F A I S A L A B A D I N D U S T R I A L E S T A T E D E V E L O P M E N T & M A N A G E M E N T C O M P A N Y

BIDDING DOCUMENT NO: GS-AIIC-02 (R-I)
Single Stage - Two Envelope Bidding Procedure

FOR

PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF

NEW 132 kV AIS GRID STATION NO. 02
AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.

REVISED (APRIL– 2024)

CHIEF EXECUTIVE OFFICER, FIEDMC, FAISALABAD

CONSULTANT

EnMasse (Pvt.) Ltd
Address: 18, Block E-2, Johar Town, Lahore.
Tel: 042- 35314701-02
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Web: www.enmassepakistan.com

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VOLUME – I
BIDDING PROCEDURES & CONTRACT FORMS
BIDDING DOCUMENT NO.: GS-AIIC-02 (R-I)

CONSULTANT

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INVITATION TO BIDDERS

1. https://e.jang.com.pk/lahore/03-05-2024/page4

FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY

RE-INVITATION TO BID FOR

PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 kV AIS GRID STATION NO. 02, AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY FAISALABAD.

(Contract No. AIIC-GS-02)

The Employer, Chief Executive Officer, Faisalabad Industrial Estate Development & Management Company, Faisalabad invites sealed bids for the below mentioned Works under Single Stage Two Envelopes Bidding Procedure, from eligible firms with valid licensed for the year 2023-24, by the Pakistan Engineering Council in Category C-1 or above having specialization codes of CE- 10, EE-04 & EE-05 and registered with FBR for Sales Tax and Income Tax:

Sr. No.	Description	Estimated Cost (Rupees in Million)	Bid Security	Bidding Procedure	Bid Submission Date
1	Procurement of Plant, Design, Manufacture, Supply, Civil Works, Installation, Erection, Testing & Commissioning for the Construction of new 132 kV AIS Grid Station No. 02, at Allama Iqbal Industrial City (AIIC), Near Sahianwala Interchange, M-4 Motorway Faisalabad. (Contract No. AIIC-GS-02)	1,800/-	2% of Estimated Cost i.e., Rs. 36 Million	Single Stage Two Envelopes	28-05-2024

Bidders may obtain further information from, inspect at PPRA Punjab and/or FIEDMC websites and acquire the Bidding Documents on submission of a written application to the Office of the Chief Executive Officer, FIEDMC, M-3 Industrial City, near Sahianwala Interchange M-4 Motorway, Faisalabad, upon payment of a non-refundable fee of Rs. 10,000/- (Rupees Ten Thousand only). Bidding Documents shall not be issued on the Bid Submission Date. The proof of purchase of Bidding Documents must be attached with the Technical Bid.

Bids must be submitted in two main envelopes, one marked “Technical Bid” and other as “Financial Bid” under Single Stage Two Envelopes Bidding Procedure. All bids must be accompanied by acceptable Bid Security (Bank Guarantee from Scheduled Bank/CDR) and must be delivered to Office of the Chief Executive Officer, FIEDMC at or before **1400** hours, on 28-05-2024.

Any bid received by the Employer after the deadline for submission of bids will be returned unopened. Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive. Bids/ tenders with any condition shall be rejected.

Technical Bids will be opened at **1430** hours on the same day, in the presence of bidder’s representatives who choose to attend at the same address. Date of opening of Financial Bids of technically qualified bidders shall be notified at a later date after Evaluation of the Technical Bids.

Punjab Procurement Rules 2014, together with amendments, shall apply.

Office of Chief Executive Officer

Faisalabad Industrial Estate Development & Management Company (FIEDMC)

M-3 Industrial City, near Sahianwala Interchange, M-4 Motorway, Faisalabad

Tel: 041-8900201-7

(IPL-3794)

INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS AND APPENDICES

(A) GENERAL

IB.1 Scope of Bid and Source of Funds

1.1 Scope of Bid

FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY

(Hereinafter called the "Employer") wishes to receive Bids on Single Stage Two Envelope for the scope of work which includes, but shall not be limited to:

PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 KV GRID STATION NO. 02, AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD; BIDDING DOCUMENT NO. GS-AIIC-02 (R-I)

A detailed scope of work has been described elsewhere in these documents. The successful Bidder will be expected to complete the Works within the stipulated period of 360 days as specified in these Bidding Documents.

Bidders must quote prices for the complete scope of work. Any Bid covering the partial scope of work will be non-responsive, pursuant to Clause IB.24.

1.2 Source of Funds

The Employer has arranged the funds from own resources in Pakistani Rupees and it is intended that part of the proceeds of this fund will be applied to eligible payments under the Contract for which these Bidding Documents are issued.

IB.2 Eligible Bidders

2.1 Bidding is open to all firms and persons meeting the following requirements:

a) Duly licensed by Pakistan Engineering Council (PEC) in Category **C-1 or above** valid for the year 2023-24, having Specialization Codes of CE-10, EE-04 & EE-05.

b) Foreign Bidders from eligible countries as per Appendix `A' to Instructions to Bidders duly enlisted by PEC and Licensed by PEC for this specific project as per Bye Laws of PEC.

IB.3 Eligible Goods and Services

3.1 All Goods & ancillary Services to be supplied under this Contract shall have the origin of the manufacturer from eligible countries as per Appendix 'A' to Instructions to Bidders and all expenditures made under the Contract will be limited to such Goods and Services.

3.2 For purpose of this Clause, "origin" means the place where the Goods are mined, grown or produced or from where the ancillary services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.3 The origin of Goods and Services is distinct from the nationality of the Bidder.

IB.4 Cost of Bidding

4.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Bidding process.

(B) BIDDING DOCUMENTS

IB.5 Contents of Bidding Documents

5.1 In addition to Invitation for Bids, the Bidding Documents are those stated below, and should be read in conjunction with any Addenda issued in accordance with Clause IB.7.

1. Instructions to Bidders with Appendices (A, B & C)

2. Form of Bids & Schedules to Bid are the following:
   (i) Schedule A: Specific Works Data
   (ii) Schedule B: Work to be Performed by Subcontractors
   (iii) Schedule C: Proposed Programme of Works
   (iv) Schedule D: Deviations from Technical Provisions
   (v) Schedule E: Deviations from Contractual Conditions
   (vi) Schedule F: Method of Performing Works
   (vii) Schedule G: Proposed Organization
   (viii) Schedule H: Integrity Pact
3. Schedule of Prices
4. Preamble to Conditions of Contract
5. General Conditions of Contract
6. Particular Conditions of Contract
7. Standard Forms

   Forms include the following:
   (i) Form of Bid Security
   (ii) Form of Contract Agreement
   (iii) Form of Performance Security
   (iv) Form of Bank Guarantee/Bond for Advance Payment
8. Specifications - Special Provisions
9. Specifications - Technical Provisions
10. Drawings

5.2 The Bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of Bid submission will be at the Bidders own risk. Pursuant to Clause IB.24, Bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.6 Clarification of Bidding Documents

6.1 A prospective Bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer with a copy to the Project Manager/Engineer in writing or by fax at the address as provided under Sub-Clause 49.2 of GCC. Employer will examine the request for clarification of the Bidding Documents which it receives not later than **fourteen (14) days** prior to the deadline for the submission of bids and if needed will issue the clarification/amendment of the Bidding Documents at least **seven (07) days** before the date of submission of Bids (without identifying the source of enquiry) to all prospective Bidders who have purchased the Bidding Documents.

IB.7 Amendment of Bidding Documents

7.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by issuing addendum.

7.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub- Clause 7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective Bidders shall acknowledge receipt of each addendum in writing to the Employer. The Bidder shall also confirm in the Form of Bid that the information contained in such addenda have been considered in preparing his Bid.

7.3 To afford prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may at its discretion extend the deadline for submission

of Bids in accordance with Clause IB.19.

(C) PREPARATION OF BIDS

IB.8 Language of Bid

8.1 The Bid prepared by the Bidder and all correspondence and documents relating to the Bid, exchanged by the Bidder and the Project Manager/Engineer shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language so long as accompanied by an English translation of its pertinent passages in which case, for purposes of interpretation of the Bid, the English translation shall govern.

IB.9 Documents Comprising the Bid

9.1 The bid prepared by the bidder shall comprise Technical Bid and Financial Bid of the following components:

A) The Bidder shall submit with its Technical Bid the following documents

1. Letter of Technical Bid dully filled, signed and sealed in accordance with Clause IB.17.
2. Bid Security furnished in accordance with Clause IB.15.
3. Schedules (A to H) to Bid duly filled and signed, in accordance with the instructions contained therein and Appendices A, B & C of Instruction to Bidders.
4. Power of Attorney in accordance with Clause IB.17.5.
5. Joint Venture Agreement (if applicable). A foreign Bidder is entitled to bid only in a joint venture with a Pakistani constructor in accordance with the provisions of relevant PEC Bye-Laws.
6. Documentary evidence established in accordance with Clause IB.13 that the Bidder is eligible to Bid and is qualified to perform the Contract if its Bid is accepted (past performance and present commitments to be filled in as per schedule I to Bid).
7. Documentary evidence established in accordance with Clause IB.14 that the Plant and ancillary Services to be supplied by the Bidder are eligible Plant and Services and conform to the Bidding Documents.
8. Any other documents prescribed in Particular Conditions of Contract or Technical Provisions to be submitted with the Bid.
9. In separate envelope, the documents in support of Technical Bid as stipulated.

B) The Bidder shall submit with its Financial Bid the following documents

1. Letter of Price Bid duly filled, signed and sealed, in accordance with Clause IB.17.
2. Schedule of Prices completed in accordance with Clauses IB.11 and IB.12 in separate sealed envelope.

IB.10 Letters of Bids and Schedules

10.1 The Bidder shall complete, sign and seal the Letters of Bids, Schedules (A to H, or as modified) to Bid and Schedule of Prices furnished in the Bidding Documents and shall also enclose other information as detailed in Clause IB.9.

IB.11 Bid Prices

11.1 The Bidder shall fill up the Schedule of Prices attached to these documents indicating the unit rates and prices of the Works to be performed under the Contract. Prices on the Schedule of Prices shall be entered keeping in view the instructions contained in the Preamble to the Schedule of Prices.

11.2 The Bidder shall fill in rates and prices for all items of the Works described in the Schedule of Prices. Items against which no rate or price is entered by a Bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Schedule of Prices.

11.3 The Bidder's breakup of price components in accordance with Sub-Clause 11.1 above will be solely for the purpose of facilitating the comparison of Bids by the Employer and will not

in any way limit its right to contract on any of the terms offered.

11.4 Unless otherwise stipulated in the Conditions of Contract, prices quoted by the Bidder shall remain fixed during the Bidder's performance of the Contract and not subject to variation on any account. When the Bidders are required to quote only fixed price(s), a Bid submitted with an adjustable price quotation will be treated as non-responsive, pursuant to Clause IB.24.

11.5 Any discount offered shall be valid for at least the period of validity of the Bid. A discount valid for lesser period shall be considered null and void.

IB.12 Currencies of Bid

12.1 Prices shall be quoted in the following currencies:

(a) For Plant/ Goods and Services which the Bidder will supply from within Pakistan, the prices shall be quoted in the Pak. Rupees.

(b) For Plant/ Goods and Services which the Bidder will supply from outside Pakistan, the prices shall be quoted in Pak Rupees.

12.2 Further, a Bidder expecting to incur a portion of its expenditure in the performance of the Contract in more than one currency (but use no more than 3 foreign currencies), and wishing to be paid accordingly, shall so indicate in its bid.

12.3 The currencies of payment shall be as stated in Particular Conditions of Contract.

IB.13 Documents Establishing Bidder's Eligibility and Qualifications

13.1 Pursuant to Clause IB.9, the Bidder shall furnish, as part of its Bid, documents establishing the Bidder's eligibility to Bid and its qualifications to perform the Contract if its Bid is accepted.

13.2 The documentary evidence of the Bidder's eligibility to Bid shall establish to the Employer's satisfaction that the Bidder, at the time of submission of its Bid is from an eligible source country as defined under Clause IB.2.

13.3 The documentary evidence of the Bidder's qualifications to perform the Contract if its Bid is accepted, shall establish to the Employer's satisfaction:

(a) that, in the case of a Bidder offering to supply Plant under the Contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized by the Plant manufacturer or producer to supply the Plant to Pakistan;

(b) that the Bidder/ Manufacturer has the financial, technical and production capability necessary to perform the Contract; and

(c) that, in the case of a Bidder not doing business within Pakistan the Bidder is or will be (if successful) represented by an agent in Pakistan equipped and able to carry out the Supplier's maintenance, repair and spare parts stocking obligations prescribed by the Conditions of Contract and/or Technical Provisions.

13.4 (a) Bidder/ Manufacturer must possess and provide evidence of the following experience: -

As per Sub-Clause IB.22A

13.5 Joint Venture

A Joint Venture comprising not more than three (03) members and formed in accordance with PEC Bye Laws is eligible to participate. A Foreign Company can participate only as a Joint Venture partner with a Pakistani Firm as per PEC Bye Laws.

In order for a Joint Venture to qualify:

(a) **At least one of the partners of joint venture** shall satisfy the relevant experience criteria specified in Sub-Clause 13.4(a) hereinabove.

(b) All firms comprising the joint venture shall be legally constituted and shall meet the eligibility requirement of Sub-Clause 2.1 hereof.

(c) All partners of the joint venture shall at all times and under all circumstances be liable jointly and severally to Employer for the execution of the entire Contract in accordance with the Contract terms and conditions and a statement to this effect

shall be included in the authorization mentioned under para (f) below as well as in the Form of Bid and Form of Contract Agreement (in case of a successful Bidder).

(d) The Form of Bid, and in the case of successful Bidder, the Form of Contract Agreement, shall be signed so as to be legally binding on all partners.

(e) One of the joint venture partners shall be nominated as being in-charge and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners.

(f) The partner-in-charge shall be authorized to incur liabilities, receive payments and receive instructions for and on behalf of any or all partners of the joint venture.

(g) A copy of the agreement entered into by the joint venture partners shall be submitted with the Bid stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partners without prior written consent of the Employer (Refer Schedule - H).

13.6 The Bidder shall propose, in order of his priority; plant, equipment or goods of **not more than three (3) Manufacturers**. Employer/Engineer at his own jurisdiction will evaluate the plant, equipment or goods of only one of such Manufacturers.

IB.14 Documents Establishing Plant's Eligibility and Conformity to Bidding Documents

14.1 Pursuant to Clause IB.9, the Bidder shall furnish, as part of its Bid, documents establishing the eligibility and conformity to the Bidding Documents of all Plant and Services which Bidder proposes to perform under the Contract.

14.2 The documentary evidence of the Plant and Services eligibility shall establish to the Employer's satisfaction that they will have their origin in an eligible source country as defined under Clause IB.3. A certificate of origin issued at the time of shipment will satisfy the requirements of the said Clause.

14.3 The documentary evidence of the Plant and Services' conformity to the Bidding Documents may be in the form of literature, drawings and data and shall furnish:

(a) A detailed description of the Plant, essential technical and performance characteristics.

(b) Complete set of technical information, description data, literature and drawings as required in accordance with Schedule A to Bid (Specific Works Data). Drawings and data submitted must be in sufficient detail and clarity to permit the Employer to verify compliance with the provisions of the Bidding Documents. This will include but not be limited to the following:

(i) A sufficient number of drawings, diagrams, photographs, catalogues, illustrations and such other information as are necessary to illustrate clearly the significant characteristics such as general construction dimensions and other relevant information about the Plant to be furnished.

(ii) The approximate weight and dimension of the main components, a brief description of the principal materials and fabrication processes to be used and recommended methods of assembly.

(iii) Any other information which is required for evaluation purposes.

(c) A clause-by-clause commentary on Technical Provisions, provided with the Bidding Documents, demonstrating the Plant's and Service's substantial responsiveness to those Specifications or a statement of deviations and exceptions to the provisions of the Technical Provisions as required in Schedule F to Bid.

14.4 For purpose of the commentary to be furnished pursuant to Sub-Clause 14.3(c) above, the Bidder shall note that standards for workmanship, material and equipment, and references

to brand names or catalogue numbers, designated by the Project Manager/ Engineer in the Technical Provisions are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalogue numbers in its Bid, provided that it demonstrates to the Project Manager/ Engineer's satisfaction that the substitutions are substantially equivalent or superior to those designated in the Technical Provisions. Copies of the standards proposed by the Bidder other than those specified in the Bidding Documents shall be furnished.

IB.15 Bid Security

15.1 Each Bidder shall furnish, as part of his Bid, a Bid Security of an amount not less than **02% of the estimated value of the Works of Rs. 1,800/-, Million Pak Rupees** or an equivalent amount in any freely convertible currency. The Bid Security shall be submitted in the Technical Bid Envelope.

15.2 The Bid Security shall be, in the form of Bank Guarantee/CDR in favor of the Employer, valid for a period twenty-eight (28) days beyond the bid validity date.

15.3 The Bid Security is required to protect the Employer against the risk of Bidder's conduct which would warrant the security's forfeiture, pursuant to Sub-Clause 15.7 hereof.

15.4 Any Bid not accompanied by an acceptable Bid Security shall be considered by the Employer as non-responsive, pursuant to Clause IB.24.

15.5 The Bid securities of unsuccessful Bidders will be returned upon award of contract to the successful Bidder or on the expiry of validity of Bid Security whichever is earlier.

15.6 The Bid Security of the successful Bidder will be returned when the Bidder has furnished the required Performance Security, pursuant to Clause IB.34 and signed the Contract Agreement, pursuant to Clause IB.35.

15.7 The Bid Security may be forfeited:

(a) If a Bidder withdraws his Bid during the period of Bid validity;

(b) If a Bidder does not accept the correction of his Bid Price, pursuant to Sub-Clause 24.2 hereof; or

(c) In the case of a successful Bidder, if he fails to:

(i) Furnish the required Performance Security in accordance with Clause IB.34, or

(ii) Sign the Contract Agreement, in accordance with Clause IB.35.

IB.16 Validity of Bids

16.1 Bids shall remain valid for **120** days after the date of Bid opening as prescribed in Clause IB.19.

16.2 In exceptional circumstances prior to expiry of original Bid validity period, the Employer may request the Bidders to extend the period of validity for a specified additional period which shall in no case be more than the original Bid validity period. The request and the responses thereto shall be made in writing. A Bidder may refuse the request without forfeiture of his Bid Security. A Bidder agreeing to the request will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.15 in all respects in which case, the Employer will be obligated to compensate the Bidders, upon substantiation for their increase in costs (if it is a fixed price bid).

IB.17 Format and Signing of Bid

17.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.

17.2 All Schedules to Bid (A to H) are to be properly completed and signed.

17.3 No alteration is to be made in the Form of Bid nor in the Schedules thereto except in filling up the blanks as directed. If any alteration be made or if these instructions be not fully complied with, the Bid may be rejected.

17.4 The Bidder shall prepare one original of the **"TECHNICAL BID"** and one original of the **"FINANCIAL BID"** comprising the Bid and clearly mark it **"ORIGINAL-TECHNICAL BID"** and **"ORIGINAL-FINANCIAL BID"**. In addition, the Bidder shall submit **two (2) copies** of the Bid and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

17.5 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign (in the case of copies, Photostats are also acceptable). This shall be indicated by submitting a written Power of Attorney authorizing the signatory of the Bidder to act for and on behalf of the Bidder. All pages of the Bid and Schedules to Bid shall be initialed and stamped by the person or persons signing the Bid.

17.6 The Bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

17.7 Bidders shall indicate in the space provided in the Form of Bid their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their Bids and the Contract is to be sent.

17.8 Bidders should retain a copy of the Bidding Documents as their file copy.

(D) SUBMISSION OF BIDS

IB.18 Sealing and Marking of Bids

18.1 Each Bidder shall submit his Bid as under:

(a) ORIGINAL and two copies of the **"TECHNICAL BID",** & ORIGINAL and two copies of the **"FINANCIAL BID"** shall be separately sealed and put in separate envelopes and marked as such.

(b) The envelopes containing the Original and copies of the **"TECHNICAL AND FINANCIAL BIDS"** will be put in outer sealed envelope and addressed / identified.

(c) The Technical Bid should comprise of documents listed in IB 9.1(A) & the price bid should comprise of documents listed in IB 9.1 (B) which shall be placed in separate envelopes in accordance with IB 9.1.

18.2 The inner and outer envelopes shall;

(a) Be addressed to the Employer at the address given in Sub-Clause 6.1 heretofore.

(b) Bear the Project name, Contract No. and Date of opening of Bid.

(c) Provide a warning not to open before the time and date for Bid opening.

18.3 The Bid shall be delivered in person or sent by registered mail at the address to Employer as mentioned in the Invitation to Bids.

18.4 In addition to the identification required in Sub-Clause 18.2 hereof, the inner envelope shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared "late" pursuant to Clause IB.20.

18.5 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

IB.19 Deadline for Submission of Bids

19.1

(a) Bids must be received by the Employer at the address specified in Invitation for Bids not later than the time and date stipulated in the Invitation for Bids.

(b) Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the Bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of Bids.

(c) Where delivery of a Bid is by mail and the Bidder wishes to receive an

acknowledgment of receipt of such Bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed Bid package.

(d) Upon request, acknowledgment of receipt of Bids will be provided to those making delivery in person or by messenger.

19.2 Bids submitted through telegraph, telex, fax or e-mail shall not be considered.

19.3 The Employer may, at his discretion, extend the deadline for submission of Bids by issuing an addendum in accordance with Clause IB.7, in which case all rights and obligations of the Employer and the Bidders previously subject to the original deadline will thereafter be subject to the deadline as extended.

IB.20 Late Bids

20.1 (a) Any Bid received by the Employer after the dead line for submission of Bids prescribed in Clause IB.19 will be returned unopened to such Bidder.

(b) Delays in the mail, delays of person in transit, or delivery of a Bid to the wrong office shall not be accepted as an excuse for failure to deliver a Bid at the proper place and time. It shall be the Bidder's responsibility to determine the manner in which timely delivery of his Bid will be accomplished either in person, by messenger, courier service or by mail.

IB.21 Modification, Substitution and Withdrawal of Bids

21.1 Any Bidder may modify, substitute or withdraw his Bid after Bid submission provided that modification, substitution or written notice of the withdrawal is received by the Employer prior to the deadline for submission of Bids.

21.2 The modification, substitution or withdrawal of any Bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.18 with the outer and inner envelopes additionally marked **"MODIFICATION", "SUBSTITUTION"** or **"WITHDRAWAL",** as appropriate.

21.3 Withdrawal of a Bid during the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified in the Form of Bid may result in forfeiture of the Bid Security pursuant to Clause IB.15.

(E) BID OPENING AND EVALUATION

IB.22 Bid Opening

22.1 A committee consisting of nominated members by the Employer and by the Project Manager / Engineer will open the Technical Proposals / Bids, including withdrawals, substitution and modifications made pursuant to Clause IB.21, in the presence of Bidders' representatives who choose to attend, at the time, date and location stipulated in the Invitation for Bids. Technical Bids will be opened first. The Financial Proposals Bids of the Bidders will remain unopened and will be held in custody of the Employer until the specified time of their opening. At the end of the evaluation of the Technical Bids, the Employer will invite Bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend opening of the Price Bids.

The Bidders' representatives who are present shall sign in a register evidencing their attendance.

22.2 Envelopes marked **"MODIFICATION", "SUBSTITUTION"** or **"WITHDRAWAL"** shall be opened and read out first and the name of the Bidder shall be read out. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.21 shall not be opened.

22.3 The Bidder's name, Bid Prices, unit rates, any discount offered, Bid modifications, substitutions and withdrawals, the presence or absence of Bid Security, and such other details as the Employer at its discretion may consider appropriate, will be announced by the Employer at the Bid opening. The Employer will record minutes of Bid opening.

Any Bid Price or discount which is not read out and recorded at Bid opening will not be taken

into account in the evaluation of Bid. Any discount offered by the Bidder on its quoted prices, shall only be considered if such discount is either shown on the duly filled- in, signed and stamped Form of Bid / Letter of price bid or on the Summary Page of the quoted amount for Lump sum contract/bill of quantities as applicable. In case of any discrepancy or difference in the rate or amount of discount mentioned in the Form of Bid / Letter of price bid (as duly filled-in and signed), and on the Summary Page of the Priced BOQ, the discount shown on the Priced BOQ shall prevail. Discount, if offered, through a separate letter of discount submitted with the Bid, will not be entertained and shall be considered null & void.

22.4 Discounts offered for lesser period than the Bid validity shall not be considered in evaluation.

IB 22A Technical Evaluation Criteria

A. Mandatory Requirements

For consideration of the Technical Proposals submitted by the bidders following are the mandatory requirements:

i. PEC registered firm having valid PEC license in **C-1 Category & above** valid for the year 2022, 2023 having specialization codes of CE-10, EE-04 & EE-05.

ii. Bid Security as mentioned in Instruction to Bidders Clause IB-15.

iii. Provision of certificate that the Bidder will comply with all Technical Specifications/Tests indicated in technical document of all original equipment manufacturer.

iv. Documentary evidence of the year of establishment and registration papers (Incorporation Certificate) Partnership Deed, of the bidding firm or firms.

v. At least 01 (One) project of 132kV or higher voltage Grid Station successfully completed/energized in last 05 (five) years, on turnkey basis.

vi. A detailed description of the proposed Works.

vii. Drawings, including plans, elevations and typical cross-sections; these may be A1 size and/or bound A3 volumes, at 1:1000 to 1:100 scales.

viii. For the following BOQ Items the bidders must submit the manufacturers' brochures/ specifications/ details including their consent letters for their ability to provide these items of Plant including spares.

a) 132 kV Switchgear Equipment.

b) Power Transformer (132/11.5 kV; 31.5/40 MVA).

c) Control & Protection System.

d) MV Switchgear.

ix. The list of recommended spare parts for the plant good enough for two years of operations (except for any limited time expiry items which would be properly identified with their normal expiry times).

x. Affidavit on the stamp paper (duly notarized) of Rs. 100/- that the bidding firm or all the firms in case of (JV) is not black listed by any Procuring Agency, Govt. or Semi-Govt. Departments, Autonomous bodies, International Organization and any Client/Employer, DHA or Cantonment in Pakistan.

xi. List of any present or past litigation of the Bidding Firm or both the firms in case of (JV) with any Organization, Govt. Dept. or private concern (**If "No" write "Nil" and submit an affidavit on Stamp Paper (duly notarized) of Rs. 100/- in this regard**). Litigation statement shall be provided in the following format:

Sr. No.	Name of Person / Entity	Litigation Nature	Name of Project	Litigation date	Litigation result in Progress / Concluded	If Concluded mention Result

Further evaluation of only those bidders will be done who have cleared all the Mandatory requirements. Bids of applicants who do not have the required PEC License and / or have not provided the above mandatory documents, will be declared as non-responsive, will not be processed further and their financial bids will be returned un-opened.

B. Qualification Requirements

Following documents shall be evaluated (only for those Bidders who clear all mandatory requirements) on the basis of points as detailed below. Financial proposal of only those bidders shall be opened whose Technical Proposal gets 50% in each of the four categories mentioned below and 70 overall qualifying points out of 100 maximum points. The following information shall be presented in an orderly manner and no extra/ additional information is required so as to facilitate efficient evaluation.

1. Previous Experience Max. Point 30

a) <u>Completed Works Documents Requirement</u>

The applicant should submit his previous work experience as follows, to be considered for qualification purpose (Only those projects will be considered whose paper work as identified below are, attached):

A) If the applicant has carried-out the work as Main Contractor:

i) Work-order by Employer in the name of Contractor identifying the Project and Contract amount.

ii) Completion certificate

iii) Satisfactory Performance Certificate (for at least 2 Years)

B) If the applicant has worked as sub-contractor:

i) Works Award in the name of Main Contractor identifying the contract work and contract amount.

ii) Sub-Contract between main Contractor and the applicant duly identifying the Scope of the Work and sub-contract amount.

iii) Completion certificate from Employer to the main contractor and

iv) Completion certificate from main contractor to sub-contractor

b) <u>Qualification Criteria for Completed Works</u> Max Point 10

a) Experience of General Electrical Works in last 10 years, (02 points for each project of Rs. 100 million or above upto a maximum of 05 such projects). Documentary proof (i.e., work order & completion certificate) be attached. The projects should be presented strictly in the following format and no additional information should be given.

Sr. No.	Name of Work	Employer / Client	Amount (Rs.)	Date		Documents enclosed (Y/N)	
				Start	End	W-order	Completion
1							

2							
3							

Note:-

1. *Pro-rata lesser points shall be given in-case of bidders' submission details are smaller than the required criteria.*

b) Experience of specific exp. i.e., installation of Grid Station (132 kV or higher voltage), on Turnkey basis, completed/energized in last 05 years. (7.5 points for each project up to a maximum of 02 such projects). Documentary proof (work order & completion certificate) must be attached. The projects should be presented strictly in the following format and no additional information should be given. Max Point 15

Sr. No.	Name of Work	Employer / Client	Amount (Rs.)	Date		Documents enclosed (Y/N)	
				Start	End		
						W-order	Completion
1							
2							

c) <u>In-Hand Works Documents Requirement</u>

The applicant should submit his in-hand work as follows, to be considered for qualification purpose (Only those projects will be considered whose paper work as identified below are, attached):

A) If the applicant is working as the Main Contractor:

i) Work-order by Employer in the name of Contractor identifying the Project and Contract amount

B) If the applicant is working as the Sub-Contractor:

i) Works Award in the name of Main Contractor identifying the contract work and contract amount and

ii) Sub-Contract between main Contractor and the applicant duly identifying the Scope of the Work and sub-contract amount.

d) <u>Qualification Criteria for In-Hand Works</u> Max. Point 05

- Experience of specific exp. i.e., installation of Grid Station (132 kV or higher voltage), works in hand on Turnkey basis. (05 points for each project up to a maximum of 01 such project. Documentary proof (work order) must be attached. The projects should be presented strictly in the following format and no additional information should be given.

Sr. No.	Name of Work	Employer / Client	Amount (Rs.)	Date		Documents enclosed (Y/N)
				Start	End	
						W-order
1						

1. Proposed Construction Schedule, Method Statement & Organization Chart Max. Point 20

a) Proposed Detailed Time Schedule (inter-relating all the sub-heads of the works) Max. Point 06

b) Detailed Method Statement (inter-relating all the sub-heads of the works) Max. Point 03

c) Organization Chart of the proposed project team. Max. Point 02

d) Proposals for training. Max. Point 02

e) Proposals for post-contract technical support and supply of spare parts. Max. Point 02

f) The bidder shall provide with his Technical Bid, at least three names of Independent Laboratories of International Repute **as per requirement of NTDC** for testing of the equipment in nearest international location for the approval of Employer/ Engineer. Visit of the selected Laboratory by the Representatives of Employer and Engineer prior to its approval. Max. Point 03

g) The manpower required to run, operate and maintain his proposed plant with sufficient details of the designation as well as qualification / experience requirement of each individual position. Max. Point 02

2. Proposed Design & Execution Team for Project Max. Point 25

a) Previous Design Experience of Proposed Design team. Max. Point 10

The Proposed Design Team must have experience, as Prime Designer of 132/11 kV Grid Station of at least 40 MVA Power Transformer capacity, duly successfully completed and in **operation for last 03 years.**

TWO POINTS for each 132/11 kV Grid Station designed by the Design Team [either i) for the Employer directly or ii) as part of the Design / Built Turnkey team or iii) for a Design- Built Turnkey Contractor who have been awarded the project by an Employer], with complete design works, of 40 MVA capacity or above upto a maximum of 5 such projects. Documentary proof be attached. The projects should be presented strictly in the following format and no additional information should be given:

Sr. No.	Name of Work	Employer / Client	Name of Contractor	Capacity in MVA	Completion Date / Year	Document (Completion Certificate)
1						
2						

Only those projects will be considered whose Work-orders are attached issued either i) by the Employer in the name of the Design Team as Prime Designers OR ii) by a Design- Built Turnkey Contractor in the name of the Design Team mentioning clearly that the Design Team has designed the said Transformers.

In this case the letter issued by the Employer of the said project in the name of the said Design- Built or Turnkey Contractor shall be attached.

b) Type Test Reports of similar capacity equipment of proposed manufacturer **as per requirement of NTDC** for the following items: - Max. Point 05

- **i)** Circuit Breaker
- **ii)** Disconnector
- **iii)** Current & Voltage Transformer
- **iv)** Power Transformer
- **v)** Medium Voltage Switchgear
- **vi)** Surge Arrester
- **vii)** Insulators (Disk & Post)
- **viii)** Hardware (Connectors and Strings)

c) Proposed Project Manager — Max. Point 10

- Proposed Project Manager - At-least BE (Elec.) registered in PEC as Professional Engineer with at- least 15 years overall experience out of which minimum 5 Years' experience should be in Constructions of Grid Stations (detailed CV along with PEC registration, to be submitted).
  a) Qual. = 4 points (02 points for BE and 04 points for MS).
  b) Exp. = 6 points (03 points for each Grid Station).

3. Documentary evidence of Financial Soundness — Max. Points 25

a) Comprehensive Audited Reports from Chartered Accountant of the firm for last 05 years — Max. Points 05

b) Average Annual Turnover of last 05 years (to be ascertained from Audited Reports or Income Tax return dully accepted by FBR). — Max. Points 20

o Less than Rs. 150 million	00 Points
o Above Rs. 150 million to Rs. 300 million	04 Points
o Above Rs. 300 million to Rs. 450 million	08 Points
o Above Rs. 450 million to Rs. 600 million	12 Points
o Above Rs. 600 million to Rs. 750 million	16 Points
o More than Rs. 750 million	20 Points

Note: -

FIEDMC may verify the validity of submitted documents from the respective Employers / Clients / Banks / Auditors, etc. and if it is found out that any fake / misleading / un-verifiable document and / or information has been provided by the Bidder than the subject Bid would be liable for rejection and proceedings for blacklisting of the bidder may be initiated as per Punjab PPRA rules.

IB 22B Financial Proposal Opening

1. At the end of the evaluation of the Technical Bids, the Employer will invite only those bidders who have been technically qualified and substantially responsive.

2. Financial proposal/ Bids of only those bidders shall be opened whose Technical Proposal get 50% points in each of the four categories and 70 overall qualifying points out of 100 maximum points (mentioned in IB 22A Technical Evaluation Criteria).

3. The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Proposals/ Bids being substantially non-responsive to the requirements of the Bidding Document and return their Price Bids unopened before inviting others, who are determined as being qualified, to attend the opening of Price Bids.

4. The Employer shall conduct the opening of Financial Proposals/ Bids of Technically qualified Bidders, public ally in the presence of Bidders' representatives who choose to attend at the address, date and time specified by the Employer.

   The bidders' representatives who are present shall sign in a register, evidencing their attendance.

5. The bidder's name, Bid Prices, unit rates and any discount, and such other details as the Employer at its discretion may consider appropriate, will be announced by the Employer at the bid opening. The Employer will record minutes of bid opening.

   Any Bid Price or discount which is not read out and recorded at bid opening will not be taken into account in the evaluation of bid.

IB.23 Clarification of Bids

23.1 To assist in the examination, evaluation and comparison of Bids, the Employer may, at its discretion, ask the Bidder for a clarification of its Bid. The request for clarification and the response shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

IB.24 Preliminary Examination & Determination of Responsiveness of Bids

24.1 Prior to detailed evaluation pursuant to Clause IB.26, the Employer will determine the responsiveness of the Bids as follows:

(a) The Employer will examine the Bids to determine whether;

- (i) The Bid is complete and does not deviate from the scope.
- (ii) Any computational errors have been made.
- (iii) Required sureties have been furnished.
- (iv) The documents have been properly signed.
- (v) The Bid is valid till required period.
- (vi) The Bid prices are firm during currency of contract if it is a fixed price bid.
- (vii) Completion period offered is within specified limits.
- (viii) The Bidder/Manufacturer is eligible to Bid and possesses the requisite experience.
- (ix) The Bid does not deviate from basic technical requirements; and
- (x) The Bids are generally in order.

(b) A bid is likely not to be considered, if;

- (i) It is unsigned,
- (ii) Its validity is less than specified,
- (iii) It is submitted for incomplete scope of work,
- (iv) It indicates completion period later than specified,
- (v) It indicates that Works and materials to be supplied do not meet eligibility requirements,
- (vi) It indicates that Bid prices do not include the amount of income tax, and

(vii) Alteration in Form of Bid as per IB.17.3.

(c) A bid will not be considered, if;

(i) It is not accompanied with bid security,

(ii) It is submitted by a Bidder who has participated in more than one Bid,

(iii) It is received after the deadline for submission of Bids,

(iv) It is submitted through fax, telex, telegram or email,

(v) It indicates that prices quoted are not firm during currency of the contract whereas the Bidders are required to quote fixed price(s),

(vi) The Bidder refuses to accept arithmetic correction,

(vii) It is materially and substantially different from the Conditions / Specifications of the Bidding Documents.

It is after review and determination of the responsiveness as per above that further action on technical evaluation will be taken.

24.2 Arithmetical errors will be rectified on the following basis:

If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between the words and figures the amount in words shall prevail. If there is a discrepancy between the total Bid price entered in Form of Price Bid and the total shown in Schedule of Prices Summary, the amount stated in the Form of Price Bid will be corrected by the Employer / Project Manager / Engineer in accordance with the Corrected Schedule of Prices.

If the Bidder does not accept the corrected amount of Bid, his Bid will be rejected, and his Bid Security forfeited.

24.3 Prior to the detailed evaluation, pursuant to Clause IB.26 the Employer will determine the substantial responsiveness of each Bid to the Bidding Documents. For purpose of these Clauses, a substantially responsive Bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations.

A material deviation or reservation is one:

(i) Which affect in any substantial way the scope, quality or performance of the Works;

(ii) Which limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the Contract; or

(iii) Whose rectification / adoption would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.

The Employer's / Project Manager / Engineer's determination of a Bid responsiveness will be based on the contents of the Bid itself without recourse to irrelevant evidence.

24.4 A Bid determined as substantially non-responsive will be rejected and will not subsequently be made responsive by the Bidder by correction of the non-conformity.

24.5 Any minor informality or non-conformity or irregularity in a Bid which does not constitute a material deviation may be waived by Employer, as long as the waiver does not prejudice or affect the relative ranking of any Bidder.

IB.25 Conversion to Single Currency

Delete the sub-clause in its entirety.

IB.26 Detailed Evaluation of Bids

26.1 Only the Bids previously determined to be substantially responsive pursuant to Clause IB.24 will be evaluated and compared in detail by the Employer / Project Manager / Engineer as per the requirements given hereunder:

26.2 Evaluation and Comparison of Bids

(a) Bids will be evaluated for each item and/or complete scope of work.

(b) Basis of Price Comparison

The prices will be compared on the basis of the Evaluated Bid Price pursuant to Para (e) herein below.

(c) Technical Evaluation

It will be examined in detail whether the Plant/facility offered by the Bidder comply with the Technical Provisions of the Bidding Documents. For this purpose, design offered by the Bidder will be reviewed for which the Bidder's data submitted with the Bid under Schedule A to Bid (Specific Works Data) will be compared with the technical features/criteria of the Plant/facility detailed and prescribed by the Employer in these documents. Other technical information submitted with the Bid regarding the Scope of Work will also be reviewed including importations, if any, required.

(d) Commercial Evaluation

It will be examined in detail whether the Bids comply with the commercial/ contractual conditions of the Bidding Documents. It is expected that no major deviation/ stipulation shall be taken by the Bidders.

(e) Evaluated Bid Price

In evaluating the Bids, the Employer will determine for each Bid in addition to the Bid Price, the following factors (adjustments) in the manner and to the extent indicated below to determine the Evaluated Bid Price:

(i) Making any correction for errors pursuant to Sub-Clause 24.2 hereof.

(ii) Excluding Provisional Sums, if any, but including priced Day work.

(iii) Making an appropriate adjustment for any other acceptable variation or deviation.

26.3 Evaluation Methods

Pursuant to Sub-Clause 26.2, Para (e) (iii) following evaluation methods for price adjustments will be followed in the financial evaluation:

(a) Price Adjustment for Completeness in Scope of Work

(b) Price Adjustment for Technical Compliance

(c) Price Adjustment for Commercial Compliance

(d) Price Adjustment for Deviations in Terms of Payment

(e) Price Adjustment for Completion Schedule

(i) Price Adjustment for Completeness in Scope of Work

In case of omission in the scope of work of a quoted item, no price adjustment for the omitted item(s) shall be applied provided that the Bidder has mentioned in his Bid that the same is covered in any other item.

The price adjustment shall not justify any additional payment by the Employer. The price(s) of omitted item(s) shall be deemed covered by other prices of the Schedule of Prices.

(ii) Price Adjustment for Technical Compliance

The cost of making good any deficiency resulting from technical non-compliance will be added to the Corrected Total Bid Price for comparison purposes only. The adjustments will be applied taking the average price quoted by other Bidders being evaluated in detail in their original Bids for corresponding item. In case of non-availability of price from other Bidders, the price will be estimated by the Project Manager / Engineer.

(iii) Price Adjustment for Commercial Compliance

The cost of making good any deficiency resulting from any quantifiable acceptable variations and deviations from the Bid Schedules and Conditions of Contract, as determined by the Employer will be added to the Corrected Total Bid Price for comparison purpose only. Adjustment for commercial compliance will be based on Corrected Total Bid Prices.

(iv) Price Adjustment for Deviation in Terms of Payment

If a bid deviates from the terms of payment/ payment conditions as specified in the Conditions of Contract and if such deviation is considered acceptable to the Employer, mark-up earned for any earlier payments involved in the terms outlined in the Bid as compared to those stipulated in the Conditions of Contract shall be calculated at the following **mark-up rates KIBOR +2% per annum** and shall be added to the Corrected Total Bid Price for comparison purposes only.

(v) Price Adjustment for Completion Schedule

Bids indicating completion in advance of the dates stated in Preamble to Conditions of Contract, no credit will be given in this evaluation.

Bids indicating completion period later than the period set out in Preamble to Conditions of Contract shall be adjusted in the evaluation by adding a factor of 0.05% of the Corrected Total Bid Price for each calendar day of completion later than specified period of the completion.

26.4 If the Bid of the successful Bidder is seriously unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Schedule of Prices to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in Clause IB.34 be increased at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

IB.27. Domestic Preference

27.1 In the comparison of evaluated Bids, the Goods manufactured in Pakistan, will be granted a margin of preference in accordance with the following procedures, provided the bidder shall have established to the satisfaction of Employer that the manufacturing cost of such Goods includes a domestic value addition equal to at least 20% of the ex- factory Bid price of such Goods. Bidders applying for domestic preference shall fill in Appendix-C to these Instructions to substantiate their claim.

27.2 The Employer ***/*** Engineer will first review the Bids to determine, the Bid group classification in accordance with Sub-Clause 10.2 hereof.

27.3 The comparison shall be Ex-factory price of the Goods to be offered from within Pakistan (such prices to include all costs as well as custom duties and taxes paid or payable on raw materials and components incorporated or to be incorporated in the Goods) and the **DDP** (CIF + Customs Duty, Sales Tax and Other Import Charges) Pakistan seaport price of the Goods to be offered from outside Pakistan.

27.4 The lowest evaluated bid of each Group shall first be determined by comparing all evaluated bids in each Group among themselves taking into account:

(a) In the case of Goods manufactured in Pakistan, sales tax, local body charges and other similar taxes which will be payable on the furnished Goods in Pakistan.

(b) In the case of Goods of foreign origin offered from abroad, customs duties, sales tax and other import charges which will be payable on furnished Goods in Pakistan.

(c) In the case of Goods of foreign origin already located in Pakistan, customs duty, sales tax and import charges on CIF price as applicable for Sub-Clause 27.4(b) hereabove.

27.5 The price preference to Group A bids will be:

(i) 15% of the ex-factory bid price, if the value addition through indigenous manufacturing is at least 20%;

(ii) 20% of the ex-factory bid price, if the value addition through indigenous manufacturing is over 20% and up to 30%; and

(iii) 25% of the ex-factory bid price, if the value addition through indigenous manufacturing is over 30%.

27.6 The applicable price preference i.e., as per Sub-Clause 27.5 here above will be applied to Group A Bid by reducing the ex-factory bid price.

IB.28 Process to be Confidential

28. 1 Subject to Clause 23 heretofore, no Bidder shall contact Employer and / or Project Manager / Engineer on any matter relating to its Bid from the time of the Bid opening to the time the Bid evaluation result is announced by the Employer. The evaluation result shall be announced at least ten (10) days prior to award of Contract. The announcement to all Bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the Bids evaluated.

28.2 Any effort by a Bidder to influence Employer and / or Project Manager / Engineer in the Bid evaluation, Bid comparison or Contract Award decisions may result in the rejection of his Bid. Whereas any Bidder feeling aggrieved may lodge a written complaint not later than fifteen (15) days after the announcement of the Bid evaluation result; however, mere fact of lodging a complaint shall not warrant suspension of the procurement process.

(F) AWARD OF CONTRACT

IB.29. Post-Qualification

29.1 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:

Provided that such qualification shall only be laid down after recording reasons therefore in writing. They shall form part of the records of that bid evaluation report.

29.2 The determination will take into account the Bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualification submitted under Appendix B to Instructions to Bidders "Evidence of Bidder's Capability" by the Bidder pursuant to Clause IB.13, as well as such other information as required under the Bidding Documents.

29.3 An affirmative determination will be a pre-requisite for award of the Contract to the lowest evaluated Bidder. A negative determination will result in rejection of that Bidder's Bid in which event, Employer will proceed to undertake a similar determination of the next lowest evaluated Bidder's capabilities to perform the Contract satisfactorily.

IB.30 Award Criteria

30.1 Subject to Clause IB.32, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price, provided that such Bidder has been determined to be qualified to satisfactorily perform the Contract in accordance with the provisions of Clause IB.29.

IB.31 Employer's Right to Vary Quantities

31.1 Employer reserves the right at the time of award of Contract to increase or decrease by up to 15% the quantity of Plant and Services contained in the Schedule of Prices without any change in the unit price or other terms and conditions.

IB.32 Employer's Right to Accept any Bid and to Reject any or all Bids

32.1 Notwithstanding Clause IB.30, the Employer reserves the right to accept or reject any Bid, and

to annul the bidding process and reject all Bids, at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or any obligation to inform the affected Bidders of the grounds for the Employer's action except that the grounds for its rejection shall upon request be communicated, to any Bidder who submitted a Bid, without justification of grounds. Rejection of all Bids shall be notified to all Bidders promptly.

32.2 No negotiation with the Bidder having been evaluated as lowest responsive or any other Bidder shall be permitted. However, the Employer may have clarification meeting(s) to get clarified any item(s) in the Bid evaluation report.

IB.33 Notification of Award

33.1 Prior to expiration of the period of Bid validity prescribed by the Employer, the Employer will notify the successful Bidder in writing ("Letter of Acceptance") that his Bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the design, execution and completion of the Works/facility by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Contract Price").

33.2 The Letter of Acceptance and its acceptance by the Bidder will constitute the formation of the Contract, binding the Employer and the Bidder till signing of the formal Contract Agreement.

33.3 Upon furnishing by the successful Bidder of a Performance Security, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful and return their Bid securities.

IB.34 Performance Security

34.1 The successful Bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Conditions of Contract within a period of twenty-eight (28) days after the receipt of Letter of Acceptance.

34.2 Failure of the successful Bidder to comply with the requirements of Sub-Clauses IB.34.1, IB.35 or Clause IB.44 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

IB.35 Signing of Contract Agreement

35.1 Within fourteen (14) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send to the successful Bidder the Form of Contract Agreement provided in the Bidding Documents, duly filled in and incorporating all agreements between the parties for signing and return it to the Employer.

35.2 The formal Agreement between the Employer and the successful Bidder shall be executed within fourteen (14) days of the receipt of such Form of Contract Agreement by the successful Bidder from the Employer.

(G) ADDITIONAL INSTRUCTIONS

IB.36 Instructions not Part of Contract

36.1 Bids shall be prepared and submitted in accordance with the above Instructions to Bidders including Additional Instructions which are provided to assist Bidders in preparing their Bids, and do not constitute part of the Bid or the Contract Documents.

IB.37 Contract Documents

37.1 The Documents which will be included in the Contract are listed in the Form of Contract Agreement set out in these Bidding Documents.

IB.38 Sufficiency of Bid

38.1 Each Bidder shall satisfy himself before bidding as to the correctness and sufficiency of his Bid and of the rates and prices entered in the Schedule of Prices. Except in so far as it is otherwise expressly provided in the Contract, the rates and prices entered in the Schedule of Price shall cover all his obligations under the Contract and all matters and things necessary for the proper completion of the Works/facility.

IB.39 One Bid per Bidder

39.1 Each Bidder shall submit only one Bid either by himself, or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid will be disqualified and Bids submitted by him shall not be considered for evaluation and award.

IB.40 Bidder to inform himself

40.1 The Bidder is advised to obtain for himself at his own cost and responsibility all information that may be necessary for preparing the Bid and entering into a Contract for execution of the Works / Facility. This shall include but not be limited to the following:

(a) Inquiries on Pakistani Income Tax to the Commissioner of the Income Tax and Sales Tax, **(Federal and / or Provincial).**

(b) Inquiries on customs duties and other import taxes, to the concerned authorities of Customs and Excise Department.

(c) Information regarding port clearance facilities, loading and unloading facilities, storage facilities, transportation facilities and congestion at Pakistan seaports.

(d) Investigations regarding transport conditions and the probable conditions which will exist at the time the Plant will be actually transported.

IB.41 Alternate Proposals by Bidder

41.1 Should any Bidder consider that he can offer any advantage to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his Bid to be submitted in strict compliance with the Bidding Documents, submit any Alternate Proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Form of Bid shall be that which represents complete compliance with the Bidding Documents.

41.2 Alternate Proposal(s), if any, of the lowest evaluated responsive Bidder only may be considered by the Employer as the basis for the award of Contract to such Bidder.

IB.42 Site Visit and Local Conditions

42.1 Bidder must verify and supplement by his own investigations the information about site and local conditions. However, Employer will assist the Bidder wherever practicable and possible.

42.2 All Bidders are required to visit the site at their own expense to review the areas allocated for the Plant and the interfacing facilities, if any. Bidders may also wish to study local conditions, available facilities, communications, craft wages, roads and other transport facilities. Bidders shall also acquaint themselves with the relevant laws, rules, and regulations of Pakistan.

42.3 The Bidders and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the Bidders, their personnel and agents, will release and indemnify the Employer, his 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 such inspection.

IB.43 Pre-Bid Meeting

43.1 The Employer may, at his own or at the request of any prospective Bidder(s), hold a Pre- Bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of Pre-Bid meeting, if convened, shall be intimated through letter for invitation.

All prospective Bidders or their authorized representatives shall be invited to attend such a Pre-Bid meeting.

IB.44 Integrity Pact

44.1 The Bidder shall sign and stamp the Integrity Pact provided in Schedule-J to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding Rupees ten

million. Failure to provide such Integrity Pact shall make the Bid non- responsive.

IB.45 General Performance of the Bidders

45.1 The Employer reserves the right to obtain information regarding performance of the Bidders on their previously awarded contracts/ works (Schedule-I to bid). The Employer may in case of consistent poor performance of any Bidder as reported by the employers of the previously awarded contracts, interiliac, reject his bid and/or refer the case to the Pakistan Engineering Council. Upon such reference, PEC in accordance with its rules, procedures and relevant laws of the land take such action as may be deemed appropriate under the circumstances of the case including black listing of such Bidder and debarring him from participation in future bidding for similar works.

IB.46 Pre-Bid Meeting

Pre-Bid meeting to be held as per the following venue, time and date:

Venue: Faisalabad Industrial Estate Development & Management Company (FIEDMC),

Main Gate, M-3 Industrial City, Near Sahianwala Interchange, M-4 Motorway, Faisalabad.

Time: _____ Hours

Date: _____

(H) APPENDICES

The Appendices to ITB are as given below:

- Appendix-A: Name of Eligible Countries
- Appendix-B: Evidence of Bidder's Capabilities
- Appendix-C: Domestic Goods (value added in Pakistan)

Appendices are given here below:

APPENDICES TO INSTRUCTIONS TO BIDDERS

APPENDICES

- Appendix-A: Name of Eligible Countries
- Appendix-B: Evidence of Bidder’s Capabilities
- Appendix-C: Domestic Goods (value added in Pakistan)

NAME OF ELIGIBLE COUNTRIES

Eligible Countries for Imported Products:

All imported products under the contract shall be from renowned manufacturers as approved by NTDC.

Note: Origin of equipment should be as per NTDC approval.

Foreign Bidders Eligibility:

Foreign Bidders must be from a country recognized by UN and having diplomatic relations with Islamic Republic of Pakistan and duly Enlisted with Pakistan Engineering Council as Foreign Constructor and licensed for PEC for this specific project as per Byelaw 7 of PEC.

EVIDENCE OF BIDDER'S CAPABILITY

[Note: Bidders to provide the following information with the bid separately and indicate herein its references where this information is available.]

Sr. No.	Information to be Supplied	Bid References
1.	Name of bidder, business address and country of incorporation.	
2.	Type of firm whether individually owned, partnership, corporation or joint venture and the names of its owners or partners.	
3.	**(a)** The annual reports giving general description of the firm, sort of business carried out, balance sheets, profit and loss statements, turn over and business done by the firm, duly authenticated, for the last five (5) years. Audited Balance Sheets for the preceding five (5) years and projected assets and liabilities for the next two (2) years shall be provided. i. Total value of works in hand on bid opening/ preparation date. ii. Total value of works completed in last three years.	
4.	Has successfully completed/energized at least One (1) project of Grid Stations (132 kV or higher voltage). Satisfactory Certificate from end user will be provided. (Schedule-I to bid)	
5.	Location and address of manufacturing facilities.	
6.	Full description of factories owned and the annual manufacturing capacities of various items made therein.	
7.	Details of the facilities where the offered equipment is proposed to be manufactured. This description should include the facilities and capacities of the particular factories including testing facilities and the processes used in manufacturing and testing. Where parts or components are purchased from outside, the details of equipment purchased and the names and experience record of the suppliers.	
8.	Detailed description of the quality control testing and research facilities. If the equipment is manufactured under license, the name of the licensee and details of the licensing arrangements, such as the duration of the license, the facilities provided to the Bidder by the licensee and whether future improvements are available or not etc. A copy of the license agreement may be attached. Quality Control/ Quality assurance plan must also be submitted.	

Sr. No.	Information to be Supplied	Bid References
9.	**(a)** Names, qualifications and experience of the key technical personnel along with Resumes.	
	(b)	
	(i) Nos. of total permanent Staff on roll of the company.	
	(ii) Nos. of total qualified engineers on roll of the company.	
10.	The time since the manufacturer has been in this business and the time since he has been doing work of similar nature.	
11.	The time since the particular equipment offered has been manufactured and the time for which it has been in service. The manufacturer shall have the experience stated in Sub-Clause IB 13.4 (a).	
12.	Reference lists of similar works done by the Bidder in its country and abroad indicating the name of customer, description and quantity of product, year of supply and the approximate value. This is an important consideration and should be filled in with full details (attach separate sheet if needed).	
13.	Details of projects under execution and future contractual commitments (for each partner, in case of a joint venture).	
14.	**(a)** Banking reference, names of banks and addresses may be given to whom reference regarding financial capability of the Bidder may be made, with authority to make inquiries from the Bidder's bankers and clients regarding any financial and technical aspects (for each partner, in case of a joint venture).	
	(b) Detail of OD limit allowed to the firm by the bank for the business including amount and its validity period.	
15.	Health, Safety and emergency plan as well as Risk Management plan for the project.	
16.	Detailed / Integrated work plan alongwith methodology to complete the assignment.	
17.	Information on any litigation or arbitration resulting from contracts completed or under execution by the Bidder over the last ten (10) years. The information shall indicate the parties concerned, the matter of dispute, the disputed amounts and the result thereof (for each partner, in case of a joint venture).	

Domestic Goods (Value added in Pakistan)

[Bidders claiming eligibility for domestic preference should fill in for supply items only, all columns hereunder and provide necessary documentation to substantiate their claim]

Sr. No.	Description of Indigenous Goods	Unit	Qty.	Total Price of Goods Ex-Factory (Pak Rs.)	Domestic value added in the manufacturing cost as percentage of Ex-Factory price	Amount of value addition (Pak Rs.)
1	2	3	4	5	6	7
Total in Columns 5 & 7						

Computations:

A. Total amount of Value Addition (from Col. 7) Rs. _____

B. Total Ex-Factory Price of Indigenous Goods (from Col. 5) Rs. _____

C. Total DDP Price of imported supply items Eqv. Rs. _____

D. Total price of supply items [B+C] Eqv. Rs. _____

E. % of value addition = [(A/D) x 100] _____%

F. Domestic Preference = (15, 20 or 25) % of B Rs. _____

FORM OF TECHNICAL BID
&
SCHEDULES TO BID

TO BE SUBMITTED BY THE BIDDER ON HIS COMPANY LETTER PAD

Date:_____

Bid Reference No: _____

FORM OF TECHNICAL BID

Chief Executive Officer (CEO),
Faisalabad Industrial Estate
Development & Management
Company (FIEDMC),
Main Gate, M-3 Industrial City, Near
Sahianwala Interchange, M-4
Motorway, Faisalabad.
Tel # 041-8900201-7

Subject: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 kV AIS GRID STATION NO. 02, WITH TWO NOS. 31.5/40 MVA POWER TRANSFORMERS AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD (CONTRACT NO. GS-AIIC-02 (R-I)).**

Gentlemen,

1. Having examined the Bidding Documents including Instructions to Bidders, Conditions of Contract, Specifications, Drawings, Schedule of Prices and Addenda Nos._____ for the execution of the above- named Works, we, the undersigned, being a company doing business under the name of and address _____
_____
and being duly incorporated under the laws of _____ hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto.
2. We understand that all the Schedules attached hereto form part of this Bid.
3. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of _____ drawn in the favor of, or made payable to the Employer, _____ and valid for a period of Twenty-Eight (28) days beyond the period of validity of Bid.
4. We undertake that Price Schedules as per requirements of the Bidding Documents are enclosed with the Price Bid.
5. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the whole of the Works comprised in the Contract within the time(s) stated in Preamble to the Conditions of Contract.
6. We agree to abide by this Bid for the period of 120 days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
7. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
8. We undertake, if our Bid is accepted, to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.
9. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other person or persons making a Bid for the Works.

10. We do hereby declare that our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries *[insert the nationality of the Bidder, including that of all parties that comprise the Bidder if the Bidder is a consortium or association, and the nationality of each Subcontractor and Supplier]*.

11. We, including any subcontractors or suppliers for any part of the Contract, do not have any conflict of interest.

12. We are not participating, as a Bidder, in more than one bid in this bidding process.

13. We confirm, if our Bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer. (Please delete in case of Bid from a single firm).

Dated this …… day of.....20…

Signature ……... in the capacity of duly authorized

to sign the Bid for and on behalf of …….

(Name of Bidder in Block Capitals) (Seal of Bidder)

Bidder's Address

……

……

……

Witness:

Signature:

……..

Name: ……

Address:

……

……

……

Occupation

……..

SCHEDULES TO BID

- Schedule A to Bid: Specific Works Data
- Schedule B to Bid: Work to be Performed by Subcontractors
- Schedule C to Bid: Proposed Programme of Works
- Schedule D to Bid: Deviations from Technical Provisions
- Schedule E to Bid: Deviations from Contractual Conditions
- Schedule F to Bid: Method of Performing Works
- Schedule G to Bid: Proposed Organization
- Schedule H to Bid: Integrity Pact

SCHEDULE - A TO BID

SPECIFIC WORKS DATA

WORK BY CONTRACTOR

The works to be executed under this contract, on turnkey basis, includes design, manufacture, insurance to site, delivery to wharf at port of Karachi, unloading and loading at Karachi, transportation to the substation site, unloading and storage at site, erection, testing and commissioning of **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 kV AIS GRID STATION NO. 02, AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**

BIDDING DOCUMENT NO. GS-AIIC-02 (R-I), as specified herein and listed in the schedule of prices.

The substation equipment to be provided, installed, tested and commissioned at the substation includes but is not limited to the following:-

1. Power Transformers
2. Circuit Breakers
3. Disconnectors for bus bar
4. Disconnectors for transformer
5. Current Transformers
6. Surge Arresters
7. High voltage bus work
8. Steel Structures
9. Substation Grounding System
10. Control Panels and Metering Panels
11. Relay Panels and protective relaying systems
12. Control and small Power Cables
13. AC/DC Auxiliary Supplies Systems
14. Equipment foundations including foundation mounting channels and embedded parts for indoor and outdoor equipment.
15. Construction of cable trenches, ducts and drainage system associated with cable trenches and switchyard surface area.
16. All other auxiliary items for the completion of work.
17. Cable trays, ladders, conduits and accessories inside the switchyard and building.
18. Any other item which is not included here but is necessary for integrated operation of the Plant as advised by the Engineer.

SCHEDULE - B TO BID

WORK TO BE PERFORMED BY SUBCONTRACTORS

The bidder will do the work with his own forces except the work listed below which he intends to sub-contract.

Items of Work to be Sub-Contracted	Name and address of Sub-Contractor	Statement of similar works previously executed (Attach evidence)

Note:

1. No change of Sub-Contractor shall be made by the bidder without prior approval of the Employer.
2. The truthfulness and accuracy of the statement as to the experience of Sub-Contractors is guaranteed by the bidder. The Employer's judgment shall be final as to the evaluation of the experience of Sub-Contractors submitted by the bidder.
3. Statement of similar works shall include description, location & value of work, year completed and name & address of the clients.

SCHEDULE – C TO BID

PROPOSED PROGRAMME OF WORKS

Bidder shall provide a Programme in a bar-chart and Primavera (level III) showing the sequence of work items by which he proposes to complete the work of the entire Contract. The Programme should indicate the sequence of work items and the period of time during which he proposes to complete the Works including the activities like designing, schedule of submittal of drawings, ordering and procurement of materials, manufacturing, delivering, construction of civil works, erection, testing and commissioning of Works to be supplied under the Contract.

A separate Bar Chart Showing monthly percentage progress showing major activities related to Cost of Project as per Specimen below be attached which will be considered as "Scheduled Progress" throughout the currency of Contract unless revised with the approval of Client.

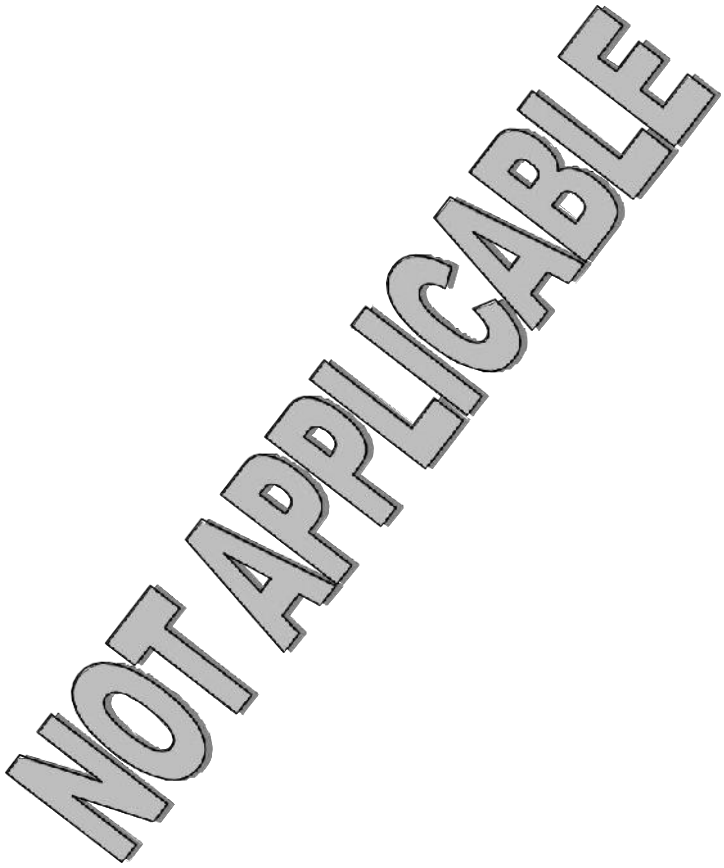
S/No.	Activity	Months										
		1	2	3	4	5	6	7	8	-	-	12
	ABC											
	XYZ											
Percentage Scheduled Progress		5%	10%	17%	20%	30%	-	-	-	-	-	100%

SCHEDULE – D TO BID

DEVIATIONS FROM TECHNICAL PROVISIONS

It is presumed that the bidder shall not take any deviation. However, if he intends to take deviations to the specified terms, those must be listed in the space provided below:

Sr. No.	Clause No. / Section No.	Deviations/Clarifications



[Note: Attach additional sheets, if necessary]

SCHEDULE - E TO BID

DEVIATIONS FROM CONTRACTUAL CONDITIONS

It is presumed that the bidder shall not take any deviation. However, if he intends to take deviations to the specified Contractual/Commercial Conditions, those must be listed in the space provided below:

Sr. No.	Clause No. / Section No.	Deviations/Clarifications

[Note: Attach additional sheets, if necessary]

SCHEDULE – F TO BID

METHOD OF PERFORMING WORKS

The bidder is required to submit a narrative outlining the method of performing the Works. The narrative should indicate in detail and include but not be limited to:

- The sequence and methods in which he proposes to carry out the Works, including the number of shifts per day and hours per shift, he expects to work.
- A list of all major items of constructional and erection plant, tools and vehicles proposed to be used in carrying out the Works at Site, including number of each kind, make, type, capacity of all equipment, working condition, which shall be deployed by him for Civil Workhand Erection, Testing and Commissioning of the Works, in sufficient detail to demonstrate fully that the equipment will meet all the requirements of the Technical Provisions.
- The procedure for installation of equipment and transportation of equipment and materials to the site.
- Details regarding mobilization in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.
- Organization chart indicating head office & field office personnel involved in management, supervision and engineering of the Works to be done under the Contract.

SCHEDULE – G TO BID

PROPOSED ORGANISATION

The bidder shall list in this Schedule the key personnel he will employ from Head office and from Site office to direct and execute the Works, together with their names, qualifications, experience, positions held and their nationalities.

Designation	Name of	Summary of Qualifications Experience, Present Position and Nationality

- Head Office:

- Site Office:

  Contractor's

  Representative

  Site

  Superintendent

  Supervising

  Engineer Plant

  Erectors

  Construction

  Supervisors

  Other Key Staff

SCHEDULE – H TO BID

(INTEGRITY PACT)

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS INCONTRACTS WORTH RS. 10.00 MILLION OR MORE

Contract No._____ Dated _____
Contract Value: _____
Contract Title: _____

…… [name of Supplier] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan (GoP) or any administrative subdivision or agency thereof or another entity owned or controlled by GoP through any corrupt business practice.

Without limiting the generality of the foregoing, [name of Supplier] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

[name of Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of Supplier] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Supplier] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.

Name of Buyer: ……	Name of Seller/Supplier: ……
Signature: ……	Signature: ……
[Seal]	[Seal]

FORM OF PRICE BID
&
SCHEDULE OF PRICES

TO BE SUBMITTED BY THE BIDDER ON HIS COMPANY LETTER PAD

Date:_____

Bid Reference No: _____

FORM OF PRICE BID

Chief Executive Officer (CEO),
Faisalabad Industrial Estate
Development & Management
Company (FIEDMC),
Main Gate, M-3 Industrial City, Near
Sahianwala Interchange, M-4
Motorway, Faisalabad.
Tel # 041-8900201-7

Subject: PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 kV AIS GRID STATION NO. 02, WITH TWO NOS. 31.5/40 MVA POWER TRANSFORMERS AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD (CONTRACT NO. GS-AIIC-02 (R-I)).

Gentlemen,

1. Having examined the Bidding Documents including Instructions to Bidders, Conditions of Contract, Specifications, Drawings, Schedule of Prices and Addenda Nos._____ for the execution of the above- named Works, we, the undersigned, being a company doing business under the name of and address _____ _____ and being duly incorporated under the laws of _____ hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto.
2. We understand that all the Schedules attached hereto form part of this Bid.
3. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of _____ drawn in the favor of, or made payable to the Employer, _____ and valid for a period of Twenty-Eight (28) days beyond the period of validity of Bid.
4. We undertake that Price Schedules as per requirements of the Bidding Documents are enclosed with the Price Bid.
5. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the whole of the Works comprised in the Contract within the time(s) stated in Preamble to the Conditions of Contract.
6. We agree to abide by this Bid for the period of **120** days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
7. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
8. We undertake, if our Bid is accepted, to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.
9. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other person or persons making a Bid for the Works.
10. We do hereby declare that our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries *[insert the nationality of*

the Bidder, including that of all parties that comprise the Bidder if the Bidder is a consortium or association, and the nationality of each Subcontractor and Supplier].

11. We, including any subcontractors or suppliers for any part of the Contract, do not have any conflict of interest.

12. We are not participating, as a Bidder, in more than one bid in this bidding process.

13. We confirm, if our Bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer. (Please delete in case of Bid from a single firm).

Dated this …… day of.....20…

Signature ……... in the capacity of duly authorized

to sign the Bid for and on behalf of …….

(Name of Bidder in Block Capitals) (Seal of Bidder)

Bidder's Address

……

……

……

Witness:

Signature:

……..

Name: ……

Address:

……

……

……

Occupation

……..

SCHEDULES OF PRICES

	Description
1.	Preamble to Schedule of Prices
2.	Schedule of Prices

PREAMBLE TO SCHEDULE OF PRICES

1. General

1.1 The Schedule of Prices shall be read in conjunction with the Conditions of Contract together with the Specifications and Drawings.

1.2 The Contract shall be for the whole of the Works as described in these Bidding Documents. Bids must be for the complete scope of Work. The Time for Completion for whole of the works is 360 days reckoned from the Commencement Date for the Project.

2. Description

2.1 The general directions and descriptions of work and materials are not necessarily repeated nor summarized in the Schedule of Prices. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the Schedule of Prices.

2.2 The quantities shown in the Schedule of Prices are estimated quantities only as an indication of the Scope of Work to enable the bidder to bid for different items of the Works for his estimate of costs. The estimated quantities shall be used for comparing the bids. It is, however, to be noted that in the event of any increase or decrease in the quantity of any item of Works and subject to provisions of the Conditions of Contract herein, the actual quantities executed will be paid.

3. Units & Abbreviations

3.1 Units of measurement, symbols and abbreviations expressed in the Bidding Documents shall comply with the Systeme Internationale d' Unites (SI Units).

The following abbreviations shall be used in the Schedule of Prices:

	Abbreviation
Pakistani Rupees	PKR/Rs
Delivered Duty Paid	DDP
Number	No.
Kilometer	Km
Kilogram	Kg
Cubic Meter	Cu. m
Provisional Sum	PS
Percent	%

4. Rates and Prices

4.1 Except as otherwise expressly provided under the Conditions of Contract, the rates and amounts entered in the Schedule of Prices shall be the rates at which the Contractor shall be paid and shall be the full inclusive value of the work set forth or implied in the Contract; except for the amounts reimbursable to the Contractor under the Contract.

4.2 Unless otherwise stipulated in the Conditions of Contract, the rates and prices entered by the bidder shall not be subject to adjustment during the performance of the Contract.

4.3 The Contractor shall obtain and pay for import license and permit fee for importation of Goods into Pakistan, however, the Employer may assist the Contractor in this respect, if required. The Contractor shall also arrange custom clearance and shall pay all sums payable to Government of Pakistan in respect of Pakistani custom duties, sales tax, surcharges and other import taxes levied upon Goods imported into Pakistan and all sums payable in respect of sales tax, excise duty and other similar taxes levied upon finished indigenous Goods. The Contractor shall also pay all sums payable in respect of octroi charges and zila tax payable on transport of above said Goods to the sites.

4.4 The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Schedule of Prices, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works and no separate payment will be made for those items.

The rates, prices and amounts shall be entered against each item in the Schedule of Prices. Any item against which no rate or price is entered by the bidder will not be paid for by the

Employer when executed and shall be deemed covered by the rates and prices for other items in the Schedule of Prices.

4.5 The bidder shall be deemed to have obtained all information as to port clearance facilities and charges, loading and unloading facilities and charges, storage facilities and charges, transportation facilities and charges, congestion and/or other conditions to be expected at Karachi Port and or any other seaport of Pakistan and all requirements related thereto.

The Contractor shall be responsible to make complete arrangements for the transportation of the Plant to the Site.

The bidder shall be deemed to have included all clearing, forwarding and other incidental costs in this regard in his bid. The Contractor will have the option to use either Karachi Port or any other seaport of Pakistan.

4.6 The Contractor shall provide for all parts of the Works to be completed in every respect for commercial operation. Notwithstanding that any details, accessories, etc. required for the complete installation and satisfactory operation of the Plant, are not specifically mentioned in the Specifications, such details shall be considered as included in the Contract Price.

4.7 All costs in connection with inspection and testing as per provision of the Contract Documents including the costs in connection with the witnessing of Factory Acceptance tests as per provision of sub-clause 20.7 of COC Part-II shall be borne by the Contractor and shall be deemed to have been included in the quoted prices.

4.8 Rates shall also include Contractor's cost for providing Performance Security, marine insurance, insurances in respect of Contractor's operations in Pakistan such as Erection/ Construction. All Risks insurance of Works, Third Party insurance, insurance against Accident to Workmen etc.

4.9 The unit rates shall be extended to show the total amount for each item. The total of the Price Schedule is the Total Bid Price and shall be entered in paragraph 1 of the Bid (Form). Where a discrepancy exists between the unit rate and the extended total amount, the unit rate shall be taken as correct and the total amount adjusted accordingly.

5. Bid Prices

5.1 Break-up of Bid Prices

The various elements of Bid Prices shall be quoted as detailed below:

A) DDP (Site) Price

The Bidder shall quote for various items of plant to be supplied on the basis of Delivered Duty Paid (DDP) at site. It shall include the cost of the following:

1) Design, manufacture, finishing, factory testing, export packing and all shipping costs incurred in placing the Plant and other materials on board the vessel at the port of shipment.

2) Provision of clean, on-board bills of lading.

3) Responsibility for any loss or damage until the Plant and other materials have been placed on board the vessel at the port of shipment.

4) Export taxes, fees or charges levied on exporting Plant and other materials in the country of origin.

5) Provisions of certificate of origin, consular invoices (if required) or any other documents issued in the country of shipment.

6) Marine freight from port of shipment to the port of entry in Pakistan for all Plant and other materials to be imported for the Contract. Such prices shall include all marine transportation costs including ocean freight, heavy lift charges, fees and other charges, etc.

7) Marine transportation shall be quoted for shipment through Pakistan National Shipping Corporation (PNSC) or any other reputed shipping lines with flag of any country except Israel and India acceptable to the Employer. Cost of shipment(s) effected by the

Contractor at his option by Aircraft shall be deemed to be included in the Total Bid Price.

8) Insurance cover from ex-factory/ex-works to the Site for all Plant and other materials to be provided for the Contract. Such prices shall include all insurance costs covering the responsibility for all loss or damages while loading, unloading, storing and trimming on board or on inland carrier and transportation to Site.

9) The marine insurance shall be quoted on the basis of insurance through an Insurance Company of AA Rating as approved by the Employer.

10) Inland transportation shall be Contractor's responsibility in respect of:

a) The Plant offered form outside Pakistan, from the port of entry in Pakistan to the storage area at the Site, and

b) Indigenous Plant, if any offered from within Pakistan, from the ex-works in Pakistan to the storage area at the Site, and all charges occurring there from including fees and charges for loading, forwarding and unloading expenses shall be borne by the Contractor. Unloading at the Site, handling of the Plant and other materials to the designated point of site storage, checking and verifying all shipments received against shipping documents, issue of all receiving reports and issue of damage reports (when applicable) shall be the Contractor's responsibility. The bidder shall recognize all elements of the cost which they expect to incur in the performance of the Works and shall include all such costs in the rates and amount entered in the Price Schedule.

11) All taxes, duties, octroi charges, zila tax etc. shall be included in the prices quoted under this equipment.

B) Erection

The bidder shall quote prices for Erection for the sub-totals of the Plant at the Site. Such prices shall include the costs of handling of the Plant and other materials from Site storage to point of final installation, erection, installation, testing, commissioning including all inspection, reliability tests, the cost of foreign and local erection staff and labor, tools and equipment, etc. It shall also cover the services of qualified representative(s) of the supplier(s) of Plant or adviser(s) to assure proper erection and commissioning of the Plant. The price shall also include cost of arranging insurance in respect of Contractor's operations in Pakistan which insurances shall be affected by the Contractor with the National Insurance Company (NIC) of Pakistan or any other insurance company operating in Pakistan and acceptable to the Employer and must be rated AA by PACRA. Costs of such insurances shall be borne by the Contractor.

5.2 Total Bid Price

The total of bid prices shall be entered in the Summary of Bid Prices. The unit rates and prices entered in the Schedule of Prices will be the rates at which the Contractor will be paid, and shall be deemed to be the full inclusive value of the work including all costs of performing the Works such as overheads, income tax, super tax, profits, costs of accepting the general risks, liabilities and obligations set forth or implied in the Contract except for the amounts reimbursable, if any, to the Contractor under the Contract. The rates shall also include Contractor's cost for providing Performance Security and other Bank Guarantees required for performance of the Contract.

6. Provisional Sums

6.1 Provisional Sums included and so designated in the Schedule of Prices if any, shall be expended in whole or in part at the direction and discretion of the Employer/ Engineer. The Contractor will only receive payment in respect of Provisional Sums if he has been instructed by the Employer/Engineer to utilize such sums.

SCHEDULES OF PRICES
GRAND SUMMARY

Client / Owner: Faisalabad Industrial Estate Development & Management Company

Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 kV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)

Location: Faisalabad Dated:……

Item No.	SUB HEAD	TOTAL PRICE (PKR)
A	Transformers & Surge Arrestors	
B	145 kV Equipment	
C	132 kV Bus Work	
D	132 kV Control Protection & Metering	
E	Sub Station General Equipment	
F	Miscellaneous Works for CHB	
G	Maintenance Tools & Furniture	
H	Required Spare Parts	
I	Civil Works, Installation, Erection, Testing & Commissioning and Other Works	
	Total Amount (A+B+C+D+E+F+G+H+I) *(Including all Taxes & Duties as stated in the Bidding Documents)*	
	Add: PRA/PST @ 5% (If Applicable)	
	Total Amount (PKR) (Without Provisional Sum)	
	Addition: Provisional Sum (Not to be included in the evaluation the Bid Price). It may be included in the item of days works, such as utility service diversion/repair or any other item required to complete the work but not envisaged/listed in the BOQ, at the Employer's discretion) (PKR).	50,000,000
	Grand Total Price (PKR)	

Note:
Bidder must quote Prices taking into account the items described and included in the Specifications - Special Provisions, Specifications - Technical Provisions, drawings and/or any other section of the Bidding Documents.

(Rupees_____)
In Words

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CONTRACTOR **FIEDMC**

SCHEDULES OF PRICES

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Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
A - TRANSFORMER & SURGE ARRESTERS						
1.0	**Power Transformer** 132/11.5kV, 31.5/40MVA Power Transformer, 50Hz, 10% Impedance, Vector Group Dyn11, with extended creepage distance bushings, Auxiliary Panel, on-load tap-changer (MR Germany make or equivalent), and other allied accessories as described in FESCO/NTDC Specs P-46:2008 (amended to date).		2	No.		
2.0	**Surge Arresters** 120 kV Metal Oxide Gapless Surge Arresters with extended creepage distance insulator, Surge Counter, complete with steel supporting structure, grouting bolts, Along with Terminal Connectors with all other allied accessories as per NTDC Specification P-181:2012 (amended to date).		6	No.		
3.0	12 kV Surge Arrestor with surge counter, extended creepage distance and terminal with insulating leads and protective cap and mounting bracket complete along with Terminal Connectors etc., as per NTDC Specification P-181:2012 (amended to date).		6	No.		
4.0	**Total Amount Rs**					

(Rupees_____) In Words

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CONTRACT NO. GS-AIIC-02. (R-I)

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Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
B - 132 kV EQUIPMENT						
1.0	**Circuit Breakers** 145 kV, 2000A, 40kA, 3-Pole, SF_6 Circuit Breaker with extended creepage distance insulator, steel supporting structure, grouting bolts, with all other allied accessories as per NTDC Specifications P-193:2010 (amended to date).		7	Set		
2.0	**Line Disconnectors** 145 kV, 2000 A, 40 kA, 3-Pole Single Throw Line Disconnectors equipped with motor and manual operating mechanism and with earthing switch having extended creepage distance, insulator complete with steel supporting structure, grouting bolts, Earthing Platform, along with Terminal Connectors with all other allied accessories as per NTDC Specification P-193:2007 (amended to date).		4	Set		
3.0	**Bus Disconnectors** 145 kV, 2000 A, 40 kA, 3-Pole Single Throw Bus Disconnectors (Parallel Arrangement) equipped with motor and manual operating mechanism and without earthing switch having extended creepage distance, insulator complete with steel supporting structure, grouting bolts, Earthing Platform, along with Terminal Connectors with all other allied accessories as per NTDC Specification P-193:2007 (amended to date).		3	Set		
4.0	**Bus Disconnectors** 145 kV, 2000 A, 40 kA, 3-Pole Single Throw Bus Disconnectors (Serial Arrangement) equipped with motor and manual operating mechanism and without earthing switch having extended creepage distance, insulator complete with steel supporting structure, grouting bolts, Earthing Platform, along with Terminal Connectors with all other allied accessories as per NTDC Specification P-193:2007 (amended to date).		13	Set		
5.0	**Current Transformers for Power Transformer** 145 kV, 40 kA, Single phase Current Transformer ratio 400:200/5 A, 4-core with extended creepage distance insulator, complete with steel supporting structure, grouting bolts, along with Terminal Connectors with all other allied accessories, as per NTDC Specification P-90:2012 (amended to date).		6	No.		

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CONTRACT NO. GS-AIIC-02. (R-I)

Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
6.0	**Current Transformers for 132 kV Line & Bus Coupler Bays** 145 kV, 40 kA, Single phase Current Transformer ratio 1200:600:300/5 A, 4-core with extended creepage distance insulator, complete with steel supporting structure, grouting bolts, along with Terminal Connectors with all other allied accessories, as per NTDC Specification P-90:2012 (amended to date).		15	No.		
7.0	**Voltage Transformers** 145 kV, 50 Hz, Single Phase, Voltage Transformer, ratio 132/√3 kV / 110/√3 V, with extended creepage distance insulator, steel supporting structure, grouting bolts, along with Terminal Connectors with all other allied accessories as per NTDC Specification P-129:85 (amended to date).		6	No.		
8.0	**145 kV Post Insulators** 145 kV Post Insulators, 650 BIL complete with extended creepage distance insulator, steel supporting structure, grouting bolts, along with Terminal Connectors with all other allied accessories.		6	No.		
9.0	Any other item which is not mentioned here but required for completion of the specified scope of work. The details of items and its cost breakdown be attached separately.		1	Lot.		
10.0	**Total Amount Rs**					

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CONTRACT NO. GS-AIIC-02. (R-I)

Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
C - 132 kV BUS WORK						
	The steel structure, conductor, insulators and hardware for installation of switchyard equipment, buses and overhead shield wires etc., as per NTDC Specifications: P-182:91, P-139:80, P-176:86, P-19:83, P-12:80 and others relevant specifications (amended to-date).					
1.0	**132kV Steel Gantries**					
1.1	Beam (12m) for 1x600 mm sq. conductor		6	No.		
1.2	Beam (12m) for 2x600 mm sq. conductor		8	No.		
1.3	Column (13.8+3.1) m		11	No.		
1.4	Column (10+3.1) m		9	No.		
1.5	Earth Mast (13.1) m		1	No.		
2.0	**132 kV Substation Hardware and Connectors**		1	Lot		
3.0	**Aluminium Tubular Conductor**					
3.1	100 mm Aluminium Tubular Conductor, 4m long		2	Set		
3.2	Hardware and accessories for 100 mm Aluminium Tubular Conductor complete.		2	Set		
3.3	11kV Structure, complete with all accessories & Anchor Bolts.		2	Set		
4.0	**Overhead Flexible Conductor**					
4.1	All Aluminium Conductor 600 mm sq. (Hawthorn).		1	Lot		
4.2	Hardware and Connectors for Equipment and Busbar for 1x600 mm sq. and 2x600 mm sq. All Aluminum Conductor as per drawings & Specifications.		1	Lot		
5.0	**Overhead Shield wire**					
5.1	Earth wire 7/3.25mm (9mm dia) for Switchyard shielding.		1	Lot		
5.2	Earth Wire Tension Assemblies with G-Clamps and accessories for overhead shield wire as specified.		1	Lot		

SCHEDULES OF PRICES

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CONTRACT NO. GS-AIIC-02. (R-I)

Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
6.0	**Tension and Suspension String Assemblies**					
6.1	145 kV Single Tension String Assembly for 1 x 600 mm sq. All Al. Conductor with Fog Type Disc Insulators, complete with hardware, D Shackle and all allied accessories etc.					
6.1.1	With Turn Buckle		1	Lot		
6.1.2	Without Turn Buckle		1	Lot		
6.2	145 kV Double Tension String Assembly for 2 x 600 mm sq. All Al. Conductor with Fog Type Disc Insulators, complete with hardware, D Shackle, and all allied accessories etc.					
6.2.1	With Turn Buckle		1	Lot		
6.2.2	Without Turn Buckle		1	Lot		
6.3	145 kV Double Suspension String Assembly for 2 x 600 mm sq. All Al. Conductor with Fog Type Disc Insulators, complete with hardware, D Shackle, and all allied accessories etc.		1	Lot		
7.0	Any other item which is not mentioned here but required for completion of the specified scope of work. The details of items and its cost breakdown be attached separately.		1	Lot		
8.0	**Total Amount Rs**					

(Rupees_____)

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Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
D – 132 KV CONTROL PROTECTION & METERING SYSTEM As per NTDC Specification P-151:2008, P-149:95 (amended to date)						
1.0	CP-32, Control Panel for 132 kV Line Bay with double bar mimic, complete.		4	No.		
2.0	CP-51, Control Panel for 132/11.5 kV, 31.5/40 MVA Transformer Bay with double bar mimic, complete.		2	No.		
3.0	CP-40, Control Panel for 132 kV bus coupler with double bar mimic, complete.		1	No.		
4.0	RP-3, Relay Panel for 132 kV Line Bay, complete.		4	No.		
5.0	RP-4, Relay Panel for 132/11.5 kV, 31.5/40 MVA Transformer Bay, complete.		2	No.		
6.0	RP-1, Relay Panel for 132 kV Bus coupler bay, complete.		1	No.		
7.0	Marshalling kiosks, complete with the all accessories as per control and protection schemes.		2	No.		
8.0	CT Boxes, including Terminal Connectors, Shorting Links, MCBs, MCCBs, Cable Glands, and Conduits, etc. as per approved drawings.		7	No.		
9.0	PT Boxes, including Terminal Connectors, MCBs, MCCBs, Cable Glands, and Conduits, etc. as per approved drawings.		2	No.		
10.0	Miscellaneous relays and accessories required for complete operation of protection system.		1	Lot		
11.0	Any other item which is not mentioned here but required for completion of the specified scope of work. The details of items and its cost breakdown be attached separately.		1	Lot		
12.0	**Total Amount Rs**					

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CONTRACT NO. GS-AIIC-02. (R-I)

Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
E – SUBSTATION GENERAL EQUIPMENT						
1.0	**Control Cables** As per NTDC Specifications P-100:2005 (amended to date) and other relevant specifications (i) 4 x 2.5 mm sq (ii) 8 x 2.5 mm sq (iii) 16 x 2.5 mm sq. (iv) 4 x 6 mm sq.		1	Lot		
2.0	**Power Cables** As per NTDC Specifications P-29:2010 (amended to date) and other relevant specifications					
2.1	15 kV, 1000 MCM, Al. Conductor, single core, XLPE power cable for Power Transformers & 11 kV Incoming Panels		1	Lot		
2.2	15 kV, 500 MCM, Al. Conductor, single core, XLPE power cable for 11 kV Capacitor Bank and 11kV outgoing feeders with terminations		1	Lot		
2.3	Outdoor termination kits for 15 kV single core 1000 MCM power cable with all accessories		1	Lot		
2.4	Outdoor termination kits for 15 kV single core 500 MCM power cable with all accessories		1	Lot		
2.5	Indoor termination kits for 15 kV single core 1000 MCM power cable with all accessories		1	Lot		
2.6	Indoor termination kits for 15 kV single core 500 MCM power cable with all accessories		1	Lot		
2.7	15 kV 120mm^2, 3 cores power cable.		1	Lot		
2.8	Indoor Termination kit 120mm^2, 3 cores power cable.		1	Lot		
2.9	Outdoor Termination kit 120mm^2, 3 cores power cable.		1	Lot		
3.0	**Sub Station Grounding System** Substation grounding system for 132kV outdoor equipment & control building as per drawing and specifications					
3.1	120 mm^2 Copper conductor		1	Lot		
3.2	95 mm^2 Copper conductor		1	Lot		
3.3	Earthing rod 16 mm dia 3 meter long		1	Lot		
3.4	Moulds with holding clamps, connectors and cartridges etc.		1	Lot		
3.5	Any other item whether specified or not but necessary for completion of the specified scope of work.		1	Lot		
3.6	Control House Building Lightening Protection System including Air Terminal Rods, Earthing Rods, Copper Strips, Connectors, Clamps, Lugs and Test Block Arrangement etc. Complete in all aspects.		1	Lot		
3.7	Switchyard outdoor lighting (normal and emergency) complete in all respect with power receptacles including all material as per specification and drawing		1	Lot		

SCHEDULES OF PRICES

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Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
4.0	**11 kV Metal clad Switchgear**					
4.1	11 kV, 2500 A, 25 kA, Incoming panel complete with protection & metering		2	No.		
4.2	11 kV, 2500 A, 25 kA, Outgoing panel complete with protection & metering.		16	No.		
4.3	11 kV, 2500 A, 25 kA, Bus Coupler panel complete with load break switches and protection		1	No.		
4.4	11 kV, 630 A, 25 kA, Capacitor Panel complete with protection & metering and automatic switching of the capacitor bank as per NTDC/FESCO specifications (amended to date)		2	No.		
5.0	**11 kV Capacitor Bank** 11 kV, 7.2 MVAR (36 x 200 kVAR), 50A Fuses, Capacitor Bank comprising of 1-phase capacitors (200 kVAR) complete with mounting racks, fuses and bus works with Neutral CT as per NTDC/FESCO Specifications (amended to date).		2	Set		
6.0	**AC & DC Services System** as per NTDC/FESCO Specifications P-48:81 (amended to date)					
6.1	240/415 VAC, 110 VDC, AC & DC Auxiliary Service Panel suitable for installation in a 3-phase, 4-wire LT distribution AC system and 2-wire 110 V DC with 2 x battery system complete with interlocking and changeover schemes		1	Set		
6.2	11/0.415 kV, 200 kVA, Pad Mounted Station Auxiliary Transformer, as per NTDC/FESCO Specifications (amended to date)		1	No.		
6.3	110 V DC, 150 AH, Station Battery type Lead acid complete as per NTDC/FESCO Specifications P-132:88 (amended to date)		2	Set		
6.4	110V DC, 25 A, Charger for Station Battery, fully automatic, constant voltage type, semi-conductor rectifier equipment, intended to be permanently connected across the nominal 110 V battery (lead-acid type) and DC load of a substation in the floating battery system, complete as per NTDC/FESCO specifications P-133:95 (amended to date)		2	No.		
6.5	Distribution Boards complete with two incoming main breakers and one tie breaker each of 160 A (adjustable type) complete for control, protection, signalling and indication equipment as per NTDC/FESCO Specifications (amended to date)		1	Lot		

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Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
7.0	**Fire Fighting System**					
7.1	Fire Extinguisher for switchyard area, trolley mounted, 50 kg bottle of powder type as per FESCO/NTDC specifications.		1	Lot		
7.2	Fire Extinguisher, wall mounted, CO_2 type 5 kg cylinder for Control Building as per FESCO/NTDC specifications.		1	Lot		
8.0	Any other item which is not mentioned here but required for completion of the specified scope of work. The details of items and its cost breakdown be attached separately.		1	Lot		
9.0	**Total Amount Rs**					

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Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
F – MISCELLANEOUS WORKS FOR CONTROL HOUSE BUILDING						
1.0	Supply, of telephone and computer cabling. All equipment and services shall conform to IEEE/Electric Inspector regulations for buildings and FESCO requirements.		1	Lot		
2.0	XLPE cable, Copper, 600/1000V connection including from 200kVA Station Transformer to AC/DC Main Distribution panel/board and all connecting cables to sub distribution boards and outside lighting and services.		1	Lot		
3.0	Internet Cable (Cat. 6) in PVC pipe 20 mm dia from outside of building laid in floor slab include all necessary accessories for completion of the work as per Specification and instruction of the Engineer. Cable shall be laid from outside the building to Servers and Office.		1	Lot		
4.0	Complete Fire Alarm System including Smoke Detector of all zones with control panels, fire retardant cable single core in 3/4" iron pipe recessed from smoke detectors as per approve design/drawings. The work of pipe shall be carried out as per specification and instruction of the Engineer, including all the accessories required for completion of the work.		1	Lot		
5.0	Supply of HVAC Inverter Type AC Units complete with Copper Piping, AC Drain System & Power Supply.		1	Lot		
6.0	**Total Amount Rs**					

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Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
G - MAINTENANCE TOOLS & FURNITURE						
1.0	Clip on meter with provision of measuring, power factor, frequency and phase angle.		1	No.		
2.0	Service Engineer Tool Kit		1	No.		
3.0	Extension Cable 50-meter 3 X 1.5mm²		3	No.		
4.0	SF_6 refilling device with provision of checking the setting of pressure switches suitable for the installed SF_6 gas CBs.		1	No.		
5.0	Set of single end torque wrenches with to fit every size of nut and bold head use for the circuit breaker, (Bidder to provide details and unit price.)		1	Set		
6.0	Screw drivers, Pliers and other normal tools, (Bidder to provide details and unit price.)		1	Set		
7.0	Digital standard multi range clip on Ammeter/Voltmeter suitable for DC/AC circuits, ampere range 0-1/5//30/300 A, voltage range 0-5/ 300/750 V.		1	No.		
8.0	Digital type standard multi range multi meter with AC, DC Voltmeter, current and ohm scales with selectable AC/DC current range 2/20/200 mA and 2/10 A and selectable AC/DC voltage range 0.2/2/20/200/1000 V. also suitable for measuring capacitance, frequency and temperature. Fluke make or approved equivalent		1	No.		
	Control Building Furniture					
9.0	Officer Table (7 x 4 ft) Wooden, with green cloth and 8-inch glass cover as per FESCO/Engineer instructions		3	No.		
10.0	Supervisor Table (5 x 3 ft) Wooden, with green cloth and 8 in glass cover		1	No.		
11.0	Officer's Chairs Wooden		4	No.		
12.0	Visitor's Chairs Wooden		12	No.		
13.0	Water Dispenser		2	No.		
14.0	Heater (200W)		2	No.		
15.0	Notice Board (6 x 4 ft)		4	No.		
16.0	Digital Station Clock renowned brand		2	No.		
17.0	Any other item which is not mentioned here but required for completion of the specified scope of work. The details of items and its cost breakdown be attached separately.		1	Lot		
18.0	**Total Amount Rs**					

(Rupees_____)
In Words

_____ _____

CONTRACTOR **FIEDMC**

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
H - REQUIRED SPARE PARTS						
1.0	**132/11.5kV Power Transformer**					
1.1	132kV bushing (with extended creepage distance) complete with gaskets and terminal connectors.		1	No.		
1.2	11.5kV bushing (with extended creepage distance) complete with gaskets and terminal connectors		1	No.		
1.3	Neutral Bushing		1	No.		
1.4	Cooling fans with motors		1	No.		
1.5	Transformer oil with container		410	Litres		
1.6	Tap changer motor drive mechanism		1	No.		
1.7	Tap changer protective relay		1	No.		
1.8	Oil level indicator, magnetic type		1	No.		
1.9	Oil temperature indicator, liquid type		1	No.		
1.10	Oil temperature indicator, resistance type		1	No.		
1.11	Buchholz Relay complete		1	No.		
1.12	Winding temperature indicator		1	No.		
1.13	Air Breather, each type		1	Set		
1.14	Remote tap position indicator		1	No.		
1.15	Complete set of gaskets for cover of manhole and hand hole with lubricating grease, if any		1	Set		
1.16	Complete set of pressure relief device replacement parts		1	Set		
1.17	Set of on-load tap changer parts subject to wear such as fixed contacts for transition resistor arcing contacts for diverter switches etc. complete. (To be recommended by the manufacturer)		1	Set		
1.18	Complete sets of switches, contactors, auxiliary relays etc. used on tap changer drive and cooling equipment.		1	Set		
1.19	Complete set of valves		1	Set		
1.20	Silica gel		10	Kg		
2.0	**145kV Circuit Breaker**					
2.1	Single Pole Circuit Breaker (excluding Base)		1	No.		
2.2	Closing Coils		2	No.		
2.3	Trip Coils		2	No.		
2.4	SF_6 gas in standard container of 40kg		1	No.		
2.5	Complete set of control and shut off valves along with seals		1	No.		
2.6	Gas density monitor		1	No.		
2.7	Handles for manual charging of closing spring		1	No.		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
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CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
3.0	**145kV Disconnector**					
3.1	Interlocking coils for disconnector and earthing switch		2	No.		
3.2	Operating mechanism completes		1	No.		
3.3	Set of moving and fixed contact or contact blades for disconnector and earthing switch		1	No.		
4.0	**Surge Arrester**					
4.1	120kV surge arrester, single pole, complete with discharge counter, without steel supporting structure		1	No.		
4.2	12kV surge arrester		1	No.		
5.0	**Control and Energy Meter Panels**					
5.1	MCBs of each type		1	Set		
5.2	Control and instrument switches (one for each type used)		1	Set		
5.3	Test blocks and plugs of each type used		1	Set		
5.4	Test switches of each type used		1	Set		
5.5	Watt and VAR transducers of each type used		1	Set		
5.6	**Indicating and recording instruments consisting of following:**					
5.6.1	Ammeter		1	No.		
5.6.2	Voltmeter		1	No.		
5.6.3	MW meter		1	No.		
5.6.4	MVAR meter		1	No.		
5.6.5	Selector switch for voltmeter		1	No.		
5.6.6	Frequency meter		1	No.		
5.6.7	PF meter		1	No.		
5.7	Semaphore indicator		1	No.		
5.8	DC hooter		1	No.		
5.9	DC siren		1	No.		
5.10	AC bell		1	No.		
5.11	DC annunciator relays unit complete one for each type		1	No.		
5.12	Fuses (5 No. each type used)		1	Set		
5.13	AC annunciator unit complete including annunciator relay		1	Set		
5.14	Discrepancy type control switch		1	No.		
6.0	**Relays and Relay Panels**					
6.1	Distance relay, each type used in RP		1	No.		
6.2	Over current and earth fault relay, each type used in RP		1	No.		
6.3	Transformer Differential relay, type used in RP		1	No.		
6.4	Supervision relay for DC supply		1	No.		
6.5	Supervision relays for trip coil circuit		1	Set		
6.6	Tripping relay one for each type		1	Set		
6.7	MCBs and fuses (2 No. of each type used)		1	Set		
6.8	Auxiliary relays (01 of each type used)		1	Set		
7.0	**AC/DC Auxiliary Supply Panels**					
7.1	Circuit breaker (01 of each type used)		1	Set		
7.2	DC under voltage relay		1	No.		
7.3	Annunciator Unit Complete		1	No.		
7.4	Annunciation auxiliary relay of each type used		1	Set		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Country of Origin	Quantity	Unit	Unit Price DDP at Site (PKR)	Total Price DDP at Site (PKR)
8.0	**11kV Metal Clad Switchgear**					
8.1	11kV Incoming Trolley complete in all respects		1	No.		
8.2	11kV Outgoing Trolley complete in all respects		1	No.		
8.3	Complete pole of circuit breaker of each type used		1	No.		
8.4	Voltage transformer		1	No.		
8.5	Set of trip coil of each type used		1	Set		
8.6	Charging motor of each type used		1	Set		
8.7	Over current relay of each type used		1	Set		
8.8	Signalling lamps (5 No. each type used)		1	Set		
8.9	Set of lamp covers (5 No. each type used)		1	Set		
8.10	Ammeter of each type used		1	Set		
8.11	Voltmeter of each type used		1	Set		
8.12	Power factor meter		1	No.		
8.13	Auxiliary relay of each type		1	Set		
8.14	Contactors of each type		1	Set		
9.0	**110V DC Batteries**					
9.1	Vent plugs, 20 Nos. of each type		1	Set		
9.2	Intercell connectors, 10 Nos. of each type		1	Set		
9.3	Terminal connectors, 10 Nos. of each type		1	Set		
10.0	**110VDC Battery Charger**					
10.1	Hermetically sealed thyristor (2 No. of each type used)		1	Set		
10.2	Hermetically sealed diode (2 No. of each type used)		1	Set		
10.3	Automatic current limiter (2 Nos. of each type used)		1	Set		
10.4	Converter transformer (1 No. of each type used)		1	Set		
10.5	Voltage regulation unit complete (1 No. of each type)		1	Set		
10.6	Indication lamps (2 No. of each type used)		1	Set		
10.7	Fuses (5 No. each type used)		1	Set		
10.8	AC/DC MCBs (2 of each type used)		1	Set		
11.0	**Total Amount**					

(Rupees_____)
In Words

_____ _____
CONTRACTOR **FIEDMC**

Notes:

1. Cost of Spare Parts shall not be included in the Bid Award Price, however, if required the Contractor will be asked to provide at his quoted price.

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
I – CIVIL WORKS					
1	**General Works**				
1.1	Cleaning and grubbing of the complete site area for bushes, vegetation trees, roots and weeds etc. as per specifications and as directed by the Engineer including dismantling of old civil works (if any) disposal of debris away from site to any lead.	1	Lot		
1.2	Filling, levelling, dressing and compaction of the complete site area to raise the level of the area up to the required level. Compaction of soil in 200 mm thick layers with 95% modified proctor density as per specifications & as directed by the Engineer.				
1.2.1	Using excavated material with compaction 95% proctor density with mechanical means with any lead and lift for raising (after clearing, grubbing of site, joint level survey will establish the backfilling quantity).	12500	Cu. m		
1.2.2	Using borrow fill material /sand with compaction 95% proctor density with mechanical means with any lead and lift for raising (after clearing, grubbing of site, joint level survey will establish the backfilling quantity).	19100	Cu. m		
1.3	Geotechnical investigation including field testing, sample collection, lab testing and preparation of report for the recommendation of bearing capacity of shallow and deep foundations as per specifications and as directed by the Engineer.				
1.3.1	From NSL to depth of 20 m	150	Lin. Mtr.		
1.3.2	From 20 m to depth of 25 m	85	Lin. Mtr.		
1.4	Pile Load test as per requirement and directed by the Engineer.	2	Each		
2.0	**132kV Switchyard Equipment Pile Foundations:** Providing and placing of reinforced cement concrete work in equipment and gantry foundations, having 28 days, minimum cylinder strength of 280 kg/cm^2 for Pile, 210 kg/cm^2 for pile cap and grouting in block outs (if any). inclusive of dewatering (if any), reinforcement of Grade 60 as per ASTM A-615, shuttering, concreting, curing, installation of stubs and anchor bolts, capping & grouting under structure and in block-out, bitumen coating for waterproofing etc. inclusive of excavation, removal of surplus earth from site area, lean concrete having 28 days, minimum cylinder strength of 140 kg/cm^2 having (if any) etc. as per specification and drawings.				
2.1	Construction of Pile foundation including pile caps, transformer walls, 90 lbs. / or as per design rails, fish plates & oil resistant paint for **Three Phase 132/11.5 kV, 31.5/40 MVA Power Transformer** as per specification and approved drawings.	2	No.		
2.2	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for three pole **132 kV Circuit Breaker** as per specification and approved drawings.	7	Set		
2.3	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for three pole **132 kV Disconnector with/without Earthing Switch** foundation as per specification and approved drawings.	20	Set		
2.4	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for Single pole **132 kV Current Transformer** foundation as per specification and approved drawings.	21	No.		
2.5	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for single pole **132 kV Voltage Transformer** foundation as per specification and approved drawings.	6	No.		
2.6	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for single pole **132 kV Surge Arrester** foundation as per specification and approved drawings.	6	No.		
2.7	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for single pole **132 kV Post Insulator** foundation as per specification and approved drawings.	6	No.		
2.8	Construction of Pile foundation including pile caps, beams, fixing of stubs & bitumen coating for **132 kV Steel Gantries & Earth Mast** foundation as per specification and approved drawings.				
2.8.1	**Column (13.8+3.1) m (High Level Gantry Tower)** foundation.	11	No.		
2.8.2	**Column (10+3.1) m (Low Level Gantry tower)** foundation.	9	No.		
2.8.3	Construction of Pile foundation including pile caps, beams, fixing of stubs & bitumen coating for **Earth Mast** foundation as per specification and approved drawings.	1	No.		
2.9	Construction of PMT foundation including the trench/UPVC Pipe for **Pad Mounted Station Auxiliary Transformer** (11kV/415V) foundation as per specification and approved drawings.	1	No.		
2.10	Construction of Pile foundation including pile caps, beams, fixing of anchor bolts & bitumen coating for **Single Pole 11 kV Structure** foundation as per specification and approved drawings.	2	No.		
2.11	Construction of foundation including fixing of anchor bolts & bitumen coating for **7.2 MVAR Capacitor Bank** foundation as per specification and approved drawings.	2	Set		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
3	**Switchyard Cable Trenches**				
3.1	Providing RCC cable trenches type H, H1 & K inclusive excavation, lean concrete (having 28 days cylinder strength 140 kg /cm^2, steel re-reinforcement (Grade-60), curing for specific period, application of two coats of protective bitumen of PB-60 or equivalent on face in contact with soil, compacted backfilling, removal of surplus material for Cable trenches, all types of various PVC Pipe crossings, slopes and civil works for installation of embedded in walls etc. Providing & fixing hot dip galvanized steel brackets (hangers) in the cable trenches type H, H1 & K including fixer and all accessories, Supply & Construction of Precast/Prestress RCC covers as per drawing for covering of Cable Trenches having 28 days cylinder strength of 210 kg/cm^2 including reinforcement and hooks / holes for lifting as per drawings and specifications: complete in all respects as per Drawings and Specifications.				
3.1.1	Type-H (Cable trench ≥ 1000 mm)	250	Li. m		
3.1.2	Type-H1 (Cable trench ≥ 750 mm)	200	Li. m		
3.1.3	Type-K (Cable trench ≥ 500 mm)	415	Li. m		
3.2	Construction of RCC culverts over cable trenches of type H, H1 & K including excavation, PCC (140 kg/cm^2), RCC (210 kg/cm^2) works, re-reinforcement (Grade-60), backfilling up to 95% of standard proctor density etc. complete in all respect as per specifications and drawings.				
3.2.1	Type-H (Cable trench ≥ 1000 mm)	1	Lot		
3.2.2	Type-H1 (Cable trench ≥ 750 mm)	1	Lot		
3.3	Construction of switchyard surface & cable trenches water drainage system including pipes with manholes, Draw Pits its connection with cable trenches, road crossing and its disposal system including the pumping arrangement complete in all respects as per Drawings and specifications	1	Lot		
3.4	Supply and installation of RCC conduit/pipes 225 mm dia for carrying 11kV cables from 11kV structures under the road including sand filling and 100mm lean concrete having 28 days cylinder strength140 kg/cm^2 layer complete in all respects as per Drawings & Specifications.	100	Li. m		
3.5	Supply and installation of PVC Conduits for carrying miscellaneous cables from cable trenches to equipment as specified and as directed by the Engineer.				
3.5.1	50mm (2 inch) dia along with accessories (i.e., bends, joints)	200	Li. m		
3.5.2	50mm (4 inch) dia along with accessories (i.e., bends, joints)	150	Li. m		
3.5.3	50mm (6 inch) dia along with accessories (i.e., bends, joints)	80	Li. m		
4.0	**Boundary Wall, Fence, Roads, Transformer Way & Pathways**				
4.1	Construction of R.C.C Transformer way (4.5 m wide) for transformers including dressing, leveling, compaction, removal of surplus material, PCC (140 kg/cm^2), RCC (210 kg/cm^2), laying of drainage pipes for switchyard drainage, laying of UPVC pipe for earthing underneath the concrete work in switchyard area, without steel rails 90 pounds / yard as per drawings and specifications for 132 kV transformers.	60	Li m		
4.2	Construction of 2 m wide P.C.C. walkway / service roads for maintenance of equipment in switchyard including excavation, leveling, brick edging, compaction, back filling, PCC 140 kg / cm^2, RCC 210 kg/cm^2, expansion joints and their sealing with sealant material etc. as per drawings and specifications:	135	Li m		
4.3	Construction of 4.5 m wide Asphalt Roads inclusive of development of sub-grade (with borrow fill material), sub-base, base, wearing surface, 50 mm surface carpeting, crossing, culverts brick edging from main entrance to switchyard premises complete in all respects as per specifications and drawings approved by the Engineer.	75	Li m		
4.4	Construction of 3 m wide Asphalt Roads inclusive of development of sub-grade (with borrow fill material), sub-base, base, wearing surface, 50 mm surface carpeting, crossing, culverts brick edging from main entrance to switchyard premises complete in all respects as per specifications and drawings approved by the Engineer.	110	Li m		
4.5	Construction of Boundary wall including foundation, pillars, brick work and plaster, DPC, Bitumen coating, angle, barbed wire etc. complete in all respects as per specifications and drawings approved by the Engineer.	760	Li m		
4.6	Providing and construction of Boundary Wall Gate including Pillars, foundations and painting and allied works as per specification and drawing approved by the Engineer.	1	Each		
4.7	Construction of switchyard fence with galvanized steel chain link, squares piker switchyard fence including foundation, pillars, brick work and plaster, bitumen coating, weather sheet paint, angle, barbed wire etc. complete in all respects as per specifications and drawings approved by the Engineer.	300	Li m		
4.8	Providing and construction of fence Gate including Pillars, foundations and painting and allied works as per specification and drawing approved by the Engineer.	1	Each		
4.9	Construction of guard cabin on Main Entry Gate complete in all respects as approved by the Engineer, including Electrification.	1	Each		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company

Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)

Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
4.10	Civil Work (excavation & Backfilling) for Substation Grounding System complete for 132kV as per Drawing and specifications:	1	Lot		
4.11	Supply and placing of river run gravel size 40mm to 75mm blanket as specified and as directed by the Engineer.	800	Cu. m		
5.0	**Civil Works for Control House Buildings (having covered area approx. 520 m^2)**				
5.1	Construction of RCC frame structure including pile foundation, Pile caps, frame structure. The Control House Building (CHB) consist of Control Room, 11kV Switchgear Room, Store, Battery Room, Offices, Wash Rooms. The scope of work which includes but not limited to architectural, structural works, electrifications fitting & fixtures, (with material including wires, all energy saver, supply and installation of Ceiling Fans, size 56-inch, with proper conduits and alongwith hanging arrangement for ceiling fans, LEDs/bulbs, LED tube lights, Energy Saving Lamps, Energy Savers, switches, Light Plugs, Power Plugs/Receptables, alongwith Light Fittings for indoor use, outdoor type weatherproof fitting with long life lamps, weatherproof receptables for outdoor installation, PVC conduits, sockets, call bell, DBs, butterfly shutter, water supply including OHWT, Sanitary bath fittings, utensils, wash basins, traps, and sewerage work including septic tank, water supply & sewerage work to be connected with the main water supply & sewerage system or directed by the Engineer, fair face bricks, plaster work, aluminum work for door & windows with 2 mm thickness, Plastic emulsion paint, mosaic flooring, polishing, roof proofing with felt, jambulon, tiles, almirahs, provision, supply and installation of False Ceiling in Control room where cooling/air conditioning system is provided including corridors, fire hydrants, Cable trench in 11 kV room having size 1500x1000 mm with grating at top, Cable trench in control room having size 600x600 mm with chequred plates at top, etc. complete in all aspects as per Specifications and approved Drawings.	1	Lot		
6.0	Construction of Open R.C.C vehicle parking area (for 6 vehicles) near building complete In all respects as per Specifications and Drawings.	1	Lot		
7.0	**External Electrification and Road Lighting**				
7.1	Supply and Installation of 10 m high single bent arm conical octagonal galvanized steel poles with extension arm luminaire arrangement, foundation, base plate, J rag bolts, 2 Amp SP MCB, pole numbering and earthing etc., using underground cable system and Road Lighting LED Luminaries 120 W make Signify (Philips), Schreder, Tungsram (GE) or equivalent in Grid Station premises.	1	Lot		
8.0	Any other item (equipment or works) whether specified or not but necessary for completion of the specified scope of work.	1	Lot		
9.0	**Grand Total**				

(Rupees_____)
In Words

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CONTRACTOR **FIEDMC**

Notes:

1. Wherever the word "Lot" has been used in the BOQ, the contractor is required to provide the detail of items included therein with cost breakup.
2. The quantities stated in the BOQ are estimated and will be used for Evaluation purposes. Actual quantities may vary from the BOQ based on the detail design.
3. All civil works quantities are tentative and indicative only for evaluation purposes only.
4. Any other item deemed necessary for the successful completion and operation of the project as per design and not quoted above may also be quoted or included.
5. Any other item deemed necessary by the bidder for the successful completion and operation of the project as per design and not quoted above may also be quoted separately and mentioned herewith.

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
INSTALLATION, ERECTION, TESTING & COMMISSIONING					
1.0	Complete Installation, Erection of 132/11.5kV, 31.5/40MVA Power Transformer, 50Hz, 10% Impedance, Vector Group Dyn11, with extended creepage distance bushings, Auxiliary Panel, on-load tap-changer (MR Germany make or equivalent), and other allied accessories as described in NTDC/FESCO Specification P-46:2008 (amended to date).	2	No.		
2.0	Complete Installation, Erection 120 kV Metal Oxide Gapless Surge Arresters with extended creepage distance insulator, Surge Counter, complete with steel supporting structure, grouting bolts with all other allied accessories as per NTDC/FESCO Specification P-181:2012 (amended to date).	6	No.		
3.0	Complete Installation, Erection of 145 kV, 2000A, 40kA, 3-Pole, SF_6 Circuit Breaker with extended creepage distance insulator, steel supporting structure, grouting bolts, with all other allied accessories as per NTDC/FESCO Specifications P-193:2010 (amended to date) including step ladder and working platform on support foundation fixed with Anchor Bolts.	7	Set		
4.0	Complete Installation, Erection of 145 kV, 2000 A, 40 kA, 3-Pole Single Throw Bus Disconnectors (Parallel Arrangement) equipped with motor and manual operating mechanism and without earthing switch having extended creepage distance, insulator complete with steel supporting structure, grouting bolts, Earthing Platform with Foundation support and Anchor Bolts, with all other allied accessories as per NTDC/FESCO Specification P-193:2007 (amended to date).	3	Set		
5.0	Complete Installation, Erection of 145 kV, 2000 A, 40 kA, 3-Pole Single Throw Bus Disconnectors (Serial Arrangement) equipped with motor and manual operating mechanism and without earthing switch having extended creepage distance, insulator complete with steel supporting structure, grouting bolts, Earthing Platform with Foundation support and Anchor Bolts, with all other allied accessories as per NTDC/FESCO Specification P-193:2007 (amended to date).	13	Set		
6.0	Complete Installation, Erection of 145 kV, 2000 A, 40 kA, 3-Pole Single Throw Line Disconnectors equipped with motor and manual operating mechanism and with earthing switch having extended creepage distance, insulator complete with steel supporting structure, grouting bolts, Earthing Platform with Foundation support and Anchor Bolts, with all other allied accessories as per NTDC/FESCO Specification P-193:2007 (amended to date).	4	Set		
7.0	Complete Installation, Erection of 145 kV, 40 kA, Single phase Current Transformer ratio 400:200/5 A, 4-core with extended creepage distance insulator, complete with steel supporting structure, grouting bolts, with all other allied accessories, as per NTDC/FESCO Specification P-90:2012 (amended to date).	6	No.		
8.0	Complete Installation, Erection of 145 kV, 40 kA, Single phase Current Transformer ratio 1200:600:300/5 A, 4-core with extended creepage distance insulator, complete with steel supporting structure, grouting bolts, with all other allied accessories, as per NTDC/FESCO Specification P-90:2012 (amended to date).	15	No.		
9.0	Complete Installation, Erection of 145 kV, 50 Hz, Single Phase, Voltage Transformer, ratio 132/√3 kV / 110/√3 V, with extended creepage distance insulator, steel supporting structure, grouting bolts, with all other allied accessories as per NTDC/FESCO Specification P-129:85 (amended to date).	6	No.		
10.0	Complete Installation, Erection of 145 kV Post Insulators, 650 BIL complete with extended creepage distance insulator, steel supporting structure, grouting bolts, with all other allied accessories.	6	No.		
11.0	Complete Installation, Erection of 12 kV Surge Arrestor with surge counter, extended creepage distance and terminal with insulating leads and protective cap and mounting bracket complete etc., as per NTDC/FESCO Specification P-181:2012 (amended to date).	6	No.		
12.0	**Complete Installation, Erection of 132kV Steel Gantries:**				
12.1	Column (13.8 + 3.1) m	11	No.		
12.2	Column (10+3.1) m	9	No.		
12.3	Beam (12m) for 1x600mmsq.conductor	6	No.		
12.4	Beam (12m) for 2x600mmsq.conductor	8	No.		
12.5	Earth Mast 13.1 m	1	No.		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
13.0	Complete Installation, Erection of 11 kV, 7.2 MVAR (36 x 200 kVAR), 50 Fuses, Capacitor Bank comprising of 1-phase capacitors (200 kVAR) complete with mounting racks, fuses and bus works with Neutral CT as per NTDC/FESCO Specifications (amended to date).	2	Set		
14.0	Complete Installation, Erection of Pad mounted transformer, 200kVA, 11kV/0.415 kV, along with 19/.083 (10mmsq), 4 core LV Cable.	1	No.		
15.0	**Complete Installation, Erection of cable connections, cable fixing complete, 132 kV Control & Protection System as per interconnection diagrams and NTDC/FESCO Specifications (amened to date).**				
15.1	CP-32, Control Panel for 132 kV Line Bay with double bar mimic, complete with Glands & Blind Plates.	4	No.		
15.2	CP-51, Control Panel for 132/11.5 kV 31.5/40 MVA Transformer Bay with double bar mimic, complete with Glands & Blind Plates.	2	No.		
15.3	CP-40, Control Panel for 132 kV bus coupler with double bar mimic, complete with Glands & Blind Plates.	1	No.		
15.4	RP-3, Relay Panel for 132 kV Line Bay, complete with Glands & Blind Plates.	4	No.		
15.5	RP-4, Relay Panel for 132/11.5 kV Transformer Bay, complete with Glands & Blind Plates.	2	No.		
15.6	RP-1, Relay Panel for 132 kV Bus coupler bay, complete with Glands & Blind Plates.	1	No.		
15.7	Marshalling kiosks, complete with the accessories as per control and protection schemes	2	No		
15.8	CT Boxes, including Terminal Connectors, Shorting Links, MCBs, MCCBs, Cable Glands, and Conduits, etc. as per approved drawings.	7	No		
15.9	PT Boxes, including Terminal Connectors, MCBs, MCCBs, Cable Glands, and Conduits, etc. as per approved drawings.	2	No		
15.10	Miscellaneous relays and accessories required for complete operation of protection system.	1	No		
16.0	**Complete Installation, Erection of 132 kV Substation General Equipment.**				
16.1	Laying, installation of complete 132 kV Busbars including Hawthorn conductor, single/double tension string and suspension string assemblies complete with installation and hardware connections required for the job completion in all respect as per design drawings and specifications.	1	Lot		
16.2	Laying and Installation of Connection of equipment with Hawthorn/Tabular Conductor, connectors, etc. to complete the job in all respect as per design drawings and specifications.	1	Lot		
16.3	11 kV Al. pipes 100 mm dia 4m long.	1	Lot		
16.4	Earth wire 7/3.25 mm for Switchyard Shielding.	1	Lot		
16.5	Earth wire Tension Assemblies with G-clamps.	1	Lot		
16.6	11 kV extended creepage distance Post insulator with fittings.	1	Lot		
16.7	11 kV Structure with extended creepage distance insulators and fittings for power cables.	1	Lot		
16.8	11 kV Structure with Post insulators for 11 kV bus bars and fittings for power cables, 11 kV surge arresters, complete in all respects.	1	Lot		
16.9	All Aluminum Conductor 600 mmsq. (Hawthorn).	1	Lot		
16.10	Hardware and Connectors for Busbar for 1 x 600 mm sq. and 2 x 600 mm sq. All Aluminum Conductor as per drawings & Specifications.	1	Lot		
17.0	**Laying/ Installation, connections of Cables and accessories.**				
17.1	**15 kV XLPE Power cables as per NTDC/FESCO Specifications (Amended to Date).**				
17.1.1	1-core 1000MCM	1	Lot		
17.1.2	1-core 500MCM	1	Lot		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
17.2	**Termination Kits as per NTDC/FESCO Specifications (Amended to Date).**				
17.2.1	Indoor T/ Kits a/w Clamps for 1000 MCM	1	Lot		
17.2.2	Indoor T/ Kits a/w Clamps for 3 Core 4/0 AWG 120 mm sq. Cables.	1	Lot		
17.2.3	Outdoor T/ Kits a/w Clamps for 1000 MCM cables.	1	Lot		
17.2.4	Outdoor T/ Kits a/w Clamps for 3 Core 4/0 AWG 120 mm sq. Cables.	1	Lot		
18.0	**Laying/ Installation, connections of Control Cables as per NTDC/FESCO Specification (amended to date).**				
18.1	Control Cable 4 x 2.5 mm^2	1	Lot		
18.2	Control Cable 8 x 2.5 mm^2	1	Lot		
18.3	Control Cable 16 x 2.5 mm^2	1	Lot		
18.4	Control Cable 4 x 6 mm^2	1	Lot		
19.0	**Laying/ Installation, jointing, connections of risers to equipment foundations and steel support structures of Earthing Material in Switchyard grounding system.**				
19.1	120 mm^2 Copper Conductor	1	Lot		
19.2	95 mm^2 Copper Conductor.	1	Lot		
19.3	Earthing rod (16mm dia, 3m long).	1	Lot		
19.4	Earth Pits for Power Transformer and 11kV Panel Boards.	1	Lot		
19.5	**Cartridges:**				
19.5.1	Type A	1	Lot		
19.5.2	Type B	1	Lot		
19.5.3	Type C	1	Lot		
19.6	**Moulds with holding clamps**				
19.6.1	Type A	1	Lot		
19.6.2	Type B	1	Lot		
19.6.3	Type C	1	Lot		
19.7	**Grounding Connectors**				
19.7.1	Type I	1	Lot		
19.7.2	Type II	1	Lot		
19.7.3	Type III	1	Lot		
20.0	Installation of Switchyard Lighting/Emergency Lighting System, Mercury arc light fittings, 250W, 240V AC, complete, Power sockets outlets 415V, 3-PH. 5-Pin, 30A including wiring/ cabling etc. as specified.	1	Lot		
21.0	Installation of Control House Building Lightning Protection System including Air Terminal Rods, Earthing Rods, Copper strips, Connectors, clamps, lugs and Test block arrangement etc. complete in all respects.	1	Lot		
22.0	**Installation of 11 kV Switchgear Panels:**				
22.1	11 kV Incoming panel, 25 kA, 2500A.	1	Lot		
22.2	11 kV Outgoing panel, 25 kA, 630A.	1	Lot		
22.3	11 kV Capacitor panel 25 kA, 630A.	1	Lot		
22.4	11 kV Bus Coupler panel, 25kA, 2500A.	1	Lot		
23.0	**Installation of Battery and Battery Charger:**				
23.1	Battery Bank 110V DC, 150AH.	1	Lot		
23.2	Battery charger 240VAC/ 110VDC, 25A.	1	Lot		
23.3	AC/ DC Station Auxiliary Services Panel.	1	Lot		
24.0	**Installation of Fire Fighting system:**				
24.1	Fire Extinguisher for switchyard area, trolley mounted, 50kg bottle of powder type as per FESCO/NTDC specifications.	1	Lot		
24.2	Fire Extinguisher, wall mounted, CO2 type 5 kg cylinder for Control Building as per FESCO/NTDC specifications.	1	Lot		

SCHEDULES OF PRICES

Client / Owner: Faisalabad Industrial Estate Development & Management Company
Name of Work: **PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132KV AIS GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.**
CONTRACT NO. GS-AIIC-02. (R-I)
Location: Faisalabad Dated:……

Sr. No.	Particulars	Quantity	Unit	Unit Price (PKR)	Total Price (PKR)
25	**Miscellaneous Works for Control House Building**				
25.1	Installation of telephone, and computer cabling along with all equipment and services shall conform to IEEE/Electric Inspector regulations for buildings and FESCO requirements.	1	Lot		
25.2	Installation of XLPE cable, Copper, 600/1000V connection including 200kVA Station Transformer to AC/DC Main Distribution panel/board and all connecting cables to sub distribution boards and outside lighting and services.	1	Lot		
25.3	Installation of Internet Cable (Cat. 6) in PVC pipe 20mm dia from outside of building laid in floor slab include all necessary accessories for completion of the work as per Specification and instruction of the Engineer. Cable shall be laid from outside the building to Servers and Office.	1	Lot		
25.4	Installation of complete Fire Alarm System including Smoke Detector of all zones with control panels, fire retardant cable in 3/4" iron pipe recessed from smoke detectors as per approve design/drawings. The work shall be carried out as per specification and instruction of the Engineer, including all the accessories required for completion of the work.	1	Lot		
25.5	Installation of HVAC Inverter Type system complete including Copper Piping, Drain System & Power Supply as per specifications and drawings advised by the Engineer.	1	Lot		
26	Individual Testing of all Equipment and Testing & Commissioning of the complete Grid Station as required per Specifications and Design Drawings NTDC/FESCO.	1	Lot		
27.0	**Total Amount**				

(Rupees_____)
In Words

_____ **CONTRACTOR**

_____ **FIEDMC**

1. Wherever the word "Lot" has been used in the BOQ, the contractor is required to provide the detail of items included therein with cost breakup.
2. The quantities stated in the BOQ are estimated and will be used for Evaluation purposes. Actual quantities may vary from the BOQ based on the detail design.
3. Any other item deemed necessary for the successful completion and operation of the project as per design and not quoted above may also be quoted or included.
4. Any other item deemed necessary by the bidder for the successful completion and operation of the project as per design and not quoted above may also be quoted separately and mentioned herewith.

PREAMBLE TO CONDITIONS OF CONTRACT

PREAMBLE TO CONDITIONS OF CONTRACT

Commencement Date	Sub-Clause 1.1.1.(i) The date for commencement of the Works is the date of issuance of the Project Manager / Engineer's Written Order to Commence which shall be issued within 14 days of signing of Contract Agreement and also site possession has been delivered.
Defect Liability Period	Sub-Clause 1.1.11 The Defect Liability Period is 365 days after the date certified in the Taking-Over Certificate but subject to extension as provided under Sub- Clause 30.4. The defects at site considering structural stability, physical appearance and precautionary measures shall be identified by the Employer's Representative.
The Employer	Sub-Clause 1.1.12. The Employer is: **Chief Executive Officer** Faisalabad Industrial Estate Development & Management Company (FIEDMC) Main Gate, M-3 Industrial City, Faisalabad. Tel. # 041-8900201-7 Email: fiedmc@fiedmc.com.pk URL: www.fiedmc.com.pk
The Project Manager/Engineer	Sub-Clause 1.1.15. The Engineer wherever appears will be read as The Engineer unless specified otherwise. The Engineer is: **ENMASSE PVT., LTD.** 18, Block E-2, Johar Town, Lahore. Phones: 042-35314701-02 Email: enmasse@enmassepakistan.com; URL: www.enmassepakistan.com
Time for Completion	Sub-Clause 1.1.35. The Time for Completion for whole of the Works is **360 days** reckoned from the Commencement Date for the project
Warranty Period	Sub-Clause 1.1.40. The Warranty Period is 01 years for (goods / equipment). However, in case of delay in commissioning of sub-station due to unavailability of 132 KV Transmission line, the extended warranties during the intervening period shall be borne by FIEDMC.
Project Manager/Engineer's Duties & Authorities	Sub-Clause 2.1 The duties & authorities of the Engineer are specified in Particular Conditions of Contract.
Confirmation in Writing	Sub-Clause 2.6 (i) If the Contractor shall require the confirmation, it shall be notified to the Engineer within ten (10) days.

	(ii) Engineer shall confirm the decision/instruction within fourteen (14) days of the requirement.
Ruling Language	Sub-Clause 5.1. The version in **English** language (ruling language) shall prevail.
Day to Day Communications	Sub-Clause 5.2. The language for day-to-day communication is **English**.
As Built- Drawings	Sub-Clause 6.10 As-Built drawings shall be provided to the Engineer forty-five (45) days from the date of issue of Taking-Over Certificate.
General Obligation	Sub-Clause 8.1 The Contractor shall provide all Erection & Testing Equipment and maintenance Tools.
Programme to be Furnished	Sub-Clause 12.1. The proposed Programme of work must be submitted to the Procuring Agency and the Engineer as described in Schedule-C to Bid.
Electricity Water, Gas and Other Services	Sub-Clause 14.3. Supplies on the Site are: a. Electricity b. Water c. Gas d. Other Services } As described in the Particular Conditions of Contract.
Employer's Equipment	Sub-Clause 14.4. There will be no Employer's Equipment available for use by the Contractor.
Working Hours	Sub-Clause 18.3. The normal working hours on the Site are to conform to the applicable labor laws and the existing Customs of Pakistan.
Time for Completion	Sub-Clause 25.1 Period of Completion is as stated under Sub-Clause 1.1.35 hereof.
Earlier Completion	Sub-Clause 26.3 Not applicable.
Delay in Completion	Sub-Clause 27.1. Failure of the Contractor to meet the Time for Completion entitles the Employer to deduct from the Contract Price, the liquidated damages @ 0.1% of the Contract Price as stated in Letter of Acceptance, excluding Provisional Sums for each and every day, including holidays, of delay or part thereof; but to a maximum limit of 10% of the Contract Price as stated in Letter of Acceptance, excluding Provisional Sums.
Prolonged Delay	Sub-Clause 27.2. Maximum amount recoverable from the Contractor by the Employer shall be 10% of Contract Price as stated in the Letter of Acceptance, excluding Provisional Sum.

Failure to meet guarantees	Sub-Clause 27.3 Liquidated Damages for Failure to meet Performance Guarantee for each transformer unit. i) kVA guarantee PAK Rs. 6,500 for each kVA under run of 132/11.5 kV power transformer unit against guaranteed kVA of transformer. ii) Loss guarantees for 132 / 11.5 kV power transformer. a) PAK Rs. 275,000 for each kW of measure no-load loss above guaranteed no-load loss for respective transformer. b) PAK Rs. 145,000 for each kW of measure load loss above guaranteed load loss for respective transformer. Limitation of Liquidated Damages for failure to meet guarantees is upto Ten percent (10%) of Contract Price in addition to liquidated damages specified under sub-clause 27.1 above as stated in Letter of Acceptance excluding Provisional Sums.
Terms of Payment	Sub-Clause 33.1. In addition to the provisions under Clause 33, the terms of payment shall be as stated in Sub-Clause 33.1 of Particular Conditions of Contract.
Payment	Sub-Clause 33.5 i) Period of Payment by Employer to Contractor: Within thirty (30) days after receipt of Certificate of Payment from the Engineer. ii) Period of Payment by Employer to Contractor: Within sixty (60) days after receipt of Certificate of Payment from the Engineer.
Payment in Foreign Currencies	Sub-Clause 35.1. Not used.
Rates of Exchange	Sub-Clause 35.3. Not used.
Insurance of Works	Sub-Clause 43.1. The amount of insurance shall be for full replacement value of the Works. For the deductibles, if any, the Contractor shall submit an undertaking that he shall indemnify and keep indemnified the Employer for the number of deductibles provided in the insurance policy. Sub-Clause 43.1.(a) The additional risks to be insured are as stated in Sub-Clause 43.1(a) of the Particular Conditions of Contract.
Third Party Liability	Sub-Clause 43.3. The amount of insurance against third party liability taken out by the Contractor shall not be less than Pak Rs. 2,000,000/- per occurrence with number of occurrences unlimited.
Payment on Termination for Employer's Default	Sub-Clause 46.3. The additional amount payable by the Employer on termination shall not exceed the actual cost of work executed.
Labor, Materials and Transport	Sub-Clause 47.1. The Sub-Clause is deleted

Disputes & Arbitration	Sub-Clause 50.4 Venue of Arbitration shall be Faisalabad, Pakistan.
Applicable Law	Sub-Clause 51.1. The Contract in all respects be read and construed and shall operate as a Pakistani Contract in conformity with the Laws of Islamic Republic of Pakistan.
Procedural Law for Arbitration	Sub-Clause 51.2. The procedural law for arbitration shall be the Rules of Pakistan Arbitration Act 1940 as amended.
Language and Place of Arbitration	Sub-Clause 51.3. The language of arbitration is English. The place of arbitration is **Faisalabad**, Pakistan.

PART –I

GENERAL CONDITIONS OF CONTRACT

[Notes on the Conditions of Contract

The Conditions of Contract comprise two parts:

(a) General Conditions of Contract
(b) Particular Conditions of Contract

Over the years, a number of "model" General Conditions of Contract have evolved. The one used in these Standard Bidding Documents was prepared by the International Federation of Consulting Engineers (Federation Internationale des Ingenieurs-Conseils, or FIDIC), and is commonly known as the FIDIC Conditions of Contract. (The used version is the 1987 edition, reprinted in 1988 with editorial amendments).

The FIDIC Conditions of Contract have been prepared for an ad measurement (unit price or unit rate) type of contract, and cannot be used without major modifications for other types of contract, such as lump sum, turnkey, or target cost contracts.

The standard text of the General Conditions of Contract chosen must be retained intact to facilitate its reading and interpretation by bidders and its review by the Employer. Any amendments and additions to the General Conditions, specific to the contract in hand, should be introduced in the Particular Conditions of Contract.

The use of standard conditions of contract for all electrical/mechanical Works will ensure comprehensiveness of coverage, better balance of rights or obligations between Employer and Contractor, general acceptability of its provisions, and savings in time and cost for bid preparation and review, leading to more economic prices.

The FIDIC Conditions of Contract are copyrighted and may not be copied, faxed, or reproduced. Without taking any responsibility of its being accurate, Pakistan Engineering Council with prior consent of FIDIC Secretariat, has reproduced herein the FIDIC General Conditions of Contract for reference purpose only which cannot be used by the users for preparing their bidding documents. The bidding document may include a purchased copy, the cost of which can be retrieved as part of the selling price of the bidding document. Alternatively, the FIDIC Conditions of Contract can be referred to in the bidding documents, and the bidders are advised to obtain copies directly from FIDIC*.

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* Add the following text if the bidding documents, as issued, do not include a copy: "Copies of the FIDIC Conditions of Contract can be obtained from:
FIDIC Secretariat
P.O. Box 86 1000 Lausanne 12, Switzerland
fidic.pub@fidic.org – FIDIC.org/bookshop]

The **"CONDITIONS OF CONTRACT FOR ELECTRICAL AND MECHANICAL WORKS"** section from page 71-141 has been removed as FIDIC doesn't allow it to be copied. Copies of the FIDIC Conditions of Contract can be obtained, by the successful bidder to include in the Contract Agreement, from:

FIDIC Secretariat
P.O. Box 86
1000 Lausanne 12 Switzerland
e-mail: fidic.pub@fidic.org - FIDIC.org/bookshop]

PART II
PARTICULAR CONDITIONS OF CONTRACT

PART-II: PARTICULAR CONDITIONS OF CONTRACT

TABLE OF CONTENTS

PART-II: PARTICULAR CONDITIONS OF CONTRACT

1.1 Definitions

The text of Sub-Clause 1.1.1 is deleted and substituted by the following:

"Commencement Date" means the date specified in the Preamble to Conditions of Contract.

The text of Sub-Clause 1.1.2 is deleted and substituted by the following:

"Conditions" means the Preamble to Conditions of Contract, General Conditions of Contract and Particular Conditions of Contract.

Sub-Clause 1.1.3

The words "Employer's Drawings and" are deleted. At the end of Sub-Clause, the following is added:

"Any subsequent document mutually agreed and signed by the Employer and the Contractor, shall be the part of the Contract."

The text of Sub-Clause 1.1.5 is deleted and substituted by the following:

"Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works subject to such additions thereto or deductions therefrom as may be made under the provisions herein after contained and remedying of any defects therein in accordance with the provisions of the Contract.

Sub-Clause 1.1.11

The Defects Liability Period is the period mentioned in the Preamble to Conditions of Contract.

Sub-Clause 1.1.13

The sub-clause 1.1.13 is deleted.

Sub-Clause 1.1.15

The following is added at the end of Sub-Clause:

"or any other competent person appointed by the Employer as his replacement."

Sub-Clause 1.1.23

The following paragraph is added:

The word "Goods" is synonymous with "Plant."

The text of Sub-Clause 1.1.27 is deleted and substituted by the following:

"Schedule of Prices" means the completed and priced Schedule of Prices, or any part or individual schedule thereof, submitted by the Contractor with his Bid or revised and mutually agreed and forming a part of the Contract documents.

Sub-Clause 1.1.33

The word "Tender" is synonymous with the word "Bid" and the word "Tender Documents" with the word "Bidding Documents".

The following Sub-Clauses 1.1.38 to 1.1.50 are added:

Sub Clause 1.1.38

"Month" means calendar month according to Gregorian calendar.

Sub Clause 1.1.39

"Operation and Maintenance Manuals" has the meaning described in Sub- Clause 6.6.

Sub Clause 1.1.38

"Warranty Certificate" means the certificate against specified goods/equipment, for the period mentioned in the Preamble to Conditions of Contract, to be issued by the Contractor that the goods/ equipment supplied under the Contract are new, unused and incorporate all recent

improvements in design and materials unless provided otherwise in the Contract and that the Contractor will be responsible for making good or replacing any defective goods/equipment during the Warranty Period specified in the Preamble to Conditions of Contract which should commence after expiry of Defect Liability Period.

Sub-Clause 1.1.41

The word "Part II" stated in FIDIC Conditions of Contract is synonymous with the word "Particular Conditions of Contract".

Sub Clause 1.1.42 "Local Goods" is synonymous with the words "Indigenous Goods "and the work "Installation" with "Erection".

Sub-Clause 1.1.43 "Turnkey Basis" means the single responsibility for design, supply, installation, testing and commissioning of all mechanical and electrical equipment, civil and other works necessary for the completion and commercial operation of the Plant and shall include all such items of Plant and equipment or work, whether mentioned in the Specifications, Bid drawings, Schedule of Prices or not, which are required to make the Plant operationally complete to deliver electrical power in accordance with the guarantees prescribed under the Contract.

Notwithstanding the foregoing, it may be clarified however, that unless expressly prescribed otherwise by the Contract, the payment to the Contractor shall be made by measurement in accordance with the provisions set out under sub-clause 33.8 of Particular Conditions of Contract and the Contract shall not be construed as lump sum contract in this regard.

Sub-Clause 1.1.44

Not used

Sub-Clause 1.1.45 "Constructional Plant" means all appliances or things of whatsoever nature (other than Temporary works) required for execution and completion of the Works and the remedying of any defect therein but does not include Plant, materials or other things intended to form or forming part of Permanent works. The word "Constructional Plant" is synonymous with "Contractor's Equipment".

Sub-Clause 1.1.46 "Contractor's Agent" means the person for the time being or from time to time appointed by the Contractor pursuant to the provisions of Clause 13. The word "Contractor's Agent" is synonymous with" Contractor's Representative".

Sub-Clause 1.1.47 "Performance Tests" means tests intended to demonstrate the attainment of guaranteed contract performance to be conducted in accordance with the requirement of the Specifications.

Sub-Clause 1.1.48 "Reliability Test" means such test or tests as are provided for in the Contract, or as may be agreed upon, which shall be successfully completed as a pre- requisite to Taking Over.

Sub-Clause 1.1.49 "Temporary Works" means all temporary works of every kind (other than Contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defects therein.

Sub-Clause 1.1.50 "Permanent Works" means the permanent works to be executed (including Plant) in accordance with the Contract

1.6 Cost, Overhead Charges and Profit

The last sentence "Any profit _____ stated in the Preamble" is deleted and substituted by the following:

"Any profit entitlement shall be added to cost at the percentage stated in the Bid and agreed in the Contract Agreement."

2.1 Engineer's Duties

The text of Sub-Clause 2.1 is deleted and substituted by the following: "The Engineer shall carry out the duties specified in the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or

necessarily to be implied from the Contract. The Engineer is required to obtain the specific approval of the Employer before carrying out his duties in accordance with the following Clauses of General Conditions of Contract:

(a) Approval of Subcontractor under Sub-Clause 4.1,

(b) Certifying additional sums under Sub-Clause 5.4,

(c) Certifying additional costs under Sub-Clauses 11.3 & 12.3,

(d) Certifying any cost under Sub-Clause 14.6,

(e) Approval of extension of time under Clause 26,

(f) Issuing a Taking–Over Certificate under Sub-Clause 29,

(g) Issuing a Defects Liability Certificate under Sub-Clause 30.11,

(h) Issuing a Variation Order under Clause 31,

(i) Fixing rates or prices under Clauses 31 and 34,

(j) Certifying additional costs under Sub-Clause 44.5 and

(k) Certifying additional costs under Sub-Clause 47.2;

Except for such variations pursuant to Sub-Clause 31.1 of the GCC which may be necessary in an emergency affecting safety of life, the works or of adjoining property."

Except as expressly stated in the Contract the Engineer shall have no authority to relieve the Contractor of any of his obligations under this Contract."

2.6 Confirmation in Writing

(i) In line 3 after the words "undue delay" the following is added:

"But not after the number of days mentioned in the Preamble to Conditions of Contract from the instruction or decision."

(ii) At the end of Sub-Clause 2.6, the following is added:

"The Engineer shall confirm or otherwise within the period mentioned in the Preamble to Conditions of Contract from the receipt of requirement(s) from the Contractor."

2.7 Disputing Engineer's Decisions and Instructions

The following text is deleted:

"If either party .....in accordance with the Contract."

2.8 Replacement of Engineer

The text of Sub-Clause 2.8 is deleted and substituted by the following:

If the Employer intends to replace the Project Manager/ Engineer, the Employer shall, not less than fourteen (14) days before the intended date of replacement, give notice to the Contractor, of the name, address and relevant experience of the intended replacement Project Manager / Engineer. The Employer shall not replace the Project Manager/Engineer with a person against whom the Contractor raises reasonable objection by notice to the Employer, with supporting particulars.

The following Sub-Clause 2.9 is added:

2.9 Engineer Not Liable

Approval, reviews and inspection by the Engineer of any part of the Works does not relieve the Contractor from his sole responsibility and liability for the supply of remaining materials and equipment for the Works and parts thereof and complete the remaining erection works and testing and commissioning in accordance with the Contract and neither the Engineer's authority to act nor any decision made by him in good faith as provided for under this Contract whether to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any of their representatives or employees or any other person performing any of the works. However, the Contractor shall be compensated if

any loss/ damage is occurred due to the decision of the Engineer.

The following Sub-Clause 4.2 is added:

4.2 No Contractual Relation between Subcontractor and the Employer

Nothing contained in the Contract Documents shall create any contractual relation between any Subcontractor and the Employer.

5.3 Priority of Contract Documents

Sub-Clause 5.3 is deleted and substituted by the following:

"Unless otherwise provided in the Contract the priority of the Contract Documents shall be as follows:

1. The Contract Agreement (if completed)
2. The Letter of Acceptance
3. The completed Form of Bids
4. Preamble to Conditions of Contract
5. The Particular Conditions of Contract
6. The General Conditions of Contract
7. Preamble to Schedule of Prices
8. The priced Schedule of Prices
9. The completed Schedule to Bid (A to H)
10. The Drawings
11. The Specifications (Special Provisions and Technical Provisions)
12. Any other document forming part of the Contract

In case of discrepancies between drawings, those of larger scale shall govern unless they are superseded by drawing(s) of a later date regardless of scale. All drawings and specifications shall be interpreted in conformity with the Contract Agreement and these conditions."

5.4 Documents Mutually Explanatory

The text appearing in the last line after the words "the Contract Price" is deleted and the following text is added:

The Technical Specifications are taken to be correct, but complete accuracy is not guaranteed. Any error or ambiguity must be reported to the Employer and the Project Manager / Engineer before starting the work affected. In the event of any dispute arising as to the true intended meaning of Technical Specification, the Project Manager / Engineer shall interpret the same and his interpretation shall be accepted as final and binding upon all parties concerned, except to the extent provided for in the Arbitration provisions hereof.

6.2 Consequences of Disapproval of Contractor's Drawings

Full stop is deleted and the following words are added at the end of Sub-Clause:

"For the approval of the Engineer. However, the Contractor shall not be entitled for time extension on this account."

6.6 Operation and Maintenance Manuals

Paras 2 & 3 are deleted and the following text is added at the end of Para 1 of Sub- Clause:

"The Operation and Maintenance Manuals shall include full instructions for the operation, servicing and maintenance of the Plant, not only during the period of the Contractor's liability but more particularly during its operating life.

The directions shall be set out simply, clearly and systematically. This may be divided into two volumes if desirable, one for operation and the second for servicing and maintenance (in sub-volumes for major items of Plant).

The operational data shall include a complete physical and functional description of the Plant (in sub–volumes for major items of Plant) and step–by–step procedures for inspection, checking and adjustments for proper operation of the Plant.

The maintenance data shall include complete instructions for routine checks, servicing, maintenance and repair of all parts and for dismantling, handling and re–assembly of all equipment, sub–assemblies and all separate components. The maintenance data shall also include were possible parts catalogues. The lists shall provide all necessary information for identifying the parts and for re–ordering the parts including name of part, part number and catalogue references where applicable, name of manufacturer, size, capacity and other characteristics.

General arrangements, single line diagrams and detailed drawings shall be provided for ready reference in the operation and maintenance instructions.

The manuals shall be printed on ISO paper size A4 (210x297 mm) with offset or equivalent printing strongly bound in a durable stiff cover bearing the title in approved legend. Drawings shall be folded or reduced to 297 mm height. All volumes shall baron the spine an approved shortened version of the title.

The Contractor shall submit three (3) draft copies for approval of the Engineer prior to producing finished volumes.

The Contractor shall provide ten (10) copies of the approved Operation and Maintenance Manuals prior to Taking Over by the Employer. Supplementary Operation and Maintenance Manual shall be provided by the Contractor, if required, to incorporate changes resulting from experience during the operation and maintenance period. The work shall not be considered to be completed for the purpose of taking over until such manual and drawings have been supplied to the Employer.

The Contractor's attention is also drawn to the provisions of Clause 23 of the Specifications - Special Provision."

6.9 Manufacturing Drawings

The words "Unless otherwise specified in Part-II" are deleted and the following is added at the end of Sub-Clause:

"However, the Contractor is required to disclose to the Engineer or the Employer any confidential information necessary to justify the reliability, the efficiency and the operation and maintenance of the Plant supplied by him."

Following sub-clause 6.10 is added:

6.10 "As-Built" Drawings

The following new Sub-Clause is added:

The Contractor shall furnish to the Engineer six (6) copies and Two (2) reproducible of approved quality of all "As–Built" drawings within the period mentioned in the Preamble to Conditions of Contract. All drawings (using latest AutoCAD or related software) shall also be provided in an electronic form i.e. USB and DVD.

Following sub-clause 6.11 is added:

6.11 Shop Drawings

The Contractor shall submit to the Engineer for review three (3) copies of all shop and erection drawings applicable to this Contract as per provision of relevant sub-clause of the Contractor.

Review and approval by the Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and that the Engineer's review or approval shall not relieve the Contractor of any of his responsibilities under the Contract.

7.1 Errors in Contractor's Drawings

Second line, the text "unless they are due to incorrect Employer's Drawings or other written information supplied by the Employer or the Engineer" is deleted.

7.2 Errors in Employer or Engineer

Sub-Clause is deleted in its entirety.

8.1 General Obligations

The text of Sub-Clause 8.1 is deleted and substituted by the following:

(a) The Contractor shall commence the work on the date specified in the Preamble to Conditions of Contract and shall proceed with the same with due expedition and without delay.

(b) The Contractor shall, in accordance with the Contract, with due care and diligence, complete the Works and test and commission the Plant and carry out the Works within the Time for Completion. The Contractor shall also provide all necessary Contractor's Equipment, superintendence, labor and except as stated hereinbelow, all necessary facilities therefore.

The Employer will permit use of the Erection, Testing Equipment and Maintenance Tools as stated in the Preamble to Conditions of Contract.

The above facilities shall be provided at no cost to the Contractor but he shall procure at his cost all required consumable materials and any other items necessary for the proper execution of the Works. These shall be properly used and maintained by the Contractor and returned to the Employer upon handing over of the Works in good condition, fair wear and tear excepted. In case of any damage, loss or theft, the items shall be replaced by the Contractor at his own cost.

8.2 Setting Out

The first three (3) paragraphs are deleted and substituted with the following:

The Contractor shall be responsible for correctness of position, level and dimensions of the work according to the drawings notwithstanding that he may have been assisted by the Employer/ Engineer in setting out the same.

Following sub-clause 8.3 is added:

8.3 Boreholes and Exploratory Excavation

The Contractor shall conduct all investigations necessary for the design of the Works at his own cost as directed by the Employer/ Engineer.

9.1 Contractor Agreement

In the last line, modify the words “cost of the Employer” to read “cost of the Contractor”.

10.1 Performance Security

Sub-Clause 10.1 is deleted and substituted by the following:

“The Contractor shall provide a Performance Security in the prescribed Form annexed to these Documents. The said Security shall be furnished by the Contractor within 28 days after the receipt of Letter of Acceptance. The Performance Security shall be of an amount equal to 10% of the Contract Price in the currency (ies) of the Contract at the option of the bidder, be in the form of either (a) bank guarantee from any Scheduled Bank in Pakistan or (b) bank guarantee from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan.

The cost of complying with the requirements of this Sub-Clause shall be borne by the Contractor.”

10.3 Claims under Performance Security

Sub-Clause 10.3 is deleted in its entirety. The following Sub Clause 10.4 is added:

10.4 Performance Security Binding on Variations and Changes

“The Performance Security shall be binding irrespective of variations and changes in the quantities of the Works or extensions in completion time of the Works, which are granted or agreed upon under the provisions of the Contract.”

11.1 Site Data

The following paragraphs are added at the end of Sub-Clause:

The Contractor shall satisfy himself as to the nature of the ground, the hydrological and climatic conditions, the form and nature of the Site, the quantities and nature of the Work and materials necessary for the completion of the Works, and the means of access to the Site, the accommodation he may require and in general shall himself obtain all necessary information as to risks, contingencies, and other circumstances which may influence or affect his Bid.

The Employer does not guarantee the correctness of any data/information/drawings either verbal and/or written provided herein nor any interpretations, deductions or conclusions relative to conditions at Site. The Contractor must form his own opinion of the character of the work and of the materials to be excavated etc. He must make his own interpretations, and satisfy himself by his own investigations and research regarding all conditions affecting the work to be done. The Contractor must assume all responsibility for deductions and conclusions as to the nature or conditions of the materials to be excavated and of doing other work affected by the geology at the Site.

12.1 Programme to be Furnished

Sub-Clause 12.1(a) is deleted and substituted by the following:

(a) the order in which the Contractor proposes to carry out the Works (including preliminaries, required material ordering, delivery to Site, erection and rectifications work, testing, commissioning and taking–over by the Employer). The Programme shall also include the following:

(i) Employment of local and expatriate labor of various categories,

(ii) Local material procurement,

(iii) Material imports, if any."

Sub-Clause 12.1(c) is deleted and replaced with following: -

(c) The times by which the Contractor requires the Employer:

(i) To provide access to the Site,

(ii) To have completed the necessary civil engineering work (including foundations for the Plant) and

(iii) To have obtained any import licenses, consents, way leaves and approvals necessary for the purpose of the works

The Contractor shall submit the Programme of work before issuance of Letter of Acceptance on final primavera (level iii) or MS Project. The Contract must also attach monthly progress schedule in terms of Percentage of project as described in Schedule C to Bid, which will be considered as Scheduled Progress.

The approval by the Engineers of the Programme shall not relieve the Contractor or the Employer from any obligation under the contract.

12.4 Monthly Progress Report

The following Sub-Clause 12.4 is added:

"During the period of the Contract, the Contractor shall submit six (6) sets of report to the Engineer not later than the 8th day of each month, including:

(i) A construction schedule indicating the progress achieved during the preceding month;

(ii) Description of all work carried out since the last report;

(iii) Description of the work planned for the next forty-two (42) days sufficiently detailed to enable the Engineer to determine his Programme of inspection and testing;

(iv) Summary of daily job record for the preceding month; and

(v) Color photographs to illustrate progress. The following Sub Clause 12.5 is added:

12.5 Daily Job Record

"During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be made available to the Engineer as and when requested.

The daily record shall include particulars of weather conditions, number of men working, in different categories, deliveries of materials, quantity, location and assignment of equipment."

13.1 Contractor's Representative

At the end of the Sub-Clause the following is added:

"The Contractor's Representative shall be a competent and skilled person approved by the Engineer (which approval may at any time be withdrawn) and who shall be present on the Site during all working hours. He shall be fluent in the English language. He shall not be transferred from the Site without the consent of the Engineer. The Contractor's Representative shall be a Registered/Professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)."

The following Sub-Clause 13.3 is added:

13.3 Language Ability of Superintending Staff of Contractor

"A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the English language."

The following Sub-Clause 13.4 is added:

13.4 Employment of Local Personnel

"The Contractor shall, to the extent practicable and reasonable, employ staff and labor from sources within Pakistan."

14.1 Contractor's Equipment

Replace the word "or" at the end of Sub-paragraph (a) by the word "and" and insert the following at the end of Sub-paragraph (b):

"Which shall not be unreasonably withheld."

14.2 Safety Precautions

At the end of the Sub-Clause the following is added:

"In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the safety requirements of the Government of Pakistan with such modifications thereto as the Engineer may authorize or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose.

Due precautions shall be taken by the Contractor to ensure safety of his staff and labor at his own cost. Safety devices shall be used as required and shall include but not limited to those described hereinafter. Efficient safety helmets, safety shoes and safety harness where required shall be provided for all personnel of Engineer and Contractor. Excavated areas shall be properly guarded from the beginning of excavation. Full precautions shall be taken to ensure maximum safety.

The Contractor shall make, maintain, and submit reports to the Engineer concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe."

14.3 Electricity Water and Gas

The text of Sub-Clause 14.3 is deleted and substituted by the following:

"The Contractor shall be responsible for making his own arrangements for the adequate supply of electricity, water and gas required for the effective performance of his obligations under the Contract. Subject to the aforesaid, the Contractor shall be entitled to use for the purposes of the Works such supplies and services as may be available on the Site. The Contractor shall, before the commencement of the work at Site, seek the approval of the Engineer as to his detailed requirements of electricity, water and gas for the entire Contract period. The Contractor shall pay the Employer at the rates/cost incurred by the Employer. The Contractor shall at his own cost provide any apparatus necessary for such use."

14.4 Employer's Equipment

The text of Sub-Clause 14.4 is deleted and substituted by the following:

"The Employer shall, if the Contractor so requests for the execution of the works, operate any available equipment of which details are given in the Preamble to Conditions of Contract. The Contractor shall pay the Employer a mutually agreed price for such use.

The Employer shall during such operation retain control of and be responsible for the safe working of the equipment.

14.8 Information for Import Permits & Licenses

The text of Sub-Clause 14.8 is deleted and substituted by the following:

"The Contractor shall submit to the Employer in good time such details of all Plant and Contractor's Equipment as is to be imported into Pakistan and identify as to what assistance of the Employer is required for obtaining by the Contractor of all necessary import permits or licenses."

15.2 Compliance with Laws

The Sub-Clause 15.2 is deleted and substituted by the following:

"The Contractor shall comply with the Laws of country of manufacture and the Laws of Pakistan where the Plant is to be erected."

The following new Sub-Clauses 16.4 and 16.5 are added:

16.4 Photographs of Works and Advertisement Prohibited

"Except with the prior written authorization of the Employer the Contractor shall not exhibit or permit to be exhibited any photographs or advertisement on the Works. Any authorized exhibition shall be immediately removed if the Employer so requires."

16.5 Training of Employer's Staff

The Contractor shall provide such facilities for the training of Engineers of FESCO for the works at the Site as specified or directed by the Engineers. The Contractor shall be responsible for all expenses incurred in imparting such training including fee and allowance to be paid to the instructors.

The language of training at the above stated premises shall be English and Urdu.

17.3 Civil Works on Site

The text of Sub-Clause 17.3 is deleted and substituted by the following:

The Contractor shall carry out design and associated civil work required for the completion of the Works under the Contract.

17.4 Consents and Way Leaves

The Sub-Clause 17.4 is deleted and substituted by the following:

The Employer shall issue permissions, letters, certificates and provide such other assistance to the Contractor (requested in advance by the contractor in writing) for his obtaining permits-to-work, way leaves and approvals from any other department/ authority and right of way from private owners, if required. The Contractor will bear the cost of logistics, fees, etc. for such activities.

17.5 Import Permits and Licenses

The word "Employer" is deleted and substituted by the word "Contractor" and the following is added at the end of Sub-Clause 17.5:

"The Employer will provide assistance for this purpose."

18.1 Engagement of Labor

At the end of the Clause the following is added:

"in accordance with the regulations, orders and requirements of the Govt. of Pakistan.

"The following Sub-Clauses 18.5 to 18.16 are added:

18.5 Employment of Persons in the Service of Others

The Contractor shall not recruit or attempt to recruit staff and labor from amongst the persons in the service of the Employer or the Engineer and vice–versa, unless mutually agreed between the Employer/Engineer and the Contractor.

18.6 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his Subcontractors, agents, employees or labor.

18.7 Arms and Ammunition

The Contractor shall not give, barter or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

18.8 Festivals and Religious Customs

The Contractor shall in all dealings with his staff and labor have due regard to all recognized festivals, days of rest and religious or other customs.

18.9 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his staff and labor and for the preservation of peace and protection of persons and property in the neighborhood of the Works against the same.

8.10 Records of Safety and Health

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.

18.11 Reporting of Accidents

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition to appropriate action required under the law, notify the Engineer immediately by the quickest available means.

18.12 Rates of Wages and Conditions of Labor

The Contractor shall pay rates of wages and observe conditions of labor not less favorable than those established for the trade or industry where the work is carried out. In the absence of any rates of wages or conditions of labor so established, the Contractor shall pay rates of wages and observe conditions of labor which are not less favorable than the general level of wages and conditions observed by other employers whose general circumstances in the trade or in industry in which the Contractor is engaged are similar.

18.13 Housing for Labor

Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such housing accommodation and amenities as he may consider necessary for all his supervisory staff and labor, employed for the purposes of or in connection with the Contract including all fencing, electricity supply, sanitation, cookhouses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities. On completion of the Contract, these facilities shall be handed over to the Employer or if the Employer so desires, the temporary camps or housing provided by the Contractor shall be removed and the Site reinstated to its original condition, all to the approval of the Engineer.

18.14 Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for purpose of dealing with and overcoming the same.

18.15 Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer or his representative, adequate supply of drinking and other water for the use of his staff and labor.

18.16 Compliance by Subcontractors

The Contractor shall be responsible for compliance by his Subcontractors of the foregoing provisions.

19.1 Manner of Execution

The following is added at the end of Sub-Clause:

"The Contractor shall submit for approval of the Engineer, his detailed method statement(s) for the execution of such items of work as may be desired by the Engineer. Approval of such method statement(s) shall neither relieve the Contractor of his responsibilities under the Contract nor form any basis for claiming additional costs."

19.3 Uncovering Work

The following is added at the end of second paragraph of Sub-Clause 19.3:"In any other case, all costs shall be borne by the Contractor."

The following Sub-Clause 19.4 is added:

19.4 Use of Pakistani Materials

"The Contractor shall so far as may be consistent with the Contract make the maximum use of materials, supplies and equipment indigenous to or produced in Pakistan and services available in Pakistan or operated in Pakistan provided such materials, supplies, equipment and services shall be of required standard."

The following Sub-Clauses 20.6 to 20.8 are added:

20.6 Type Tests

The equipment, plant and materials offered shall have been fully type tested in accordance with relevant international standards. The bidder must furnish one set of type test reports alongwith the bid in respect of all equipment, plant and materials offered. The type test must have been carried out at test laboratory, which is independent of the bidder. These type tests must be in compliance with NTDC Policy. Bids submitted without such type test reports will be treated as non- responsive.

20.7 Witnessing of Factory Acceptance Test (FATs)

Factory Acceptance Tests as stipulated in the relevant standards shall be witnessed by the personnel of the Employer, FESCO and the Engineer. All costs in connection with witnessing of the factory acceptance tests by the Employer, FESCO and the Engineer shall be borne by the Contractor. The contractor shall arrange factory acceptance test of manufacturing plant / factory by at-least but not limited to Six (06) officers, two (02) from Employer, two (02) from consultants and two (02) from FESCO. These shall include the cost of all the expenses of the above arrangements with and including for arranging the relevant visas for designated officers of the Employer and the Engineer, their visa fees, Air Tickets (Business Class), boarding in a minimum of four star hotel, lodging, local transport costs in independent vehicles aboard etc., in addition a TA / DA will be paid to the visiting officials at the rate of US$ 500 per head per day for inspection / testing to be conducted outside Pakistan and Rs 20,000/- per head per day for inspection / testing to be conducted inside Pakistan for each visit of every person to witness these tests. The costs shall be based on anticipated twelve (12) trips consisting of fifty-five (55) man-days each for the Employer, FESCO and the Engineer including both local and foreign visits.

20.8 Site visits by the Officials

The contractor shall arrange site visit / inspection by the outstation officials of Employer, Engineer / Consultants and FESCO. These shall include the cost of all the expenses of the arrangements with and including for arranging the Air Tickets, boarding in a minimum of four-star hotel, lodging, local transport costs in independent vehicles etc., in addition a DA will be

paid to the visiting officials at the rate of Rs. 20,000/- per head per day for inspection/ testing to be conducted.

24.1 Cost of Suspension

At the end of the second paragraph after the word “Contractor” the following is added:

“Or for the proper execution or for the safety of the Works or Plant unless such necessity results from any act or default of the Engineer or the Employer or in consequence of any of the Employer's Risks under Sub-Clause 37.2.”

24.4 Resumption of Work

First paragraph of Sub-Clause 24.4 is deleted and substituted by the following:

“If the Contractor chooses not to treat prolonged suspension as an omission or termination under Sub-Clause 24.3, the Employer shall, upon the request of the Contractor, take over the responsibility for protection, storage, security and insurance of the suspended Works and of the Plant which has been delivered to the Site and which is affected by suspension and the risk of loss or damage thereto shall thereupon pass to the Employer.”

25.1 Time for Completion

The text of Sub-Clause 25.1 is deleted and substituted by the following:

“The Works at the place of the project mentioned in the Preamble to Conditions of Contract shall be completed tested and commissioned within the period mentioned in the Preamble to Conditions of Contract.”

26.1 Extension of Time for Completion

Sub-Clause 26.1(h) is deleted.

The following sub-clause 26.1.1 is added:

26.1.1 Financial Compensation Against Extension of Time

The Contractor shall not be entitled for any financial compensation consequent upon the extension of time (EOT) for completion granted to him under the provisions of sub- clause 26.1 of the General Conditions of Contract and he shall not have any further recourse or claim against the Employer, nor shall have any right of an action against Employer for loss or damage suffered by the reasons of delay whatsoever, on which basis EOT is granted to him.

26.3 Earlier Completion

Existing clause is deleted in its entirety.

26.4 Rate of Progress

The Contractor Shall ensure that rate of progress does **not fall below 20% o**f Scheduled Progress as reflected in the Programme of work (submitted before issuance of letter of acceptance).

If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Works or any Section is at any time, in the opinion of the Engineer, is below 20% of Scheduled Progress as reflected in the Programme of work, then the Client will have prerogative to either terminate the contract or reduce/delete portion of work if the contractor fails to improve the progress within 45 days of receipt of notice under this Clause. The Engineer shall so notify the Contractor who shall thereupon take such steps as are necessary, subject to the consent of the Engineer, to expedite progress so as to comply with the Time for Completion. The Contractor shall not be entitled to any additional payment for taking such steps. If, as a result of any notice given by the Engineer under this Clause, the Contractor considers that it is necessary to do any work at night or on locally recognized days of rest, he shall be entitled to seek the consent of the Engineer so to do. Provided that if any steps, taken by the Contractor in meeting his obligations under this Sub-Clause, involve the Employer in additional supervision costs, such costs shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any moneys due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

27.1 Delay in Completion

Sub-Clause 27.1 is deleted and substituted by the following:

"If the Contractor fails to deliver the Works, or any part thereof, within the time stated in Sub-Clause 25.1, or fails to complete the whole of the Work, or, if applicable, any Section within the relevant time prescribed by Sub-Clause 25.1, then the Contractor shall pay to the Employer the relevant sum stated herein below as liquidated damages for such default (which sum shall be the only moneys due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant time for Delivery or Time for Completion and the actual date of delivery at site or the date stated in a Taking-Over Certificate of the whole of the Works or the relevant Section, as the case may be, subject to the applicable limit stated herein below.

The Employer may deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations & liabilities under the Contract.

The liquidated damages for each day of delay and the maximum amount of liquidated damages shall be the amounts mentioned in the Preamble to Conditions of Contract.

The following Sub-Clauses 27.3 is added:

27.3 Liquidated Damages for Failure to Meet Performance Guarantees

1. If the Plant fails to meet any performance guarantee set forth by the Contract, the contractor shall, within four (04) weeks after the test which demonstrated such failure, prepare a schedule approved by the Engineer to search for and correct the defect which caused the failure.
2. Should the Contractor fail to prepare such agreed schedule and fails to correct the defect within three (3) months from the date of the test which demonstrated failure of any performance guarantee, or should the Contractor fail to correct such defects (s) within the time allowed by the agreed schedule so that the Plant will meet the guarantees as set forth by the Contract and the Works be otherwise in satisfactory operating conditions, then the Contractor shall pay to Employer shall pay to Employer as liquidated damages the sum or sums stated in Preamble to Conditions of Contract.
3. The amount so paid shall in no case exceed the applicable limit of liquidated damages for failure to meet guarantees stated in Preamble to Conditions of Contract.

28.7 Consequences of Failure to Pass Tests on Completion

The words "by arbitration" appearing at the end of the Sub-Clause 28.7(c) are deleted and substituted by the words "by the Engineer".

30.4 Extension of Defects Liability Period

At the end of 4th paragraph of Sub-Clause, the following is added: "or a mutually agreed period."

30.5 Failure to Remedy Defects

In first line after the words "reasonable time" the following is added: "fixed by the Engineer".

30.9 Defects in Employer's and Engineer's Designs

Sub-Clause 30.9 is deleted in its entirety. The following Sub-Clause 30.13 is added:

30.13 Unfulfilled Obligations

"After the Defects Liability Certificate has been issued, the Contractor and the Employer shall remain liable for the fulfillment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force."

31.1 Engineer's Right to Vary

The following is added at the end of second paragraph:

"No such variation shall in any way vitiate or invalidate the Contract, but the effect, if any, of all such variations shall be valued in accordance with Clause 31. Provided that where the issue of

an instruction to vary the Works is necessitated by some default of or breach of Contract by the Contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the Contractor."

31.5 Record of Costs

The word "Engineer" in 4th line of Sub-Clause is deleted and substituted by "Engineer / Employer". The following Sub-Clauses 31.6 to 31.8 are added:

31.6 Daywork under Variation Order

"A Variation Order may provide that work done pursuant thereto shall be executed as Daywork. In such case the Contractor shall be paid for such work under the conditions and the rates and prices set out in the Day Work Schedule."

31.7 Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which in the Contractor's opinion will reduce the cost of constructing, maintaining or operating the works, or improve the efficiency or value to the Employer of the completed Works or otherwise be of benefit to the Employer. Any such proposal shall be prepared at the cost of the Contractor. However, Employer is not bound to accept such proposal.

31.8 Changes in Estimated Quantities

For the removal of doubt, it is declared that any increase or decrease of the estimated quantities set out in the Schedule of Prices ascertained by measurement in accordance with the provisions of sub-clause 33.8 hereof is not a variation within the meaning of this Clause or Contract.

33.1 Terms of Payment

The text of Sub-Clause 33.1 is deleted and substituted by the following:

The Total Contract Price shall be broken down into the following components:

i) DDP Price for Supply of Plant to Site

ii) Cost of Erection and Civil Works

Unless otherwise agreed the Contractor shall be paid in the following manner, the Contract Price, adjusted to give effect to such addition thereto and such deductions therefrom as are provided in the Contract.

i) DDP Price for Supply of Plant to Site

- **Advance on signing of the Agreement:**

An interest-free Mobilization Advance of 15% of the Contract Value of DDP (Site) for all Plant shall be paid by the Employer to the Contractor in two equal parts upon submission by the Contractor of a Mobilization Advance Guarantee for the full amount of the Advance in the specified form from a Scheduled/ Commercial Bank in Pakistan acceptable to the Employer.

a) First part within 14 days after signing of the Contract Agreement or date of receipt of Engineer's Notice to Commence, whichever is earlier; and

b) Second part within 42 days from the date of payment of the first part, subject to:

(i) Satisfaction of Engineer regarding mobilization of contractor on site.

(ii) Provision of Engineer's Facilities as per Schedule of Price.

This Advance shall be recovered in equal installments; first installment at the expiry of third month after the date of payment of first part of Advance and the last installment two months before the date of completion of the Works.

On full recovery of the Mobilization Advance, the Employer will return the said Guarantee to the Contractor duly discharge. However, the Employer will beat liberty to encase the Bank Guarantee of the Contractor, if the Contractor fails to extend the said guarantee 15 days before the expiry date of the guarantee.

- **Consignment of the Plant:**
  - 70% of the Contract Value of DDP (Site) of each consignment of the Plant upon submission of documents as specified below duly certified by the Engineer and the Employer.
    - **i)** Notice to Deliver, issued by the Engineer.
    - **ii)** Shipping Documents comprising:
      - a) Payment/ Commercial Invoice
      - b) Clean on-board Bill of Lading or airway bill issued by freight forwarder.
      - c) Certificate or Policy of Marine Insurance from Ex- works to the Project Site, of the portion of the Plant for which Certificate of Payment is requested.
    - **iii)** Certificate of Origin, issued by the Contractor
    - **iv)** Warranty Certificate
    - **v)** Inspection Certificate or letter of waiver, issued by the Engineer/ Employer
    - **vi)** Certificate of Delivery at Site duly certified by the Employer / Engineer.
    - **vii)** Certificate that the plant complies with the specifications.
    - **viii)** Any other document as necessary due to statutory requirement.

- **On issuance of Taking- Over Certificate:** 10% of the Contract Value of DDP (Site) of all Plant after issuance of Taking-Over Certificate and against submission of an invoice duly certified by the Engineer and the Employer together with a copy of Taking-Over Certificate.

- **On completion of Defect Liability Period:** 5% of the Contract Value of DDP (Site) of all Plant as Retention Money upon issuance of Defect Liability Certificate, pursuant to Clause 30.11 of the General Conditions of Contract.

ii) For Cost of Erection and Civil Works

• **Advance on signing of the Agreement:**	An interest-free Mobilization Advance of 15% of the Contract Value (Erection and Civil Works) on commencement of respective work in accordance with approved schedule, shall be paid by the Employer to the Contractor in two equal parts upon submission by the Contractor of a Mobilization Advance Guarantee for the full amount of the Advance in the specified form from a Scheduled/ Commercial Bank in Pakistan acceptable to the Employer **a) First part within 14 days after signing of the Contract Agreement or date of receipt of Engineer's Notice to Commence, whichever is earlier; and** **b) Second part within 42 days from the date of payment of the first part, subject to the satisfaction of the Engineer as to the state of mobilization of the Contractor** This Advance shall be recovered in equal installments; first installment at the expiry of third month after the date of payment of first part of Advance and the last installment two months before the date of completion of the Works. On full recovery of the Mobilization Advance, the Employer will return the said Guarantee to the Contractor duly discharge. However, the Employer will be at liberty to encase the Bank Guarantee of the Contractor, if the Contractor fails to extend the said guarantee 15 days before the expiry date of the guarantee.
• **Against Monthly Invoices**	70% of the Contract Value (Erection and Civil Works) against monthly invoice for actual progress of work for the respective month accompanied by the statement of work duly certificated by the Engineer and the Employer.
• **On issuance of Taking- Over Certificate:**	10% of the Contract Value (Erection and Civil Works) after issuance of Taking- Over Certificate and against submission of an invoice and documentation duly certified by the Engineer and the Employer together with a copy of Taking- Over Certificate.
• **On completion of Defect Liability Period:**	5% of the Contract Value of DDP (Site) of all Plant as Retention Money upon issuance of Defect Liability Certificate, pursuant to Clause 30.11 of the General Conditions of Contract.

The following new Sub-Clauses 33.1.1 to 33.1.5 are added:

33.1.1 Retention of Payment

If at any time any payment would fall due for Works or part of Works and, if there shall be any defect in part of such Works in respect of which such payment is proposed, the Employer may

retain the whole or any part of such payment. Any sum retained by the Employer pursuant to the provisions of this Clause shall be paid to the Contractor after the said defect is removed.

33.1.2 Payment Where Taking-Over Certificate Issued for Section or part of Works

If any section or part of the Works shall be taken-over separately under Clause 29 (Taking-Over) hereof, the payments herein provided for on or after Taking-Over shall be made in respect of the section or part taken-over and reference to the price shall mean such part of the price as shall, in the absence of agreement, be apportioned thereto by the Engineer.

33.1.3 Extra Payment

No extra payment in respect of overtime, additional materials, or special conditions or hardship shall be claimed by the Contractor unless otherwise provided in the Contract or such payments have been previously authorized in writing by the Engineer or the Employer.

33.1.4 Breakdown of Lump Sum Items

For the purposes of statements to be submitted in accordance with Sub-Clause 33.1 hereof, the Contractor shall submit to the Project Manager/Engineer, within twenty-eight (28) days after the receipt of the Letter of Acceptance, a breakdown for each of the lumpsum items contained in the Bid. Such breakdowns shall be subject to the approval of the Engineer.

33.1.5 Method of Payment

All Payment shall be directly disbursed to the Contractor upon receipt of application for certification of Payment by the Employer and Engineer.

33.2 Method of Application

The following paragraphs are added:

The Contractor shall submit to the Employer / Project Manager / Engineer six (6) copies of the Application for Certificate of Payment (invoices) each signed by the Contractor and in such form as the Employer/Project Manager/Engineer may from time to time prescribe.

The Employer / Project Manager / Engineer shall examine such invoices within the times stated in Sub-Clauses 33.3 and 33.5. After such time each invoice will be deemed to have been accepted. If the invoice amount is not accepted by the Employer/Project Manager/Engineer, the disputed amount which is retained, shall be communicated, giving the reasons in writing, to the Contractor within the same time. If the objections of the Employer/Project Manager/Engineer are not acceptable to the Contractor he will justify his claims with necessary documentation and include left over amounts / items in the next invoice. However, the portions of such invoices accepted by the Project Manager/Engineer shall be paid as per Sub-Clause 33.5.

33.5 Payment

Sub-Clause 33.5 is deleted and substituted by the following:

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other term of the Contract, shall, subject to Clause 27, be paid by the Employer to the Contractor within a period mentioned in the Preamble to Conditions of Contract after such Interim Payment Certificate has been jointly verified by Employer and Contractor, or, in the case of the Final Certificate referred to in Sub-Clause 33.10 within a period mentioned in the Preamble to Conditions of Contract after such Final Certificate of Payment has been delivered to Employer.

Deduction shall be made from the net amounts payable to the Contractor of any sum(s) in accordance with the prevalent Federal and/or Provincial laws, provided that no such deduction shall be made from those payments in respect of which the Contractor has obtained exemption under the Law.

33.6 Delayed Payment

Not Applicable.

33.8 Payment by Measurement

The Engineer shall except as otherwise stated, ascertain and determine by measurement the value in accordance with the Contract of Work done in accordance with the Contract. He shall,

when he requires any work to be measured, give notice to the Contractor's Agent who shall forthwith attend or send a qualified agent to assist the Engineer or the Engineer's Representative in making such measurement and shall furnish all particulars required by either of them. Should the Contractor not attend, or neglect or omit to send such agent, then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of the Work. For the purpose of measuring any work to be measured by records, the Engineer's Representative shall prepare records month by month of such work and the Contractor as and when called upon to do so in writing shall within (14) days attend to examine and agree with such records with the Engineer's Representative and shall sign the same when so agreed and if the Contractor does not attend to examine and agree any such records shall be taken to be correct. If after examination of such records the Contractor does not agree to the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor shall within fourteen (14)days of such examination lodge with the Engineer's Representative for decision by the Engineer notice in writing of the respects in which such record are claimed by him to be incorrect.

The following Sub-Clauses 33.12 and 33.15 are added:

33.12 Withholding of Payment

If the Works or any part thereof are not being carried out to the Engineer's satisfaction and in order to protect the Employer from loss on account of:

(a) Defective work not rectified

(b) Guarantees not met

(c) Claims filed against the Contractor

(d) Failure of the Contractor to make payments due for Plant procured or labor employed by him.

(e) Damage to any other contractor employed by the Employer.

(f) Contractor's non–compliance with the Contract

(g) Any Government dues recoverable from the Contractor if notified by the Government.

The Engineer may notify withholding of such payments or part thereof as may, in his opinion, be related to the aforesaid reasons/grounds. When the reasons/grounds for withholding the payment are removed by the Contractor, the Engineer shall upon being satisfied to that effect issue Certificate of Payment in respect of withheld amounts.

33.13 Payment Schedule

Within thirty (30) days after receipt of the Letter of Acceptance, the Contractor shall submit a proposed payment schedule indicating the estimated payment throughout the currency of the Contract. This schedule shall be in a format satisfactory to the Employer and the Project Manager/Engineer, shall be consistent with the Program of Works, the advance, progress and final payment provisions included herein, and shall be in sufficient detail to permit preparation of cash flow projections for use by the Employer.

33.14 Payment Deductions

All costs, damages or expenses which the Employer shall have paid for which the Contractor is liable under the terms and conditions of the Contract, may be deducted by the Employer from any monies due or becoming due to the Contractor from the Employer.

33.15 Cost Account Statement

Before completion of the Project, the Contract shall submit a completion Cost Account Statement of all works performed hereunder broken down in such detail and using cost account codes as the Employer may direct.

35.1 Payment in Foreign Currencies

The text of the Clause is deleted in its entirety.

35.2 Currency Restrictions

The text of Sub-Clause 35.2 is deleted and substituted by the following:

"Any required foreign currency transactions shall be met by the Contractor at his cost from his own resources."

35.3 Rates of Exchange

The text of Sub-Clause 35.3 is deleted and substituted by the following:

"Any import, if required and approved by the Employer shall also be paid in local currency with exchange rate for the period as notified by the State Bank of Pakistan."

36.4 Payment against Provisional Sums

Sub-Clause 36.4 is deleted and substituted by the following:

"Provisional Sum if any will be expended on the direction of the Engineer through Variation Orders which would be valued in accordance with the provisions of Clause 31 Conditions of Contract."

37.2 Employer's Risks

The text of Sub-Clause 37.2 is deleted and substituted by the following: "The Employer's Risks are:

(a) (In so far as they relate to Pakistan) war and hostilities (whether war be declared or not), invasion, act of foreign enemies;

(b) (In so far as they relate to Pakistan) rebellion, revolution, insurrection, military or usurped power or civil war;

(c) Ionizing radiation or contamination by radioactivity from any nuclear fuel, radio- active toxic explosives or other hazardous properties of any explosive nuclear assembly or nuclear components thereof;

(d) Pressure waves caused by aircraft travelling at sonic or supersonic speed;

(e) (In so far as they relate to Pakistan) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors.

(f) Use or occupation of the Work or any part thereof by the Employer;

(g) Fault, error, defect or omission in the design of any part of the Works by the Engineer, Employer or those for whom the Employer is responsible for which the Contractor has disclaimed responsibility in writing within a reasonable time after the receipt of such design;

(h) The use or occupation of the Site by the Works or any part thereof, or for the purposes of the Contract: or interference, whether temporary or permanent with any right of way, light, air or water or with any easement, way leaves or right of a similar nature which is the inevitable result of the construction of the Works in accordance with the Contract;

(i) The right of the Employer to construct the Works or any part thereof on, over, under, in or through any land;

(j) Damage (other than that resulting from the Contractor's method of construction) which is the inevitable result of the construction of the Works in accordance with the Contract; and

(k) The act, neglect or omission or breach of contract or of statutory duty of the Engineer, the Employer or other contractors engaged by the Employer or of their respective employees or agents."

39.2 Loss or Damage Before Risk Transfer Date

The words "by arbitration under Clause 50" are deleted and substituted by the words "by the Engineer".

The following Sub-Clause 39.4 is added:

39.4 Duty to Minimize Delay

Each Party shall at all times use all reasonable endeavors to minimize any delay in the

Performance of the Contract as a result of Risks.

The Contractor shall give notice to the Employer and vice versa the Employer shall give notice to the Contractor in case of foreseeable delay by the Risks.

40.2 Employer's Liability

The text of Sub-Clause 40.2 from the words “or of death or personal injury” to the end of the Sub- Clause, is deleted and substituted by the following:

“(other than the Works) or of death or personal injury to the extent caused by any of the Employer's Risks listed in paragraphs (f), (g), (h), (i), (j), and (k) of Sub-Clause 37.2 but not otherwise.”

42.2 Maximum Liability

The words “the sum stated in the Preamble to Conditions of Contract or if no such sumis stated” appearing in 2nd line of Sub-Clause are deleted.

42.6 Foreseen Damage

Sub-Clause 42.6 is deleted in its entirety.

43.1 The Works (Insurance)

The other risks to be insured are:

(i) Fire, smokes, explosion, falling objects, earthquake, perils of the sea, tempest, impact by aircraft or land vehicle, aircraft and other aerial devices or articles dropped there from

lighting, strike, riot, civil commotion, escape of water, inundation, rain, snow, landslides, flood, act of God, vandalism or malicious damages, windstorm or hail storm, accidental damage to the plant during installation, erection, commissioning and O & M, and

(ii) Collision, upset, overturn, derailment, stranding or sinking of an automobile or any conveyance of a common carrier by land, water or air in which the Plant/ equipment or any part thereof is being carried including overland transport in Pakistan from port of entry to the Site, and

(iii) Theft, burglary or attempted theft or burglary, robbery, and

(iv) Any loss or damage during pre-erection storage, and

(v) Faults in construction and erection, lack of skill, lack of experience, negligence, malicious act, and

(vi) Any other sudden and unforeseen event such as loss or damage due to collapse etc. on site, transport of items to be erected, and

(vii) Actions of Employer in the operation of plant or part therefore on behalf of the Contractor, and

(viii) Any loss occurred to the Employer and or the Engineer due to damage of underground, at- ground or over-ground utilities whether known or unknown to the Contractor which occurs due to any operation and/ or action of the Contractor, and

(ix) Any loss due to delay in shipment or during shipment, delay in offloading, at port, clearance for Custom or any other delay in reaching the site of works.

The following further Sub-Clauses are 43.1.1, 43.1.2 and 43.1.3 are added:

43.1.1 Marine Insurance of Plant

(1) The Contractor shall in the joint names of the Contractor and the Employer, obtain Marine Cargo All Risks Insurance to cover loss or damage to the Plant or part thereof during transport.

(2) The insurance for each consignment of Plant or part thereof shall attach from the time the Plant or part thereof leave the warehouse or place of storage and terminate after ninety (90) days on its completion of unloading at the Site or until insurance survey whichever occurs first. Upon arrival of each consignment at the Site, the Contractor shall, immediately arrange insurance survey by the insurance company.

(3) The sum insured for imported Plant or part thereof shall be for its full replacement value at the Site i.e., 100 % DDP value at the Site for each consignment of the Plant or part thereof plus not less than 30 % of DDP value at the Site to cover any additional costs resulting from loss or damage thereof.

(4) The Insurance Policy for imported Plant etc. shall be on "All Risks" basis and shall not be limited to the attachment/endorsement of following clauses:

(i) Institute Cargo Clauses (A)

(ii) Institute War Clauses (Cargo)

(iii) Institute Strikes Clauses (Cargo)

(iv) Institute Cargo Clauses (Air) excluding sending by Post

(v) Institute War Clauses (Air Cargo) excluding sending by Post.

(vi) Institute Strikes Clauses (Air Cargo)

(vii) Special Replacement Clauses (Air)

(viii) Institute Theft, Pilferage and Non-delivery Clauses

43.1.2 Erection/ Construction All Risks Insurance

(1) The Contractor shall insure the Works or part thereof in the joint names of the Contractor and the Employer.

(a) from the date following the completion of the first unloading at the Site of the Plant or part thereof and other materials (to be used for construction or erection) and from commencement of Works at Site until the Risk Transfer Date against any loss or damage caused by any of the Contractor's risks and any other risks specified in Sub-Clause 43.1.(a) above and

(b) during the Defects Liability Period against any loss or damage which is caused either:

(i) By the Contractor in completing any outstanding work or complying with his obligations under Clause 30, or

(ii) By any of the Contractor's risks and any other risks specified in Sub-Clause 43.1(a) above, which occurred prior to the Risk Transfer Date.

(2) The sum insured shall be the full replacement value at the Site, which includes:

(a) (i) DDP value of imported Plant to be erected

(ii) Ex-factory value of Indigenous Plant to be erected, if any

(b) Freight and insurance including local transport

(c) Custom duties and taxes etc.

(d) Cost of erection

(e) Cost of civil engineering work including escalation

(f) Clearance of debris, maximum @ 5 % of minimum amount of Third-Party Liability Insurance

Plus 30% to cover any additional costs resulting from loss or damage thereof.

43.1.3 General

Should a loss be sustained, the Contractor shall replace or repair any loss or damage at his own cost and complete the Works in accordance with the Contract as soon as possible after occurrence of such loss or damages, without waiting for the settlement of the insurance claim.

43.2 Contractor's Equipment

Sub-Clause 43.2 is deleted and substituted by the following:

"The Contractor shall insure the Contractor's Equipment for its full replacement value while on the Site against all loss or damage caused by any of the Contractor's Risks."

43.7 Remedies on the Contractor's Failure to Insure

In 3rd line after the word, "purpose", the expressions "and reasonable costs including the man-hours costs of Employer's Personnel" are added.

The following new Sub-Clauses 43.9 to 43.12 are added:

43.9 Currency of Insurance

"All policies of Insurance of the Plant shall provide for payment of indemnity to be made in such amounts as will allow making good of loss of or damage to the whole or any part of the Works, or other requirements under the Contract and in a freely convertible currency."

43.10 Contractor to Notify

"It shall be the responsibility of the Contractor to notify the insurance company of any changes in nature and extent of the Works and to ensure the adequacy of the insurance coverage at all times in accordance with the provisions of the Contract."

43.11 Procurement of Insurance Policies

"The Contractor shall procure and submit the insurance cover under this Clause within a period of 28 days from the date of receipt of Letter of Acceptance so that terms of the policy may be agreed and approved by the Employer."

43.12 Insurance Company

Any Insurances related to the Works / project shall be National Insurance Company (NIC) or any other company acceptable to the Employer and must be rated AA by PACRA. Costs of such insurances shall be borne by the Contractor.

44.6 Damage Caused by Force Majeure

At the end of the Sub-Clause 44.6 the following is added:

"However, the Contractor shall put up his claim to the Employer / Engineer with full details and justification."

44.8 Payment on Termination for Force Majeure

Text in sub-para (c) is deleted and para (d) and (e) are re-numbered as (c) and (d).

44.10 Force Majeure Affecting Engineer's Duties

Sub-Clause 44.10 is deleted in its entirety.

45.2 Contractor's Default

The following paragraph is added at the end of Sub-Clause 45.2.

The Employer or such other contractor may use for such completion any Contractor's Equipment which is upon the Site as he or they may think proper, and the Employer shall pay the Contractor a reasonable compensation for such use.

45.4 Payment after Termination

The text of Sub-Clause 45.4 is deleted and substituted by the following:

The Employer shall not be liable to make any further payments to the Contractor until the Works have been completed. When the Works are so complete, the Project Manager/Engineer shall certify the total cost of such completion of Works.

The Employer may recover the extra cost of such completion, as certified by the Engineer, from any sums otherwise due and payable to the Contractor and/or by disposing of the Contractor's Equipment and stores taken over by the Employer under this Clause or as otherwise provided by law. If there is no such extra cost the Employer shall pay any balance due to the Contractor.

Sub-Clause 45.6 is added as follows:

45.6 Integrity Pact

If the Contractor or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Schedule-H to his Bid, then

the Employer shall be entitled to:

(a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Subcontractors, agents or servants;

(b) terminate the Contract; and

(c) recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants.

The termination under Sub-Para (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clauses 45.2 to 45.5 and the payment under Sub-Clause 45.4 shall be made after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.

46.1 Employer's Default

The comma and the word "or" at the end of paragraph (d) of Sub-Clause 46.1 are deleted and substituted by period (.) Paragraph (e) of Sub-Clause 46.1 is deleted.

46.3 Payment on Termination for Employer's Default

The words "including loss of profit" in the second paragraph of Sub-Clause 46.3 are deleted.

47.1 Labor, Materials and Transport

The text of the Clause is deleted in its entirely.

48.1 (a) Local Taxation

The following sub-clause 48.1 (a) is added:

The rates and prices quoted by the Contractor in the Schedule of Prices shall be deemed to have included (i) business taxes, income tax, super tax and other taxes on income, and (ii) fees charged for services provided under this Contract.

48.6 Reimbursement to the Contractor

Not used.

48.7 Non-Reimbursable Fees, Duties and Taxes

Not used.

48.7.1 Refundable Duties and Taxes

Not used

48.7.2 Statement of Reimbursements

Not used

48.8 Foreign Taxation

The prices quoted by the Contractor shall be deemed to have included all taxes, duties and other charges imposed outside Pakistan on the production, manufacture, sale and transport of the Plant including Erection and Testing Equipment and Maintenance Tools, Spare Parts, Contractor's Equipment, materials and supplies to be furnished or used under the Contract, and on the services performed under the Contract. All such taxes and duties levied outside the territory of Pakistan shall be to the account of the Contractor.

48.9 Port Charges and Port Congestion

The Contractor shall be deemed to have obtained all the information regarding facilities and charges, in respect of port clearance, loading and unloading, storage, transportation, congestion and confirmed the requirements thereof at his own responsibility and all such costs and charges are deemed to be included in the rates and prices of the Schedule of Prices.

49.1 Notice to Contractor

The following is added at the end of Sub-Clause 49.1:

"For the purposes of Sub-Clause 49.1 the Contractor shall, immediately after receipt of Letter of Acceptance, intimate in writing to the Employer and the Engineer by registered post, the address of his principal place of business or any change in such address during the period of the Contract."

50 Disputes & Arbitration

Clause 50 is deleted and in its place the following Sub-Clauses 50.1 to 50.5 are inserted:

"**50.1** If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with, or arising out of, the Contract or the execution of the Works, whether during the execution of the Works or after their completion and whether before or after repudiation or other termination of the Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. No later than the fifty sixth (56) day after the day on which he received such reference, the Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this Clause.

Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Work with all due diligence, and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided in an amicable settlement or in an arbitral award.

In any case where the Conditions of Contract provide that the decision of the Engineer is to be final and conclusive, such decision shall not be preferable to arbitration under this Clause nor shall the same be questioned in any other form of proceedings whatsoever.

50.2 If either the Employer or the Contractor be dissatisfied with a decision of the Engineer or if the Engineer fails to give notice of his decision on or before the fifty sixth (56) day after the day on which he received the reference, then either the Employer or the Contractor may, on or before the twenty eighth (28) day after the day on which the said period of fifty-six (56) days expired, as the case may be, give notice to the other party to commence arbitration, as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to Sub- Clause 50.5, no arbitration in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notification of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the twenty eighth (28) day after the day on which the parties received notice as to such decision from the Engineer the said decision shall become final and binding upon the Employer and the Contractor.

50.3 Where notice of intention to commence arbitration as to a dispute has been given in accordance with Sub-Clause 50.2, arbitration of such dispute shall not be commenced unless an attempt has first been made by the parties to settle such dispute amicably through mutual negotiation within ninety (90) days from the date of notification of Engineer's decision.

50.4 Any dispute in respect of which:

(a) the decision, if any, of the Engineer has not become final and binding pursuant to Sub-Clause 50.1 and

(b) amicable settlement has not been started/reached within the period stated in Sub-Clause 50.3 shall be finally settled, unless otherwise specified in the Contract, under the Pakistan Arbitration Act, 1940 (Act No. X of 1940) and Rules made thereunder as amended, by one or more arbitrators appointed under such Rules.

The said arbitrator(s) shall have full power to open up, review and revise any decision,

opinion, instruction, determination, certificate or valuation of the Engineer for the purpose of obtaining said decision pursuant to Sub-Clause 50.1. No such decision shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

The venue of arbitration proceedings shall be the place in Pakistan as mentioned in the Preamble to Conditions of Contract.

50.5 Where neither the Employer nor the Contractor has given notice of intention to commence arbitration of a dispute within the period stated in Sub-Clause 50.1 or 50.2 and the related decision has become final and binding, either party may, if the other party fails to comply with such decision, and without prejudice to any other rights it may have, refer the failure to arbitration in accordance with Sub- Clause 50.4. The provisions of Sub-Clauses 50.1 to 50.2 shall not apply to any such reference."

FORMS

- **BID SECURITY**
- **FORM OF CONTRACT AGREEMENT**
- **FORM OF PERFORMANCE SECURITY**
- **FORM MOBILIZATION ADVANCE GUARANTEE/BOND**

BID SECURITY

[Letter by the Guarantor to the Employer]

Name of Guarantor with address: _____
Name of Principal (Bidder) with address: _____
Penal Sum of Security (express in words and figures): _____
Bid Reference No. _____ Date of Bid _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal, we the Guarantor above-named are held and firmly bound unto the _____, (hereinafter called The "Employer") in the sum stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Bid numbered and dated as above for _____ (Particulars of Bid) to the said Employer; and WHEREAS, the Employer has required as a condition for considering the said Bid that the Principal furnishes a Bid Security in the above said sum to the Employer, conditioned as under:

(1) that the Bid Security shall remain valid for a period 28 days beyond the period of validity of the Bid;

(2) that in the event of;

(a) The Principal withdraws his Bid during the period of validity of Bid, or

(b) The Principal does not accept the correction of his Bid Price, pursuant to Sub-Clause 24.2 of Instructions to Bidders, or

(c) Failure of the successful bidder to

(i) Furnish the required Performance Security, in accordance with Clause 34 of Instructions to Bidders, or

(ii) Sign the proposed Contract Agreement, in accordance with Clause 35 of Instructions to Bidders,

then the entire sum be paid immediately to the said Employer as liquidated damages and not as penalty for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a formal Contract with the said Employer in accordance with his Bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Security with good and sufficient surety , as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Guarantor shall forthwith pay to the Employer the said sum stated above upon first written demand of the Employer without cavil or argument and without requiring the Employer to prove or to show grounds or reasons for such demand notice of which shall be sent by the Employer by registered post duly addressed to the Guarantor at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated above, or has defaulted in fulfilling said

requirements and the Guarantor shall pay without objection the sum stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above bounden Guarantor has executed the instrument under its seal on the date indicated above, the name and seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

_____

Guarantor (Bank)

WITNESS:

Signature _____

1. _____

Name _____

_____

Title _____

Corporate Secretary (Seal)

Corporate Guarantor (Seal)

2. _____

_____

Name, Title & Address

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the day of _____ (month) 2020 between _____ (Hereafter called the "Employer") of the one part and _____ (hereafter called the "Contractor") of the other part.

WHEREAS the Employer is desirous that certain Works, viz _____ should be executed by the Contractor and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW this Agreement witnesses as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

2. The following documents after incorporating addenda, if any except those parts relating to Instructions to Bidders shall be deemed to form and be read and construed as part of this Agreement, viz:

   (a) The Contract Agreement (if completed)

   (b) The Letter of Acceptance

   (c) The completed Form of Bid

   (d) Preamble to Conditions of Contract

   (e) Specifications - Special Provisions

   (f) The Particular Conditions of Contract - Part-II

   (g) The General Conditions of Contract - Part-I

   (h) The priced Schedule of Prices

   (i) The completed Schedules to Bid

   (j) The Drawings

   (k) Specifications - Technical Provisions

   (l) (Any other document)

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this Contract Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor	Signature of the Employer
_____	_____
(Seal)	(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:	Witness:
_____	_____
(Name, Title and Address)	(Name, Title and Address)

FORM OF PERFORMANCE SECURITY

Guarantee No._____

Executed on _____

Expiry date _____

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with address: _____

(Scheduled Bank in Pakistan)

Name of Principal (Contractor) with address: _____
Penal Sum of Security (express in words and figures) _____

Letter of Acceptance No._____ Dated: _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the _____ (Hereinafter called the Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance for _____ (Name of Contract) for the _____ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 30, Defects after Taking Over, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, _____ (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Employer’s designated Bank & Account Number.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above-bounden Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

Guarantor

1. Witness:

1. Signature: _____

2. Name:_____

3. Title: _____

_____

Corporate Secretary (Seal)

2. Witness:

1. Signature: _____

2. Name:_____

3. Title: _____

_____

Corporate Secretary (Seal)

MOBILIZATION ADVANCE GUARANTEE/BOND

Guarantee No._____

Executed on_____

Expiry date_____

[Letter by the Guarantor to the Employer]

WHEREAS the _____ (hereinafter called the Employer) has entered into a Contract for _____ (Particulars of Contract), with _____ (Hereinafter called the Contractor).

AND WHEREAS the Employer has agreed to advance to the Contractor, at the Contractor's request, an amount of Rupees _____ (Rs _____) which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS the Employer has asked the Contractor to furnish Guarantee to secure advance payment for performance of his obligations under the said Contract.

AND WHEREAS _____ (Bank) (hereinafter called the Guarantor) at the request of the Contractor and in consideration of the Employer agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

NOW THEREFORE the Guarantor hereby guarantees that the Contractor shall use the advance for the purpose of above-mentioned Contract and if he fails and commits default in fulfillment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the Employer for payment not exceeding the aforementioned amount.

Notice in writing of any default, of which the Employer shall be the sole and final judge, as aforesaid, on the part of the Contractor, shall be given by the Employer to the Guarantor, and on such first written demand payment shall be made by the Guarantor of all sums then due under this Guarantee without any reference to the Contractor and without any objection.

This guarantee shall come into force as soon as the advance payment has been credited to the account of the Contractor.

This guarantee shall expire not later than _____ by which date we must have received any claims by registered letter, telegram, telex or telefax.

It is understood that you will return this Guarantee to us on expiry or after settlement of the total amount to be claimed hereunder.

_____

Guarantor

1. Witness:	2. Witness:
1. Signature: _____	1. Signature: _____
2. Name:_____	2. Name:_____
3. Title: _____	3. Title: _____
_____	_____
Corporate Secretary (Seal)	Corporate Secretary (Seal)

SPECIFICATION – SPECIAL PROVISIONS

SPECIFICATIONS - SPECIAL PROVISIONS

TABLE OF CONTENT

SPECIFICATIONS - SPECIAL PROVISIONS

1. ACQUAINTANCE WITH SITE

The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith before submitting his Bid, as to the form and nature thereof, including the subsurface conditions, the hydrological and climatic conditions, the extent and nature of work and materials necessary for the completion of the Works, the means of access to the Site and the accommodation lie may require and, in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Bid.

2. DESCRIPTION OF PROJECT

The works to be executed under this contract, on turnkey basis, comprise the PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 KV GRID STATION NO. 02, AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD. BIDDING DOCUMENT NO. GS-AIIC-02, as given in the BOQ and Drawings of this Bidding Documents.

2.1 Site

(i) The Site shall be deemed to comprise the area of the substation at Allama Iqbal Industrial City (AIIC), Faisalabad together with such work areas, warehouse, workshop, accommodation, work yard, storage areas and lay down areas as the Employer may from time to time provide adjacent to the substation.

(ii) Within the areas which may from time to time be defined as the Site, the Contractor shall carry out and perform the Works and subject to the approval of the Engineer, will be permitted to construct temporary roadways, camps, buildings and temporary works which he may require for the execution of the Works. If the Contractor wishes to use any land other than as aforesaid for construction of camps or for any other Contract purposes, the Contractor shall make all necessary arrangements with the owner thereof and shall bear all rentals or other costs connected therewith.

(iii) The Employer will give to the Contractor possession of as much of the area designated and defined as the Site and shown on the drawings as may be required to implement the Works, when the Engineer's Written Order to Commence is issued.

2.2 Location of Site

FIEDMC Allama Iqbal Industrial City (AIIC) is strategically located in Faisalabad and is connected with all major cities of Pakistan through rail and road.

3. SITE CONDITIONS

3.1 Site Conditions and Meteorological Data

(i) The Site is subject to dust storms. insects and vermin are prevalent. Particular care in design must therefore, be taken to prevent ingress of dust, insects and vermin and to ensure resistance to attack by insects and vermin.

The statistics of meteorological data of the substation area is given in the General Specifications (Volume-II).

(ii) The Employer does not guarantee the correctness of any data provided herein nor any interpretations, deductions or conclusions relative to subsurface conditions at Site. The Contractor must form his own opinion of the character of the work and of the materials to be excavated. He must make his own interpretations and satisfy himself by his own investigations and research regarding all conditions affecting the work to be done. The Contractor must assume all responsibility for deductions and conclusions as to the nature or conditions of the materials to be excavated and of doing other work affected by the geology at the Site.

3.2 Recommended Values for Design

The Plant to be installed in the substation and covered by these Specifications shall before outdoor use and shall be suitable in every way for continuous service. The conditions under which it will operate are specified in the relevant Specification of the Technical Provisions (Volume-II).

4. MATERIAL AND WORKMANSHIP

4.1 Material and Workmanship

(i) All materials, manufacture, testing and workmanship of Plant, shall comply with the requirements of the Contract Documents. Plant or parts which are not covered by these Specifications shall comply with the applicable standards, rules, codes and regulations of the Internationally approved standardizing bodies as indicated in these Contract Documents.

(ii) The intent of these Specifications is that the Plant, materials and workmanship of Works under this Contract should be equal to or superior than those actually described herein. Reference to a brand or manufacture, if made, is only for the sake of comparison as to type, design, character or quality of the Plant or parts and materials described and not be interpreted as eliminating other plant and materials of equal performance, quality and durability.

(iii) In choosing materials and their finishes due regard shall be given to the conditions prevailing at substation described in the Technical Provisions.

(iv) All matters relating as to the acceptability or otherwise of the Plant and materials offered under this Contract shall be decided by the Engineer whose decision shall be final.

4.2 Extent of Specifications

The extent of the Contract Documents is to provide for the Works herein specified to be fully complete in every detail for the function designated. All fittings, accessories, apparatus or labor which are not specifically mentioned in the Contract Documents, but which, in the opinion of the Engineer, are usual or necessary for the satisfactory completion of the Works shall be deemed to be included in the Contract Documents and shall be provided by the Contractor without extra cost to the Employer / FESCO.

5. WORK BY CONTRACTOR

5.1 Scope of Work

Scope of the supply of Works includes but not limited to design, manufacturing, testing, delivery to wharf at seaport of Pakistan, unloading and loading at seaport, transportation to the substation site, unloading and storage at site, insurance to site, designing & construction of associated civil works/structure according to the site requirements considering the required seismic factors (0.16g) by following the Building Code of Pakistan (Seismic Provision-2007) issued by the Ministry of Housing and Works Government of Pakistan [SP-2007] including Control House Building, Mechanical Services Building, Metering Room, equipment foundations, Cable Trenches, Switchyard Fencing , Switchyard Paths & Transformer Ways, Switchyard Gate, Lightning Arrangement, Fire Protection walls, walk ways, complete erection, Testing and Commissioning, Preparation of Operation & Maintenance Manual and Project Completion Report etc. for 132 kV AIS Grid Station No. 02 at Allama Iqbal Industrial City (AIIC), near Sahianwala interchange, M-4 motorway, Faisalabad, (on Turnkey Basis).

The substation equipment to be provided, installed, tested and commissioned at the substation includes but is not limited to the following: -

1. Power Transformers
2. Circuit Breakers
3. Disconnectors
4. Disconnectors with earthing switches
5. Current Transformers

6. Voltage Transformers
7. Surge Arresters
8. High voltage bus work
9. Steel Structures
10. Substation Grounding System
11. Control Board and Metering Board
12. Relay Boards and protective relaying systems
13. Control and small Power Cables
14. AC/DC Auxiliary Supplies Systems
15. Auxiliary Transformer
16. Emergency lighting system
17. Substation lighting system and power receptacles
18. Demolition, clearing, cutting, filling, leveling and compaction of earth required to level the 132 kV switchyard area
19. Contouring of the site area, raising of site area with borrow fill material including embankment of roads
20. Construction of new Control House and Relay building
21. Equipment foundations including foundation mounting channels and embedded parts for indoor and outdoor equipment
22. Construction of cable trenches, ducts and drainage system associated with cable trenches and switchyard surface area
23. Construction of concrete approach & service roads and moving areas for transformers and equipment in the Substation.
24. Laying of gravel blanket in the switchyard
25. All other auxiliary items for the completion of work
26. Cable trays, ladders, conduits and accessories inside the switchyard and building
27. Construction of substation fence, gates and installation of fence, its lighting and grounding.
28. Any other item which is not included here but is necessary for integrated operation of the Plant as advised by the Engineer.

Detailed design (Electrical, Mechanical & Civil) of a complete 132kV Grid Station as per above mentioned scope, complete in all aspects along with all allied facilities as per international practice, ready to use, to house and install the plant supplied as per Schedules of Prices, Section-4 of this Bidding Documents.

The Contractor shall carry out Soil Investigation and submit the Geotechnical Investigation report prior to submission of detailed design for approval by the Employer. The quantities of civil work shall be adjusted according to detailed design and approved drawings. Unit Rates quoted in the bid shall remain firm and final.

The Contractor shall design & prepare Switchyard Layouts, Foundation Layout Plan, Cable Trench Layout etc. in appropriate terraces/levels as per site conditions to minimize cutting and filling with proper provisions of rain water drainage, the same to be approved by the Project Manager. For this purpose, the Contractor will first prepare the Contour Plan of Project Site and get approval of the same by the Project Manager.

Substation design including but not limited to preparation of General Layout Plan (GLO), Contour Plan, Single Line diagram, Switchyard/Equipment Layout, Equipment Foundation Layout Plan, Tubular & strain Bus Bars design, cable trench Layout Plan, protection/ schematics drawings, relay setting, substation earthing & Lightning protection, Substation lighting etc. shall be the

responsibility of the Contractor. Although, it is an EPC contract, however, some of the data/drawings are provided for general information of the prospective bidders.

All civil works drawing including architectural, structural, foundations for CHB, mechanical services building, metering room, switchyard equipment, gantries, cable trenches switchyard fence/gate, fire protection wall, water supply, sewerage and all allied structure etc. shall be designed considering the Geotechnical Investigation report in conjunction with the building code of Pakistan (Seismic Provisions-2007) and supplied by the approval of Project Manager.

6. DRAWINGS

6.1 Drawings in Contract

6.1.1 Specification Drawings

The specification drawings contained in Volume III of the Bidding Documents show the scope of work to be performed by the Contractor.

6.1.2 Contractor's Bid Drawings

The Contractor's bid drawings are the drawings prepared by the Contractor for bidding purposes, and shall be part of his bid.

The Specification Drawings and Contractor's bid drawings shall not be used for execution of the Works unless specific instructions for such use are given by the Engineer.

6.1.3 Approved Drawings

The Works shall be performed in accordance with the approved drawings in terms of Clause 6 of the Conditions of Contract.

6.2 Drawings and Other Data to be Furnished by the Contractor

All drawings shall be in English language and all dimensions shall be in Metric System. Symbols shall be in accordance with IEC standards. All drawings shall be clearly marked:

Faisalabad Industrial Estate Development and Management Company (FIEDMC)

132/11.5 kV Substation No. 02,

at Allama Iqbal Industrial City (AIIC),

Faisalabad (GS-AIIC-02).

All drawings/ data submitted for approval shall conform to IS0 paper sizes A0 to A4.

The Contractor shall submit, base design and detailed civil, electrical and mechanical drawings for approval by the Engineer, in accordance with Clause 6 of the Conditions of the Contract, and the additional requirements specified in the respective Clauses hereof.

6.2.1 Outline Schematic and Civil Works Drawings

The Contractor shall submit within forty-five (45) days of the Commencement Date, for approval of the Engineer, outline schematic, civil, electrical and mechanical drawings of all the Plant to be furnished under the Contract, together with overall and handling weights and dimensions of the Plant to be provided under the Contract.

Single line diagrams, general layout drawings, interlocking and base design drawings shall also form part of the outline drawings. The drawings shall also show the methods, equipment required and clearances necessary for erection and dismantling.

The Contractor shall submit architectural and structural drawings of the civil works showing detail of all loads, forces and moments acting on the structures.

6.2.2 Detail Drawings

The Contractor shall submit within ninety (90) clays of the Commencement Date, for approval by the Engineer, detail drawings as required herein and in accordance with the schedule to be made by the Contractor and required by Clause 12 of the Conditions of the Contract. All computations, drawings, functional description of equipment and schemes and other information required to check adequacy of the design shall accompany drawings submitted for approval. The drawings shall be complete, shall have been reviewed and checked by the

Contractor and shall be submitted in time and in logical order to facilitate proper coordination.

6.2.3 Drawings, Data and Instruction Manuals

The following drawings shall be submitted within the time stated in the Contract and in accordance with the Programme required by Clause 12 of the Conditions of Contract: -

1. Dimension prints of all electrical equipment
2. Substation control schematics
3. Control diagrams of circuit breakers and disconnectors
4. Substation protection schematics
5. Constructional details of all electrical and mechanical equipment
6. Technical data and manufacturer's catalogues of all electrical and mechanical equipment
7. Equipment Layout Drawings
8. Name plate drawings
9. DC schematics
10. AC drawings/calculations
11. Setting and erection drawings
12. Structural and Architectural drawings
13. Interconnection wiring diagrams for all electrical equipment
14. Cable schedules
15. Current transformer stability and accuracy calculations and protective relay settings
16. Fabrication and assembly drawings of switchyard and indoor equipment
17. Such other drawings as are required by the Engineer to demonstrate that all parts of the Plant being furnished conform to the requirements of the Specifications
18. Instruction. operation and maintenance manuals for all equipment
19. Complete power transformer drawings, schematics of control panels and all other specifications as desired by the Engineer.

6.2.4 Data other than Drawings

All of the applicable requirements of this Clause with reference to drawings to be prepared by the Contractor shall apply equally to catalogues, cuts, illustrations, printed specifications, or other data submitted for approval.

6.3 Submission and Approvals

6.3.1 Drawings for Approval

Drawings for approval, shall be distributed to addresses and in number as specified in Sub-Clause 6.3.4 hereof.

All drawings submitted for approval shall be provided with a blank white space, approximately 90 mm in height by 120 mm in width, near the lower right-hand corner to be used for notations by the Engineer.

6.3.2 Approval of Drawings

(1) All changes will be made and will be marked "APPROVED", "APPROVED EXCEPTAS NOTED" or "RETURNED FOR CORRECTION" on the relevant drawings. One print will be returned to the Contractor. The other shall be retained by the Engineer for his own use and for the use of the Employer and shall serve as the Master Copy and shall prevail in case of any doubt or discrepancy subsequently arising.

(2) If the drawing is returned to the Contractor stamped "APPROVED" he may immediately proceed with the Works. Any drawing marked "APPROVED" by the Engineer shall be known as an "Approved Drawing".

(3) If the drawing is returned to the Contractor stamped "APPROVED EXCEPT AS NOTED" he may proceed with the Works taking into account the corrections and comments noted on the drawing. The Contractor shall revise the drawings as required and resubmit them in the same routine as before for record purposes.

(4) If the drawing is returned to the Contractor stamped "RETURNED FOR CORRECTION" he shall not proceed with the Works but shall make the changes and corrections or prepare new drawings and resubmit the revised drawing to the Engineer for approval at no change in price or Schedule Resubmitted prints and calculations will be subject to the same routine as before. Time required for such revisions and resubmittal of drawings or calculations will not entitle the Contractor to any extension in completion/commissioning time.

(5) If the Contractor does not agree with exceptions taken by the Engineer, the Contractor shall slate in his Letter of resubmittal his reasons for not complying with the Engineer's exceptions. Revision number and date and description of change shall be shown on all drawings or calculations revised.

Documents	**Engineer**		**Employer**	**Total**
	Head Office	**Site Office**		
Record drawings for approval	2	1	-	3
Record drawings (As-built)	1	1	2	4
Set of Electronic copies of all approved & as- built Drawings	1	-	2	3
Codes and Standards used (with As-Built Drawings)	1	-	1	2
Instruction Manuals for approval	1	-	1	2
Approved final Manuals (at the time of commissioning)	1	1	1	3
Workshop Test procedure for approval	1	-	1	2
Approved Test Procedure	1	1	2	4
Workshop test reports	1	1	2	4
Completion/Acceptance test procedure for approval	2	1	1	4
Approved completion/acceptance test procedure	1	1	2	4
Manufacture progress information	1	-	1	2
Insurance Certificates	1	-	1	2
Receiving Reports	1	-	1	2
Damage Reports	1	-	1	2
Erection Progress Reports	1	-	1	2
List of Spare Parts	1	1	2	4
List of Erection Equipment	1	1	1	3
Correspondence with FESCO/NTDC	1	1	1	3
Correspondence with the Engineer’s Head Office	1	1	1	3
Correspondence with the Engineer’s Site Office	1	1	1	3

6.3.3 Record Drawings

In the event of the Plant or any part thereof being, with the approval of the Engineer, properly built-in or installed otherwise than in accordance with the Approved Drawings, then the Contractor shall ensure that the Approved Drawings are marked up to show the conditions of the Plant as installed and at least two (2) copies of such marked up drawings shall be submitted by the Contractor to the Engineer for approval. One copy of each of marked up drawings approved by the Engineer shall be returned to the Contractor by the Engineer and these shall be used for the preparation of the Record Drawings pursuant to Sub-Clause

6.10 of the Conditions of Contract Part-II. A further copy of each of the marked-up drawings shall be retained by the Engineer for the purpose of checking the Record Drawings.

The Contractor shall furnish to the Engineer six (6) complete sets of all Record Drawings and data within the time stated in Preamble to Conditions of Contract. The Contractor shall also furnish to the Engineer and the Employer two (2) sets on CD of all final Record and other drawings which, in the opinion of the Engineer, may be required for the erection, construction of civil works operation and maintenance, for identification of parts and for ordering replacement parts and materials.

6.3.4 Ownership of Drawings and Data etc.

All the drawings, details, bill of materials and any other information or documents furnished by the Contractor shall become the property of the Employer and shall be non-returnable. The Employer will have the right to use this property.

7. APPROVAL OF MATERIALS AND EQUIPMENT

As soon as practicable after Award of Contract, the Contractor shall submit for the approval of the Engineer, specifications, drawings, catalogues, cuts, diagrams and other descriptive data for all materials and components of equipment which the Contractor proposes for use under this Contract. For certain materials and plant, data may be required to be submitted in accordance with a detailed form furnished by the Engineer. Items submitted shall be properly labeled to indicate owner's name, the Contract number, Project, manufacturer, source of supply, Contract Item number, and other data required by the Specifications. All items shall be submitted in sufficient time, but not later than ninety (90) days prior to use thereof, to permit proper consideration and action thereon without delaying the approved time schedule. Item sent for approval shall be shipped prepaid by the Contractor to the Engineer, and the Contractor shall give the Engineer advance notice in writing of all items shipped. Reference in Specification to the Product of a specific manufacturer is intended only to establish a standard of quality, durability and design and shall not be construed as limiting competition. Product of other manufacturers will be acceptable provided such products are in the opinion oldie Engineer equal to that specified.

8. STANDARDS AND TYPICAL DESIGN

8.1 General

The Specifications cite or imply International Standards and typical design for Plant and material. Other equivalent Standards and typical designs are equally acceptable provided that they in no way detract from the quality, safety, operability of the Plant and materials furnished. However, when standards or typical design other than those cited or implied are offered by a bidder, he shall set forth in his bid the alternative standards proposed so that a direct comparison can be made before Contract Award. Each specific difference from the Specifications shall be clearly indicated by the bidder. If no alternatives are set forth by the bidder, it will be assumed that Plant and material will be in accordance with the International Standards and typical design as cited or implied in the Specifications.

Where the documents provide requirements for material or substations by specifying a standard such as, for example, one of the international standard organizations which has its origin in one country, it is not the intention to restrict the requirements solely to that standard and that country. Other standards, including standards of other countries will be accepted provided the requirements thereof in the sole opinion of the Engineer, are at least equal to the requirements of the standards specified. The Contractor may propose to the Engineer an equivalent standard other than that specified, in which case he shall submit the proposed

standard and all other information required by the Engineer and shall submit written demonstration that his proposed standard is equivalent to or superior to the one specified herein. The submission must be made in English language. Moreover, the bidder shall also supply the latest revision of the specified standards/ new proposed used in his design.

8.2 Abbreviation of Standards

Standard specifications and codes of the following listed authorities wherever cited herein are referred to by use of the abbreviations shown below. All Plant shall be designed, manufactured and tested generally in accordance with the latest revision of the standards laid down by the following institutions or other approved institutions, except where specifically directed otherwise.

Sr. No.	Standards	Abbreviation
1	American National Standards Institute, Inc. 1430 Broad-way, New York, New York 10018	ANSI
2	American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.	ASTM
3	American Society of Mechanical Engineers 345 East 47th Street New York, New York 10017.	ASME
4	American Society of Engineers 345 East 47th Street New York, New York 10017	ASCE
5	American Welding Society 345 East 47th Street, New York, New York 10017	AWS
6	American Gear Manufacturer's Association.	AGMA
7	American Petroleum Institute.	API
8	British Standards Institution British Standard House 2.Park Street, London, W 1 England.	BS
9	Comite Consultant International Telefonique et Telegraphique.	CCITT
10	Comite Consultant' International Radio.	CCIR
11	Deutch Industrie Norms.	DIN
12	Diesel Engine Manufacturer's Association.	DEMA
13	Electronic Industries Association	EIA
14	International Electrotechnical Commission, Geneva, Switzerland.	IEC
15	Insulated Power Cable Engineers Association 230 Valley Road, Montclair New Jersey 07042.	IPCEA
16	Institute of Electrical and Electronics Engineers Inc. 345 East 47th Street, New York, New York 10017.	IEEE
17	National Electrical Manufacturers Association 155 East 47th Street, New York, New York 10017	NEMA
18	National Electrical Code. Board of Underwriters, 85 John Street, New York, New York, 1007, U.S.A.	NEC
19	National Fire Protection Association, 60 Battery march Street Boston, Massachusetts 020110	NFPA
20	Steel Structures Painting Council, 4400 Fifth Avenue Pittsburgh, Pa.15213.	SSPC
21	Verband Deutscher Electro-techniker.	VDE

8.3 Applicable Standards and Codes

(1) All Plant for substation design shall be generally in accordance with latest revision of the standards except where specifically directed otherwise in Section 2 of the Technical Provisions. If these Specifications conflict with any or all the standards stated in the Technical Provisions, these Specifications shall have Precedence and shall govern.

(2) In case deviation from the above standards is minor, the approval of the Engineer may be given to the use of other national standards prevalent in the country of manufacture. No departure from the standard specified will be considered after the contract has been awarded unless specific authorization is requested in writing from the Engineer.

(3) When national standards (such as ANSI, NEMA, VDE, DIN, JIS) are only referred to, the bidder shall propose the IEC equivalent standards, if any. In this case, the Contractor shall attach four (04) sets in English language of the standards or rules applicable to his design, calculations, drawings or technical data within four (4) weeks following receipt of Engineer's Written Order to Commence.

9. PORT OF ENTRY AND DISEMBARKATION

The Contractor would have the option to use either Karachi Port or Port Muhammad Bin Qasim or both, as the port(s) of entry and disembarkation, at his own risk and costs. For the purpose of clarification, the term "Wharf at the Port of Karachi" wherever used throughout this document shall mean:

(a) Wharf at the Port of Karachi, and/or

(b) Wharf at the Port of Muhammad Bin Qasim

10. TROPICALIZATION

10.1 General

In choosing materials and their finishes due regard shall be given to the tropical conditions under which Plant may be called upon to work. Some relaxation of the following provisions may be permitted where Plant is hermetically sealed but it is preferred that tropical grade materials should be used wherever possible. Requirements are detailed below and in the Technical Provisions.

10.2 Metal

Iron and steel shall in general be painted or galvanized as appropriate. Painting shall be in accordance with the Technical Provisions. Indoor parts may alternatively have chromium or copper-nickel plating or other approved protective finish. Small iron and steel parts (other than stainless steel) of all instruments and electrical equipment, the cores of electromagnets, and the metal parts of relays and mechanism shall be treated in an approved manner to prevent rust. Cores, etc. which are built up of laminations or cannot for any other reason be anti-rust treated, shall have all exposed parts thoroughly cleaned and heavily enameled, lacquered or compounded. When it is necessary to use dissimilar metal in contact, these shall be so selected that the potential difference between them in the electro-chemical series is not greater than 0.5 volt. if this is not possible, the contact. Surfaces of one or both of the metal shall be electroplated or otherwise finished in such a manner that the potential difference is reduced to within the required limits or, alternatively, the two metal shall be insulated from each other by an approved insulating material or a coating or approved varnish compound.

10.3 Screws, Nuts, Springs, Pivots, etc.

The use of iron and steel shall be avoided in instruments and electrical relays wherever possible. Steel screws, when used, shall be zinc, cadmium or chromium plated or, may be of corrosion resisting steel when plating is not possible owing to tolerance limitations. All wood screws shall be of dull nickel-plated brass or other approved finish. Instruments screws (except those forming part of a magnetic circuit) shall be of brass or bronze. Springs shall be of non- rusting material, e.g., phosphor bronze or nickel silver, as far as possible. Pivots and other parts for which nonferrous material is unsuitable shall be of an approved stainless steel where possible.

10.4 Fabrics, Cork, Paper, etc.

Fabrics, cork, paper and similar materials, which are not subsequently to be protected by

impregnation, shall be adequately treated with an approved fungicide. Sleeving and fabrics treated with linseed oil, or linseed oil varnishes shall not be used.

10.5 Wood

The use of wood in Plant and Erection Equipment shall be avoided. When used, wood work shall be of thoroughly seasoned teak or other approved wood which is resistant to fungal decay and free from shakes and warp, sap and wane, knots faults and other blemishes. All woodwork shall be treated in approved manner to protect it against the ingress of moisture and from the growth of fungus and termite attack, unless it is naturally resistant to those causes of deterioration. All joints in wood-work shall be dovetailed or tongued and pinned if practicable. Metal fittings where used shall be of nonferrous material.

10.6 Adhesives

Adhesives shall be specially selected to ensure the use of type which are impervious to moisture, resistant to moulds growth, and not subject to the ravages of insects. Synthetic resin cement only shall be used for jointing wood. Casein cement shall not be used.

10.7 Electrical Material and Equipment

Materials and components which are inherently fungus resisting or are protected by hermetic sealing or oil immersion need not be treated. Other elements shall be protected by additional varnish for high humidity and given anti-fungus treatment.

11. NAME PLATES

The Contractor shall provide and attach to each major piece of equipment, a metal name and rating plate to be approved by the Engineer giving the name and address of the manufacturer, the date and rating data. All ratings shall be in English. Large lettering on any of the parts will not be permitted.

12. APACKING AND MARKING

12.1 Packing

(1) The Contractor shall prepare and pack all parts of the Plant for shipment in accordance with the requirements of the Contract Documents and in the best possible manner to withstand damage or loss from repeated handling and extremes of climate during transport and storage at Site. All parts of the Plant shall be packed so as to guarantee safe transportation of the Plant to the Site under any conditions and limitations which may be encountered. The manner of packing shall be such that it protects the Plant and other material against breakages, damages and losses from the factory until its arrival at its final destination at the Site.

(2) The final packing shall be such that the weight and dimensions of packages are within reasonable limits in order to facilitate handling, storage and transportation.

(3) Tube ends and other similar open ends shall be protected from both external damages and ingress of dirt and moisture. Flanged pipe shall have their open ends protected by adhesive tape or jointing and then be covered with a wooden blank flange secured by service bolts. Precautions shall be taken to protect shafts and journals where they rest on wooden or other supports liable to contain moisture. At such points, wrappings, impregnated with anti-rust composition or vapor phase inhibitors shall be used, of sufficient strength to resist chafing and indentation due to movement which is likely to occur in transit. The protective wrappings and impregnations shall be suitable for a period of three (3) years. Lids and internal cross battens of all packing cases shall be fixed by screws and not nails. Hoop metal bindings of cases shall be sealed where ends meet and if not of rust-resisting material shall be painted.

(4) Each crate, case, box, package or bundle shall have labels and or tags made from strong waterproof material and marked in indelible and non-fade able ink securely attached hereto. These labels or tags shall indicate at least the names of the Project, the Consignee and the manufacturer, the type of Plant or component and the quantity it contains so that it can be easily checked upon delivery. A packing list shall be included in each crate or box.

(5) Each package delivered under the Contract shall be consecutively numbered and shall also be marked with code number or other identification to be approved by the Engineer/Client/FESCO so that various components of the Plant which are shipped, disassembled and which may not be interchangeable can be identified collected and stored at the Site together. Additional information and or color coding that may reasonably be required by the Engineer/ FESCO to facilitate identification, shipment to stores or site handling and storage will also be provided.

(6) All boxes weighing in excess of 500 kilograms shall be adequately marked for straining and lifting. Whenever necessary the boxes shall be provided with lifting hooks attached by means of vertical rods secured to strong bottom supports.

12.2 Cases

Contents of cases shall be bolted securely or fastened in position with struts or cross battens and not with wood chocks wedged in place. All struts or cross battens shall preferably be supported by cleats fixed to the cases above and below to form edges on which the batten may rest. As required, cases shall be up-ended after packing to prove that there is no movement of contents. Where parts are required to be bolted to the sides of the case, large washers shall be used to distribute the pressure and the timber strengthened by means of a pad. Wood wool shall be avoided as far as possible. Waterproof paper and felt linings shall overlap at seams at least 12.5 mm and the seams shall be secured together in an approved manner, but the enclosure shall be provided with screened openings for ventilation. Where practicable all indoor items such as electric motors. switches and control gears, instruments and panels, machine components, etc. shall be "cocooned" or covered in polyethylene sheeting, sealed at the joints and the enclosure provided internally with an approved desiccator. Prior to dispatch, the Contractor shall state what precautions are being taken to avoid indentation of the bearing races of roller bearings. If the method proposed is not approved or if no special precautions are taken, then, as required by the Engineer, the Contractor shall have replacement bearings available at Site and shall replace indented bearings at his own expenses.

12.3 Container Marking

In addition to labels and marking indicated above all packages, containers cases or boxes shall be clearly and boldly marked on two opposite sides and on the top as follows:

Consignee:	Chief Executive Officer, FIEDMC, East Canal Road, Zia Town, Near Kashmir Bridge, Faisalabad, Pakistan
Ultimate Consignee Destination:	Chief Executive Officer,
Contract No.	_____
Name of Project:	_____
Weight and Dimension:	_____
Serial Number:	_____
Inscription:	FIEDMC

13. TRANSPORTATION OF PLANT

13.1 General

(1) The Contractor shall insure and transport the Plant and his Equipment from its place of manufacture or origin to the Site and shall be solely responsible for selection of routes and can-iers, and expediting in order that all shipments are safely and expeditiously transported to the Site.

(2) The Contractor shall carry out the maximum degree of shop assembly of the Plant and shall deliver maximum sized sub-assemblies consistent with convenient and safe transportation.

13.2 Shipping

The shipment of all the consignment relating to Plant and Contractor's Equipment shall be arranged by the Contractor through Pakistan National Shipping Corporation (PNSC)or any other shipping line acceptable to the Employer. For working out a proper schedule to match the completion of Works, the Contractor will keep a continuous liaison with the Agent of the respective shipping corporation within the country of origin.

13.3 Transportation in Pakistan

(1) The Plant corning by sea can be received by the Contractor either at Karachi Port and at Port Muhammad Bin Qasim. The Site is connected by an all-weather road with bridges and culverts wherever needed.

(2) At Port Muhammad Bin Qasim, a conveyer belt nearby Steel Mill crosses the road with a clearance of 6 meters from road surface. In case the carrier with the consignment would be more than 6 meters in height, then the Plant can be received at Karachi Port where, except for a busy road during the day, there is no constraint.

(3) The Contractor however, shall be solely responsible for satisfying himself at the time of transportation as to the adequacy of the road surfaces and structures. All costs related with reinforcement of roads, structures, diversions and the like, if any, shall be borne by the Contractor. The Contractor shall advise the concerned authorities in advance of the proposed transit of the heaviest and largest items of Plant and Equipment and shall comply with instructions given by said authorities.

(4) Within the limits imposed by law, the Contractor shall be entitled to utilize all the roads and other communication facilities existing in the country, to the same extent as any other user.

13.4 Unloading and Storage at the Site

(1) The Contractor shall unload all plant and other material at the Site. Items for permanent installations shall be properly stored in areas designated by the Employer and shall be protected as required to prevent damage or deterioration of any type. Storage methods shall be such as to cause minimum inconvenience to others and shall be arranged to facilitate inspection.

(2) All plant and other material storage shall comply with the requirements of the specifications or to the approval of the Engineer.

13.5 Ownership of Packing Materials

All packing boxes, shipping containers except those containers which are not the property of the Contractor, planking covers, etc. shall become the property of the Employer. Ail the packing materials shall be handed over to the Employer immediately after storage requirements of the Plant or part thereof and other materials are over. The Employer, on application from the Contractor, may permit the Contractor to use some of the boxes and containers, without charge for construction erection/installation purposes.

13.6 Receiving Reports and/or Damage Reports

(1) The Contractor shall prepare and submit receiving reports to the Employer and the Engineer to cover shipments received and checked at the job Site and/or storage area. Shipment on arrival at the job Site and/or storage area shall be unloaded, opened, and carefully checked by the Contractor in the presence of a designated representative of the Engineer / Employer for any loss and damages in transit. In the event of loss and/or damage, the Contractor shall immediately submit a damage report to the Employer / Engineer countersigned by the Engineer to the Insurance Company with copies to the Engineer / Employer. Prompt action shall be taken and intimated to the Engineer / Employer to record the damaged or missing item(s) and it shall be ensured that the deliveries meet the final delivery dates and/or commissioning dates.

(2) In all cases of irreparable damage, the Contractor shall immediately notify the original manufacturer(s) for re-manufacture and supply of the damaged part(s).

14. SPARE PARTS

As per BOQ

15. ERECTION AND TESTING EQUIPMENT AND MAINTENANCE TOOLS

As per BOQ

16. SHOP INSPECTION AND ORDERS FOR MATERIALS

16.1 Inspection

Unless otherwise authorized by the Engineer no material or equipment shall be shipped from its point of original manufacture or final shop assembly before it has been inspected and approved by the Engineer.

16.2 Material Orders

The Contractor shall provide to the Engineer a list of Sub-Contractors and vendors with whom orders are to be placed for materials or equipment which will enter directly into the work of the Contract. Triplicate copies of material or equipment orders and list of stock material or equipment shall be provided to the Engineer. All orders and stock lists shall state the material, standard specification under which the material is to be furnished, pertinent drawing and part numbers if any, and the required delivery date, and shall be subject to inspection and testing by the Engineer.

16.3 Acceptance of Materials

The approval by the Engineer of any material or equipment prior to shipment shall in no way relieve the Contractor of any of his responsibilities for meeting all the requirements of the Specifications and shall not prevent subsequent rejection if such material or equipment is later found to be defective or not conforming to the Specifications.

17. SHOP PAINTING AND FINAL PAINTING

Where shop painting is not described in the Specifications but is nevertheless necessary to adequately protect or finish the Plant and material supplied hereunder, Contractor shall supply and apply such paint in accordance with best practices using the highest quality paint products. Surfaces to be painted shall be properly cleaned and/or sand blasted, and then given coats of rust inhibitive primer and other paints as required. The Contractor shall paint prime as required and finish equipment and surfaces using the highest quality paint products, which will be according to the approval of the Engineer.

18. PROGRAMME, PROGRESS REPORTS AND MEETINGS

18.1 Programme

The Contractor shall carry out the Works in accordance with the dates / periods specified in the Preamble to Conditions of Contract and with the Programme which shall be provided pursuant to Clause 12 of the Conditions of Contract. The Contractor shall regularly review the Programme and notify the Engineer promptly of any revisions which in his view may be required from time to time.

18.1.1 Form of Programme

The Programme shall be a detailed CPM (critical path method) type, time scaled according to calendar dates and Project month 'numbers. The CPM for planning, scheduling, and controlling will be used for the Contract. The Contractor shall submit a

Programme showing the logical sequence in which the Works will be carried out insufficient detail to satisfy the Engineer that the Works are thoroughly planned and meets all the requirements of the Contract Documents.

18.1.2 Shipping of Plant to Site

(1) Each group of Plant shall be completely delivered to the Site stated in the Contract. The Contractor shall keep the Engineer informed of the progress of the Contract and notify the

Engineer approximately thirty (30) days in advance, in writing, as to when the Plant will be ready for inspection and for shipping and shall supply lists covering each consignment in sufficient detail to enable the Engineer to check the contents of the packages. The Engineer may use such information as a basis for issue of the Permission to Deliver in accordance with Sub-Clause 22.1 of the Conditions of Contract, Part-I.

(2) In preparing the Programme the Contractor shall fully take into account the requirements (and possibilities) for ocean (or air) freight, inland transportation and expediting through customs. Progress of all shipments to the Site shall be continuously monitored and the Contractor shall provide staff or agents to expedite all shipments to ensure compliance with the approved Programme.

18.1.3 Erection / Construction

(1) The delivery of sub-assemblies and other parts of the Plant should be so estimated so as to permit erection work and construction work to proceed in an orderly manners that the Plant can be completed by the required Commissioning Dates. The Contractor in preparing and regularly reviewing the Programme in respect of the erection work shall comply with the requirements of Clause 12 of the Conditions of Contract, Part-I.

(2) The Contractor shall promptly bring to the attention of the Engineer any amendment to the Programme which in his view may at any time be required to ensure that the Commissioning Date/Periods will be met.

18.2 Progress Reports

(1) The Contractor within one month of the issuance of the Engineer's Order to Commence shall submit in writing for the approval of Engineer a Programme for the design, manufacture, delivery, erection, testing and commissioning of the Plant and design and construction of the associated civil works.

(2) The submission or approval by the Engineer / Employer of such Programme etc. shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

(3) At monthly intervals after submission of the Programme the Contractor shall submit to the Engineer upto three (03) copies of a written detailed progress report in an approved form together with copies of the above-mentioned Programme indicating the stage reached in design, approval of drawings, ordering and procurement of materials, manufacture, delivery, erection/ construction, in percentage terms. Such monthly reports shall show the actual progress plotted against the scheduled progress. These reports shall be accompanied by such diagrams, bar charts, and curves in approved standard form, as may be required by the Engineer. The reports shall be forwarded not later than the 8th of the subsequent month. The numbers of copies shall be as stipulated in the Specifications or as instructed by the Engineer.

(4) The Engineer shall at all reasonable times be afforded access to the Contractor and any Sub-Contractor's premises for the purpose of ascertaining progress.

18.3 Meetings

(1) Soon after the date of signing of Contract, the Engineer will, with the approval of the Employer require a conference with the Contractor and the Engineer at a place mutually agreed upon, to discuss scheduling of drawings, manufacture, scheduled sequences of delivery and other similar problems which may be pertinent to the completion of the project.

(2) From time to time during the execution of the Contract, the Engineer may call meetings, either in his Offices at Lahore or at site office Faisalabad or at the Contractor's Office in Pakistan as is deemed necessary for the purpose of the Contract.

(3) As required by the Engineer, responsible representatives of the Contractor shall attend such meetings.

19. FAILURE TO MEET GUARANTEES

(1) For the removal of the doubt, it is stated that should the Plant fail to meet the guaranteed characteristics, it will constitute a defect within the meaning of Clause 30of the Conditions of Contract.

(2) Pursuant to Clause 27.3 of the Conditions of Contract, Part-II results of the Final Acceptance Tests will be used in calculating the Liquidated Damages.

(3) The value and limitation on Liquidated Damages for failure to meet guarantees are specified in Preamble to Conditions of Contract.

20. REPAIRS AFTER TAKING OVER

The Employer / FESCO will operate the plant after it has passed the Commissioning Tests and prior to the Final Acceptance Tests. All repairs or alterations found to be necessary to meet Contract requirements during such operation shall be made by the Contractor as directed by the Engineer in such a manner and at such a time as will cause the minimum interruption in the use of the Plant by the Employer / FESCO.

21. INSTRUCTIONS MANUAL

21.1 General

Pursuant to Sub-Clause 6.6 of the Conditions of Contract Part-I the Contractor shall provide Instruction Manuals in three (03) volumes, one of each of the four sections referred to below, divided into chapters dealing with each major item of Plant or Erection Equipment, to cover transport to the Site, unloading, storing (the "Handling Section") for erection and building-in (the "Erection Section"), testing and setting to work (the "Site. Testing Section"), and operation and maintenance (the "Operation and Maintenance Section"). Each volume shall be on ISO paper size A4 (210 x 297mm) paper 80 to 90 grams with offset or equivalent printing strongly bound in a durable stiff cover bearing the title in approved legend. Drawings shall be folded or reduced to 297 mm height. All volumes shall bear on the spine an approved shortened version of the title.

21.2 Supplement to the Instruction Manuals

Following complete installation, testing and taking over the substation by the Employer the drawings shall be revised to include all changes, and revised drawings shall be submitted as a supplement to the Instruction Manuals.

22. TESTS

22.1 Tests during manufacture

The type, acceptance and routine tests and tests during manufacture to be carried -out on the material and equipment shall mean as follows:

- **Type Tests** shall mean those tests, which are to be carried out to prove the process of manufacture and general conformity of the material to this Specification. These tests shall be carried out on samples prior to Commencement of commercial production against the order. The Bidder shall indicate his schedule for carrying out these tests.
- **Routine Tests** shall mean those tests, which are to be carried out on the material to check requirements, which are likely to vary during production.
- The norms and procedure of sampling for these tests will be as per the Quality Assurance Programme to be mutually agreed to by the Contractor and the Employer. The standards and norms to which these tests will be carried out as per acceptable standards where a particular test is a specific requirement of this Specification, the norms and procedure of the test shall be as specified or as mutually agreed to between the Contractor and the Employer in the Quality Assurance Programme.

22.2 Test Reports

Equipment, which has never been tested for critical performance, shall not be accepted. In such cases, a promise or agreement by a bidder to have the equipment tested after award of a contract is not acceptable. All Bids must be accompanied by the Routine, Type and Special Test Certificates of equipment offered as per NTDC Type Test Policy (amended to date).

Test reports to be acceptable must be related directly to the equipment offered i.e., it is identical in design, rating and construction with the equipment for which the type test certificates have been submitted.

22.3 Test Certificates

All test certificates of major equipment are to be provided along with the bids. Type test certificates of other equipment shall be submitted after issue of notice of award. All certificates shall be in English or duly notarized translation in English.

23. SITE FACILITIES AND SERVICES

The Contractor shall provide, operate and maintain the following facilities within one week of Engineer's Notice to Commence and shall continue un-interrupted till the completion of works. Please refer to SP-29, below.

24. WORKYARDS AND STORAGE AREAS

(1) Apart from the provisions specified in Sub-Clause SP-13.4 hereof, no roofed structure shall be provided by the Employer at substation Site to store indoor equipment. The Contractor shall procure, furnish, provide and arrange for all the necessary services and be responsible for the construction and maintenance of the necessary construction camps, offices and warehouses; and perform all other work necessary for completion of the Works described herein in strict conformance with these Specifications.

(2) Outdoor storage space is available at the Site. The Contractor shall cooperate with other contractors in the use of the storage space assigned to him by the Employer.

(3) The Contractor shall provide watch and ward service including security lighting at night to ensure security and safety of the Plant and Site Area.

(4) In case, there is a delay in taking over of the Works by the Employer, the Contractor shall provide his own electrical foreman and watchman services to ensure security and safety of the Plant and material for the intervening period.

25. TEMPORARY BUILDINGS

(1) The Contractor shall provide and maintain all temporary structures required including warehouses, changes, change houses for workmen, sheds, etc. He shall also provide his own field office complete with telephone so that the Contractor or his official presentative can be contacted by the Employer and/or Engineer at all times.

(2) Such temporary buildings and/or utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the Works unless the Employer agrees otherwise and the Site reinstated to its original condition, all to the approval of the Engineer.

(3) All temporary erection facilities described above shall he removed by the Contractor after completion of the works, and the site cleared and cleared of refuse or other foreign material as per instructions of the Employer / Engineer.

26. ELECTRICITY

The Employer will provide metered three phase AC power supply of proper kVA rating required by the Contractor for substation service for temporary construction purpose, inside the substation area. The bill for the energy consumed shall be paid by the Contractor at applicable standard WAPDA tariff. The Employer does not guarantee or accept any responsibility for regular supply of electricity without any interruption, breakdowns, or any other default.

27. PAYMENT FOR WORK REQUIRED BY SPECIAL PROVISIONS

Unless expressly excluded, the cost of all work required by the Special Provisions shall be considered to be included in the price and amounts quoted in the Schedule of Prices.

28. COMMUNICATIONS WITH THE ENGINEER

Pursuant to the definition of Engineer, Clause 1 of the Conditions of Contract Part-I, the Engineer will establish a Project Office to which the Contractor shall address all communications. The address of the Engineer's office shall be communicated to the Contractor at that stage.

29. FACILITIES FOR THE ENGINEER/CONSULTANT:

The Contractor shall provide for the following:

1. Separate Site office for Engineer/Employer with facilities of HVAC System, water dispenser, personal computers (PCs), laptops, printers, scanners, photo copiers, Stationery, furniture, lavatory besides mineral water, daily tea & food etc. The contractor shall arrange and maintain his offices at his own cost. The Contractor shall provide and maintain at his own cost separate office & facilities for employer and engineer use, at site.
2. The Contractor shall provide and maintain at his own cost separate (fully furnished) residential accommodation and transportation facilities for employer and engineer use, along daily tea & food etc. Complete associated cost shall be borne by the Contractor. The contractor shall provide and maintain such housing accommodation and amenities as he may consider necessary for all of his supervisory staff and labor employed for or in connection with this contract including all fencing, electricity, supply, sanitation, cook-houses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities.
3. Fully maintained Brand New 1600 CC (Latest model) car Toyota/Honda/equivalent for transportation services to the Engineer/Consultant till the Energization of the Grid Station. Its maintenance along with a driver including fuel/POL shall also be the responsibility of the Contractor. This item shall become the property of the employer after the completion of the Project.

   The above vehicles shall be brand new, latest model with Driver, install tracker facility, registered and insured to the name of the Employer. The above vehicles are for the exclusive use of the Engineer / Engineer's supervision Team to meet their transportation needs. The use of such transportation facility shall be exclusively under the control of the Engineer and the contractor shall be wholly responsible for furnishing at all times above said facilities.
4. The Contractor shall provide at his cost one cellular telephone (Android/Apple) including SIM, postpaid package, maintenance and servicing for use of the Engineer, acceptable to Engineer.
5. Two (02) Nos. Laptops of HP/ Dell, intel Core-i9 14th Generation or higher, up to 6 GHz, 16 GB DDR5 RAM, 2GB or above dedicated Graphic Card, 1TB PCIe Gen4 NVMe SSD (Solid State Drive) & 2TB SATA HDD (Hard Disk Drive), 15.6 Inch OLED Display & touch screen, Camera, Bluetooth, Gigabit ethernet LAN, Card reader, DVD writer, WIFI along with genuine licensed Microsoft windows 11 or latest operating system, MS Office 2021 professional edition or latest version (Maintenance Included) along with accessories (Bag, Wireless mouse & keyboard, mouse pad, 256 GB USB etc.). This item shall become property of employer after the completion of the Project.

   ***Note**: The Contractor must provide, operate and maintain the above-mentioned facilities (SP-29), within one week of Engineer's issue of commencement letter and shall continue uninterrupted till the completion of works. The above facilities provided one time shall be in use of the Engineer and shall become property of the employer after completion of the project. In case of non-provision of above facilities, the Engineer shall deduct from any money due/ becoming due to the Contractor by the employer appropriate amount till these facilities are provided satisfactorily to Engineer.*

30. ANY MALFUNCTION

Any equipment with malfunction during Defect Liability Period (DLP), shall be replaced with brand new equipment, without any dispute, at the cost of the Contractor.

31. MATERIAL RECONCILIATION REPORT

Material Reconciliation Report must be furnished by the Contractor, for approval, by the Engineer, before applying for Taking Over Certificate (TOC). The Contractor shall keep records of all Site inspections/Delivery-notes/approved-data/photographs of site progress or any other information, in the opinion of the Engineer, deemed necessary for the purpose of Material Reconciliation Report and TOC.

32. COMMISSIONING TESTING PROTOCOLS

Commissioning Testing Protocols must be furnished by the Contractor (at least 21 days in advance), for approval by Engineer, before Testing & Commissioning. Any delay shall be at Contractors account.

F A I S A L A B A D I N D U S T R I A L E S T A T E D E V E L O P M E N T & M A N A G E M E N T C O M P A N Y

BIDDING DOCUMENT NO: GS-AIIC-02 (R-I)
Single Stage - Two Envelope Bidding Procedure

FOR

PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF

NEW 132 kV AIS GRID STATION NO. 02
AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.

REVISED (APRIL– 2024)

VOLUME – II
TECHNICAL SPECIFICATIONS
BIDDING DOCUMENT NO.: GS-AIIC-02 (R-I)

CONSULTANT

EnMasse (Pvt.) Ltd
Address: 18, Block E-2, Johar Town, Lahore.
Tel: 042- 35314701-02
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Web: www.enmassepakistan.com

TABLE OF CONTENT

GENERAL

1. INTRODUCTION

Scope of the supply of Works includes but not limited to design, manufacturing, testing, delivery to wharf at seaport of Pakistan, unloading and loading at seaport, transportation to the substation site, unloading and storage at site, insurance to site, designing & construction of associated civil works/structure according to the site requirements considering the required seismic factors (0.16g) by following the Building Code of Pakistan (Seismic Provision-2007) issued by the Ministry of Housing and Works Government of Pakistan [SP-2007] including Control House Building, Mechanical Services Building, Metering Room, equipment foundations, Cable Trenches, Switchyard Fencing , Switchyard Paths & Transformer Ways, Switchyard Gate, Lightning Arrangement, Fire Protection walls, walk ways, complete erection, Testing and Commissioning, Preparation of Operation & Maintenance Manual and Project Completion Report etc. for 132 kV AIS Grid Station No. 02 at Allama Iqbal Industrial City (AIIC), near Sahianwala interchange, M-4 motorway, Faisalabad, (on Turnkey Basis).

1) Two (02) No. 31.5/40 MVA, 132/11.5 k Power Transformers.
2) Two (02) No. Power Transformers Bays.
3) Four (04) No. 132 kV Line Bays.
4) 132 kV Twin Bundle Conductor Double Busbar System.
5) One (01) No. 132 kV Bus Coupler Bay.
6) Two (02) No. PT Bays.
7) One (01) Set 11 kV Switchgear Panels (2 I/C + 16 O/G + 1 Bus Coupler).
8) Two (02) No. 11kV, 7.2MVAR Capacitor Bank with Control Panels.
9) 110 V Battery Two (02) Sets along with Two (02) Nos. Battery Chargers.
10) 415/230 V AC & 110 V DC Supply Systems.
11) Complete Control, Protection and Metering System.
12) Construction of Civil Foundations & allied Civil Works, in all respect.
13) Spare Parts
14) Maintenance Tools.
15) Smoke detection and Fighting system.
16) Testing and commissioning and handing over to FESCO/Employer.

Detailed design (Electrical, Mechanical & Civil) of a complete 132kV Grid Station as per above mentioned scope, complete in all aspects along with all allied facilities as per international practice, ready to use, to house and install the plant supplied as per Schedules of Prices, Section-4 of this Bidding Documents.

The Contractor shall carry out Soil Investigation and submit the Geotechnical Investigation report prior to submission of detailed design for approval by the Employer. The quantities of civil work shall be adjusted according to detailed design and approved drawings. Unit Rates quoted in the bid shall remain firm and final.

The Contractor shall design & prepare Switchyard Layouts, Foundation Layout Plan, Cable Trench Layout etc. in appropriate terraces/levels as per site conditions to minimize cutting and filling with proper provisions of rain water drainage, the same to be approved by the Project Manager. For this purpose, the Contractor will first prepare the Contour Plan of Project Site and get approval of the same by the Project Manager.

Substation design including but not limited to preparation of General Layout Plan (GLO), Contour Plan, Single Line diagram, Switchyard/Equipment Layout, Equipment Foundation Layout Plan, Tubular & strain Bus Bars design, cable trench Layout Plan, protection/ schematics drawings, relay setting, substation earthing & Lightning protection, Substation lighting etc. shall be the responsibility of the Contractor. Although, it is an EPC contract, however, some of the data/drawings are provided for general information of the prospective bidders.

All civil works drawing including architectural, structural, foundations for CHB, mechanical services building, metering room, switchyard equipment, gantries, cable trenches switchyard fence/gate, fire protection wall, water supply, sewerage and all allied structure etc. shall be designed considering the Geotechnical Investigation report in conjunction with the building code of Pakistan (Seismic Provisions-2007) and supplied by the approval of Project Manager.

2. ENVIRONMENTAL CONDITIONS AND APPLICABLE STANDARDS

2.1 Site Acquaintance

The Contractor must be fully aware of site conditions and the roads along which the Equipment/Plant will be transported as well as Karachi Port. The failure of the Contractor to acquaint himself with these conditions will not relieve him from the responsibilities of properly estimating and successfully completing the works.

2.2 APPLICABLE STANDARDS AND CODES

All Plants for grid station design shall be generally in accordance with the latest revisions/editions of the following standards except where specifically directed otherwise. The latest applicable standards shall be those which are in force 30 days prior to the date of Bid opening. All other relevant, IEC, ANSI/IEEE, ASTM, BS, ACI or UBC standards and specifications shall be followed, where applicable.

2.2.1 General

IEC 60050	International Electro Technical Vocabulary
IEC 60071-1	Insulation Co-ordination Part-1: Definitions. Principles and Rules.
IEC 60071-2	Insulation Co-ordination Part 2: Application Guide
IEC 60417	Graphical Symbols for Use on Equipment, Index, Survey and Compilation of Single Sheet
IEC 60617-1~13	Graphical Symbols for Diagrams.

2.2.2 Insulation Media

IEC 60085	Electrical Insulation – Thermal Evaluation and designation.
IEC 60156	Insulating Liquids - Determination of the Breakdown Voltage at Power Frequency -Test Method
IEC 60247	Measurement of Relative Permittivity. Dielectric Dissipation Factor and D.C. Resistivity of Insulating Liquids.
IEC 60296	Specifications for Unused Mineral Insulating Oils for Transformers and Switchgear
IEC 60296-aml	Amendment No. 1
IEC 60376	Specification and Acceptance of New Sulphur Hexafluoride
IEC 60376A	First Supplement: Section Thirteen. Mineral Oil Content
IEC 60376B	Second Supplement: Clause 26
IEC 60475	Method of Sampling Liquid Dielectrics
IEC 60480	Guide to Checking of SF6 Taken from Electrical Eqpt

2.2.3 Power Transformers

IEC 60076-1	Part 1: General
IEC 60076-2	Part 2: Temperature Rise
IEC 60076-3	Part 3: Insulation Levels and Dielectric Tests,
IEC60076-3-aml (1981-01)	Amendment No. 1
IEC 60076-3-1	Part 3-1: External Clearance in Air
IEC 60076-5	Part 5: Ability to Withstand Short-Circuit
IEC 60551	Determination of Transformers and Reactors Sound Levels
IEC 60214	On-load Tap changer
IEC 60296	Fluids for Electro technical applications –Unused mineral insulating oils for Transformers.
IEC 60354	Loading Guideline for Oil Immersed Transformers.
IEC 60422	Fluids for electro technical applications-unused mineral insulating oils for transformers and switchgear.

2.2.4 Switchgear

IEC 62271-1	High Voltage Switchgear and Control gear Common Specifications.
IEC 62271-100	High Voltage Alternating Current Circuit Breakers
IEC 62271-102	Alternating Current Disconnectors and Earthing Switches
IEC 62271-103	Switches for Rated Voltages Above 1kV and less than 52kV
IEC 62271-104	Switches for Rated Voltages of 52kV and above.
IEC 62271-105	Alternating Current switchgear – fuse combinations
IEC 62271-200	AC metal enclosed switchgear and control gear for rated voltages above 1kV and up to & including 52kV.
IEC 60529	Degrees of Protection provided by Enclosures (IP Code)

2.2.5 Instrument Transformers

IEC 60044-1	Instrument Transformers: Part 1: Current Transformers
IEC 60044-2	Part 2: Inductive Voltage Transformers
IEC 60044-3	Part 3: Combined Transformers.
IEC 60044-6	Part 6: Requirements for Protection Current Transformers for Transient Performance
IEC 60051(1-9)	Direct acting indicating analogue measuring instruments

2.2.6 Relays

IEC 60255-1	Measuring Relays and Protection Equipment- Common requirements
IEC 60255-5	Electrical Relays - Part 5: Insulation coordination for measuring relays and protection equipment - Requirements and tests

IEC 60255-22	Measuring relays and protection equipment - Part 22-1: Electrical disturbance tests - 1 MHz burst immunity tests
IEC 60255-151	Measuring Relays and Protection Equipment – Part 151: Functional requirements for over/under current protection
IEC 61850	Communication protocols for IEDs

2.2.7 Surge Arresters

IEC 60099-1	Surge Arresters Part 1: Non-linear Resistor Type Gapped Arresters for A.C. Systems
IEC/TR 60099-3	Surge Arresters Part 3: Artificial Pollution Testing of Surge Arresters.
IEC 60099-4	Surge Arresters – Part 4: Metal Oxide Surge Arresters Without Gaps for AC System.
IEC 60099-5	Surge Arresters – Part 5: Selection and, Application Recommendations – Section General
IEC 61109-	Insulators for overhead lines - Composite suspension and tension insulators for AC systems with a nominal voltage greater than 1000 V - Definitions, test methods and acceptance criteria

2.2.8 Insulators and Bushings

IEC 60137	Insulating Bushings for Alternating Voltages above 1000V.
IEC 60168	Test on Indoor and Outdoor Post Insulator of Ceramic Material or Glass for System with Nominal Voltages Greater than 1000V.
IEC 60168-aml	Amendment No. 1
IEC 60273	Characteristics of Indoor and Outdoor Post Insulators for Systems with Normal Voltages Greater than 1000 V.
IEC 60383-1	Insulators for Overhead Lines with a Nominal Voltage above 1000V Part 1: Ceramic or Glass Insulator Units for A.C. Systems Definitions, Test Methods and Acceptance Criteria.
IEC 60383-2	Insulators for Overhead Lines with a Nominal Voltage above 1000V Part 2: Insulator Strings and Insulator Sets for A.C. Systems – Definitions, Test Methods and Acceptance Criteria.
IEC 60437	Radio Interference Test on High Voltage Insulators.
IEC 60471	Dimensions of Clevis and Tongue Couplings of String Insulator Units.
IEC 60471-aml	Amendment No. 1
IEC 60506	Switching Impulse Tests on High Voltage Insulators
IEC 70507	Artificial Pollution Tests on High Voltage Insulators to be Used on A.C. Systems
IEC TR 60575	Thermal-Mechanical, Performance Test and mechanical Performance Test on String Insulator Units

ANSI C29.1	Electrical Power Insulators-Test Methods
ANSI C29.2	American National Standard for Insulators—Wet-Process Porcelain and Toughened Glass—Suspension Type

2.2.9 Capacitor Bank

IEC 60871-1	Shunt capacitors for AC power systems having a rated voltage above 1000 V - Part 1: General
IEC 60549	High-voltage fuses for the external protection of shunt power capacitors
IEC 60282-2	High-voltage fuses - Part 2: Expulsion fuses

2.2.10 Power & Control Cables

IEC 60183	Guide to the Selection of High Voltage Cables
IEC 60183-aml	Amendment No. 1
IEC 60228	Nominal cross-sectional areas and composition of conductors of insulated cables.
IEC 60230	Impulse Tests on Cables and their Accessories
IEC 60287-1-1	Electric Cables – Calculation of the Current Rating Part 1: Current Rating Equations (100% load factor) and Calculation of Losses – Section 1: General
IEC60287-1-1 aml	Amendment No. 1
IEC 60287-1-2	Electric Cables – Calculation of the Current Rating – Part 1: Current Rating Equations (100% load factor) and Calculation of Losses – Section 2: Sheath Eddy Current Loss Factors for Two Circuits in Flat Formation
IEC 60287-2-1	Electric Cables – Calculation of the Current Rating – Part 2: Thermal Resistance – Section 1: Calculation of Thermal Resistance.
IEC 60287-2-2	Electric Cables – Calculation of the Current Rating – Part 2: A Method for Calculating Reduction Factors for Groups of Cables in Free Air, Protected from Solar Radiation.
IEC 60287-3-1	Electric Cables – Calculation of the Current Rating – Part 3: Sections on Operating Conditions – Section 1: Reference Operating Conditions and Selection of Cable Type.
IEC 60287-3-2	Electric Cables – Calculation of the Current Rating-Part 3: Sections on Operating Conditions – Section 2: Economic Optimization of Power Cable Size.
IEC 60287-3-2– aml	Amendment No. 1 to IEC 287-3-2
IEC 60502-1	Power Cables with Extruded Insulation and their Accessories for Rated Voltages from 1Kv up to 30Kv– Part 1: Cables for Rated Voltages of 1Kv and 3Kv
IEC 60502-2	Power Cables with Extruded Insulation and their Accessories for Rated Voltages from 1Kv up to 30Kv– Part 2: Cables for Rated Voltages from 6Kv. Up to 30Kv

IEC 60502-4	Power Cables with Extruded Insulation and their Accessories for Rated Voltages from 1Kv up to 30Kv– Part 4: Test Requirements on Accessories for Cables with Rated Voltages from 6Kv up to 30Kv
IEC 60811	Common test methods for insulating and sheaths material of electric (Series) cables.
IEC 60885	Electrical test methods for electric Cables
IEC 60986	Short circuit Temperature limits of Electric cables with rated voltage from 6Kv up to 30Kv
IEEE48-2009	Test procedures and requirements for AC cable Terminations used on shielded wires
VDE278- (Part 629-1)	Test requirements on accessories for use on Power Cables of rated voltage from 3.6/6(7.2) kV up to 20.8/36(42) kV-Cables with extruded solid insulation

2.2.11 Batteries

IEC 60896-1	Stationary Lead Acid Batteries – General Requirements and Methods of Test - Part 1: Vented Types.
IEC 60896-1-aml	Amendment No. 1
IEC 60896-1-am2	Amendment No. 2
IEC 60896-2	Stationary Lead Acid Batteries – General Requirements and Test Methods - Part 2: Valve Regulated Types.
IEC 60146-1	Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements

2.2.12 Telecommunication and SCADA

IEC 60353	Line Traps for A.C. Power Systems
IEC 60358	Coupling Capacitors and Capacitor Dividers
IEC 60481	Coupling Devices for PLC Systems
IEC 60495	Single Side Band Power Line Carrier Systems.
IEC 60663	Planning of (SSB) PLC Systems
IEC 60870-5-104	Telecontrol equipment and systems - Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles
IEC 61850	Communication Protocols

2.2.13 High Voltage Tests

IEC 60052	Recommendations for Voltage Measurement by Means of Sphere-Gaps (one sphere earthed
IEC 60060-1	High Voltage Test Techniques Part-I: General Definitions and Test Requirements.
IEC 60060-2	High Voltage Test Techniques Part-2 Measuring Systems
IEC 60060-2-aml	Amendment No. I to IEC 60060-2
IEC 60270	Partial Discharge Measurements

IEC 62271-101	HV switchgear and control gear-Synthetic Testing

2.2.14 Steel Structures

ASTM 36/A36M-14	Standard Specification for Carbon Structural Steel
ASTM A123/A123M-17	Standard Specification for Zinc (Hot – Dip Galvanized) Coatings on Iron and Steel Products
ASTMA143-07	Standard Practice for Safeguarding against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A153/A153M-16a	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B317/B317M-07	Standard Specification for Aluminum – Alloy Extruded Bar, Rod, Tube, Pipe, structural Profiles, and Profiles for Electrical Purposes (Bus Conductor)
ASTM A325-14	Standard Specification for High-strength Bolts for Structural Steel Joints
ASTMA384-07	Standard Practice for Safeguarding against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
ASTM A394-08	Standard Specification for Steel Transmission Tower Bolts, Zinc Coated and Bare
ASTM A572/A572M-15	Standard Specification for High Strength Low- Alloy Columbium-Vanadium Structural Steel
ASTM B201	Standard Practice for Testing Chromatic Coatings on Zinc and Cadmium Surfaces
ASTM E94-17	Standard Guide for Radiographic Testing
ASTM E709-15	Standard Guide for Magnetic Particle Examination
ISO R898	Mechanical Properties of Fasteners

2.2.15 Conductors

ASTM B-231, JIS H-2110.

IEC 61089 (1991-06)	Round Wire Concentric Lay Overhead Electrical Stranded Conductors.
IEC61089-aml (1997-05)	Amendment No. I.

2.2.16 Civil Works

For material and civil design, the following standards and publications will be applied.

AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials
BS	British Standards
ISO	International Standard Organization
AASHTO M-20	Standard Specification for penetration-graded asphalt cement

AASHTO M-81	Standard Specification for Cutback Asphalt (Rapid–curing type)
AASHTO M-82	Standard Specification for Cutback Asphalt (Medium–curing type)
ASTM A615-14a	Standard Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
ASTM C33-08	Standard Specification for Concrete Aggregates
ASTM C150-17	Standard Specification for Portland Cement
ASTM C260-10a	Standard Specification for Air Entraining Admixtures for Concrete
ASTM C494-17	Standard Specification for Chemical Admixtures for Concrete
ASTM D1556-15	Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D1557-09)	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D2419-14	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2937-10	Standard Test Method for Density of Soil in Place by the Drive - Cylinder Method
BS 12: 1996	Specifications for Ordinary and Rapid Hardening Portland Cement.

The Contractor shall provide the standards as part of the as-built documentation. However, an additional set of the standards, comprising the standards listed herein and other standards that the Contractor will intend to use in the design, construction, testing and commissioning, shall be submitted to the Engineer for his reference within ONE month after the signing of the Contract Agreement i.e. prior to the commencement of design review activity.

2.3 DEFINITIONS

(i) The IEC relevant definitions shall apply for current/voltage carrying equipment.

(ii) Engineer or Inspector: An authorized representative of FIEDMC, Consultant and FESCO / NTDC for the purpose of attending, witnessing or approving the Tests carried out according to the requirement of Technical Specifications or inspecting the offered material for their conformity to Specifications.

2.4 Type Test Requirements

2.4.1 The bidder shall offer type tested equipment for the construction of new 132kV Grid station No. 02, with two No. 31.5/40MVA Power Transformers, at M-3 Industrial City, near Sahianwala Interchange, M-4 Motorway Faisalabad, as mentioned in FESCO/NTDC Type Test Policy (revised to date).

Delays in accepting the equipment due to a lack of requisite Type Test reports as per NTDC type Policy will not be accepted as a justification for delay in the Project's completion. As a result, in the best interests of the project, Bidders should consider equipment that have already been type tested and have valid reports, as per the NTDC type test policy.

3 SUBSTATION DESIGN PARAMETERS

3.1 General

These provisions cover the requirements for design, supply, installation, testing and commissioning of the aforementioned the construction of **new 132kV Grid station No. 02** with two No. 31.5/40MVA Power Transformers, at M-3 Industrial City, near Sahianwala Interchange, M-4 Motorway Faisalabad. Design of civil engineering works associated with this Project, in all respect, is also included in the Scope. Drawings showing general layout, equipment arrangement, details and sections of indoor and outdoor equipment are contained in Volume-III of the Bidding Documents to indicate envisaged details of work to be carried out.

The Contractor shall prepare detail drawings on the basis of information provided in the Bidding Documents and investigation/tests reports carried out by Contractor for approval of Engineer and FESCO/NTDC.

3.2 Physical Design Parameters

The site of Grid Substation is close to Chak Jhumra, Faisalabad which lies in the seismic zone 2A according to Building Code of Pakistan with Seismic Provision 2007 issued by Ministry of Housing and Works, Government of Pakistan. Therefore, the design will be carried out according to prevailing site condition and seismic zone.

Employer / Engineer do not guarantee the correctness of any data provided herein nor any interpretations, deductions or conclusions relative to subsurface conditions at Site.

Any approval of the document(s), shall not relieve the Contractor of any responsibility or reliability. In case of any failure, complete responsibility sole rests with the Contractor.

The bidder should apprise himself and confirm the correctness of any data provided herein. Any interpretation, deduction or conclusions related to sub surface conditions at site will be the bidder's entire responsibility, in all respect. He must make his own interpretations, and satisfy himself by his own investigations and research regarding all conditions affecting the work to be done. The Contractor must assume all responsibility for deductions and conclusions as to the nature or conditions of the materials to be excavated and of doing other work affected by the geology at the Site.

The bidder should ensure that the design of civil works, including foundations and supporting platforms / structures are such that the finished structure is safely able to withstand the weight, transverse loading of the equipment it is required to support, keeping in consideration the effect due to expected seismic shocks.

The Plant to be installed in the substation and covered by these Specifications shall be for indoor/outdoor use and shall be suitable in every way for continuous and satisfactory operation under the following service conditions.

3.2.1 Outdoor Ambient Air Temperature:

Maximum	50 °C
Minimum	-10 °C
Maximum, mean average	
over 24 hours	45 °C
Maximum, mean in any year	30 °C

3.2.2 Relative Humidity: The relative humidity may approach 100 percent. During the monsoons high humidity may persist for many days at a time, with temperature ranging from 30 °C to 40 °C.

3.3 Electrical Design Parameters

Following design parameters shall be considered as a guide line for design of the 132 kV outdoor equipment:

		132 kV
(1)	Nominal system voltage, kV, rms	132
(2)	Highest voltage for the equipment, kV, rms	145
(3)	Frequency, Hz	50
(4)	Rated continuous current at 50 °C ambient temperature, A, rms	
	a- Bus Bar	2000
	b- Feeders	2000
(5)	Short Circuit Rating of Bus Bars:	
	a- 132 kV Bus Bar kA	40
	b- 11kV Bus Bar kA	25
(6)	Bay width, center lines of columns, mm	12,000
(7)	Bay equipment clearances:	
	a) Phase to Phase (center lines), mm	3,000
	b) Average height of equipment live parts in the bay from the foundations level, mm	4,250
(8)	Minimum clearance live part to ground, mm	1,750
(9)	Overhead feeder conductors clearances:	
	a) Phase to Phase (center lines), mm	3,500
	b) Average height of equipment live parts in the bay from the foundations level, mm	10,000
(10)	Height of overhead Shield wire, mm	13,100
(11)	Minimum creepage distance, mm	3,800
(12)	Lightning impulse withstand level, kV, peak	650
(13)	One minute power frequency withstand voltage, kV (rms)	275

3.4 Electrical Service Conditions

3.4.1 Circuit Voltage:

Supply, Nominal:

-	3-Phase grounded neutral	11 kV & 415 volts
-	1-Phase	240 volts
-	Fluctuation of supply Voltage	+ 10 percent - 15 percent
-	For equipment rating: 3-Phase	415 volts

	1-Phase	240 volts
3.4.2	Frequency:	50 Hz
3.4.3	Station Battery:	
	- 132 kV Equipment	110 volts DC
3.4.4	DC Control voltage:	
	- Nominal	110 volts
	- Range	+ 10 percent
		- 15 percent

3.5 High Voltage Switchgear

The Scheme of High Voltage Equipment in the switchyard has been shown in Single Line Diagram and Switchyard Layout attached in the Bidding Documents. The connections between switchgear and line bays or transformer bays shall be preferably as mentioned in the relevant clause of the specifications. The arrangement of switchgear, however, must be such as to enable later extension of the bus bars and shall follow the latest modern engineering practice. Contractor shall obtain approval of equipment and schemes from the Consultant and FESCO/NTDC and bear the cost of such approvals.

3.6 Protection, Control and Metering

The addition and/or alteration in protection, control and metering system shall be designed in accordance with NTDC Specifications P-151:2008 and other relevant specifications for 132kV system and match the existing schemes. Contractor shall obtain approval of equipment and schemes from FESCO/NTDC and bear the cost of such approvals. In addition, following features shall be incorporated in the protection schemes:

3.6.1 All the main relays such as Distance, Line differential, Transformer differential, Bus Bar and Breaker failure, over current and earth fault etc. shall be numerical, fully microprocessor based.

3.6.2 The distance protection for 132 kV transmission lines shall also have provision for operating in any of the carrier aided schemes vis-à-vis permissive under reach transfer tripping, permissive over-reach transfer tripping, stage acceleration and blocking. The protection scheme shall include interconnections between the distance relays and protection signaling equipment in the power line carrier (PLC) communication system.

3.6.3 The distance relay shall have in built auto reclosure (1 phase and 3 phases, multiple shots) along with the synchro check feature, this synchro check feature shall be used only for Auto reclosure. Separate synchro check relay(s) shall be provided for synchronizing schemes, if applicable.

3.6.4 Instead of having separate over current relays for each phase & one earth fault relay, Single Over current and earth fault relay having four independent elements (3 elements for phase faults and one element for earth fault) shall be used.

3.6.5 The 132 kV relay panels shall have front door with glass window. Rear doors shall be of double leaf type.

3.6.6 All panels, cubicles and boxes shall have door operated lamps for interior illumination. Three pin single phase, 230V AC service receptacle shall be provided. Separate MCBs shall be provided for lighting and power receptacles. MCBs shall be equipped with auxiliary contacts and sensitive earth fault protection for personnel safety. All panel cubicles and boxes shall be constructed according to protection class IP 54.

3.6.7 Humidity control in the panels, cubicles and boxes shall be affected by heaters controlled by humidistats and thermostats.

3.6.8 Energy meters shall be digital type, 0.2 accuracy class and shall have import and export MWh, MVarh & MW in one unit. Energy meters shall have telemetering and other facilities as per NTDC specifications

3.6.9 Rating of MCBs shall be commensurate with the intended application.

3.6.10 For 132kV line, where parameters does not allow effective settings in distance relays, a line differential protection will be required. In that case, line differential relays at both ends of the line shall be of same type and make.

3.7 Overhead Lightning Protection

Surge arresters and overhead shielding wires as specified in the relevant Specifications shall be provided to adequately protect all equipment in the grid station against lightning strokes and switching surges. Earth masts shall be provided wherever necessary. The Contractor shall also provide design calculations of the earthing and shielding system for approval by the Engineer and FESCO/NTDC.

3.8 132 kV Voltage Transformers

The voltage transformers shall have class of 6P for protection core and class of 0.5 for metering core.

3.9 132 kV Current Transformers

3.9.1 The Secondary side of all 132 kV current transformers shall be having a rating of 5 ampere.

3.9.2 The current transformers for all feeders shall have accuracy Class of 0.5 for metering and the protection core shall have a class of 10P.

3.9.3 132 kV current transformers for line bays shall have primary rating of 1200/600/300 Ampere for 4 cores.

3.9.4 The current transformer for power transformers shall have primary rating of 200/100 Ampere for 3 cores.

3.10 11 kV Current Transformers

3.10.1 The ratio of current transformers to be fitted in the incoming panels for over current protection and metering shall be 2400:1200 / 5-5 Amps.

3.10.2 The ratio of current transformers for differential protection shall be 2400:1200 / 5 Amps.

3.10.3 The ratio of current transformers to be fitted in the outgoing panels for over current protection and metering shall be 400:200 / 5-5 Amps.

3.11 Isolating Terminals

Isolating terminals with each earthing switch shall be provided for maintenance / testing.

3.12 Tension and Suspension Insulators

Tension and suspension insulator strings shall be designed using insulators of fog type whose characteristics are given in the relevant specifications. The scope of supply of tension and suspension string assemblies shall also cover the supply of disc insulator type U80BLF as per specification No 10. The disc insulators per assembly shall be 08 (min) in each string for 132 kV equipment as per NTDC specifications, amended to date.

3.13 Cable Trenches

Contractor shall construct all cable trenches leading from the outdoor equipment in the substation to the equipment in the control house buildings and within the control house and 11 kV switchgear rooms for all interconnections and interfacing purposes.

Cable trenches for outdoor equipment shall be designed in accordance with requirements of Specifications Civil and relevant specification drawings in Volume-III of bidding document. Cable

trenches shall be made of complete monolithically reinforced concrete work. Each type of cable trench shall be provided with expansion joint at intervals of max. 20 linear meter. All trench covers shall be of reinforced concrete to withstand a load of 300 kg at the centre except those at road crossing which should withstand a load of 5 tons at the centre. The trench covers shall be of such size as to facilitate their handling by manual labour and provided with suitable lifting hooks. The trenches shall be connected to the drainage system, designed and constructed by the Contractor in such a manner that sub-soil water due to water logging cannot enter the trenches and rain water collecting in trenches is drained out efficiently. Trench entrances in to the buildings shall be designed to seal off entry of water or vermin and pests into the buildings through these entrances.

3.14 Station Lighting and Power Outlets

The Contractor shall provide complete outdoor lighting and power receptacles for his scope of work in the substation including wiring and control. The switchyard "Normal" and "Emergency" lighting shall be designed for general illumination levels of 50 and 10 lux respectively.

Sufficient number of receptacles shall be provided at suitable locations. Receptacles shall be 30A, 415V three phase and 15A, 240V single phase with ground terminal.

3.15 Cable Laying

Control cables, small power and lighting cables shall be laid in cable trenches and cable conduits. Direct burial of cables shall not be allowed. Joints shall not be used for cables.

3.16 Grounding System Design

Grounding system shall match the existing system and will be designed in accordance with requirements of the IEEE Guide for safety in A.C Substation Grounding (IEEE Standard 80 & 81). The material and properties of 95 mm^2 copper conductor for earthing shall correspond to XP-16:68 as applicable to 13mm (7/4.2mm) copper conductor. Dimensions and characteristics shall be as follows;

Nominal size	: 120 mm^2
Stranding and wire diameter (No/mm)	: 7/4.2 mm
Diameter of complete conductor	: 14 mm

The Maximum Permissible Earthing Resistance shall be 1 (One) Ohms at any point in the switchyard.

For Earth rod the material and properties shall be as described in FESCO/NTDC Specifications P-116:81.

3.17 Steel Structures

The steel structure for equipment supports and switchyard tower gantries shall be designed in accordance with requirements of relevant FESCO/NTDC Specifications. Suitable accessories shall be provided on columns and girders of the supports structures for supporting earth wire. The Drawings and other details of steel supporting structures shall be supplied with the bid.

3.18 Control House Building

If applicable, the Contractor shall construct/alter Control House Building (CHB) with covered area in accordance with civil Specifications and construction drawings. This building shall be provided with split type of air-conditioning units in Control and Relay Room as approved by the FESCO/Engineer. Requirements of the air-conditioning system for design purpose are as hereunder:

-	Outside air conditions	Min. - 10 °C
		Max. + 50 °C
-	Room temperature	22-25 °C

- Humidity 50-60% r.h.
- Sound pressure level
  (measured in centre of room) 40 dB(A)

In addition to the consideration of heat dissipation from the relay and control panels being installed, the future installation of panels shall also be considered for heat dissipation in designing the air-conditioning system with the approval of the FESCO/Engineer.

The Contractor shall perform work covering Procurement of Plant, Design, Supply, Civil Works, Installation, Testing & Commissioning design, supply, install, test and commission the following equipment control and protection system in the Control House Building:

1) 132 kV control panels
2) 132kV relay Protection panels
3) Telecom/Scada panels, if applicable
4) MV Switchgears panels
5) Capacitor banks and control panels
6) 110VDC power supply system
7) Cable trays, cable mounting racks, control and small power cables for equipment interconnection and power cables
8) All grounding cables from grounding cable risers in the building to equipment grounding terminals
9) Batteries and chargers, if applicable.
10) AC and DC Distribution Boards and other ancillary equipment
11) Grounding of the building and all grounding cables from grounding cable risers in the building to equipment grounding terminals
12) Any other equipment required to comply with the Specifications

3.19 Cables Layout

All cables should enter the panels from the bottom of the panels and held in a manner not effected by downward gravity pull and shall be well protected for insects or browsing by mistake.

3.20 Leveling of Site

If required, the Contractor shall fill the required area in layers of 150mm (max) & compact to 95% Modified Proctor Density and level the site as required and to the satisfaction of FESCO/Engineer.

3.21 Reinforced Concrete Work

Contractor shall furnish all materials and equipment for the performance of all reinforced concrete work for permanent structures in accordance with the drawings and specifications. Reinforced concrete work and plain concrete work shall comply with all requirements of AC1 318-14. Concrete shall have uniform quality with the required strength, durability, water tightness, etc. The strength of concrete shall generally be based on 28 days compressive cylinder strength as mentioned on drawing. Reinforcement steel, cement, water, fine aggregate, coarse aggregate etc. shall be in accordance with the clause-5 of specifications -Civil and ASTM Designations.

3.22 Gravel Pavement Work

Contractor shall provide a blanket of river run gravel in the outdoor switchyard area along the equipment foundation. A 200mm layer of hard, durable, gravel shall be provided by the

Contractor in the switchyard area around the equipment's above the reference ground level. Maximum size of gravel shall vary from 20 to 75 mm., crushed rock shall not be allowed.

3.23 Drainage Work

The Contractor shall design and construct the drainage system of the substation for the purpose of draining the rain water out of substation outdoor area, cable trenches and its disposal/pumping out to the nearby drain. The cost of the drainage system shall be included in the respective price schedule item of substation drainage system.

3.24 Drawings and Descriptive Data

Following drawings and descriptive data shall be submitted in addition to those indicated in the relevant sections of these specifications.

3.24.1 Drawings and Descriptive Data to be submitted with the Bid:

The Contractor must provide, information/data/literature, complete in all respect and deemed necessary by Employer/Engineer, but not limited to the following:

(1) Proposed general arrangement of equipment in the Grid station along with sections, details of the equipment, and clearances fully dimensioned

(2) Arrangement and layout of equipment in the control building fully dimensioned

(3) Arrangement and layout of trenches and ducts

(4) Substation lighting and receptacle layout

(5) Steel structures drawings indicating the type of structures with necessary details and weights

(6) Type test reports as per latest/revised NTDC/FECSO Type Test Policy

(7) Manufacturer Technical data and Specification of the Equipment

(8) Technical literature, data and information required in tender specifications

(9) Any other information/data/literature to support equipment qualification, required by Employer/Engineer

3.24.2 Approval of Detailed Drawings:

Contractor shall prepare the detailed drawings / documents with supporting calculations and submit these to the Engineer for vetting and to FESCO/NTDC for approval, as applicable. The Contractor shall comply the observations conveyed by Engineer/FESCO/NTDC and obtain APPROVAL. The Contractor shall bear the cost of such approval from FESCO/NTDC. The drawings / documents shall include, but not limited to the following:

(1) Base Design Electrical including:

- Single line drawings
- Equipment List
- Control & Protection Logic Diagram
- Technical Data Sheets

(2) Substation layouts and sections

(3) Control, Protection and metering drawings

(4) Three Line drawings/Schematic drawings

(5) Interconnection drawings

(6) Panel wiring drawings

(7) Conduit and cable drawings

(8) Consolidated Cable List

(9) Equipment drawings/data

(10) Foundation and trench arrangement drawings

(11) Erection drawings

(12) Lighting layout drawings.

(13) Civil works drawings with design calculations

(14) Grounding layout with design calculations

(15) Bill of Material

(16) Design Calculations as required by Engineer/ FESCO/NTDC

(17) Project Time Schedule in Primavera/MS Project or as required by Engineer/FESCO/NTDC.

Additional Details on Control House Building Drawings:

The details of Control Building prepared by the Contractor shall show the following additional details if required:

(1) Equipment layout and equipment foundation details.

(2) Construction details and layout of cable trenches, cable trays and cable racks, if applicable.

(3) Layout of grounding cables for equipment grounding

(4) Details of all wall and roof openings, if applicable.

(5) Any other detail necessary for installation of equipment in the building, required by Employer/Engineer.

SPECIFICATIONS FOR PROCUREMENT
OF
CIVIL WORKS

CIVIL WORKS

1. INTRODUCTION

This section comprises the Standards and Specifications pertaining to the fundamental requirements of design, material, workmanship, construction, testing, inspection and maintenance of the Civil Works required or specified under the Contract. The Contractor shall perform the work in accordance with these specifications and other specifications supplemental to these specifications as may be specified by FESCO/ Engineer from time to time. Should the Contractor follow other specifications, these must be approved by the FESCO/Engineer prior to carrying out these works.

1.1 Works:

The Contractor shall carry out all the works required for the design, construction, completion and maintenance of the Civil Works required under the Contract including foundations, cable trenches, pavements, roads, buildings, drainage and other allied works as required or specified in the Contract and as shown in the drawings.

The prices of all additional works, which are not shown in “Price Schedule” but specified in the Contract Documents, shall be included in the prices of other items of “Prices Schedule”. The Contractor shall not claim additional cost for any item, which is required to be executed as per Contract Documents but not specially mentioned in the “Price Schedule”.

1.2 Materials:

i) The Contractor shall furnish all materials and equipment for the performance of civil work.

ii) Materials to be used for civil work shall conform to the relevant ASTM standards and specifications. However, in case of using other standards, the Contractor shall obtain prior approval of the FESCO/ Engineer.

iii) In all matters relating to the acceptance or otherwise of the equipment and material offered under this contract the decision of the FESCO/Engineer shall be final.

The Engineer shall have the right to reject any material and/or equipment, which do not meet the requirements of the Contract Documents. All rejected material or equipment shall be removed from the Site as soon as possible.

The Engineer reserves the right to witness any test on material if necessary. The Contractor shall provide proper facilities to witness tests and shall also bear all the expenses on this account. Should the Engineer require the detailed data on material, the Contractor shall furnish the same in writing to the Engineer.

2.0 DESIGN CONDITIONS

2.1 General

All drawings and statements shall be in the English language and metric system of measurements shall be used.

The area is highly seismic and due consideration shall be given in designing and construction of civil works.

The following design conditions shall be used for the design of civil work and shall not be deviated unless approved by FESCO/Engineer.

2.2 Design Condition

The values used in this project are as follows:

i. **Seismic Zone**:

The site of Allama Iqbal Industrial City 132kV Grid Station lies in the seismic zone 2A as per Building Code of Pakistan (2007)

ii. Seismic Coefficient:

Vertical	Kv = 0.03g
Horizontal	Kh = 0.08 - 0.16g

iii. Wind Load:

a. Design Wind Pressures

Design wind pressures for buildings and structures and elements therein shall be determined for any height in accordance with the following formula:

P = Ce Cq qs Iw

Ce = combined height, exposure and gust factor coefficient as given in Table 5.7.

Cq = pressure coefficient for the structure or portion of structure under consideration as given in Table 5.8.

Iw = importance factor as set forth in Table 5.10.

P = design wind pressure, KN/m2 (psf)

qs = wind stagnation pressure at the standard height of 10 meters (33 feet) as set forth in Table 5.6, KN/m2 (psf)

Basic Wind Speed = 100 MPH

Wind Pressure Qs= 1.0 kN/m2

Combined Height, Exposure and Gust Factor Coefficient (Ce) = .67

Wind Exposure = Exposure B

Pressure Coefficient (Cq):

Walls:

Windward wall	0.8 Inward
Leeward wall	0.5 Outward

Roofs:

Wind perpendicular to ridge:	0.7 Outward
Leeward roof or flat roof:	0.7 Outward

Importance Factor:

I = 1.0

2.3 Design of Foundations:

1) Geotechnical Investigations

The results of the Soil investigation are summarized as follow:

- From the result of grain size analysis, the strata is generally Classified as CL according to the unified soil classification system.
- SPT ranges from 06 to 21 blows

- The Cohesion C ranges from 04 to 09 kPa and angle of internal friction ranges from 21 to 26 degrees.
- The Sulphate contents of the soil ranges from 0.26% to 0.5%
- Sulphate contents water sample ranges from 165 to 170 mg/liter
- The chloride contents of water sample s ranges from 78 to 100 mg/liter
- The Average allowable bearing capacity of soil has been established as 0.8 Tons per square feet at depth of 5 feet for 3 feet wide footing.

2) Foundations

All foundations shall be designed up to 200 mm or as shown in the drawings from top of gravel level, appropriate slope shall be provided on the top end of the foundation in order to ensure sufficient drainage. The load for design of foundation shall be taken from the foundation reactions calculated in the design of gantries and respective equipment's after applying appropriate load factors.

The Contractor shall submit to Engineer/FESCO for his approval calculations and load analysis used for design of gantries, equipment foundations and building works.

The size and type of foundations i.e. spread footing, mat footing or pile foundations including soil replacement if any shall be based on Geotechnical Investigation Report.

The gantry stubs and anchor bolts shall be available at Site before pouring of concrete for gantry and equipment foundations. If block outs are to be provided in the foundations due to any constraint, pre-mixed non-shrink grout shall be used for the embedment of stubs and anchor bolts as per approval of FESCO/Engineer.

3) Leveling Concrete

A leveling concrete shall be placed in thickness of 100mm or as shown in drawings.

2.4 Design Standard and Code

For foundations and building designs, the Contractor shall conform to the applicable requirements of the latest revisions of following standards and publications, in principle.

1) ASTM (American Society for Testing and Material)
2) ACI (American Concrete Institute)
3) BS (British Standards) – where specified only

2.5 Testing

In addition to following tests on coarse and fine aggregate to be used for constructions;

i) Specific gravity of aggregates
   - Coarse grading
   - Fine grading

ii) Unit weight

iii) Gradation analysis

iv) Flakiness and elongation indices

v) Los Angle Abrasion:

- Coarse grading
- Fine grading

vi) Soundness

vii) Crushing

viii) Water absorption

ix) Aggregate impact value

x) ASR test for aggregates

xi) Petrographic test:

- Fine aggregates
- Coarse aggregates

The following chemical analysis shall be carried out for water to be used in concrete, ground water and for soils which are to come in contact with concrete:

- pH
- Chloride (mg/litre)
- Magnésium, (mg/litre)
- Ammonium, (mg/litre)
- Sulphate (mg/litre)
- Potassium permanganate, (mg/litre)
- Total hardness (milli equivalent/liter)
- Non carbonates
- Carbonic acid

Cement to be used shall have alkali content less than 0.5% of soda equivalent. Test reports for the tests carried out to verify the alkali contents shall be submitted to the Engineer for review and approvals.

The Contractor shall compare chemicals found in water, soil and construction material with those values allowable in design code and submit report for Engineer's approval. The Contractor shall take precautions in designing civil works and shall add admixture in concrete and take remedial measures to prevent structure from any expected attack from chemicals observed.

3.0 TEMPORARY WORK

3.1 General

1) This clause covers the furnishing of all appliances, labour, materials tools, transportation and services required to perform and complete all preliminary work and temporary construction.

2) Immediately after award of the Contract, the Contractor shall submit to the Engineer in writing the schedules for machinery and equipment to be supplied and temporary work to be constructed by the Contractor in connection with the execution of the permanent work.

Even though such schedules have been submitted to the Engineer, by no means the Contractor shall be relieved from any liabilities and responsibility to be borne by him in accordance with the Contract.

However, the schedules for minor and simple work may not be submitted if allowed by the Engineer.

3. Any drawing and design calculation sheets for the equipment to be used and for the temporary work specified in the specifications shall be submitted to the FEDMIC Engineer for his approval.

3.2 Scaffoldings and Path

In order to complete the construction, the Contractor shall furnish and maintain all required scaffolding, stairways, platforms and other necessary pertinent.

3.3 Temporary Transportation Road

1) The Contractor shall carry out investigation, design, construction of the temporary transportation roads required for execution of the work at his expense, and submit such design in writing to the Engineer and obtain his approval.

2) The Contractor shall, at his expense, carry out maintenance and management of the temporary transportation road.

3) After completion of the work, the Contractor shall dismantle or leave the temporary transportation road as mutually agreed by the concerned parties subject to the approval of FEDMIC Engineer.

4 EARTH WORK

4.1 General

This clause covers the performance of all works in connection with the required cutting, filling, leveling and compaction of site area, excavation for the various types of foundations as shown in the drawings, or any other excavation and banking that may be necessary during the progress of works including the removal, use or disposal of all excavated material.

4.2 Clearing and Grubbing

1) Clearing and grubbing shall include dismantling and removal of structures, removal of trees and shrubs, stumps and other obstacles from the area necessary for the execution of work. The Contractor shall cut and remove all such objects from the project area up to any lead as approved by the Engineer.

2) The Contractor shall not cut any tree outside the premises of the construction site without permission of the parties concerned.

3) Clearing and Grubbing shall also include removal of unwanted top layer up to 150 mm, if required.

4.3 Excavation

1) Excavation under this section shall consist of the removal, hauling dumping, and satisfactory disposal of all materials from required excavations for leveling the site area and construction of civil works. Excavation in rock by means of drilling, blasting, chemicals etc. shall also be done by the contractor wherever required.

2) The excavated slope surface shall be protected against any erosion due to heavy rains during construction period. Should any damage be caused on any face of slope, the Contractor shall immediately repair any such damage at his expense.

3) Excavation shall be carried out by adopting a suitable method for excavation of the ground so as not to loosen the ground outside the excavation. If necessary, temporary sheeting shall be constructed.

4) During excavation, work shall be performed carefully so as not to cause any damage to adjacent structures and buried structures owned by the public or third party. The execution of work in such areas shall be carried out following instructions of the Engineer

5) If the excavated material is to be temporarily stockpiled, designated spaces shall be kept at suitable distance from the shoulder of the road while considering the earth pressure at the excavated surface and the working space. Temporary sheeting or other such structures, if necessary, shall be constructed so that the stockpile can be protected from damage or being washed away

6) After completion of excavation, excavated widths and bottoms shall be subject to inspection by the FESCO/Engineer.

7) Any and all excess excavation for the convenience of the Contractor or over-excavation performed by the Contractor for any purpose or reason, except as may be ordered in writing by the Engineer, and whether or not due to fault of the Contractor, shall be at the expense of the Contractor. All such excess excavation shall be filled at the expense of the Contractor with materials as approved by the FESCO/Engineer. However, for the switchyard equipment, gantry and building foundations, excess excavation underneath the foundations if any done, shall be filled with lean concrete at the expense of the Contractor.

8) The Contractor may request the Engineer in writing to change the excavation line as required according to the soil conditions of the foundation during the progress of excavation line, the Contractor shall prepare the revised design of the said foundation and submit it to the FESCO/Engineer for his approval.

9) The Contractor will carry out dewatering of structural and equipment foundations if required to maintain excavations free of water as required for proper construction of the works. Dewatering shall be accomplished in a manner that will prevent the loss of fines from the foundations, will maintain stability of excavated slopes, will result in all construction operations being performed free form standing water, and will result in all foundations being sufficiently dry for proper bonding of the backfill material with the foundations and proper compaction of the material placed.

10) If at any point, in any excavation, material unsuitable for foundation is encountered, as determined by the Engineer, the engineer shall order, in writing, removal of all such materials and refilling with selected materials thoroughly compacted by tamping or rolling in layer not more than 150mm thick

4.4 Filling and Back Filling

1) Filling and back-filling shall be executed as construction proceeds along with the removal of shoring and other materials at the filling and back-filling site.

When sheeting is to be left and buried in order to prevent shear failure of soil or due to some other inevitable reasons, it shall be done according to the direction of the Engineer.

2) Except as noted otherwise in the specifications or the drawings, all the materials for filling and back-filling shall comply with the following requirements.

a) Material shall not include any harmful materials, such as fertile soil or pieces of wood, slurry mud organic and other unsuitable material.

b) Material shall not be of an extreme swelling nature.

c) The gradation of the general fill material shall conform to the following limits:

Material Size, U.S. Shieve Series	Percent Finer Than, by Weight
No. 10	100
No. 50	70-95
No. 100	25-75

No. 200 0-30

However, for the gradation of the engineered fill under the light structures i.e. foundations, proposal of well graded gravelly sand shall be submitted by the Contractor for approval of the FESCO/Engineer.

d) No stones or the like shall be used for filling and back-filling.

e) Impermeable clay shall not be used for back-filling of a structure which is susceptible to earth pressure.

Location of borrow pits and method of obtaining materials for banking shall be reported to the engineer in advance for the approval.

3) If the inflow of water exists at the site of filing and back-filling, it shall be appropriately handled at the expense of the Contractor.

4) The compaction shall be made in the filed by ramping machines or other mechanical means as approved by the Engineer. The layer of compacted earth filling shall not be more than 5 cm per lift, and it shall be graded at horizontally as possible, and shall be sufficiently compacted to produce not less than 95% of laboratory maximum dry density as determined by ASTM Designation D1557-00 “Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort”. Field dry density shall be measured according to ASTM D-1556-00 – Standard Test Method for Density and Unit Weight of Soil in Place for Sand – Cone Method or ASTM D-2937-00 “Standard Test Method for Density of Soil in Place by the Drive – Cylinder Method” or other methods as approved by the FESCO/Engineer.

5) If there is any surface or buried structure owned by the public or the third party at the site of filling and back-filling, care shall be taken so as to cause no harmful effect to them and the execution of the work shall be carried out following instructions by the Engineer.

6) For back-filling adjacent to a structure, compaction and back-filling shall be carried out in such a manner that will prevent damage to the structure.

4.5 **Disposal of Excavated Materials**

1) Spoils produced by excavation shall be piled, graded, sloped or disposed of at the locations as directed by the Engineer.

2) In transporting the spoils, care shall be taken so as to neither hamper traffic nor cause trouble to the third party by scattering the spoil over the road.

4.6 **Inspection:**

The instructions and tests specified herein shall include the following:

1) Volume of work executed

2) Inspection of test of construction materials

3) Inspection of excavation (including bed surface)

4) Inspection of disposal of excavated materials

5) Inspection of compaction test of back-filling

6) Other tests and inspections which the Engineer deems necessary

7) Other tests and inspections required according to pertinent regulations, codes and standards

The works for which the Engineer deeds inspection necessary, shall be executed in the present of the Engineer.

5. REINFORCED CONCRETE WORK

5.1 General

1) This clause covers the performance of all reinforced concrete work for permanent structures in accordance with the drawings and these specifications.

2) The Contractor shall furnish all materials and equipment for the performance of concrete work.

3) Reinforced concrete work and plain concrete work shall comply with all requirements of ACI 318-14. Also test on material shall, in principle, follow relevant ASTM Standard or equivalent approved by the FESCO/Engineer.

4) Concrete shall have the uniform quality with the required strength, durability water tightness etc.

5) Strength:

a) The strength of concrete shall generally be based on 28 days compressive cylinder strength

b) Compression tests for concrete shall be performed in accordance with relevant ASTM standards or approved equivalent.

o28 = 350 kg/cm² For grouting under base plate of equipment steel structure with mixing of non-shrinking agent.

o28 = 280 kg/cm² For water retaining structures.

o28 = 210 kg/cm² For foundation of each equipment gantry towers, cable trenches, buildings and other structures as specified.

The minimum cement contents shall be 350 kg per cubic meter of concrete.

o28 = 100 kg/cm² For leveling concrete.

Where o28 means concrete compressive cylinder strength at the age of 28 days.

Table-1 – Basic Mix Data

Design Strength o28 kg/cm²	Max Size of Aggregate (mm)	Slump (cm)	Air Entrainment (%)	Description
350	As per Table-3	4 ± 2	-	Grouting under base plates of equipment steel structure.
280	As per Table-3	10 ± 2	4 ± 1	Water retaining structures.
210	As per	6 ± 2	4 ± 1	Foundation, buildings and

	Table-3			other structures.
140	As per Table-3	10 ± 2	4 ± 1	Leveling concrete.

Note: 1. Specific gravity in design

Cement – 3.15, Fine Aggregate – 2.62, Coarse Aggregate and Crushed Stones – 2.62.

2. The Contractor shall submit proposal of mix design for approval of the Engineer.

3. Maximum size of coarse aggregate may be reduced for columns, beams and slabs etc. as directed by the Engineer.

5.2 **Material**

1) **Material for Reinforced Concrete**

a) **Cement**

Classification shall be Ordinary Portland Cement to be complied with British Standard 12:1996 “Specifications for Ordinary and Rapid Hardening Portland Cement” or to ASTM Designation C150-17 Standard Specification for Portland Cement for Type-I”, or equivalent and Sulphate Resistant (SR) cement shall be used in water logged area and as per requirements of Geotechnical investigations and this shall be according to ASTM C150-17 Type-V.

b) **Water**

i) Water shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances deleterious to concrete or reinforcement.

ii) Sea, river or canal water shall not be used in mixing concrete for reinforced or plain concrete.

iii) Test as described in clause 2.5 shall be within acceptable limits.

iv) Non-potable water shall not be used in concrete unless specifically approved by the Engineer.

c) **Fine Aggregate**

i) **General**

Fine aggregate shall be clean, strong, hard, durable, suitably graded and free from injurious amounts of dust, mud, organic impurities, salts etc.

Beach sand shall not be used for concrete.

ii) **Grading**

Fine aggregate shall consist of large and small particles suitably mixed, and its grading shall, as a standard, be within the range shown in Table-2.

Table - 2 - Standard Grading of Fine Aggregate

Sieve Designation	Percent
U.S. Standard Square Mesh	Passing
0.375 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	80 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (600 μm)	25 to 60
No. 50 (300 μm)	10 to 30
No. 100 (150 μm)	02 to 10

The sand equivalent value of the fine aggregate, as determined by ASTM Designation D-2419-14 “Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate”, shall not be less than 75. The Fitness Modules shall range between 2.3 to 3.1.

d) **Coarse Aggregate**

i) **General**

Coarse aggregate shall be clear, strong, hard, durable, suitable graded and free from injurious amount of flakes, elongated pieces, organic impurities, salts etc.

ii) **Crushed Stones**

Coarse aggregate shall consist of large and small particles suitably mixed and its grading shall be within the range shown in Table-3 as a standard.

Sieve analysis shall be performed in accordance with ASTM Designation C33-14, or equivalent.

Table - 3 - Standard Grading of Coarse Aggregate

Percent by weight finer than each laboratory sieve

US Standard Sieve Size	1.5 in. to 0.75 in.	0.75 in. to No. 4	0.5 in. to No. 4
2 in.	100	-	-
1.5 in.	90 to 100	-	-
1 in.	20 to 55	100	-
0.75 in.	0 to 15	90 to 100	100
0.5 in.	-	-	90 to 100
0.375 in.	0 to 5	20 to 55	40 to 70
No. 4	-	0 to 10	0 to 15
No. 8	-	0 to 5	0 to 5

e) **Reinforcement**

Steel bar reinforcement, shall be deformed bars conforming to the provisions of ASTM Designation A615/A615M-14, “Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete

Reinforcement" and shall have a minimum yield stress of 4200 kg/cm^2. Steel bar reinforcement in the openings to be filled with second stage concrete shall be of mild steel. At least 45 days prior to issuing each order for reinforcing steel, the Contractor shall notify the Engineer in writing of the Contractor's proposed sources of supply so that the Engineer may make arrangements for plant examination, testing and inspection. A similar notification shall be given prior to each shipment to the Site. The Contractor shall provide such assistance, instruments, machines, labour and materials as are required for examining, measuring and testing the quality, weight or quantity of steel at the mill and at the Site. If and when required Contractor shall provide all necessary facilities to Engineer for the selection of test pieces and shall prepare these to the required shape and length and submit it to the laboratory where directed for tests at Contractor's cost. No steel shall be incorporated in the Works without prior approval of FEDMIC Engineer.

f) **Admixture**

i) The Engineer shall select the source and brand of air-entraining admixture, if required. The air-entraining admixture will be an approved substance or compound conforming to the requirements of ASTM Designation C260-10a, "Standard Specification for Air-entraining Admixtures for Concrete", which will produce entrained air in the concrete as hereinafter specified. The air-entraining admixture shall be added to the batch in solution in a portion of the mixing water. This solution shall be matched by means of mechanical batcher capable of accurate measurement and in such a manner as to ensure uniform distribution of the admixture throughout the batch during the specified mixing period.

ii) The source, brand and types of suitable water-reducing cement-dispersing admixtures, if required, shall be selected by the Engineer. The water-reducing admixture will be compatible with the air-entraining admixture specified above and shall be batched and added to the concrete in the manner specified for the addition of air-entraining admixture but separate from the portion of the mixing water containing the air-entraining admixture. The quantities of water-reducing cement-dispersing admixture to be used shall be in accordance with the instructions of the Manufacturer, as approved by the Engineer. Water-reducing admixture will conform to the requirements of ASTM Designation C494-17"Standard Specification for Chemical Admixtures for Concrete". Water-reducing admixtures shall be sampled at the source of supply and tested at the expense of the Contractor. Additional tests if deemed necessary shall also be arranged by the Contractor without any claim of cost under the supervision of the Engineer.

iii) Admixture for non-shrinking of concrete shall be used for grouting wherever required.

g) **Mortar**

Before placing the fresh concrete, a mortar cost, approximately two cm thick shall be placed on construction joint. The proportion of the

mortar mix shall be one part of cement to two parts of sand of fineness of between No. 100 and No. 4 sieves, with a consistency which allows spreading it over the surface and completely filling of all irregularities in the old concrete. Before concrete is placed over a construction joint, the joint shall be thoroughly cleaned and wetted. Any excess water shall be removed prior to concreting.

2) **Storage of Materials**

a) **Storage of Cement**

i) Cement shall be stored separately for each type in either silos or damp-proof warehouses.

ii) Silos to store cement shall be built or equipped with suitable means so that cement will not be retained at the bottom without being conveyed out.

In case of sacked cement, it shall be stacked on the floor rising at least 30 cm from the surface of the ground, and shall be stored in such a manner as to facilitate conveyance and inspection. Height of each stack shall be at most 13 sacks.

iii) Any bag for which portion of cement has hardened during its storage shall not be used at all. Cement stored for long period shall be tested for its quality prior to its use.

iv) Cement with excessively high temperature shall be used only after lowering the temperature.

b) **Storage of Aggregate**

i) Fine aggregate, coarse aggregate and other aggregate of different type and grading shall be separately stored with dividers between each.

ii) When receiving, storing and handling aggregate, facilities shall be well maintained and handling shall be carefully performed so that no segregation of large particles from small ones may occur, no foreign materials may become mixed, or in case of coarse aggregate, no particles may be crushed.

iii) Storage facility of aggregate shall be equipped with a suitable drainage system, and shall have a suitable capacity so that the aggregate with uniform surface water may be used separately and the aggregate received may be used after being tested.

iv) In hot weather, aggregate shall be stored in a place with a facility to avoid direct exposure to the sun etc. so that extreme drying or temperature rise in the aggregate does not occur.

c) **Storage of Reinforcement**

Reinforcement shall not be directly placed on the ground, and it shall be stored in a warehouse or a place with suitable cover.

d) **Storage of Admixture**

i) Admixture shall be stored so as to be free from dusts and other impurities. Admixture in powder form shall be stored in such a manner that absorption of water and hardening are prevented and admixture in liquid form shall be stored in such

a manner that segregation and change in quality are prevented.

ii) Admixture material shall be carefully handled.

iii) Admixture material shall be stored in silos or warehouses which are damp-proof and shall be used in the same order as they are received.

iv) Admixture stored for a long period or found to have changed shall be tested prior to its use. Should it be found in the test that admixture does not possess the required characteristics; its use shall not be allowed.

5.3 **Mix Proportions**

1) Mix proportion for concrete shall be determined in such a manner that the unit quantity of water its minimized while the required strength, durability, water tightness and the workability suitable or the work are secured.

2) Mix proportion for concrete and results of tests mixing shall be determined so as to provide the required strength, workability, uniformity and durability. The scheme of mix proportion shall be submitted to the Engineer for approval. The form of submission as per Table-4 shall be used. The design strengths of the concrete shall be the classes indicated below.

o28 = 350 kg/cm² For grouting under base plate of equipment steel structure

o28 = 280 kg/cm² For water retaining structures.

o28 = 210 kg/cm² For foundation and buildings

o28 = 100 kg/cm² For leveling concrete.

Where o28 means concrete compressive cylinder strength at the age of 28 days.

The Contractor shall prepare concrete mix design according to basic design data for mixing as indicated in the Table-4 herein.

Table-4 Concrete Mix Design Report

					Quantity (per Mixed 1m³)				
Mix Size of Aggregate	Slump (cm)	Air-Entrainment (%)	Max Water/ Cement w/c (%)	Sand percent s/a (%)	Water (W) kg	Cement (C) kg	Fine Aggre. (S) kg	Coarse Aggre. kg	Admixture gm/cm³

Note: The quantity of admixture shall be indicated in cm³ or gram without solution or dilution.

5.4 **Batching**

Each material to be used in concrete shall be obtained through batching.

1) **Batching Equipments**

a) Batching method and batching equipment for each material shall be subject to the approval of the FESCO/Engineer in advance.

b) Batching equipment for each material shall be inspected and adjusted if necessary, prior to the commencement of the construction work and periodically during the construction.

2) **Batching of Materials**

a) Batching shall be made in accordance with the mix design approved by the Engineer. Test for surface water of the aggregate shall be in accordance with relevant ASTM Designation of equivalent or as directed by the Engineer. Test for the quantity of the effective absorption of water, in case of dried aggregate, shall be as directed by the Engineer.

b) Volume of one batch shall be determined as directed by the Engineer.

c) Each material shall be batched by weight and/or by volume as approved by FESCO/Engineer except the water and the solution of admixture, which may be measured by volume only.

d) Error in the measurement in each batch shall be within the permissible error range given in Table-5.

Table-5 Permissible Error in Measurement

Type of Materials	Permissible Error (%)
Water	± 1
Cement & admixture material	± 2
Aggregate	± 3
Solution of admixture agent	± 3

5.5 **Mixing**

Materials for concrete shall be thoroughly mixed until the mixed concrete becomes uniform in quality.

1) **Mixers**

a) Mixers shall be either tilting batch mixers or forced batch mixers

b) Any concrete mixers to be used under this project shall be subject to approval of the Engineer.

c) Mixers shall be such that they will not cause any separation of materials at the time of discharging.

2) **Mixing**

a) When charging a mixer, all the materials shall be charged uniformly and simultaneously in principle.

b) Mixer shall be rotated at a speed recommended by the manufacturer.

c) Mixing time shall, in principle, be determined based on tests. As a standard, it shall be at least 1 minute and 30 seconds for tilting type mixers and 1 minute for forced mixers.

d) Mixing shall not be continued for more than three times the specified mixing time.

e) Materials for new batch shall not be charged into the mixer until all the concrete in the mixer is discharged.

f) Mixers shall be thoroughly cleared before and after their use.

g) Concrete which is left mixed and has commenced setting shall not be used after re-tempering.

h) Hand mixing shall not be allowed

5.6 Conveying and Placing

1) General

a) Prior to the commencement of the construction work, a plan to conveying and placing shall be made, and this shall be subject to the approval of the Engineer.

b) Concrete shall be conveyed by methods which will prevent separation and loss of materials, shall be placed immediately and then, shall be thoroughly compacted. Even when it is impossible to place the concrete immediately due to some special reasons, the time between mixing and the completion of placing shall not exceed 30 minutes.

During the waiting period, the concrete shall be protected against direct exposure to the sun, wind and rain, and the concrete left for a relatively long time shall be remixed without adding water. 'No. batch of concrete, which has started to harden, shall be used.

c) When segregation is observed in concrete during its delivery or placement, it shall be made uniform in quality by remixing.

2) Conveying Equipment

Equipments to be used in conveying concrete shall be those which can easily deliver the concrete to its required place. Should the delivery distance be long, they shall be equipped with such facility as an agitator.

3) Buckets

Structure of buckets shall be such that they will not cause any separation of materials when charging or discharging concrete, and that the concrete can be easily and swiftly deposited from them.

4) Conveyer Belts

Should conveyer bolts be used, they shall be suitably located so that they will not impair the quality of the concrete and the end of the line shall be provided with baffle plates and an elephant trunk so that the segregation of concrete can be prevented.

5) Buggies and Trolleys

Should buggies or trolleys be used, a level runway or path shall be constructed so that separation of material will not occur in conveying concrete.

6) Chutes

a) Should any chute be used, it shall be drop-chute in principle. The drop chute shall be connected to an elephant trunk so that the separation of materials is minimized.

b) Open chutes may be used, only when approved by the Engineer. Each open chute shall be inclined at uniform angle all along its length and the slope shall be such that it will not cause any separation of materials of the concrete to be placed. The distance between the bottom end of the chute and the surface on which concrete is to be deposited, shall be at most 1.5 m. The discharging end shall be equipped with a suitable elephant trunk.

7) **Preparation of Placing**

a) Prior to the placement, the arrangement of reinforcement, forms etc. shall be approved by the Engineer.

b) Prior to the commencement of the placement, it shall be certified that conveying equipments and placing equipments are in conformance to the plan of placing specified in clause 5.6(1).

c) Prior to the placement, conveying equipments, placing equipments and the inside of forms shall be thoroughly cleaned to prevent foreign materials from being mixed into the concrete. Portions expected to face concrete and to absorb water shall be moistened in advance.

d) Water in pits and sumps shall be removed prior to the placement of the concrete. Suitable protective measures shall be taken so that water running into these pits and sumps will not wash the concrete just placed.

8) **Placing**

a) Concrete shall be placed in accordance with the plan of placing specified in clause 5.6(1) should it be inevitable to change the placing method, it shall be so done as directed by the Engineer.

b) When concreting is done in hot weather, special attention may absorb the water in concrete shall be given to the materials, placement, curing etc.

c) Portions such as the ground and foundations which may absorb the water in concrete shall be thoroughly wetted prior to the placement of concrete.

d) Temperature in concrete at the time of placing shall be at most 25 deg. C for gantry foundations and 32 deg. C for equipment foundations and other structures. If the temperature goes up, precautionary measures approved by the Engineer have to be taken.

e) Conveying equipments for concrete shall be such that they will protect concrete from being dried or heated.

f) Concrete shall be protected as soon as the placement is completed or interrupted. Special care shall be exercised to keep the surface of the concrete moist.

g) During the concreting operation, attention shall be paid not to disturb the arrangement of the reinforcement.

h) Concrete shall be placed in such a manner that it will not be required to be moved after being deposited.

i) Should any notable separation of materials be observed during concreting, the concrete shall be remixed to obtain the uniform quality and necessary measures to prevent separation shall be taken before the placing operation is resumed.

j) Concrete for one section shall be placed continuously until it is complete.

k) Concrete shall, in principle, be placed in such a manner that the surface of the placed concrete will be horizontal within the section. One lift in placement shall be at most 30 cm, in principle, if the length of the vibratory rod is larger than the concrete lift.

l) Should concrete be placed in layers, each succeeding layer shall be placed while the one below it is still plastic. Should it become necessary to place concrete on top of layer which has started setting, it shall be done in accordance with clause 5.8.

m) When height of the form work is great, it shall be provided with openings for concrete placing or the placement shall be done using droop chutes in order to prevent the concrete from being segregated or from adhering to the reinforcement or to the forms above the layer to be placed.

n) The height of the end of buckets and hoppers shall be at most 1.0 m above the level of placement.

o) Should there be any water coming out and accumulated during the placement, the concrete shall not be placed further until the water is removed by suitable means.

p) When concreting high structures such as walls and columns continuously, the consistency of the concrete and the rate of lifting shall be controlled, in such a manner that separation of materials during the placement and the compaction is minimized.

5.7 Compaction

1) In principle, internal vibrators shall be used to compact the concrete. When it is difficult to use internal vibrators in the case of thin walls suitable means shall be adopted. Vibrators to be used shall be subject to the approval of the Engineer.

2) Concrete, shall be thoroughly compacted immediately after placement, and shall be thoroughly worked around the reinforcement and into the corners of the form. Where conditions make compaction difficult, batches of mortar containing the same proportions of cement, sand and water as used in the concrete shall first be deposited to ensure the compaction.

3) When compaction is achieved by vibrators, it shall be inserted into the layer below the one just placed by about 10 cm. The vibrators shall be pulled out very slowly so that no hole will form in the concrete.

4) When concreting is to be compacted by internal vibrators the spacing and the time of their application shall be as directed by the Engineer.

5.8 Additional Placing

Should additional placing be made on top of a layer which has already started to harden, it shall be thoroughly and carefully worked on a directed by the Engineer so that the top and the lower layer become monolithic.

5.9 Curing

1) General

a) Concrete, after being placed, shall be sufficiently cured without being subjected to injurious effects caused by low temperature, drying, sudden change in temperature etc.

The Contractor shall report the said method to the Engineer and obtain his approval

b) Concrete shall be protected from vibrators, impacts and loads while it is hardening.

2) Wet Curing

a) Concrete being placed and compacted shall be protected from the sun, wind, showers etc. until it starts hardening.

b) Any exposed surface of concrete which has hardened to a degree that works can be done without impairing it shall be either covered with wet mats, canvas, sand etc. or directly watered and shall be kept moistened

continuously for at least seven (7) days after the placement in case Ordinary Portland Cement is used.

c) When sheathing boards are expected to become dry, they shall be watered.

5.10 Joints

1) General

a) Location and structure of joints including expansion joints shall be as per relevant standards and codes and shall be shown and specified in the drawings.

b) Should any joint not specified in the design be made, its location, direction and method of construction shall be determined in the plan of construction so that it will not impair the strength and the appearance of the structure and this shall be subject to the approval of the Engineer.

2) Construction Joints

a) Construction joints shall be located where the shear forces are minimum and with their faces in perpendicular, in principle, to the direction of compression in the member as approved by the Engineer.

b) Should it be unavoidable to make a construction joint at a location where large shear is acting, it shall be reinforced by forming tendons or grooves, or embedding suitable steel as approved by the Engineer.

3) Construction of Horizontal Construction Joints

a) Sides of the surface of a horizontal construction joint intersecting the forms shall be kept as horizontal and straight as possible.

b) When new concrete is placed, the surface of the old concrete shall be removed of all laitance, interior concrete, loosened aggregate etc. and shall be thoroughly wetted.

c) Prior to the placement of new concrete, the forms shall be tightened, standing water removed and either cement paste or mortar with the same mix proportion as in concrete shall be applied on the surface of the old concrete.

4) Construction Method for Vertical Construction Joints

a) When a vertical construction joint is to be made, the forms at the joint shall be rigidly supported and the concrete in the vicinity of the joint shall be thoroughly compacted by vibrators.

b) Fresh concrete shall be placed after the surface of the aged concrete at the joint is removed of the surface film or is roughened and thoroughly wetted or after the surface is treated as directed by the Engineer.

c) Fresh concrete shall be thoroughly compacted at the time of placement so that the fresh and aged concrete is in tight contact with each other.

5.11 Reinforcement Work

1) Processing of Reinforcement

a) Reinforcement shall be processed to the shape and the dimensions as shown in the drawings by a method which will not impair the quality of the material.

b) Reinforcement shall be processed in ordinary temperature. When it is unavoidable to heat for processing, the whole process shall be subject to the approval of the Engineer.

2) **Placing of Reinforcement**

a) Prior to fabrication and at time concrete is placed, reinforcement shall be thoroughly cleaned and free from must, oil, loose rust and any other non-metallic coatings which may impair the bond between the reinforcement and the concrete.

b) Reinforcement shall be accurately placed to the designated position, and shall firmly be supported so that it will not be dislocated during the placement of concrete. Erection bars, if required, shall be used for this purpose.

Important crossing of reinforcement shall be fastened by either annealed wire of at least 0.9 mm in diameter or binding wire.

c) Clearance between reinforcement and sheathing board shall be maintained correctly by use of spacers.

d) Reinforcement shall always be inspected by the Engineer before placing of concrete.

3) **Covering of Concrete**

a) The covering shall be at least one diameter of the reinforcement.

b) In general, the minimum covering shall be as shown in Table-6, unless otherwise noted on the drawings.

Table – 6 Minimum Covering (cm)

Conditions	Slabs, Walls	Beams, Columns
When not directly exposed to severe weather or ground	2.0	4.0
When effective coating is not applied on the portion which may be subjected to injurious chemical reaction due to smoke, acid, alkali, oil, deicing salts, brackish water etc.	5.0	6.5

c) In case of footings and important members of a structure, it is recommended that the covering be at least 7.5 cm when concrete is placed directly facing the ground, and at least 5 cm for bars with diameter or more than 19 mm and 4 cm for bars with the diameter of less than 19 mm when the concrete is buried and directly facing the ground or when it is subjected to severe weather conditions. However, the covering at the bottom side of slabs may be at least 2.5 cm even if the portion of it is subjected to extreme weather conditions.

d) The covering in structures which are required to be especially fireproof shall be determined based on the temperature of the fire, duration, characteristics of aggregate to be used etc.

4) **Joints of Reinforcement**

a) Lap joints of reinforcement shall be made by lapping the required lengths and fastening them together at several points with annealed wire of at least 0.9 mm in diameter. Lap length shall be according to ASTM Designations.

b) Reinforcement projecting from the structure and exposed for future jointing shall be protected from damage, corrosion, etc.

5.12 Forms and Timbering

Forms and timbering shall be so designed and constructed as to have the required strength and rigidity, to secure correct position, shape, lines dimensions of the structure and to secure the satisfactory quality in concrete.

1) Design of Forms

a) Forms shall be those which can easily be fabricated and stripped; joints of sheathing boards and panels shall be forced in parallel with or perpendicular to the axis of the member so that it will have to structure which is tight against mortar.

b) The structure form shall be such that the corners of concrete can be mould even when it is not particularly specified.

c) Temporary openings, if necessary, shall be made at suitable locations to facilitate cleaning and inspection of the forms and the placing of concrete.

2) Design of Timbering

a) Suitable type of timbering shall be selected and the load carried by them shall be correctly transferred to the foundation by appropriate means.

b) As design of timbering for important structures is concerned they shall be subjected to the approval of the Engineer.

3) Construction of Forms

Stripping agents shall be applied on the inside of the sheathing board.

4) Construction of Timbering

a) Timbering shall be constructed so as to have sufficient strength and stability.

b) An amount of the settlement of the form works due to the weight of the placed concrete shall be estimated and a camber shall be introduced, if necessary, in the shoring.

5) Removal of Forms and Timbering

a) Forms and timbering shall not be removed until the concrete reaches a strength required to carry the concrete weight and the load applied during the construction work.

b) Time and sequence of the removal of the forms and timbering shall be subject to the approval of the Engineer.

Loading on a structure immediately after the removal of the forms and timbering shall be subject to the approval of the Engineer.

5.13 Finishing

1) General

When the uniform appearance should be obtained on the exposed surface, special attention shall be given to place the concrete for the predetermined section continuously without changing the materials, proportions and the method of the placement.

2) Surface Note Facing Sheathing Boards

a) Surface of the concrete compact and approximately leveled to the required level and shape shall not be finished until the water coming out ceases and is removed.

b) Cracks formed after finishing but before hardening shall be removed by tamping or re-finishing.

3) **Surface Facing Sheathing Boards**

a) Concrete which will be exposed shall be placed and compacted in such a manner that the surface solely composed of mortar will be secured.

b) Projections and lines formed on the surface of concrete shall be removed to ensure surface flatness. Honeycombs and chipped places shall be removed and the surface shall be moistened and patched with appropriately proportioned concrete or mortar to be finished flat.

c) Cracks formed after the removal of the forms due to temperature stress, drying, shrinkage, etc. shall be repaired as directed by the Engineer.

5.14 **Tests**

Contractor shall submit to the Engineer six copies of reports as directed by the Engineer.

1) **Test of Material**

a) All the materials (cement, water, fine aggregate, coarse aggregate, reinforcement, admixture, etc.) to be used shall be approved by the Engineer after the Contractor submits the test results.

b) The testing method shall comply with relevant ASTM Designation or equivalent.

2) **Tests of Concrete**

Materials of concrete, reinforcement, equipments, and workmanship shall be controlled to produce reinforced concrete of the required quality economically.

a) During construction the following tests shall be carried out as directed by the Engineer.

i) Slump test

ii) Temperature test

iii) Compression test of concrete

Samples for compression tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 100m3 of concrete, nor less than once for each 450m2 of surface area for slabs or wall.

b) In order to determine the suitability of the curing method and the time to remove the forms, and in order to certify the safety for early loading, strength tests shall be performed on specimens cured under the conditions as similar as possible to those of the concrete at the site. Should the result of the test indicate that the obtained strength of the specimen is much smaller than that of the specimens cured under the control condition; the method of curing at the site shall be changed as directed by the Engineer.

c) For compression test of concrete, minimum six (6) test specimens shall be required with a minimum of one set of samples per concrete, pour from a randomly selected batch of concrete, taken at point of discharge from mixer or truck, cured under standard conditions.

Three (3) specimens shall be tested for seven (7) or fourteen (14) days strength, the remained three (3) specimens shall be tested for twenty-eight (28) days strength.

d) Should it become necessary after the completion of the work, non-destructive test of concrete or tests on concrete specimens cut out from the structure shall be carried out.

The expenses for the above tests shall be included in the unit prices.

3) **Control of Concrete by Compressive Strength**

a) Control of concrete by compressive strength shall be based on 28 days compressive strength. Specimens, in this case, shall be taken in such a manner that they will represent the concrete of the structure for at least each separate pour.

b) Test results of compressive strength to be used for the control of concrete shall generally be considered satisfactory if arithmetic average of strength tests for specimens taken from the same batch, equals or exceeds specified compressive strength and not individual strength test falls below specified compressive by more than, 35 kg/cm2.

4) **Inspection of Quality of Concrete**

a) The Contractor shall submit to the Engineer the results of the tests of concrete obtained according to the quality control test in the preceding paragraph 5.14 (2)&(3) and obtained approval of the Engineer.

b) When the results of tests show that the strength of any concrete is below the minimum specified, Engineer may give instructions for the whole or part of the work concerned to be removed and be replaced at the expense of Contractor. The Contractor's Works which has to be removed and replaced as a result of the defective concrete. If any concrete is held failed, Engineer may order the proportions of that class of concrete to be changed in order to provide the specified strength.

5) **Test of Reinforcement Bars**

In the case where there is no test certificate of reinforcement bars (mill sheet) or in case the Engineer deems necessary, the Contractor shall carry out the characteristics and strength test of reinforcement bars and obtained approval from the Engineer for its use.

a) **Test Method**

Test method shall conform to the relevant ASTM Designation or equivalent, unless directed otherwise by the Engineer.

b) **Report**

The result of the tests shall be reported to the Engineer without delay.

5.15 **Inspection**

1. **General**

The inspection and tests specified herein shall include the following:-

a) Volume of work executed

b) Inspection and test of construction materials

c) Inspection of reinforcement bar assembly

d) Inspection of forms

e) Inspection of the lines, grades and dimensions of the structures

f) Identification test of the quality of concrete at site (cast-in-place concrete).

g) Other tests and inspections required according to pertinent regulations, codes and standards or as deemed necessary by the Engineer.

The following tests and inspections shall be executed in the presence of the Engineer.

i) Strength test of reinforcement steel

ii) Compression test of concrete

iii) Other tests and inspections the Engineer deems necessary.

2) **Inspection of Reinforcement Bar Assembly**

Prior to placement of concrete, the Engineer shall inspect reinforcement bar assembly to confirm the classification and diameter of reinforcement bar, space between reinforcement, length of lap joint and covering etc. are according to the Drawings.

3) **Inspection of Forms**

Prior to placement of concrete, the Engineer shall inspect the form work and shall give approval for concreting.

4) **Inspection of the Dimensions of the Structure**

Inspection of the dimensions of the structures shall be made as required by the Drawings.

Concrete work shall not exceed, in general, the tolerance limits specified below:

a) Variation from plumb or specified batter for surface of stems and lines.

i) In any 3.0 m of length 5 mm

ii) Maximum for the entire length 15 mm

b) Variation from the level for slabs

i) In any 3.0 m of length 5 mm

ii) In any 6.0 m of length 8 mm

iii) Maximum for the entire length 15 mm

c) Variation in cross sectional dimensions of stems and thickness of slabs.

i) Minus 5 mm

ii) Plus 10 mm

d) Variation and level specified at tope of foundations.

i) Minus 10 mm

ii) Plus 10 mm

e) Variation in protective covering of reinforcement steel.

i) With cover of 40 mm or less -5 mm

ii) With cover more than 40 mm -10 mm

f) Variation from effective depth of reinforcement steel. 20 mm

6 CABLE TRENCH WORK

6.1 General

The Contractor shall provide all cable trenches leading from the outdoor equipment in the switchyard to the indoor equipment in the buildings as shown in the Drawings.

The design shall cover the following requirement.

1) The design of cable trenches shall be similar to the design shown in bidding documents and with draining system.

2) Cable trenches shall be made of complete monolithically reinforced concrete work. Each type of cable trench shall be provided with expansion joint at intervals of max. 20 linear meter.

3) All trench covers shall be of reinforced concrete to withstand a load of 300 kg at the centre except those at road crossing which should withstand a load of 5 tons at the centre.

4) The trench covers shall be of such size as to facilitate their handling by manual labour.

5) Trenches in substation will be built with the top of the trench cover 150 mm above the gravel level or as shown in the bid drawings.

6) The trenches shall be connected to a drainage system, designed and constructed by the Contractor in such a manner that sub-oil water due to water logging cannot enter the trenches and rain water collecting in trenches is drained out efficiently. The drainage system for trenches shall be designed with proper slope for flow of water, entering the trenches.

7) All cable trenches shall set on a layer or leveling concrete of thickness 100 mm.

8) Cable trays shall be provided in trenches at adequate intervals horizontally and with sufficient vertical spacing between trays to freely accommodate the cables, Plenty of working space shall be provided for handing the cable during installation and maintenance.

9) Each trench shall have two sections, one to accommodate cables for primary and other for secondary protection system. The later shall also accommodate power cables.

10) Trench-road & trench-trench crossings shall be culvert type and so designed that plenty of space is available for handling the cables during installation, future requirements of bays and maintenance at these crossings. Proper water drainage system shall also be designed on these crossings.

11) Trench entrances into the buildings shall be designed to seal off entry of any water or vermin and pests into the building through these entrances.

12) The trench covers shall be upper covers type for trench-road-crossings where embedded covers shall be used.

13) Small openings shall be provided in the walls of cable trenches as required for entry of cable carrying pipes during construction stage which shall be sealed later with appropriate sealing compound as approved by the engineer. The appropriate measures shall be adopted to protect these pipes against corrosion and damages. All joints of these pipes shall be properly sealed to prevent/ingress of subsurface water.

6.2 **Inspection**

The Engineer shall inspect the cable trenches as for the compliance of the specifications and drawings approved by the Engineer.

7. **GRAVEL PAVEMENT WORK**

The Contractor shall provide a blanket of river run gravel in the switchyard area along equipments foundation and as shown in the drawings.

A 200 mm layer of hard, durable, gravel shall be provided by the Contractor in the switchyard area around the equipments above the reference ground level. The size of gravel shall generally vary from 20 to 75mm. The material shall be placed to its full thickness of 200 mm in one layer and in such manner as to avoid displacing the under-laying material. The material shall not be compacted.

The gravel shall conform to the following gradation limits, unless otherwise specified.

U.S. Standards Sieve Designation	**Percentage Passing by Weight**
(3 inch) 75 mm	100
(2 inch) 50 mm	85-100
(3/4 inch) 20 mm	0-10

Crushed rock shall not be allowed, the gravel which shows any sort of chemical reaction as per site conditions shall also be not allowed. Contractor shall get the approval of the source of supply from the Engineer prior to placement of gravel.

8. **ROAD WORK**

The Contractor shall prepare roads in the substation as shown on the drawings. Proper slopes shall be maintained.

8.1 **Foundation for Road**

1) **Sub-Grade Work:** Any excavation required for sub-grade construction shall be carried out in accordance with the respective provisions in the clause for earth work.

The materials required for banking and displacement shall be so placed that the finished thickness of one layer after compaction will become 20 cm or less. The sub grade should be compacted with sheep foot roller or 8 to 10 Ton Roller as approved by the Engineer.

2) **Sub-Base Course Work:** The material to be used for sub-base course shall be as approved by the Engineer. The Contractor shall submit a report concerning the quality of materials and the method of sampling to the Engineer for approval.

3) **Testing:** The sub-grade surface shall be finished by proof rolling in order to obtain the contract pressure sufficient to permit smooth traffic of vehicles of 8 tons or over.

Should any defects be detected as a result of proof rolling, such defective sub-grade surface shall be finished again to the satisfaction of the Engineer.

4) **Inspection**

a) **Sub-grade:** The finished sub-grade surface shall be within ± 5 cm of the design elevation.

b) **Sub-base:** The finished sub-base course shall be within –10 mm and + 5mm of the design elevation.

8.2 Asphalt Concrete Pavement

1) Material

a) Asphalt

Bituminous material shall be used in the design of Asphalt Concrete Pavement Work.

The asphalt material shall conform to the requirements of AASHTO M-20, M-81, M-82 and M-40. The type shall be as directed by the Engineer.

b) Fine Aggregate

Fine aggregate passed a 2.5 mm sieve and shall be clean, strong, hard, durable, suitable graded and free from injurious amounts of dust, mud organic impurities, salts etc.

Soundness test result of aggregate retained on a 0.3mm sieve should be less than 12%.

c) Coarse Aggregate

Coarse aggregate which retained on a 2.5 mm sieve, and shall be clear, strong, hard, durable, suitably graded and free from injurious amount of flakes, elongated pieces, organic impurities, salts etc.

Coarse aggregate for pavement shall comply with the following requirements.

i)	Specific gravity	more than 2.5
ii)	Absorption value	less than 3.0%
iii)	Percentage wear	less than 35.0%
iv)	Soundness test	less than 12.0%
v)	Content of shale and soft fragment of stone	less than 5.0%
vi)	Content of slender and thin fragment of stone	less than 25.0%

Note: Ratio of longer width and the other is more than three times, and on thin fragment ratio of thickness and width is more than three times.

d) Filler

Particles of stone means the material which was crushed a limestone or igneous rock and water content of filler shall be less than 1%.

Grading range of the filler shall comply with the following requirements.

Sieve	**Percentage Passing**
0.6 mm	100%
0.15 mm	90-100%
0.074 mm	70-100%

2) Storage of Material

a) Asphalt

Asphalt shall be stored in exclusive tank.

b) **Aggregate**

i) Storage facility of aggregate shall be equipped with a suitable drainage system

ii) Fine aggregate, coarse aggregate and other aggregate of different type and grading shall be separately stored with divides between each.

iii) When receiving, storing and handling aggregate facilities shall be well maintained and handling shall be carefully performed so that no segregation of large particles from small ones may occur, no foreign materials may become mixed, or in case of coarse aggregate, no particles may be crushed.

iv) During storage of fine aggregate, water contents should not change rapidly.

3) **Mix Proportions:** Mix proportions for the dense grade asphalt concrete shall be determined in such a manner that the test piece which conform stability flow value, percentage of void and degree of saturation by marshal testing of the asphalt volume at intervals of five percentage and submit such data in writing to the Engineer for approval.

Material for dense grade asphalt concrete, shall in principle, comply with the following requirements .

a) Thickness of surface shall be 5 cm

b) Maximum size of aggregate shall be 20 mm:

Material Size	**% age Passing**
25	100
20	90 - 100
13	75 - 90

c) Weight percentage of those passing a sieve:

Material Size	**% age Passing**
5	45 - 65
2.5	35 - 50
0.6	18 - 29
0.3	10 - 21
0.15	6 - 16
0.075	4 - 8

d) The volume of asphalt 5 – 7 %

e) Penetration test 80 - 100

Percentage of passing weight:

(on permissible error)

5 mm	+ 5 %
2.5 mm	+ 4 %
0.56 mm, 0.3 mm, 0.15 mm	+ 3 %
0.075 mm	+ 1.5 %

Percentage of asphalt volume + 0.3 %

4) **Working:** Asphalt concrete shall be placed on the clean and completely dry base course. The temperature in the working area shall not be less than 20 deg. C for at least one hour prior to the commencement of operations.

Asphalt concrete layer shall be compacted up to 95% maximum dry density. Curing period shall be minimum 24 hours and during this period no traffic shall be allowed to move on the road.

5) **Testing:** The marshal test shall be observed in the dense grade asphalt concrete for surface.

On standard values of marshal testing.

Soundness	more than 600
Value of flow	20 – 40%
Porosity	75 – 85%
Submerged marshal retained soundness	more than 75%

6) **Inspection:** Inspection of surface shall comply with following requirements.

Thickness of surface	10 – 15 %
Profile index part of each work	less than 5%

The mixture shall be spread uniformly, rolled and finished into the specified thickness. Then the finished surface shall be measured in parallel to the center line of the load by using a 3-meter straight line ruler. In this case, the depth of any case section shall not exceed 5mm.

8.3 **Reinforced Concrete Pavement/Service Road**

1) **Material**

a) Cement, water, fine aggregate and coarse aggregate shall be in accordance with the clause “Material for Reinforced Concrete”.

b) Water reducing agent shall conform to the standards for water reducing agent by relevant ASTM Designation or approved equivalent.

c) Reinforcement steel shall be deformed bars conforming to ASTM 615-96a grade –40 or equivalent as approved by the Engineer.

d) The Contractor shall submit the report of tests for quality of the materials as directed by the Engineer for his approval.

e) If on receipt of tests from laboratory any change is observed in material, the matter shall be referred to the Engineer for his approval.

2) **Concrete Mix:** The following requirements shall be observed in concrete pavement.

a) The bending strength at 28 days of concrete is 45 kg/cm^3 and this test shall, in principle, be performed in accordance with relevant ASTM Designation or approved equivalent.

b) Maximum size of coarse aggregate shall be 40 mm.

c) Consistency in concrete shall be less than 2.5 cm by slump test and initial setting time is 30 sec.

d) Air content shall be between 3 to 6 percent.

3) **Form Work** Form material shall be straight and have width for designed thickness of pavement which is more than 3m in length, and it shall be fixed on the position in accordance with the drawings.

4) **Detachment of Form:** It shall not be detached within 20 hours after concrete placing. However, if increase in concrete strength delays under certain conditions, approval of removing forms shall be given by the Engineer.

5) **Joint:**

a) The joints shall be provided at appropriate locations as per relevant standards

b) Flouring of joint shall be done after form is cleaned up and dried sufficiently.

6) **Placing:** Placing for concrete pavement shall, in principle, be in accordance with clause 5.6 Conveying and Placing of Reinforced Concrete".

7) **Installation of Reinforcement:** Mesh and reinforcement bar shall be set correctly at a position designated as shown in the drawings.

8) **Finishing:** Finishing of surface shall be done after leveling and compaction of concrete.

9) **Curing:** Curing of concrete pavement shall, in principle, be in accordance with clause 5.9 "Curing" of Reinforced Concrete Work.

10) **Testing:** The Contractor shall submit to the Engineer six copies of report on these tests.

a) During placing of concrete following tests shall be carried out as directed by the Engineer.

i) Slump test

ii) Temperature of concrete

iii) Compression/bending test

The test of concrete shall be executed not less than once for each one hundred (100) cubic-meters of concrete to be poured on the same day with a minimum of one set of samples per concrete pour.

b) **Test of Material**

Coarse aggregate shall provide limit of wear reduction maximum 30 by Loss Angeles test of ASTM Designation.

11) **Inspection:** Finishing of concrete pavement shall meet the following requirements.

Profile index	Less than 10
Difference from maximum height	Less than 3 cm
Difference at two points picked up arbitrarily at intervals of 20 cm.	Less than 1 cm

Joints shall not have the difference of more than 3 mm between adjoining pavement slab by measurement rectangularly against inclination with a 3 m ruler and the depth of any section shall not exceed 5 mm.

9. BRICK WORK

1) Prior to commencing the brick masonry work, the surface of brick shall thoroughly be cleaned and sufficiently moistened in order to ensure smooth adherence of

mortar to the brick surface. Ist class bricks shall be used which shall be approved by the Engineer.

2) The masonry joints shall in principle be 10 mm in thickness and mortar (1:3 c/s ratio or as shown in drawings) shall be filled sufficiently between each masonry joint in order to eliminate any void between brick and mortar.

10. DRAINAGE WORK

1) The drainage work shall be carried out in conformity with standard practices “Earth Work” and “Reinforced Concrete Work” shall be as per Clause-4 & Clause-5 respectively described here above.

2) The water-plumbing facility for drainage shall be of such a system as not to cause any trouble against the surrounding area and structures. The Contractor shall submit the design and execution schedule for the water plumbing work to the Engineer for approval.

11. FENCE WORK

1) The design of fence shall conform to the drawing included in Volume-III of Bidding Documents.

2) The galvanized iron shall be used in accordance with ASTM Designation or equivalent.

3) Construction of fence, welding shall comply with ASTM Designation or equivalent.

12. BUILDINGS

12.1 Control House Building

Contractor shall construct Control House Building (CHB) complete with covered area as shown in the drawings. The building shall be provided with split type air-conditioning units as approved by FEDMIC Engineer.

In addition to the consideration of heat dissipation from the relay and control panels being installed, the future installation of panels shall also be considered for heat dissipation in designing the air-conditioning system with the approval of the FEDMIC Engineer.

All the buildings shall be designed and constructed as reinforced concrete frame structure with RCC Columns and beams at plinth and at each roof level and beams will connect all periphery Columns / Grids & RCC roof slab. Any concrete to be used for structure shall conform to the relevant specifications of this section. Specifications of the material and workmanship shall apply for the building as noted in this section.

Toilet shall be finished with glazed ceramic tiles on the floor and up to height of 2 meters on the walls. Electric geyser of 50 gallons in toilet shall be provided or as approved by the Engineer. An overhead water storage tank of min. 200 gallons capacity shall be provided for storage of water.

12.2 Walls

All walls to be erected between the concrete columns shall be of brick masonry with cement sand mortar, plastered on both sides with mortar as shown in the relevant drawings.

12.3 Roof

All roofs of concrete slab shall also be covered with bitumen felts and thermal insulation material with one (1″) inch thick Jamboolan board in addition to other roofing layers.

12.4 Ceiling

Ceiling shall not be plastered and be provided fair faced. False ceiling shall be provided in the Control Room and wherever required as shown in the drawings. Design and materials for the false ceiling shall be subject to approval by the Engineer.

12.5 Floors

Terrazzo floors/ Tiles shall be provided in all rooms except acid resistance tiles in Battery Room as shown in the drawings. The surface of floor exposed to extremely heavy wear and tear shall be improved by additives against abrasion.

12.6 Earthing

The described indoor equipment, cable ducts, buildings, itself, etc. must be connected to the common Earthing system.

12.7 Doors and Windows

All doors, windows and other frames etc. to be installed in the building shall be made of Anodized Aluminum metal. Windows shall be provided with aluminum wire gauze mesh on inside and window blinds, steel safety grill should be provided inside as per drawing and instruction of the Engineer. All sections of frames etc. shall be subject to the approval of the FEDMIC Engineer.

PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF NEW 132 kV AIS GRID STATION NO. 02 WITH TWO NOS. 31.5/40 MVA POWER TRANSFORMERS AT M3 INDUSTRIAL CITY, NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD
PROCUREMENT NO. FIC-GS-02 (R-I)

LIST OF NTDC/FESCO SPECIFICATIONS

Sr. No.	Description	Specification Number
1	Specification for Procurement of Power Transformers	P-46:2008
2	Specification for 132 kV, 66 kV and 33 kV Circuit Breaker	P-193:2007
3	Specification for 145 kV, 72.5 kV & 36 kV AC Bus and Line Disconnectors (Isolators)	P-128:2011
4	Specification for Current Transformers (145 kV, 72.5 kV & 36 kV)	P-90:2012
5	Specification for Voltage Transformer	P-129:1985
6	Specification for Procurement of 11 kV Capacitor Bank & Control Equipment	P-165:1989
7	Specification for Procurement of 132 kV Metal-Oxide (Gapless) Surge Arresters	P-181:2005
8	Specification for 11000 V Metal Clad Switchgear	P-44:1996
9	Specification For Procurement Of 15 kV XLPE Power Cables & Termination Kits	P-29
10	Specification For Procurement of Control Cables	P-100:2005
11	Specification For Procurement of Three Phase Pad Mounted 11,000/415 Volts Transformers	DDS-71:2004
12	Specification For Procurement of Station Batteries	P-132:1988
13	Specification For Standard Type Control and Relay Panels	P-149:1995
14	Specification For Procurement of 132 kV Control and Relay Panels	P-151:2008
15	Specification For Procurement of Steel Nuts and Bolts (Inch Series)	P-19:1983
16	Specification For Procurement of Tension Strings	P-143:1982
17	Specification For Procurement of Suspension Strings	P-140:1982
18	Specification For Procurement of Thermite Joints for Substation Earthing	P-114:1982
19	Specification For Procurement of Copper Wire for Earthing	P-16:1968
20	Specification For Procurement of Earth Rod	P-166:1981
21	Specification For Procurement of Galvanized Steel Wire	P-12:1980

FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY

BIDDING DOCUMENT NO: GS-AIIC-02 (R-I)
Single Stage - Two Envelope Bidding Procedure

FOR

PROCUREMENT OF PLANT, DESIGN, MANUFACTURE, SUPPLY, CIVIL WORKS, INSTALLATION, ERECTION, TESTING & COMMISSIONING FOR THE CONSTRUCTION OF

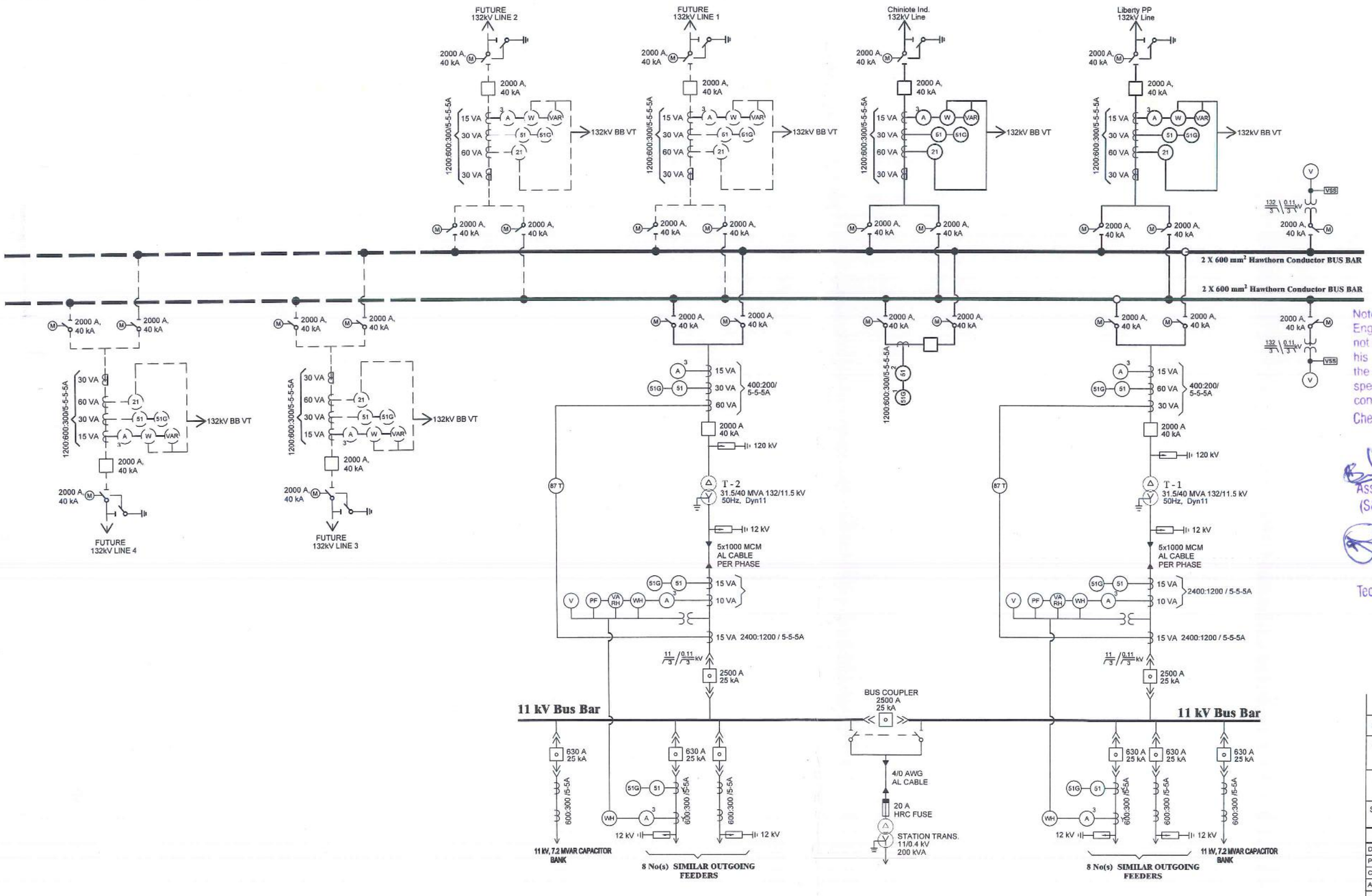
NEW 132 kV AIS GRID STATION NO. 02
AT ALLAMA IQBAL INDUSTRIAL CITY (AIIC), NEAR SAHIANWALA INTERCHANGE, M-4 MOTORWAY, FAISALABAD.

REVISED (APRIL– 2024)

VOLUME – III
BIDDING DRAWINGS
BIDDING DOCUMENT NO.: GS-AIIC-02 (R-I)

CONSULTANT

EnMasse (Pvt.) Ltd
Address: 18, Block E-2, Johar Town, Lahore.
Tel: 042- 35314701-02
E-mail: enmasse@enmassepakistan.com
Web: www.enmassepakistan.com



LEGEND :-

- ISOLATOR (MOTOR OPERATED)
- EARTHING SWITCH
- POWER CIRCUIT BREAKER
- DRAW OUT TYPE CIRCUIT BREAKER
- CURENT TRANSFORMER
- POTENTIAL TRANSFORMER
- LIGHTNING ARRESTOR
- POWERCABLE
- TWO WINDING TRANSFORMER
- RELAY (NO IN SYMBOL INDICATES IT FUNCTION)
- 51 OVER CURRENT RELAY
- 51G EARTH FAULT RELAY
- 21 DISTANCE RELAY
- 87 T DIFFERENTIAL RELAY (TF)
- A AMMETER (7 Nos)
- W WATT METER
- VAR VAR METER
- V VOLTMETER
- VARH VAR HOUR METER
- WH WATT HOUR METER
- HRC FUSE
- PF POWER FACTOR METER
- VSS VOLTAGE SELECTOR SWITCH
- PROPOSED
- FUTURE

Note: Engineer's approved does not relive the contractor of his responsibility to execute the work as per standard specifications and contract provisions.

Checked & Recommended by
Asst.Dir. (S&D)
Dy. Dir. (S&D)
Approved by
Director (S&D)
Technical Services Directorate
FESCO, Faisalabad

FOR TENDER PURPOSE ONLY

NO.	DATE	REVISION

CLIENT:- FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY(FIEDMC)

CONSULTANT :- EnMasse

SCOPE OF WORK
2 NOs 132/11.5 kV, 31.5 /40 MVA T/F & 2 NOs 132 kV LINE BAYS

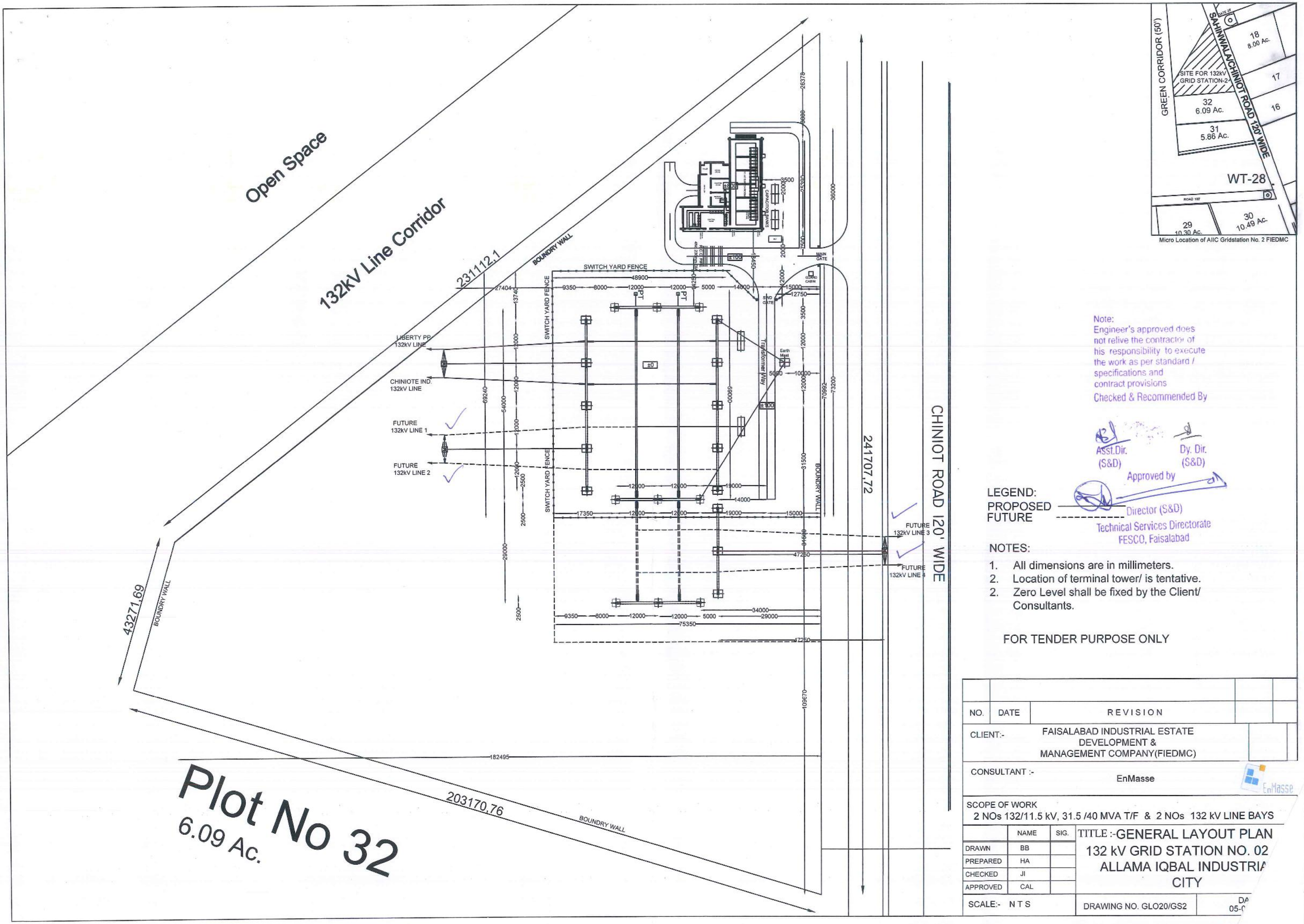
	NAME	SIG.
DRAWN	BB	
PREPARED	HA	
CHECKED	JI	
APPROVED	CAL	

TITLE :- SINGLE LINE DIAGRAM 132 kV GRID STATION NO. 02 AT ALLAMA IQBAL INDUSTRIAL CITY

SCALE:- N T S

DRAWING NO. SLD20/GS2

DATE 04-03-2023



Micro Location of AIIC Gridstation No. 2 FIEDMC

Note:
Engineer's approved does not relive the contractor of his responsibility to execute the work as per standard / specifications and contract provisions

Checked & Recommended By

Asst.Dir. (S&D)

Dy. Dir. (S&D)

Approved by

Director (S&D)
Technical Services Directorate
FESCO, Faisalabad

LEGEND:
PROPOSED
FUTURE

NOTES:

1. All dimensions are in millimeters.
2. Location of terminal tower/ is tentative.
2. Zero Level shall be fixed by the Client/ Consultants.

FOR TENDER PURPOSE ONLY

NO.	DATE	REVISION

CLIENT:- FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY(FIEDMC)

CONSULTANT :- EnMasse

SCOPE OF WORK
2 NOs 132/11.5 kV, 31.5 /40 MVA T/F & 2 NOs 132 kV LINE BAYS

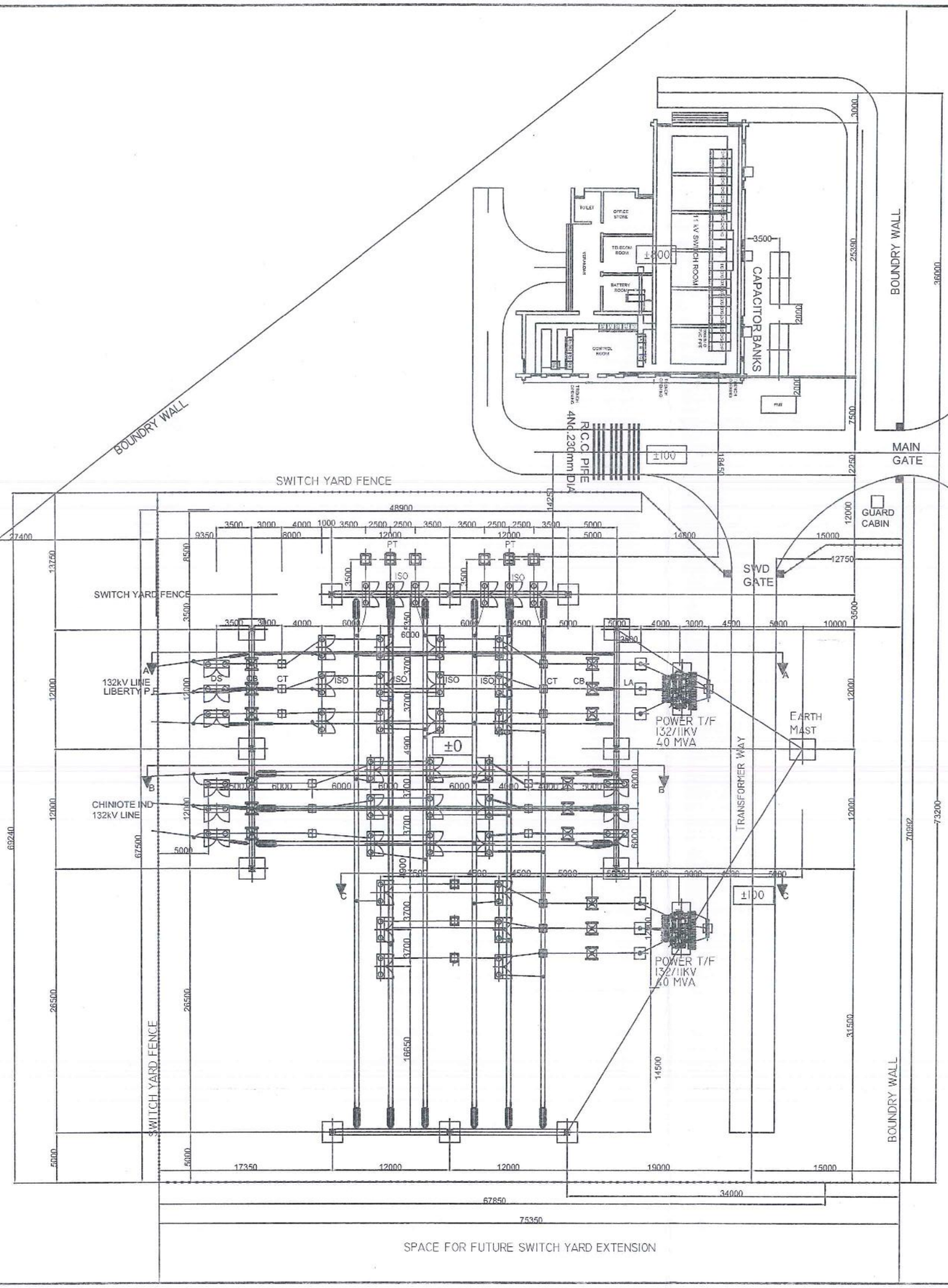
	NAME	SIG.
DRAWN	BB	
PREPARED	HA	
CHECKED	JI	
APPROVED	CAL	

TITLE :-GENERAL LAYOUT PLAN
132 kV GRID STATION NO. 02
ALLAMA IQBAL INDUSTRIA CITY

SCALE:- N T S

DRAWING NO. GLO20/GS2

DA 05-0



Note:
Engineer's approved does not relive the contractor of his responsibility to execute work as per standard specifications and contract provisions

Checked & Recommended by

(S&D) (S&D)

Approved by

Director (S&D)
Technical Services Directorate
FESCO, Faisalabad

NOTES:

1. All dimensions are in millimeters.
2. Location of terminal tower is tentative.
2. Zero Level shall be fixed by the Client/ Consultants.

FOR TENDER PURPOSE ONLY

NO.	DATE	REVISION

CLIENT:- FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY(FIEDMC)

CONSULTANT :- EnMasse

SCOPE OF WORK
2 NOs 132/11.5 kV, 31.5 /40 MVA T/F & 2 NOs 132 kV LINE BAYS

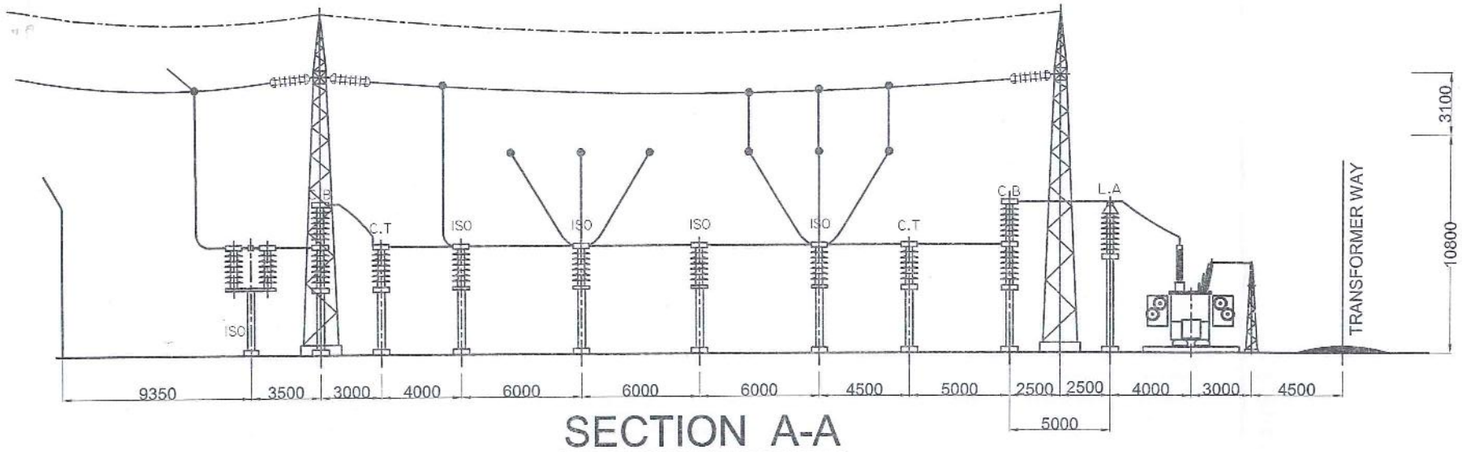
	NAME	SIG.
DRAWN	BB	
PREPARED	HA	
CHECKED	JI	
APPROVED	CAL	

TITTLE:-
SWITCHYARD LAYOUT PLAN
132 kV GRID STATION NO. 02 AT
ALLAMA IQBAL INDUSTRIAL CITY

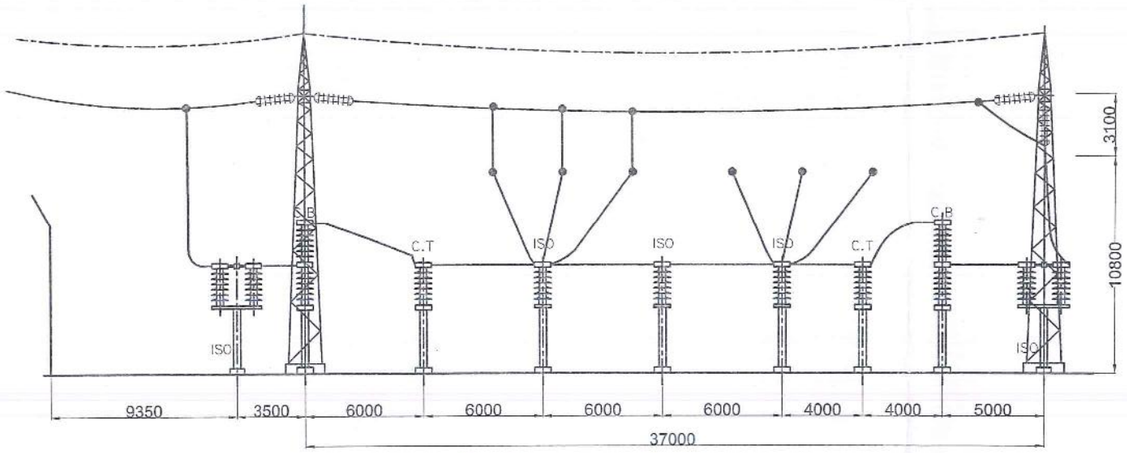
SCALE:- N T S

DRAWING NO. SLO21/GS3

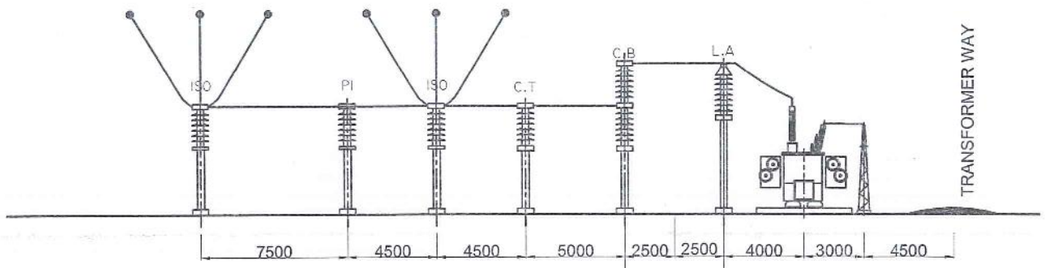
DATE 05-03-2023



SECTION A-A



SECTION B-B



SECTION C-C

Note:
Engineer's approved does not relive the contractor of his responsibility to execute the work as per standard / specifications and contract provisions

Checked & Recommended By

Asst Dir. (S&D)

Dy. Dir. (S&D)

Approved by

Director (S&D)
Technical Services Directorate
FESCO, Faisalabad

NOTES:

1. All dimensions are in millimeters.
2. Location of terminal tower is tentative.
2. Zero Level shall be fixed on drawing by the Client/ Consultants.

FOR TENDER PURPOSE ONLY

NO.	DATE	REVISION		

CLIENT:- FAISALABAD INDUSTRIAL ESTATE DEVELOPMENT & MANAGEMENT COMPANY(FIEDMC)

CONSULTANT :- EnMasse

SCOPE OF WORK
2 NOs 132/11.5 kV, 31.5 /40 MVA T/F & 2 NOs 132 kV LINE BAYS

	NAME	SIG.
DRAWN	BB	
PREPARED	HA	
CHECKED	JI	
APPROVED	CAL	

TITLE :-
SWITCHYARD SECTION
132 kV GRID STATION NO. 02 AT
ALLAMA IQBAL INDUSTRIAL CITY

SCALE:- N T S

DRAWING NO. SWS20/GS2

DATE
22-02-2023