weight of Complete Drum Length (±5%)	kg	---	
	iv. EMBOSSED every 1 meter length	-	Rated voltage, conductor size, manufacturer's name, year of manufacture, purchaser's name RURAL ELECTRIFICATION BOARD.	

Seal and Signature of the Bidder

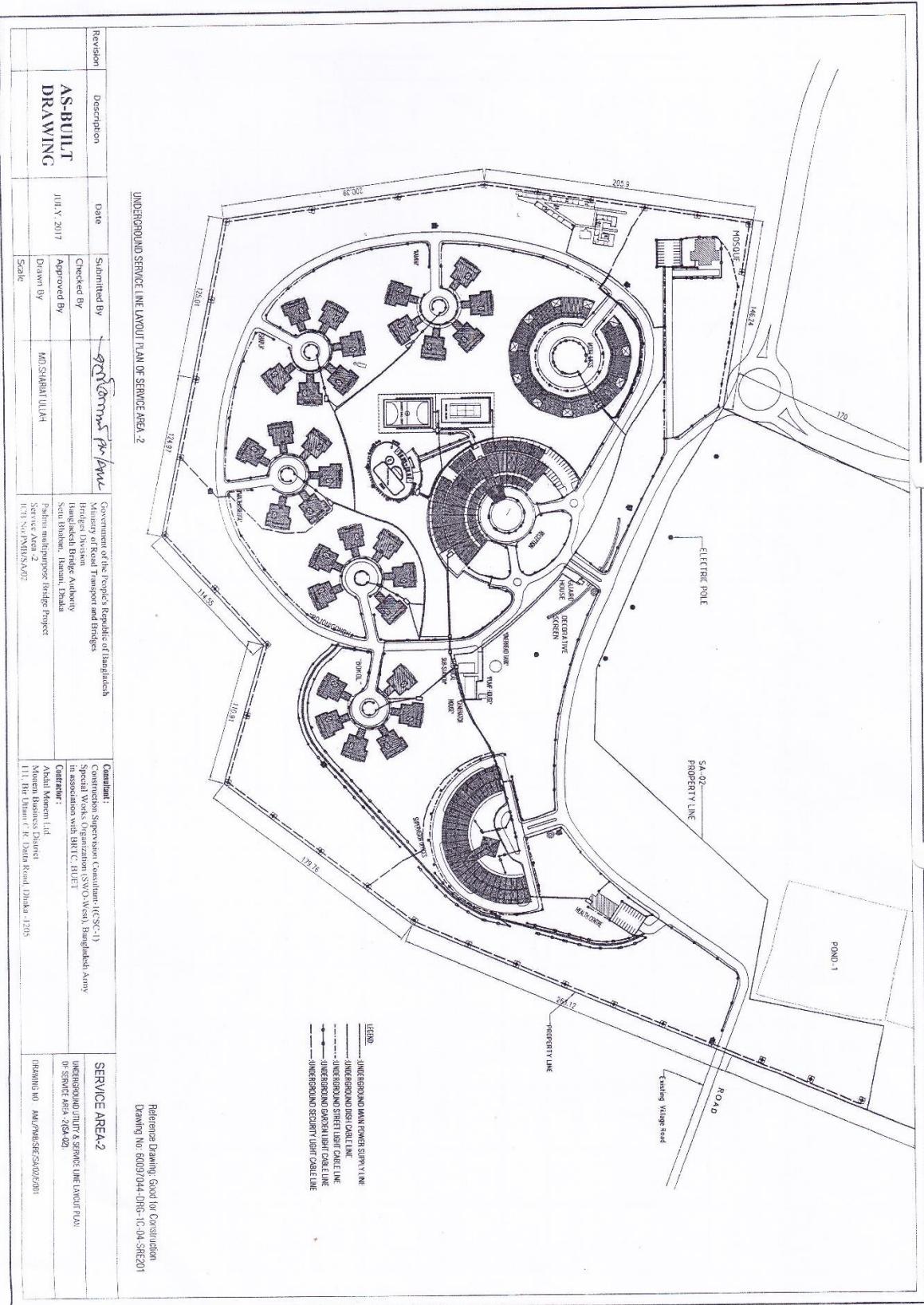
Seal and Signature of the Manufacturer

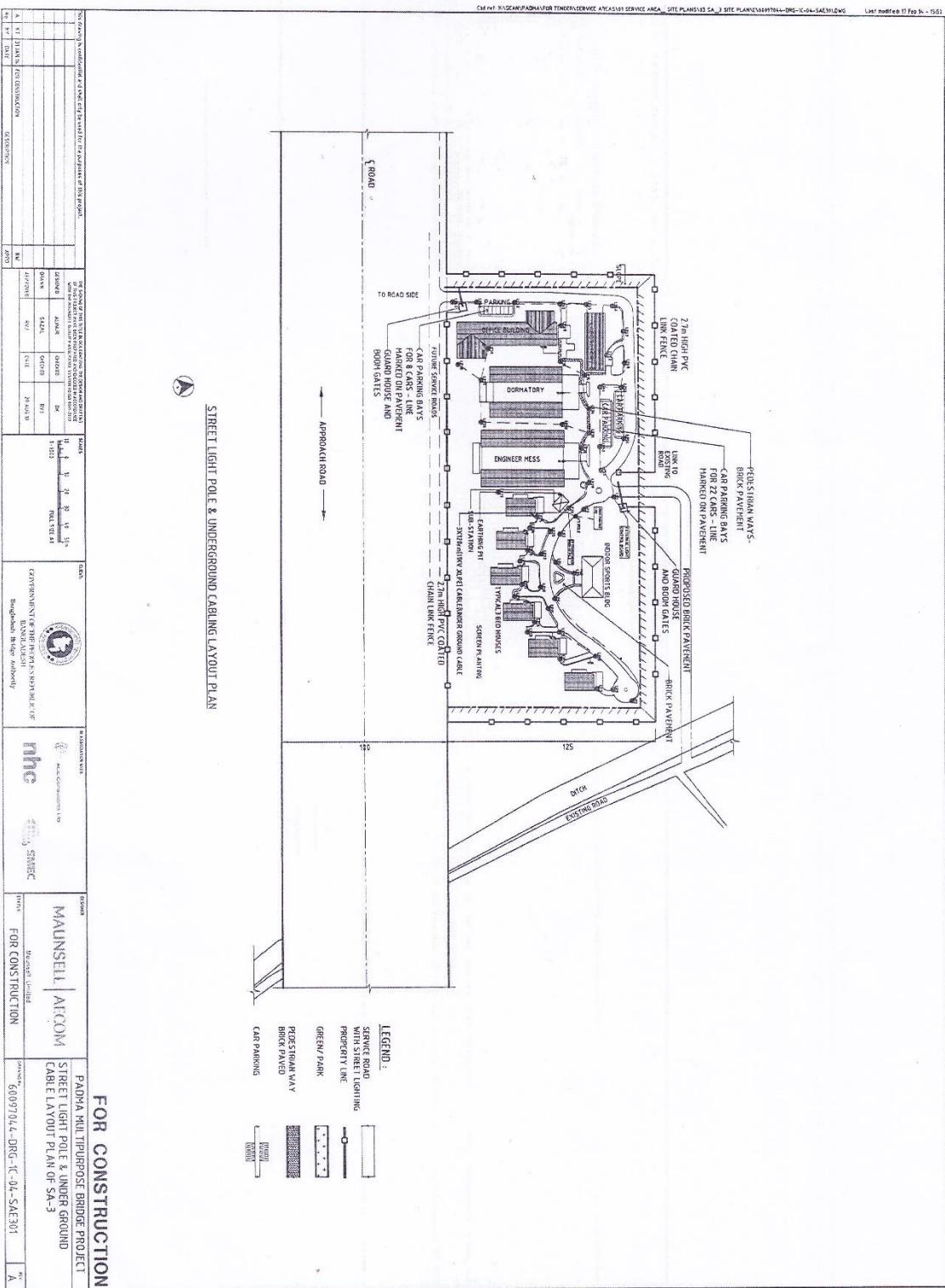
Section 7. Drawings

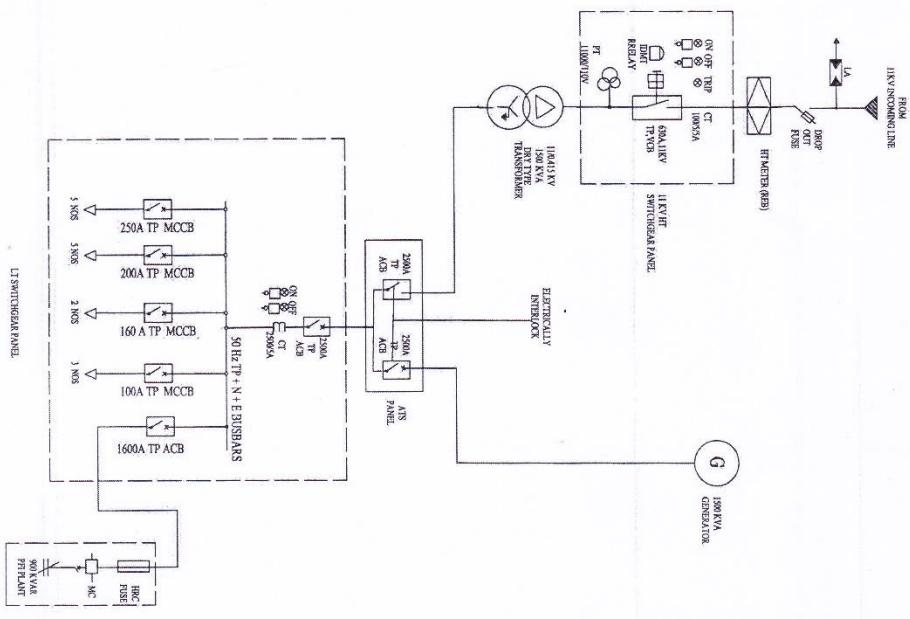


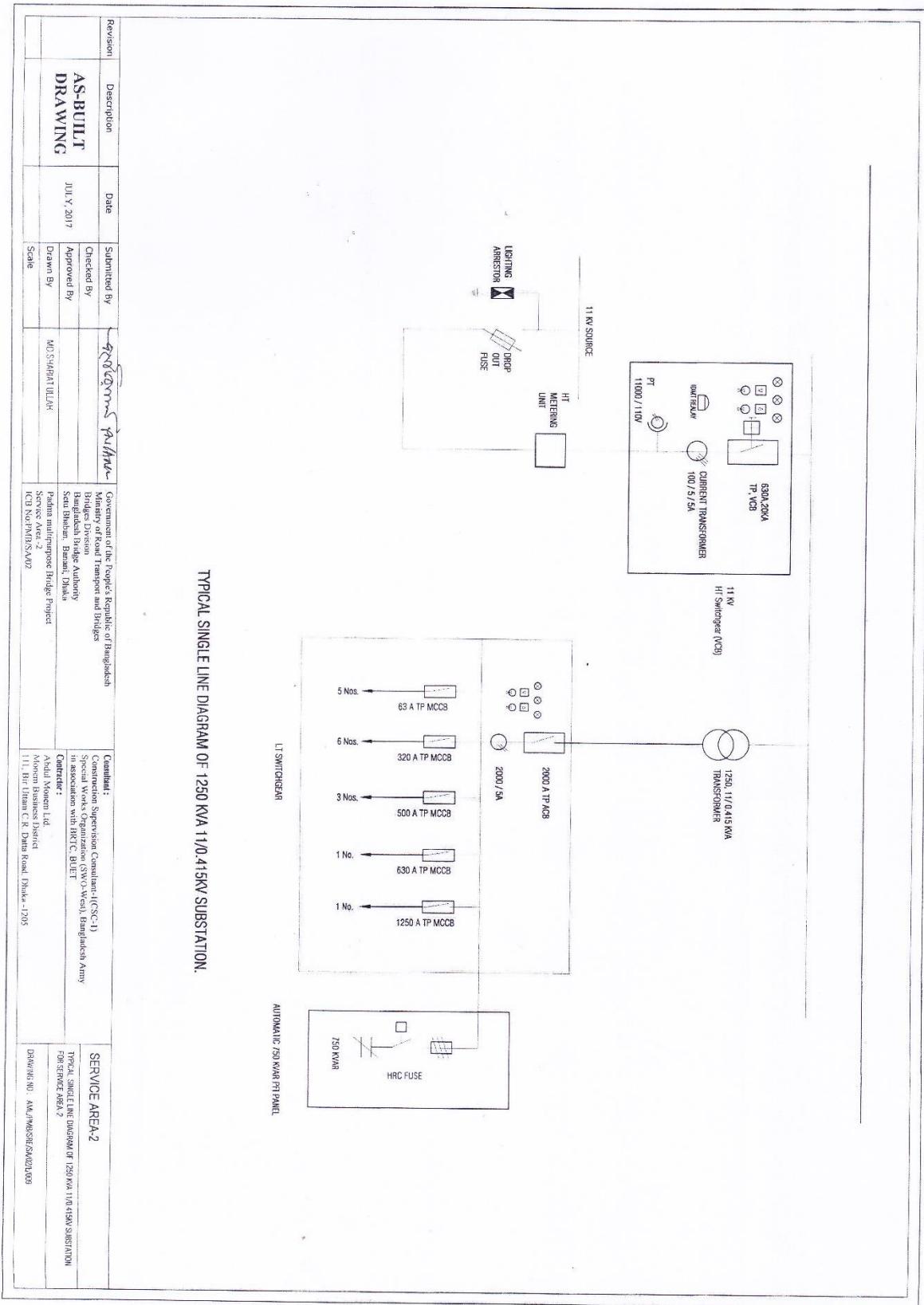
NOTE: EACH POLE TO POLE DISTANCE 40'-0" TO 45'-0"

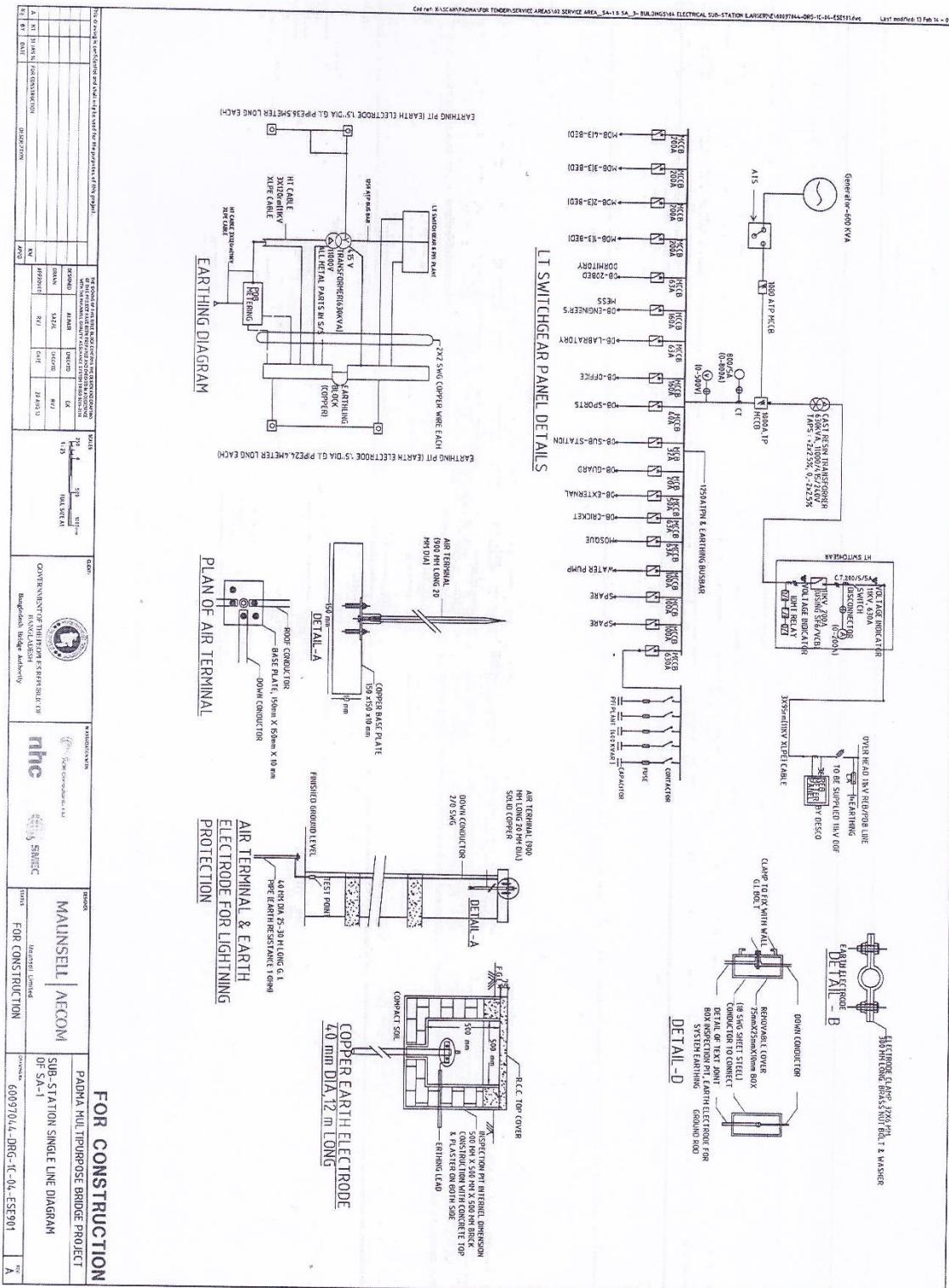
Revision	Description	Date	Submitted By	Checked By	Approved By	Drawn By	Scale	Comment:	Construction Supervisor Consultant-1 (CSC-1) Special Works Organization (SWO-West) Bangladesh Army In Association with BRTC, BUEI	Contractor:	AMUL ITC LTD Munir Business District 111, Bir Uttam C.R. Deka Road,Dhaka-1205	CABLE ROUTE & STREET LIGHT STREET LIGHT POLE & UNDERGROUND CABLE LAYOUT PLAN OF S.A.!	DRAWING NO.: 06996461086-104-SAF-01
	AS-BUILT DRAWING	October 2016				Eng. Razzouq Kam			Government of the People's Republic of Bangladesh Ministry of Road Transport and Bridges Bridge Division, Bangladesh Bridge Authority Sector 12, Banani, Dhaka	Palma Multipurpose Bridge Project Tal Palma & Bridge End facilities ICB No:pMBAR02			











END